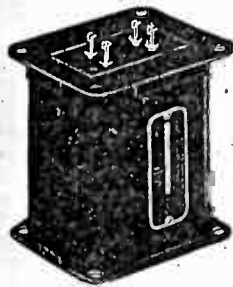
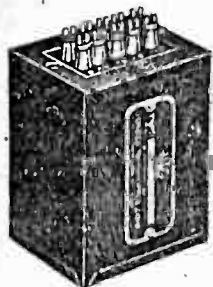




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1. **THE PUBLIC ADDRESS SERIES** of audio, filter and power components are designed to satisfy the demand for a popular priced quality line with universal features and impedances. All cases are finished in a black eggshell enamel to suit exacting commercial requirements as to appearance.



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will be pleased to furnish readers of The "Technician" the new U-1000C Amplifier Bulletin.

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TRANSFORMER CORP.**



*clipped*

**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

JOHN A. ORME  
Secretary-Treasurer



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JUNE, 1934

No. 10

**EDITORIAL**

By The Editor

*"Why You Should Join The CRTA"*

The radio industry as a whole is a peculiar one with peculiar problems. The rapidity of advancement is truly astounding. Our design engineers, all specializing in their chosen fields, are continually developing newer and better circuits and tubes.

The service profession as applied to modern radio has its own very perplexing problems. Due to the tremendous number of different types of receivers and allied equipment which have been put into the hands of users during the past ten years the scope and range of a service technician's knowledge and experience must be almost limitless in order to cope with the ordinary day's assortment of work and repair jobs. As a result of this fact and the unprecedented advancement of the art, the old "screwdriver" technician and neighborhood tinkerer has been almost entirely eliminated. Much has been done to raise the status of the efficient radio technician and service dealer.

What are the requirements of an efficient, modern radio service technician? He must have an extensive fundamental knowledge of electricity and radio. He must have some means of keeping continually in step with the rapid progress of the industry. Inasmuch as radio becomes more complicated in theory and practice day by day he must have some means of extending his general engineering knowledge. He must have connections to assist him repulse the underhanded attacks of unscrupulous and unqualified

competition. He must have extensive equipment and the where-with-all to maintain it in step with the constant improvement and changes in standard and custom built equipment.

The next question is how is one to provide himself with all these things? An enterprising, energetic man with an education considerably above the average and experience can, at substantial expense, manage to maintain himself and provide these requisites individually.

The majority of us, however, lack one or more of these points of advantage even if we did desire to be a lone wolf. Competition is keen, money is scarce—how may we, the majority, manage to survive in such a maelstrom as the radio service profession of today proves itself to be? "In unity there is strength." By combining our assets and energies we may gain for ourselves these advantages.

The officers and members of the Certified Radio Technicians Association have worked valiantly and striven, not in vain, to build an organization of, by and for honest, deserving, competent and far-reaching radio technicians for the benefit of the entire radio industry and the radio public.

As a group we have been able to publicize our aims and purposes. In issuing certificates of proficiency yearly by examination, we have been able to give the public protection in identifying a competent man. This in turn protects the

(Continued on Next Page)

## TUBE TESTING FROM THE SERVICE VIEWPOINT

BY J. L. MAHON, Sylvania Tube Distributor.

A paper presented before the L. A. Section of the Institute of Radio Engineers Mar. 26.

### PART THREE

A novel way of obtaining transconductance on a uniformly divided scale, and at the same time eliminating the reading of the D. C. component, is arrived at by use of the dynamometer movement. In this circuit one of the coils of the dynamometer is excited with a constant A. C. current 180 degrees out of phase with the A. C. grid voltage, and the other coil carries the plate current of the tube. The deflections of the meter are then directly proportional to the A. C. component of the plate current. The D. C. component in the plate circuit does not affect the reading because there is no fixed polarized field for it to react with. To complement the last test, some manufacturers provide a D. C. milliammeter for the D. C. component. A satisfactory test for gas content based on grid current, is provided by introducing a large resistance, usually one-half megohm, in the grid circuit. The change in plate current caused by the change in grid voltage arising from grid current in this resistor is reduced to zero by a small potentiometer. This potentiometer changes the grid voltage by small increments. The amount of change in grid voltage required to offset the change due to gas current, is taken as an arbitrary value for ionization and serves the purpose very well.

