journal

January/February 1970

35 cents

TECHNICIANS

COMPUTER SERVICE TECHNICIANS

Immediate openings for Computer Service Technicians to maintain and repair digital computer and rotating memory equipment at customer locations in the Washington, D.C. area. Persons selected will receive hands-on training at full pay in Anaheim, California, beginning September 7.

QUALIFICATIONS INCLUDE

– Minimum 2 years technical school training or college level EE courses.

– 2 years experience in solid state circuitry, digital logic, rotating memories and trouble shooting commercial computer equipment.

– Preference to applicants with commercial systems experience.

CalComp is now the established leader in computer graphics and provides careers with excellent promotional opportunities.

LOCAL INTERVIEWS WILL BE HELD SOON

call Ed Hoyles (301) 946-0006. ...time outlining experience to us at ...ille, Md. 20852.

COMP

COMPUTER PRODUCTS, INC.

...al Opportunity Employer M/F

ELECT. TECH.

$9000 FEE PAID

INSTALL & TROUBLE SHOOT SOLID STATE MEDICAL EQUIP. FOR THIS TOP NOTCH FOREIGN MFR. AFTER 2 WKS.

TRAINING IN EUROPE!

NEW CAR & ALL EXPENSES PAID + EXCEL. FRINGE BENE. FIT PACKAGE. TO APPLY CONTACT MR. HEYDE. 532-4411

MANAGEMENT RECRUITERS, FALLS CHURCH, VA. (Pers.)

TV TECHNICIAN 40 hr. wk., ...of outside work and some bench work. $150 wk., call 736-1224.

TV TECHNICIAN – Full or part time. exper. nec. DYNAMIC TV. 949-3322.

...equip. 481-0020. Haslowe Pers., 3622 Columbia Pike.

...radio & wire systems & ...TECHNICIAN

WIREMAN TECHNICIA

Position available for ... with 2 or more years o... or technician background portunity, liberal fringe permanent position. Call ... apply in person.

RACAL COMMUNICATION ... 8440 2nd Ave. Silver Sp... An Equal Opportunity Em...

ELECTRONIC TECHNICIANS ENGINEERS

FOR HAWAII

...in installation & che... ...equip. to be ins... ...med. opening.

...AM HINN...

ELECTRONICS TECHNICIAN

$7722—$10,352

THE MONTGOMERY COUNTY, MARYLAND GOVERNMENT ... seeking a career minded, alert, energetic individual to do ...chnical work at the journeyman level in the proper installation ... maintenance of precision electronics equipment to include VHF, and WHF land-mobile microwave systems. Combine ...curity and fringe benefits of Government employment to ...free uniform laundry and on-the-job transportation.

qualifications include: High School Graduate (State ...ol Equivalency Certificate acceptable) plus graduate ... applicable trade or military service school and five ...essional electronic technician experience with land ...stems, good health, and free from color blindness. ... applicant; be or become Montgomery County ... 2nd class RTO license and Maryland driver...

...on call, write, or visit the Mont... ...nnel Office, Employment Divis... ...ing, 100 South Perry Stree...

E.O.E.

TV REPAIRMAN

...tment, call Ed Hoyles (301) 946-0006. ...time outlining experience to us at ...ille, Md. 20852.

As assistant to shop foreman, top wages & benefits. See Mr. Jerry, 1031 7th St. N.W.

TV Technicians

Are you an experienced technician looking for a full time position with top pay and excellent company benefits? Apply in person or call Sears, Roebuck & Co. for appoint...ment.

SEARS-ROEBUCK

2900 V...st, N.E. 529-5500, ext. 253
...pringfield, Va. 321-8200, ext. ...94
16401 Shady Grove Rd.
...ersburg, Md. 948-3535, ext. 252

...TECHNICIAN – Full or part time, ...ec. DYNAMIC TV. 949-3322.

...RONICS TO $12,000 ...HNICIANS

...perience plus military or ...school. R.F., digital or in...tion background. Proto...ting, or field service po...ontact RAY SIMS, 657-...NAGEMENT RECRUIT... ... Chevy Chase.

ELECTRONIC TECHNICIAN

Fabricate, repair, maintain & calibrate electronic equipment & instruments used in research work. Graduation from high school & recognized technical school in electronics desired. Good pay, advancement, other fringe benefits. Call (301) 454-3503 or send resume & salary needs to Frank Bednarek, Dept. of Physics & Astronomy, Univ. of Md., College Pk., Md. 20742. (E.O.E.).

ELECTRONICS INSTALLER and SERVICE TECHNICIAN

...diate employment. ... Experien...

ASSEMBLERS ELECTRONIC

Preferably NASA certified, to assemble P/C boards, cables, and electronic components.

Pleasant Working Conditions
Excellent Pay & Benefits

Call or Apply at once.

TAAG, INCORPORATED
7207 Baltimore Ave.,
College Park, Md.
Phone 927-5222
An Equal Opportunity Em...

TECHN... ...tronic and electr... ...ience required. ele... ...of standard electronic ... ...during equipment sys... ...with magnetic ... ...computer sys... Mrs. Hebder...

ELECTRONICS—Young men ove... ...brate alarm tech... ...21, to train as burglar alarm tech... ...Any previous electrica... ...helpful. Good starting sal... ...Benefits. Call H. E. Malone... ...RE 7-5300, Mon. thru Fri. 10 a.m.-... ...p.m.; eves. call 772-0181. FED... ...ERAL ALARM SERVICES OF...

ELECTRONIC TECHNICIAN

Fabricate, repair, maintain an... ...brate electronic equipment a... ...struments used in research ... Graduation from high school a... ...ognized technical school in e... ...ics desired. Good pay, advan... other fringe benefits. ... 301 – 454-3503 or send resum... ...ary needs to Frank Bedna... ...of Physics and Astronom... Md., College Park, Md. ... Equal Opportunity Em...

ELECTRONICS TECH... ...class license required.

Adventures In Electronics Kit

FROM CONAR . . .

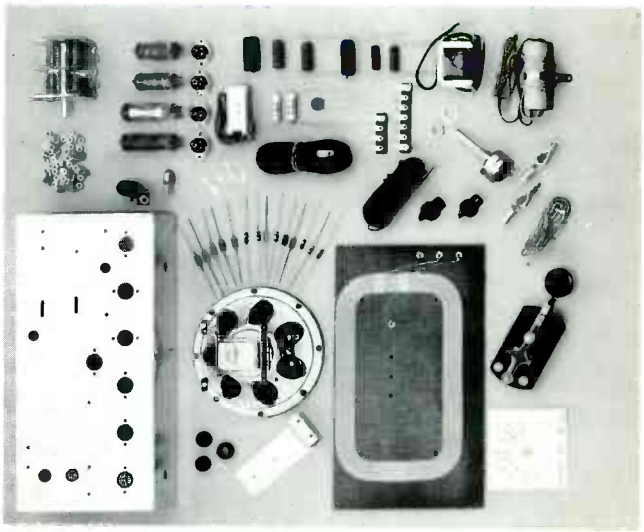
The Perfect Gift for Some Lucky Boy (or his Dad)!

★ More Than 100 Parts

★ A Dozen Experiments

$18.95

Stock #26UKSIP
Weight 6 lbs.
Parcel Post



Ten *fascinating* and *safe* educational projects. This kit is used by teachers in many school classrooms to introduce students to electronics—help them toward satisfying and profitable careers. Here's proof positive of its sound educational value and thorough training.

Kit contains over 100 top-quality parts—name brands you'll recognize. This is not the *"plastic-cardboard-battery"* type experimenter's kit usually found on store shelves. IF PURCHASED SEPARATELY, THE PARTS USED IN THE ADVENTURES IN ELECTRONICS KIT WOULD RUN WELL OVER $30.00.

You learn about electronics and *have fun* doing it. Each project graphically demonstrates a number of electronics principles. You're shown "why" and "how" these principles work. You need *no previous electronic training or experience*. Just follow the simple, concise instructions and large diagrams in the 48-page project manual. The manual includes a glossary of common electronics terms for quick and easy reference.

The projects cover a seemingly endless variety of activities:

• **You build a Radio Receiver** which performs exactly like a manufactured set—picks up local broadcasts and distant stations.

• **You learn about Testing Radio Sets.** In this project you build a signal tracer and use it to find the exact point in a circuit where the signal stops. The signal tracer is a test instrument used by professional electronics technicians.

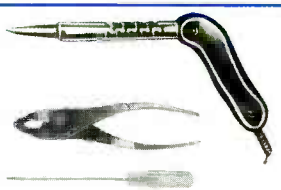
• **Then you become a Radio Announcer.** You set up a broadcast station, and with the speaker as your "mike," transmit your voice through your radio or a neighbor's set.

• **Now you assemble a "Secret Listener."** The speaker becomes a concealed microphone. Put it in one room and hear any conversations through a receiver without being present. Use it as an electronic "baby sitter." Mother can place the "Listener" near baby's crib and hear cries while she's in another room.

• **You'll experiment with sound.** In one project you build an Audio Oscillator and produce a wide range of sounds. Another experiment teaches how sound is magnified. After putting together an Audio Amplifier, you amplify sounds from a phonograph pick-up.

ALL THE TOOLS YOU NEED ARE INCLUDED FREE

SOLDERING IRON • SCREWDRIVER • PLIERS



USE CONVENIENT ORDER BLANK ON PAGE 25

journal

January/February 1970
Vol. 27, No. 1

Published bimonthly by National Radio Institute, 3939 Wisconsin Ave., Washington, D.C. 20016. Subscription $2.00 per year. Litho in U. S. A. Second class postage paid at Washington, D.C.

CONTENTS

How to Get a Good Paying Job in Electronics

by Louis E. Frenzel, Jr.

Almost all of us have been in a position at one time or another where we were faced with the problem of finding a new job. As you probably know, finding a new job isn't easy. It's a lot of work, and if you are going to be successful at it, you should give it some thought and planning. The best approach is to map yourself out a campaign, and if it's handled properly, the result can be quite profitable to you.

As an NRI student or graduate, you are no doubt interested in working in the electronics field. The electronics field is big and growing more each year. There are plenty of opportunities and jobs in the industry in a wide variety of fields. The work is interesting and it pays well. It is difficult to name another industry that is as interesting and offers as much opportunity as electronics. Generally speaking, jobs as electronics technicians are plentiful, and if you use the proper approach you are sure to find one of them for yourself.

Here we outline five specific steps that you should take to find yourself a new job in electronics. Let's assume that you have decided that you wish to work as an electronics technician. You are prepared to seek a new job in electronics. At the present time you may or may not be working in the electronics industry. It makes no difference since the five steps that we outline here will take care of either situation. As the steps are outlined, make yourself a set of notes corresponding to each of the steps. If you do this you will have a complete plan for finding a job when you finish reading the article.

