

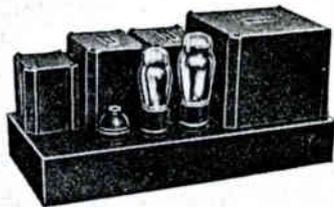
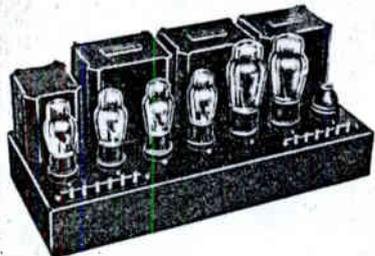


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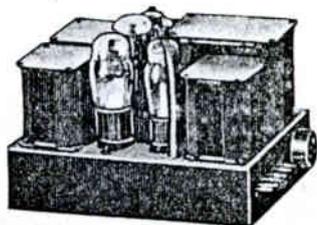
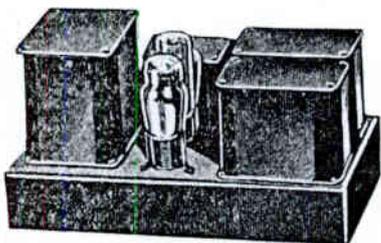
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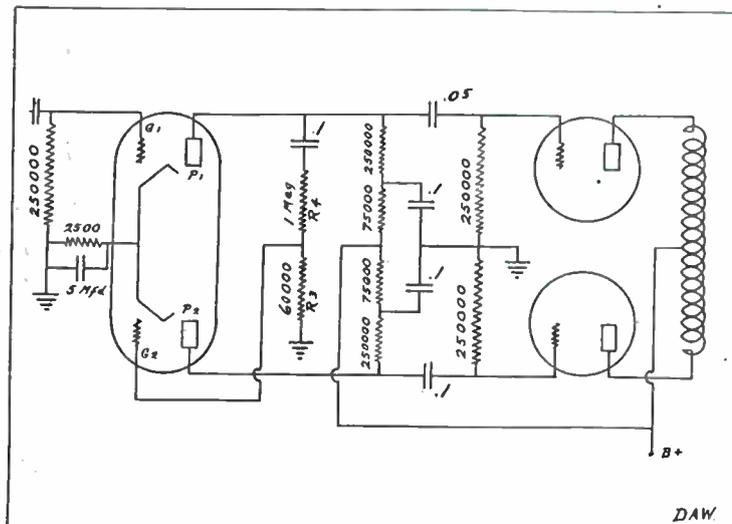
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JULY « The » 1934
"TECHNICIAN"



THE 53 TUBE AS A PHASE INVERTER
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AND

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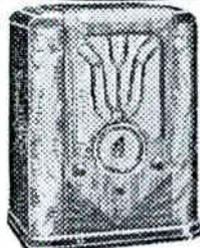
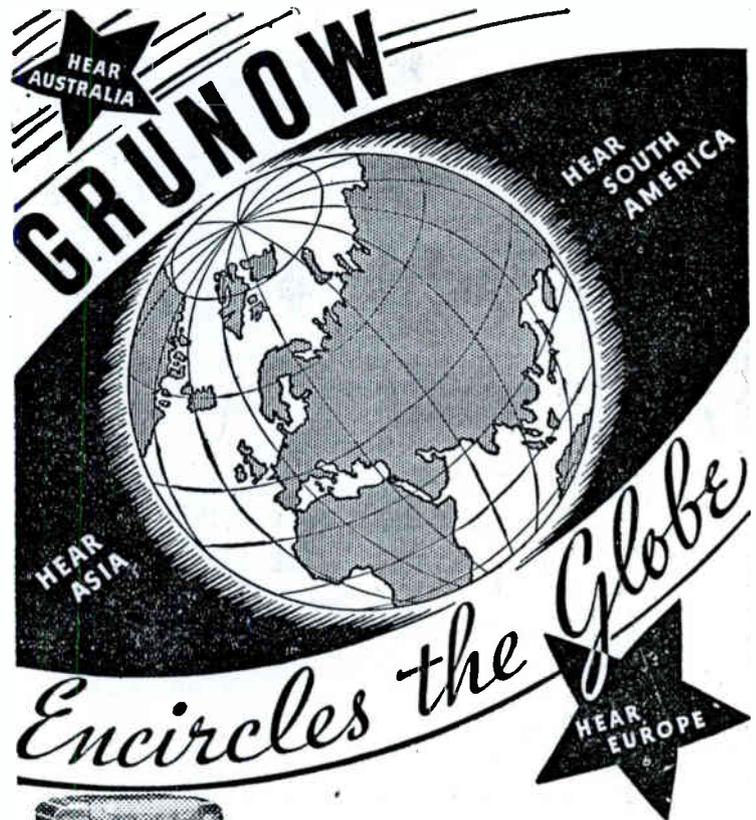
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The "TECHNICIAN"

Official Publication of the Certified Radio Technicians' Association
An Organization of Competent, Qualified and Trustworthy Radio Technicians for the
Purpose of Advancing the Radio Art and for the Protection of the Public.