The most important of the internal leakage conditions found in service is that between cathode and heater. The most practical method so far developed for testing that condition is to observe the plate current of the tube under regular operating conditions. When the cathode is disconnected, any leakage through to heater and ground will tend to close the plate circuit and a small increment of plate current will be observed.

Tube testers operating with D. C. potentials on the tubes may be connected to any audio amplifier and reproducer through an interstage transformer or by impedance coupling. This serves the purpose of testing for conditions that come under the general classification of noise.

Rectifier testing presents no serious problems, the diode emission being observed when a proper A. C. potential is supplied to the anode and cathode. The error should not be made of testing rec-

tifiers with a D. C. anode potential, because the ionization current of gas would be added to the thermionic emission, causing an erroneous reading that would not indicate the rectifying ability of the tube.

A recent development in commercial equipment available for tube testing that seems to be making a favorable impression on the public and members of the servicing fraternity—who are quick to react to anything with public appeal—is the introduction of so-called "English reading" testers. Irrespective of the basic circuit the instruments are compensated in various ways so that the meter will indicate a definite value for a good tube, regardless of type. The meter scale usually has a sector marked "Good," "Fair," "Reject," etc. While there are no theoretical reasons why an instrument could not be built to perform in such a manner, it is found in actual practice that instruments of that type have not reached the necessary precision. The limits of acceptance are usually found to vary on different types of tubes in such a manner as to make one standard impractical.

In my opinion, it would be better to use equipment reading directly in the characteristics as we know them. The public, of course, should be educated to expect the technician to use and interpret the readings so obtained. This would necessitate cooperative action on the part of the industry as a whole, but the results in improved service through standardization would more than offset the trouble required. Under a system of that type, a manufacturer of equipment using vacuum tubes would determine in his laboratory at what low value of standard characteristics of the tubes the operation of the equipment would be so impaired as to make tube replacements desirable. This information would be available with other service instructions.

Among the things of importance to be considered in connection with testing tubes and future developments is the fact that there has been a tendency to increase the impedance of amplifier tubes and associated circuits. The plate resistance may take the place of the transconductance as an important characteristic. Recent developments in the use of

(Continued on page 19)

### LOCAL FIRMS OFFER PRIZES

The prize contest announced in the last issue of The "TECHNICIAN," and which is expected to arouse considerable interest among readers, is made possible by the cooperation of four of the leading wholesale concerns in Los Angeles. Prizes are being awarded by the Radio Specialties Company, 1816 W. 8th St., Radio "Doc," of 721 S. Main St., Mr. Bill Hitt, local representative of the General Transformer Corp., and Thomas B. Pritchard, California Sales Agent for the Arcturus Radio Tube Company.

### PATTERSON ENGINEER ADDRESSES CRTA

Mr. Ray Gudie, chief engineer of the Patterson Radio Co., addressed the Certified Radio Technicians Association at a recent meeting. Mr. Gudie described the technical features of the all-wave models and how best to install and maintain them. He also spent considerable time giving the members detailed information on the peculiarities of certain older models with suggestions to simplify service on them.

### NEW FIELD FOR AUTO RADIO SETS

Something different in the way of auto radio installations was brought to light with the installation of a Philco receiver in an ice delivery truck owned by Mr. Ray Skeels of South Pasadena. Mr. Skeels, a distributor in the Highland Park district for the Frozen Steam Ice Co., had this installation made the first of June (by a Certified Radio Technician, of course) and reports not only that does it relieve some of the hardships of his daily toil but has attracted considerable interest from customers, prospective customers and other delivery men. His chief difficulty seems to be avoiding the receipt of "hot" music when he has a load of ice.

### WHAT IS A SALE?

At a recent meeting of the CRTA the speaker challenged any member of the audience to define a sale. Promptly, our usually quiet Charlie Nichols arose in the back of the hall and said, "These days a sale is a transaction in which two persons endeavor to 'out-chisel' one another." We are afraid Charlie is correct.

## Technicians !!!

INCA TRANSFORMERS are original equipment in the great majority of all receivers built on the Pacific Coast. Why use rewinds or expensive universal transformers when a duplicate of the original unit is available at very low cost? INCA TRANSFORMERS may be had at all the better jobbers.

