High Quality Public Address Audio Components In a Parallel Push Pull 45A Prime Amplifier

Fully shielded drilled deck for power sections. List price $9.00—Net to dealers, hams. $5.40

PA-245—output for fixed or self bias 45's A prime (20 watt peak power) to 500, 200, 16, 8, 5, 3. 1.5 ohms. List price $7.00—Dealer's price $4.20

PA-201—output for self bias 45's A prime to 5000 and 3000 ohms. List price $7.00—Dealer's price $4.20

Ideal for broadcasting, recording, and public address applications. Will drive output amplifiers modulating up to 500 watts A.F. into R.F. stage. High power output with low cost power tubes.

SPECIFICATIONS

Input will match 50, 200, and 500 ohm lines. Center tap on 200 and 500 ohm lines for double button microphone. Output will match 500, 200, 16, 8, 5, 3, and 1-5 ohms.

Three balanced push pull audio stages. Tubes used: 2-57's triode connected, 2-65's, 4-45's in parallel push pull fixed bias, 1-83, 1-45.

Stable fixed C bias for output stage. Undistorted class A prime output 38 Watts.

Gain + 90 D.B.

Trap resonant filter affords maximum filtering efficiency.

UTC Public Address Type components used are:

<table>
<thead>
<tr>
<th>UTC Public Address Type components used are:</th>
<th>List Price</th>
<th>Dealer's Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1—PA-135—500, 200, or 50 ohm line to pull grid...</td>
<td>$6.50</td>
<td>$5.90</td>
</tr>
<tr>
<td>1—PA-133—triode 57 plates to 56 grids...</td>
<td>6.00</td>
<td>3.60</td>
</tr>
<tr>
<td>1—PA-233—driver 56 plates to 45 grids...</td>
<td>6.00</td>
<td>3.60</td>
</tr>
<tr>
<td>1—PA-445—A prime push pull parallel 45 output fixed or self bias...</td>
<td>12.50</td>
<td>7.50</td>
</tr>
<tr>
<td>1—PA-15—A prime input swinging choke...</td>
<td>8.00</td>
<td>4.80</td>
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<tr>
<td>1—PA-102—Output trap resonant smoothing choke...</td>
<td>8.00</td>
<td>4.80</td>
</tr>
<tr>
<td>1—PA-423—Heavy duty A prime 45 plate filament and C bias transformer...</td>
<td>12.00</td>
<td>7.20</td>
</tr>
<tr>
<td>1—PA-45—High impedance C bias choke...</td>
<td>4.50</td>
<td>2.70</td>
</tr>
</tbody>
</table>

$63.50 $38.10

UTC 45 A prime kits, drilled decks and associated components now available through our distributors.

PACIFIC RADIO EXCHANGE
RADIO SUPPLY COMPANY

UNITED TRANSFORMER CORP.
YES, it really does it. You can’t appreciate how wonderful this “Signal Beacon” is until you see and hear it operate. Come in today for a free demonstration! It will amaze you.

Grunow Radio

"Signal Beacon"

"Stops you at the stations of the world!"

Watson & Wilson, Inc.

DISTRIBUTORS
PRospect 7281

Los Angeles
THANKS--

Thank you for all the nice things you say about us. "Word of Mouth" advertising is invaluable—It accelerates the already rapid growth of our concern—And we are deeply appreciative!

RADIO SPECIALTIES COMPANY
1816 West 8th Street
Los Angeles • • • Federal 6633
A STUDY OF IMPEEDANCE MATCHING AT AUDIO FREQUENCIES

By L. W. HOWARD, Engineer
Inca Mfg. Division of Phelps-Dodge Copper Prod. Corp.

In audio networks it is often necessary to supply energy to a circuit without considering power. The impedance matching with this network to another will take place, neglecting phase angle, when the impedance of the supply circuit and of the network are equal in absolute impedance value. A study of reflection in transmission lines, filters, and similar networks will show that to eliminate distortion due to reflection a network must be terminated in its own impedance. Since it is obviously impossible to operate every network into a resistance equal to its own impedance it becomes necessary to use impedance-matching transformers to act as a coupling device. In the ordinary audio network many such transformers will be used. Such transformers are used to match the load impedance to a suitable value, thereby eliminating the effect of the network being terminated. In general these values are such, for maximum distortionless transmission of energy, that a line or other network operates into its own reactive impedance, while a tube may operate at any place from two to five times its own input impedance, thus being able to drive, to about one-fifth its internal impedance, as in pentodes.