Step No. 1. Define your goals.

The very first thing that you should do before you begin to look for a job in electronics is to define your specific goals. Ask yourself these questions: What type of work do I want to do in electronics? What type of job would suit me best? What area of specialization do I wish to work in?

It is extremely difficult to begin to look for a job in electronics if you really don't know what you want to do or where you want to work. Electronics is an extremely broad field, and most successful electronics technicians are specialized in only one or possibly two areas. You can work in communications with mobile radio or you may work with logic circuits in computers. You may want to be a TV serviceman or you may desire to work as an engineer in an FM broadcast station. The field is very broad and you must be specific about your interests. Keep in mind too, that within any given specified area of specialization, there are also many different types of jobs. You may be working with an engineer in circuit development, or you could possibly do maintenance and repair work. Other typical jobs involve equipment operation and installation or perhaps production line checkout. There is a large variety of different types of jobs available.

Take a look at your own interests in electronics. What do you like to do and what specific subjects in electronics interest you most? Generally your interests will give you a good clue as to what particular field you want to work in and the type of job you wish to do in this area. This is a pretty broad subject and we can't really do justice to it here. Try to determine as soon as possible what you want to do. If at this time you cannot determine the type of work or the field that suits you best, then you are probably not ready for a job in electronics. If this is the case, then you should try to get more education in electronics and do some reading of electronics publications to familiarize yourself with the many fields and opportunities that are available.

Once you have defined the field of work and the position that you want, write it down as the first step in preparing your plan of action.

Step No. 2. Get the necessary education.

Once you have decided that you want to work in electronics, then the first thing that you must do is obtain the necessary education. Almost all positions for electronics technicians require some type of formal education. This may be obtained in a variety of ways, one of which is home-study education. As an NRI student or graduate you have already taken the necessary steps to obtain this needed education. Your formal education in electronics is the key element to your success as an electronics technician. Not only will it help you to obtain a job in electronics, but the knowledge you gain will help you to do a good job.

Keep in mind too that your education does not stop with your school studies.

Try to read as many electronics publications and books as you can to broaden your understanding of electronics and to gain a knowledge of the products, fields and trends in the industry.

Step No. 3. Get some practical experience.

Once you have completed your formal electronics training, then theoretically you are ready to go to work in electronics. Notice the word "theoretically" in the previous sentence. We emphasize this term because in actuality you may not be ready to work as an electronics technician after you have completed your education. Most employers of electronics technicians want experienced men. If you have a basic education but no experience, then you may find it quite difficult to find a job. Therefore, it is important that you try to get some practical experience in electronics before you look for full time work. There are some large companies that take trainees, so possibly you can locate one of them if you do not have experience. They will teach you all you need to know. A good example is the programs offered by stores like Sears and Montgomery Ward for TV service trainees.

This problem of obtaining experience in a job is one that is ages old. Almost everyone has encountered the problem of having no experience to obtain a job only to realize that if he doesn't get the job he will never get the experience. This is an unfortunate situation, but it can be overcome. Here are several suggestions that might help you to get some practical experience.

(a) Offer to do part-time work in electronics to obtain experience. Many electronics companies will permit an individual seeking basic training experience to work part-time. For example, if you are interested in a career in TV servicing, then you may wish to volunteer your time on Saturdays or in the evenings to work in a service shop performing various basic functions to obtain experience. The part-time job that you obtain may not be one that will make full use of your electronics education, but it will provide you with some basic experience that you can refer to later when applying for full-time work. Don't be too picky about the type of work that you do. Remember that you are trying to gain some basic experience. Then again, do not under any circumstances offer to work for nothing. If you do any amount of work, regardless of what it is, you are entitled to receive pay for that work. The employer will have much more respect for you if you use this approach. And, who knows, you might do very well and receive a full-time job offer from your part-time employer.

(b) Numerous large manufacturing companies often have night shift work in their assembly and production facilities. Often a person can obtain night work in a training job of some type to gain necessary experience.

(c) Any type of experience that you can obtain in electronics will be helpful to you when you look for a full-time job. Such things as your personal experiences in amateur radio or radio control models, hi-fidelity, or any other hobby interest,

can be considered as useful experience. If you have built a number of kits, you can consider this as some useful experience. Everything you do in electronics that helps you to learn more about it can be considered as experience.

Step No. 4. Make yourself a resume.

Before you approach a prospective employer, it is a good idea to prepare a resume of your qualifications. A resume is a short presentation outlining your personal qualifications such as education and experience. Briefly, it is a complete summary of all information about you, pertinent to your seeking employment. A prospective employer can look at your resume and quickly determine your background and capabilities. A resume actually duplicates the information generally requested by employers on a standard application form. You will make a big impression on a prospective employer if you beat him to the punch with a resume that you have prepared yourself.

A resume should contain certain basic information. It should contain your name, address, telephone number, and personal information such as your age, number of dependents and draft status. It should also contain a short section summarizing your education. For example, you may want to list your high school education, as well as any other education that you have. Particularly, you will want to list formal education relating to electronics. It's a good idea to give name and location of the school and dates graduated or attended.

Perhaps the most important section of the resume is the section outlining your experience. You should list all of the pertinent jobs that you have held within the last several years in electronics. Start with your most recent job and work backward. For each listing, record the name of the company with whom you worked, its location, your dates of employment and give a short summary of the work that you performed. This will give the prospective employer a good idea as to what type of work you have done in the past and perhaps will give him a clue to what you are capable of doing.

Any other pertinent information that you may want to present at this time can be put at the end of the resume. If you have an FCC license or belong to some industrial organization, you can record this information at the end under a miscellaneous facts section.

As an option, you may also wish to provide at the very beginning of the resume, a short paragraph discussing your job objectives. This tells a prospective employer what type of work you are interested in doing and in which field you wish to work. This doesn't have to be a long paragraph but just a few short sentences describing your capabilities and what you would like to do with them.

A sample resume is shown on the next page. This will give you some idea as to the format and content your resume should have. In addition, here are several hints that will be helpful to you in preparing your resume.

(a) Keep the resume as short as possible. Try to get it on one page or no more than two pages.

RESUME

OF

JOHN J. BUNDA

7777 5th Street
Picoville, Ohio 80761
Phone: 999-826-4321

Personal Information:

Date of Birth: March 21, 1939 (age 30)
Married, two children
Draft classification: 4A
Health: excellent

Job Objectives:

Desire a position as transmitter engineer in an AM/FM radio station.

Education:

Graduate Picoville High School 1957
USAF Basic Electronics 1957-1958
USAF Communications 1959
Correspondence Course in Communications, National Radio Institute, graduated 1963.

Experience:

Electronic Communications Company, Picoville, Ohio, 1966 to present. Radio Technician. Install, maintain and repair FM mobile radio equipment, both tube and transistor units. Antenna installation at base stations.

TV and Electronics Repair Shop, Picoville, Ohio, 1962-1966. Bench repairman. Repaired both tube and transistor radios; table top, portable and auto types. Also repaired hi-fi equipment and tape recorders. Repair and adjustment of CB radios.

USAF 1957-1962. Communications Technician (Airman 1st class). Repaired and maintained both AM and FM communications equipment.

Miscellaneous Information:

FCC 1st class radiotelephone license.
Advance class amateur radio license.
Member: American Radio Relay League.
NRI Alumni Association.

(b) Be sure to type the resume. A handwritten resume will not carry as much weight as a typewritten one. Write your resume up initially in longhand and then either type it yourself or have it typed. Be sure to make yourself several carbon copies.

(c) Make the resume neat. If you type the resume yourself, be extremely careful to avoid mistakes. Keep it neat and clean as it will make a good presentation for a prospective employer.

A resume is essentially a personal sales brochure. It is a device that will help to sell your qualifications to some prospective employer. When you are preparing your resume, write it so that you emphasize your abilities. Here is your chance to brag a little about yourself and your accomplishments. A prospective employer can get a pretty good idea about how a person feels about himself when reading the resume. If he reads a resume written in a negative tone, then he will feel that the applicant may not have enough self-confidence to handle any position. On the other hand, if the resume reflects positive attitudes and self-confidence, it will make a good impression.

The action you take to write a resume is excellent preparation for you in seeking a new job. It makes you stop and think about what you want to do. In addition, as you prepare a resume, you summarize in your own mind all of your training experience and various qualifications. You show your strong points as well as your weak ones. By putting all this information together in one spot, it may help you to recognize your likes and dislikes. Don't overlook this important step in seeking employment in electronics.

Step No. 5. Look for a full time job and make an application.

The first thing that you should do before you begin to look for a full-time job is to ask yourself whether or not you will be able to find a position that you want in your local area. If you live in a large city, chances are probably good that you will be able to find a desirable job in town. However, if you live in a small town where the electronics industry is limited, then there is no sense deciding to go to work in a specific field if you cannot find that work in your area. If this is the case and you still wish to work in that particular field, then you must go where the jobs are. Electronics jobs are everywhere these days, particularly in the very big cities. Electronics jobs are particularly plentiful in areas such as San Francisco, Los Angeles, Houston, Dallas, Chicago, New York, Boston and Washington.

The first approach that you can take toward finding a job in electronics is to check the classified ads in your local newspapers. If you have more than one newspaper in your town, be sure to check them all. Look for jobs under the headings of electronics, technicians, radio, television, computers and other related topics. Scan the ads carefully and make note of those that interest you.

Another approach is to use employment agencies. An employment agency can save

you a tremendous amount of leg work in finding a new job. You go to the agency, tell them what type of work you want and they in turn will help you locate that job. Be careful when you use an employment agency, however. Be sure you understand any financial obligations to them that you might incur. Many employment agencies require that the person seeking employment pay a fee equal to 30-40% of his first month's salary. This is a substantial chunk of money and if you use the agency you must be prepared to pay it. Many agencies these days find jobs for people at no cost. In such situations the employer pays the fee. Don't forget state and local employment agencies. These can be quite helpful and, of course, are free to those who wish to use them.

If you know of some specific organization for whom you wish to work, you can of course, make application directly to them. If you are not sure what the electronics industry in your town is like, use the yellow pages of the telephone book and look at the various industries listed under electronics, radio, television, computers and other related headings. Make note of the ones that interest you and then approach them directly, asking about possible work in the field that you have selected. In a big employment seeking campaign you may actually have your resume reproduced in fairly large quantities and send them out with an accompanying letter to companies with which you may wish to work. The theory here is that the more applications you send out, the more prospective job offers you will obtain. The result is sure to be a good paying job in electronics.