INCA'S new 24-page catalog, containing circuit diagrams, design chart and performance curves, in addition to complete data on INCA'S new line of transformers will be at your jobber on or about June 20th. Get one there, or write to—

## Inca Manufacturing Division

of Phelps Dodge Copper Products Corp.

Los Angeles Branch

2375 East 27th Street Los Angeles, Calif.



## QUALITY IN PUBLIC ADDRESS

By I. A. MITCHELL

Chief Engineer United Transformer Corp.

The tendency towards reduction in quality of reproduction in P. A. and broadcast amplifiers during the past few years has brought about a strong reaction on the part of purchasers and users of this equipment. Many amplifier manufacturers and constructors have been under the impression that quantity production and low prices are the only way to get business. The error of this assumption is gradually becoming apparent, and many amplifier constructors who take pride in the performance of their equipment realize that low prices are a safe policy only when quality does not suffer.

The word "quality" in audio amplifiers can be covered by four major points insofar as the ear is concerned. These are low frequency discrimination, low harmonic distortion, ample power-handling ability, and low hum level. The first of these qualities is controlled almost entirely by the transformers used in the amplifier. Good transformers are available; one grade on the market today having a response from 30 to 15,000 cycles. The second factor, harmonic distortion, is inherent in the amplifier construction, and also in the transformers used. Proper bias should be maintained on all the tubes, and transformers with negligible saturation are required. Transformers used in class B circuits are particularly critical, and matched units of a reliable manufacturer are the best bet towards good reproduction.

Power handling ability is inherent in the circuit and tubes used. Many wild and exaggerated claims are being made today regarding the output of amplifiers on the market, but few of the manufacturers of these amplifiers can state that harmonic content is non-objectionable at these inflated power outputs. The best method of judging power handling ability is from the data published by responsible tube companies.

Objectionable hum can be attributed to four distinct sources. These are plate supply hum, filament supply hum, electrostatic pickup, and electro-magnetic pickup.

Plate supply hum can be readily corrected through the use of adequate filtering. It is important in this respect to use dependably rated filter chokes. There are many highly over-rated reactors available on the market today, which lose as

much as 80 per cent of their inductance when appreciable D C is passed through them. Filament supply hum has been reduced to a negligible value through improvements in tube structure, heater type filaments, and correctly center tapped filament windings. Electrostatic pickup can be neglected if all high potential A. C. leads are kept short, and far from input equipment. It is also essential that the power transformer coil be electrostatically shielded. Magnetic pickup is the most common form of hum. It is essential that audio components and wiring are placed as far as possible from the power supply, even making the amplifier in two units, when necessary. An aluminum chassis will also eliminate a very large portion of the stray flux normally carried by the chassis. The input transformer is the most likely source of hum pickup and should be rotated to the point where minimum output hum is obtained before being permanently fastened.

Broadcast transmitters and phonograph recordings have been improved from year to year to a present very high standard of quality. Why not manufacture "quality first" equipment, which can really take advantage of this high quality level?

## EXCEPTIONAL LECTURE ON SALESMANSHIP

At the June 6th meeting of the CRTA a very worthwhile talk was given by Mr. Carroll Page Fisk, following the regular technical hour. Mr. Fisk is well-known to executives and large concerns in and around Los Angeles and has been employed to conduct classes in modern methods of selling for such firms as the Evening Herald and the May Company and has been conducting classes at the University of Southern California.

Mr. Fisk's manner of approach to the subject was dynamic and left no doubt as to his wholehearted effort to teach the art of making a sale. The usual dull and dry talk on selling was changed into a drama in which the salesman becomes the hero actor, while the buyer takes the roll of the villain who hides behind his excuses, bluster and closed doors. How to conquer the villain, battle down the excuses and win the desired good will of said buyer is all in the cards which Mr. Fisk holds.

Mr. Fisk held the attention of the gathered assembly of 150 without a single "walkout" for an hour. A number of progressive technicians are contemplating enrollment in a five weeks course offered by this gentleman.

## INCA ISSUES NEW CATALOG

The Inca Manufacturing Division of the Phelps Dodge Copper Products Corporation, will have a new catalog ready for distribution to the trade in the very near future. This catalog will contain specifications and prices of a complete line of transformers and chokes for every purpose.

