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The ORIGINAL complete line of Exact Duplicate Replacement Vibrators Offers You a Golden Opportunity!

Radiart engineers have prepared a complete six months' correspondence course on auto radio power supply circuits which covers 90% of all auto radio servicing. To all authorized radio service men the cost of this course is only 25c to cover the cost of mailing and handling.

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THE RADIART CORP.,
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Cleveland, Ohio

I enclose 25c to cover the cost of mailing and handling. Please enroll me in your correspondence course on auto radio servicing. I understand that this is a complete six months' course.

Name.....
Address.....
City..... State.....
My Jobber is.....
.....

« THE » "TECHNICIAN"

MAY, 1935

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Excellent Parking Facilities Away from the Congested Downtown Area

National Union Service

To the Dealers who are selling National Union Tubes, the service which National Union Radio Corporation has given them has been a big factor in helping them establish and maintain their service shops as the finest equipped shops in their communities.

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in the promotion of finer shops for radio service men. Up-to-date libraries covering all phases of technical information should be in every serviceman's store. National Union will furnish this to you. You can also have the newest of tube testers, analyzers, oscillators and other equipment which will help you to make your store one of the best.

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All The Nationally Known Makes of

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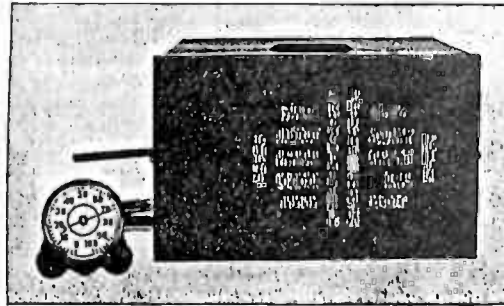
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A Powerful 5-tube Super-heterodyne.

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Lowest battery drain of any auto radio on the market.

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Beautiful remote control mounted on either steering post or instrument panel of car. One 6A7, one 6D6, on 75, one 84, one 41 first grade licensed tubes. Weight, 16 pounds net.

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DeLuxe Model
with tone control

\$2995

6-Tube
De Luxe Model

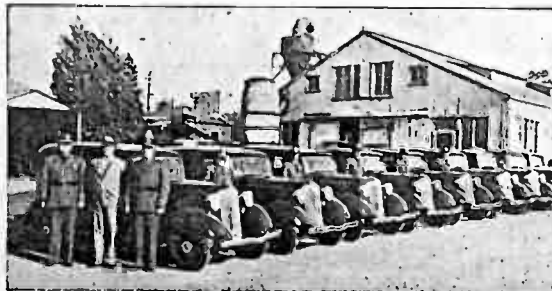
\$4950

Five Years of Auto Radio Engineering is why MISSION BELL is the best for Western reception and use in Los Angeles Sheriff's patrol cars 24 hours every day. We were the first to manufacture "B" battery eliminators and all-electric auto radios. These new models still LEAD in new features.

Thousands of Satisfied Customers is your best reason for selling MISSION Auto Radios. And also, nearly all of the largest sellers of Auto Radios in Los Angeles sell MISSION BELLS, which is your guarantee of the highest quality radio. All Models licensed by R. C. A. and carry the standard R. M. A. 90-day warranty.

All Patrol Cars of the L. A. Sheriff's Office Are Equipped with Mission Police Radio Receivers

Partial fleet of Los Angeles Sheriff's Patrol Cars that are equipped with Mission Police Radio Receivers. These cars give protection to thousands of residents of Los Angeles County, and must be equipped with radio sets that may be depended upon in emergencies, and that's why MISSION-BELL auto radios were selected.



These units have been in constant use for almost 2 years. To what more gruelling and excruciating punishment can any auto radio be subjected?

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The "TECHNICIAN"

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

A. PAUL, Jr., President

JOHN A. ORME, Vice-President

FRED KNOWLDEN, Secretary-Treasurer

NORMAN B. NEELY

Editor - Manager



1656 N. Serrano Street
Los Angeles, California

\$1.50 Per Year

15 Cents Per Copy

Vol. 11

May, 1935

No. 9

EDITORIAL

By The Editor

Listener Interest

We have all been inclined to bemoan business conditions in general, and those in the radio industry in particular. In addition to general complaint, some of us may claim credit for conscientiously and sincerely trying to devise means and methods of improving the radio business and elevating the position of service technicians to the professional standing which they deserve.

Past experience should have taught us that the most logical and effective way of attacking any problem is to consider fundamentals and endeavor to effect improvement by influence on underlying factors rather than by futile discussion of results.

Therefore, let us consider what effect we can have upon the most fundamental, underlying and determining factor in the activity of our radio business—listener interest! After all, it is most apparent that the extent of listener interest in the available programs is the all-important controlling factor in influencing these listeners to purchase and maintain radio equipment, the sale and service of which is our livelihood.

Service technicians and dealers would do well to seriously consider how they may stimulate listener interest by offering tips on outstanding programs, broadcast schedules, station locations and other useful information. This is more than ever true with the ever increasing interest in all wave reception. Every serviceman and dealer should keep himself well informed as to where, when and what to listen for on the short waves and be prepared to discuss this information with his customers. On the broadcast band there are many outstanding programs and many last minute changes

in schedule which the customer will appreciate having pointed out. Take full advantage of this opportunity to make all radio owners more program-conscious—encourage them to write their favorite stations, offering helpful suggestions and criticism of their favorite programs. Only by this expression of interest from the listeners, can the broadcast stations intelligently plan programs which will please the greatest number of their regular listeners.

Those radio owners who particularly enjoy fine music will undoubtedly be customers for high fidelity sets or modernization service if they can be made to realize that many excellent programs of high-class music are available. Many owners of radio equipment, who are potential customers for service work, neglect to have their radios properly maintained due to waning interest in the programs which they seem to be able to find. By intelligent investigation and selection, it is possible for nearly every taste to be fitted, nearly every hour of the day with the wide variety of programs available. Analyze your customers and their tastes in programs and music. Then take the trouble of considering just what programs would be most likely to please them, inform them of your findings and remind them frequently of new or special programs which you feel would interest them.

The broadcast stations will undoubtedly appreciate this effort on your part and will make even greater efforts to improve the quality and acceptance of the material presented over their stations. Write a letter to leading stations

(Continued on Next Page)

LISTENER INTEREST

(Continued from Page 5)

outlining your findings amongst your customers and asking their cooperation in meeting what you have found to be the greatest demands. These stations will be quick to realize that you in the field have a far better chance to determine the wants of their listeners than they. They will also realize that the more completely they can please their audience, the more in demand will their advertising time be and the greater will be their income therefrom.

