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« THE » "TECHNICIAN"

APRIL, 1935

TUBE WAR IS DECLARED!

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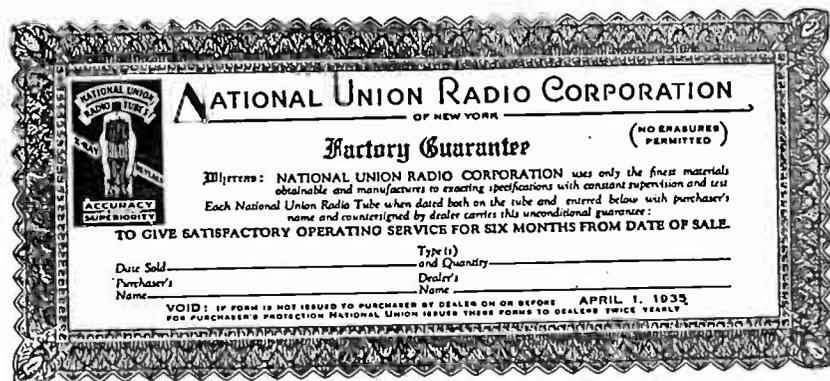
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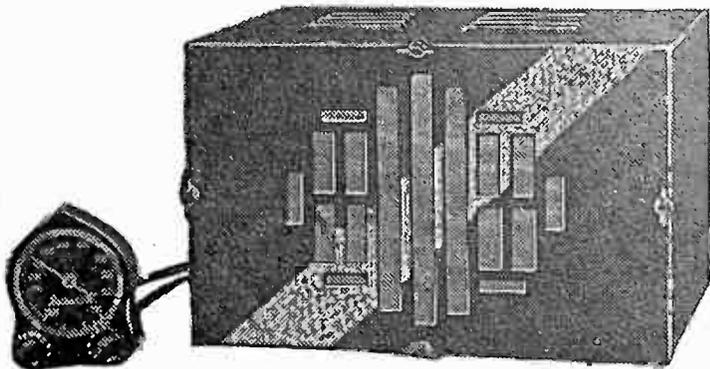
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EDITORIAL

By The Editor

Whither Tube Prices?

"Wherever there's smoke, there's fire." This old and well-known adage most certainly obtains in the case of the recent and still existing upset in the list prices of radio receiving tubes. There is certainly plenty of smoke but the nature of the fire seems to be considerably in doubt.

It is not so difficult, however, to determine the disastrous results and the irreparable damage to the well-being and business success of the retail and service trade, resulting from this unwarranted and untimely reduction in the list prices of tubes, which were already too low.

This further reduction of prices must of a certainty have some sinister purpose lurking in the background which has not yet been fully disclosed. Many of the tube companies have valiantly striven to keep their faith with the trade and maintain tube prices somewhere near a legitimate and stable minimum.

There are, of course, many viewpoints on the entire situation and in this issue of the "Technician" we have endeavored to present the views of six of the leading companies, manufacturing radio receiving tubes. However, statistics which are reputed not to lie, show us that the total number of tubes sold in 1932 was greater by some 900,000 than in a similar period in 1934, while the list prices in 1932 were considerably higher than in 1934. Considering the state of the depression in both periods, the relative list prices and the relative number of tubes sold, it would appear that the selling price of tubes is not the paramount controlling factor in the movement of tube stocks.

It is the only hope of the retail radio business to use every influence, force and

weapon to prevent further reductions in tube prices and bring about increased list prices as soon as is humanly possible. To do this we must support the companies who have proved their worthiness of our support.

We humbly present the plan of placing a list price on all radio receiving tubes of \$1.00 regardless of type. If further investigation indicates that this plan is unsatisfactory, why not group all the tubes into two or three general groups, placing a definite list price on each group. For instance, Group A could be 90 cents; Group B, \$1.25; Group C, \$1.50. The actual figures of course are only for the purpose of explanation and would have to be determined by those in a far better position to calculate prices compatible with manufacturing and distribution costs than we are. However, we are sure they should NOT be 59, 69, or 99 cents!

This odd-cent scale of prices puts tubes right at home on the shelves of cut-rate concerns and the posting of such prices in your window advertises that you are bidding for the patronage of bargain-hunting chiselers. Keep faith with the customers who trust you.

In closing let us summarize that a great majority of the members of the radio trade feel that this recent reduction in tube prices is unwarranted, inexcusable and detrimental to the welfare of all members of the radio trades in general and the retail dealer and service technician in particular. You must lend your support in aiding an intelligent, unselfish and mutually beneficial solution to this very serious problem which demands our attention immediately.

Views on the Tube Situation

NOTICE!

In presenting articles and expressions which are of a controversial nature, the "Technician" wishes it clearly understood that such statements are the opinions of the contributors and do not necessarily represent the opinions, editorial policies or recommendations of the "Technician," its editorial staff or the Certified Radio Technicians Ass'n. Any expressions of opinion, which in the judgment of the editorial staff are of general interest, will find acceptance in these columns, provided they are submitted by responsible parties, who will furnish for publication their name, address and company affiliations. This invitation is extended to all and sundry in the radio industry who wish to add further comment to any existing controversy or launch upon discussions of new subjects.—The Editor.

WHY REDUCE TUBE PRICES?

By CHAS. R. KIERULFF
Natl. Union Tube Distributor

From various national sources of information, it appears that the average list price of radio tubes used in the replacement market before the recent reductions was about one-third of the average list prices in January, 1930.

In April, 1932, it appears that the sales of tubes for replacement were about 29,500,000, while the 1934 replacement sales were less than this by about 900,000 tubes.

In view of the fact that the replacement tube sales were greater in 1932, at a time when the depression was at its lowest ebb, than in 1934, when almost everyone admits that conditions are considerably better, it does not seem that the selling price of tubes is the controlling factor in the movement of them.

The average list price of tubes in 1932 being higher than in 1934, would make us believe that the general public would have purchased more tubes in the latter year because of being able to buy them cheaper. However, the reverse has happened, and still we now face further reduced prices with further reduced profit for the dealer, without apparent increase in volume.

Whatever that reason may be must be known to the tube manufacturers. We certainly hope that if these differences do exist between these manufacturers,

LET'S BE FAIR!