The iron core transformer is the most common matching device which is used at audio frequencies. An ideal transformer for such a purpose would satisfy the requirement that

\[ V_s = I_s L_s = N_s \cos(\beta) \]

(See Figure 1).

Actually such a relation is only true with ordinary transformers when the values of impedance to which it is connected are within a limited range. For a given transformer, if the impedances to which it is connected are too high, the transformer itself will act as a shunting load, while if the generator or load impedances are too low, the resistances of the respective windings will cause too great a loss. For this reason, impedance transformers for communication purposes, the approximate impedances between which they are to operate are given, for example, a transformer to couple a vacuum tube to a line having impedance

\[ L_s = 10 R_s \]

(Continued on page 11)
NEW SALES ORDINANCE
(Continued from page 7)

Section 8. All provisions of ordinances conflicting with the provisions of this ordinance are hereby rendered null and void. Words used in the singular hereinafter cited shall be construed as though they were in the plural and vice versa.

Sec. 9. It shall be unlawful for any person to sell or offer for sale at retail, or advertise for sale at retail, any device or apparatus, or any device or apparatus used for the purpose of measuring or recording electrical current, voltage, or power, not expressively included in the provisions of this ordinance.

Sec. 10. The provisions of this ordinance shall not be construed to apply to the current generating, transforming or converting device or apparatus, or any device or apparatus used for the purpose of measuring or recording electrical current, voltage, or power, expressly included in the provisions of this ordinance.

NEW SPARTON DESCRIBED

At the July 9th meeting of the CRTA, Mr. Eddie Freitas, service manager for A. E. Ravenscroft, distributors of Spartaon, gave a technical description of the new Sparten Triolian. Mr. Freitas described in detail and actually performed the operation of converting and reconstructing electrical appliance, apparatus, device, or apparatus used for the purpose of measuring or recording electrical current, voltage, or power, used or consumed in such rebuilding or reconstruction conform in all particulars to the provisions of this ordinance.

At the instance of Mr. Freitas, the City Clerk shall certify to the proper authorities, that the laws concerning the provisions of this ordinance have been complied with.

In addition, the City Clerk shall certify the same to be published in the Los Angeles Daily Journal.

ROBT. DOMINGUEZ
City Clerk
Approved this 10th day of April, 1934
FRANK L. SHAW
Mayor

DISTRIBUTORS INC.
HAVE ANNIVERSARY

Distributors Inc., organized by C. F. Zehner, celebrated the second anniversary of business in Los Angeles on July 15.

Mr. Zehner was formerly vice president and sales manager for Ignition Service and Supply Company in Albany, N. Y., and distributor for Majestic Radio, in upper New York State.

This firm, distributors of Tung-Sol tubes, has done much to improve local sales conditions and eliminate indiscriminate price cutting on radio tubes. Mr. Zehner is due congratulations and thanks for his past two years record as a business man in Los Angeles.

AMERICAN ARTS FOUNDATION
STATES ITS PURPOSES

When questioned upon the subject, during a recent interview, Mr. Bennett, chairman of the Board of Regents of the American Arts Foundation, which has recently established an Assembly of its organization in Hollywood, replied:

"If I am asked what the American Arts Foundation is, my answer, in behalf of my organization, is that it is established to perform its purposes insofar as they affect members, and prospective members, of the twenty Academies operating under that banner. The primary object of the Foundation, according to its Regents, is to maintain an institution of service from three standpoints: First, to serve the creative artist, in any recognized line, whose needs are to be met by stimulating patronage, not only locally, but in other cities and countries; Second, to serve laymen by providing an Assembly for cultural entertainment; Third, to interest business firms in a wider acceptance and demand for various forms of art in the presentation of commercial products to the public.

"What are those twenty 'Academies' to which you refer?"

Namely: (1) Modern Art; (2) \"sculpture; (3) Drama; (4) Poetry; (5) \"music; (6) \"literature; (7) Philosophy; (8) \"Architecture; (9) \"Graphic Arts; (10) \"Dancing; (12) Cinema; (13) Radio; (14) \"Oratory; (15) Sciences; (16) \"Interior Decoration; (17) \"Commercial Art; (18) Journalism; (19) \"Landcape Gardening; (20) \"Culinary Art.