## MR. ALEX HIRSCH TO CONTINUE SPONSORSHIP

Mr. Alex Hirsch of the Radio-Television Supply Co., who has been sponsoring Mr. Leitner's lectures for the past three months has very kindly offered to continue the sponsorship for a further period. The members of the Certified Radio Technicians Association are indebted to Mr. Hirsch for many favors during the development of our organization.

## GUEST CARD

The meetings of Certified Radio Technicians Association are closed meetings and admission is only gained by presentation of a membership card showing the bearer to be a member in good standing. In order to give the readers of The "TECHNICIAN" an opportunity to see just what one of these weekly meetings is like the coupon below, when filled out and presented to the doorman, will admit the bearer as a guest. These meetings are held every Monday evening in the auditorium on the third floor of the National Radio and Electrical School, at the corner of Santa Barbara and Figueroa.

Mr. Leitner begins his lecture at 8:00 P. M. At 9:00 the meetings are convened for business or for the presentation of other speakers.

Please admit  
Mr. ....  
Whose  
Address is.....  
Telephone Number.....

This invitation as a guest is authorized by the Board of Directors of the Certified Radio Technicians Association.

(To be valid this form must be filled in).

*May we extend  
our thanks to the  
members of the  
CRTA for their  
patronage.*

We are convinced that those members with whom we have had the pleasure of doing business are certain as we are that

**"There is no substitute  
for a  
Good Rewind"**

All work guaranteed one year

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SPEAKER FIELD COILS  
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TRANSFORMERS  
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**California  
Radio  
Laboratories**

2523 South Hill Street  
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### A CALL TO ARMS

By A. PAUL, JR.  
President CRTA

The Radio service industry, your industry if you please, is fighting a battle to the death against those monsters in human form, those despicable vultures, those carrion-fed ghouls, who are destroying the confidence of the public in our profession. This situation is especially tragic at this time, as it affects not alone our means of earning a livelihood, but due to the vast amount of unemployment among our fellow citizens, radio entertainment is their only surcease from worry over their pitiable plight; and yet, every day, many of these unfortunates are deprived of their last chance of relief from the monotony of their dreary existence by these swindlers.

What are you doing to help rid an honorable profession of these parasites?

As a good American citizen, it is your duty to vote. If you don't go to the polls and voice your opinions on major issues, you are in the same category as those creatures, who, either through indifference to their country's fate, or sheer cowardice, fail to respond to the call to the colors when their homeland is invaded. The term "slacker" is a mild name for individuals of this type.

If you are a legitimate and capable Radio Technician or Service Man, it is your duty to your fellows to join with them and fight for the survival of this noble profession, which does so much to bring sunshine into a world overcast with gloom. You should feel just as obligated to vote and fight for major issues which affect the welfare of your profession as those which affect the destinies of your country.

Therefore, I implore you, don't be a "slacker," don't let the rest of us fight for you, while you lap up the gravy. Heed the clarion call to arms, join the legion of the CERTIFIED RADIO TECHNICIANS, and help us vanquish this unwholesome foe, whose foul stench nauseates even the angels on high.

### STOLEN SET

Philco 60B table model, serial No. T68566. Stolen from Lancaster Radio & Music Co., Lancaster, Calif. Any information regarding this set will be appreciated by the Lancaster Radio & Music Co., and may be communicated directly to them or to the editorial offices of The "Technician."

### THRIFTY LOOSES BLUE EAGLE

Los Angeles, June 6—According to a news item in the Los Angeles morning Times, the National Recovery Administration ordered the Thrifty Drug Stores in California to surrender its Blue Eagle for violation of the trade practice provision of the retail drug code.

The case has been referred to the compliance division of the NRA with a request that suit be filed to obtain an injunction against the company to restrain further violation of the code.

The assertion made against the stores was that they had violated the code by selling certain articles at retail prices below the manufacturers list price per dozen.

### PIONEER IN LOCAL RADIO SUCCUMBS TO HEART ATTACK

On May 18, 1934, Mr. A. E. Ravenscroft, of A. E. Ravenscroft, Inc., was the victim of a fatal heart attack. This gentleman, friend to an untold following in the radio industry, was a member of the pioneer firm of Kierulff and Ravenscroft who were distributors of Crosley radio for many years. This firm was the original builder of the radio station which is now KHJ and the old station KNRC which is now KTM.