There is no use denying that there is much smoke in the radio sky arising from the conflagration ignited by the recent juggling of tube prices. Those who are responsible for this move, may or may not be due severe criticism from the trade, depending upon the individual attitudes of the various members of the trade. However, please accept this word of caution—always bear in mind that this controversy is between the trade and the manufacturing concerns who may be responsible. Reliable jobbing institutions who have proved their service to and interest in the radio trade with many years of service should most definitely be eliminated as targets for any criticisms or ill feeling, either justifiable or otherwise, arising from the present confusion in the tube industry.

they can be patched up soon enough to avoid a general demoralization of this branch of the radio industry, which, without apparent cause, has cost us all a loss of profit, as well as loss of confidence in those who should be stabilizing factors in this industry.

TUBE PRICE REDUCTIONS UNWARRANTED

T. B. PRITCHARD, California Sales Agent
Arcturus Tubes

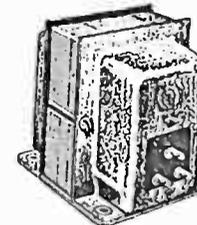
The past thirty days have brought about lower prices of radio tubes, which are absolutely unwarranted. The general trend of conditions is upward, which, we are led to believe, is the salvation of business. It is the thing for which the Nation has striven during the past year; and why the tube industry should make two or three reductions in prices at this time can hardly be satisfactorily explained by those who are responsible for the move.

With the latest drop in list prices, we were confronted with several problems. Many distributors, dealers and servicemen, when they learned of the cut, expressed the wish that list prices be kept up. Certainly the trade is justified in resenting a diminishing realization on their tube sales. However, the time has not yet come when they will pay more for a tube to secure a greater profit. Consequently, the establishment of a high-

(Continued on page 8)

"Vacuum Treated"

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The addition, several months ago, of an extensive vacuum treating plant to our equipment was very much in line with the INCA policy of applying the most advanced technique in coil construction to every INCA transformer.

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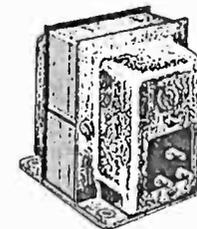
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(Continued from page 6)

er list to preserve and improve the dealers' realization and purchase schedule on a competitive basis is imperative.

In the Radio Tube business, as with other business, there is a low price line which cannot be passed without sacrifice of quality and service.

Prices which do not allow for high quality and clean marketing will naturally result in grief for all. Therefore, when list prices are cut so close to actual cost of production, it is natural to suppose the channel for marketing will be cut-throat operators who sell price only—and do not consider quality or service. Repeat business is forfeited and eventually the consumer will have to look for a reputable, responsible service man who can stand back of his job. Consumers don't blame the materials used when things go wrong—they invariably blame the man who put them in. If you use the best quality and put your best work into a job, you have no trouble securing your fee and repeat business will follow.

When a dealer resells a quality tube at an established list price which is slightly higher than the low priced tubes—but buys this tube at a cost no more than the cheap tube—his margin of profit is larger and his chances for having made a satisfactory sale are greatly enhanced.

TUBE SITUATION DEPLORABLE

W. BERT KNIGHT, Factory Agent
Ken-Rad Tubes

The present situation in the tube industry is indeed most deplorable. We might well all agree that it is truly unfortunate that such a highly technical commodity should be marketed solely on the basis of price, thereby forcing the legitimate serviceman, jobber, dealer and manufacturer to sacrifice any chance of profit.

TUNG-SOL CONTINUES CONSIGNMENT

Tung-Sol Radio Tubes, Inc., of Newark, New Jersey, will continue its consignment plan of tube distribution which it has had in effect since pioneer consignment tube plans were established over four years ago. Mr. H. W. Harper, President of the Company, said, "Unlike most radio tube manufacturers, Tung-Sol entered this industry with a background of more than a quarter of a century of selling through independent dealers. Because of our experience, basic policies

were shaped with full consideration of our dealers and their problems. They have remained consistent and unchanged.

"We regret that the present price and policy changes in the industry have resulted in the lowering of lists, but, Tung-Sol will continue to place its retail distributors in a position to resourcefully meet competition.

"Tung-Sol, as a matter of policy, has always backed constructive moves designed to improve the radio tube industry, and we believe that after the present hysterical condition is past and the situation more clearly appraised, prices of greater mutual advantage will prevail."

QUALITY OR PRICE?

E. P. DEMAREST
Sylvania Pacific Co.

Along with the terrific bombardment we have been getting since the latter part of March on the "very chaotic" condition of the radio industry as a whole and the tube business in particular, perhaps we in the industry can now definitely decide this is the time for us to review the situation and to make up our minds whether or not we shall stay in the business and why, and also, should we decide to remain a part of it how we can best go about the business of making a success of our individual parts of it.

It seems to me that if I were a retail dealer or serviceman these "very chaotic" conditions, we are told so much about, would be very vivid signals to me. I think this is just the time I would take stock of myself and my business and decide which course I would take. I would review the business I had conducted for some time and consider the possibilities for the future.—I would try to find out whether I should drift along and get what I could or whether this is the opportune time to make the greatest possible play for real business and so establish myself as a permanent merchant in my community. I very frankly feel that this is the time of all times for the fellow who has any gray matter in the attic and any of the well known fortitude to dig in and follow the latter course. Why—

So far as sales of replacement items are concerned, we must admit that tubes will head the list. Tubes are the bread and butter item of dealers and servicemen—they are things we must have. The prices of tubes have been battered all over the map, and, apparently for very heavy losses. This is most unfortunate and most of us in the tube manufactur-

(Continued on page 10)

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(Continued from page 8)

ing business do not enjoy the idea any more than you fellows selling them. Nevertheless, we are not going to stop building them and you, certainly, should not overlook the inevitable replacement sales of them.

Now here is the point. In my rambles I have noticed that, what I consider, too low a percentage of the men in the business are not quite sure they are in a "business." Apparently they are still content to let people think radio is something for only high school kids and "bugs" to be associated with. Some of us seem to feel that although we are in it, we got into it in some unaccountable manner and so "here we are." All comparatively new businesses must go through a period of stabilization and that is what we have been experiencing in our own industry, and it is an industry. This is the time those of us who are going to remain in it must establish ourselves and let the world know we are in the radio business and that we are here to serve. Get the public out of the idea that a radio man is one who goes around in jumpers with a pair of pliers and a soldering iron sticking out of his back pocket who is willing to tinker with your set for whatever you think is right. We are in business—and entitled to all consideration and fair profit returns for investment and knowledge that any other business is. So let's go to it intelligently.

