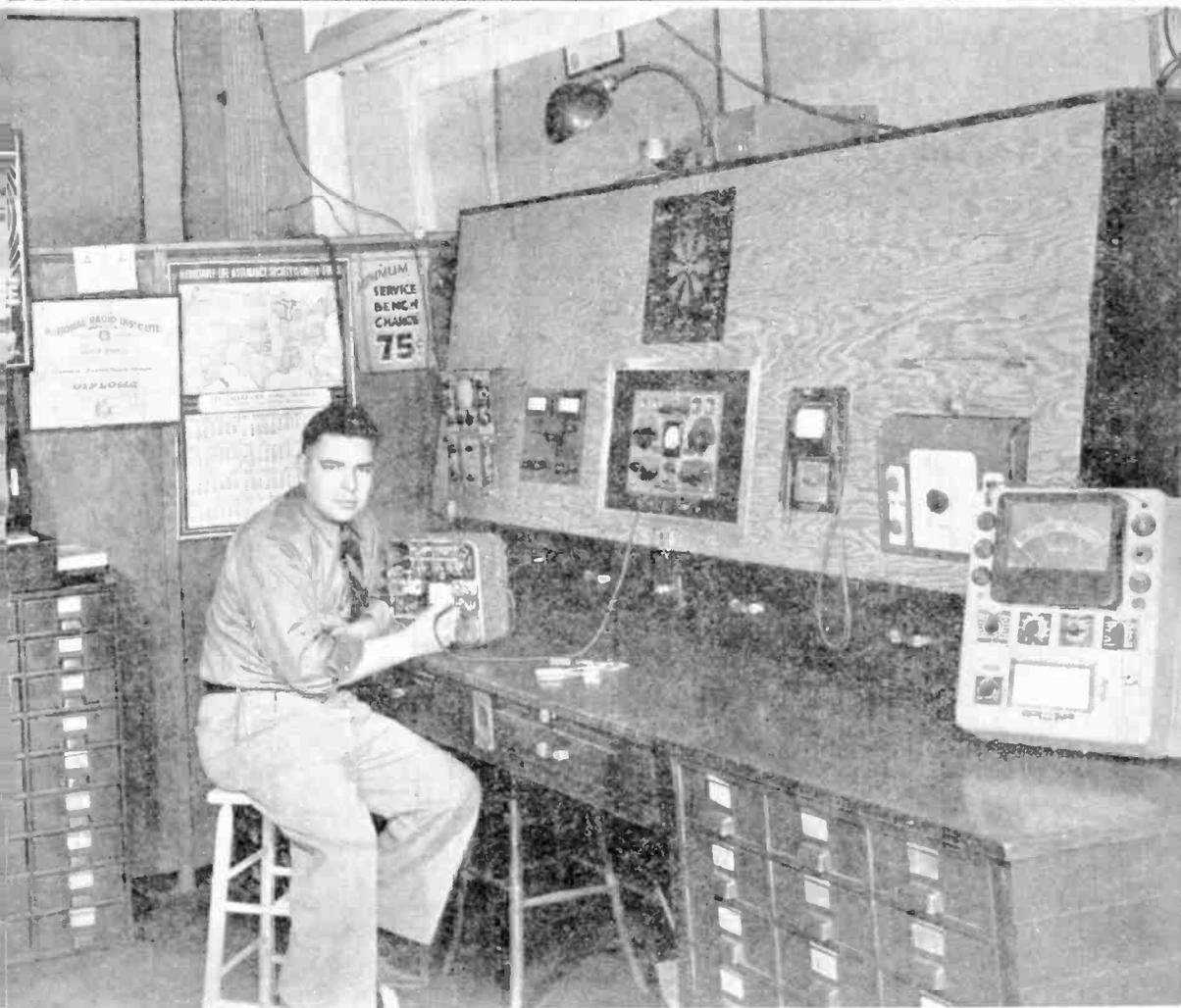


NATIONAL RADIO NEWS



IN THIS ISSUE

What About the Future of Radio
Electronics, Inc.
Alumni Association News

OCT.-NOV.
1940

VOL. 9
NO. 5



Honesty IS the Best Policy

We were all taught in childhood that "Honesty is the best policy." As we grew older we heard and read things which sometimes caused us to wonder whether this is strictly true or if it is just a pious statement handed down by some who assume respectability but do not always practice what they preach. But in time we learned that while an occasional man makes a little money by shady practices, the really sound successes are built upon a foundation of integrity.

Many years ago, even before the days of Radio, I attended a political rally. Men were debating the merits of their party candidates. I remember one man who talked for about fifteen minutes. His object was to convince his listeners that his candidate was inherently honest. He dwelt at great length on that one point. He made quite an impression.

Then came the time for a man on the other side of the political fence to speak. He said, "My friend has used all of his time in an effort to convince you that his candidate is honest. I feel that he has told you little of importance—not that we are unwilling to concede that his candidate is honest but because I feel you will agree with me that it is no credit to a man to say that he is honest—*he is supposed to be honest.*" With that simple truth he swept aside, in a few words, all the effect of what the other man had spent fifteen minutes to build up.

In the radio business, as in most businesses, here and there some tricky fellows will pop up with unethical methods for the purpose of gaining a few dollars. Shun these practices like you would the plague. Don't feel that you must meet this competition if it is not strictly honest. Your neighbors will catch up with these unscrupulous fellows soon enough. No man can stay in business long who does not have the full confidence of everyone in his community.

I want every man who carries the stamp of approval of the National Radio Institute to uphold the dignity of the Radio profession and of this institution. N.R.I. men are taught to conduct their business affairs in a manner which must be above reproach. We insist upon that principle, for only through strictly ethical practices is an N.R.I. man worthy of the high regard in which our graduates are held.

"Honesty is the best—and only policy" in life and in business.

J. E. SMITH, *President.*

What About the Future of Radio

By STUART M. ARMSTRONG

N.R.I. Registrar



Stuart M. Armstrong

CAN you remember some of the things you did, say twelve or fifteen years ago?

Remember the struggles you went through manipulating the complicated controls of those very expensive, un-beautiful, battery operated Radio receivers in order to get squealing, hissing, fading programs?

While you were fooling with one of those contraptions, what if someone had predicted that by 1940 your Radio could be a beautiful piece of furniture, which would bring in broadcasts from all over the world, and could be bought for about one-tenth the price of a good 1925 set?

What if that person had prophesied that by 1940 you could merely plug in an inexpensive receiver, select your station by pressing a button, then hear music and voice as clearly and naturally as if the performers were in the next room?

What if he had talked on, and told you that by 1940, Radio would be a billion dollar industrial giant—employing thousands upon thousands of technicians—producing services which influence the opinions and guide the actions of millions of people the world over?

Twelve or fifteen years ago, you probably would have found such predictions hard to believe. You might have questioned the good judgment of any person who expressed such highly optimistic, exaggerated opinions.

It is for this reason that I hesitate to make many statements about what I believe Radio will accomplish during the coming five or ten years. I even hesitate to say what developments I believe will take place within the next twelve months.

So incredibly **MANY** things are entirely possible and probable that even conservative predictions about the future of Radio may sound fantastic, wild and unbelievable.

For Radio is not bound by any limits of stone, metal or wood—not even by the earth, the winds or the waters. Radio is limited **ONLY** by the ability of free and energetic men to dream, and think, and do.

Let your own imagination give you some ideas about the future wonders of Radio.

And when you start thinking about what you believe Radio will accomplish in the years to come, let your judgment be partially based upon the record so far established by Radio. Keep in mind some of the advances made by Radio during the past eighteen or twenty years.

Growth of Radio in 20 Years

For instance, it was only twenty years ago—November 2, 1920—when the first regular schedule of broadcasting was started by KDKA in Pittsburgh. That same year, WWJ in Detroit

also initiated a schedule of daily broadcasting.

Only nineteen years ago, on July 2, 1921, the broadcasting of sports events got started when Major J. Andrew White described the Dempsey-Carpentier fight from Boyle's Thirty Acres in Jersey City. That same year, the American Radio Relay League held its first annual convention—and stations WBZ, WJZ and KYW went on the air.

A short eighteen years ago, in 1922, there were just 30 broadcasting stations in existence in the United States. Today there are 814. In 1922, there were less than one-half million Radio sets in use—while today the U. S. public owns well over forty-five million receivers!

From \$60,000,000 to \$375,000,000

And let's see what people are willing to pay for Radio. In 1922, the total sales of broadcast receivers, tubes, batteries and parts brought the sum of \$60,000,000. Last year that figure reached \$375,000,000—an increase of three hundred fifteen million dollars.

Last year, counting in sale of time, talent cost and Radio servicing costs, the U. S. public paid for Radio the staggering total of \$814,000,000. Radio has almost climbed to the billion dollar a year mark.

Here's another interesting point—an unusual coincidence: the total money spent in the U. S. for receivers, tubes, batteries and parts was \$60,000,000 in 1922. But in 1939, the U. S. public paid \$60,000,000 for the servicing of Radio sets alone.

Several other things happened in Radio in 1922—only eighteen years ago—which should be noted here. Only eighteen years ago, two-way Radio conversation from ship-to-shore was first established; stations WGY and WEAJ went on the air; the superheterodyne as a broadcast receiver was first demonstrated; the first football game was broadcast; the New York Philharmonic Orchestra broadcast for the first time; and the first "chain" broadcast was tried out, featuring a telephone tieup between New York and Boston.

Radio Is Still An Infant

Do these facts which help show you how far Radio has advanced within two decades, strike and excite your imagination as they do mine? Do they help you realize that here is an Industry which has come from almost nothing, to its present position of great prominence, while all of us were watching it? Do these facts about Radio's recent, small starting point make you feel that here is an Industry which seems to know no limitations? Here is a science which is only beginning to unfold its mysteries!

Page Four

Or would you be inclined to think that perhaps Radio has gone through its period of real glory? Possibly you have a feeling that new developments of great importance cannot be expected from now on.

If you have any inclination whatsoever to feel this way about Radio, I only ask you to remember that ever since it got properly under way, the record of Radio has been a record of unflinching progress, success and development. Something NEW is constantly being done. Something NEW is constantly being tried. And something NEW is constantly being proposed for future experimentation and development.

Radio Keeps On Moving Forward

Radio has never been satisfied to say, "now the thing is perfect—now we will stay put." Radio hardly gets one job well under way, before two bigger, more spectacular jobs are started!

Let's prove that statement by looking at a brief, partial record of the past five years in Radio.

Here are just a few of the high-lights: 1935—RCA announced it will spend \$1,000,000 for field Television tests; static-less Radio system based on Frequency Modulation demonstrated by Major Armstrong; British Government recommended that England establish Television as a public service; Scripps-Howard Newspapers enter broadcasting field; Italo-Ethiopian situation discussed for U. S. listeners directly from Addis Ababa and Rome; "Youth Sings Across Borders" program rebroadcast throughout America, with pick-ups from thirty-one countries.

1936—President addressed a joint session of Congress at 9:00 in the evening, in order that the nation might listen by Radio; Television wire circuit carried image 186 miles; Radio performed great public service during flood disasters in east and midwest; coaxial cable was developed by Bell Laboratories and Massachusetts Institute of Technology, opening new prospects for network television; Philco demonstrated television system; over \$2,000,000 spent in Radio for Roosevelt-Landon political campaign; Olympic Games at Berlin broadcast internationally through elaborate short-wave system, and 40-nation switchboard; FCC holds public hearings on proposals for super-power broadcasting stations.

Radio Helps Save Flood Victims

1937—Radio performed great humanitarian role in disastrous Ohio-Mississippi floods, and its rescue and relief broadcasts were accredited with reducing toll of life; crash of German dirigible Hindenburg described by eye witness Radio announcers; Television projected to motion picture size, 8 x 10 feet, by RCA in demonstration before Institute of Radio Engineers; facsimile tests

authorized by FCC; coronation of King George VI of England broadcast throughout the world; NBC and RCA experimented with mobile, outdoor television units, and also began tests with 411-line Television images, supplanting 343-line experiments.

1938—Major networks hailed for remarkable service they gave in covering the Sudeten crisis, from Hitler's Nuremberg speech to Munich Pact; National Association of Broadcasters selected Neville Miller as paid president at salary of \$25,000.00 per year; FCC allocated 25 ultra-high frequency bands for non-commercial educational broadcasting; RCA announced it would make television public at New York World Fair; Texas State Network of twenty-three stations organized.

1939—Congress recognized Radio on par with press and provided gallery for Radio reporters; Television sets were placed on the market, and RCA-NBC took mobile Television unit on 10-day "road show"; Yankee Network began operation of \$250,000 frequency modulated transmitter; national Radio broadcasting networks began coverage of European war crisis, which in September changed to covering World War II, and marked the beginning of a new chapter in the history of Radio Communications.

And Now—Frequency Modulation

For an example of what is being accomplished in Radio this year, consider the rapid advances made by Frequency Modulation. The Federal Communications Commission said only last April: "Frequency Modulation is highly developed. It is ready to move forward on a broad scale and on a full commercial basis. A substantial demand for F. M. transmitting stations for full operation exists today. A comparable public demand for receiving sets is predicted. The Commission has concluded that Frequency Modulation has advanced to the stage where broadcasting on a commercial basis is desirable in the public interest."

Dr. O. H. Caldwell, in his editorial in the July issue of Radio and Television Today, very ably states the present outlook for Radio when he says, "Radio is never finished. Something new is always happening. We no sooner passed through all-wave, AFC, and push-button control, than along came portables, frequency modulation and television.

"Hemmed in by no narrow limits, Radio serves every group and class. Today its appeal and interest are universal, whether it is bringing in a European news bulletin, political speeches, the music of Toscanini or the light swing of Benny Goodman. Every cross-section of American life is a pleased purchaser for our products. Where else will you find a business that combines such glamour, interest, and profit—in so glorious a mixture?

"In this year of 1940, we all count ourselves fortunate to be Americans. The readers of these lines can feel ourselves fortunate, too, to be in Radio.

"America in 1940 is the Best Place on Earth. And Radio is the best business in America—any way you look at it.

"We are in a grand business today. It will be even more wonderful tomorrow."

Radio Keeps Nation Informed

And now, if you want to get an even greater glow of pride out of the fact that you are associated with the Radio Industry, just stop to realize that TODAY this entire nation depends on Radio for world news, national news, and local news.