Everyone in the industry will be benefited by any increase in general listener interest—the service technician, dealer, wholesaler, parts jobber, factory agent, manufacturer, broadcaster, program sponsor, entertainer, engineer and the public. Is not the possibility of improving conditions and helping all these agencies worth your sincere effort aside from the fact of improving your own immediate condition?

This matter of creating greater listener interest should not be passed over lightly. It is a subject with many ramifications and cannot be adequately discussed in this space. However, if by a few random suggestions, your interest can be aroused and you are made conscious of the tremendous importance of the activity in this direction, we will feel that our effort has been very successful.

TROYS POPULAR

The new and complete line of Troy Radio sets, covering all types of receivers, is proving quite popular with the trade. A catalog, giving complete information on all of the thirty-three models is available for the asking.

NEW CLOUGH-BREngle OSCILLOGRAPH

"NOW IN STOCK"

All Latest Types Test Equipment and Instruments

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ELECTRIC PRODUCTS SERVICE

1358 South Grand Ave., Los Angeles

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THE BAY CITIES ORGANIZE

On Tuesday, May 14th, 1935, a number of technicians from the Santa Monica Bay area were called together to discuss the proposed licensing ordinance of Los Angeles and the possibility of a similar ordinance for Santa Monica.

Following this the chair called for suggestions as to a name and the Bay Cities Radio Technicians was selected. The chair called for an election of officers and the following were elected: Jim Hester as President; Henry James as Vice-President and Robt. L. Sperry as Sec.-Treas. It was agreed to meet twice each month, on the second and fourth Tuesdays.

The ordinance committee was given the proposed Los Angeles ordinance and told to go to work. A committee was named to contact the absentees and another committee named to get publicity in the Santa Monica Outlook.

It was decided that the dues would be twenty-five cents per month for the time being and this was collected by Mr. Sperry.

(Editor's Note: Watch the "Technician" each month for personals and reports of activity from this progressive group. We congratulate them).

DUBILIER ABROAD

William Dubilier, distinguished American radio inventor, who is vice-president in charge of research of the Cornell-Dubilier Corporation, of New York, left during the early part of April for a two-month tour of Europe. He will visit the firm's British and continental affiliates, make first-hand observations of engineering progress in half a dozen countries and pay particular attention to television developments in Great Britain and Germany.

THE RADIO FELLOWSHIP

By FRANK D. ANDREWS

The "AROUND THE RADIO WORLD NEWS" program presented by the writer over KFI at 11:30 P. M. each Friday night has many references to radio associations and clubs located in many sections of the World. Few people beyond the membership of these associations know the functions and purposes for which they have been organized. When these associations were first organized, some eight or nine years ago, it was for the purpose of arranging special programs on various stations in the United States at a time of the night when there was no interference with them. These programs were publicized by the association or club throughout the World with a card or letter so distant listeners might know when and where to turn the dial. The stations derived a benefit in that they received reports on their transmissions from points they did not realize they reached, and this gave them the incentive and opportunity to improve their coverage.

The radio club idea has expanded to a combined circulation of over a million. One prominent club on the East coast with membership in every state of the U. S., every province of Canada and

38 foreign countries publishes a monthly magazine and a weekly bulletin of radio developments as reported by members from all parts of the world. During February, 1935, this club arranged several special broadcasts from radio station LR5 RADIO EXCELSIOR, Buenos Aires, the Argentine, to establish international good-will. One program fell on Lincoln's birthday and station LR5 broadcast a story of the life of Lincoln as arranged by Mr. Dale Carnegie, of the National Broadcasting Co., N. Y. A marvelous tribute for a foreign country to pay the U. S. Reports were received by LR5 from every state of the U. S. and many other countries. A special international good-will program was broadcast by WABC New York, in December, 1934, and 23 foreign countries responded.

THE INTERNATIONAL DX'ERS ALLIANCE is one of the foremost radio clubs in the world with headquarters in Bloomington, Ill. Mr. Charles A. Morrison is the President and organizer. This club publishes a monthly magazine with a large circulation among its members which are scattered in every state of the U. S., every province in Canada and

(Continued on page 11)

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Aerial Kits

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TUBE PRICE CHART

The following is a comparative and ready reference chart of the advertised list prices of seven leading brands of radio tubes. Authority for publication and price lists were secured from authorized representatives of the companies.

This chart has been prepared for the guidance of readers of the "Technician" in readily and quickly determining the existing list prices of all types of radio tubes as maintained by the various companies.

Type	Nat'l. Union	Arcturus	Raytheon	Ken-Rad	Tung-Sol (West Coast)	Sylvania	RCA
OOA	\$1.35	\$	\$1.35	\$	\$1.35	\$	\$1.25
O1A	.69	.70	.65	.59	.70	.70	.59
O1AA	.79						
1A6	1.35	1.35	1.35	1.25	1.35	1.35	1.25
1C6	1.60	1.60	1.60	1.50	1.60	1.60	1.50
1V	.99		1.00	.89	1.00	1.00	.89
1					1.00		1.25
2A3	1.35	1.35	1.35	1.25	1.35	1.35	1.25
2A3H			1.35	1.25			
2A5	1.09	1.10	1.10	.99	1.10	1.10	.99
2A6	1.09	1.10	1.10	.99	1.10	1.10	.99
2A7	1.35	1.35	1.35	1.25	1.35	1.35	1.25
2B7	1.35	1.35	1.35	1.25	1.35	1.35	1.25
5Z3	.99	1.00	1.00	.89	1.00	1.00	.89
6A4	1.35		1.35	1.25	1.35	1.35	1.25
6A6	1.35	1.35	1.35	1.25	1.35	1.35	1.25
6A7	1.35	1.35	1.35	1.25	1.35	1.35	1.25
6B7	1.35	1.35	1.35	1.25	1.35	1.35	1.25
6C6	1.09	1.10	1.10	.99	1.10	1.10	.99
6C7		1.90					
6D6	.99	1.00	1.00	.89	1.00	1.00	.89
6D7		1.75					
6E6	1.70			1.60			
6E7		1.75					
6F7	1.60	1.60	1.60	1.50	1.60	1.60	1.50
6Y5		1.90	1.35		1.35		
10	2.10	2.10	2.10	2.00	2.10	2.10	2.00
11							1.25
12							1.25
12A	.79	.80	.75	.69	.80	.80	.69
12A5	2.20		2.20	2.10	2.20	2.10	
12A7	2.30	2.20	2.30	2.20	2.30	2.20	
12Z3	1.09	1.10	1.10	.99	1.10	1.10	.99
12Z5		1.50					.99
15	2.95		2.95	2.85		2.00	
18						2.00	
19	1.09	1.10	1.10	.99	1.10	1.10	.99
20	1.09		1.10	.99	1.10	1.10	.99
22	1.35	1.35	1.35	1.25	1.35	1.35	1.25
24A	.99	1.00	1.00	.89	1.00	1.00	.89
25Z5	1.09	1.10	1.10	.99	1.10	1.10	.99
26	.69	.70	.65	.59	.70	.70	.59
27	.79	.80	.75	.69	.80	.80	.69
30	.79	.80	.75	.69	.80	.80	.69
31	.79	.80	.75	.69	.80	.80	.69
32	1.35	1.35	1.35	1.25	1.35	1.35	1.25
33	1.09	1.10	1.10	.99	1.10	1.10	.99
34	1.35	1.35	1.35	1.25	1.35	1.35	1.25
35/51	.99	1.00	1.00	.89	1.00	1.00	.89
36	.99	1.00	1.00	.89	1.00	1.00	.89
37	.79	.80	.75	.69	.80	.80	.69
38	.99	1.00	1.00	.89	1.00	1.00	.89