There are always two classes of buyers in the public, we are told by successful merchandisers—the price buyer and the man who will pay a bit more and expect the best in quality. The dealer and serviceman must make up his mind which class he is going to cater to. Not very often can the same fellow cater to both successfully. Too many men in sales and service work on radios today buy prices or discounts. Those fellows should appeal to the price buying class, but I am afraid some radio men who want to appeal to quality buyers still find themselves looking strenuously through binoculars at fancy discounts and "special this week only" deals when fast talking salesmen come around. The successful merchant, whatever the line, carefully picks out the merchandise he wants to have coupled with his name and reputation and, strange as it may seem, that merchandise is very often not bought or taken on because it may have a ten cent or 10% better price. Instead, he looks into the reputation of the firm offering the line, he finds out whether or not the people who have been handling the line for years before have been successful in doing it,

finds out the reputation of the manufacturers—whether or not they are considered well among the trade and he looks into the financial stability of the company. Recognizing this to be a fact, a few of the more alert manufacturers of radio tubes have concentrated their advertising for some time on the dealer and the serviceman, rather than the public. Their advertising is not based alone on the prices and discounts because they feel that the successful merchant can and will sell the line he has chosen from other standpoints such as quality, acceptance and stability. The tube manufacturer's advertising job then, if he has any confidence in the present-day dealer and serviceman, is to sell them and not the street walker through fancy bargain prices shown on window streamers in large figures.

So, if we pay a little less attention to prices and temporary fancy deals and spend more time fitting ourselves up with a quality line that affords a decent profit for our knowledge and service, as the doctor or lawyer does who wants the business of the quality buyer, what time is more ripe than that we have right now, when many in the business are floundering from lack of keen insight, to make up our minds to stock up, pep up and get up after the business under our noses. Any radio man who has the courage of his convictions can sell the line of parts or tubes or sets he chooses whether or not the retail prices on those items are higher than those offered by some of his competition, just the same as some lawyers and doctors get higher fees than others. The old saying goes and we can back ourselves up with it—the merchandise that costs a little more is usually worth a little more—and that applies to service as well as merchandise. So let's make merchandisers out of ourselves because we have something to sell.

PRINTED WITHOUT COMMENT

In the April 20, 1934, issue of the RCA Service News a message from E. T. Cunningham, president of RCA Radiotron Company, Inc., contains among other statements the following: "In adopting the Agency Plan the Cunningham-Radiotron organization places itself in a position to establish sound business-building policies and can therefore protect good dealers from the few who, through price cutting, would destroy market stability and consumer confidence."

In a column adjoining this message
(Continued on Page 27)

A. V. C. ACTION ANALYSIS

This is the second of a series of excerpts from the Signal Generator Handbook and Shop Notes prepared by the engineering staff of the Triumph Manufacturing Company. This manual furnished with the Triumph Signal Generator contains, in condensed form, valuable and definite procedure for attacking service problems by laboratory methods where such is advisable. The complete manual may be secured free of charge by writing the Triumph Manufacturing Company.

The value of an A.V.C. circuit hinges upon its ability (among other things) to hold a fading signal to a steady speaker volume. This function can be investigated by means of the Signal Generator. Connect the generator to the set and tune the generator and receiver to resonance. Now adjust the generator to a low input and note the set output.

Next, advance the attenuator and multiplier to a high value (not beyond overload of the set) and note if the output meter indicates constant output. Assuming that the undistorted power of the output set is 3 watts, then, 1 watt reference level is usually employed in such a test, which means that the receiver volume control should be preset so that the output meter indicates 1 watt—a 2-1 ratio is considered fair for such a test by some engineers. Meaning that the set output may rise (the A.V.C. system is not perfect) but the output of the set at full input from the generator should not be more than twice (2 Watts) the original, preset, output (1 Watt). If, however, during the test, the output of the set goes down it indicates overload in the receiver.

SQUELCH CIRCUIT CHECK

The so-called squelch circuit is employed on late type superheterodynes to eliminate in-between-station noise due to the action of automatic volume control. Squelch action is usually arrived at by employing a vacuum tube or a "neon noise gate" tube. This tube is generally in the circuit of the first audio grid. The operation is such that when no steady carrier is tuned in, the current through the tube sets up a voltage across a resistor which biases the audio tube to the cut off point.

It is obvious that an improper squelch tube condition will cause the set to operate erratically, since the whole action of

the squelch circuit consists in automatically regulating bias on the first audio tube.

Weakness, fading and distortion are brought about by a defective squelch circuit. The set may remain dead or may pick up noise between stations indicating that the squelch tube is not being controlled by the incoming carrier and either over biasing the A.F. or not biasing at all.

Recognizing only the wrong operating condition of the set but not knowing the cause, it will be necessary to remove the squelch tube from the circuit and go through the regular tests for sensitivity and A.V.C. action.

When the receiver has been so tested and is known to be otherwise normal, a signal should be applied to the antenna and ground connections of the set with the Generator and set tuned to resonance.

Now replace the squelch tube and tune the set back and forth across the signal. If no signal comes through at all, it indicates over bias of the first audio tube and the squelch tube should be replaced with a new one as a preliminary test. If replacing the tube makes no change in the condition then examine the circuit to the biasing resistor and to the grid of the first A. F. tube for a defect such as a wrong value bias resistor. Where the in-between-station noise continues after putting the squelch tube into its socket, it indicates an under biased condition. If replacement of the squelch tube makes no improvement a defect in the squelch circuit should be looked for, such as, shorted or low value of bias resistor. The manufacturer's data should be referred to in every case where such squelch circuit data can be obtained.

R. F. COIL RATIO

Connect an R.F. coil primary to the Generator Output and connect a Vacuum Tube Voltmeter to the secondary of the coil. Adjust the Generator to obtain a good reading on the V.T. Voltmeter. Note the reading on the meter, then apply the meter to the primary side while generator is still connected and note the input voltage as shown by the meter. To find the step up ratio of the coil, divide the secondary reading by the primary reading— $E_s \div E_p =$ amplification of the coil.

BOOK REVIEW

Photoelectric Cell Applications—R. C. Walker and T. M. C. Lance—Pitman Publishing Corporation, 2 West 45th St., New York City—\$2.50. This book is prepared to give definite and workable information to the engineer and technician in understanding and using photoelectric cells. Throughout the book the authors have endeavored to keep to one ideal; namely, simplicity of treatment, hoping that the descriptions will prove of value to the practical man and enable him to attack many of his problems with a new weapon. Some of the deeper theoretical and mathematical considerations involved in some of the problems have been intentionally omitted in favor of practical information. The physics of Photoelectric Cells has been condensed into one short chapter, giving the necessary fundamental information. This book is recommended to all engineers and technicians familiar with electrical circuits who wish an authoritative treatise on the actual applications of photoelectric cells for commercial uses.