Once you have made initial contact with an employer and you find that he is interested, you will be asked to come in for an interview. The fact that a company offers you an interview gives you some indication that they are definitely interested in you. The interview is an extremely important part of finding a job, so you should handle it properly.

The purpose of the interview is for the employer to find out more about you as a person and your qualifications. The interview is generally a question and answer period where you and the prospective employer exchange information. He will want to know more about you and you in turn will definitely want to know more about the company and the exact position. Don't hesitate to ask questions at this time to find out as much as you can about the company. Ask about the detailed job duties and the pay. Ask about overtime and the company benefits such as vacations, insurance and retirement plans. The interviewer will certainly not hesitate to ask you questions about your qualifications and abilities, so be prepared to answer them.

Even though you may present a resume to the employer at the beginning of the interview, you still may be asked to fill out several application forms. These are special forms that every company has that insures that the employer has the proper information about an employee. Be sure to fill these forms out as extensively as they require. You may also find that they require you to take an examination of some sort. Only the larger companies generally require these and if you are qualified to apply for the job then you should have no trouble in passing the examination. If in doubt about your ability to pass, make a good stab at it anyway.

It is very important that you make a good initial impression upon a prospective employer. For that reason be sure to be on time for your interview. If for some unavoidable reason you cannot make the appointment on time be sure to call and explain your reason for being late. Most companies like employees who are prompt. Be on time by all means.

When you go for the interview wear a suit, a white shirt and tie regardless of the position that you are applying for. Be sure to have your suit pressed and shine your shoes. A clean shave and a neat haircut are also important items. All these things may seem too obvious to mention, but every little bit helps. The better the initial impression you make, the more likely you are to obtain a good paying job in electronics.

Miscellaneous Hints

If you follow the steps outlined here, your chances of finding a good paying job in electronics are very good. Here are several additional hints that you may find helpful.

Generally, if you are seeking a new job, you are either out of work completely or you are presently employed but seeking new employment for some reason. You may not like your present job or the pay may be too low. Whatever the reason, it is always worthwhile to try to make a go of things where you are. Why not have a talk with your current supervisor and discuss the matter with him in detail? If you feel that you are qualified for higher level work, tell him so. Perhaps he doesn't know that you are qualified. If you feel that you are not paid enough, ask for a raise. Before you do this, however, be sure that you are doing your job properly and are worth the extra money. In any case, most supervisors will generally understand your problem and will attempt to help. Perhaps you may be able to get a much better job in electronics in the company you now work for. It certainly doesn't hurt to ask.

There are many instances where you will not be able to find a better job in your present company. The work itself may be limited in technical scope as is the pay. It may have other disadvantages as well that you wish to avoid. In such cases you will want to find a new job. By all means do not quit your present job before you locate a new one. It is not generally necessary to let the company you are working for know that you are looking for a job. Just be very discreet about handling this to avoid conflict.

Once you have located a new position, you can then give your employer notice. It is a good idea to notify the employer approximately two weeks prior to the time you wish to begin the new job. This is a fair period of time to give the employer to locate someone to fill your position. If you simply quit and walk out the minute you find a new job you could leave your employer in a difficult situation that may cost him time or money. If such is the case he may not give you a good reference later on. Do everything you can to help your employer during the final two weeks you are there. He will appreciate it and you will no doubt feel better about it as well.

It is a little different for those of you who are just out of high school. You face a military obligation of some sort. You may be lucky and sneak by without going

in. Then again you take the chance of being drafted only to spend several years of your life doing something you don't want to do, delaying your desire for employment in the electronics field. However, you can turn this seemingly unhappy prospect into a very profitable experience. All of the services need electronics people to work with the sophisticated military gear and they are willing to spend thousands of dollars and lots of time in training. Why not take advantage of this situation and volunteer for one of the services? Insist upon electronics training when you enlist. Chances are you will get it. Military electronics training and experience is quite valuable. Industrial employers have high regard for it. It will come in handy when you get out of the service and look for a job. Where else can you get such good training and experience and at the same time get paid for it?

There are so many opportunities in electronics today that a qualified technician could probably change jobs once a year and still not run out of opportunities during his lifetime. That sounds like an exaggerated statement but in actuality it is not. Even though opportunities do exist, it is not a good idea to change jobs too often. A person who does this can be labeled as a "job hopper", and with such a reputation it can be difficult to find a new job. When a prospective employer looks at a resume that lists many jobs where you stayed only a short period of time, he will be suspicious of your capabilities and your desires for employment. Most employers look for a permanent full-time employee who is willing to be around for a number of years. Generally there is a training period when a new employee starts and it may be as much as six months to a year before the new employee learns his job well enough to produce useful work for his employer. Therefore, when you take a job, you should plan to stay there for as long as you can.

Even though this is good practice it is not always possible. You may find that you can handle your new job quite well. If you learn the new job quickly, it is possible that you will eventually become bored with the work and want to find something newer and more challenging to do. If this is the case, don't hesitate to tell your employer about it. Perhaps he can provide you with a new opportunity. In any case, you should always find yourself in a job where you are learning. You should be learning new skills and continually broadening your knowledge. If you find yourself in a position where you are repeating the same work over and over again and not learning anything new, then it is time to move onward and upward.

Another important fact to consider is that there is no faster way to increase your salary than by changing jobs. Almost every job change is accompanied by an increase in salary. If you make a number of pertinent job changes in a fairly short period of time, you can raise your income quite substantially. However, be careful in doing this, as you do not want to be labeled a job hopper. Be sure to give your new employer a fair share of your work.

Best of luck to you in finding a good paying job in electronics!

RADIO OPERATOR LICENSE FEES

It's good to know what things cost these days. Every month some of us take license exams and would like to know the fees ahead of time. This is rather necessary because the fee must go along with the application. So here is a convenient reference for now or at a later date.

FEES FOR COMMERCIAL RADIO OPERATOR EXAMINATIONS AND LICENSING

First-class license, either radiotelephone or radiotelegraph	$5
Second-class license, either radiotelephone or radiotelegraph	4
Third-class permit, either radiotelephone or radiotelegraph	3
Restricted radiotelephone permit	2
Application for renewal of operator license	2
Application for endorsement of operator license	2
Application for duplicate license or for replacement license	2
Application for provisional certificate for a radiotelephone third-class operator permit endorsed for broadcast use	3

FEES FOR SAFETY AND SPECIAL RADIO SERVICES

Amateur Radio Service:

For initial license, including new class of operator license and for renewal of license	$ 4
For modification of license	2
Request for special call sign	20

Citizens Radio Service:

For Class A station authorization	10
For all other classes of stations in the Citizens Radio Service	8

Don't forget: send the correct fee with each application.

NRI JOURNAL CHANGE OF ADDRESS LABEL

Name _____

Student No. _____ Date _____

OLD ADDRESS

Street _____

City _____ State _____

NEW ADDRESS – after _____ 19 _____

Street _____

City _____ State _____

Zip Code _____

Test Transistors and Diodes with your Ohmmeter

by Harold Turner, Jr.

There are two general reasons for testing a transistor: You may want to know whether or not a known transistor is good, or you may have an unmarked transistor and you'd like to know something about it. Making a few simple checks with an ohmmeter will tell you all you need to know in most cases.

By becoming familiar with the ohmmeter readings expected, you will be able to judge with a high degree of accuracy whether any transistor is good or bad. Of course, there are a number of instruments on the market now which are used exclusively for testing transistors. But you already have a vtvm or vom, so why spend more money for something you can easily do without? True, some transistor checkers will tell much more about a transistor than the ohmmeter method will, but most transistor defects are gross defects, where there is usually either a dead short circuit or a completely open circuit between terminals. An ohmmeter check will definitely spot shorted and open transistors. In addition, this simple test will tell you whether an unmarked transistor, such as found in experimenters' "grab-bags", is NPN or PNP, silicon or germanium.

One important precaution must be observed when using a volt-ohmmeter to test a transistor. Many transistor types are designed for operation from very low voltages. Some ohmmeters use fairly high battery voltages (7.5, 15, or even 22.5 volts). You must make sure that these high voltages never exceed the voltage ratings of the transistor under test. If your meter is a vtvm, you can be fairly sure it will be safe to use on all resistance ranges, as almost all vtvm's use only a single 1.5 volt flashlight cell in the ohmmeter circuit. Many vom's, however, use higher voltages. Fortunately, most meters using high voltages use the full voltage only on the highest resistance ranges. Since you will need only the lower ranges (R X 1 through R X 1000) for transistor testing, a meter of this type will generally be acceptable. If there is any doubt at all, use another meter to measure the voltage across the ohmmeter leads on each resistance range. This measurement must be made with a vtvm.

A vom will not give an accurate reading because of excessive circuit loading. Once you know just how much voltage appears across the ohmmeter leads on each range, you know which ranges will be safe to use. Any range which applies three volts or less to the test leads can be considered safe for most tests. If in doubt, don't take a chance on damaging the transistor. Use another test.

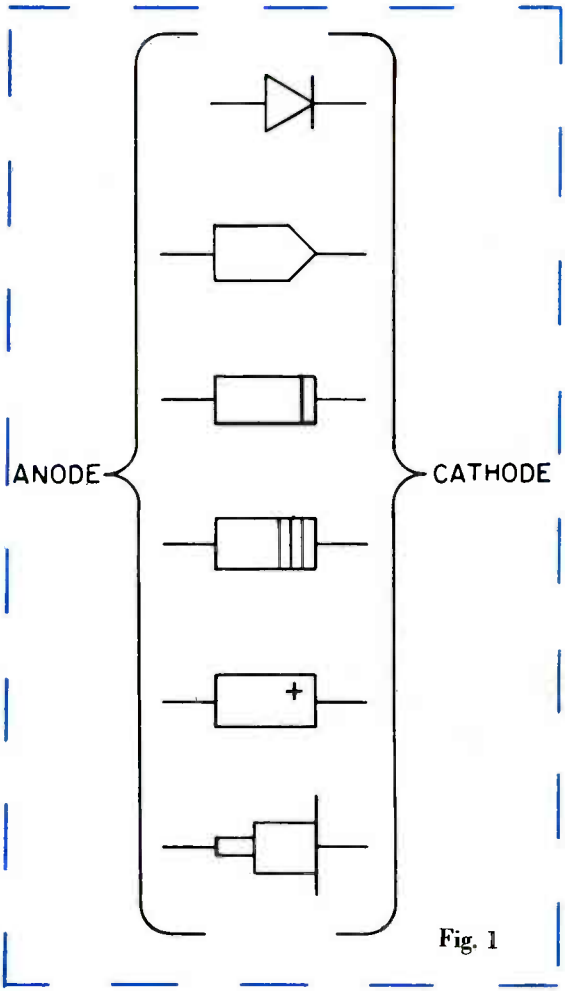


Fig. 1

You must also determine the polarity of the voltage across the ohmmeter leads. You may do this with another meter if one is available. But you will probably find it easier to do this by measuring a known good diode with the ohmmeter. If you measure a power diode, use the R × 1 range; for small-signal diodes, use the R × 1K range. Connect the meter leads across the diode and read the resistance. Reverse the leads and read the meter again. The lower resistance reading will be obtained when the negative ohmmeter lead is connected to the cathode of the diode. Since you can identify which diode lead is the cathode (See Fig. 1), you will now know which meter lead is negative.