A. PAUL, Jr., President

JOHN L. VINCENT, Vice-President

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NORMAN B. NEELY
1569 Munson Avenue
Los Angeles, California

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VOL. 1

JULY, 1934

No. 11

EDITORIAL

By The Editor

"LOYALTY"

Loyalty is a quality, a possession of mind and character, which is denied none of us whether we be rich or poor, white or black, highly educated or uneducated. It is a paramount quality which not only gains respect and commendation from our fellows in all walks of life and strata of society but is a tonic to our self respect and inner selves.

Regardless of our political creed, our religious belief, or our everyday association, let us be loyal to our beliefs, our fellows, and most important, to ourselves. If you are employed by any concern, regardless of its merits, either be loyal to its interests or resign. Support your religion or change to one which you can support.

By the same token support your radio association, the Certified Radio Technicians' Association! Minor differences of opinion are not important in comparison to the aims and objectives of this group as a whole. State your personal views in open meetings by all means, but if they are not incorporated into the policies of the association don't cease to be loyal. Only by one hundred per cent loyalty of all our members may we expect to reach our goal!

Support your officers—you are indeed fortunate in having a dynamic, competent president, who has the intestinal fortitude and ability to promote publicity, coopera-

tion and support of our aims from other branches of the industry. Our president leads a board of directors composed of men who have signified and proved their willingness and ability to shape the destinies of a new organization in the face of depression and adverse business conditions.

To these men you owe your undying loyalty and support. Your association is guided by these men who are working and sacrificing their personal interests for your interests — your business — your status in the radio industry. They demand and need your whole-hearted cooperation and support. If you cannot be loyal to them and the Certified Radio Technicians Association there is only one thing to do. That is to resign! Loyalty to yourself comes first! Therefore if, for any reason, you cannot support and work for the mutual benefit of hundreds of men and relinquish petty personal ideas and differences of opinion you owe it not only to The Certified Radio Technicians Association, but to yourself, to sever your connections with these men.

These may seem harsh words but loyalty has ever been considered an esteemed and fundamental virtue. Only by loyalty of its members to its ideals and aims may the Certified Radio Technicians Association hope to accomplish the tremendous task before it.

SIMPLE INDUCTANCE MEASUREMENTS

By C. E. MILLER, Consulting Radio Engineer

Occasions frequently arise where it is desirable to know, with a fair degree of accuracy, the inductance of a choke or transformer primary. While few of us are so fortunate as to have inductance bridges available, nearly everyone has an AC milliammeter of the iron vane type at hand. This meter may have a built-in series resistor and have the scale marked AC volts but never the less it is fundamentally an AC milliammeter and is therefore suitable for our purpose. (The rectifier type AC voltmeter is not suitable for this purpose unless it has a scale calibrated for 0-25 milliamperes AC).

The setup is very simple as it consists merely of connecting the meter and coil in series across the AC line. Since we are interested in the current through the circuit the meter reading must be converted to milliamperes. Since the sensitivity of an AC voltmeter is generally unknown it will have to be computed by measuring the DC resistance with an ohmmeter and applying Ohm's law.

Thus if the measured resistance of the meter on the 15 volt scale is 780 ohms each volt on the scale represents 1/780 ampere or 1.283 ma.

For approximate results we may neglect the resistance of the coil and meter when measuring inductances of 30 henries or more at 50 cycles. The impedance is then considered as being all due to the reactance of the coil. By Ohm's law the impedance is found as the quotient obtained by dividing the applied voltage by the current indicated by the meter. Then if the frequency is 50 cycles the inductance may be found from the following table:

Inductance in Henries	Reactance In Ohms
1	314
2	628
3	942
4	1257
5	1571
6	1885
7	2199
8	2513
9	2827
10	3142

12	3769
14	4400
16	5026
18	5655
20	6283
22	6911
24	7539
26	8167
28	8800
30	9425
X	314.16 x X

If a high degree of accuracy is desired or the resistance of the circuit is high with respect to the reactance of the coil the following corrections may be made. Measure the DC resistance of the meter and coil in series. Then the true reactance will be the square root of the difference between the impedance squared and the resistance squared.

As an example, let us assume we have a 15 volt AC meter with a resistance of 780 ohms and the 50 cycle line voltage is 115 volts. The DC resistance of the coil to be measured is 500 ohms. When the coil and meter are connected across the line the meter reads 10.9 volts.

Converting the meter reading to amperes we have $10.9 \div 780 = .014$ amperes. Since the applied voltage is 115 the impedance is $115 \div .014 = 8200$ ohms. Referring to the above table we find that the inductance is about 26 henries.

If a higher degree of accuracy is desired we may subtract the square of the total resistance, $1280^2 = 1,630,000$ from the square of the impedance, $8200^2 = 67,300,000$, which gives 65,670,000, the square of the reactance. Taking the square root we have the reactance equal to 8100 ohms, which when divided by 314.16 gives the inductance of the coil as 25.8 henries. This illustrates that our error in neglecting the resistance in the approximate solution was less than one per cent.