Actual Troubles in Commercial Radio Receivers—Bertram M. Freed—Servicemen's Publishing Company, 136 Liberty Street, New York City—\$1.00. This book is a pocket-size manual listing actual troubles in radio receivers encountered by service technicians and engineers. It has been prepared for the express purpose of placing before the servicemen those troubles actually encountered with a number of the more popular radio receivers over a period of several years. Ordinary troubles are not listed but only unusual troubles or those difficult to locate are noted.

Electric Fun—T. A. Cutting—Cutting & Sons, Campbell, California—\$1.00. This book is a treatise containing 200 simple experiments in the field of electricity using 110 volts A.C. Much of the

material is entirely new, being the result of the writer's own experiments. These devices attempt to illustrate many of the fundamental characteristics of electricity without the use of expensive equipment. This book is particularly recommended to amateurs, experimenters and teachers. Also, many interesting and unusual effects are described, which would have commercial applications in window advertising, etc. It is an interesting and worthwhile treatise for anyone interested in the electrical field.

The Chuckker—Freed's Radio Company, 5053 Baltimore Ave., Philadelphia, Pa.—\$1.00. The "Chuckker" is a chart compiled by Freed's Radio Company, based upon 1,000 actual repair jobs. It is the compiled results of extensive work on the part of radio engineers covering their records and average prices charged for the necessary repairs. It enables the serviceman to determine with a considerable degree of accuracy the probable trouble in the receiver and quote a price including labor and parts. It is recommended as a useful addition to any serviceman's repair kit.

Radio Builders' Manual—Modern Mechanix Publishing Company, 529 S. 7th Street, Minneapolis, Minnesota—50c.

This is a 130-page book, giving practical construction and repairing hints concerning all branches of radio. Detailed constructional articles with diagrams and sketches for transmitters, public address equipment, broadcast, all-wave, short-wave a.c., d.c., a.c.—d.c., battery receivers, photo cell amplifiers, auto sets and many other devices are furnished. Many practical hints are given as to easy ways to do difficult things, build many useful articles out of inexpensive equipment and numerous other handy suggestions, hints and diagrams. It is an interesting and valuable addition to any serviceman's library.

ADDITION AND CORRECTIONS TO DIRECTORY APPEARING IN MARCH ISSUE OF TECHNICIAN

Due to an unavoidable oversight the following listings were omitted from the factory agent directory appearing in the March issue of the "Technician." The Jackson Electrical Instrument Company.....B. M. Fuhrman Factory Agents: B. M. Fuhrman.....1121 S. Lucerne Blvd.—Whitney 7364

CORRECTION

Don C. Wallace.....4214 Country Club Drive, Long Beach—Phone 434-59



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1440 BROADWAY, NEW YORK, N. Y.

TRAVELING THE TERRITORY WITH MILTON

Here we are again, boys; just the same old Traveler in the same old way at the same old time at the same old place. And so, to business.

We are told that over there in them there Catalina hills the Arcade Radio Shop is boasting loud and long of its new post office address, which for the benefit of the such and sundry is Box X-1. Ho hum, just another case of "X" marking the spot.

We have been informed that Harry LeGoube of Washburn-Walker's Radio Dept. has just returned from a very happy honeymoon spent at Yosemite. If they would depend on Harry for the principal means of subsistence, the restaurants in the vicinity of 4th and Western would all go out of business; for Harry has become a formidable proponent of home cooking. And, as they say in Spanish, "Con razon!"

It seems that Phil Johnson, who keeps the customers contented for Hancock Music in Pasadena, is about to add to his titles that of Doctor of Dental Surgery. "Phil" is now in the act of constructing a capacity bridge for use in his service laboratory, especially for the customers who watch him in open-mouthed amazement.

The population of Manhattan Beach has been increased by one. So we are informed by Ray Rusthoi, proprietor of the trim little radio service shop in that city, who proudly is exhibiting baby Faith Rusthoi to all of his friends and family. Congratulations, Ray!

And in Los Angeles, too, Old Man Stork seems to be staying on the job. Hal Rowland, who keeps the soldering iron burning at the Kendall Tune Radio Shop, is now a mighty proud papa; and, after seeing little Kenneth Harold, we all agree that his pride is very well founded. Another future radio man!

And while Walter Winchell-izing, we might add that, at Lovinger's Radio Shop on North LaBrea, Teddy, the pet Spitz of Mr. and Mrs. Andy, is the sire of a new happy family. Just a gentlemen of litters, that's what.

The Traveler takes this opportunity of greeting most cordially the Mexican technicians in the territory. The 5th of May being the Mexican 4th of July, on that date there will be many festivities among the local colony in celebration of their independence; and although slightly ahead of time the Traveler extends his sincere congratulations to his many Mexican

friends for the continued progress that our sister republic has made especially in the last few years. Felicidades, amigos!

In the spring a young man's fancy— Uh huh, and it strikes hard and heavy when it strikes home. They tell us that Al Ezor, at the Pioneer Radio Service on South Vermont, has just abandoned the regiments of bachelors to prove that there can be such a thing as a happy husband. Good luck, Al!

Everything comes to him who waits. Yeah, man! For the past six months Dale Sliger in Redlands has been wondering where to place his specially built antenna towers, and now the spot has been finally chosen on State Street. Dale has promised to christen the towers with champagne, and extends a cordial invitation to all the Technician-ers to be present at the function. Get ready the speeches and the brass bands, boys!

For interesting experiences one can listen for quite a time to F. A. Robinson, one of the old-line radiomen in Pasadena. Besides attending to his regular customers, he finds time to teach radio and electrics to boys in the FERA camps, to whom "F. A." has become a real pal as well as confidant.

And so, all you boyses and girlsies, don't eat too many eggs on Easter day. We'll be seein' yuh!

DELCO SYNCRO-TUNING

The new Deleo receiver is equipped with a special antenna input circuit known as Syncro-tuning. The antenna is kept in constant resonance by a special resonating condenser connected directly to the tuning condenser gang shaft which automatically varies the antenna resonating capacity with the frequency that is being received. The antenna is thus constantly in resonance with the signal received and will deliver maximum signal strength to the grid of the first tube at all times. This greatly increases the selectivity and sensitivity due to higher efficiency. Syncro-tuning is an entirely new principle to be applied to automobile radio and is giving very satisfactory results. This is especially true on the new type automobiles with turret tops, which must use underneath type antennae, which at best are not extremely efficient. The Electric Products Service, local distributor for Delco Automobile Radios, invites readers of the "Technician" to call upon them for further details regarding the operation of this new and improved circuit and demonstration of the receivers.