Of course, the lower reading is obtained when the diode is forward-biased; this indicates that the diode is conducting. Any reading in the reverse direction indicates leakage current. An ideal diode would show zero ohms in the forward bias direction and infinite resistance - no current flow at all - in the reverse bias direction. In general, silicon diodes approach this ideal, while germanium diodes show higher forward resistance and lower reverse resistance.

Before you can test a transistor, you must identify the connection to each element; emitter, base, and collector. Also, many metal-cased transistors use the case as a shield, which may be connected to one of the elements or to a separate shield lead. Although there are many thousands of transistor types, there are (fortunately) only a few popular basing arrangements. Some commonly used ones are shown in Fig. 2. Notice that on the TO-18 and TO-92 styles, the base and emitter connections are frequently reversed.

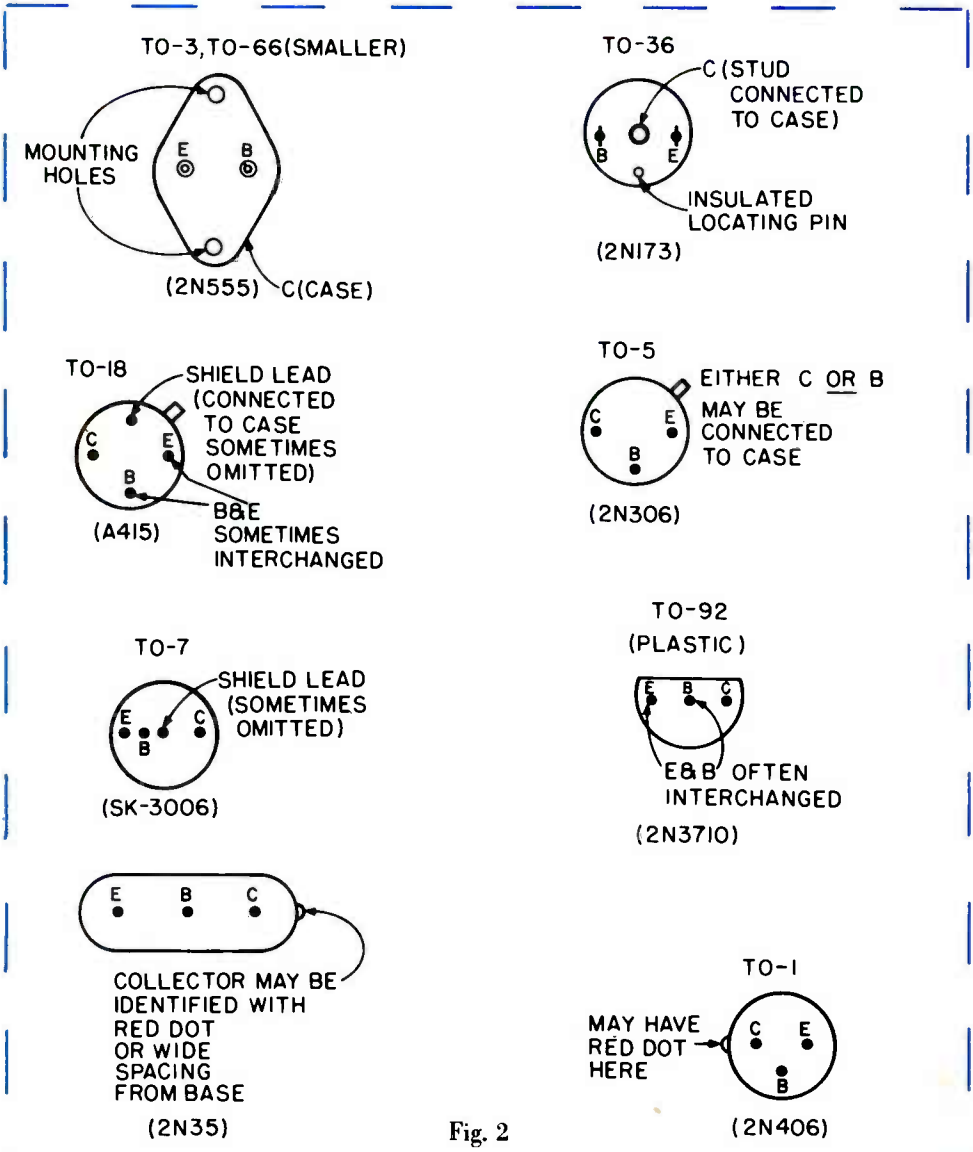


Fig. 2

A transistor appears to the ohmmeter as two diodes connected in series, anode to anode (NPN), or cathode to cathode (PNP). In all cases, the base is the junction of the two apparent diodes. By measuring the forward and reverse resistance of each diode, you can tell if the transistor is normal, open, or shorted. Since there are only two diodes, and each must be measured in both directions, only four resistance measurements need be made. If the transistor appears good, you should also measure from emitter to collector in both directions. We'll discuss this later.

In an NPN transistor, lowest resistance readings are expected when the positive ohmmeter lead is connected to the base; in PNP types, lowest readings are expected when the negative ohmmeter lead is connected to the base.

In general, the difference between silicon and germanium transistors is the same as the difference between silicon and germanium diodes: The germanium types have higher forward resistances and lower reverse resistances. In many silicon types, reverse resistances approach infinity.

Power transistors can usually be distinguished from small-signal transistors by their larger physical size. By far the most popular power transistor case style is the TO-3. In general, you should use the R X 10 range of your ohmmeter for power transistors and R X 1000 for small-signal units. In case of doubt, use a range which gives a clear indication of the ratio between forward and reverse resistances. **Remember that it is the ratio between the two that is of concern, not the exact resistance readings. If the reverse-to-forward ratio is less than ten to one, the device is almost certainly defective.**

As an example, let us examine the resistance readings obtained from a 2N555 or similar garden-variety power transistor. Since this is a power transistor, the R X 10 range is used. Refer to Fig. 3. First, connect the negative ohmmeter lead to the base. Now, touch the positive lead to the collector, then to the emitter. If the transistor is good a very low resistance will be indicated - perhaps 12 ohms. Next, connect the negative meter lead to the collector, and touch the positive lead to the base. Move the negative lead to the emitter and again touch the positive lead to the base. In both cases, a high resistance should be indicated - perhaps 10K-ohms or so. Notice that

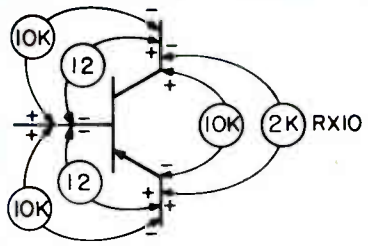


Fig. 3

there is some measurable resistance in the reverse bias direction. This represents leakage current which indicates that the transistor is a germanium unit. Of course, the fact that lower readings are obtained with the negative lead connected to the base tells us that the transistor is PNP. If one of the readings is far from the expected value, then the transistor is defective.

Now, measure the resistance in both directions from emitter to collector, first with the negative lead on the emitter and then on the collector. Both readings should be fairly high, but when the negative lead is connected to the collector, the reading should be noticeably lower. If both of these readings are very low, the transistor is shorted, **regardless of the earlier readings.**

Now refer to Fig. 4 for a look at the Amperex A415 transistor. This type is an NPN, so all readings are reversed from those of the PNP just tested. But also notice that the reverse readings are all infinite resistances. This shows that the transistor is a low leakage silicon unit. Since this is a small-signal type, you should use the R X 1K range of your meter. Again, any great departures from the expected readings shown in Fig. 4 indicate a defective transistor.

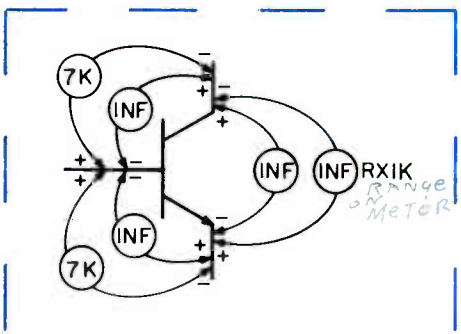


Fig. 4

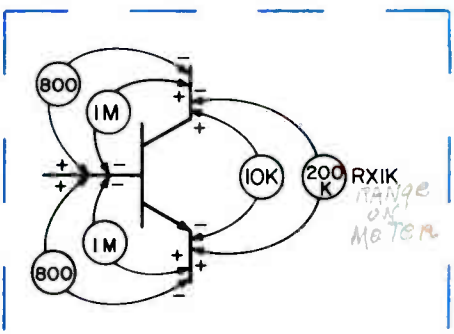
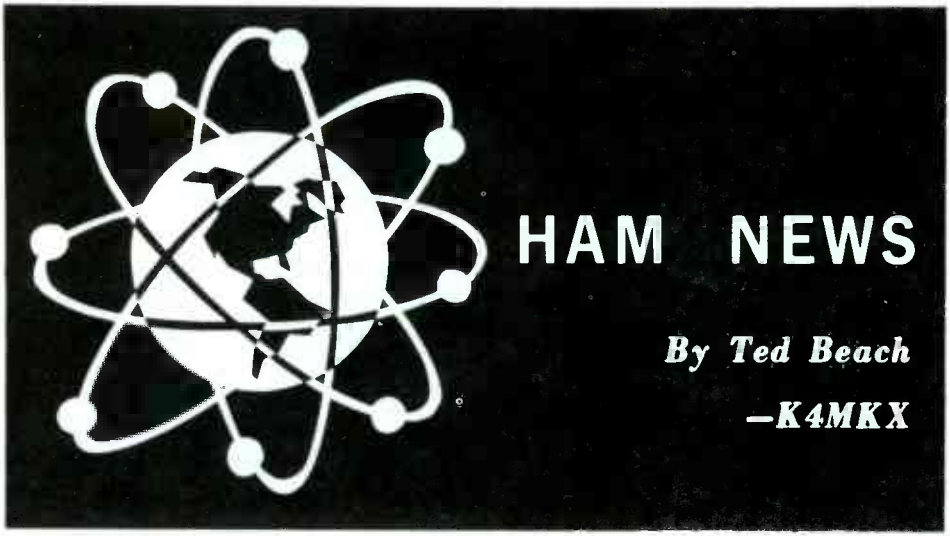


Fig. 5

The 2N306 type is shown in Fig. 5. Notice that the readings are similar to those on the A415, but reverse current is in evidence, since this is an NPN germanium transistor.