Information which the people of the U. S. want and need during this critical, fast moving period in the history of the world, is brought to them by Radio. No matter where or when things happen, our broadcasting companies are on the job to report quickly and dramatically to all listeners.

Today, Radio keeps the people of this country better informed than any people have ever been before, about what is going on at home and abroad. We no longer wait days, or even hours, for news.

Up to the minute, first hand reports of each important happening in every part of the world can be had instantaneously by the twenty-eight million Radio set owners in this country, by means of more than forty-five million home and automobile receivers.

You, and I, and our neighbors can know about political moves and baseball games—air raids, prize fights, ship movements and football games—diplomatic negotiations and battles, the same day, the same hour they occur.

A good example of the way this country uses and depends on Radio today, is the manner in which the campaign is conducted for the Presidency of the United States. In this campaign, Radio is a decisive factor.

Today RADIO keeps this nation informed. RADIO influences public opinion. RADIO is a powerful, moving force in our modern way of living.

What About the Future?

What will be Radio's place tomorrow, and in the years to come? What will future developments in Radio produce?

A reasonable way to answer these questions is to repeat—the future of Radio is limited ONLY by the ability of free and energetic men to dream, and think, and do.

Puzzling Radio Questions From Students

Whistling P. A. System

QUESTION: *When operating my P. A. system indoors and particularly in small auditoriums, a whistle is heard when the volume control is adjusted for high power output. What is the cause, and how can I cure the trouble?*

ANSWER: From the typical question presented above, it is understood that the system functions satisfactorily when used out of doors. Since the electrical characteristics of the amplifier have not been changed, it is natural to assume that the only change made in the operation of the system is in its relative location. That is, the loudspeakers as well as the microphone are now placed within a room or an auditorium having a very low sound absorption. The sound waves which are produced by the loudspeaker either reach the microphone directly or by reflection from the walls of the auditorium. This feedback results in reinforcement of the sound waves picked up by the microphone, and the result is a continuous whistle or squeal.

It is sometimes impossible to eliminate feedback without reducing the power from the loudspeaker. This is due to poor frequency response characteristics of the amplifier system. That is, the microphone, the amplifier and the loudspeaker cause the amplification of some audio frequency signal to which the auditorium resonates. Feedback will then occur at the frequency which gives the most gain in the system. If the frequency of the feedback signal is high, we can, of course, reduce the level or the amplification at these higher frequencies by placing a conventional tone control consisting of a variable resistor and a fixed condenser in series and between the grid and chassis of a voltage amplifier tube.

On the other hand, if the feedback is of a low frequency, it will then be necessary to design an equalizing unit which will reduce the amplification at the low frequency end of the audio frequency range covered.

It is to be remembered that the use of projectors on the loudspeaker units which have the proper length and directional characteristics, will tend to reduce feedback to a minimum. A further reduction in feedback may be obtained by using a microphone having directional characteristics, such as a velocity type. Then too, the microphone should not be placed at a point which is in the direct beam of the sound waves leaving the loudspeaker projectors.

Red-Hot Tubes

QUESTION: *I have a receiver using a 42 type output tube, and the set is dead while the screen grid of the output tube glows cherry red. What could cause this?*

ANSWER: Your trouble is due to an open in the primary of the output transformer, thus preventing the application of voltage to the plate of the 42 tube and thereby making the set dead. The screen overheats because it carries its normal current plus the current which would normally flow to the plate.

Changing Oscillator Tubes

QUESTION: *I have a receiver which is designed to use a 27 type oscillator tube. I have been trying to use a 56 type tube which has about the same characteristics but the receiver blocks and plays intermittently. Is the tube bad or is something else wrong?*

ANSWER: The action you have observed is natural and is due to the higher gain of the 56 tube. This tube oscillates far more strongly than the 27, and its greater grid current flowing through its self-biasing grid resistor produces such a high negative bias that the tube plate current falls to zero, thus stopping oscillation. The grid voltage drops, the tube starts oscillating again, and the whole action repeats itself. To use the 56 tube in this circuit, reduce the oscillator grid resistor by about one-third of its present value. Better still, use a 27 type tube.

N.R.I. Training Plan In Farm Districts

QUESTION: *I live in a district that does not have power lines. How can I gain experience by the N. R. I. plan? Can I use a battery set?*

ANSWER: If A.C. power lines are not available, then the recommended type of receiver for gaining practical experience would be an automobile receiver. This should preferably be one of a type having a tube rectifier.

An ordinary battery operated receiver can be used for learning to trace circuits and read diagrams, according to the N. R. I. plan. However, there are a number of limitations in regard to using such a set. The tube filaments are very easily burned out, and therefore any accidental short circuit may burn out the complete set of

Are Answered By N. R. I. Experts

tubes. Furthermore, experiments which cause increased current drain can destroy the batteries quickly. These receivers therefore have to be handled with extreme caution, and certain types of tests cannot be made on them at all. It is quite important when measuring continuity in such a receiver with an ohmmeter, that all batteries be disconnected from the set. Then, you will have to remember that continuity exists from the battery cable terminals to various points in the circuit.

An A.C. operated radio receiver or an automobile receiver does not have these limitations. The rectifier tubes normally used in such receivers are capable of withstanding quite an overload. With these types of receivers, you can learn the effects of more different types of trouble than is possible with an ordinary battery operated receiver.

The following question is one typical of those asked at examinations for a commercial radio operator's license.

Don't Let Extra Data Confuse You

QUESTION: *What is the correct value of negative grid bias, for operation as a Class B amplifier, for a vacuum tube having the following characteristics: plate voltage 1,000 volts, plate current 127 milliamperes, filament voltage 4 volts, filament current 5.4 amperes, mutual conductance 8,000 micromhos, and amplification factor 25?*

ANSWER: This is a question which may appear to be difficult to answer since a large number of the tube characteristics are given. The problem is easy to solve, however, if you remember that there is a definite relationship between the plate voltage, the amplification factor and the grid voltage of a tube for plate current cut-off. The C bias voltage for a class B amplifier will be the plate voltage divided by the amplification factor. Thus, 1,000 divided by 25 equals 40, or 40 volts will be the correct value of negative grid bias.

Operating Loudspeakers In Phase

QUESTION: *When two loudspeakers are operated close to each other from a common amplifier, how can they be connected to prevent one from interfering with the other?*

ANSWER: When two loudspeakers are operated together, the diaphragms of both should move forward at the same time (be in phase). Both

will then exert maximum pressure on the surrounding air, with no cancellation of sounds in the region served in common by both loudspeakers, and the low-frequency response will be far better than for the out-of-phase connection.

To determine the phase relationship between two loudspeakers which have been connected to a common amplifier, insert momentarily in series with the secondary of the output transformer a d.c. voltage. Note which way the diaphragms move; if in opposite directions, reverse the connections to one loudspeaker. Use 4.5 volts if the impedance of the line to the loudspeakers is below 200 ohms. If 4.5 volts does not give a perceptible movement with higher-impedance lines, use a 45-volt B battery instead.

Old-Age Problem

QUESTION: *I have a small superheterodyne receiver using a 6CG combination detector-oscillator tube. The tube refuses to oscillate at the low frequency end of the dial. The circuit tests okay, and a new tube does not remedy the trouble.*

ANSWER: This condition occurs frequently in sets using this design. It may be attributed to aging of the oscillator coil and to the fact that the circuit was designed to use an extra peppy tube. Correct the trouble by reducing the cathode bias resistor value from its present size of about 9,000 ohms to around 6,000 ohms. If in a circuit of this sort oscillations are not maintained at the high-frequency end of the dial, it is necessary to install a new coil, as the old one has absorbed moisture, thus introducing losses at the higher frequencies which kill oscillations.

Static In Auto Radio

QUESTION: *I have an Auto-Radio to service, and the set picks up noise only when the car is in motion. It is noisy even with the motor shut off as long as the car coasts. What can I do to correct this condition?*

ANSWER: The trouble you are experiencing is due to tire static. To eliminate the trouble put static collectors under the hub caps of the front wheels. These spring type collectors may be obtained from any Radio supply house. Where collectors do not solve the problem take the car to the distributor of the tires used with it and have him paint the inside of the casings with his special preparation which eliminates static.

Radio Operators Wanted For F. C. C.

These articles were released to NATIONAL RADIO NEWS by the Federal Communications Commission, Washington, D. C.

A Civil Service examination is open now for radio operator positions in the Federal Communications Commission. In view of the emergency, the Federal Communications Commission is prepared to accept applications from licensed commercial operators and amateurs for appointment as radio operators in the field service, with the understanding that those selected will be given temporary employment for ninety days and examined during that time by the Civil Service Commission. The temporary employees who pass the Civil Service examination, and are reached in the order of their standing on the eligible list, will receive indefinite probationary appointment on a temporary basis as the present emergency may justify.

Applicants receiving appointments must defray the expense of travel to the city or town designated by the Commission as their headquarters. The Commission reserves the right to make transfers from time to time according to the best interests of the service. A few positions will be available outside the Continental United States to operators who pass the Civil Service examination. Those who are willing to accept appointment in Alaska, Hawaii, and Puerto Rico should indicate their order of preference. Order of preference may also be shown for regions within the Continental United States, as, for example, "West Coast," "Southeast," etc.

Temporary appointees are also required to pass a physical examination which is conducted at U. S. Public Health stations throughout the United States.

Operators will be required to travel in Commission field cars on official business, and when operating outside of the limits of their headquarters station will be paid five dollars per diem for subsistence.

Operators in the Commission's service are required to stand a rotating watch which involves work on Saturday afternoons, Sundays and holidays.

Persons holding radiotelegraph first class licenses will be appointed to fill positions at \$1800 per annum and those holding radiotelegraph second class licenses at \$1620 per annum.

Amateur licensees desiring to file applications for positions as operators in the Commission's field service must possess the following qualifications:

- (a) Must be at least 21 years of age and not over 55 unless they have veterans' preference.
- (b) Must hold an amateur operator's license for a continuous period of at least five years prior to making application for employment.
- (c) Must demonstrate in a Commission field office their ability to transmit and receive plain English text in the International Morse Code at the rate of 20 words per minute.

The salary for amateurs who qualify for appointment is \$1620 per annum. A deduction of 3½ per cent is made from all salaries toward retirement, but this is returned if the employee leaves the government service before retirement.

Applications should be submitted on U. S. Civil Service Application Form 8 to the Secretary, Federal Communications Commission, Washington, D. C. Complete information must also be filed with respect to citizenship and finger-prints under Federal Communications Commission Order No. 75.

Further information relative to these positions may be obtained by writing to the Federal Communications Commission or to the U. S. Civil Service Commission, Washington, D. C.

More Television Stations

Opening television broadcast channels to an increased number of stations in leading cities from coast to coast for the purpose of rendering the utmost in public service on an experimental basis, with adequate safe-guard against monopolistic practices, is provided in the new rules and regulations governing television announced recently by the Federal Communications Commission.

In conformity with this policy of encouragement to that industry, the Commission tentatively approved 23 applications for television stations in various sections of the country, and announced that it will consider 19 remaining applications and outstanding licenses in the immediate future.

Most of these stations will be permitted to furnish television programs to the public, and it is expected that when the industry has developed uniform transmission standards offering a satisfactory level of performance these standards will be adopted by the Commission as a basis for regular commercial television operation. Meanwhile, every television station license will undertake to carry on substantial research and experimentation on the different engineering problems and to assist in the development of television for wide-spread public service.

With the completion of the projected stations, this country will have far more television broadcast stations than any other nation in the world.

The complete list of applications which the Commission plan to grant promptly upon a proper showing of a program of research and development follows, with proposed channel assignments:

City	Person or Firm	Channel No.
New York	National Broadcasting Co.	1
	Columbia Broadcasting Sys.	2
	Bamberger Bro'dcast'g Serv.	6
Chicago	Allen B. DuMont Labora.	4
	Zenith Radio Corporation	1
	Balaban & Katz	2
Los Angeles	National Broadcasting Co.	5
	Don Lee Broadcasting Sys.	1
	Television Productions	4
Washington	Hughes Tool Co.	2
	Allen B. DuMont Labora.	1
	National Broadcasting Co.	2
San Francisco	Don Lee Broadcasting Sys.	1
	Hughes Tool Co.	2
	Philco Radio & Tele. Corp.	3
Philadelphia	*Radio Corp. of America (Camden)	5
	WCAU	5
	Crosley Corporation	1
Cincinnati	Crosley Corporation	1
Albany	General Electric Co.	3
Fort Wayne	*Philo T. Farnsworth	3
W. Lafayette, Ind.	*Purdue University	3
Passaic, N. J.	*Allen B. DuMont Labora.	4
Iowa City	*Iowa State University 1 & 12	

*Indicates stations primarily for laboratory research, or training; no public program service authorized.

Of the 19 cases held in abeyance, 16 are new applications and four are existing licenses under the old rules and regulations. In each instance the applicant may supplement his application and make satisfactory showing that a grant will result in engineering work which will tend to the development of a uniform system of transmission standards of acceptable technical quality.

These pending cases are:

City	Person or Firm
Boston	*General Television Corp.
	Boston Edison Co.
	R. B. Eaton
Des Moines	Travelers Broadcasting Service Corp.
Hartford	WDRC
Iowa City	*Iowa State University (2100-2200 kc.)
Kansas City, Mo.	*First National Television Midland Broadcasting Co.
Los Angeles	Earl C. Anthony
	May Department Stores LeRoy's Jewelers

City	Person or Firm
Milwaukee	Milwaukee Journal
Manhattan, Kans.	Kansas State College
New York	*Radio Pictures, Inc.
	Metropolitan Television, Inc.
Philadelphia	National Broadcasting Co.
Springfield, Mass.	Henry Walczak
Sacramento	Grant Union High School
St. Paul	KSTP, Inc.

*Indicates existing licenses.

All licenses will be on a basis of research and experimentation tending to promote the development of television and to assist the engineers of that industry to reach an agreement upon uniform transmission standards which will permit the early and general commercialization of television. Until accord is reached on this vital point, no charges—either direct or indirect—may be made for the transmission of any type of television program.