SERVICE KINKS AND PET EQUIPMENT

EDITOR'S NOTE: Through the kindness and courtesy of Mr. H. K. Bradford, president of the Capitol Radio Research Laboratories, we are able to publish the following material taken from the manual, CASE RECORDS OF BROADCAST RECEIVER REPAIRS.

GENERAL ELECTRIC H-31—IMPROVING SENSITIVITY

Remove the shield from the first I. F. transformer.

CROSLY 124—HOWL AND DISTORTION

This trouble is generally caused by a defective voice coil.

CROSLY 120—INOPERATIVE

When the receiver is found to be dead over the lower end of the dial, it is quite possible that the dynatron oscillator used in this receiver is not functioning. This may usually be traced to an over-oxidized flat-head screw and stationary plate of the padding system used for the low frequency end of the tuning range. Such units must be carefully cleaned and replaced as before. Use sand-paper and alcohol in cleaning these units, and apply a thin coating of vaseline to each part when replacing to prevent further oxidation.

CROSLY 42-S—OVER-SENSITIVITY

This is more than likely due to an open 5,500 ohm bleeder resistor which results in raising all voltages and causing unstable operation.

CROSLY FIVER—INTERMITTENT RECEPTION

Sometimes the use of a 2.5 volt pilot lamp will allow the subsequent voltage rise to cause erratic oscillator operation. Be sure to use 6.3 volt or 6-8 volt.

BRUNSWICK 16—DEAD

When the oscillator refuses to function

replace its screen resistor with a 5,000 ohm $\frac{1}{2}$ watt unit. If the volume is insufficient, change the screen bleeder resistor to a lower value, say between 10,000 and 7,500 ohms. The original value used is 14,000 ohms. For abrupt change in volume, or intermittent reception, check the 10 mfd. coupling condenser between r-f tube and first detector. This is mounted on the bottom of one of the tuning condensers with a machine screw which often loosens, causing trouble.



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ELECTROLYTIC CONDENSER STUDIES

By RESEARCH STAFF, Henry L. Crowley & Company

While the application is electrical, the functioning is chemical—and mighty involved electro-chemistry at that—when dealing with electrolytic condensers. Hence chemists become readily intrigued by the problems and revel at the possibilities of this young art, as has been our experience.

A critical study of electrolytic condensers leads us to the conclusion that so-called dry or semi-dry condensers are simply variations of the wet type. The usual electrolyte is ammonium borate, boric acid and water, the solution having been condensed beyond the saturation point, and the desired fluidity restored by means of glycerin, glycol or ethylene glycol acting as a carrier. Such a mixture may and frequently does give rise to certain difficulties in use. First, there is the natural tendency to settle out, reducing capacity and decreasing uniformity. Further, the freeing of separate chemicals because of their nature tends to dissolve the oxide coating—the dielectric of the electrolytic condenser—and forms a hydroxide, with increased leakage under shelf conditions. Still further and due to the fact that the state of the mixture and solution will vary from precipitation to solution, from time to time, the degree of ionization and the character of the path of free ions will change and thus alter the leakage and life conditions.

Intensive research extending over several years has enabled us to evolve a single chemical that acts as an ideal electrolyte. Since a single material has no tendency to separate or precipitate, or otherwise change its characteristics chemically or physically, this new electrolyte has been found to maintain uniform conditions as regard ionization, path of these ions, and specific resistance. This means that leakage remains constant and low, capacity is constant, and service life is readily predetermined. Conditions of

manufacture and operation become ideally uniform.

It has been found, further, that the new electrolyte, which in thin sheets tends to be a resinous-like film, does not dissolve the oxide coating on the metallic plates, but rather tends to improve such coating.

Electrolytic condensers made with this new electrolyte indicate several important characteristics:

1. Increase of peak voltage during life.
2. Self-healing properties.
3. Ability to operate at voltage above foil formation voltage.
4. Unusually low leakage.
5. Permanent uniformity.

The average electrolytic condenser must be operated at a considerably lower voltage than that at which its foil was formed. For instance, a 450 working voltage condenser is usually formed at 575 volts, and is said to have a peak surge voltage of 525. By way of comparison, a condenser with the new electrolyte and a foil formed at 510 volts can be safely operated at 525 volts. Condensers of 8 mfd. capacity, so made, have been operated with leakage far below the usual tolerance, and have indicated a peak of 550 volts and higher. Samples have been operated even at 600 volts—not mere flash voltage or instantaneous peaks, but sustained voltages for a reasonable period of time. Such tests indicate that the new electrolyte adds to dielectric strength.

A long period of testing has indicated that a condenser with say a 510-volt foil will, when new and unaged, have a peak voltage of about 475 with, of course, a high leakage. After an aging of only 30 minutes, its peak voltage will be in the neighborhood of 490 to 500. After a few hours aging at say 450, this peak will mount to 525 volts. Further aging or use or even shelf life will increase this peak for 510 volt foil to 550 volts peak. Tests made by impartial radio engineers indicate that the condenser could actually operate under a steady 550 volt load and show a leakage of 1.0 milliamperes for an 8 mfd. 450-volt section. The drop in capacity that would normally be expected in such an increase in peak does not take place. A condenser measuring 8.3 mfd. will decrease to 8.2, or at most 8.1, and then will remain constant; but the peak voltage apparently increases until some of the old-

(Continued on page 22)

NEW — 1935 ALL-WAVE SETS



"Western made for Western Reception"

FORWARD, AMERICA!

(Continued from Page 12)

who were frozen out by the chains, the owners of these stores are deprived of their income, part of which we, the radio technicians used to get for service work.

And don't forget, the independent merchant who faces extinction will carry with him every jobber, wholesaler and small manufacturer.

Now you ask, what can we do about it? I'll tell you. First, discourage everyone you come in contact with from buying any merchandise whatsoever from chain stores. Instill in them the necessity of dealing with the independent merchant if they themselves wish to survive. Secondly, use every legal means within your power to keep those with whom you have influence from buying any merchandise whatsoever made by a manufacturer who dumps part of his product through a chain store outlet.

Thirdly, support those candidates for public office who will pledge themselves to tax the chain store out of existence.