This should give you a pretty good idea of where to start in checking doubtful or unknown diodes and transistors. But always remember that these simple measurements do not tell everything about the component under test. Replacement is the only sure way to tell if a device is defective. In the next issue we'll discuss the selection of replacement semiconductors.



We were quite pleased to find among the 62 NRI amateurs and graduates listed in this issue, 11 who are enrolled in our Course for Amateur Licenses. Actually, one of the eleven, KØYGC, is a graduate and has his Extra Class license to show for it. Congratulations Dick! Wesley Henson, WA1HXX, is enrolled in our Advanced Course and is hoping to get his Extra very soon as does Art, WA9NJN. WA9MNB, Jerome, is presently a Technician and is expecting to upgrade to Advanced Class when he is ready for it. The remainder of the eleven Amateur Course participants have just taken the first step and are brand new Novices! We will be very pleased and proud to report their progress as well as the progress of our other students. Keep up the good work.

It is really quite gratifying to find that there are so many people interested enough in Amateur Radio to undertake a home study course to get started or to advance themselves in the amateur ranks. In fact, we feel that these perceptive people should receive due recognition of their effort. So, starting in this issue of the Journal we will list the people who are enrolled in the NRI Course for Amateur Licenses apart from the list of other calls of our students and graduates -- starting with:

WA1HXX	G	Bradford, RI
WN1LGU	N	Easthampton, MA
WN1LIE	N	Moretown, VT
WN2IQA	N	Jersey City, NJ
WN2LJU	N	Brooklyn, NY
WN3MFC	N	Norristown, PA
WN3NMC	N	Beltsville, MD
WN4NRI	N	Seneca, SC
WA9MNB	T	Brown Deer, WI
WA9NJN	G	Valparaiso, IN
KØYGC	E	Minneapolis, MN

Did you notice the eighth call listed? WN4NRI, Mickey Wood in Seneca, South Carolina has really beaten us to the punch. And his call was assigned on rotation! (We haven't gotten our club station license yet as the by-laws are still being drawn up). Mickey works all bands and has California on 15, Kansas on 80, and Iowa and Massachusetts on 40 for his best DX so far. He didn't say if he was using a CONAR rig or not, but at any rate that is pretty good going since he has only had his ticket since June of 1969.

Ed Cullen, WN2IQA, is an oldtimer as far as experience in radio goes, having served in the Second World War in the Navy as a radio operator. After the Ham Bug bit and he got his Novice ticket, Ed saw that he needed some academic help in order to upgrade, so here he is in the NRI family. Welcome aboard, Ed.

WN1LGU is perhaps the only YML we have enrolled in our Course for Amateur Licenses. Carol is a mother of two young girls but still finds time to work all bands and has 30 states, 27 confirmed, for WAS. Between diapers, dusting, dishes and studying, she still manages to work some DX on 15: OHØ, CR6 and VK3 to mention a couple of her 30 countries (with a Ranger, yet!).

Almost everyone who has written in has expressed an interest in a 40 meter CW net. But so far no one has suggested a time or day(s) or has indicated that he would care to start it off. Andy, WA1LJJ, suggested that possibly if we get going that perhaps we could have "on-the-air" classes on 40 and also 15. Well Andy, it sounds like a fine idea but I'm afraid that theory classes at 5 to 13 WPM would get pretty lengthy. But I certainly think that we would participate as much as possible in any way to help out on-the-air. IF we get our club station going, that is.

The other 51 NRI Hams we have heard from since the last issue are:

W1FNB	**G**	**Wilder, VT**
WA1LJJ	**G**	**Laconia, NH**
W1NBT	**A**	**Pittsfield, MA**
WB2FPJ	**T**	**Brentwood, NY**
WB2JZD/MM	**C**	**Cape May, NJ**
WB2LAO	**G**	**Tuckerton, NJ**
K2RUX	**A**	**Brewerton, NY**
WB2RZF	**A**	**Merrick, NY**
W2SAT	**G**	**Hicksville, NY**
WA3HAD	**G**	**Ambridge, PA**
WA3KNP	**T**	**Silver Spring, MD**
W3LQE	**T**	**Claymont, DE**
W3PCN	**A**	**Harrisburg, PA**
K3YCA	**G**	**Baltimore, MD**
K4CGV	**A**	**Tallahassee, FL**
WB4LIC	**T**	**Virginia Beach, VA**
WN4LIM	**N**	**Huntsville, AL**

WA4MSE	C	Orlando, FL
WN4MMH	N	Woodbridge, VA
WN4MMW/6	N	Salem, VA/Beale AFB, CA
WN4NRG	N	McLean, VA
WA4TUM	C	Round O, SC
K4PXY	G	St. Petersburg, FL
WA5VJU	T	Ft. Worth, TX
WA5WUR	T	Denham Springs, LA
WA5YSL	T	Shawnee, OK
WB6CHO	A	San Francisco, CA
WB6HZS	A	Redlands, CA
K6QKO	G	Weimar, CA
W6LJH	E	San Diego, CA
WA7IMT	G	Jerome, ID
W7JGL	A	Tucson, AZ
WN8ECM	N	Wyoming, MI
WN8FBJ	N	Battle Creek, MI
W8GMM/3	A	Charlestown, WV/DC
WA8HBP	A	Iron Mountain, MI
W8UAB/3	E	Bedford Heights, OH/Ft. Mead, MD
WA9HYM	G	Waukegan, IL
WA9ZLN	T	Chicago, IL
KØBFF	G	Kansas City, MO
WAØKLD	G	Mt. Pleasant, IA
WAØQHL	G	Breckenridge, MN
WAØWGL	A	Denver, CO
WAØWOJ	A	Burlington, CO
WNØYOX	N	Arkansas City, KS
WNØZRA	N	Fayette, IA
WNØZZP	N	Rapid City, SD
VE2AZS		Granby, PQ
VE3AC		Sudbury, ONT
VE3BZP		Petrolia, ONT
VE5LC	A	Naicam, Sask.

Please notice that in this nice large group we got two more states for our WAS - South Dakota and Idaho. This leaves only Hawaii, Nevada and Wyoming. How come these guys are so shy (or are they just rare)? Back in the September/October issue we indicated that we had not heard from Quebec. Well, this prompted a response from Maurice, VE2SV, who reminded us that he had sent a card some months ago (would you believe it was listed in the March/April issue?). Sorry about that, Maurice. Our bookkeeping is a bit lax these days! By the way, Maurice says that transistors, not being quite as rugged as tubes, have slowed him down a bit. Then came along the integrated circuits and now he misses 90% of the fun of building electronic gadgets (he still enjoys electronics as a hobby, though).

Ed, W1NBT, likes the Ham Column and suggests we devote a bit of space each issue to an NRI Ham Graduate, showing his shack and telling how he got started in ham radio. Any comments?

Graduate John Olar, W6LJH, just got his Extra ticket in June. He has been a ham since 1937 in Chicago (W9TMS). He got his current call in 1951 after nine years of ham inactivity during WWII.

Bill, W7JGL, like K4JVH is a QRP man and runs 9 watts to a 2E26 (real cool!). He says that he gets better signal reports with 9 watts AM than with 500 watts sideband with a 350C Swan. Can you buy that?

Our first Idaho respondent, WA7IMT, says he has had the same problems with his HW100 as Russ, W3FSP. Maybe it's congenital, Jerome.

Virgil, WN4NRG, says he can't compete as the youngest ham (September/October - WA7JCQ), but how about being the oldest novice at 54?? Virgil says he won't hold this title long as he hopes to trade his "N" in for an advanced ticket very soon.

Don, WAØQHL, tried to come to our rescue regarding the lack of a South Dakota QSL. Breckenridge is 20 miles north of the border. Sorry, Don, but WNØZZP came to the rescue. Besides, being close only counts in horseshoes.

Al, WB2RZF, suggests regional vhf nets for NRI Hams. I don't know, Al. The way we have had such non-response about the 40 meter net, I doubt if it would work. But who knows? Check the lists in the Journal and see what you all can do locally.

Stew, K4CGV, also still holds the first call he was issued, W1KJQ, in 1936. He is also ex - K3DBG, W4NCW, W5CBF and OE13JR(?). Shucks, the only two calls I have ever held were KN4MKX and K4MKX (in Florida and Virginia only).

A 35 day, 9000 mile trip resulted in over 100 QSO's for W8GMM this summer. Steve operated in Canada as a Mobile in VE7 and VE6 land but couldn't operate in Mexico. He also had a 2 hour Q5, S9 QSO with a station at the South Pole on his junket. Sounds like he had a ball.

We also have a student on active duty in the Coast Guard stationed on the cutter "Dallas" off Viet Nam, WB2JZD/MM, Bob. He is chief radioman and is going strong in our complete Communications Course.

For your further enlightenment, here are the two-letter abbreviations for the states in the fifth through tenth call areas as promised last time:

5th Arkansas, AR; Louisiana, LA; Mississippi, MS; New Mexico, NM; Oklahoma, OK; Texas, TX

6th California, CA

7th Arizona, AZ; Idaho, ID; Montana, MT; Nevada, NV; Oregon, OR; Utah, UT; Washington, WA; Wyoming, WY

8th Michigan, MI; Ohio, OH; West Virginia, WV

9th Illinois, IL; Indiana, IN; Wisconsin, WI

10th Colorado, CO; Iowa, IA; Kansas, KS; Minnesota, MN; Missouri, MO; Nebraska, NB; North Dakota, ND; South Dakota, SD

And that makes it QRT for this time. Send in your QSL card and let us know what you are doing these days. We'll list your call, class and QTH in the Journal. If you are a student or graduate of the Course for Amateur Licenses, be sure to indicate this also.

73 fer nw - TED, K4MKX

FLASH!! - - *as we go to press*

Your editor just received a phone call from Paul Morey, K1PNB and he has expressed an interest in getting the NRI 40 meter cw net going. All those interested in this project, write Paul at:

304 Main Street
Townsend, MA
01469

---

job-ops

---HELP WANTED--- ---HELP WANTED--- ---HELP WANTED---

SEARS HAS MANY CAREER OPPORTUNITIES FOR EXPERIENCED TV TECHNICIANS OR RECENT GRADS OF ELECTRONICS SCHOOLS. TOP BENEFITS - LOCATIONS THROUGHOUT THE U. S.