(Continued on page 10)

ORIGINATORS OF PRACTICAL RADIO ENGINEERING INSTRUCTION

Did You Ever Stop to Notice That The Good Men in Radio Have Good Jobs!

Those men who DESERVE jobs . . . HAVE jobs . . . but today, more than ever, it's TECHNICAL TRAINING that paves the way for a real future in Radio. A thorough technical education combined with your own experience will equip you to take advantage of every opportunity to advance yourself.

Our Courses Are Not Written For Just The "Average" Man.

You men of the CRTA will appreciate the high standards of the CREI home-study and residence courses. Why not discuss your enrollment with Mr. Guilford, or if you prefer, write direct to Mr. Rietzke, President, in Washington. Both will be glad to answer all questions and show how our courses can "dovetail" with your present work.

Write for Free 44-Page Catalog



Capitol Radio Engineering Institute

Dept. T-5

14th and PARK ROAD, N. W. WASHINGTON, D. C.

California Representative:

EDWARD H. GUILFORD

315 W. Lomita St., Glendale, Calif.—DOuglas 777

Mr. Guilford, member of CRTA, will be glad to be of assistance to you in answering inquiries and describing courses.

TUBE PRICE CHART

(Continued from page 8)

Type	Nat'l. Union	Arcturus	Raytheon	Ken-Rad	Tung-Sol (West Coast)	Sylvania	RCA
39/44	.99	1.00	1.00	.89	1.00	1.00	.89
40			.75		.80		.69
41	.99	1.00	1.00	.89	1.00	1.00	.89
42	1.09	1.10	1.10	.99	1.10	1.10	.99
43	1.09	1.10	1.10	.99	1.10	1.10	.99
45	.79	.80	.75	.69	.80	.80	.69
46	1.09	1.10	1.10	.99	1.10	1.10	.99
47	.99		1.00	.89	1.00	1.00	.89
48	2.60		2.60	2.50	2.60	2.60	2.50
49	1.09		1.10		1.10	1.10	.99
50	2.60	2.60	2.60	2.50	2.60	2.60	2.50
52			1.70				
53	1.35	1.35	1.35	1.25	1.35	1.35	1.25
55	1.09	1.10	1.10	.99	1.10	1.10	.99
56	.79	.80	.75	.69	.80	.80	.69
57	.99	1.00	1.00	.89	1.00	1.00	.89
58	.99	1.00	1.00	.89	1.00	1.00	.89
59	1.35	1.35	1.35	1.25	1.35	1.35	1.25
64	2.90						
65	2.90						
67	1.90						
68	2.90						
71A	.79	.80	.75	.69	.80	.80	.69
75	1.09	1.10	1.10	.99	1.10	1.10	.99
76	.79	.80	.75	.69	.80	.80	.69
77	1.09	1.10	1.10	.99	1.10	1.10	.99
78	1.09	1.10	1.10	.99	1.10	1.10	.99
79	1.35	1.35	1.35	1.25	1.35	1.35	1.25
80	.69	.70	.65	.59	.70	.70	.59
81	2.10	2.10	2.10	2.00	2.10	2.10	2.00
82	.99	1.00	1.00	.89	1.00	1.00	.89
83	.99	1.00	1.00	.89	1.00	1.00	.89
83V	1.60		1.60	1.50	1.60	1.60	1.50
84/6Z4	1.35	1.35	1.35	1.25	1.35	1.35	1.25
85	1.09	1.10	1.10	.99	1.10	1.10	.99
89	1.09	1.10	1.10	.99	1.10	1.10	.99
99V	1.09	1.10	1.10	.99	1.10	1.10	.99
99X	1.09	1.10	1.10	.99	1.10	1.10	.99
WD-11			1.35				
WX-12			1.35				
AF		1.80					
AG		2.05					
GA		2.75					
PZ		1.00					
PZH		1.60					
182B						1.65	
183					1.60	1.65	
257					2.60		
482B		1.65					
483	1.75	1.65					
485	1.55	1.45					
864				1.55	1.45		
874					1.60		
876							4.90
886							6.70
IB5-25S							6.75
BA		7.50		1.25			
BH		4.65					
BR		2.75					

Your Radio Sales Will Double With

PARAMOUNT RADIO

4 Tube Paramount.....Your Cost \$7.50

Works on AC or DC—Built-in Aerial—High Gain Coils—Etc.

5 Tube ParamountYour Cost \$8.95

Works on AC or DC—Dynamic Speaker—Built-in Aerial—Etc.

5 Tube Paramount (Aeroplane dial) Your Cost \$9.45

Also 6 and 10 Tube Models

COMPLETE PARTS STOCK AT NEW LOW PRICES

Transformers	Resistors	Condensers
Speakers	Volume Controls	Sockets, Etc.

LOS ANGELES RADIO MFGS. STORES

944 South Broadway

TUcker 7326

Open every night until 9 o'clock—Sundays 12 to 6 p. m., for your convenience

THE RADIO FELLOWSHIP

(Continued from page 7)

35 foreign countries. It has active membership of over 100 in Great Britain alone. Local clubs are formed known as Chapters in the large centers of population which operate under the parent organization at headquarters.

Recently the RADIO FELLOWSHIP was organized in the Hollywood, Beverly Hills, West Los Angeles district. Mr. Carl Haverlin of KFI, chairman of the By-laws committee, presented the by-laws at the first meeting on March 5th and after they were adopted, officers were elected. Mr. M. H. Ryder, of 258 Palm Drive, Beverly Hills, was elected Chairman, Mr. Howard V. Cote, of 144 Stanley Drive, Beverly Hills, was elected vice-chairman and Frank D. Andrews, Secretary-Treasurer.