"What about the Radio Academy?"

"In reply to that question," Mr. Bennett continued, "I can best serve you by paraphrasing the question that has been known in radio circles, who is Regent of the Foundation's Academy of Radio."

"Whereupon Mr. Haverlin said, "That is an ambitious program, as you will see.""

"That is an ambitious program, as you will see," Mr. Haverlin continued, "but it is not impossible and will be made easy and effective by a registration of members in the Academy of Radio who are actively concerned in one or more of the above phases."

In conclusion it is our opinion, based not only upon the statements above set forth but through observation as a guest at one of the Foundation's recent meeting at the Hollywood Knickerbocker Hotel (the premises of the questioners) that technicians and engineers in the field of radio should avail themselves of the opportunity, from a standpoint of business, cultural and official advantage, to line up with this splendid organization.

Further particulars may be had by communicating with A. Paul Jr., President of the Certified Radio Technicians Association.

AUDIO COMPONENTS TO BURDEN

The new line of audio components designed and built to order by the California Radio Laboratories will be welcomed by technicians and engineers. A well trained workmen and all types of general rework service this firm announces rework service on the old CREBE audio transformers, making it possible to obtain new transformers at a fraction of the cost of replacement. Also the discount schedule has been increased ten per cent for the benefit of technicians.

NEW RECORDING EQUIPMENT

The Technical Service Laboratories, owned by A. Paul Jr., has recently installed a complete new set of equipment for radio and musical recording. The transcription department of this Company has done a vast amount of extensive research and work on this new equipment, a final result of this experimental work, is the most advanced to be found in Los Angeles and Hollywood.

ARTCURUS ANNOUNCES
MAJESTIC TYPE TUBE

To the rather complete line of Artcurus tubes have been added the special Majestic spray, Artcurus, that come equipped with a glove-fitting metal shield, soldered in place with proper ground connection, and are identical in all phases of radio operation and interchangeable with the spray-shield tubes.

These tubes, developed after many tests and much experimental work, are available for prompt shipment.
"HOT" ALL-WAVE SET

The new all-wave receivers recently released by Grunube, distributed by Watson and Wilson are really "something" according to their technical staff. This opinion is enthusiastically substantiated by Karl Hatfield, who reports phenomenal results during a trial for a couple of nights. The table model is a seven tube chassis but regardless of the number of tubes seems to have a head start on most all-wave sets thus far. One of the features making satisfactory operation by inexperienced listeners on short wave bands possible is the beat oscillator which may be used or not used as desired by throwing a switch.

A PRIME 45 AMPLIFIER

The engineers of the United Transformer Corporation have recently designed a new public address amplifier using four type 45 tubes in the output stage. The power tubes are operated as Class A. Prime amplifiers and the output is rated at 38 watts. Special audio and power components are available as well as drilled chassis to simplify construction.

GUILFORD ADDRESSES CRTA

At the August 6 meeting of the Certified Radio Technicians Association, Mr. E. H. Guilford delivered a paper entitled "Electrical Prospecting." The speaker is an outstanding authority on the subject of geophysical science, having been chief engineer of the Radiore Corporation, which did considerable pioneer development and research work in the field of locating ore deposits by the use of electrical equipment. The talk lasted approximately one-half hour, at the end of which time the members and guests present planted the speaker with numerous questions. The ensuing discussion was fully as interesting as the main part of the paper.

Mr. Guilford is now the West Coast representative for the Capitol Radio Engineering Institute of Washington, D.C. The home study and resident courses in radio engineering offered by this organization are extremely valuable to the man who wishes to progress, and Mr. Guilford will be glad to furnish information concerning the details of the courses.

ANNIVERSARY ISSUE II

Celebrating the first anniversary of the "Technician," the September number will feature articles by many leading scientists and engineers. Among the outstanding contributors for this issue will be Dr. August Hund, renowned for his work in the realm of high frequency; Dr. John F. Blackburn, consulting physicist of the California Institute of Technology; Richard G. Leitner, who needs no introduction to our readers; Fred B. Holstein, chief radio engineer for the Southern California Edison Co.; Ralph Lamm, chief engineer for Troy Radio Manufacturing Co.; Mr. Otto M. Wolf, head of the Research Laboratory of the Department of Building and Safety of the City of Los Angeles, and many others. Also contributing to the contents of all the issues of Volume No. 1, compiled by Mr. Henry James, will appear. In addition new policy will be inaugurated in this issue with the first installment of a science fiction story, written especially and exclusively for The Technician.