As there was no DC component flowing through the coil when the above measurements were made, the actual inductance under operating conditions may be considerably less if the coil is forced to carry a DC component above its rated capacity.

SERVICE FROM CARBON TYPE MICROPHONES

By JAMES L. FOUCH, Test Technician Universal Microphone Co.

The carbon type microphone is in greatest use today because of its overall practicability. Other types such as condenser, ribbon, etc. require more space and more amplification. The main factor in Radio and Public Address apparatus has always been amplification and the greater output obtained from the carbon granule type microphone usually displaces the one or two stages of amplification required by other types. True, the condenser and other types of microphones are coming into demand, but their initial cost has placed them beyond the reach of the majority.

Periodical repairs are necessary upon carbon microphones in proportion to the services obtained from them if they are not abused. The greatest objection to the service given is the loss of sensitivity after a long period of time. This loss of sensitivity may be caused by a great number of things. The first logical cause is the ageing of the granules due to the current passing through them. Second, there is a natural deterioration of granules which continues even while the microphone is out of use. The former cause may be reduced considerably by using a lower voltage upon the buttons, that is, three volts or less. This low voltage not only lengthens the life of the granules, but also protects the delicate gold contact surfaces.

Carbon granules are especially adept in the absorption of moisture. The front button of a double button microphone, being exposed to the air, has a tendency to absorb moisture; making this button higher resistant. The back button is usually enclosed and is not effected readily by the moisture of the air, a condition which naturally throws the button currents out of balance. The presence of a perfect balance of button currents in a double button microphone is not always essential. A microphone should not be removed from service just because it does not have a balance of button currents. Defective quality or a lowered sensitivity should be the only reasons for taking a microphone out of service.

An exaggerated case of moisture absorption is seen in the microphone that "packs" or "blocks" in a humid atmosphere. A gentle warming of the microphone under an electric light or in the sunshine will often alleviate this condition if brought about by moisture.

"Packing" caused by the cohesion of granules may sometimes be alleviated by gently tapping the microphone upon the side while in a horizontal position with the current off. If this does not remedy the condition, repairing of the unit is necessary. "Packing" caused either by moisture or natural cohesion, results in a lower sensitivity.

After a length of time there may be a noticeable increase in hiss level of a carbon microphone. Usually a lowered sensitivity, caused by age, brings the output level of the microphone close to the hiss level, thus making the hiss appear louder. Corroded gold contact surfaces, which were chemically deposited, cause innumerable microphones to be sent in for repairs because of the high hiss level developed. Moisture, when in contact with the granules, causes additional hiss and noise. High voltage applied to the microphone often damages the contact surfaces to such an extent that there is more hiss, and the life of the granules is likewise shortened.

A dented or corroded diaphragm is often the cause of resonance and a lowered sensitivity. If some person who doubts that the diaphragm is movable jabs it with a toothpick or pencil, or a screw driver slips when connecting the microphone, the result will be a dented diaphragm. With the general use of the thin, stretched diaphragm it has been found necessary to protect it with a grating or grid.

A change in the pitch of a microphone is often due to the effects of moisture upon the granule retaining washers, or the loosening of the damping with age. Loosening of the damping results in a greater response to the higher frequencies. Other times, there might be distortion, resonance and a tendency for the microphone to "feed-back" when the diaphragm has to push dead granules. If there are conditions duplicating these in locations where the acoustics are bad, do not blame the microphone.

All Broadcast and the best Public Address type microphones now have stretched diaphragms. Some operators have been caused some consternation on finding a stretched diaphragm broken without any apparent reasons. As these diaphragms are very thin and stretched to quite a tension, a fall or jar, or the pass-

(Continued on page 8)

A PHASE- INVERSION AUDIO SYSTEM

By DON WALKER

Service Manager Troy Radio Mfg. Co.

The Phase-inverted amplifier offers high fidelity at low cost. Its principal advantages are: absolute minimum of hum and distortionless push-pull amplification. This is not a new trick circuit, but a sound and proven principal that has been neglected because of lack of step-up ratio. Now with the advent of the type 53 tube it has been recovered from the files, dusted off, and given new life. Referring to a tube chart you will find the 53 tube to be two hi-mu triodes in a single envelope, cathode type, gain 35 per section—nothing left to be desired for a phase-inversion circuit.

The technician will readily see the commercial possibilities of this amplification. There are thousands of old style radios in use today that were equipped with the good old 45's in push-pull but their input transformers, in most cases, are not capable of handling present day broadcasting.

A glance at the circuit (on front cover) shows input to G_1 standard, input to G_2 is obtained from a signal voltage divider in circuit of P_1 . The ratio of R_1 to R_2 is such that the signal impressed on G_2 is equal to that on G_1 . Coupling from P_1 and P_2 to grids of power tubes is conventional. Biasing of power tubes may be any standard method. Power tubes may be either triodes or pentodes in Class A.

In the case of pentodes in a super using a 55 tube as detector and AVC, the triode section of the 55 is not needed, as ample volume will be obtained by connecting G_1 of the 53 tube to the high side of the diode return resistor in the 55 circuit. If, in a set of this type, there is not socket space available for the 53, then replace the preceding IF tube with a type 2B7 tube, using the pentode section for IF and the diodes for detector and AVC. The 55 tube can now be removed and its socket space used for the 53 tube.