Fourthly, support the independent manufacturer against the monopoly with all the strength you have.

TRIPLE-SEALED CARTRIDGE CONDENSERS

Startling moisture-proof qualities are claimed for Aerovox triple-sealed cartridge condensers. Originally introduced some time ago by the Aerovox Corporation, this design was temporarily set aside in favor of the shorter, spun-over-end design because of space limitations in tiny AC-DC miniature sets then in the ascendency. With the return to full-sized sets and more critical electrical requirements, the triple-sealed condenser is re-introduced.

Being made available as rapidly as production schedules will permit, triple-sealed units are distinguished by: (1) Thorough wax-coating of the non-inductive section of selected paper and foil; (2) The use of a sturdy wax-impregnated tubing, with imbedded aluminum foil; (3) Liberal wax-sealed ends in place of usual spun-over ends. Foil lining was found impractical with the spun-over-end design. Although units with wax-sealed ends are more costly to make, the new units are being offered at no price advance.

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KFI 13TH ANNIVERSARY

Tuesday, April 16, Radio Station KFI celebrated its 13th Anniversary on the air. This station, having steadily improved its technical features, its quality of programs, increased its power and ever broadened its service to the radio public for the past thirteen years, is, we feel, due a unanimous vote of thanks and congratulation on the culmination of its thirteenth year of superb service. We salute you, KFI, and sincerely wish you the best of luck — may you progress as much during the next thirteen years as you have during the past!

RTSD NEXT MONTH

Beginning in the May issue of the "Technician" the Radio Technicians of San Diego will have a regular department devoted to activities and news of the border city association. Mr. D. W. Seibert, member of R.T.S.D. has been appointed to conduct the column. We know our readers will enjoy trading news and keeping advised of the progress and doings of our fellow technicians further south.

NEW TRIPLETT POWER LEVEL METER

The Electric Products Service, distributors and factory service for Triplett instruments, announce the addition of a new direct reading power level meter in the Triplett line. This instrument is mounted in a standard 3 1/2-inch bakelite case equipped with a rectifier type movement reading direct on the scale from minus ten db to plus six db with standard zero level, at 500 ohm line.

COMBINATION SET

The Melburn Radio Manufacturing Company offers a combination auto and house set of unusual design which will appeal to many dealers as a spring and summer special. It is a 5-tube super, built in an attractive table model cabinet and incorporating in its design a vibrator type "B" eliminator. The set may be operated from any 110 a.c. supply by simply plugging in the a.c. cord. Another cord and plug fits into a 6-volt socket for an automobile, motorboat or other place and permits instantaneous use of the set from this supply.

ELECTROLYTIC CONDENSER STUDIES

(Continued from page 20)

est condensers tested have attained a peak over 600 volts.

The rising peak voltage and constant capacity are important indications of probable service life. These features are directly attributable to the effect of the new electrolyte on the foil. Closely paralleling this effect is the high degree of self-healing which the new chemistry offers. Units have been overloaded beyond absolute peak and dielectric puncture has occurred; and reformed, without affecting leakage, capacity or power factor, sometimes even without the voltage being lowered to its proper peak. This has been repeated on some condensers as many as 30 times, after which the condensers have remained satisfactory operating units. This self-healing of course will not take place if the amperage or power discharged through the condenser is of such high order as to destroy completely a considerable amount of foil. The self-healing feature is also attributable to the new electrolyte.

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A NEW COMPLETE OSCILLOSCOPE

The Electric Products Service, distributors and factory service for Clough-Brengle equipment, will soon have in stock the new Clough-Brengle Oscilloscope Servicer Unit. This unit will consist of a cathode ray tube, power unit and linear sweep oscillator together with the Clough-Brengle signal generator, with built-in frequency modulator. With this unit the service man will be able to accurately balance both radio frequency and intermediate stages of a receiver, and show the customer directly on the screen the selectivity curve of the receiver before and after it has been serviced. He can use it in checking the individual performance of each individual stage in the receiver, locating sources of distortion, intermittent reception and causes of fading, and hundreds of other tests.

X LICENSE APPLICATION

Ben S. McGlashan, owner and operator of Radio Station KGFJ, has applied to the Federal Communications Commission for a general experimental license to cover operation of a Portable-Mobile one hundred watt transmitter. The application requests permission to operate on 31,100, 34,600, 37,600, and 40,600 K.C.

METAL TUBES

RCA Radiotron announces a new line of metal radio tubes which will probably be available to the trade July 1. The tentative plan is that there will be ten types of tubes of all-metal construction to fill the entire need of radio receiving set design. These tubes are approximately 1 1/4-inch in diameter, measuring anywhere from 1 1/2 inch to 3 inches high, depending upon the type. They will employ an entirely new and different type of base than the present type or types. Some of these new tubes employ an 8-prong base. In the center of the prongs there is a sizable round projection equal in length to the prongs, apparently for the purpose of making insertion in sockets easier.

By the oil bubble test Dr. Ervin Langmuir was able to develop films only a single molecule in thickness. His findings show that the molecules oriented themselves so that their heads were always down.

DRESSEN WITH RADIO SPECS

Don Dressen, actively engaged in radio engineering in Southern California for a number of years, is now connected with the Radio Specialties Company at the Los Angeles store. Don's consultation will be available to all those in the field, who have peculiar or difficult problems which they find hard to solve.

RADIOTONE RUSHED

The Radiotone Recording Co. of Hollywood reports that business has been so good of late that the personnel finds it almost impossible to keep production anywhere near demand. This company produces a complete line of home, studio and portable recording units and accessories.

TRIOPH POPULAR

The new model 400 Triumph tube tester has met with enthusiastic acceptance by the trade. The improved signal generator using a new airplane dial and directly calibrated from 100 k.c. to 30 megacycles is proving even more popular than the former model. It has been accepted extensively by manufacturing concerns and laboratories. Triumph gives advance notice of two new instruments which will be announced shortly after May 1.

PACKARD-BELL AUTO SET

The Packard-Bell Company announces a new 5-tube superheterodyne auto set, giving exceptional performance at a surprising price. The tube equipment of the set is 6A7, 6D6, 85, 84, 42. First-class parts and construction are used throughout and the list price makes it an attractive specialty for the spring and summer months.

SPEAKING OF PUBLICATIONS

At a newspapermen's convention one of the guests proposed the following toast: "Women! Second only to the press in the dissemination of news!"

Fifty years ago the first electric street railway in the United States was opened by Frank J. Sprague, September 1, 1885, at Baltimore, Maryland.