The objects and purposes of this organization are to first render constructive progress in radio and help to make it a more enjoyable utility; to aid in the instruction of how the average listener may better enjoy distant and foreign broadcasts and to publicize and further the education of the subject generally in support of higher standards of radio communication and entertainment. The members propose to support legislation

to further aid in these undertakings and to eliminate unnecessary radio interference; support radio scientists, engineers and technicians, and in a body contribute generally to the advancement of radio reception and inspire friendly relations and international good-will.

Much thought has been given in the selection of a home and permanent headquarters for the RADIO FELLOWSHIP. One which will be of convenient access and yet a good radio receiving point removed from interference. A site has been selected which meets the requirements and funds have been raised to build and furnish the club buildings. These funds have been underwritten by the members themselves, no outside financial help being necessary.

Regular meetings are held on the first Tuesday of each month, but several features which will keep the club house active every night are contemplated. One of these will be code lessons, twice a week and lessons in Spanish twice a week. Technical demonstrations will be given by leading technical authorities in radio and kindred arts from time to time. This organization invites to its membership, radio and public-minded citizens to enjoy and do their part to add to the advancement and progress of the radio art.

What is the exact inductance of that coil?
 What is the exact resistance of that resistor?
 What is the exact capacity of that condenser?
 How is the power factor of that condenser?
 How bad is the leakage in that condenser?

卐 卐 卐

Is this condenser or that resistor or coil causing the trouble in a given stage or circuit?

卐 卐 卐

Can you answer all these questions easily, quickly, accurately, definitely and without substituting any parts? You can with Triumph's newest instrument!

卐 卐 卐

The new Triumph Model 500 Component Analyzer is truly the answer to a service technician's prayers—a dream come true!

卐 卐 卐

A real professional laboratory instrument, housed in a beautiful walnut finished instrument case with hinged cover—it is an instrument you will be proud to own—it is rugged, accurate and you will appreciate its convenience.

卐 卐 卐

Open and shorted parts show up instantly but in addition the Model 500 will show you actual values.

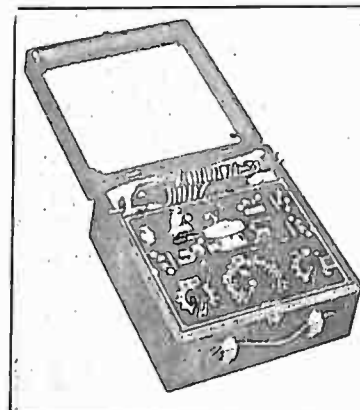
卐 卐 卐

Resistance from five ohms to two megohms—capacity from .00005 mfd. to 20 mfd.—inductance from 50 microhenries to 20 millihenries. ALL DIRECT READING.

卐 卐 卐

Binding posts are provided for external standards thus making easy the extension of the instrument's ranges.

Power factor can be shown as "GOOD" or "POOR" and leakage as "NORMAL" or "EXCESSIVE". Circuit continuity as high as four megohms may be checked. The instrument measures wet or dry electrolytic and paper condensers.



The Triumph Model 500 Condenser—Bridge—Analyzer measures 10" by 9¾" by 5¼". Weight packed for shipment is 10 pounds. Operates on from 100 to 130 volts, 50 or 60 cycle power supply. A compartment is provided in the case for carrying test leads, phones and accessories.

Let your jobber show you how the Triumph Model 500 will pay for itself on a few "tough jobs" by time, labor and expense saved and customer good will increased.

Never before has the service technician been given real laboratory facilities at a price compatible with service profits.

\$20⁹⁵

On The
West Coast

卐 卐 卐

KEEPING A PROMISE

Triumph stated that the Model 400 Tube Tester would not be obsoleted by ordinary changes in tubes. Triumph keeps this promise with the first "ORDINARY CHANGE" involving the introduction of ten new eight-prong all-metal tubes, to be announced to the trade July 1. Several weeks in advance of the availability of these tubes, Triumph is providing all owners of a Model 400 Tube Tester with test chart information and an eight-prong adapter ENTIRELY FREE OF CHARGE! It will only be necessary for owners to write to the factory giving the serial number of their instrument and information as to from whom it was purchased. The only expense will be postage charges.

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BOOK REVIEWS

How to Build It—Modern Mechanix Publishing Company, 529 S. 7th Street, Minneapolis, Minn.—50c. This is a 150-page book, giving helpful hints, construction details and shop notes of interest to all who work with tools and do any sort of construction. The book is divided into eight departments as follows: Autos and Trailers, Entertainment, Boats and Ice Craft, Model Building, Radio and Electricity, Work Shop Tools, Amateur Photography and Sports Equipment. The book contains 146 different projects and 379 illustrations. Detailed plans for construction, cover projects ranging from auto trailers and cabin cruisers to model stream line trains, all wave radio receivers, auto receivers, conversion of auto generators for all purposes and eerie effects for Halloween parties. It is recommended as a very handy reference manual for the constructor or handy man to have in his shop.

Inventors' Selling Guide by Raymond Francis Yates—Donley Publishing Co., 509 5th Ave., New York City—\$2. This book presents in convenient form vital information which previously has been available to inventors only at the expenditure of large sums for individual consultation and advice. With its valuable list of manufacturers who are in the market for inventions, it is a "where and how to sell" book which has been long needed by inventors. The author, Mr. Yates, is the author of twenty-two technical books, has been managing editor of "Popular Science Monthly," "Popular Radio," "Television" and is a regular contributor to the best known magazines throughout the entire world devoted to mechanics, science and inventions. His rich experience has proved to him that thousands of men, who may have perfected inventions potentially capable of yielding rich fortunes, are faced by risks and dangers which can easily rob them entirely of the fruits of their labors. In short, this book is full of vital, necessary information to any and all who have, may have, or desire to have any idea or invention of a patentable nature.

Mathematics—Calculations by Frank D. Graham—Theo. Audel & Co., 65 West 23rd Street, New York City—\$1.50. This is a handy pocket-size manual in flexible leather binding containing approximately 250 pages. The chief aim of the author in the preparation of this book is to present the subject in all its branches in a way so different from that usually em-

ployed, as to render a difficult subject not only easy but interesting. To master a subject, the student's interest must be aroused and to this end the author has exhausted every means of unusual and forceful presentation that he could use. The subjects are presented concisely and progressively to higher mathematics with calculations covering a great variety of important subjects. The general arrangement of the book comprises: principal divisions of practical mathematics with sub-classifications and illustrations presented in a step-by-step easily understood manner such as to arouse the interest of any student. Subjects included are Arithmetic, Plane Geometry, Geometrical Propositions, Geometrical Problems, Mensuration, Solid Geometry, Spherical Geometry, Descriptive Geometry, Analytical Geometry, Trigonometry, Algebra and Calculus. This book will prove itself valuable to beginners, technicians and mechanics as a reference and concise guide-in making calculations and solving problems in any branch of practical mechanics. It is so arranged as to offer immediate assistance in solving problems of the moment as well as a well planned progressive course in practical mathematics. It is sincerely felt that this manual cannot be too highly praised.