CONTACT: WILLIAM J. LYNOTT
DEPARTMENT 731A - E
SEARS, ROEBUCK AND CO.
P. O. BOX 6742
PHILA., PA. 19132

Immediate opening for an experienced technician or trainee for in-home color TV servicing. Good company benefits.

Richard Miller
Balie Girffith Firestone
400 N. Texas Ave.
Odessa, Texas
915-322-8282

Position open for a technician in the radio-TV field. Located in British Colombia for 25 years.

CONTACT: George Schoenenberger
George's Electric
Box 832
Fort St. John, B.C.
Canada
ST-5-2701

MANAGEMENT OPPORTUNITIES

Career opportunities leading to management positions in TV-Stereo Service and Sales. Profit Sharing, Retirement, continuous training, individual recognition, good compensation and other benefits. A good place to work in a community you will like.

CONTACT: Jim Renier
RENIER'S
Dubuque, Ia.

WANTED ! ! ! ! ! ! ! !
Field Service Technicians

Positions now available in the Graphic Communications field. Technicians needed to install and maintain such equipment as Electronic hand writers and Facsimile units.

Top starting salary and excellent benefits.

Contact:

Telautograph Corp.
44 W. Madison
Oak Park, Ill. 60302
312-848-7266

Montgomery Ward has opportunities for TV technicians or grads from electronics schools. Openings available in Wash., Md., and Va. areas.

Call or Write:

Pat F. Consentini
7100 Old Landover Road
Landover, Md. 20785
301-322-3344

WANTED . . . RADIO-TV TECHNICIAN

Top Wages for experienced Man. Or if you prefer to "Start on your Own", we are ready to assist in capital needed. Our aim is to have Service to back Sales. It's our 37th year.

TOMALINO'S RADIO-TV
A. Tomalino
Box 1126
Glendive, Mont. 59330
Phone: 406-365-3645

Do you have your FCC license and a desire to work in the vehicular radio field?

If so, contact:

William J. Cling, Jr.
International Mobile
Telephone Systems
10442 Burbank Boulevard
North Hollywood,
California 91601

Positions available dealing with heavy duty industrial equipment, 2-way radios, closed circuit TV and paging systems. Requires at least 2nd Class FCC License.

CONTACT: Mr. Glenn White
District Service Manager
19-A Bradston Street
Boston, Mass. 02118
617-445-4545

WANT TO MAKE UP FOR LOST TIME?

RCA HAS TRAINING PROGRAMS FOR THE INEXPERIENCED BEGINNER IN BASIC TV SERVICE AS WELL AS FOR THE EXPERIENCED TECH IN THE LATEST SOLID STATE CIRCUITRY.

IF YOU'VE GOT SOME CATCHING UP TO DO, WRITE TO:

J. E. CLAIR
EMPLOYMENT MANAGER
RCA SERVICE COMPANY
CHERRY HILL, NEW JERSEY

WANTED

Experienced or well-trained two-way radio technicians. Ideal positions open for responsible men. FCC second class license required.

CONTACT

Manager, Communications Dept.
Lafayette Radio Electronics
2025 Arden Way
Sacramento, Calif. 95825
Phone: 916-927-2701

TECHNICIAN TO SERVICE STEREO AND RADIO WITH OPPORTUNITY TO BREAK INTO BLACK/WHITE AND COLOR TV.

SLATTERY'S RADIO & TV
4309 Wisconsin Ave. N.W.
Washington, D. C. 20016

NRI HONORS PROGRAM AWARDS

For outstanding grades throughout their NRI course of study, the following September and October graduates received Certificates of Distinction along with their NRI Electronics Diplomas.

WITH HIGHEST HONORS

Robert G. Bartlett, Maumee, Ohio
Richard A. Bracken, Portland, Oregon
Melvin E. Cash, Millington, Tenn.
Robert K. Chambers, Charlotte, N. C.
Christopher P. Clark, San Ramon, Calif.
Robert L. Dore, Laurel, Miss.
Marion T. Friday, Houston, Texas
Gene M. Gillock, Roanoke, Va.
Charles L. Gray, Lexington Park, Md.
Glenn T. Jenkins, Las Vegas, Nevada
Richard A. Mountain, Halifax, N.S., Canada
Theodore G. Smith, St. Petersburg, Fla.

WITH HIGH HONORS

Bobby C. Adams, Poteet, Texas
Ernest R. Adler, Fitchburg, Mass.
Waine H. Allison, San Antonio, Texas
John F. Arnold, Vestal, N.Y.
Henry Alvin Arrindell, Curacao, Neth Antilles
J. W. Balliew, El Paso, Texas
Vincent Domenico Belle, Owego, N. Y.
Lucian T. Bias, Roanoke, Va.
Kenneth Biddle, Bellefonte, Pa.
John Brandt, III, Stites, Idaho
James A. Bristol, Garland, Texas
Stephen R. Brothers, Baltimore, Md.
Guy P. Buck, Torrance, Calif.
William J. Caldara, Long Beach, Calif.
William F. Coldewey, Jr., Milford, Ohio
William L. Cole, Phenix City, Alabama
Louis N. Cook, Fernandina Beach, Fla.
William T. Coughlin, Westover AFB, Mass.
Willard H. Cousins, Eureka, Calif.
James L. Dodson, Fort Ritchie, Md.
Richard L. Downs, Tulsa, Okla.
William E. Edwards, Texarkana, Arkansas
Richard D. Fowler, APO New York
Robert A. Frechin, El Paso, Texas
Charles B. Gantz, Norman, Oklahoma
Arthur G. Geigley, Lancaster, Pa.
William H. Gignac, Uncasville, Conn.
Karl W. Gronquist, Brooklyn, N.Y.
Eckhard P. Hallmann, Park Ridge, N. J.
Thomas E. Harpring, Forest Park, Ga.
Raymond L. Hensley, East Paterson, N.J.
Charles Herrington, Vandenberg AFB, Calif.
J. R. Hoffman, Oelwein, Iowa
Gerald Hulsey, Owensboro, Ky.
Robert W. Jensen, Cedar Rapids, Iowa
Rune Johansson, San Gabriel, Calif.
Luther R. Johnston, Meadville, Pa.
Richard L. Johnston, Saginaw, Mich.
Edward A. LaRoche, APO San Francisco
Mark L. Long, Jr., FPO New York
Eugene A. Markowski, Virginia Beach, Va.
Ralph F. Mason, APO New York
Ralph J. McGinty, Manhattan, Kansas
Robert R. McGlasson, Morgan City, La.
Thomas E. McNary, APO San Francisco
Milton C. McPherson, Fort Bliss, Texas
Kenneth W. Megan, Norwood, Mass.
Gerald K. Moore, St. Petersburg, Fla.
John R. Morrone, Philadelphia, Pa.
Donald G. Neighbour, Winnipeg, Man., Canada
Vincent Eugene Pace, Mooringsport, La.
Mohammad Yousuf Palla, San Francisco, Calif.
Frank L. Phelps, FPO New York
Richard N. Pierson, Shreveport, La.
Randall E. Price, Packsville, West Va.
Gerard J. Rooney, Washington, D. C.
Tom H. Russell, APO San Francisco
Timothy A. Ryan, Lititz, Pa.
Duane Schnur, Caro, Michigan
Delmar Louis Simpson, Atoka, Tenn.
Morris E. Sullivan, San Antonio, Texas
Sylvia Tabor, Crayne, Ky.
James L. Thomas, Pottstown, Pa.
John A. Truebenbach, Mountain View, Calif.
Charles E. Wallis, Spokane, Wash.
Irvin Reed Weir, Syracuse, N. Y.
Charles E. Whipple, Jr., Toledo, Ohio
Donald R. Wilcheck, Slidell, La.
Billy G. Willard, Maryville, Tenn.

Walter H. Willey, Denver, Colorado
Dale L. Williams, Reading, Pa.
Paul Winsor, Corner Brook, Nfld., Canada

WITH HONORS

Kaare Aker, Fukiai Ku Kobe, Japan
Jerry L. Bailey, Battle Creek, Mich.
Stephen W. Baugh, FPO San Francisco
Aime A. Beaudry, Manchester, N. H.
Maynard V. Bender, Rockford, Ill.
Donald Wayne Bennett, Albany, Ga.
Douglas E. Bergman, Dallas, Texas
George Boucher, Edmundston, N.B., Canada
Berwyn M. Bourelle, Chicago, Ill.
Dieter Brandau, Manteca, Calif.
Harry A. Brewer, Phoenix, Arizona
Joseph M. Brumbley, Jr., Tacoma, Wash.
James D. Caldwell, Falls Church, Va.
Marvin E. Carroll, Roseburg, Oregon
Clifford C. Cavnor, Irving, Texas
Melvin T. Chambers, Pontiac, Mich.
Johnny M. Chase, Holloman AFB, New Mexico
Alan R. Clarke, Orleans, Ont., Canada
Charles Cooley, Alvin, Texas
Jerry R. Cottrell, Tyler, Texas
Frank L. Cross, Rock Springs, Wyoming
Avon E. Decker, Olathe, Colorado
George Dempsey, New Orleans, La.
Francois Dube, Ottawa, Ont., Canada
Walter Engel, Morris Plains, N. J.
Frank W. Fabricius, Jr., Des Plaines, Ill.
George D. Fahey, St. Paul, Minnesota
Ray Fisher, Jr., Cocoa Beach, Fla.
Dennis G. Fogler, Horsham, Pa.
Raymond Gay, Rio Grande City, Texas
John A. Gehrke, Denver, Colorado
John J. George, Jr., Watertown, Conn.
Mojtaba Mohtasham Gilani, Andimeshk, Iran
Allen Glover, Mobile, Ala.
Henry Clay Greene, Knoxville, Tenn.
Elijio Guzman, Fort Worth, Texas
Wallace R. Harper, Holloman AFB, New Mexico
Nolly N. Hashimuray, Durham, N. C.
George W. Howard, Brownwood, Texas
Harry Hyneman, Pompano Beach, Fla.

CONAR ORDER BLANK

J10

DIVISION OF NATIONAL RADIO INSTITUTE, 3939 WISCONSIN AVE., WASHINGTON, D.C. 20016

PLEASE PRINT

NRI STUDENT NUMBER

NAME .....

ADDRESS .....

CITY STATE ZIP .....

☐ CASH
☐ C.O.D. (20% Deposit required)
☐ ADD TO MY CONAR ACCOUNT
☐ NEW EASY PAYMENT PLAN (10% Deposit)

Quantity	Model	Name of Item	Price Each	Total

If you live in Washington, D.C., add sales tax.
All prices are net, F.O.B. Washington, D.C.