Mr. Ravenscroft was the first chief of the Radio Pioneers of Southern California. A short time ago, at the dissolution of the firm of Kierulff and Ravenscroft, he started the new concern which bears his name. This business, so splendidly begun, will be carried on by his daughter, Mrs. Allene Ravenscroft Magner.

The industry has indeed lost one of its most dependable and well-liked members who has done so much in the development of the art and the maintenance of honest business.

### JOBBER EXTENDS SERVICE

The Radio Products Sales Co. has recently established a separate department specializing in public address systems and all types of amplifiers with Frank Hernfeld in charge. Mr. Hernfeld is well-known in Southern California for his engineering ability and offers to consult with all technicians on matters concerning their daily problems. Ebert Matteson and C. E. McCoy, CRTA members, are also members of the technical staff and invite other members to give them an opportunity to be of service.

### QUESTIONS AND ANSWERS

Conducted by CHARLES MILLER  
Chairman, Technical Board

Q. Can a different type of IF coil be substituted for the parallel wound type that has only the secondary tuned? I have had several short out.

A. Such breakdowns due to surges or excessive B voltages can be eliminated by using an IF having two 3/16" windings coupled 1/16" apart. Tune the secondary only, as before.

Q. Can an 84 be substituted for a 6Y5?

A. Yes, if the socket is changed to a five prong.

Q. What is the cause of the blue shadow on the glass of some 47 tubes?

—A. A. S.

A. This glow is due to fluorescence caused by stray electrons from the filament striking the thin film of getter on the inside of the bulb. This fluorescence is a natural phenomenon and has no relation whatever to the performance or condition of the tube.

### LECTURE COURSE

VERY VALUABLE

The weekly lecture course in advanced servicing and practical engineering conducted by Mr. Richard G. Leitner, for the exclusive benefit of Certified Radio Technicians and Associate members, becoming more and more valuable as progresses. Mr. Leitner, who needs no introduction or description of qualifications to the radio trade, has spared no effort in preparing his lectures in such a manner as to give a maximum amount of real, usable and important information in each week's one hour lecture.

All members are urged to be sure not to miss a single one of these lectures as they follow a definite sequence. All non-members interested in keeping up to date and advancing their knowledge in step with the trend of development in modern radio are invited to join the association and take advantage of this, among many other privileges.

### Radio Products Sales Offers A Few Specials to Readers of The "Technician."

- 1 mfd. 1000v Condenser ..... \$1.29
- 2 mfd. 1000v Condenser ..... \$1.98
- 4 mfd. 1000v Condenser ..... \$2.98

These are Can Condensers and are full voltage and capacity. Something new in L. A. Guaranteed 100 per cent.

\* \* \* \* \*

### "B" BATTERIES, 45-v—New Stock

SPECIAL OFFER—65c EACH; 59c in lots of 6

\* \* \* \* \*

### STRANDED PUSH-BACK WIRE—Red, Black and Green 40 CENTS PER 100 FOOT ROLL

\* \* \* \* \*

### WE CARRY A REPLACEMENT TRANSFORMER FOR ANY RADIO—GET OUR PRICES BEFORE YOU BUY.

\* \* \* \* \*

### FULL LINE OF CARTER REPLACEMENT VOLUME CONTROLS.

\* \* \* \* \*

## Radio Products Sales Co.

PR. 0490      1314 South Hill Street      Los Angeles  
We Welcome You With Prices That Are Right.

# MICROPHONES



Handi-Mike

**HANDI-MIKE.** Single and double button. "On" and "Off" switch in handle. Dealer's net cash: single, \$5.88, Double, \$8.82.

**MODEL X and XX.** Single and double button. Stretched and protected diaphragm. Pioneer among low-priced mikes. Dealer's net cash: single, \$4.41; double, \$5.88.

**MODEL A.** Single button. Highest developed microphone of this type. 200 Ohms—100 to 3500 cy. Dealer's net cash, \$8.82.



Model "KK"

**MODEL BB.** Two button. General all-purpose microphone. 200 ohms—50 to 5000 cy. Dealer's net cash, \$14.70.

**MODEL KK.** Two button. Three degrees of sensitivity. 200 ohms—40 to 6000 cy. Dealer's net cash, \$23.52.



"E" Condenser

**MODEL LL.** Two button. Three degrees of sensitivity. Extra rugged and dependable. 200 ohms—30 to 7000 cy. Dealer's net cash, \$35.28.