There will appear the many regular features, including service hints, questions and answers, by Charles Miller; Interference Bureau Activities, by W. F. Miller; and many others.

PRIZE WINNERS

The winners of the prize contest are as follows: V. Karl Hatfield won the first prize of a Pioneer Gen-El-Mator given by Radio Specialties Co. with an article entitled "Ohmmeters and Their Calibration." A. Paul Jr. was awarded the second prize, which was $1,000 worth of Arcuturus Tubes, presented by Mr. T. B. Pritchard, Arcuturus distributor. Mr. Paul titled his article "Condenser Leakage Tests." The third prize, a General Transformer Corp. Universal replacement power transformer, was given to Arthur Moser, whose article was entitled "Construction of Experimental Trumpets." "Resistors in High-Frequency Circuits," written by John Orme, won the fourth prize winner, and Mr. Orme won a Jackson soldering iron offered by Radio "Doc."

The editorial staff of The "Technician" wishes to take this opportunity to thank all the contestants for their interest and efforts in submitting entries in this contest. Also, we wish to thank the members and representatives who presented the prizes for their interest and contributions which made the contest possible.

IMPEDANCE MATCHING

(Continued from page 6)

A transformer would have a turns ratio of 4000/500 or 2.828 and could be used for coupling other impedances; the same ratio if the difference from the rated value were not too great; that is, such a transformer would satisfactorily couple 8000 to 1000 ohms. It would not be suitable for connecting 40 ohms to 5 3 ohms or 400000 ohms to 50000 ohms.

It should be noted that the impedance of a 4000/500 ohm transformer is not 4000 ohms but should be large in comparison with 4000 ohms while the secondary impedance should be large in comparison with 500 ohms. "Matching" a transformer circuit requirements does not mean an equality of transformer and circuit impedances but rather the selection of the proper turns ratio and winding impedances, so that the maximum power will be transferred from one winding to the other with a minimum loss in the transformer itself.

Since the impedances of the transformer windings are also dependent on frequency, the frequency range is usually specified on transformers used for communication purposes. The lower end of the range will be determined by the drop in mutual reactance while the upper limit is determined by the increase in leakage reactance and in capacitive reactance of windings and load.

In application of the foregoing, the experimenter is often interested in knowing what degree of success a transformer intended for one impedance match can be used for similar ratios of not too great a variation in absolute value of impedance and what loss in frequency response can be expected. A recent problem in output meter design afforded an excellent chance to illustrate this point. In this unit the primary winding and secondary load resistance are kept constant; taps on the secondary being used to vary the transformation ratio and thus to reflect various impedances into the primary circuit. A fixed primary being used would not be necessary to use considerable care to attain a compromise having the least low frequency attenuation when used as a high-impedance load and to limit the high-frequency attenuation when used as a low-impedance load. The resultant curves are shown herewith.

Now $6.00

RCA Victor's New World-Wide Antenna Kit

Stock No. 9500

Scientifically designed by the RCA Victor Engineers who designed the RCA trans-oceanic telephone antennae.

Leo J. Meyberg

Company, Inc.

335 West Washington

Prospect 9255 Los Angeles

Mention The "Technician" when answering advertisements—It identifies you.
TECHNICAL QUESTION AND ANSWER DEPARTMENT

Conducted by C. E. MILLER

Q. I have a Victor R8 that motorboats and oscillates badly. All voltages and condensers seem to be normal. What is the cause?

A. Your trouble is probably in the condenser bank. The only satisfactory cure is complete replacement of the bank.

Q. How should a Grebe SK3 be lined up?

A. Screw the coupling condenser down all the way and back all of them out an equal amount about 1/2 to 3/4 turn. Set the L-D switch to distance and align the gang with the compensation at 1400 kc. and bend plates if necessary at the lower frequencies.

NEW LOCATION

From now on patrons and friends of the Radio-Television Supply Co. will find this firm located at 1701 So. Grand Ave. instead of the old location at 1000 So. Broadway. This new and more spacious location away from congested traffic areas will undoubtedly be welcomed by many technicians.

NEW -- NEW

Radio Products Sales scores again. We now have a Complete Line of Majestic replacement coils recently developed by Miller Coil Co.