The Superheterodyne Receiver by Dr. R. H. von Liedtke—Radio Research Publications, Radio Research Bldg., Fort Wayne, Indiana—\$2.00. For many years the Radio Research Labs. under the direction of its chief engineer, Dr. Liedtke, has conducted a bureau of information for servicemen, amateurs, and engineers. Superheterodyne design and construction and the construction of component parts have been topics concerning which these laboratories have received many inquiries.

The contents of this book is the summary of fifteen years of research work in the design and construction of superheterodyne circuits and is presented in a language the average servicemen can understand; however, it should not be confused with explanatory works published to give information to the layman and novice.

The contents are quite technical in nature and really provide a source of fundamental theoretical knowledge as applied to practical application in the design of superheterodynes. At this time, when radio receiver circuits are becoming constantly more complicated and a thorough understanding of the fundamental theory of superheterodynes is very essential, this book is most timely and is highly recommended.

(Continued on page 19)



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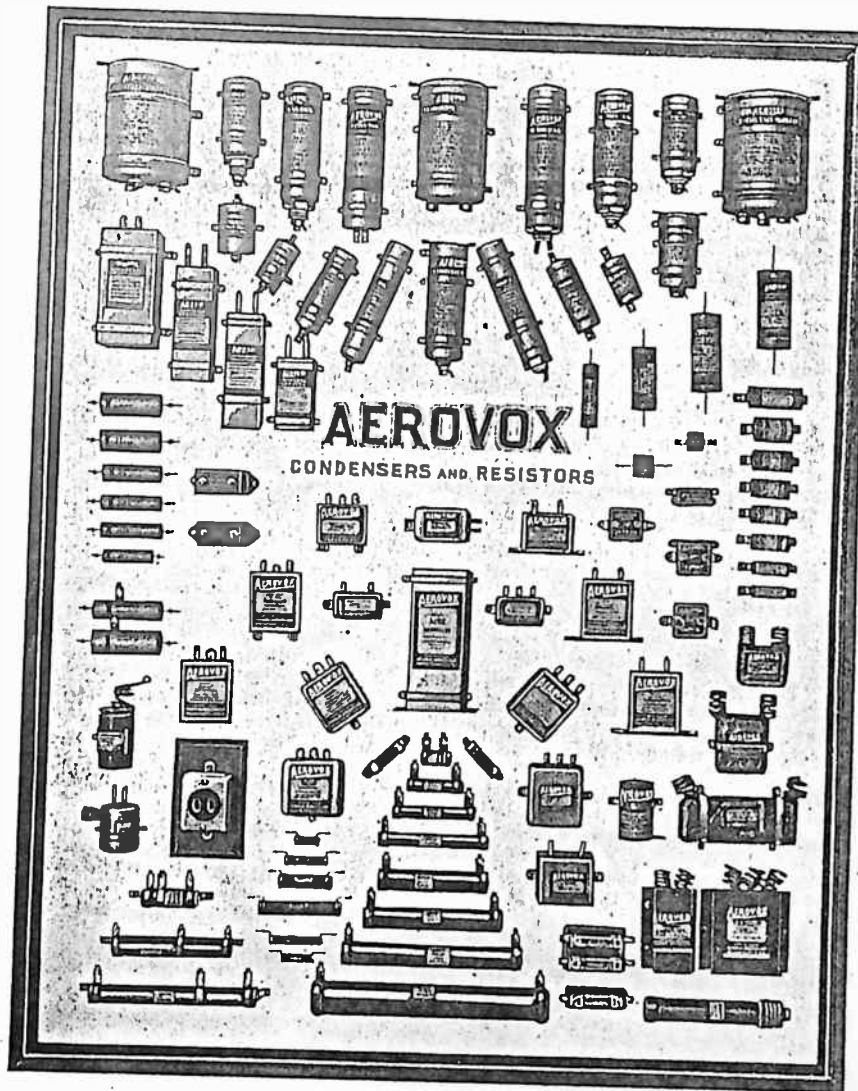
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TRAVELING THE TERRITORY WITH MILTON

Well boys, here we are again; another month, another dollar (we hope). So what?

Old Man Stork seems to be on the job again in this little radio colony of ours. Reports from the Bureau of Vital Statistics tell us that Richard Howard Hartman, born on May 5 at the age of 0 (weight 6 lbs. 1 oz.) will be the future owner of Hartman Radio Service. Sue us if we're not right, Julius!

And while vitally statistic-ating, let's give Wally and Mrs. Frederick a big hand. Yes indeed, little Tommy Frederick is the reason for all the congratulations sent to the local RCA representative, whose big broad smile has increased in due proportion. A future radioman or Congressman? Wally says to ask Mrs. Frederick!

For all sorts of trick gadgets on amplifying material we take our hat off to Pol Verbecke, of House Radio Service on Santa Monica boulevard. If in the near future you happen to see a sound truck running down the street with no driver at the wheel, don't pay any attention—it's just Pol's new remote control apparatus.

Those of you who are wondering what makes all these queer noises in a rumba orchestra would do well to spend a few minutes in Calderon's Music Store on North Main street. Of all the queer gadgets that are called musical instruments—boy, you ain't seen nothing yet!

The old Traveler takes this opportunity of saying hello to his friend Ronald Hope, now enroute to New York, who is bound for the King's Jubilee in England. Chief Engineer for Radio Station 7-HO in Australia, Ronnie stopped off in Los Angeles just long enough to be shown our orange groves and motion picture studios, after which he ate a hearty Southern California dinner a la Francaise. Mighty pleasant recollections, Ronnie!

All of Phil Johnson's friends will be sorry to learn of the auto accident which has confined Phil to a hospital for several weeks. Although badly missed in the service department at Hancock Music in Pasadena, he has capably taken care of the situation by giving Al Cole full charge in his absence. Al, however, will be chaffing at the bit until Phil's return, due to a splendid proposition in Mexico which has suddenly appeared on the horizon. But we still can't see how he'll live on \$8.00 a month!

After years and years of research and investigation, we have just found out that

the "E" in the signature of E. Minder stands for "Emil". For verification just call, write or phone to the Pico Radio Shop on West Pico Blvd., where radios are radios and we wonder why.