In order to put to the fullest possible public use the 18 regular channels (50,000-108,000 and 162,000-294,000 kilocycles) plus any 6,000 kilocycle band above 300,000 kilocycles (excluding 400,000-401,000 kilocycles), made available to television under Commission Order No. 67, the Commission will not, except for extraordinary cause, authorize any one television broadcast station to use more than one channel in the main seven channels constituting Group A (50,000-108,000 kilocycles).

At the same time, the Commission stipulates that no person, directly or indirectly, shall operate or control more than three public programming television stations in this important group of channels, or operate or control more than one such station in the same service area. This, however, does not apply to stations which do not transmit programs for public reception.

The three groups of high-frequency channels assigned to television are:

GROUP A		GROUP B		GROUP C
Channel No.	Kilocycle Band	Channel No.	Kilocycle Band	
1	50,000-56,000	8	162,000-168,000	Any 6,000
2	60,000-66,000	9	180,000-186,000	kilocycle
3	66,000-72,000	10	186,000-192,000	band above
4	78,000-84,000	11	204,000-210,000	300,000
5	84,000-90,000	12	210,000-216,000	Kilocycles
6	96,000-102,000	13	231,000-237,000	excluding
7	102,000-108,000	14	240,000-246,000	band 400,000
		15	258,000-264,000	to 401,000
		16	264,000-270,000	kilocycles
		17	282,000-288,000	
		18	288,000-294,000	

The 11 channels in Group B (Channels No. 8 to 18 inclusive) and the auxiliary channels in Group C may be assigned to television stations for supplementary purposes as television relay stations.

No mobile or portable television station for direct public service will be licensed at this time.

— n r i —

From the F.C.C. Mail Bag

Proof of citizenship required by the Federal Communications Commission of all licensed radio operators has placed a Washington State mother in a quandary. In her perplexity she has written the Commission. It appears that her son, a licensed amateur subject to the provisions of the order, is in fact an adopted son. She states that she has not advised him of the fact of his adoption, and does not wish him to know of it if it can possibly be avoided.

While the Commission cannot make individual exceptions under the order, it suggests to the worried mother that her son execute the responses to the questionnaire and fingerprint card, turn them over to the parent and let her attach the necessary certification as to birth and adoption and herself forward the papers to the Commission. It is hoped that through the suggested method she may take care to her own satisfaction of the situation which she wrote the Commission about.

A San Francisco woman requests Commission aid in having broadcast stations assist her in locating her missing father. The Commission is not authorized to require radio stations to make particular announcement of this sort. However, it suggests that the woman communicate direct with the broadcast stations located in her vicinity, and at the same time ask the local police authorities for further advice and assistance.

An Oak Park, Ill., woman wants the Commission to require the listing of all public telephones in telephone directories. The Commission advises that regulations covering listing of telephone numbers fall within the regulatory powers of State commissions and suggests, therefore, that she address her suggestion to the Illinois Commerce Commission.

A New York organization inquires as to the number of regular program-broadcast stations in the world. Commission records show that as of December 1, 1939, there were 2,452 regular broadcast stations listed throughout the world, of which number 814 were in the United States.

Two letters from Michigan complain of alleged monopoly in the music publishing field and of certain action by a radio station with respect to a musicians' union. These are matters over which the Commission has no jurisdiction.

A Greeley, Colo., man who inquired about "fraud or exaggeration in radio advertisements" is advised by the Commission that under existing leg-

islation, the respective station licensees have the responsibility of the selection of commercial contingencies in the public interest. However, the National Association of Broadcasters has placed certain restrictions with respect to advertising upon its member stations. The Commission points out that the Federal Trade Commission is given direct jurisdiction over matters involving fraudulent or misleading representation in interstate commerce.

By the same token, it refers a Pittsburgh man who complains of inability to purchase a receiving set at the terms allegedly announced over the air, to the Federal Trade Commission.

To a New Yorker who asks about the use of the words "hemorrhoids" and "piles" over the radio, the Commission advises: "Neither the Communications Act of 1934 nor any Commission rules now in effect contain specific prohibitions with respect to the terminology to be used to describe products advertised on the radio. Broadcast stations, however, are required to serve the public interest, convenience, and necessity, and they have the duty of applying this standard in determining whether or not to accept program material offered."

The Commission has noted, but is unable to take action with respect to the following communications:

A New Orleans man protests the substitution of a broadcast covering the proceedings of the Democratic national convention for a scheduled program covering the Armstrong-Jenkins fight.

A New Yorker objects to a statement made over a broadcast station concerning the number of seats available at the Polo Grounds for a particular baseball game.

A Pennsylvania woman wants all broadcasting to be discontinued until peace returns to the world.

A Los Angeles man complains of certain radio stations "depriving the people of California the right to hear Hitler," while a New Yorker and a New Jersey man both protest over stations carrying Hitler's speech.

A Providence man urges that radio stations begin and close their daily programs with patriotic music. (He pursued the right course by offering his suggestion direct to the networks concerned).

By way of concluding this installment, an Englewood, N. J., resident wants to know what "thirty" means in a good-night radio salutation. The term "thirty" used in this connection originated in telegraphy and means "the end" or "that is all."

The Laboratory Page

By GEORGE J. ROHRICH

The purpose of this department is to furnish supplemental experiments to students who have completed their Home Laboratory Course, but who wish additional laboratory experience. You are not required to perform these experiments, but you will gain increased knowledge by doing so.

Most of the material required will be that received as part of the Laboratory Course. Any other material necessary can be purchased very reasonably and will constitute an investment rather than an expense, as it will serve as replacements in service work or be useful in your shop later.



George J. Rohrich, Engineer
in Charge N. R. I. Laboratory

HELPFUL INFORMATION ON EXPERIMENTS 27, 28 and 29

In experiments Nos. 27, 28 and 29 of Outfit 3BA-1, as well as in other experiments, oscillations sometimes stop entirely, or stop over a portion of the dial when the oscillator is connected to the broadcast receiver. In this case remove the wire from the ground terminal on the receiver but leave the other end attached to the oscillator. Attach another length of wire to the ground terminal on the receiver. Gradually twist this wire together with the wire which you removed, but do not allow the bare ends of the two wires to come in contact. The cotton insulation will prevent electrical contact. This will introduce a small capacity into the circuit and oscillation will be maintained.

The reason that oscillation ceases is due to the fact that an extremely large load is demanded of the oscillator which it cannot supply.

By introducing the small capacity between the two wires the load is reduced.

Therefore, with the wires connected as directed, or even leaving one terminal disconnected, oscillation will be maintained.

Do not be surprised if you hear amateur and broadcast signals with the circuit used in Experiments Nos. 27 to 29 inclusive. This is possible because the circuits in an oscillator are identical with those used in a regenerative type detector. This is explained later when you work in Outfit 5BA-1. The only difference is in the method of controlling oscillation. In other words, in the

oscillator you must adjust the tickler so oscillations are produced.

On the other hand, the tickler must be adjusted so oscillations do not exist when the circuit is used for a receiver.

Furthermore, the experimental oscillator often serves as a frequency converter in the manner in which an oscillator tube functions in a superheterodyne receiver. The receiver input itself serves as a tuned circuit for the "intermediate frequency" which is produced, even when this broadcast receiver itself is of the superheterodyne type and produces further conversion in its own intermediate frequency stages.

When working with experiments 28 and 29, select a position on the receiver dial where no squeals or broadcast signals are heard.

Probably you have noticed when using a regular telephone that you apparently do not hear your own voice although the telephone receiver is constantly held to your ear. Actually, your voice is being reproduced also in the receiver held to your ear but this is not apparent because the sounds in the air are louder than those in the receiver.

Quite often a similar condition may make you think that you are not successful with experiments 28 and 29 in Outfit 3BA-1. If you will remove the receiver into a separate room from the oscillator and its microphone, then have some one

speak into the microphone you can only hear those signals coming from the receiver, then I feel sure you will get a sufficient indication that it is possible to modulate the radio frequency oscillation with a voice as pointed out in the experiments.

On the other hand, where you are alone and the microphone and receiver must be located together, if you will blow your breath against the diaphragm of the microphone, you will hear a rushing noise in the receiver and this is an indication that the radio frequency oscillations are being modulated by the movements of the microphone diaphragm.

If you are not successful in this last observation then try difficultly with experiment No. 28 in Outfit 3BA-1 may be due to the fact that the diaphragm of your phone is too close to the pole pieces. I would suggest that you remove the cap of the phone in order to turn the diaphragm over. In other words, remove the diaphragm and replace it so that the surface which was on the outside will be on the inside, near the pole pieces. Then screw the cap *tightly* on the phone in order to raise the diaphragm from the pole pieces.

While carrying out this procedure of turning the diaphragm over it may be well to see that the phone is connected in the plate circuit in the manner which will make the magnetism of the pole pieces the strongest. To do this, notice the amount of force required to remove the diaphragm while the circuit is working with the largest reading of plate current. Then reverse the wires of the phone leading to the meter and to terminal No. 4. Again check the amount of force required to remove the diaphragm. Leave the phone connected in the manner which requires the greatest force when removing the diaphragm, as this will insure the greatest signal strength of reproducing your voice.

Repeat the experiment by tuning your oscillator to resonance with your receiver. Obtain the loudest signal from the oscillator by advancing your volume control on the receiver to maximum. Then gradually decrease the coupling on the oscillator until the buzzing signal disappears. At this point you should be able to hear a reproduction of your voice in the loudspeaker. The adjustment is sometimes best when the receiver is tuned near 1,300 to 1,500 kilocycles. Reversing the connections to T_1 and T_2 on the oscillator coil will allow you to tune your oscillator to these higher frequencies. In some cases the voice signals will be louder when the grid leak is removed. The oscillator can be made to produce fundamental oscillations near 1,300 to 1,500 kilocycles by reversing the connections to terminals T_1 and T_2 on the oscillator coil, so terminal T_1 connects to the stator of the variable condenser and to terminal 8.

Page Twelve

Hold both lips of your mouth *against* the cap of the headphone when speaking into it.

The signals from the oscillator are much weaker when voice modulation is used than the signals which are produced by the modulation from the grid leak. I would suggest that you extend the wires from your headphone so it is placed in a closet, or in another room, and then have some one speak into the headphone while you listen for the signal in the loudspeaker, readjusting the tuning dial on your receiver carefully if this is necessary, in order to take care of any change in capacity which may or may not result from holding the headphone in the hand or holding it close to a person's mouth. Tune for this signal just as you would for a distant broadcast station.

One difficulty often encountered with experiment No. 29 in Outfit 3BA-1 may be due to the fact that you have difficulty in finding the point of resonance because you do not have the buzzing signal to guide you as you did in experiment No. 28. Therefore, I would suggest that you carry out experiment No. 28 in order to be sure that you know where to look for resonance. Make a list of the readings you obtain on the dial of your oscillator while it is in resonance with the dial on your receiver. Then proceed to change the wiring as directed for experiment No. 29 and look for modulation near those adjustments you listed for experiment No. 28.

Be careful to observe that the oscillator is actually producing oscillation as pointed out in the first observation of experiment No. 29. Notice that the meter in the plate circuit *now* must show the highest reading which can be obtained on the meter. The meter in the grid circuit also will register a current when the circuit is oscillating. Some radio receivers only have an aerial terminal, or an aerial wire. In other words there is no visible ground connection or terminal provided on them. Such receivers obtain their ground connection internally by way of a return path through the power line or through sufficient capacity offered by the exposed metal parts. Such receivers can be used also in experiments 27, 28 and 29. However, when doing so *never attach any extra wiring to this type of receiver's chassis.*

In order to carry out experiments No. 27 to 29 inclusive with your receiver, it is only necessary to connect terminal T_a to the aerial terminal on the receiver, or to the aerial wire which leads to this terminal, while this wire is coiled. Terminal T_2 can be left disconnected. However, better results will sometimes be obtained if terminal T_2 is connected to a water pipe or other grounded object. In some cases better results will be had if terminal T_2 is connected to the receiver, while terminal T_a is connected to a grounded object.



RADIO-TRICIAN

REG. U.S. PAT. OFF.

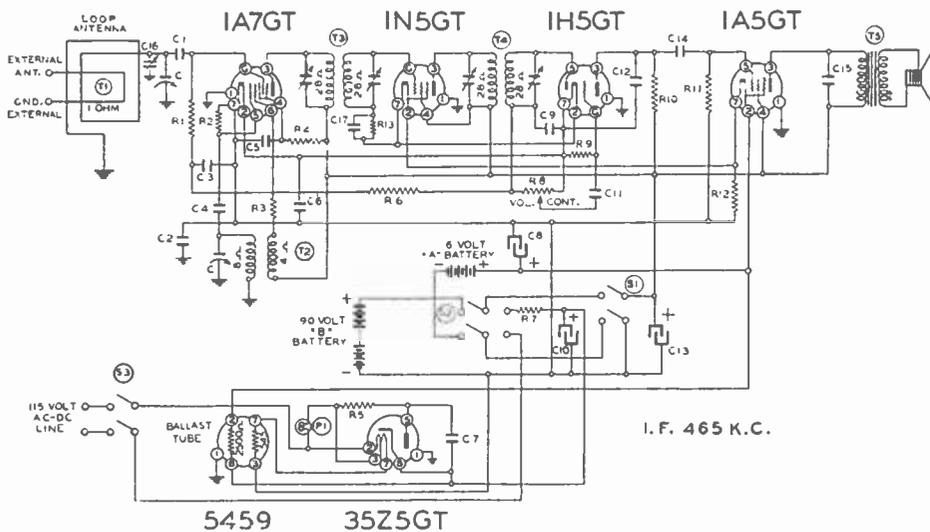
Service Sheet

Compiled Solely for Students and Graduates

NATIONAL RADIO INSTITUTE, WASHINGTON, D. C.

TRUETONE PORTABLE RADIO

MODEL W 1080, FACTORY NO. 507, SERIES B



I. F. 465 K.C.

5459 35Z5GT

Fig. 1 Schematic Diagram

VALUE OF PARTS

RESISTORS

- R1 2 megohm—1/3 W.
- R2 200M ohm—1/3 W.
- R3 4M ohm—1/3 W.
- R4 40M ohm—1/3 W.
- R5 25 ohm—1/2 W.
- R6 3 megohm—1/3 W.
- R7 2500 ohm—1/3 W.
- R8 1 megohm volume control
- R9 5 megohm—1/3 W.
- R10 500 ohm—1/3 W.
- R11 2 megohm—1/3 W.