Advance

We Sell Dealers and Service Men Only

Radio Products Sales Co.

PR. 0490 1314 South Hill Street Los Angeles

FREE CIRCUIT DIAGRAMS

The Radio Products Sales Company announces receipt of 500 amplifier circuit diagrams from the Jefferson Electric Co., manufacturers of Jefferson transformers. As long as the supply lasts copies will be available to readers of The "TECHNICIAN" free of charge.

OPEN FORUM

We all know that radio servicing is beyond the scope of the tinkerer or handy man. But Mr. Public is just learning it. Sometimes to his expense and usually to the expense of the honest technician, because after the owner of a fine radio set has called in the handy man, whose usually shop is just around the corner and had the I. F. thrown out of alignment he hesitates to spend any more on the set for fear that the next fellow will make it worse. The CRTA has, and still does, try to improve these conditions.

You members who come to the meetings regularly believe in the policies of our organization or you wouldn't show up every Monday night. But do you believe in the Association enough to boost it to every radio man you meet? Does this organization mean enough to you to ask the man waiting next to you at the counter in the wholesale store to come to the meetings? Not "some time" but next Monday night.

When you go to the "R. C. A." meetings do you ever ask the fellow sitting next to you if he is a member too? Try it the next time you go to the wholesale house or any meeting where there are radio men. You will find that he will be glad to have the opportunity to join and you will have made a new friend.

Make this your slogan, "Sell C. R. T. A. daily."

A CERTIFIED TECHNICIAN.

Majestic Replacement Transformers

Manufactured by Miller and possessing all the features of Miller construction, yet retaining the original electrical characteristics.

One especially noteworthy feature of these replacement units is the method of protecting the windings from the effects of high humidity. This method, developed by the Miller Laboratories and employed in the construction of all I. F. transformers supplied by us, is universally recognized as the most superior process of corrosion elimination in I. F. windings. We absolutely guarantee these units against coil failure due to corrosion.

Customer satisfaction is your greatest asset, so why take a chance by replacing defective coils with units subject to the same defects? Insist upon the best and get genuine MILLER COILS.

NEW NEW NEW

Radio Products Sales scores again. We now have a Complete Line of Majestic replacement coils recently developed by Miller Coil Co.

Advance

We Sell Dealers and Service Men Only

Radio Products Sales Co.

PR. 0490 1314 South Hill Street Los Angeles

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

ALL WAVE RECEPTION

The introduction of the all wave receiver is gradually resulting in increased problems for the Bureau. To date, interference problems not on the broadcast frequencies have not been of any consequence. However, it is obvious that a very great amount of educational work is going to be necessary before the listening public will be able to enjoy the all wave receiver, in the higher frequencies.

Very little is published on the schedules and expected signal satisfaction from the various high frequency broadcast stations. It is quite true that current publications and advertisements indicate to the public that high frequency broadcast stations will be heard from distant stations with approximately the same satisfaction as comparatively nearby broadcast stations. A study of the working schedules and the number of hours per day signals are available from distant high frequency stations, in Los Angeles, leading to the conclusion that signal satisfaction can be had from such stations only when it is definitely understood that reasonably good signals are available but a few hours each day of twenty-four. With moderately weak signals, or no signals, in the high frequencies it is customary for the automobile ignition noise which appears to be direct radiation from passing automobiles and therefore, little can be done to mitigate the noise, even at the expense of elaborate receiving antennae. There are stations which can be specifically designed for all wave work, and which are giving very satisfactory results in general. However, it should be kept in mind that the broadcast stations have not always made provision to ensure noise free reception for those receiving the highest frequencies. Careful study reveals the fact that radio receivers are not continuously in use, and the apparent noise background coming up in strength so rapidly that it appears to be constant.

A large portion of investigations made on reported interference in the higher frequencies has been traced directly to automobile ignition noise which appears to be direct radiation from passing automobiles and therefore, little can be done to mitigate the noise, even at the expense of elaborate receiving antennae. There are stations which can be specifically designed for all wave work, and which are giving very satisfactory results in general. However, it should be kept in mind that the broadcast stations have not always made provision to ensure noise free reception for those receiving the highest frequencies. Careful study reveals the fact that radio receivers are not continuously in use, and the apparent noise background coming up in strength so rapidly that it appears to be constant.

There is an old saying: "A prophet is not without honor save in his own country." The same is true of parts manufacturers. That Inca has been able to maintain such a predominant position in its own hometown is a strong recommendation for Inca products.