When it comes to heart-breaking experiences with playbacks of recordings, our heart is filled with sympathy for our good friends Ken Landgraf of the BT Radio Shop on Melrose Ave. Motors to the right of us, motors to the left of us—and oh boy, did you see the fluctuations!

Michigan, as a geographical location, is a state of the Union; but Michigan as a card game is a state of disappointment—as far as Al Henkin of Hollywood Radio Service is concerned. When you teach the game to someone else and that someone then takes you for a ride, then it's time to quit, says Al. Yeah man, don't we know!

And so, peoples and others, wear a little smile and remember that Decoration Day is just around the corner. Hasta luego!

NEW JOBBER

Two old timers, well known to the radio trade of Southern California, announce the opening of a new wholesale parts store. Norbert Spero and Abe Fine, operating under the name of the Zack Radio Supply Company at 1000 S. Broadway, recently opened their doors for business, offering the trade a complete stock of high-class merchandise, including component parts, tubes, meters and test equipment. Their hours are from 8:00-5:30 daily, except Sundays and legal holidays. They extend you a cordial invitation to drop in and inspect their stock and try their service. We congratulate these two old timers and wish them the best of success in serving the radio trade of Southern California.

PRIZE CONTEST

Be sure to watch the June issue of the "Technician" for details of a new prize contest to be conducted by the Mission Bell Radio Mfg. Company. According to tentative plans, this company will award one of their latest automobile radios to the technician or dealer selling the most Mission Bell radio sets during a certain specified period of time. This will be a great incentive to push sales of receivers during the summer months, and, of course the prize winner will be doubly rewarded. Full details of this contest will appear in the next issue, so be sure and look for it.

SERVICE KINKS AND PET EQUIPMENT

BRUNSWICK S-14—MUSHY, WHISTLE, HUM

Any of these troubles either while the set is warming up or continuously, indicates unbalanced, gassy, or otherwise defective power tubes.

BOSCH 28, 29—DEAD

If this condition obtains in spite of all voltage checking all right, check the rubber covered wire from the antenna variometer to the volume control.

AUTO RADIO—DISTRIBUTOR INTERFERENCE

In some cases wear of the distributor shaft carrying the rotor will be responsible for considerable trouble in the way of interference. When this has been definitely established, the remedy, of course, is to replace the shaft. Undue wear of this shaft allows variation in the spark gap setting, thus causing trouble.

ATWATER KENT 61—NOISY

In many cases after several thousand hours of use the three filament resistors wound on iron strips overheat, burn their insulation, and short to the iron. Replacement with other units is recommended.

ATWATER KENT 80, 82, 83, 84, 85—INTERMITTENT WHISTLE

If this is found near 700 Kc. it usually may be cured by replacing the gridleak of the 27 type oscillator with a 50,000 ohm unit. A wire wound or metalized unit is to be preferred.

FADA KW (48-49)—FADING, OSCILLATION, HOWLING

The by-pass condensers are mostly responsible for these troubles. Test all of them with voltages greater than rated values. It will be a good idea to use 600 volts on all tests and replace the ones which go defective with this test. Use 600 volt replacement values. A leakage test is recommended for the condensers in this set. Shield the first r-f tube with a regular tube shield. To do this remove the small metal partition near this tube. After this, be sure to realign the receiver.

LYRIC S-6—RUNNING HUM

Use a .5 megohm resistor in place of the .3 megohm unit used as part of the 24 tube's plate circuit network, (shunted to ground with a .25 mfd. condenser) and change the tone control condenser from .01 mfd. to .03 mfd. to restore the original deep tone. It may be necessary

to re-align the R.F. system and if so, the I.F. is 175 Kc. and the R.F. system should be aligned at 1,500 and 600 Kc.

LYRIC J — HUM

Replace the by-pass condenser connected from the 47 tube grid return to ground. A 0.1 unit with a rating of 200 volts is recommended.

PHILCO MODEL 7 TRANSITONE NOISY

For a sound resembling water boiling on all stations. Replace the .001 mfd. plate by-pass condenser. If this condenser tests good it may be necessary to replace with a .002 mfd. value which will be the correct remedy.

(These notes will be continued in subsequent issues.)

NEW OSCILLOGRAPH ARRIVES HERE

Electric Products Service, local distributors and factory service for Clough-Brengle equipment, announce they have just received Clough-Brengle's latest development, the new model CRA Oscillograph, which embodies new and latest methods of control, and extremely low input capacity, previously obtained only in the highest priced laboratory equipment. They cordially invite readers of the "Technician" to come in and inspect it.

BOOK REVIEW

(Continued from page 14)

Autopower—S. W. Duncan, 408 So. Hoyne Ave., Chicago, Ill.—\$1.00 This book contains detailed information concerning the rewiring and changing over of many types of ordinary auto generators design and maintenance. The book contains detailed information concerning the rewiring and changing over of many types of ordinary automobile generators to make them useful as motors and generators of different voltages and purposes. The instructions are simple, concise, not involved and accompanied by detailed drawings, wiring diagrams and winding instructions. The back of the book lists many parts which are available through the publisher, facilitating the change-over of auto generators described in the booklet. These parts are furnished at a very nominal cost and undoubtedly many technicians, engineers and mechanics will be happy to have this source of information and its accompanying source of ready made parts. This is an extremely practicable and useable book for those requiring such information.

UNUSUAL FIVE METER RADIO ACTIVITIES

The Garden City Radio Club, of New York, one of the most active clubs in the metropolitan area, has again scored in the ultra high frequency field. During a regular contact between station W2DLG, located at the Hotel New Yorker and station W2AMJ, owned and operated by Frank Lester, of Bergenfield, New Jersey, the voice from the hotel was picked up by an amateur station W3AZG at River-ton, New Jersey, which is just across the river from Philadelphia. The total air distance is approximately 100 miles.

Mr. Arthur H. Lynch, who was operating the New Yorker station at the time, says that the news from Philadelphia is most encouraging, particularly in view of the fact that the transmitter at the New York end was operating on comparatively low power. The input to the oscillator circuit being but 28 watts.

While it has been generally thought that communication on the ultra high frequency bands is limited by the horizon Mr. Lynch says that the great success of the five meter transmissions conducted between Mr. James Millen (W1HRX) of Malden, Massachusetts, and the headquarters of the American Radio Relay

League, (WIAL) at West Hartford, about a year ago, were responsible for his attempting to form a chain which would link Malden, Hartford, New York, Philadelphia, Baltimore and Washington. Elaborate schedules were organized and for a period of about a month, attempts were made to establish communication between New York and Hartford. These tests were completely unsuccessful.