TOTAL _____

ON NEW TIME PAYMENT ORDERS please be sure to complete the Easy Payment Plan credit information form on the reverse side of this page and include 10% deposit with your order. ▶

James C. Jackson, Tarboro, N. C.
Lennard Jeffrey, Port of Spain, Trinidad, W. I.
Charles D. Jennings, Homestead AFB, Fla.
Joseph J. Johnen, Jr., Marina, Calif.
Petros Kazeros, New York, N. Y.
Melvin L. Keyser, Jr., Hagerstown, Md.
R. C. Kuhn, Richlands, Va.
Benjamin F. Kuster, Jr., Dillsboro, Indiana
Walter J. Lapczynski, Somerset, N. J.
Donald G. Lebedz, Keyport, N. J.
Delmar L. Logue, Herrick, Ill.
Gerald H. Lutterman, Ft. Meade, Md.
Reuben O. Marketon, China Lake, Calif.
Jose Martinez, Long Island City, N. Y.
Ector M. Matherly, Montgomery, Ala.
Richard D. Mathews, Dayton, Ohio
T. L. McCorkle, Hartford, Ill.
William J. McGrath, APO New York
John Edward Meyer, Hudsonville, Mich.
Leonard Milgrim, Lexington Park, Md.
Walter D. Miller, Hebron, Ohio
John E. Minter, Douglas, Arizona
John L. Modesitt, Brazil, Indiana
Elmer Moore, APO New York
John S. Munch, El Paso, Texas
Darrel E. Nitz, Santa Clara, Calif.
Braulio Ortez, Dayton, Ohio
Elson L. Patrick, Loring AFB, Maine
Allen E. Pleake, Phoenix, Arizona
Noel E. Pomeroy, Kalamazoo, Michigan
Hershel R. Ramey, Jr., Jackson, Michigan
Dr. Joseph C. Root, Largo, Fla.
Alfred A. Schleif, Jr., Phoenix, Arizona
Elvin Shelly, Philadelphia, Pa.
Donald M. Slason, Rockville, Md.
Harry R. Sprague, Kansas City, Mo.
Dr. William G. Studer, Atlanta, Ga.
Charles E. Stumpf, Croyden, Pa.
Calvin Timms, Baltimore, Md.
Cyprian A. Vicars, Honolulu, Hawaii
Hugh Walker, Anniston, Ala.
Alan J. Waranis, APO San Francisco
Bruce G. Watson, Long Beach, Calif.
Donald Wilson, Montreal, P. Q., Canada
Marquis G. Witt, Newburgh, N. Y.
Donald A. Wood, Des Moines, Iowa
John N. Wynkoop, Portland, Oregon
Arthur L. Young, Jr., Freeland, Pa.

CONAR EASY PAYMENT PLAN J10

CREDIT APPLICATION

Note: Easy payment plan credit applications cannot be accepted from persons under 21 years of age. If you are under 21, have this form filled in by a person of legal age and regularly employed.

Enclosed is a deposit of $..... on the merchandise I have listed on the reverse side. I hereby apply for credit under the Conar Easy Payment Plan. The statements below are true and are made for the purpose of receiving credit.

Date ..... Written Signature .....

CREDIT APPLICATION

Print Full Name ..... Age .....

Home Address .....

City & State ..... How long at this address? .....

Previous Address .....

City & State ..... How long at this address? .....

Present Employer ..... Position ..... Monthly Income .....

Business Address ..... How Long Employed? .....

If in business for self, what business? ..... How Long? .....

Bank Account with ..... Savings ☐ Checking ☐

CREDIT REFERENCE (Give 2 Merchants, Firms or Finance Companies with whom you have or have had accounts.

Credit Acct. with ..... Highest Credit .....
(Name) (Address)

Credit Acct. with ..... Highest Credit .....
(Name) (Address)

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

(Act of October 23, 1962; Section 4369, Title 39, United States Code)

Publisher: File two copies of this form with your postmaster.
Postmaster: Complete verification on page 2

Form Approved, Budget Bureau No. 46-R029

1 DATE OF FILING: October 1, 1969

2 TITLE OF PUBLICATION: NRI Journal

3 FREQUENCY OF ISSUE: Bimonthly

4 LOCATION OF KNOWN OFFICE OF PUBLICATION *(Street, city, county, state, ZIP code)*: 3939 Wisconsin Ave., N. W., Washington, D. C. 20016

5 LOCATION OF THE HEADQUARTERS OR GENERAL BUSINESS OFFICES OF THE PUBLISHERS *(Not printers)*: National Radio Institute, 3939 Wisconsin Ave., N. W., 20016

6 NAMES AND ADDRESSES OF PUBLISHER, EDITOR, AND MANAGING EDITOR

PUBLISHER *(Name and address)*: Wm. F. Dunn, 8802 Fox Hills Trail, Potomac, Md. 20854

EDITOR *(Name and address)*: Same

MANAGING EDITOR *(Name and address)*: Allene Magann, 4012 Guinea Road, Fairfax, VA 22030

7 OWNER *(If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual must be given.)*

NAME	ADDRESS
McGraw-Hill, Inc.	330 W. 42nd St., New York, NY 10036

8 KNOWN BONDHOLDERS, MORTGAGEES, AND OTHER SECURITY HOLDERS OWNING OR HOLDING 1 PERCENT OR MORE OF TOTAL AMOUNT OF BONDS, MORTGAGES OR OTHER SECURITIES *(If there are none, so state)*

NAME	ADDRESS
NONE	

9 FOR COMPLETION BY NONPROFIT ORGANIZATIONS AUTHORIZED TO MAIL AT SPECIAL RATES *(Section 132.122, Postal Manual)*: Not applicable

(Check one)

The purpose, function, and nonprofit status of this organization and the exempt status for Federal income tax purposes: ☐ Have not changed during preceding 12 months ☐ Have changed during preceding 12 months *(If changed, publisher must submit explanation of change with this statement.)*

10 EXTENT AND NATURE OF CIRCULATION	AVERAGE NO. COPIES EACH ISSUE DURING PRECEDING 12 MONTHS	ACTUAL NUMBER OF COPIES OF SINGLE ISSUE PUBLISHED NEAREST TO FILING DATE
A TOTAL NO. COPIES PRINTED *(Net Press Run)* 271,530	45,258	48,300
B PAID CIRCULATION 1 SALES THROUGH DEALERS AND CARRIERS, STREET VENDORS AND COUNTER SALES NONE	NONE	NONE
2 MAIL SUBSCRIPTIONS	43,943	46,940
C TOTAL PAID CIRCULATION	43,943	46,940
D FREE DISTRIBUTION *(including samples)* BY MAIL, CARRIER OR OTHER MEANS	581	585
E TOTAL DISTRIBUTION *(Sum of C and D)*	44,524	47,525
F OFFICE USE, LEFT OVER, UNACCOUNTED, SPOILED AFTER PRINTING	734	775
G TOTAL *(Sum of E & F—should equal net press run shown in A)*	45,258	48,300

I certify that the statements made by me above are correct and complete.

(Signature of editor, publisher, business manager, or owner)

▶ Allene J Magann

POD Form 3526 May 1968

ALUMNI

Sam Stinebaugh ..... President
Br. Bernard Frey ..... Vice-Pres.
William Sames ..... Vice-Pres.
Graham Boyd ..... Vice-Pres.
Samuel Antman ..... Vice-Pres.
T. F. Nolan, Jr ..... Exec. Sec.

ALL CHAPTERS OF NRIAA OPEN FALL SEASON WITH ENTHUSIASM

The opening of the fall season proves that the summer recess of the NRIAA meetings has not dulled the enthusiasm of the chapter members. It looks like all chapters are in for a good year.

CHAMBERSBURG MEMBERS ALIGN COLOR TV RECEIVERS

CHAMBERSBURG (CUMBERLAND VALLEY CHAPTER) was host to the Executive Secretary of the NRIAA, Tom Nolan.

The meeting was held at the New Windsor TV Shop in New Windsor, Maryland. Mr. Stanley Gift is the proprietor. The date was Thursday, November 20, 1969.

Tom's talk concerned the alignment of color TV receivers. He used slides and brought along an RCA CTC-40 chassis for demonstration. This is one subject that all service technicians are interested in.

Thanks, Stanley, for the use of the hall.

DETROIT IS HOST TO EXECUTIVE SECRETARY

The DETROIT CHAPTER was visited by the Executive Secretary, Tom Nolan, on Thursday, October 9, 1969. The subject was color alignment of solid-state and tube-type color sets.

Mr. John Nagy brought in his portable tape recorder and at the next meeting, if there are any problems concerning Tom's lecture, we can get the correct answers.

The Chapter was sure glad to see John Standish at the meeting. He is a member of long standing, but had moved to Pennsylvania and we hadn't seen him for several years. Mr. Roosevelt Paton was introduced to Mr. Nolan. He drives all the way from Toledo, Ohio which is seventy miles away to attend the meetings each month. Also Mr. Charles Giller was visiting from Lansing, Michigan which is eighty miles away.

Mr. Earl Oliver was in charge of sandwiches and coffee which everyone enjoyed very much.

PITTSBURGH CHAPTER GETS LATEST INFORMATION ON COLOR TV

PITTSBURGH CHAPTER's own Jim Wheeler, who has his own TV shop, gave a lecture on the 23-inch Motorola color receiver. A bad yoke and filter was found and replaced. All the work was done by the members themselves. Jim Wheeler, Tom Schnader and George McElwain supervised the operation.

Jim Wheeler gives lecture on Color Receiver.

This is the type of evening that really educates the membership. Thanks, Jim, for a real good evening.

SAN ANTONIO IN FULL SWING

The September meeting of the SAN ANTONIO CHAPTER was led by Bob Bonge, Chapter Chairman, who discussed the Texas TV Repairman Licensing Law and led a discussion on TV dogs (those sets that defy fixing).

San Antonio has had excellent results with obtaining speakers from the various manufacturers' distributors. At the October meeting they had Ted Walker, Service Manager for Joe T. Thiele Co., San Antonio, the Zenith Distributor. He had a general color TV servicing program which was enjoyed by everyone.

These programs have increased the membership tremendously within the past year.

Best of luck, San Antonio.

NORTH JERSEY CHAPTER LOOKS INTO TRANSISTORS

NORTH JERSEY's September meeting was spent with the Howard Sams Transistor Review Series, Lecture No. 3 on measurements and circuit analysis. George Stoll conducted the lecture with slides and a recorder.

The October meeting was conducted by George using the Sams Color Television Review Series, Lectures 1 through 4 with slides and recorder. The program was very informative and refreshing.

This is the type of program that keeps the Chapter active. Best of luck, fellows.

SAN FRANCISCO INCREASES MEMBERS

San Francisco welcomed Mr. George Goldstein from Brisbane, California as a new member.