Six Volt Tubes For General Service

Submitted By
ENG. DEPT. KEN-RAD CORP.

The six volt line of tubes, developed originally for automotive service, has in the past found application chiefly in that field, and in small universal or AC sets employing series heaters. There is now a very definite trend toward the adoption of this line of tubes for general service in sets of other types in place of the 2.5 volt line.

One reason for this change is the fact that the use of higher voltage, lower current tubes effects a slight reduction in the cost of transformers for filament lighting. More important probably in the long run is the reduction in the number of different tube types that manufacturers, distributors and dealers must handle. A single line of tubes takes care of all requirements and avoids the duplication of types required by the use of different heater voltages.

The 6.3 volt line is quite complete and in some respects offers a wider selection of types than the 2.5 volt line. For instance the set designer has a choice between two different types of superheterodyne mixer tubes, the 6A7 and the 6F7. There is no 2.5 volt counterpart for the former, which is in exceedingly common use with set designers. For R. F. and I. F. amplifier service there are available the type 77 and 78 with external plate shielding and the 6C6 and 6D6 with shielded construction. The former have a slight advantage in overall height and in shielding against somewhat lower cost for the latter.

There is no satisfactory substitute in the 2.5 volt line for types 77 and 78. For second detector service there are available two diode triode combinations, the 75 and 85, and one diode pentode tube, the 6B7.

There are several 6.3 volt output tubes available with a fairly wide range of characteristics. These include the 89 triple purpose amplifier, the 79 Class B tube, and the 12A5, 41 and 42 pentodes. The latter two tubes are at present most popular. New ratings recently issued on type 42 cover its use as a Class A prime and Class B triode as well as a pentode.

Results show that all points mentioned in general this type must be supplied from a separate transformer winding. The type 80 will be used for small and medium sized sets and the 523 is available for larger jobs.
**RADIO WHOLESALE CODE**

The following is a copy of a suggested letter of notification to the trade regarding the provisions and rules of the District Code Authority relative to the radio wholesaling trade:

"Terms are strictly thirty days net. Each invoice shall be dated from the date of shipment. Two per cent discount will be allowed, provided that payment in full of all invoices for the previous month's billing is received by the tenth day of the month immediately following shipment. No discount will be allowed on any account showing a previous open balance over thirty days old unless all such balance shall actually be in dispute in good faith. Failure to receive your remittance postmarked on or before midnight of the tenth of the month, precludes the allowance of any cash discount."

**CRTA ELECTS OFFICERS**

At the July 30 meeting of the CRTA, officers for the coming year were elected. The nominating committee recommended A. Paul, Jr., for president, John L. Vincent for Vice-President, Karl Hatfield for Secretary-Treasurer, and Gene Sullivan for Sergeant-at-Arms.

Mr. Orme, who was approached by the committee, declined to accept nomination for the reason that his health and business would not permit his devoting another year's time and energy to the tremendous task of this post and Mr. Hatfield was chosen by reason of his many qualifications as to equipment, ability and dependability for the position. Mr. Sullivan being associated with Mr. Eklerberg, is familiar with the duties of the membership committee, and was chosen for this reason. Of course, the records of Mr. Paul and Mr. Vincent for the past year speak more than mere words for their fitness for their respective offices.

These nominees were unanimously elected without opposition of any kind. Gentlemen, we congratulate you!

**ORGANIZER ADDRESSES CRTA**

Mr. W. J. Kantenberger, publisher of The Nation Technician of Dallas, Texas, delivered a very interesting and inspiring address to the members and guests present at the July 30 meeting of the CRTA. Mr. Kantenberger has been instnumental in promoting the organization and welfare of service technicians in the South, Southwest, and Middle West. His talk pointed out that organization and united action is the only hope we have for the eventual establishment of the service profession in its rightful place in modern life and industry. Mr. Kantenberger congratulated the officers and members of the CRTA on their splendid progress and offered to be of any possible assistance to us. Also, at the risk of blushing, we should like to state that this gentleman expressed astonishment and pleasant surprise at our ability to publish and maintain a magazine of so much merit as The Technician and gain such success in less than a year.

**CRTA—A CORPORATION**

Joseph Duchowny, attorney for the Certified Radio Technicians' Association recently informed the officers and members of the Association that the process of incorporation has been completed. The Certified Radio Technicians' Association is now a non-profit corporation, duly incorporated under the laws of the State of California.