The station at the New Yorker which is located on the 43rd floor was able to carry on two way communication with Princeton, New Jersey, and was heard in Trenton. The successful spanning of the distance between New York and Philadelphia has inspired the members of the club to resume their efforts and the establishment of the eastern inter-city chain is again contemplated. A slight increase in power has been arranged at the Hotel and rather elaborate receiving antenna systems are being erected by a group of stations in the Philadelphia area which should make inter-communication possible. Another reason for the belief that regular communication can be established, is found in the improvement in ultra high frequency receiver design, as well as improvements of antenna systems for both transmitting and receiving.

Plans for the definite establishment of communication between amateurs in the Philadelphia area and those in the New York area, are now being arranged by the Garden City Radio Club and the Radio Club of Northern New Jersey. Stations in the Philadelphia area will be under the direction of W3BJQ, of 10 South Lynn Blvd., Highland, Pa., and under the direction of W2GHF, George Apfel of 44 Sheridan Street, Dumont, New Jersey, for the metropolitan New York area.

A special meeting of the Ultra High Frequency Radio Club of Northern New Jersey took place over the air on Tuesday night and Frank Lester, W2AMJ, president of the club, announced the successful reception at Philadelphia of the voice from W2DLG in New York. The meeting was conducted in much the same manner as it would have been if the members of the club had been located in an auditorium, while they were actually in their own homes.

Mr. Lester, W2AMJ, introduced Arthur H. Lynch, W2DKJ, as the principal speaker of the evening and the representative of the Garden City Radio Club. After a discussion of the activities of the Garden City Radio Club in general and the club's

Continued on page 24)

RADIO TECHNICIANS OF SAN DIEGO

By DUANE W. SEIBERT

The Radio Technicians of San Diego held its regular monthly meeting April 17th. Preceding the meeting, as is customary, a dinner was arranged and held at Vincent's Dining Room, where the association has been meeting for the past several months.

An interesting feature of the meetings of the R.T.S.D. which encourages regular attendance is the awarding of a door prize to the holder of the lucky number. These prizes are given by local wholesale houses and the Radio Specialties Company was the donor of a soldering iron, which was won by Technician Frank Thomas at the April 17 meeting. An interesting condition under which the holder of the lucky number may claim his prize is that he must have been present at the preceding meeting. This, of course, is a worthwhile incentive for regular attendance.

The principle speaker of the evening at the April meeting was Earl Kernan, who is "head man" at the Exposition Amateur Station W6USA. He discussed the equipment to be used and the means of operation. This station will be in the form of an exhibit as well as in actual nation-wide operation.

Another speaker of the evening was Mr. Wenzell, government man in the San Diego area for organization of the government-operated night school for adult education. Classes will include a full course in radio engineering, from crystal sets to supers. The course will also cover radio mathematics, a subject in which most technicians are sadly deficient.

The meetings of the R.T.S.D. are always interesting to everyone and monthly attendance is close to 100 per cent of the membership. A speaker of unusual interest, and sometimes more than one, is provided to address the guests and members present at the dinner meetings. This fine record of interesting and educational lectures and successful operation of the association is due to the efficient officers, of which Art Hunt is President. Art takes his office very seriously and has given the boys the best of everything that is in him. The Board of Directors of the Association meets the first Wednesday of every month to discuss the activities of the organization and make plans for increasing its usefulness to the service trade. One of the advantages provided for members is the maintenance of a radio library consisting of books

which have either been purchased by the organization or donated by some of the radio dealers in the city.

The boys feel that their organization of radio technicians is outstanding and of great value and benefit to them as it not only gives the fellows a chance to get together and work out mutual problems but it creates a better feeling socially among the members. After meetings are adjourned there are always a few fellows that have to be forced out of the place so it can close. After being locked outside because of the late hour, many fellows invariably stand on the sidewalk continuing their discussions, especially if Ralph Dougherty hasn't run out of stories by then, as Ralph is known amongst the radio men in San Diego as a champion story teller.

A questionnaire pamphlet on radio interference is being compiled by the R.T.S.D. to be used in collaboration with the City Electrical Inspection Department with the main purpose in view of enlisting the aid of the city in helping to reduce interference with radio programs in San Diego.

A discussion was brought up last meeting on the interference problem and one of the most thoroughly discussed points was why certain radios give interference to others in the same locality. A check

(Continued on page 30)

NEW — 1935 ALL-WAVE SETS

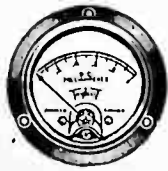


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Excerpts From Signal Generator Handbook and Shop Manual of Triumph Manufacturing Company

IMPROVING ALIGNMENT

In spite of all opinions to the contrary investigation has shown that a surprising number of active radio service-technicians are not fully familiar with the fundamental procedure to follow in properly aligning a superheterodyne type receiver. This may seem unbelievable but although the men in question may be able to properly align the receiver eventually, much time and effort could be saved, with a resultant increase in efficiency and profit, by adopting a standard logical procedure for all jobs.

Connect the signal generator to the antenna and ground posts of the receiver. The shield on the lead should be connected to the ground terminal. Turn on both generator and set and advance the multiplier and attenuator controls to a relatively high value. Tune the receiver and generator first to 1400 KC. and when in resonance, a signal should be heard in the speaker. Leaving the generator adjustment untouched, proceed to adjust the trimmer condensers on the set. If an improvement is being made on the alignment, the signal will strengthen as shown on the output indicator. Connect the output meter across the speaker voice coil or from plate of the output tube through a .1 or .25 microfarad condenser. There are, of course, cases where it is more suitable to connect the resonance indicator in the plate or cathode circuit of one of the controlled tubes in an AVC circuit. Then adjust the attenuator to provide a good deflection on the output meter. Continue to adjust the trimmers at 1400 KC. and as receiver output increases, continue to reduce the signal into the set by reducing the attenuator and multiplier so that a constant indication is shown on the

output meter. When no further improvement can be made, re-tune the generator and set to 1000 KC. and when exactly in resonance, bend the end plate of one section of the gang condenser in and out.

Watch the output meter pointer and if output increases when the end plate is bent out, make a permanent bend in the plate. If the output increases when the plate is bent in, bend the plate permanently in. Where bending the end plate in and out causes output to decrease it indicates that the end plate is in the correct position. The same procedure should be followed with the remainder of the sections of the gang condenser. Next tune the set and generator at 600 K.C. and follow the same procedure as at 1000 K. C. It should be noted that only the part of the end plate which is in "mesh" with the stator should be bent. When alignment is completed, the attenuator and multiplier settings should be noted and compared with the original settings before alignment. If, for example, the input, at 1400 K. C., was 3000 and after alignment the input has been reduced to 20, we can say that the receiver response has been increased $3000/20 = 150$ or 150 times.