- R12 1M ohm—1/3 W.
- R13 150M ohm—1/3 W.

CONDENSERS

- C1 .00025
- C2 .2 mfd. x 400 v.
- C3 .05 x 200 v.
- C4 .00025
- C5 .05 x 200 v.
- C6 .1 x 200 v.
- C7 .01 x 400 v.
- C8 Lytic 200 nfd. x 6 w. v.

- C9 .0001 mfd.
- C10 Lytic 40 mfd. x 150 w. v.
- C11 .002 x 600 v.
- C12 .0005 mfd.
- C13 Lytic 20 mfd. x 150 w. v.
- C14 .01 x 400 v.
- C15 .002 x 600 v.
- C16 Adjustable antenna trimmer
- C17 .02 x 400 v.
- C8, C10 and C13 in same unit.

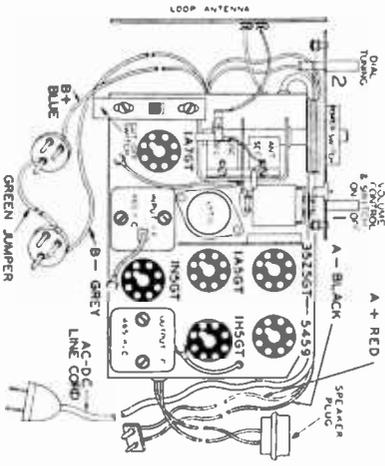


Fig. 2—Top View

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect generator ground to negative "B" at plug terminal (grey wire).
- Connect dummy antenna in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function
------	------------------------------------	---------------	---------------------	----------------------------	------------------------------------	------------------

I. F.	465 Kc.	.1 MFD.	Grid of 1A7GT	Rotor full open	Four trimmers on top See Fig. 2 and Notes "A," "B," and "C."	Output and input I. F.
-------	---------	---------	---------------	-----------------	--	------------------------

BROAD-CAST	1550 Kc.	.1 MFD.	Grid of 1A7GT	Rotor full open	Trimmer, Rear section of gang. See Fig. 2, and Notes "A," "B," and "C."	Oscillator
------------	----------	---------	---------------	-----------------	---	------------

BAND	1400 Kc.	200 Mmf.	Antenna and Ground Terminals of Loop	Set dial at 1400 Kc.	Trimmer, C16. See Notes "B" and "C."	Antenna
------	----------	----------	--------------------------------------	----------------------	--------------------------------------	---------

NOTE "A"—The loop antenna need not be connected to the radio when making these adjustments. The ground of the signal generator is connected to the negative "B" wire of the radio and the other lead from the signal generator in series with .1 MFD. dummy to the grid of the 1A7GT tube.

NOTE "B"—This adjustment should be made with the ground lead of the signal generator connected to the ground terminal of the loop assembly. The other lead of the signal generator is connected in series with a 200 Mmf. dummy to the antenna terminal of the loop assembly. It is important when making this adjustment that the same distance between the loop antenna and the chassis be maintained as when the chassis and loop are installed in the cabinet.

NOTE "C"—Adjust to maximum output.

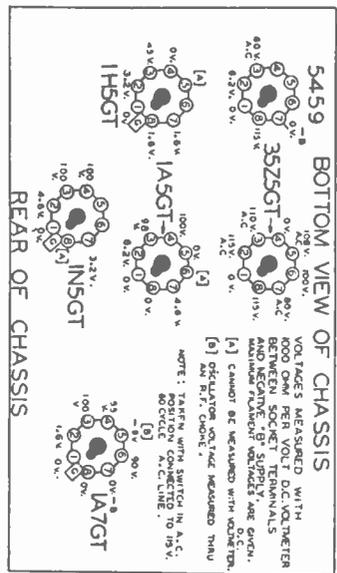


Fig. 3

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—1 Mfd., 200 Mmf.

Novel Radio Items

—BY L. J. MARKUS—

Radio Saves Commencement Speech

When J. Edgar Hoover found it impossible to make a commencement speech personally at Drake University in Des Moines, Iowa, he spoke instead at the studio of WOL in Washington. Wire lines of the Mutual Network carried his words to Station KSO in Des Moines, from which it was routed over special telephone lines to the university. This is believed to be the first time in history that a major university received its commencement speech via radio.

— n r i —

Air Hostesses Must Tune Radios

The master radio receiving units recently installed on twenty-two TWA airliners must be tuned to new stations frequently by the hostesses because the two hundred mile-per-hour cruising speed takes these large planes out of the service range of a broadcast station in a remarkably short time. Hushatone individual silent loud-speakers are provided for each passenger, under backrest cushions.

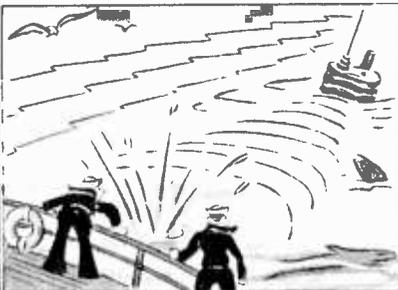
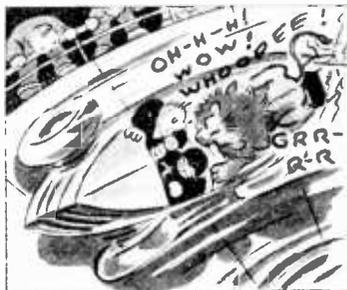
Photos Radioed 12,000 Miles!

By employing a special circuit which counteracts selective fading, radio engineers succeeded in transmitting photographs by radio to New York City from the West Base of the U. S. Navy Antarctic Expedition. The power of the Antarctic sending station was only 500 watts. The signals were received at the Press Wireless receiving station at Baldwin, Long Island, then transferred automatically to a telephone circuit and passed on to the studios of Times-Wide World Photos, where photoscanning apparatus converted the signals into varying light rays and reproduced the pictures.

— n r i —

WOR Sets New World Record!

A new world's record for technical excellence was made last year by Station WOR which piled up 8,221 hours of uninterrupted time on the air without the loss of a single second because of equipment failure. Credit for the performance goes largely to the engineering staff at Carteret, N. J., where the station's 50,000 watt Western Electric transmitter is located.



ANNOUNCER RIDES WITH LION IN MOTORDROME!

Staff announcer Neher of Radio Station WERC in Duluth gained notoriety by riding around the perpendicular wall of a carnival motordrome in a small car, with a lion for a companion, and broadcasting his impressions of the ride via a special short-wave hook-up from the transmitter carried in the car. His initial intentions to talk during the entire episode gave way to excited shouts during the middle of the ride, followed by superlatives of surprise and wonderment for the remainder of the thrilling, if not pleasant, ride.

RADIO BUOY TELLS SHIP'S DISTANCE

Ships up to 100 miles from a new radio buoy can measure their distance from the buoy by setting off a small explosive charge. The current used to set off the charge makes one mark on a moving paper tape, and the radio signal sent out by the buoy the instant it picks up the sound of the explosion with a microphone makes another mark. Since sound travels at about 1200 feet per second and since a radio signal travels almost instantaneously, the ship's distance will be proportional to the space between the two marks. The buoy is a strong fifty gallon steel drum in which is sealed a radio amplifier for the microphone and a radio transmitter for the transmitting antenna mounted atop the drum.

A SURE-FIRE KEEP-OUT SIGN

When NO ADMITTANCE and POSITIVELY NO ADMITTANCE signs failed to keep curious customers out of the work-room of one radio repair shop, the simple sign LADIES was tried. It proved a complete success, working even on salesmen and insurance agents. If you are having difficulty keeping curious people out of your shop, we recommend you try this stunt—but be prepared for some raised eyebrows from the astonished fair sex who may wonder!

Electronics, Inc.



L. J. Markus

By L. J. MARKUS

N. R. I. Technical Editor

In this science-fiction story, a secret organization called the Yellowjackets fortifies a rocky bluff overlooking the capital city of a West Indies republic, and begins bombarding Government buildings to enforce its demands for resignation of Government officials. With police and armed forces powerless to interfere, Jay and Ozzie give up plans for a Caribbean vacation to pit the resources of Electronics, Inc., against the criminal band.

LIKE most capital cities in the tropics, the town was not overly large or overly important in an industrial way. Politics was its main business, and the two buildings which dominated this business were the domed capitol and the beautiful executive mansion. These faced each other on opposite sides of the navigable river which wound through the town on its way to the Caribbean.

Among the sight-seers strolling through the streets of this peaceful town were Jay Green and Ozzie Oleson, enjoying a well-earned vacation after a strenuous year of work in their famous Electronics, Inc. service shop up in Washington. Because of their past successes in thwarting organized crime when police were stalemated, these two young men had acquired a nation-wide fame which made a restful vacation impossible in the States.

For nearly three weeks now, Jay and Ozzie had been touring the islands of the Caribbean in their fully equipped traveling radio laboratory, a streamlined delivery truck now painted an inconspicuous gray to conceal its identity. Freighters carried them between the islands, truck and all, but so far they had used the truck only for pleasure tours on the few roads they could find.

The one radio station on the island had been inspected that morning. Jay had reminisced for several hours with his old friend Mike Johnson, now chief engineer of the newly-installed 50,000-watt transmitter.

Jay and Ozzie having gone back to their hotel for lunch and the afternoon siesta, the operator on duty at the station began tapping out the noon

entry on the station log with his own leisurely one-finger-at-a-time, a different-finger-every-time typing system. Across the room, the monitor receiver with its built-in loop antenna was blaring forth the program exactly as it was being heard by listeners in homes. The operator on duty could thus monitor every single portion of the transmitter system right up to the antenna, merely by listening to this receiver.

Chief Engineer Mike Johnson entered the transmitter room, chewing nervously on the stub of a stale cigar. After the usual snort at the typing attempts of his associate, Mike grumbled: "Something's gonna happen. It has to. You just can't put a 50,000-watt job on the air in the short time we had without getting a breakdown somewhere. The whole thing's working too good—this three-tower directional array we're using to avoid interference with that other big power station on our channel should be giving trouble. I can feel it in my bones, fella—something's gonna happen today!"

Working with Mike Johnson for well over four years had taught the operator that these worrying spells were to be expected on the average of once a month, regardless of what transmitter they were mothering. Therefore, he merely grunted and continued pecking at the typewriter.

But for the first time in his life, it looked as if Mike's chronically aching bones were right. A crash of breaking window glass drew the attention of the two men to the transmitter room window, just in time to see the ominous snout of a machine gun poking through the jagged hole. Outside the window a yellow-masked man knocked out the rest of the glass with a leather-

Defies the Yellowjackets

gloved fist, braced the machine gun against his yellow-jacketed chest in preparation for the recoil, then pulled the trigger. No command was needed: the two men inside dropped to the floor of their own accord, and rolled to the only corner of the room which could not be reached by the chattering machine gun.

Tubes popped right and left as the masked man systematically riddled each rack of the new transmitter in turn with bullets. The rack of spare tubes was not overlooked; glass really did fly when these huge transmitter tubes collapsed almost simultaneously under the sweeping shower of lead. Satisfied at last, the machine gunner retired to the waiting automobile and was out of sight before the dazed radio men could stagger to their feet.

"I knew it! I knew it!" moaned Mike. "It'll take us days to get this mess back on the air even if we can get a new set of tubes from New York by the next Clipper. Those bullets must have cut a hundred wires in the transmitter, and there's no telling how many of the other parts have been ruined!"

The ringing of the studio-line telephone interrupted post mortem discussions. Mike picked up the handset, grunted a "yah" of introduction, listened a moment, then exploded, "Sure I know it, guy. We're not gonna be back on the air for a heck of a while, so tell those yodelers in the studio to save their tonsils. And listen—round up all the engineers you can and send them out here; some lunatic just shot up the works with a machine gun!"

A quick inspection of what was left at the station showed that none of the big transformers had been seriously damaged by the bullets, and circuit breakers had opened in time to prevent them from being burned out by short circuits.

By now all the telephones in the station were ringing. Mike picked up the handsets, jiggled the lever of each to break the connection, then tossed all but one on the floor. In rapid succession now he made brusque calls to police headquarters and to the owner of the station, followed by a long-distance call to New York during which he ordered a new set of tubes and an entire new set of meters for immediate shipment via the next Clipper plane.

The next call Mike put through was to the hotel where Jay and Ozzie were staying. It being just a few minutes after lunch, chubby co-partner

Ozzie was in no mood yet to dash for the telephone. Jay answered, and listened carefully to Mike's description of what had happened. Mike concluded with, "If you and Ozzie can get over here in a hurry with your truck and help me, I think we can get this mess back on the air by tomorrow morning. I'll take care of any traffic tickets you collect on the way."

"Okay, Mike," responded Jay. "The truck's ready to go now, and I'll turn on the audio oscillator siren of ours and let Ozzie push 'er down to the floorboards."

Ozzie perked up magically at Jay's last words, for Jay had long ago squelched his habit of racing with motorcycle policemen by ruling that the driver had to pay the traffic fines. At the wheel of the sleek streamlined delivery truck built to order for Electronics, Inc., Jay and Ozzie whizzed through the traffic of the town in utter disregard of red lights, and were soon racing out the highway leading to the transmitter location. Magically their electronic siren opened up traffic lanes ahead, while behind them other sirens indicated that native police were on the job.

Mike was waiting at the transmitter entrance as Ozzie skidded to a stop. In dashed Jay and Ozzie carrying tool kits and traveling bags filled with parts, while Mike remained outside long enough to explain the situation to the traffic officers and accept the collection of traffic tickets.

By now, the entire station technical staff had been mobilized. Some swept up the glass from the floor and replaced the shattered window panes, while others gingerly removed the remains of radio tubes from their sockets, and proceeded to repair the wiring under the joint direction of Mike and Jay. Each bullet hole was traced from front to back through the transmitter racks, and each part or wire in a bullet path was replaced. As soon as the apparent damage on a transmitter section was repaired, Jay went to work on it with test equipment to locate any parts which had been damaged due to shorting or failure of parts hit by bullets.

All this time, the monitor receiver in the transmitter room had been silent, except for the occasional sputter of atmospheric static which always occurs in an a.v.c.-controlled receiver when the carrier disappears. But suddenly the static vanished, and to trained ears it was apparent that a carrier signal was present on the station channel.

"Hey!" shouted Mike. "We haven't even got tubes in this rig yet; how can it be on the air?"