Mr. Ross Alexander, the Chapter Secretary conducted a discussion on transistor amplification. Various transistor circuitries such as common base, common emitter and common collector circuits were discussed by Ross.

This is the type of discussion that really teaches about solid-state.

SPRINGFIELD CHAPTER GETS NEW OFFICERS

At the September meeting of the SPRINGFIELD CHAPTER, Al Dorman was elected Chairman, Bob Niquette, Secretary and Bill Planzo was re-elected to the Treasurer's Chair.

Al Dorman gave a talk on troubleshooting transistor TV. John Parks brought in a set for diagnosis and joined in with his experiences in servicing.

Brother Frey had a letter from British Columbia concerning NRI, which he promptly answered. NRI is truly an international organization.

NEW YORK CHAPTER ACQUIRES OWN COLOR TV

The Chapter welcomed Mr. Enibal Alcaide as the season's first new member.

They also received a visit from Mr. Victor R. Smith and a letter from Mr. Mohamed Sudian from Bombay. Unfortunately his visit didn't coincide with one of our meetings, but he was entertained by Sam Antman. The chapter also welcomes Mr. Theodore Freije as a new member.

The first two meetings of the fall season have been largely occupied with work on the Chapter's new CTC-11 RCA Color set. The setup work was led by Messrs. Carter and Eaddy.

Dick Carter brought up an odd problem he had with a tape recorder which involved one of the pinch rollers. Also Willie Foggie used the B & K ANALYST to converge our color receiver. The color TV has really sparked interest in the Chapter meetings.

PHILADELPHIA CAMDEN HAS ANNUAL VISIT

The PHILADELPHIA CAMDEN CHAPTER had its annual visit from Tom Nolan, Executive Secretary.

His talk was welcomed by all the members. The latest RCA CTC-40 Color Chassis was used for demonstration of alignment.

One of the highlights of the evening was the sauerkraut and hot dogs served by the food committee.

FLINT, MICHIGAN TROUBLED BY DEER SEASON

It seems when the deer season is open in Michigan, it is hard to get anyone to attend meetings. Hunting is a real sport.

Also, the night work at the auto plant cuts into the attendance.

Mr. Andrew Jobbagy, the Chapter Secretary, is recovering from an operation, but happily he is back at work and feeling much better.

LOS ANGELES CHAPTER PROBES SOLID-STATE COLOR

The first meeting of the fall season was held at Graham Boyd's TV Shop in LA.

Graham gave a talk on Motorola Quasar, which he sells and services.

After the talk everyone was invited to look through one of the receivers and remove the printed circuit boards for examination. Graham answered questions from the members and guests.

The Chapter is looking forward to an interesting season.

SOUTHEASTERN MASSACHUSETTS ENTERTAINS EXECUTIVE SECRETARY

Tom Nolan made his annual visit to Swansea, Massachusetts to the home of John Alves.

The meeting was attended by Mr. Walter Adamiec, the past National President of the NRI Alumni Association.

The talk on solid-state color was well received by the members.

DIRECTORY OF CHAPTERS

CHAMBERSBURG (CUMBERLAND VALLEY) CHAPTER meets 8:00 p.m. 2nd Tuesday of each month at Bob Erford's Radio-TV Service Shop, Chambersburg, Pa. Chairman: Gerald Strite, RR1, Chambersburg, Pa.

DETROIT CHAPTER meets 8 p.m., 2nd Friday of each month at St. Andrews Hall, 431 E. Congress St., Detroit. Chairman: James Kelley, 1140 Livernois, Detroit, Mich. VI 1-4972.

FLINT (SAGINAW VALLEY) CHAPTER meets 7:30 p.m., 2nd Wednesday of each month at Andrew Jobbaggy's shop, G-5507 S. Saginaw Rd., Flint. Chairman: Arthur Clapp, 705 Bradley Ave., Flint, Mich. 234-7923.

LOS ANGELES CHAPTER meets 8 p.m., 2nd and last Saturday of each month at Graham D. Boyd's TV Shop, 1223 N. Vermont Ave., Los Angeles, Calif., NO-2-3759.

NEW ORLEANS CHAPTER meets 8 p.m., 2nd Tuesday of each month at Galjour's TV, 809 N. Broad St., New Orleans, La. Chairman: Herman Blackford, 5301 Tchoupitoulas St., New Orleans, La.

NEW YORK CITY CHAPTER meets 8:30 p.m. 1st and 3rd Thursday of each month at 264 E. 10th St., New York City. Chairman: Samuel Antman, 1669 45th St., Brooklyn, N.Y.

NORTH JERSEY CHAPTER meets 8 p.m., last Friday of each month at Midland Hardware, 155 Midland Ave., Kearney, N.J. Chairman: William Colton, 191 Prospect Ave., North Arlington, N.J.

PHILADELPHIA-CAMDEN CHAPTER meets 8 p.m., 2nd and 4th Monday of each month at K of C Hall, Tulip and Tyson Sts., Philadelphia. Chairman: Herbert Emrich, 2826 Garden Lane, Cornwell Heights, Pa.

PITTSBURGH CHAPTER meets 8 p.m., 1st Thursday of each month at 436 Forbes Ave., Pittsburgh. Chairman: James Wheeler, 1436 Riverview Dr., Verona, Pa.

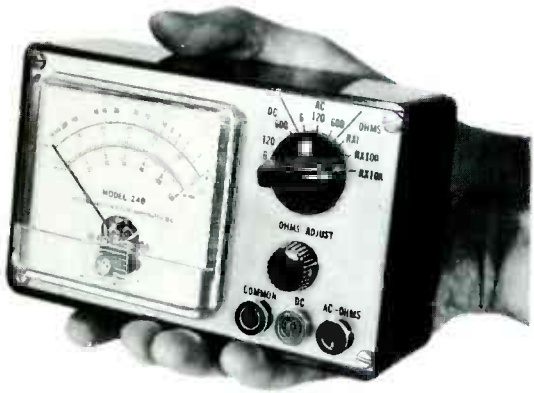
SAN ANTONIO (ALAMO) CHAPTER meets 7 p.m., 4th Friday of each month at Alamo Heights Christian Church Scout House, 350 Primrose St., 6500 block of N. New Braunfels St. (3 blocks north of Austin Hwy.), San Antonio. Chairman: R. E. Bonge, 222 Amador Lane, San Antonio, Texas.

SAN FRANCISCO CHAPTER meets 8 p.m., 2nd Wednesday of each month at the home of J. Arthur Ragsdale, 1526 27th Ave., San Francisco. Chairman: Isaiah Randolph, 60 Santa Fe Ave., San Francisco, Calif.

SOUTHEASTERN MASSACHUSETTS CHAPTER meets 8 p.m., last Wednesday of each month at the home of John Alves, 57 Allen Blvd., Swansea, Mass. Chairman: Oliva J. Laprise, 55 Tecumseh St., Fall River, Mass.

SPRINGFIELD (MASS.) CHAPTER meets 7 p.m., last Saturday of each month at the shop of Norman Charest, 74 Redfern Dr., Springfield. Chairman: Al Dorman, 6 Forest Lane, Simsburg, Conn.

CONAR portable volt-ohmmeter kit



Compact, precision, yet rugged 3-in-one instrument. Easily fits in coat pocket or tool box.

Completely portable, uses two 1.5V batteries on ohms ranges with hundreds of hours life. A stock battery size available anywhere. Has jeweled D'Arsonval meter, 1% resistors.

Easily assembled in less than one hour. Low price includes 48" test leads and two 1.5V mercury batteries.

SPECIFICATIONS

DC SENSITIVITY: 20,000 ohms per volt, AC SENSITIVITY: 5,000 ohms per volt, DC RANGES: 0-6-120-600 (30,000 volts with optional TV probe), AC RANGES: 0-6-120-600, OHMMETER RANGES: 0-1,000 ohms, 0-100,000 ohms, 0-10 meg (will estimate ½ ohm at low end, 20 meg at high end), DIMENSIONS: 3¾" x 6¼" x 3", CASE: Black bakelite, PANEL: Satin-finish aluminum, etched lettering, ACTUAL WEIGHT: 2 lbs., SHIPPING WEIGHT: 3 lbs., shipped parcel post ins.

$19.95
Kit Stock #240UK

OPTIONAL TV PROBE
Extends DC Voltage Measurement to 30,000 Volts
$5.50
Stock #240PB
Wt.: 1 lb.

CONAR transistor power supply

(factory assembled)

$18.50
Stock 510WT

The CONAR 510 is a high quality power supply designed for use in servicing transistorized electronic equipment. It is ideally suited for work on transistor radios, hearing aids, preamplifiers, and other devices requiring a source of well filtered, low voltage D.C.

The attractive 2¼" clear plastic meter measures output voltage and current in three ranges.

Control and filtering is provided by a unique transistorized shunt capacitive multiplier. This circuit provides 100% burnout protection; the 510 can be shorted with no resulting damage.

A pull-on, push-off switch is provided on the voltage control to allow the user to turn off the unit without disturbing the output setting.

SPECIFICATIONS

OUTPUT: 0-24 volts; 0-100 milliamperes
METER: 0-24 volts; 0-10 milliamperes; 0-100 milliamperes
INPUT: 110 v, 60 cy. AC only; 5 watts
SIZE: 3¾" x 6⅜" x 3"
WEIGHT: 2 lbs., shipped parcel post

USE CONVENIENT ORDER BLANK ON PAGE 25

CONAR
Resistor-Capacitor Tester

CATALOG PRICE

KIT 311UK	$29.95
WIRED 311WT	$42.50

NRI STUDENT & ALUMNI PRICE

KIT 311UK	$24.40
WIRED 311WT	$33.85

The Model 311 gives fast, accurate, reliable test on all resistors and capacitors. Measures capacity of mica, ceramic, paper, oil-filled and electrolytics from 10 mmfd to 1500 mfd, 0-450 volts. Checks for leakage, measures power factor and useful life. Shows exact value of resistors from 1 ohm to 150 megohms. Clearly indicates opens and shorts.

Has "floating chassis" design to greatly reduce shock hazards. The Model 311 will also apply actual DC working voltage to capacitors to reveal break-down under normal circuit conditions, a feature far superior to many R-C testers which give low voltage "continuity" tests.

Can be used for in-circuit tests in many applications and circuits. Has 1% precision resistors in range circuit. A basic test instrument that won't become obsolete!

USE CONVENIENT ORDER BLANK ON PAGE 25

NRI JOURNAL
3939 Wisconsin Avenue
Washington, D. C. 20016

Second-class
postage paid
at Washington, D. C.

Mr. Willard F. Velline 25923-G
1322 S. 14th
Fargo, N.Dak. 58101