**SYLVANIA**

Behind Sylvania Tubes . . .

stand four modern plants, an organization of internationally known engineers, a record of over thirty years of successful manufacturing. Best of all, from your point of view is the freedom from price cutting which the Sylvania line enjoys, the consumer acceptance which our products have built up through progressive advertising and the loyalty of our dealers and jobbers who have found our policies fair and our merchandise profitable.
L. A. ELECTRICAL TESTING DIVISION

Mr. Otto Wiemer, head of the Research Laboratory of the Department of Building and Safety of the City of Los Angeles, is preparing an article describing the technical features of the test board and equipment used in his department for testing the various electrical devices submitted to him for approval under the new sales ordinance No. 73,700.

Mr. Wiemer is very anxious to do his utmost in making this ordinance serve the purpose and intent of the agencies who instigated it in a sincere effort to improve local business and reduce fire hazards. The remarkable test board for this work represents an investment of approximately $7,500.00 in equipment alone, having been designed and built by Mr. Wiemer, assisted by the City Hall electrician.

This article will appear in the anniversary issue of The "TECHNICIAN," which will be issued about the fifteenth of September.

CLOCKS—A PROFITABLE SIDELINE

Every radio dealer and technician should investigate the opportunities offered as an authorized dealer for the National Clock Co. In a recent interview Mr. Wiemer, who addressed a CRTA meeting some time ago, explained the plan and the many attractive features should be considered by every technician interested in making a little extra money with practically no effort. This company has recently inaugurated a new and efficient pick-up and delivery service by one of the most reliable parcel services in town. Mr. Wiemer invites inquiries regarding any type of timepiece whether electrical or otherwise.

RADIO SPECS TAKES NEW LINE

The Radio Specialties Co. announces a service offering a complete line of exact replacement vibrator units for all types of auto radios. The problem of obtaining such replacements has long been a difficult one for technicians to solve and few companies have come to the rescue. The Radiant line will be handled by the Radio Specialties Co. as well as other lines of items pertaining to auto radio.

Classified Advertisements

For Sale—

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


For Sale or Trade—

Will trade first-class machine work for meters. Work done by machinist doing work for Ascot racers. J. H. Deery, UN. 3525.

Will swap Jensen Auditorium A. C. dynamic, perfect; also an R. C. A. phone 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, Capitoll 5542.

Battery-operated Pilot Super Wasp Short Wave receiver or equivalent. Also good magnetic cone speaker. Call Carl Haverlin after 6 p.m. at WH. 8784.

Filter Blocks
Speaker Fields
Special Audio Transformers
Transmitting power equipment

California Radio Laboratories
2523 South Hill Street
PROSPECT 3515
Nites THORNWALL 4777

Announcing

Longer Trade discounts effective August 1st on all power-transformer and speaker-field rewrites. Our same high standards of quality will prevail, allowing our customers to retain the same confidence in our work as before and still realize more profit on the job. Our free installation service and the guarantee of one year will hold under the new price schedule. New price-sheets will be mailed to all on our list. If you don't get yours, call us. There is still no substitute for a good rewind.

We also wish to announce at this time a new and better chassis repair service now available to our customers at reasonable prices.
August, 1934  The "TECHNICIAN"  Page 23

To facilitate ready contact with any member of the officers and directors of the
Association, the following directory is published for your convenience:

<table>
<thead>
<tr>
<th>Name</th>
<th>Office</th>
<th>Phone</th>
<th>In Charge of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Paul, Jr.</td>
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<td>Richard G. Leitner</td>
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PHILCO MEETING SOON

Listenwalter & Gough, Inc., Philco distributors, announce one of the most important meetings they have ever planned for the benefit of the service men. The invitation is extended to CTRA men, Radio Manufacturers' Service men, dealers' service men and their friends. The date is Thursday night, September 13th. It is not known at the time that The Technician goes to press, just where the meeting will be held but full details will be announced later by Listenwalter & Gough.

All service men and their friends should plan on attending as there will be, among other things, factory men to lecture on the technical side of "High Fidelity", that latest, much-talked about development of radio science. The Philco engineering laboratories, pioneering "High Fidelity" certainly should know what it is all about.

Refreshments will be served. The evening, we are sure, will be a profitable one. COME!

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