Jay was likewise puzzled, and paused in his test work to check the tuning of the receiver. "It's your frequency, all right, Mike," said Jay. "Something's fishy here."

From the loudspeaker of the monitor receiver there now came a harsh voice:

"MEMBERS OF THE RADIO AUDIENCE, THIS BROADCAST IS COMING TO YOU FROM AN UNDERGROUND FORTRESS IN A ROCKY BLUFF ON THE RIVER, EXACTLY FIVE MILES ABOVE THE EXECUTIVE MANSION. THIS FORTRESS IS THE HEADQUARTERS OF THE YELLOWJACKETS, A SECRET ORGANIZATION WHICH WILL TAKE OVER CONTROL OF YOUR GOVERNMENT EITHER PEACEFULLY OR BY FORCE, AS YOU PREFER.

"BEHIND A CAMOUFLAGED OPENING IN THIS GIBRALTAR OF THE CARIBBEAN ARE SEVEN MONSTROUS COAST ARTILLERY GUNS, ONE IS AIMED AT THE CAPITOL, THE OTHERS ARE AIMED AT THE EXECUTIVE MANSION, THE JUSTICE BUILDING, THE NATIONAL GREENHOUSE, AND THREE OTHER GOVERNMENT BUILDINGS. IN EACH CASE, THE GUNS ARE LOADED WITH SHELLS SUFFICIENTLY POWERFUL TO DAMAGE COMPLETELY THE BUILDING IN QUESTION.

"ANY ATTACKS UPON THIS FORTRESS WILL RESULT IN IMMEDIATE AND SIMULTANEOUS FIRING OF ALL SEVEN GUNS, AFTER WHICH THE GUNS WILL BE TRAINED SUCCESSIVELY ON EACH OF THE OTHER IMPORTANT GOVERNMENT BUILDINGS. AIRPLANES INADVERTENTLY FLYING OVERHEAD WILL BE WARNED OFF BY ANTI-AIRCRAFT FIRE. BOMBERS OR OTHER ATTACKING AIRPLANES WILL BE CONSTRUED AS SUFFICIENT PROVOCATION TO COMMENCE FIRING THE BIG GUNS.

"AT NOON TOMORROW, THE GUN WHICH IS TRAINED ON THE GREENHOUSE WILL BE FIRED. ALL OCCUPANTS ARE HEREBY WARNED TO GET OUT. AFTER THIS DEMONSTRATION OF THE ACCURACY OF THESE GUNS, TWENTY-FOUR HOURS WILL BE GRANTED IN WHICH TO VACATE ALL EXECUTIVE OFFICES OF THE GOVERNMENT AND ITS ARMED FORCES. IF THIS COMMAND IS NOT OBEYED, THE GUN TRAINED ON THE JUSTICE BUILDING WILL BE FIRED. EACH SUCCEEDING TWENTY-FOUR HOURS, ANOTHER BUILDING WILL BE DESTROYED UNTIL THE DEMANDS OF THE ORGANIZATION HAVE

BEEN MET IN FULL. AT THAT TIME, MEMBERS OF THE YELLOWJACKET ORGANIZATION WILL APPEAR TO TAKE OVER CONTROL AND MODERNIZE YOUR GOVERNMENT.

"YOUR RADIO STATION HAS BEEN PUT OUT OF COMMISSION TO CLEAR THE AIR FOR THIS BROADCAST BUT WILL PROBABLY BE BACK ON THE AIR IN A FEW DAYS. KEEP TUNED TO THIS FREQUENCY FOR FURTHER YELLOWJACKET GOVERNMENT BROADCASTS. THE OPERATORS OF THE RADIO STATION ARE HEREBY INFORMED THAT UNLESS THEY LEAVE THE AIR WHENEVER OUR CARRIER WAVE COMES ON IN THE FUTURE, THEIR TRANSMITTER WILL BE BLOWN OFF THE AIR BY ONE OF THESE GUNS. THAT IS ALL."

With the "invasion from Mars" radio broadcast from the United States still fresh in the minds of listeners, most of the people who heard this broadcast merely snorted in derision.

The police took no chances, however, for they had by now received a detailed report of what had taken place at the transmitter. Orders were issued to clear all people from the greenhouse and its vicinity well before noon the next day, and tape up as many as possible of the windows of government buildings in the vicinity. Fire engines and ambulances were likewise ordered to be on hand and ready for any emergency.

At the transmitter, engineers talked excitedly as they worked all through the night. Ozzie denounced the entire affair as a publicity stunt created by the radio station, despite assurances of the operators that they had nothing to do with the other transmitter. Jay, on the other hand, viewed the broadcast seriously. He said little, but was already working out plans to combat this latest criminal menace.

At Jay's suggestion, Mike sent men down to the greenhouse the next morning with equipment for a remote pick-up, on the chance that the transmitter would be back in operation in time for a special broadcast.

Just ten minutes before the bombardment deadline, the tubes and meters arrived from the airport under police escort. The huge mercury vapor rectifier tubes were inserted first, and filament power was immediately applied in order to warm them up. One by one the other tubes were inserted, meter readings checked, power applied to section after section, and the transmitter finally thrown back on the air. Immediately, the studio announcer took over with news flashes describing the wrecking of the radio station, then introduced the announcer who was waiting on the Capitol lawn with ultra-high-frequency relay equipment for the remote pick-up.

In the transmitter room, all eyes were on the clock as the hands approached 12 noon. Jay had figured out that if the Yellowjackets acted exactly on schedule, they would hear first the explosion of the shell at the greenhouse as picked up by the microphone there and relayed to the transmitter and monitor receiver at the speed of light. About twenty-five seconds later the sound wave created by this explosion would enter through the shattered window, its speed being about 1,100 feet per second. In another thirty seconds, the sound wave produced by the firing of the gun in the fortress would arrive, for it had the farthest to travel.

A few seconds after 12, with the program coming in from the remote pick-up point near the greenhouse, a deafening crash was heard from the monitor receiver, followed by a thud as if the microphone had fallen to the ground. About twenty-five seconds later, the sound of the explosion was heard through the windows; in another thirty-five seconds they heard another muffled report, just as Jay had prophesied.

The announcer on the greenhouse grounds had apparently only been knocked over by the concussion of the explosion, for he was soon back on the air with a dramatic description:

"LADIES AND GENTLEMEN, THE NATIONAL GREENHOUSE HAS JUST BEEN DEMOLISHED COMPLETELY BY A SINGLE SHELL. NOT A PANE OF GLASS IS LEFT INTACT. FLOWERS ARE SCATTERED OVER A RADIUS OF A BLOCK IN ALL DIRECTIONS. FIRE HAS STARTED IN THE OFFICE PORTION OF THE STRUCTURE, BUT FIRE ENGINES ARE NOW DASHING UP. THE YELLOWJACKET ORGANIZATION HAS MADE GOOD ITS FIRST THREAT. NO ONE WAS HURT IN THE EXPLOSION, FOR POLICE HAD EVACUATED THE BUILDING. CROWDS ARE GATHERING. POLICE AND FIREMEN ARE SETTING UP ROPE LINES TO KEEP THEM BACK. . . ."

Within a few minutes, news boys were dashing up and down the streets shouting "Extra! Extra!" and radio stations all over the world interrupted regular programs to describe the startling bombardment.

Riot cars loaded with policemen, as well as all available squad cars, headed across the river in search of the fortress. Its location had been definitely given in the broadcast, but police found this region to be essentially a virgin wilderness, traversed only by little-traveled hiking paths and wagon roads. None of the roads showed signs of being traveled heavily, yet as police spread fanwise through the woods and advanced through the underbush, they suddenly came upon a high steel fence which barred further progress. At regular intervals along the fence were signs bear-

ing the following wording:

"DANGER—HIGH VOLTAGE! ATTEMPTS TO BREAK THROUGH THIS FENCE WILL START THE BOMBARDMENT!"

Acting on orders issued by superiors, the police set up patrol beats along the outside of the fence all the way down to the river on each side of the enclosure. Police knew that they could call in power company linemen to ground the charged wires of the fence and render them ineffective, but decided not to do this for fear of starting the bombardment.

Having restored operation at the transmitter, Jay and Ozzie packed up their equipment and returned to the hotel. Both anticipated going into action soon against the Yellowjackets, but realized that their services would not be desired until the police had exhausted every facility of their own for combatting this newest crime threat.

Reporters returning from the scene of the fortress besieged Jay with requests for statements, for they remembered how Electronics, Inc., had successfully combatted previous crimes of a similar nature. Jay laughingly refused, but in turn queried them as to progress being made on the case by police and detailed descriptions of the fortress site.

The room telephone rang. Jay picked up the receiver, listened for about a minute, then answered: "Yes, your honor, I quite agree that the police cannot attack the fortress under the present circumstances. I also agree that something must be done before noon tomorrow if we are to prevent the shelling of another building. If you will give us your full cooperation, Ozzie and I can definitely promise you that we will have the Yellowjacket fortress wiped off the map by dawn tomorrow!"

The speaker apparently accepted Jay's offer of help, for he agreed to Jay's request for a conference which was to include the head of the Army, high Government officials, and the officers of Army and Navy units stationed in and near the town.

Police squad cars scattered throughout the city to pick up the men in question, and brought them all to the hotel room. There Jay outlined his plan, and issued instructions to each covering the parts they were to play.

As outlined by Jay, the Army was to supply the largest bombing plane it could spare. This could be an experimental or obsolete model, since it was to be destroyed. The plan was to strip the plane of all auxiliary equipment, install special radio mits which would permit control of the plane from the ground once the plane was in the air, then load in as much high explosives as could

be lifted from the ground at take-off.

The Army Air branch had exactly the plane required, a four-motor experimental job on which all tests had been completed. This ship had minor structural defects which made it unsatisfactory for long-range flights, but was capable of carrying a twenty-five-ton load of explosives when cabin seats, bombing equipment and regular radio equipment were stripped out. Army radio technicians were recruited to assist Jay and Ozzie in installing the required radio equipment.

Having done considerable experimental work on powered radio-controlled planes for use as anti-aircraft targets, Jay and Ozzie had all necessary special radio equipment ready in the Electronics, Inc. truck, to combine with standard apparatus available in the town.

Back to the transmitter now went Jay and Ozzie, to use shop facilities there for remodeling the truck. First of all, they made the truck completely water-proof by sealing all openings with plastic rubber and providing water-tight rubber hoods for all ignition wires. While Jay was installing special ultra-high-frequency radio equipment in the truck for use in controlling the bombing plane, Ozzie was instructed to load in two dozen heavy-duty 6-volt storage batteries and connect them all in parallel with the truck's own battery.

By 4 o'clock the next morning, Jay announced that the truck was ready. A short time later, word came from the airport that the plane likewise was ready. Ahead was the climax of the entire project. Any slip in Jay's plans would very likely mean the destruction of the town. He had only one chance to strike at the Yellow-jackets, and this must therefore be completely successful.

With Ozzie again at the wheel, the two young men headed across the bridge and out along a well-paved road which paralleled the river. A few miles out, they turned off on a narrow dirt road which Jay knew led down to the river. Bumping slowly along this rugged trail, they reached a point at the water's edge which was out of sight of the Yellowjacket stronghold but was just about one-half mile below. After a final check-up of the car with flashlights to make sure it was completely water-tight, two sets of extra heavy chains were installed on the dual rear wheels which had been mounted at the shop. Finally, all spark plugs were removed to kill compression in the cylinders. When Jay gave the signal, Ozzie cut the ignition, then pulled up a lever which held the starter button permanently down. The car now traveled on storage battery power, with the starter providing the same type of propulsion employed on submarines.

Water came higher and higher along the car as

Ozzie headed straight into the river, until finally only a few inches at the top of the windshield were left above the water. Up the river they traveled in this manner.

As they rounded a bend which brought the fortress site into view, Jay signaled Ozzie to drive still farther out into the river, completely submerging the car. Previous to this, he had pushed up an improved periscope which had been painted the same muddy color as the flood waters of the river so they could see without being seen. Air vents alongside the periscope lens brought fresh air to the interior of the car. Approaching as closely as he dared, Jay gave the signal to stop the car at a point where the periscope was in a particularly rough portion of the river.

Scanning the face of the cliff carefully, he located the most probable position for the gun emplacement, keeping in mind the fact that this position must command a sweep of the entire town. The regular transmitting aerial of the car was then pushed up above water long enough for Jay to signal back to the airport that all was ready.

The airport was a scene of hurried activity as preparations were made for the take-off. The lone pilot of the huge bomber checked his parachute pack, then clambered into the plane through an opening which had been cut in the roof of the cabin. Behind him were crates of the most powerful explosives known to mankind, filling the entire cabin from floor to ceiling.

The "all clear" signal came quickly from the airport control tower after he had taxied down to the extreme far end of the field and turned around for the take-off. With the ship carrying its very maximum load, the entire length of the field was needed for the run, and boundary markers were just barely cleared as the ship rose into the air. Carefully he maneuvered the sluggish ship into ascending spirals to gain much-needed altitude, then headed up the river. Suddenly, just beyond the city limits, the plane veered slightly to the left, as if an unseen hand had grabbed the wheel. This, the pilot knew, indicated that Jay in the submerged automobile had taken over control of the plane by radio.

A few seconds later the plane was completely under control from the earth. As the plane dipped downward at a steep gliding angle, the pilot cut the motors, then clambered out through the overhead escape door and pulled the rip cord of his parachute. The next instant he was jerked clear of the plane by the opening chute, and was floating down to the police rescue boat waiting for him on the river.

Silently the huge ship now whizzed downward through the air, in a bee-line for the rocky fort-

(Page 23, please)



RADIO-TRICIAN REG. U.S. PAT. OFF. *Service Sheet*

Compiled Solely for Students and Graduates
NATIONAL RADIO INSTITUTE, WASHINGTON, D. C.