**MODEL E.** Condenser. Two-stage amplifier. 35 to 10000 cy. Non-microphonic tubes drain 1/4 amp. at 6v and 4 mils on 180v battery. Dealer's net cash, \$35.28.

Universal's new catalog sheet has just come off the press. It contains complete details of microphone list, including lapel mikes and single and double button watch models, 3-channel mixers, stands, input stages, microphone tone control, transformers, microphone input—a hundred items of interest to those in radio. Get a copy from your jobber, or write on your letterhead direct to—

## Universal Microphone Co., Ltd.

INGLEWOOD

CALIFORNIA

Mention The "Technician" when answering advertisements—It identifies you.

### NOTICE TO CRTA MEMBERS AND THE TRADE:

Official notice is hereby given that the notices sent out recently by one Louis Natini stating that the Radio Trades Protective League would hold a meeting under the auspices of the Certified Radio Technicians Association, were not authorized or sanctioned by the Certified Radio Technicians' Association or any of its officers. This Association has no connection with Mr. Natini or the Radio Trades Protective League. Mr. Natini was allowed a short time to explain a plan which he supposed would eliminate certain unfavorable conditions in the radio industry.

Below is a copy of a letter to Mr. Natini from the office of the Secretary, which will clarify the situation:

May 25th, 1934

Mr. Louis Natini  
Radio Service Dept.  
Pan American Trading Co.,  
3465 West 6th Street  
Los Angeles, Calif.

Dear Sir:

I have at hand several letters signed by you which have been turned over to me by members of this Association. I hereby demand to know by what authority you or the "Radio Trades Protective League," or any other body, have to state that you are holding a meeting under the auspices of the Certified Radio Technicians Association. You were merely granted permission to speak for, not to exceed fifteen minutes at our meeting. As if this were not a serious enough breach of etiquette, you had the audacity to solicit funds.

Only members of our Association have the privilege of bringing guests. I therefore demand that you spare yourself and the guests you so graciously invited, the embarrassment of having them turned away at the door, by cancelling the notices you have sent out.

Respectfully yours,  
(Signed) JOHN A. ORME,  
Secretary.

### ARCTURUS USES NEW SEALED CARTON

The Arcturus Radio Tube Company, Newark, N. J., announces that its tubes are now being shipped in the new sealed-type of carton. Besides being a protection for the purchaser, this carton has a greater degree of eye-appeal and enhances the appearance of the dealers' shelves.

### UNUSUALLY INTERESTING SERVICE MEETING

An unusually interesting and instructive program was offered at the service meeting held on the RCA Victor recording stage at 1016 N. Sycamore Avenue Friday evening, June 1. This meeting was even better than the previous ones arranged for technicians by the Leo Meyberg Co.

Dick Westphal gave a brief but comprehensive technical description of the new RCA Victor automobile receiver. He also pointed out the many mechanic features which will make installation and service easier for the technician. Next on the program was Mr. Larry Lang who described the new RCA Victor all wave antenna system recently placed on the market after months of extensive research and development by RCA Victor engineers.

After a very amusing Mickey Mouse reel the feature speaker of the evening was introduced. With a view to making these meetings more interesting and appealing to the trade the Meyberg Co. has made a definite effort to secure speakers of unusual interest without any trace of advertising.

At this meeting the guests were privileged to hear Mr. Paul Johnson, transmission engineer with the Southern California Telephone Co. Mr. Johnson delivered an exceptionally interesting paper which described the problems involved in long distance transmission of audio signals over wired circuits and how these difficulties have been overcome by the Telephone Co. This paper, profusely illustrated by means of slides and supplemented by demonstrations on actual equipment set up by Mr. Johnson, was of extreme interest and value to service technicians.

The Meyberg Co. is indeed to be congratulated upon its foresight and ability in obtaining such an outstanding speaker to address the guests at this meeting. We wish them success in providing more speakers of this calibre for the benefit of the trade in general.

### WEDDING BELLS!

Mr. Roy K. Tate, well-known Certified Radio Technician, operating his own sales and service business in Inglewood recently embarked upon the sacred step of matrimony. The marriage took place several weeks ago but only became public knowledge recently. Congratulations Mr. Tate!