Two scientists of the Carnegie Institute, G. R. Wate and A. G. McNish, found an increased amount of radium in the air near the earth to be concomitant with thunder storms.

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NEW Master Craftsman's Set—17 useful accessories to grind, drill, polish, sand, cut, carve, engrave, etc. . . . Prepaid \$5.00.

For shop, home or tool kit. (Model A), A. C. or D. C. operation, 110v., 13,000 r. p.m. Order on 5-day trial. Satisfaction guaranteed.

Chicago Wheel & Mfg. Co.
112 SOUTH ABERDEEN STREET CHICAGO, ILL.

CAN YOU AFFORD To Deprive Your Business of TRIUMPH EQUIPMENT?

MODEL 400 Tube Tester

A searching "three way" test of tube performance. Tests Emission—dynamic mutual conductance—leakage. Separately tests diode and triode sections of multi-purpose tubes.

"HOT" NEON LEAKAGE TEST

Sensitive foreign broadcast receivers particularly MUST have quiet tubes. High resistance inter element leakage causes noise. The Triumph "neonized test" checks every tube element separately for leakages—even as high as five megohms.

GOOD OR BAD

Your customer can see immediately if his tubes should be replaced. The meter is plainly marked "Good" and "Bad," with no doubtful area. The neonized test is also clearly marked for customer's understanding.

UNPRECEDENTED

Never before has a dynamic mutual conductance tester, with so much appearance and tube sales ability, been offered at this low price.

California Counter or
Net Price **\$36.20** Portable

MODEL 110 Signal Generator

Direct reading vernier airplane dial. Calibrated from 100 K.C. to 30 Megacycles in two colors.

Individual alignment frequencies spotted in contrasting color.

Genuine, four step, T pad attenuator. Output power variable, zero to 500,000 microvolts, through reversible plug.

Attenuator graduated in approximate microvolts.

Electrostatically and Electromagnetically shielded and filtered for attenuation to zero.

Self-compensated, electron coupled oscillator, modulator guarantees stability at all frequencies.

400 cycle audio for 40% modulation, also separately available for Audio or P.A. work, fully attenuated.

Unmodulated carrier at the snap of a switch for heterodyning, microphonics tests, etc.

Powered by 110 volt A.C.—No Batteries, No Hot Resistance Cords—consistently dependable output power.

No one but Triumph has thought of putting the common test frequencies in color for easy reference—but here they are—175 K.C.—262 K.C. 456 K.C. I.F. and 600 K.C.—1000 K.C. and 1400 K.C. at broadcast. All are specially marked for ready tuning and quicker, lower cost repairs—a convenience you'll appreciate more, the more you use it.

California Net Price **\$31.25** Complete

Write for Your FREE Copy of the

TRIUMPH SIGNAL GENERATOR HAND BOOK and SHOP NOTES

TRIUMPH MFG. CO., 4017 W. Lake Street, Chicago

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PACIFIC RADIO EXCHANGE

M. D. EALY

DISTRIBUTORS, INC.

ELECTRIC PRODUCTS SERVICE

WESTERN RADIO & ELECTRIC CO., San Diego

COAST ELECTRIC CO., San Diego

California Representative:

NORMAN B. NEELY, 1656 North Serrano Street, Los Angeles

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(Continued from page 10)

another paragraph stands out as worthy of mention. "Under the Agency Plan, no longer will it be possible for merchants to use the famous Cunningham-Radiotron brand as a 'Price Loss Leader.' The Agency Plan gives us control over our product. The list price becomes the sale price. This means protected profits for you."

In a letter addressed to all RCA Radiotron Retail Agents, dated March 25, 1935, just eleven months after publication of the above statements, formal notice is given of termination of agency appointments. The following excerpts from this letter are worthy of consideration: "Nearly one year's experience with consigned stocks and agency selling has proven that the great majority of dealers prefer to buy radio tubes outright and prefer to avoid the nuisance of consigned stocks and monthly reports." and "our utmost endeavor will be exerted to bring about greater public demand and better market conditions. The new list prices effective March 21 and April 1 place our dealers in a stronger position to expand their renewal tube sales." It further states, "Your wholesaler has new and attractive prices to quote you—prices that mean larger profits for you. May I count on your active, aggressive sales effort?" This letter is signed by E. T. Cunningham.

TUBE CHECKERS

— and —

SET ANALYZERS

Repaired or Rebuilt—

All types of instruments
Repaired or Calibrated
Shunts or Multipliers made up

for any instrument

PROMPT — ACCURATE
RELIABLE SERVICE

Authorized Service Laboratory
for Weston Electrical
Instrument Corp.

Quality Electric Co.

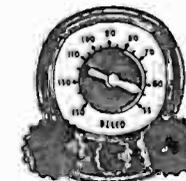
Tel. TRinity 5981

812 S. San Pedro Los Angeles

Only DELCO AUTO RADIO HAS SYNCHRO- TUNING

DELCO Radio Engineers have again developed an outstanding feature in Auto Radio—Delco Synchro-Tuning. Only Delco Auto Radios have Synchro-Tuning. Silent, smooth, positive, efficient, powerful—all of this and more describes Synchro-Tuning which only a demonstration will reveal.

FOR YOUR CAR



DELCO RADIO

Wherever you drive, whether it be a trip across the country or a short trip about town, you will get the best in radio reception with the 1935 Delco Auto Radio.

There are four new models from which to choose. They are priced to meet the purse of everyone.

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Electric Products Service

1358 S. Grand Ave. PR-3681

A. PAUL JR. AMBUSHED

The mysterious gunman who fired from ambush upon A. Paul Jr., president of the Certified Radio Technicians Assn., and owner of the Technical Service Laboratories, at 7:30 P. M. April 1st, has not yet been apprehended. Mr. Paul was on his way to preside at a protest meeting regarding recent radio tube price reductions and was just turning onto the ten hundred block of South Hudson Street preparatory to stopping at the home of Mr. Thomas B. Pritchard, Arcturus Radio Tube representative. Immediately after rounding the corner a bullet whizzed through the front of the car wounding Mr. Paul on the nose. Fortunately the wound was only slight and Mr. Pritchard was able to administer first aid at his home. Mr. Paul is at a loss to explain the incident.