In most sets using 45 type tubes in push-pull they are preceded by a 27 type first audio and, as this is replaced

by the 53 tube, you will have the necessary socket space. In the case of a 24 or 57 type power detector it may be advisable to incorporate a volume control in the circuit of G_1 of the 53 tube.

Many owners of old style radios are not in the market for new sets, but would like to have their old ones modernized with new type tubes.

The technician should find such changes as this very profitable business.

RADIO-TELEVISION SUPPLY TO MOVE

In keeping with its policy of offering trade discounts to dealers and service technicians exclusively, the Radio-Television Supply Co., is moving out of the downtown retail district.

The first week in August will see this firm installed in its new and larger quarters at 1701 South Grand Avenue. This new location, in the opinion of the Company, will offer many advantages to its host of customers in the way of ample parking facilities and freedom from heavy downtown traffic. Coincident with the occupation of new quarters a new and improved system of accommodating customers will be inaugurated which will offer quicker and more efficient service to technicians and dealers.

Service From Carbon Type Microphones

(Continued from page 7)

ing from a cold atmosphere to hot atmosphere, will often cause them to crack. This treatment given to a microphone with a corroded diaphragm is usually fatal. Moisture of the breath is an enemy to both the granules and diaphragm. Speaking across a "close talker" or damped microphone helps prevent corrosion caused by the moisture in the breath. The best hand microphones of the double button types are packed so that it is difficult for the moisture to reach the front button, allowing one to speak directly into them.

It may be concluded from the above statements that to greatly add to the service obtained from a carbon type microphone it must be kept away from moisture; operated on a low voltage, three volts or less; and treated with as much care as a delicate radio transmitting tube, not dropping or jarring it.

The writer is sure that following these precautions will repay the effort and trouble in added service.

POLICIES ---

WE are not conceited enough to contend that we are responsible for the recent trend of Radio Parts Jobbers toward "Wholesale Exclusive" policies. Neither are we so modest as to deny that we may have been a factor in this move—

For two years we have maintained our policy of fairness by refusing to compete with our customers. Perhaps that is why we are the fastest growing Parts Jobber in this locality!

RADIO SPECIALTIES COMPANY

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BEWARE OF RUBBER CHECK ARTIST

Mr. Ullberg reports a very unfortunate experience with a rubber check artist. This man ordered a set to be delivered to his apartment. The set was delivered, connected and tested. The man then wrote a check in full for the radio. Mr. Ullberg immediately went across the street called the bank and found that no such account was in existence. Returning as soon as possible he found the man to have vacated, leaving no clues as to his identity, whereabouts or the radio.

The set was a five tube dual wave Chanticleer superheterodyne, serial No. 4206. Any information concerning this man or the radio will be sincerely appreciated by Mr. Ullberg.

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RMA OF SO. CALIF.

The activities of the Radio Manufacturers Association of So. Calif. are worthy of cognizance and support by the members of the CRTA and readers of The "TECHNICIAN." The members of this association are composed of the leading and progressive manufacturers of radio receivers located in Southern California who are making an honest effort to clean up our local radio business and keep it so. They employ only local men and their money is returned to local circulation.

TROY SETS USE TRIODE CLASS A AUDIO

The high quality audio system described in the article by Don Walker, service manager for the Troy Radio Manufacturing Co., is the same as that used in the Troy models 72 and 84, described at a recent meeting of the CRTA by Ralph Lamm, chief engineer for Troy. It certainly looks great to see some of our local manufacturers (you'll notice the golden poppy on every Troy chassis) using our good old friend the '45 for real audio quality.

STOLEN SET

Motorola auto set model 75, serial No. 19844. A \$5.00 reward is offered for information leading to the recovery of this set. Anyone having such information is urged to get in touch with Arthur F. Guion, 29 N. Marengo Ave., Pasadena. Phone TErrace 7257.

YOUR PART IN OUR ASSOCIATION

By A. PAUL, JR.
President CRTA

If we are to continue the splendid work which we as an Association have begun it is imperative that each and every one of us do our part! The officers and members of the Board of Directors can be depended upon to do more than their share of the work of building up the Association.

The question which now arises is, "Will you, Mr. Certified Radio Technician, do your share?"

The most important job you have is to attend each and every meeting for the following reasons:

1. The sponsored course in radio engineering theory which has been presented weekly for many months will only continue as long as enough men attend to make providing it worth while for the sponsor to go to the necessary expense.

2. In order to obtain speakers of note as features on our program we must be able to assure them of a sizeable audience.

3. If we are to have legislation passed which is favorable to our cause we must convince the law makers that we are representative of the industry.

4. Your magazine, The "TECHNICIAN," is unique in the annals of radio service organizations. If it is to continue to function, its circulation must grow.

Your second job as a Certified Radio Technician is to see to it that every eligible qualified man in the radio service industry is acquainted with our organization, its aims and purposes, and is urged to affiliate himself with us. Because not until every worth-while man in the industry is associated with us will we really be able to function as we should.