TRUETONE CLOCK RADIO Model D1001

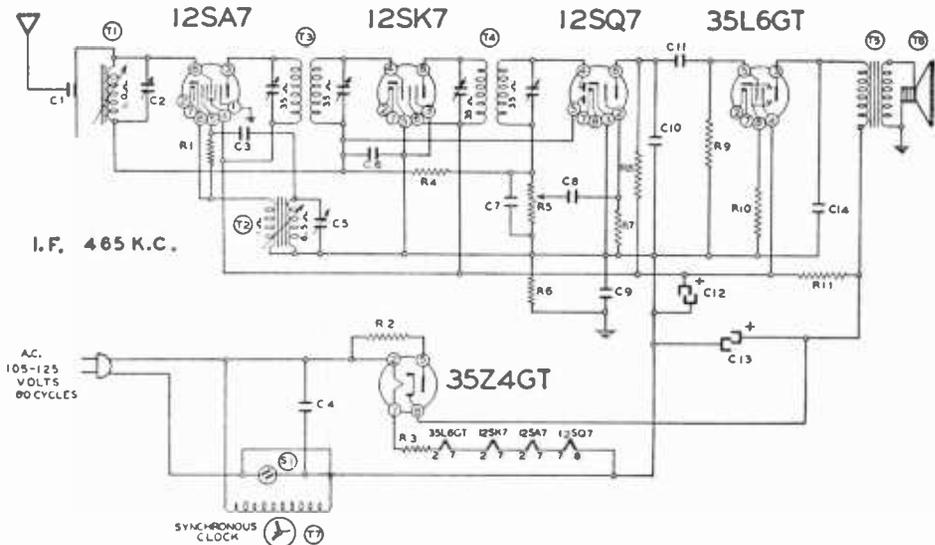


Fig. 2 Schematic Diagram

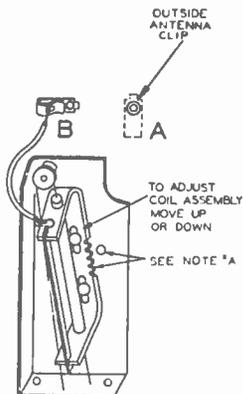
VALUE OF PARTS

RESISTORS

- R1 20M ohm—1/3 W.
- R2 25 ohm—1/2 W.
- R3 50 ohm—1 1/2 W.
- R4 3 Megohm—1/3 W.
- R5 Volume Control—1/2 Meg.
- R6 150M ohm—1/3 W.
- R7 5 Megohm—1/3 W.
- R8 150M ohm—1/3 W.
- R9 250M ohm—1 3 W.
- R10 150 ohm—1/3 W.
- R11 1500 ohm—1 W.

CONDENSERS

- C1 .0002 Washer Condenser (Ant. Clip on Ant. Plate)
 - C2 Ant. Section Dual Trimmer
 - C3 .00005 Mica
 - C4 .1 x 400 v.
 - C5 Osc. Section Dual Trimmer
 - C6 .05 x 400 v.
 - C7 .0001 Mica
 - C8 .002 x 600 v.
 - C9 .15 x 400 v.
 - C10 .0005 Mica
 - C11 .004 x 600 v.
 - C12 20 Mfd. 'Lytic
 - C13 40 Mfd. 'Lytic
 - C14 .01 x 400 v.
- C2 and C5 in one unit.
C12 and C13 in one unit.



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

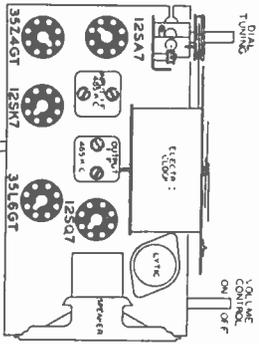


Fig. 1. Top View

ALIGNMENT PROCEDURE

IMPORTANT:

- Volume control—Maximum all adjustments.
- Connect —B of radio chassis to ground post of signal generator through 1 Mfd. Condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

- The following equipment is required for aligning:
- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
 - Output indicating meter.
 - Non-metallic screwdriver.
 - Dummy antennas—.1 mfd. and 200 mmf.

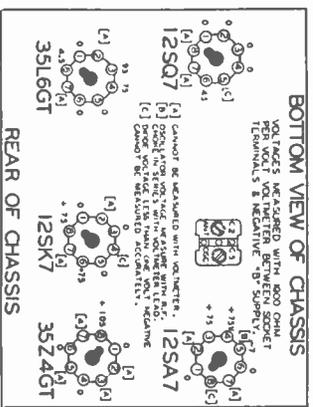


Fig. 3. Bottom View

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function
------	------------------------------------	---------------	---------------------	---------------------------------------	------------------------------------	------------------

I. F.	465 Kc.	.1 MFD.	Connect to Terminal "b" (Fig. 4)	Iron Cores All the way out	Two trimmers on top (See Fig. 1 and Note "C.")	Output I. F.
	465 Kc.	.1 MFD.	Connect to Terminal "b" (Fig. 4)	Iron Cores All the way out	Two trimmers on top (See Fig. 1 and Note "C.")	Input I. F.
	1720 Kc.	.1 MFD.	Connect to Terminal "g" (Fig. 4)	Iron Cores All the way out	Trimmer (C5) (See bottom of Radio, Fig. 3 and Note "C.")	Oscillator

BROAD-CAST	1720 Kc.	200 MMF.	Connect to Terminal "A" (Fig. 4)	Iron Cores All the way out	Trimmer (C2) (See bottom of Radio, Fig. 3 and Note "C.")	Antenna
	1400 Kc.	200 MMF.	Connect to Terminal "A" (Fig. 4)	Turn Dial to 1400 Kc.	Adjust position of antenna coil up or down (See Fig. 4 and Notes "A," and "C.")	Antenna Coil Adjustment

BROAD-CAST	1720 Kc.	200 MMF.	Connect to Terminal "A" (Fig. 4)	Turn Dial to 1720 Kc.	Adjust Trimmer (C2) (See Fig. 3 and Note "B.")	Antenna
------------	----------	----------	----------------------------------	-----------------------	--	---------

NOTE "A"—The antenna coil assembly is made so that it is movable up or down. When making the adjustment as given in the alignment procedure, move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C2) adjustment again at 1720 Kc. If no appreciable change in trimmer adjustment is made the coil is in track; if the trimmer requires considerable change, it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1720 Kc.

NOTE "C"—Adjust to maximum output.

Electronics, Inc. Defies the Yellowjackets

(Continued from page 20)

cess. Tensely Jay gripped the receiver controls, adjusting them first one way and then the other to correct the path of the plane as he gazed through the periscope and followed its progress.

Straight into the rocky cliff crashed the plane. A blinding flash and a thunderous roar was followed by a series of lesser explosions far back in the rocks. The entire cliff rose skyward, then seemed to slide down into the river. Clear across the river rolled the huge rocks, obliterating forever a fortress which threatened a government. So swiftly and silently had the huge plane glided to its objective that not a single Yellowjacket observer had spotted it in time for reprisals.

A miniature tidal wave was created by the thousands of tons of rock. Anticipating this, Jay and Ozzie had braced themselves inside the Electronics, Inc., truck. This was all that saved them from a severe pounding as the wave hit the truck and rolled it over and over down the river. The truck ended up on its side, with water spurting in from a score of cracks and with acid leaking out from the strapped-down batteries. It took the combined strength of both to push open the rear door against the pressure of the water, and swim to the surface. Then followed a struggle with the current as they swam to shore to await the rescue boats which were now speeding up the river.

The seaplane rescue boat stationed at the airport for rescuing sunken planes was dispatched up the river to hoist the Electronics, Inc. truck out of the water and bring it to land. Mechanics went to work restoring the truck to its original spotless shiny condition and drying out all radio equipment.

Back at police headquarters, Jay was explaining to newspaper reporters the details of the successful plan. He took no credit for the originality of the under-water travel idea, saying that all equipment for the fortress had been carried up the river in this same manner.

The cannon had undoubtedly been towed on sledges and brought in through an under-water entrance to the fortress, for any unusual activity of boats or barges in the vicinity would have excited the suspicion of the few fishermen and the people who lived in driftwood shacks along the river bank.

Newspaper extras came on the street heralding the latest exploit of Jay and Ozzie, and assuring the public that the town was no longer menaced by artillery. Organized crime had again met its just reward.

Radio Amateurs

From time to time, as space permits, the Editor of NATIONAL RADIO NEWS is glad to publish a list of Radio "Hams" who have reported their call letters to us.

The following amateur call letters were reported since the last listing.

Leighton E. Mead—W9SWL—Waukesha, Wis.
F. A. Stocking, Jr.—W7IPX—Portland, Oreg.
L. O. Bahls—K7IIRW—Unalakleet, Alaska.
Lee O. Falwell—XUSOF—Manila, P. I.
Ervin Lyke—W8USY—Elmira, N. Y.
Bud Thornberry—W8SYL—Flint, Mich.
George Minich—W7HCS—Seattle, Wash.
L. W. Sherman—W3CDY—Lebanon, Penna.
Edw. A. Gariel—W5HIZJ—San Antonio, Texas.
Chauncey McAbee—W9KTS—Tilford, S. Dak.
Joseph Jernick, Jr.—W2KLC—Laurel, N. Y.
Q. R. Engwall—W9INW—Courtland, Kans.
Frederick Fischer—W3ISX—Cambridge, Md.
Paul McCarty—W9IOU—Hays, Kans.
Maxime May McCarty—W9IOJ—Hays, Kans.
Victor E. Penney—W1MITS—Melrose, Mass.
Arthur L. Exe—W9OQQ—Eagle Butte, S. Dak.
J. T. Hesse—WSUYV—Buffalo, N. Y.
V. J. Olmstead—W7IGT—Kelso, Wash.

— n r i —

We Apologize for an Oversight

In connection with the article "Diagnosis by Signal Tracing" in the August-September 1940 issue of the News we used an illustration, on Page 4, taken from "Service," the popular monthly digest of Radio and Allied Maintenance. Through an oversight we failed to give a courtesy line to "Service." We apologize and are glad to make this correction here.

— n r i —

Our Cover Photograph

The photograph on the cover of this issue of the News shows the work bench in Lloyd V. Stenberg's shop. This establishment is known as Lloyd's Radio and Sound Service and is located in Willmar, Minnesota.

Lloyd does a general Radio service business and specializes in Public Address Amplifiers. His motto on his letterhead appropriately is "Our Business is 'Sound'."

In a letter from Stenberg he says this, "I got my start in Radio through the N. R. I. course. Upon graduating I answered an ad for a serviceman. My application was accepted. I held that job three years, being Service Manager the last year and a half. Then I started my own exclusive shop. I am doing a nice business. The N. R. I. course has meant a lot to me."



The Service Forum

Conducted by

J. B. Straughn, N. R. I. Service Consultant

Send in your service notes. We will re-word them for publication. To qualify your note for the NEWS you must have observed the same trouble on two or more identical receivers.

PHILCO MODEL 38-7

FADES
Set plays O.K. when first turned on, then volume drops and hits a low level at which it remains. Check plate voltage of 6K5G, first audio when set is first turned on and note whether it drops constantly after the set begins playing. If this condition holds, replace the 6K5G tube. This tube checks normal in a tube tester.

HAROLD Z. SNYDER, Maryland.

— n r i —

PHILCO MODELS 90 AND 90A WITH ONE TYPE 47 TUBE

OSCILLATION
Set whistles intermittently or constantly. Replace by-pass condenser No. 35, the R.F. grid return by-pass of the type 24 R.F. tube. This condenser opens and causes the whistle.

HAROLD Z. SNYDER, Maryland.

— n r i —

SPARTON MODEL 589

LOW VOLUME

In many cases this is due to the common ground strip that connects all three sections of the set together becoming corroded or not making good contact to any one or all of the sections. Clean strip and chassis at points of contact with sandpaper.

HAROLD Z. SNYDER, Maryland.

— n r i —

CHEVROLET MODEL 364441

MOTOR NOISE
If the receiver picks up spark noise with the antenna disconnected the shielding pigtailed on the speaker and battery cables should be checked for proper grounds.

— n r i —

CHEVROLET MODEL 364441

OSCILLATOR DEFECTIVE

If the receiver fails to oscillate entirely or oscillates on one end of the dial only, a new 36 tube should be tried in the oscillator tube socket. In case the replacing of the oscillator tube does not remedy the trouble, a careful check on resistor R-1-A and condensers C-3 located below section C-1-C of the gang condenser and C-10 located on the candom resistor strip should be made. Due to the capacity values of condensers C-3 and C-10 being slightly critical, they should be tested by replacement. If the above information does not result in a solution of the trouble, it will be necessary to replace the oscillator coil. Condenser C-3 has a capacity of .000735 mfd, while C-10 has a capacity of .002 mfd.

— n r i —

UNITED MOTORS MODEL 364441

INTERMITTENT

If all voltage tests indicate that the set should operate but fails to do so, or the set cuts out at times in the car, but apparently works satisfactorily on the test bench the R.F. coil is probably at fault. This coil is shown as T-2 in the diagram and should be removed and a visual inspection made of the leads connecting the primary winding located inside of the coil to the soldering lugs mounted on the coil form. If the bare lead made of Litz wire touches the cotton covered lead where they cross each other it will be necessary to insulate the bare wire with a small piece of spaghetti to prevent vibration from shorting them together. The touching of the two leads together completely shorts out the R.F. signal picked up by the antenna but does not materially affect the plate voltage to the first R.F. tube.

— n r i —

ZENITH CHASSIS 5405

DEAD ON LOW FREQUENCIES

If the battery voltage is O.K. interchange the two type 15 tubes. Also try reducing the cathode bias resistor of the detector oscillator tube from 8,000 ohms to 6,000 ohms.

— n r i —

CROSLEY MODEL 566

MOTORBOATING

The installation of a by-pass condenser across the C bias resistors will eliminate this trouble and improve the tone quality. You may use a 25 mfd. 25 volt condenser for this purpose. Connect the negative terminal of the condenser to the B minus terminal inside the chassis and the positive terminal of the condenser to the chassis.

— n r i —

GOODYEAR WINGS DEAD OR DISTORTED

This is due to a defective tone control on the lid of the set. The receiver will play normally when the lid is removed. To remedy the condition replace the control and the condenser used in conjunction with it. The condenser should be rated at 600 volts.

**WELLS GARDNER MODULATION HUM
MODELS OA33 AND OA35**

When modulation hum is encountered the difficulty may be due to the GSK7 first A.F. tube. Try interchanging this tube with the R.F. and I.F. tubes. If the hum is eliminated the original first A.F. tube may be left in the socket in which it has been placed.

-----n r i-----

**SONORA MODEL FILTER CONDENSERS
A-11 DEFECTIVE**

This is due to excess heating of the filter condensers and the condition may be eliminated by operating the receiver without the cabinet back in place. Removal of the cabinet back will give ample ventilation.