DYNAMIC MIKE

The Universal Microphone Co. is now producing a dynamic microphone. The instrument, according to the factory, is primarily recommended for use where complete freedom of trouble from rough handling, damp atmosphere and unusual climatic variations make it necessary to utilize a microphone with extreme ruggedness and wide angle pick-up. Only one stage of preamplification is needed for ordinary use. Bass is obtained through side venturi tube with screw cap. High frequency adjustment is provided in the diaphragm dome spacer. The permanent magnets are made of the highest grade of cobalt steel. A matching transformer is also available.

DAY RAD Radio Service Equipment

Represented by FRANK A. EMMETT CO. 1341 South Hope St. Los Angeles, Calif. Richmond 6301

SAFETY plus every NEW REFINEMENT



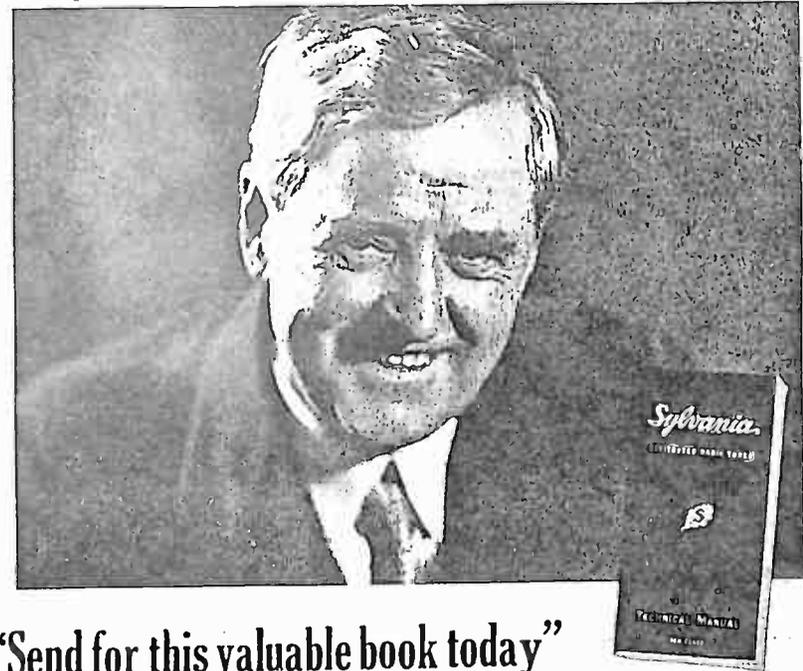
MAKES GRUNOW THE OUTSTANDING VALUE OF 1935.



You'll like these new Grunows. They're beautiful and they're safe with Carrene that you can see, smell and hold in your hand without danger or inconvenience. We have a style and a price that will suit you.

Distributed by Watson & Wilson, Inc. 711 MITCHELL PLACE Los Angeles

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"Send for this valuable book today"

You may be an old timer in radio or the field may be a new one for you. It doesn't matter. We believe you'll find that this latest Sylvania Service booklet will come in mighty handy in helping you with your work.

It contains 104 pages of real information... descriptions of various tubes, each with its circuit application. It also includes diagrams showing plainly a lot of problems that may come up in your work... and how to solve these problems.

With the help of this pocket manual, you'll find fewer "blind alleys"... fewer times when you're up against it. That's why we say that this book will actually put money in your pocket... money that you wouldn't be able to get if you didn't know how to get around these troubles.

Send for it today... you'll feel like patting yourself on the back, once you've seen how useful it is... how crammed with information that will help you take the guess work out of tube application. Don't wait! It's yours for 10c in stamps.



HYGRADE SYLVANIA CORPORATION Makers of Sylvania Tubes, Hygrade Lamps. Factories at Emporium, Pa., Salem, Mass., and St. Mary's, Pa.

10c TECHNICAL MANUAL 10c

HYGRADE SYLVANIA CORPORATION Emporium, Pa.

Please send me the new Sylvania Technical Manual. I enclose 10c in stamps.

Name Address City State

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DAYRAD Radio Service Equipment

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FRANK A. EMMETT CO.
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Los Angeles, Calif.
Richmond 6301

SAFETY

plus every NEW
REFINEMENT



MAKES GRUNOW THE OUTSTANDING VALUE OF 1935



You'll like these new Grunows. They're beautiful and they're safe with Carrene that you can see, smell and hold in your hand without danger or inconvenience. We have a style and a price that will suit you.

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Take a Tip from an Old Timer



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You may be an old timer in radio or the field may be a new one for you . . . It doesn't matter. We believe you'll find that this latest Sylvania Service booklet will come in mighty handy in helping you with your work.

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The Set-Tested Radio Tube.

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FUTURE FEATURE

Be sure to watch the May issue of the "Technician" for a very interesting and informative article entitled "The Radio Fellowship," by Frank D. Andrews, short wave commentator and originator of "Around the World Radio News," presented over KFI every Thursday evening at 11:30 o'clock. This article will be of general interest and particularly interesting to readers who are interested in world-wide all wave radio reception.

NEW PETER PAN

The Peter Pan Radio Company announces the development and manufacture of a new 5-tube super as a summer special for radio dealers. This new set is housed in a beautiful table model cabinet with new style airplane dial and uses the latest type tubes in a very efficient circuit. Hardly more than announced, it is already very popular with dealers, who report that it fills a spot in the low-priced field, which means many sales.

RADIO SPECS TAKES PHILCO

Radio Specialties Company announces its appointment as an authorized distributor for genuine Philco Replacement Parts and Aerial Kits. The company carries a complete stock of Philco Parts for all replacement purposes and solicits your inspection of the line.

R. P. S. MOVES

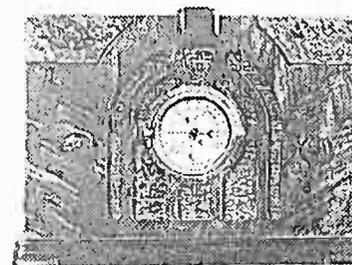
Radio Products Sales Company, operated by C. F. (Charlie) Sexton, and located on Hill Street near Pico for a number of years, has recently moved into new and more spacious quarters at 238 W. 15th Street. Coincident with this move the firm has added many lines to its already extensive stock and offers the wholesale trade a complete line of radio replacement and component parts, radio sets, kits and cabinets. A special celebration bulletin has been issued—ask for yours. Charlie invites your inspection of the new location and his complete line of merchandise.

A monument crediting Nathan B. Stubblefield with having been the first to broadcast the human voice by Radio, was dedicated on March 28, 1930, at Murray, Kentucky. This man made his first public demonstration in 1902 after ten years of experiments.

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R.C.A. LICENSED

ALL LATEST 6-VOLT TUBES

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