And last but not least, it is your duty as a member to report and help prosecute any and all unfair trade practices which may come to your attention.

ENGINEER ENTERS NEW FIELD

Mr. Richard G. Leitner, outstanding radio design engineer, formerly with the Radio-Kit Co. and consulting radio engineer, has recently entered the field of development of sound-on-film recording.

RCA Victor's New World-Wide Antenna Kit

Stock No. 9500

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by the RCA Victor Engineers who designed
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Now—\$6.00



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PERSONALS

Mr. B. M. Fuhman has just returned from a three weeks visit to the middle west including a few days in Chicago spent inspecting the second edition of the World Fair.

Bob Reed, formerly with Watson and Wilson, has recently become connected with the firm of A. E. Ravenscroft, Inc. Don't forget his ability to make things disappear—keep an eye on him when he calls on you.

John A. Orme, secretary of the CRTA is now in charge of service for the ABCO Radio Service Co., located on Western Avenue near Ninth street.

Karl Hatfield has been walking the floor nights lately with a new addition to the family. It's not what you think it is though, it's a new wire haired terrier that seems to have entirely upset the routine of the Hatfield household.

Mr. Charles E. Miller has been taking care of the extensive service business of Mr. B. M. Fuhman during the latter's trip to the World Fair and thereabouts.

Even those in the radio industry take vacations now and then. Among those absent from their duties at various times this month were Larry Lange, of Leo J. Meyberg Co., Bill Wilson of Watson and Wilson, W. L. Sexton of Radio "Doc," Mr. W. F. Grimes, chief engineer of the Radio Trades Interference Engineering Bureau and Henry James, CRTA member.

SERVICE KINKS AND PET EQUIPMENT

The following service notes are reprinted from the Bulletin of the Radio Service Men's Association of Maryland by special permission of the Editor, Mr. Albert O. Rabassa, who is also President of the Association.

Silver Marshall A-18

When set squeals with volume wide open on distant stations, try changing oscillator tube. Also check for too high screen grid voltage.

—Lanterman Radio Service.

Victor R32

Distortion and poor tone quality—look for speaker cone broken close to the voice coil.

—Chas. B. Hast.

General Motors

When hum is encountered in this receiver and everything apparently checks O. K. it will pay to short out the fuse in the chassis. If the hum stops, replace the fuse.

—J. B. Montero.

Grebe SK-4

If these sets fade on locals and are brought back by turning up the volume control or vice versa (if station comes in very loud and the volume control has to be turned down) during the first few minutes the set is turned on the trouble is gassy 24 tubes. Such tubes will often check O. K. in a tube tester, but new tubes will remedy the trouble:

—George Mason.

SKAGGS TRANSFORMER COMPANY

5894 S. Broadway, L. A. FREE DELIVERY ADams 7652

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FOR IMMEDIATE EXCHANGE

"YOU CANNOT BEAT A GOOD REWOUND TRANSFORMER"

Good rewind transformers have had the manufacturers' mistakes corrected in the use of poor insulation and corrosive soldering fluxes. They have been put together the best way, not the way that takes the least amount of time.

Just Give Us A Ring And Have It Delivered.

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Radio Manufacturers' Association of Southern California Extends Congratulations

*May your splendid work
of the past continue.*

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PETER PAN RADIO CO.
REMINGTON RADIO & TELEVISION
PACKARD BELL RADIO CO.
TROY RADIO CO.
WESTONE RADIO CORP.

RADIO INTERFERENCE BUREAU

MR. W. F. GRIMES, Chief Engineer Radio Interference Engineering Bureau

(This column is a regular feature and each month will consist of a report of interesting cases and activities of the RADIO INTERFERENCE ENGINEERING BUREAU. To report interference Phone Trinity 1244).

A. C. ARC WELDER

During the past month we have received a number of reports of a radio disturbance which has greatly disturbed radio reception in the day time in the north-west section of Los Angeles. We have traced the source of this disturbance to an alternating current arc welder.

The arc welder in question is rather unique in its operation in that the arc is kept alive by an oscillating circuit fed directly from the A. C. supply to the welder. The circuit used is of the fixed gap type at one time used with spark transmitters. The welder in question, unfortunately, uses a fundamental frequency in the broadcast band. It is understood that the manufacturer of this welder, shortly after placing the original equipment on the market, discovered the error of having the oscillating circuit tuned in the broadcast band and has since changed the design so as not to interfere with radio reception. We have discussed the matter of this welder with the concern using it as well as the manufacturer, and have been assured that the welder will either be replaced with one of a later design or will be rebuilt to prevent interference with radio reception, within the immediate future. We have experienced these welders once or twice in the past several years but their use has been discontinued before the matter of interference became general. We hope we will be successful in preventing the future use of this type of equipment.