-----n r i-----

SONORA MODEL A-11 INTERMITTENT

In many instances this is due to the solder lugs on the volume control touching the chassis. Either bend the lugs so that they no longer short or place an insulating washer between the control and the chassis.

-----n r i-----

**SILVERTONE WIRELESS TURNTABLE
RECORD PLAYER RUNS SLOW**

This condition may be eliminated by replacing the rubber tire on the idler wheel. The original tire becomes oil soaked.

-----n r i-----

**SILVERTONE DEAD OR
MODEL 6159 INTERMITTENT**

This is usually due to the oscillator coil primary shorting to the secondary. The trouble can be corrected by unsoldering the coil from the band switch and removing one turn of wire from the primary. This turn is taken off from the end which is nearest to the secondary winding and will therefore prevent future shorting and at the same time will not affect the tracking. The 150 ohm resistor going to the injector grid of the first detector tube should be checked as the short may have damaged it.

-----n r i-----

SILVERTONE MODEL 1905 HUM

To eliminate hum, replace the 14 mfd. input filter condenser which is insulated from the chassis with a 25 mfd. 450 volt unit.

-----n r i-----

**SILVERTONE NOISY VOLUME
MODEL 1905 CONTROL**

If the volume control becomes noisy after a short time, this is due to the diode current flowing through the control. To eliminate disconnect the high potential end of the control and insert a .02 mfd. 600 volt condenser between the control and the point from which it was disconnected. Then shunt both the control and the condenser with a 250,000 ohm half watt resistor. The resistor then acts as the diode load and the control will give normal service since no current then flows through it.

**CROSLEY MODEL 517 DEAD ON
BROADCAST BAND**

Check the band switch contacts. Sometimes the internal contact will break off.

-----n r i-----

**RCA AUTOMATIC PICK-UP FALLING
RECORD CHANGER OFF RECORD**

The pick-up will sometimes be thrown off the record by a clockwise twist in the pick-up cable. When securing the pick-up lead to the cabinet before the cable is plugged into the chassis, twist the lead about one-quarter turn in a counter clockwise direction. This will tend to hold the pick-up on the record.

-----n r i-----

CROSLEY MODEL 515 DEAD

Check the .006 mfd. condenser connected between the first plate of the 6B5 and the chassis for a short. This condenser is in the same container with the tone control condenser. The center terminal going to plate 1 of the 6B5 is common to both sections and to eliminate the .006 mfd. condenser cut the chassis connection from the unit as close as possible to the container and install a single .006 mfd. condenser from the plate to the chassis.

-----n r i-----

RCA MODEL 811-K DISTORTED

This is generally due to leakage in the .01 mfd. condenser marked C29 in the diagram connected to the phono-input panel.

-----n r i-----

**RCA MODEL 811-K DEAD ON BROADCAST
BAND**

Check the oscillator coil for continuity. If the coil cannot be readily repaired, install a replacement.

-----n r i-----

**MOTOROLA MODEL 82A CLOCK TURNS
RADIO ON**

If the clock turns the radio on even though it has not been set to do so, check the 24 hour contactor, which is mounted on the day and night indicator, and which maintains contact on the ends of the time bars by the tension of a coil spring. This contactor and the coil spring are sometimes assembled too close to the large gear so that at 15 minute intervals, when the cam switch closes, a spark will arc across between the two parts. To correct the trouble, bend the contactor and the indicator away from the large gear.

-----n r i-----

CROSLEY MODEL 515 DEAD

This is often due to an open in the two section candohm resistor at the rear of the chassis sub-base. The unit has a resistance of 8,500 ohms in one section and 25,000 ohms in the other section, the latter connecting to the volume control. If either section is bad install another resistor of the same size rated at 10 watts.



N. R. I. ALUMNI NEWS

Clarence Stokes	President
Dr. Geo. B. Thompson, F. E. Oliver	Vice-Pres.
Allen McCluskey, Alfred E. Stock	Vice-Pres.
Earl Merryman	Secretary
Louis L. Menne	Executive-Secretary

NOMINATIONS FOR 1941

Again it is time to call for nominations for officers of the N. R. I. Alumni Association. Our constitution provides that two months prior to January 1 of each ensuing year, nominations for the various offices shall be called for from the membership through the columns of NATIONAL RADIO NEWS.

Our Constitution further provides that one month prior to January 1 of each ensuing year the two nominees for each office shall be submitted to the entire membership. The membership shall in return submit the ballots properly marked, voting for one nominee for each office.

In accordance with this procedure it is our custom to call for nominees for the approaching year in the issue of the NEWS corresponding to this one, then present the two nominees for each office in the next issue of the NEWS, for the election of one, to take office on January 1.

All present officers may be candidates to succeed themselves, except the President. Last year, you remember, we voted on a resolution to amend our Constitution to limit the term of office of the President to one year. The purpose of the amendment was to allow a greater number of our members to fill office in our organization. This proposal was passed upon by our members and carried with a vote of 92%.

So, that grand fellow, Clarence Stokes of Philadelphia, will step out of the Presidency on December 31, 1940 to be succeeded by whomever we shall elect. Stokes, however, may be a candidate for any office, other than President, and, it should be mentioned, will be eligible for the

Presidency again after a lapse of one year. He has been a fine President and, of course, still has several months of his term to fulfill during which time he will continue to give his best to help Radiomen everywhere. Stokes also is a very influential member of Phila-Camden Chapter of the N. R. I. Alumni Association and we shall continue to get the benefits of his efforts in connection with his work in that Chapter.

All of our Vice-Presidents may be re-nominated. In fact eight candidates for Vice-President will be nominated from which number four will be elected. It is anticipated that many will want to choose our 1941 President from among our current Vice-Presidents. Other leading candidates are the officers of local chapters.

A list of Chairmen and Secretaries of local chapters is given on page 29. It stands to reason that any man who is giving his time and energy in the interests of local chapters, without compensation of any kind except the satisfaction of helping fellow N. R. I. men, certainly has the right spirit toward the organization and is worthy of consideration for a national office.

Included in this group is John Stanish, Chairman of Detroit Chapter, a hard hitting leader who would make a peach of a President next year or in some future year; F. Earl Oliver, Secretary of Detroit Chapter, who is now a Vice-President, an office he has held for a number of consecutive years; Irvin Gordy, Chairman, and Lon Kunert, Secretary, of New York Chapter, two capable and loyal members who can be depended upon at all times; Norman Kraft, Chairman of Philadelphia-Camden Chapter and L. A. Michalski the Secre-

rary of Philadelphia-Camden Chapter, who is filling an office for the first time this year and making a good job of it; Pete Dunn, Chairman of Baltimore Chapter who served as President for four consecutive years; E. O. E. Gralley, Secretary of Baltimore Chapter who seldom misses a meeting and whose influence has done much to make Baltimore one of our outstanding Chapters; Clarence Schultz, Chairman, and Eric Johnson, Secretary of Chicago Chapter, who are doing a good job for our members in that city.

In addition we want to mention such fine workers as Cecil B. Morehead of Chicago, Edward Sorg of Chicago, Alfred E. Stock of New York, Ted J. Telaak of Buffalo, Charles J. Fehn of Philadelphia who were nominees last year and polled a strong vote even though short of election.

Some of the men who are not members of local chapters are expected to run a strong race this year. Two of these are now serving as Vice-Presidents. They are Dr. George B. Thompson, Los Angeles, California and Allen McCluskey of Birmingham, Alabama.

The President and Vice-President may be nominated at large but the Executive Secretary and Secretary shall reside in or near Washington, D. C. for the purpose of remaining in active touch with the Institute Headquarters. Earl Merryman, who has held the office of Secretary since our Alumni Association was organized in 1929, is a candidate for re-election and L. L. Menne, who conducts the affairs of the Alumni Association at Headquarters, is again a candidate for Executive Secretary. Mr. Menne also acts as Editor of NATIONAL RADIO NEWS, our official publication.

In order that our members may have a wide list of candidates to choose from we are submitting a list of names of members located in various parts of the country. These are submitted merely to be of assistance to you. Any member of the Alumni Association may be a candidate for office. Use ballot on pages 29 and 30.

Allen McCluskey, Birmingham, Ala.
 Carl E. Slater, Coolidge, Ariz.
 Roy Bryan, Ft. Smith, Ark.
 C. F. West, San Francisco, Calif.
 R. H. Rood, Los Angeles, Calif.
 Dr. Geo. B. Thompson, Los Angeles, Calif.
 John R. Kelley, Denver, Colo.
 M. E. Perkins, Bristol, Conn.
 George W. Howell, Wilmington, Del.
 J. J. Jenkins, Washington, D. C.
 D. L. Hash, Washington, D. C.
 J. W. Nally, Washington, D. C.
 W. A. Bunch, Miami, Fla.
 S. H. Daniels, Orlando, Fla.
 A. E. Rudolph, Dalton, Ga.
 Oliver B. Hill, Moscow, Idaho
 Edward Sorg, Chicago, Ill.

B. A. Stalcup, Mounds, Ill.
 Lowell Long, Geneva, Ind.
 Leonard E. Close, Mt. Pleasant, Iowa
 Harry Laborde, Perry, Iowa
 William B. Martin, Kansas City, Kans.
 Roy Harvey, Louisville, Ky.
 O. M. Davidson, Jr., Ged, La.
 Robert Beaule, Lewiston, Maine
 E. O. E. Gralley, Baltimore, Md.
 J. B. Gough, Baltimore, Md.
 I. A. Willett, Baltimore, Md.
 Omer Lapointe, Salem, Mass.
 F. E. Oliver, Detroit, Mich.
 J. Stanish, Detroit, Mich.
 Frederick Gaul, Freeland, Mich.
 Lloyd R. Olson, Minneapolis, Minn.
 Al. Fisher, Clarksdale, Miss.
 Claude West, St. Louis, Mo.
 E. A. Charlton, Helena, Mont.
 R. H. Cordes, Omaha, Neb.
 C. D. Parker, Lovelock, Nev.
 E. Everett Darby, Woodsville, N. H.
 John Stein, Union City, N. J.
 Wm. Prescott, Rochelle, N. J.
 James E. Graham, Carlshad, N. M.
 T. J. Telaak, Buffalo, N. Y.
 A. E. Stock, Brooklyn, N. Y.
 Glenn A. Williams, Cuba, N. Y.
 L. J. Kunert, Middle Village, L. I., N. Y.
 Charles W. Dussing, Syracuse, N. Y.
 C. C. Cobb, Winston Salem, N. C.
 Arvid Bye, Spring Brook, N. Dak.
 Frank Moore, Portsmouth, Ohio
 Jacob J. Knaak, Cleveland, Ohio
 Edgar Haines, Bartlesville, Okla.
 Henry W. Freeman, Portland, Oreg.
 Charles J. Fehn, Philadelphia, Penna.
 Clyde D. Kiebach, Reading, Penna.
 Karl R. Smalley, Cranston, R. I.
 Noel J. Lawson, Aberdeen, S. Dak.
 W. P. Brownlow, Johnson City, Tenn.
 J. E. Collins, Paris, Tenn.
 John E. Elsik, Temple, Texas.
 R. L. Southworth, Wichita Falls, Texas
 J. H. Watkins, Ogden, Utah
 Robert S. Dumas, Fair Haven, Vt.
 Mahlon C. Atwood, Fredericksburg, Va.
 T. E. Ellis, Richmond, Va.
 Woodley C. Blackwell, Jr., Warsaw, Va.
 R. F. Keil, Seattle, Wash.
 R. A. Heise, Wheeling, W. Va.
 William Wiesmann, Ft. Atkinson, Wis.
 M. L. Githens, Rawlins, Wyo.
 Alvin L. Campbell, Burdett, Alta., Canada
 Maurice E. Mercer, Vancouver, B. C., Canada
 John J. Cain, Vancouver, B. C., Canada
 Henry H. Sutton, Flin Flon, Man., Canada
 J. Perrin, Belleview, Man., Canada
 H. V. Baxter, St. John, N. B., Canada
 D. J. Dunton, Pictou, N. S., Canada
 C. M. G. Smith, Barrie, Ont., Canada
 G. C. Gunning, Smiths Falls, Ont., Canada
 Joseph Savage, St. Jean, P. Q., Canada
 E. Bergeron, Sherbrooke, P. Q., Canada
 J. W. Meadwell, Saskatoon, Sask., Canada

Here and There Among Alumni Members



Walt Walker, Jr., of Vineland, N. J., who has been with the "Acc" Radio Shop for several years writes that he got another raise and, also important, that he was

quietly married two years ago. Why all the secrecy, Walt?

-----n r i-----

A. H. Odema, who was a professional wrestler of wide reputation, is now Service Manager for Palm Beach Radio Co., of Palm Beach, Fla. This concern was started in 1939 with a capital of \$200 and now has a net worth of over \$5,000.

-----n r i-----

John Lyons, of Pembroke, Ont., Canada, was a real outstanding success in Radio. Mr. Lyons liked to talk about his wife and five children, the things Radio enabled him to get for them. Then came appendicitis, an operation that was not successful and we lost our good friend. We shall miss him.

-----n r i-----

Leonard Dacewicz is using his Radio training to good advantage. He is technician for Dr. Lyman of Johns Hopkins Hospital acting as brain wave technician.

-----n r i-----

Howard T. Dempsey is a Radio operator with the Indiana State Police Radio System at Chesterton, Indiana.

-----n r i-----

Pete Dunn and Menne went fishing. They were standing in the hotel, minus hats, when a young lady stepped up to Pete and, taking him for the manager, said, "The door to our room won't close —there is an opening wide enough to throw a cat through." Pete replied, "I'll look into that tonight." Even the young lady smiled at that.

-----n r i-----

Since the last issue of the NEWS our very loyal friend, Charles Drotleff of Youngstown, Ohio, passed away. Charlie was one of those fellows who got a great kick out of helping some one else. He was a tip-top Radio man and had a fine business. He left a host of friends who will remember him kindly.

-----n r i-----

Albert Patrick has been making good progress. He has complete charge of service for Tampa Radio Sales of Tampa, Fla. Been with them four years. Bought a home of his own, dolled it up in new furniture and just recently carried his bride over the threshold.