DEFECTIVE HOUSE WIRING

We recently succeeded in analyzing a rather interesting source of electrical disturbance affecting reception. The noise observed in the receiver was a very rough note and was very intermittent in nature. The receiver and installation appeared to be in first class condition. By chance, it was observed that walking from the kitchen to the back porch aggravated the noise. Further investigation revealed

that the use of the hot water system also aggravated the noise. The final analysis of the difficulty revealed the fact that the hot water heater was of the instantaneous gas type and was provided with a vent. This vent was of the conventional tin chimney type and projected some four or five feet above the roof of the house. It was held in position by means of four (4) small guy wires, one of which was anchored to the conduit through which the electrical service entered the house. The ground on the conduit had become loosened thereby permitting the conduit to take up an electrical charge which resulted in a sputtering discharge when the wind was blowing the vent or any vibration of the house caused a motion of the vent.

ANNOUNCEMENT!

The September issue of The "TECHNICIAN" will be the first issue of volume number two. It will begin the second year of the venture which was originally intended to be a two or three page mimeographed bulletin but which has grown and become a permanent fixture in the radio industry of Southern California. Many were those who said it could not be done. On the other hand there were many who were enthusiastically in favor of such a publication and optimistic as to its success. These men not only had an optimistic outlook and wish for a magazine but the willingness and ability to contribute to its eventual success.

For weeks past your editor has been preparing the set-up for a special issue to celebrate the beginning of the second year of The "TECHNICIAN" and you can be assured that the September issue will surpass your expectations. Leading engineers and technicians are even now preparing feature articles especially for this big issue. Advertisers have signified their desire to cooperate in making this an extra large issue by increased advertising space.

All readers are urged to send in service kinks, descriptions of pet equipment, reports of personal activity, and any bit of interesting news or information relative to the radio industry. But whether you do or do not contribute be sure not to miss this anniversary issue of your own magazine!

PHILCO SERVICE DATA

Listenwaller & Gough, Philco distributors, announce a new service to technicians. All men who call in person at the service department of this company after August 15, will be presented, free of charge, a set of valuable service data consisting of circuit diagrams and pertinent data pertaining to late model Philco receivers.

Mr. Glenn Barr, in charge of the radio service department for Listenwaller & Gough, extends an invitation for all technicians to avail themselves of the facilities of his department in the way of advice and service hints on difficult jobs.

NOTICE TO ADVERTISERS

Advertisers are asked to cooperate in an effort to advance the date of publication of The "TECHNICIAN" by one week.

It will be greatly appreciated if all advertisers will have copy ready for pickup by August 1st, without fail.

NOISE SUPPRESSION ON FORDS

There have been many requests for a universal suppressor that will fit all cars equally well, including the Ford.

For best results, the same suppressor must not be used on all cars even though mechanically interchangeable.

The Ford ignition coil delivers unusually high voltage and since no distributor suppressor is used, the resistance of the plug suppressors should be at least twice that commonly used for other cars.

Centralab part number 304 is mechanically interchangeable on the Ford and other cars. We particularly recommend it for Fords in a resistance of 30,000 ohms. This resistance will not affect Ford motor efficiency, but is not recommended where a distributor suppressor is also used.

After installing Suppressors on any car, adjust the ignition cables as close to the motor block as possible. The capacity between the cable and the block helps prevent radiation. That is why many installers have observed that suppressors are most effective when mounted at right angles to the plugs.

—Courtesy Radio Specialties Co.

CHEAPNESS

That seems to be the keynote today when it comes to the efforts of some concerns to "horn-in" on established lines of business. This "cheapness" must, of a necessity, not only apply to the price, but to the quality of the article as well. The big chiselers seem to get away with it for awhile, but the little fellow can't. He must fail! This seems to apply particularly to the transformer rewind business. You can't get something for nothing! When someone tells you he can give the same service for a ridiculously lower price, he is either kidding himself or cheating on the job. It's far better to stick to those who charge a fair price and who do work that you can safely guarantee to your customer. "There is still no substitute for a good rewind."

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TO FORGIVE IS DIVINE

The Pacific Radio Exchange's policy of arraying its stock on open tables for easy inspection and selection was the cause of an amusing incident a few days ago. A clerk reported to Mr. LeBell that he was almost certain his customer had just slipped a filter condenser in his pocket but didn't actually see him do it. Mr. LeBell, in an effort to verify this suspicion kept a close watch over the suspect and under guise of accidentally flipping a cigarette on him brushed him off very thoroughly and noted several bulky objects in his pockets.

The culprit, becoming uneasy by this time, was caught in the act of returning a condenser to the table. Search revealed several condensers and other items concealed on the victim's person. The amusing part of the incident, however, is that it was so laughable to Mr. LeBell that he couldn't become angry and reports that the man in question apparently bears no ill feeling and is still a good customer. The moral of the story is—don't try to "snitch" merchandise from open display counters and if you do don't try to return it.—But if you should be caught laugh it off.

PRIZE CONTEST

The winners in the prize contest will be announced in the August issue of The "TECHNICIAN." Some very excellent articles were submitted in this contest and the prize winning articles will be published in subsequent issues of The "TECHNICIAN," beginning with the August issue.

TREATISE ON RECORDING

"Simplified Disc Recording," with one diagram and other useful information on the subject, has just been published by the Universal Microphone Co., Inglewood, Calif., as a 12-page leaflet.