-----n r i-----

J. M. Baldwin of Prescott, Ariz. lost his life in an automobile accident on August 1, writes Mrs. Baldwin. He was well on his way toward a prosperous future in Radio and had accumulated

some fine equipment. The Alumni Association mourns the loss of a loyal member.

-----n r i-----

Robert J. Carter of Rushville, Penna., is on the shelf for several months with some torn ligaments. Says he doesn't like the enforced vacation because he is anxious to complete his plans to open a new Radio shop.

-----n r i-----

Executive Secretary Menne is planning to visit Chicago and Detroit Chapters in October. He will also visit New York and Phila.-Camden Chapter soon.

-----n r i-----

E. A. Mallison of Linden, N. Y., sends in a picture of his test bench. It is entirely original—nothing copied—and is indeed a work to be proud of. In fact "Radio Retailing" thought well enough of it to reproduce the photograph in a recent issue.

-----n r i-----

One of the finest photographs we have seen in a long time was sent to us by J. W. Meadwell of Saskatoon, Sask., Canada. It shows his modern store front with elaborate signs and modern window display. Mrs. Meadwell, also an N. R. I. Graduate by the way, takes care of all the inside details while Mr. Meadwell makes contacts on the outside. Another photograph shows their service bench which just about rivals the one at N. R. I.

-----n r i-----

Samuel Levine of Pulaski, Virginia, who was formerly a Junior Radio Operator for the Civil Aeronautics Authority, was recently made acting Operator in charge at Pulaski Airways Communication Station with the recommendation for the job of permanent Operator in charge.

-----n r i-----

Hugh D. Rafferty of Uniontown, Penna., where he conducts a successful Radio business, is now sponsoring a weekly broadcast on his local Station which he tells us is getting remarkable results. Rafferty has a store to be proud of.

-----n r i-----

Ray L. Wanderly of Sheridan, Wyo., sends us his annual teaser to go fishing with him out there where the streams teem with trout. Sorry, Ray, but we will have to be contented with our week-end fishing in Chesapeake Bay.

-----n r i-----

Walter H. Smith, formerly of Montreal, P. Q., Canada, is now on the high seas as Radio Operator on board ship and writes that there is never a dull moment these days. For sheer adventure he says you can't beat his work.

-----n r i-----

R. H. Bourret is again stationed in Miami, Fla., where he is connected with Pan American Airways as Radio Operator, flying to Caribbean ports. Bourret paid us a visit at headquarters while on vacation.

Directory of Officers

(To Serve Until January, 1941)

President—Clarence Stokes, Philadelphia, Pa.
Vice-Presidents—
Allen McChuskey, Birmingham, Ala.
F. E. Oliver, Detroit, Mich.
Alfred E. Stock, Brooklyn, N. Y.
Dr. Geo. B. Thompson, Los Angeles, Calif.
Secretary—Earl Merryman, Washington, D. C.
Executive Secretary—L. L. Menne, National Headquarters, Washington, D. C.

— n r i —

Chairmen of Chapters

Clarence Schultz, Chicago Chapter, 1158 Diversey Parkway, Chicago, Ill.
Peter J. Dunn, Baltimore Chapter, 713 N. Fulton Ave., Baltimore, Md.
Irving Gordy, New York Chapter, 1746 Bathgate Ave., Bronx, N. Y.
John Stanish, Detroit Chapter, 12551 Camden Ave., Detroit, Mich.
Norman Kraft, Philadelphia-Camden Chapter, 6 S. 8th St., Perkasio, Penna.

— n r i —

New York Chapter

Our meetings during the summer were well attended but now that we are approaching the fall season we really expect to go after things in a big way again. It is expected that Mr. Smith, Mr. Straughn and Mr. Menne will be present with us soon at one of our big fall meetings. Arrangements have not been completed, awaiting word from our guests from headquarters as to when it will be convenient for them to make the trip to New York.

During the present year we have increased our membership considerably but we are anxious to continue to grow and we shall be very glad to have any student or graduate in the Metropolitan New York Area meet with us on any first or third Thursday of the month, at Damanzeks Manor, 12 St. Marks Place, New York City. Be careful not to confuse this street with a similar street in Brooklyn. Meetings start at 8:15 P.M.

LOUIS J. KUNERT, Secretary.

— n r i —

Alumni Association Pins

A new supply of N. R. I. Alumni pins are now in stock. They are durably made, with a patented safety clasp and are really beauties. These pins are available to members of the Alumni Association for one dollar each. If you care to order one of these pins address your letter, with remittance, to the Secretary, N. R. I. Alumni Association, 16th and You Sts., N. W., Washington, D. C.

Nomination Ballot

All Alumni Association Members are requested to fill in this Ballot and return it promptly to National Headquarters. This is your opportunity to select the men who you want to run your Association. Turn this page over—the other side is arranged for your selections.

After the ballots are returned to National Headquarters they will be checked carefully and *the two men having the highest number of votes* for each office will be nominated as candidates for the 1941 election. This election will be conducted in the next issue of NATIONAL RADIO NEWS.

The President cannot be a candidate to succeed himself but you may nominate him for any other office, if you wish. You may, however, nominate all other officers who are now serving, for President or any office, or select entirely new ones. It's up to you—select any men you wish as long as they are MEMBERS IN GOOD STANDING OF THE N. R. I. ALUMNI ASSOCIATION. Be sure to give the city and state of your selections to prevent any misunderstanding. A list of the 1940 officers are to be found in the opposite column.

Detach this slip carefully from your NATIONAL RADIO NEWS so as not to damage the book. Tear off the slip at the dotted line, fill it out carefully, and return it immediately to L. L. Menne, Executive Secretary, N. R. I. Alumni Association, 16th and U Sts., N. W., Washington, D. C.

Your signature

City State.....

(Over)

The 1941 nomination is a very important one. Choose carefully the men you desire to handle the reins of the Alumni Association for the coming year. Let's all do our part to help the staff handling the elections, by submitting ballots on or before October 15, 1940.

Tear carefully along this line

Nomination Ballot

L. L. MENNE, *Executive Secretary*,
N. R. I. Alumni Association,
16th and You Sts., N. W.
Washington, D. C.

I am submitting this Nomination Ballot for my choice of candidates for the coming election. The men below are those whom I would like to see elected as officers for the year 1941.

MY CHOICE FOR PRESIDENT IS

.....
City State

MY CHOICE FOR FOUR VICE-PRESIDENTS IS

1.
City State

2.
City State

3.
City State

4.
City State

MY CHOICE FOR SECRETARY IS

.....
City State

MY CHOICE FOR EXECUTIVE SECRETARY IS

.....
City State

Philadelphia-Camden Chapter

One of the important activities of our Chapter was a picnic held on the 25th of August. Chapter members attended with their wives, sweethearts and friends. It was a gala event. There were plenty of refreshments for all.

A vote of thanks is extended to our Chairman Norman Kraft who, almost single handed, made all arrangements for the picnic and who personally donated "Hot Dogs" and freshly picked ears of corn. During most of the day we took turns at roasting "Hot Dogs" and corn at an open fire. Some of the corn was placed in a kettle and boiled. This was especially delicious when spread with home made farm butter. The corn and other vegetables were grown on Kraft's own farm in Perkasio, Pennsylvania. The picnic was held on the Milford Square, Pennsylvania farm of Mr. Creswell, brother-in-law of Mr. Kraft. Before leaving, after a most delightful day, Mr. Creswell presented each family group with a large bouquet of flowers.

The Chapter has purchased some new equipment to be used for test purposes including a 16 tube Radio which will be used for experiments.

Five new members have been accepted. They are James Buchanan, Charles Kuhn, Joseph Nowak, Walter Soltys and Allen Harris.

One of our meetings was conducted by our member, James McCafferty, who gave a very interesting talk on the Magic Eye. Other meetings were conducted by our Chairman Norman Kraft. One of his most interesting talks was on A.V.C.

At each meeting we set aside part of our time for a brief review of some of our textbooks.

Attention is called to a special meeting which will be held on October 17, on which occasion Mr. Joseph Kaufman, N. R. I. Director of Education will address us. Those of our members who have heard Mr. Kaufman on previous occasions know that he always presents an interesting and educational talk and they will not want to miss him. Tentative plans are to hold this special meeting at larger quarters at 1626 Arch Street, but this decision is not final. Notices will be mailed to all of our members in due time.

We extend an invitation to all N. R. I. men to meet with us on the first and third Thursday each month at 8:15 P.M. at the Longshore Radio Shop, 4711 Longshore Street.

L. A. MICHALSKI, *Secretary*.

— n r i —

Oliver of Detroit Is Visitor

F. Earl Oliver, Vice-President of N. R. I. A. A. was a recent visitor at headquarters where he conferred with Executive Secretary Menne.



Likes Jay and Ozzie

I'll agree with Mr. Allen and say that Jay and Ozzie should not be discontinued. Since I enrolled I have read one story about them and I must say that I enjoyed it very much and would like to have stories about them more often. I guess I should say that I enjoy every page of every NATIONAL RADIO NEWS.

JOE E. HARRIS,
Farmington, New Mexico.

— n r i —

Pleased With Recent Articles

I must congratulate you for producing such a fine informative magazine. The Frequency Modulation discussion by Paul Thomsen was as complete as could be expected. I thought "Advantages of Outdoor Antennas" just about hit the nail squarely on the head.

WILLIAM PRUTZMAN,
Reading, Pa.

— n r i —

Interesting and Instructive

I have been reading the NATIONAL RADIO NEWS ever since I have enrolled, and I want to say I have enjoyed it tremendously. As a whole the publication is very interesting and instructive. It keeps you right up-to-date and up to a higher standard of Radio. I enjoy more particularly, however, the editorials on the first page. It makes you realize that Radio men have a lot more in common than just Radio. As a matter of fact, your whole magazine does that.

MAURICE A. CASSELL,
Manila, Philippines.

— n r i —

Wants Novel Radio Items

Puzzling Radio Questions is an excellent addition. Don't drop Novel Radio Items.

HERMAN R. WILKENING,
Loomis, Sask., Canada.

Ideas to Experimenters

Of course Novel Radio Items and Electronics, Inc., should be continued. I located an electric fence transformer by Jay and Ozzie's Halloween story. Electronics, Inc., offers ideas to experimenters.

WILLIAM L. BOSWELL,
Wilson, N. C.

— n r i —

Article Cleared Up Difficulties

The article "Diagnosis by Signal Tracing," last issue, has cleared up some difficulties I had. It is a very good article. I have tried everything else so far that has been given in the Laboratory Page and found it almost as good as another experimental course.

CLYDE CULP,
New Rockford, N. Dak.

— n r i —

Appreciates Knowledge Obtained

I cannot fully express my appreciation for the knowledge obtained from recent issues of NATIONAL RADIO NEWS, through reading such articles as "The N. R. I. Plan for Getting Practical Experience at Home"—"Making Extra Profits Changing Push Button Radios to New Frequencies"—"Diagnosis by Signal Tracing" and your articles on Frequency Modulation.

STANLEY P. GILHOOLY,
Van Dyke, Mich.

— n r i —

Signal Tracing Article

I had been looking forward for quite some time to the discussion by Mr. J. B. Straughn on Signal Tracing, and wasn't disappointed one bit in it. It was very well written and contains a lot of very good information. Keep up the good work!

GEORGE PALMER,
Valparaiso, Ind.

Page Thirty-one

Chicago Chapter

Our meetings were suspended during July and August but we all got together at our annual picnic, an event we look forward to each summer.

The picnic was held at Caldwell Woods on Sunday, August 4. We were fortunate to have a fine, clear day and a good crowd attended. Highlights were baseball and swimming with the usual number of casualties.

Other interesting side-lights were, Charlie Cada running off with the belle of the neighboring picnic crowd and getting tangled up in a rhumba; Sam Juricek getting lost in the woods; "Pop" Schultz refusing to be shaken down by the shake-down artist who tried to collect one buck per table as "cover charge"; Earl Bennett tapping the barrel with the faucet turned on; Auggie Kettlehut forgetting to remove his hat before going swimming; Rose Schultz appeasing a rival picnic crowd by sharing a large chocolate cake with them.

Cecil Morehead missed the mail and showed up for the picnic a week after it was held. Eddie Sorg, unfortunately, was unable to attend and was greatly missed by all the children with whom he is a big favorite.

We will resume our meetings in September, although as this notice is prepared, we have not yet decided on our new meeting place. Several locations are under consideration and announcements will be mailed in due time.

ERIC JOHNSON, *Secretary.*

Baltimore Chapter

We have continued our meetings right through the summer with excellent attendance.

Mr. Rathbun has been leading some of our meetings in a study of code. This has proved very interesting and beneficial. Mr. J. B. Straughn of headquarters has been our guest speaker on a number of occasions and, as always, brought a worthwhile message. We have also had the pleasure of Mr. L. L. Menne's attendance several times when he delivered his usual inspirational talks.

The fellows are planning a week-end fishing trip down Chesapeake Bay. This fall we will again hold our annual dance which is always an outstanding event. A committee has been appointed and final details are now being worked out.

Pete Dunn our Chairman, has worked hard to give us interesting programs right through the summer. A vote of thanks was extended to both Chairman Dunn and Secretary Gralley for their tireless efforts in behalf of our Chapter.

E. O. E. GRALLEY, *Secretary.*

NATIONAL RADIO NEWS

FROM N.R.I. TRAINING HEADQUARTERS

Vol. 9

October-November, 1940

No. 5

Published every other month in the interest of the students and Alumni Association of the

NATIONAL RADIO INSTITUTE
Washington, D. C.

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

Editorial and Business Office, 16th & You Sts., N. W.,
Washington, D. C.

L. L. MENNE, EDITOR

L. J. MARKUS, TECHNICAL EDITOR

NATIONAL RADIO NEWS accepts no paid advertising. Articles referring to products of manufacturers, wholesalers, etc., are included for readers' information only, and we assume no responsibility for these companies or their products.

Index

Article	Page
Future of Radio	3
Puzzling Radio Questions	6
F. C. C. Releases	8
Laboratory Page	11
Service Sheet—True Tone, Model D1080	13
Novel Radio Items	15
Electronics, Inc.	16
Service Sheet—True Tone, Model D1001	21
Service Forum	24
Alumni News	26
Here and There Among Alumni Members	28
Alumni Nomination Ballot	29
The Mailbag	31