The making of high quality recordings by stations, amateurs and others for air checks, audition records and other uses, has opened up an entirely new field in the sales and installation of recording apparatus.

In addition, many short wave enthusiasts have started to record, in permanent form, some of the foreign programs they tune in.

The Universal booklet subdivides its publication by discussing the amplifier, hum and volume levels, turntables, recording heads, types of record material, playback, mounting the lead screws, the pickup, weight on the recorder, playing time of records and a general discussion.

It was compiled by E. E. Griffin, chief engineer of the company. A small service charge of ten cents has been placed on the booklet to take care of the mailing and clerical expense.

NIKIRK ADDRESSES CRTA

At the June 25th meeting of the CRTA Thomas E. Nikirk, of the Pacific Radio Exchange, presented a very interesting paper on a. f. amplifiers and their troubles. In the course of the talk curves of typical amplifiers were shown and analyzed, showing the effects of certain circuit changes as regards frequency response.

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Now Sylvania engineers have prepared a reference book on auto-radio. This handy pocket manual contains tested information on suppression of ignition interference, 6 types of antenna and their installation, the R. M. A. Resistor Color Code, Chart of tube types and other important data you will need in auto-radio servicing. Send for your free copy. It will help to put you in on the ground floor of the fast-growing auto-radio industry . . . a business that Sylvania engineers themselves promoted with their development of the 6.3 volt tube.

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AIRCRAFT RADIO ENGINEER ADDRESSES THE CRTA

Mr. Paul O'Connor, chief engineer for the Westport Co., delivered a very interesting paper on the subject of shielding ignition systems in mobile radio installations at the CRTA meeting July 2. Mr. O'Connor held the interest of the members and guests present for over an hour at the end of which time a number of questions were asked. The ensuing discussion was very interesting and enlightening. The problems of the aeronautics radio engineer were told and the procedure for completely shielding the ignition system of a modern airplane engine was described.

NOTED ATTORNEY MEETS WITH CRTA

Mr. Joseph Duchowney, leading Los Angeles attorney specializing in radio law, addressed the members and guests at the June 18th meeting of the CRTA. His talk, lasting nearly an hour, was packed with valuable information dealing with the legal aspects of conditional sales contracts and printed forms relating thereto. The essential points of credit sales were discussed at some length and in detail. Mr. Duchowney is indeed due a great vote of thanks from all who were privileged to hear his very interesting and valuable talk.

NOTICE!

At the regular meeting of the Certified Radio Technicians Association July 9, 1934, the Board of Directors, after due consideration, unanimously passed a resolution not to enter into any action for the organization or participation in any co-operative buying group. This in view of the good will, advertising and loyal efforts of the radio jobbers and wholesalers of Southern California. It is the opinion of the Board that these jobbers and distributors are conscientiously endeavoring to elevate the radio business in this state to an honorable basis and keep it there.

CRTA MEMBERS FAVORED

Mr. Eddie Freitas, of A. E. Ravenscroft Inc., presented the members and guests present at the July 9th meeting of the CRTA with a very handy six-inch metal rule given through the courtesy of W. Bert Knight, Ken-Rad tube distributor.

MORE PRIZES

As a special incentive to bring new members into the association the Radio Supply Co., located at 912 South Broadway, has offered a Triplett universal meter to the man bringing in the greatest number of new members in the next ninety days. The meter is described in the catalog as follows: The A. C. scale has 75 divisions marked 0-15 in red. The D. C. scale is similar but printed in black. The ohms scale reads 0-1500 in black and 1-1.5 megohms in red. With multipliers, scale readings are 0-15-150-750 volts A. C. or D. C., at 1000 ohms per volt resistance. D. C. milliamperere readings are 15-150.

The copper oxide unit is employed in what is regarded as the most advanced circuit, minimizing losses of rectification. This unit with a D. P. D. T. toggle switch for A. C. and D. C. is housed with shunts for the 0-5 milliammeter in a separate case suitable for panel mounting and having four connections, 2 each for A. C. and D. C.

To further increase the interest of this contest and to encourage the search for new members, the California Radio Laboratories have offered a second prize consisting of \$5.00 worth of transformer rewind service of any description. The California Radio Laboratories are located at 2523 South Hill street.

BERT KNIGHT WILL SPONSOR LECTURES

W. Bert Knight, Ken-Rad radio tube distributor for California, is the new sponsor for Mr. Leitner's lecture course. Mr. Knight, who is a well-known figure in the radio industry of California, has offered to sponsor these lectures for the time being in the interest of Ken-Rad tubes.

INTERNATIONAL KADETTE SERVICE ANNOUNCED

The service department of A. E. Ravenscroft, Inc., which is in charge of Eddie Freitas, announces expert and prompt service on all International Kadette receivers. Undoubtedly technicians will be glad to learn where to obtain competent service and information as well as replacement parts on this line of equipment. Eddie services and carries parts for Amrad sets also.

Classified Advertisements

For Sale—

444 Jewel Analyzer, perfect condition. \$37.50. Logan, Oregon 2681. 5276 West Adams St.

250 watt crystal controlled C. W. transmitter in perfect condition. Rack and panel construction. Complete \$75.00. Phone PROspect 3515.

Triplett and Weston Meters. Complete stock. Radio "Doc."

No reasonable offer refused for the following: Rider's Manual No. 1; Readrite Test Kit No. 700; Perfect Scanning Discs for KHJ. H. I. O'Brien, A-1 Radio Co., Glendale Calif., 1379 East Colorado Blvd., Phone DOuglas 1638.

For Sale or Trade—

3 acre chicken ranch or small farm with 6-room house (clear) inside city limits small town 15 miles north of Visalia. Will trade for Beach Cottage, laboratory and P. A. equipment, or sell for cash. N. B. Neely, ALbany 1628.

RCA 104 speaker and amplifier complete with all tubes (new '10) in cabinet. Magnavox 12 inch dynamic with 6 volt field, 8 inch Lansing dynamic (47 output trans.) 2500 ohm field, new Utah auto dynamic in case (P. P. '38 output trans.). Violet ray machine and American Model EL 2 button mike, never used. Norman B. Neely, AL 1628.

Will swap Jensen Auditorium A. C. dynamic, perfect; also an R. C. A. photophone 20-watt dynamic, good for truck. Radio Art, 2924 N. Broadway, CAPitol 5542.

Wanted—

Deep sea fishing tackle in good condition, in exchange for Radio parts, etc. Radio Art, CAPitol 5542.

Dynamic horn units, 4 and 6 foot trumpets, 110 volt phono motor and turntable, line to voice coil transformer and tube tester to check up to 59's. Norman B. Neely, ALbany 1628.

Good auto radio in exchange for printing. Ralph S. Hawks, 222 So. Avenue 57, Los Angeles.

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John A. Orme	Secretary-Treasurer	AT. 9501—1348 West 20th Street.	
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Richard G. Leitner	Director		Consultant

TECHNICAL QUESTION AND ANSWER DEPARTMENT

Conducted by C. E. MILLER

Q. I have had several of the new 5 tube Internationals that are troubled with interference from the airplane beacons. They are located in Beverly Hills. Can the trouble be corrected?

A. That set has an IF of 262 kc while the beacon is on 264 kc. Your sets are probably on the beam. Realign the IF's to 256 and then rebalance the gang.

Q. I am having trouble with an AC-DC super playing KMTR all over the dial. What is the cause?

A. Your IF's are probably peaked about 100 kc too high.

Q. A Victor 9-54 has no B+ on the IF tubes although all resistors and condensers are O. K. The primaries of the IF's are not open nor grounded.

A. The trouble may be in the second detector grid circuit as that grid operates at the potential of the IF plates.

NEW KEN-RAD CARTONS

The Ken-Rad corporation, of Owensboro, Kentucky, manufacturers of Ken-Rad Radio tubes and Ken-Rad incandescent lamps, have recently adopted a new tube carton of very attractive appearance. It is of the new sealed-in type attractively colored in black, red and blue.

RADIO VOICE CONTEST

Freeman Lang's "perfect radio voice" contest closed the first of July with the awards going to Jeanette Nolan and Hanley Stafford, local radio drama people. Judges were Ben F. McGlashan owner of KGFJ; E. K. Barnes, former KHJ director; K. G. Ormiston, KNX's chief engineer; Douglas Shearer, chief recording engineer for M-C-M studios and Freeman Lang, transcription producer.

DR. HUND LOCATES HERE

Dr. August Hund, noted for his many contributions to the radio art in the past two decades and particularly for his book and subsequent revisions concerning high-frequencies, has recently located in Hollywood.

Dr. Hund proposes to maintain a consulting service and establish an extensive experimental laboratory for the development of all types of electronic devices.

PETER PAN POPULAR

According to Johnson & Mackey, distributors of the new line of Peter Pan receivers, the sets are becoming popular sellers with a large number of dealers. Note that Peter Pan sets have a golden poppy on the chassis signifying that the manufacturer is a member of the Radio Manufacturers Association of Southern California.

REPRESENTATIVE FOR JACKSON SERVICE

Mr. B. M. Fuhrman has recently announced his appointment as service representative for the Jackson Electrical Instrument Co., of Dayton, Ohio. Mr. Bill Hitt is the sales representative and the products of this company may be purchased through the A. E. Ravenscroft Co.

SINCERE THANKS

We wish to extend our sincerest thanks to the advertisers in The "TECHNICIAN" not only for their support but for their very prompt payment of advertising charges. Inasmuch as The "TECHNICIAN" is a non-profit publication maintained for the mutual benefit of the radio industry of Southern California paying no dividends, no salaries and having no surplus funds, prompt payment is essential for the continued success of the magazine.

With very few exceptions all our advertisers appear to have realized this and have cooperated to the fullest extent.

Calling Your Attention!

We are about to issue an entirely new and novel series of hook-ups which will interest you. They're yours for the asking.

We have new additions to our original line of racks and panels for public address systems, test equipment and a wide variety of miscellaneous uses.

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