I. F. TUNING ADJUSTMENT:

Intermediate frequencies for commercial receivers fall between 100 K.C. and 465 K.C. There are many odd frequencies employed and it is not possible to list them all, but any one of these values can be readily supplied by the Signal Generator, assuming a knowledge of the receiver to be adjusted. Connect the output cord from the generator to the control grid of the first detector and, with

(Continued on Page 26)

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TRIUMPH BRIDGE

The Triumph Manufacturing Company of Chicago, manufacturers of precision test equipment, announces a new instrument, known as the Model 500 Component Analyser. This instrument fills a hitherto vacant spot in the needs of service laboratories. It is a general purpose bridge which reads with a high degree of accuracy inductance, capacity and resistance over a wide range, covering the values of all component parts in ordinary radio equipment. The instrument is provided with jacks, allowing the use of external standards to increase the range of the instrument. In addition to the bridge feature, the instrument reads power factor of condensers as "GOOD" or "POOR", indicates leakages as "NORMAL" or "EXCESSIVE" and checks circuit continuity as high as four megohms.

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\$4.75

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H. K. Bradford, President and Technical Director

Name
Address

UNUSUAL FIVE METER RADIO ACTIVITIES

(Continued from page 20)

aims in establishing inter-city communication, questions were asked, through the club's chairman, at Bergenfield which were picked up from W2CVF at Wyckoff, W2AZB at Summit, W2JT at Midland Park, W2BZM North Bergen, W2VD at Belleville, W2FGB at Patterson, W3CZL at Lincoln Park and W2QF at Demarest. Their questions were answered directly by Mr. Lynch from station W2DLG located at the New Yorker.

Full details of the forthcoming tests were discussed and a definite schedule organized. The schedule follows: At midnight, May 25th, the New York stations will begin transmitting to those in the Philadelphia area and will continue to transmit for five minutes. All the New York stations will then remain silent and listen for the Philadelphia stations which will transmit from 12:05 to 12:10 Eastern daylight saving time. This process will alternate until the termination of a half hour period at 12:30 and at that time, the two master control stations, W2HGF at Dumont and W3BJQ at Highland, Pa., will issue reports indicating those stations heard in their area.

All amateurs, within range of the transmitters, taking part in this unique test are requested to forward a report of what they hear to Mr. Arthur H. Lynch, care of Garden City Radio Club at the Hotel New Yorker, 34th Street and 8th Avenue, New York City. These reports will be thoroughly analyzed and a statement regarding the success of the tests will be issued.

FREE ADAPTERS

The Triumph Mfg. Company of Chicago, manufacturers of the Triumph Model 400 Tube Tester, in both portable and counter styles, has announced that it will furnish eight-prong adapters and test data for the new series of metal tubes to be offered to the trade July 1. The Triumph Company has proven its alertness and service to users of its equipment by providing these adapters and test data several weeks in advance of the availability of these new tubes to the trade and the unusual feature of this announcement is that these adapters will be furnished entirely free of charge to all owners of Model 400 Tube Testers. All that is necessary to obtain one is to write to the factory, giving the serial number of the tester and information as to from whom it was purchased.

RADIO BOOSTERS HAVE LUNCHEON

The Radio Booster Club held an open meeting in the form of a luncheon Monday, May 20, in the Rainbow Isle Room of the Mayfair Hotel. The luncheon was attended by approximately sixty members and guests and a very enjoyable get-together resulted. Those present consisted of factory agents, representatives of the various radio trade organizations, service managers and engineers. The main speaker of the day was District Attorney Buron Fitts, who gave a most interesting talk on the inside details of the Gettel kidnapping case. Mr. Fitts' talk, which was intensely absorbing from an informative standpoint, also caused his listeners to realize what a difficult job the District Attorney's office must perform and how well that job has been done in Los Angeles County. He quoted some comparative statistics as to kidnapping cases in the East and in Los Angeles which were very enlightening. Mr. Fitts stated that such efficient action and close cooperation of law enforcement agencies as that in the Gettel case would have been impossible without the use of radio.

Other prominent members of the trade who said a few words to the group at the request of Carl A. Stone, President of the Club, were: Frank LeBell, President of the Radio Parts Jobbers Ass'n.; Mr. Herman Schmieter of the Mission Bell Radio Mfg. Company; Bill Hitt, Factory Agent and former President of the Pot and Kettle Club; A. Paul, Jr., President of the Certified Radio Technicians Ass'n.; Fred Dean of Long Beach and former President of the Radio and Music Trades Ass'n.; J. V. Guilfoyle, secretary of the Retail Hardware Men's Ass'n and President of the Pot and Kettle Club; and "Shorty" Sherman, pioneer and well known member of the local radio industry. The program was under the supervision of Glenn Shaver and consisted of several vocal and dancing numbers, greatly enjoyed by those present. Music before and during the luncheon was furnished by the Auto Boosters Club orchestra under the direction of Charles Silvey.

All in all, the luncheon was a very enjoyable affair and resulted in the making of new acquaintances, the renewal of old acquaintances and generally improved the feeling of comradeship and cooperation between prominent members of the trade. The Radio Booster Club is indeed to be congratulated upon its foresight and judgment in arranging such a luncheon.

CHIEF ENGINEER OF 7HO IN LOS ANGELES

Ronald S. Hope, Chief Engineer of Station 7HO in Hobart, Tasmania, Australia, recently spent six days in and about Los Angeles on his way to attend the King's Jubilee in London, England. Mr. Hope spent the majority of his time in visiting broadcast stations, motion picture studios and orange groves, filling in whatever time was left with general sightseeing. He was especially interested in television and its problems and consequently spent some time at Station W6XAO, the Don Lee experimental television station.

Speaking generally of his observations in Southern California, Mr. Hope thinks our climate is "bonzer" (Australian for "awell"). He approves of the freedom that women have in the United States and seems to like our country pretty well in general. Most especially he thinks our Southern California bathing beaches are most exhilarating and seems to be especially impressed with the beautiful landscaping of the homes in Beverly Hills and the uniqueness of Westwood Village. He expressed his hopes of returning to Los Angeles for an extended visit some time in the next few years.

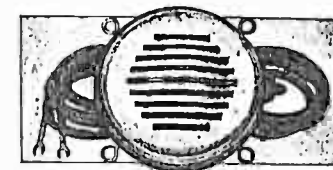
NEW CRYSTAL MIKE

The Turner Company of Cedar Rapids, Iowa, announces a new crystal microphone, designated as type G. It is available for push pull input which permits the use of lines up to 150 feet in length and eliminates the possibility of line pickups.

KIERULFF ON TRIP

Charlie Kierulff, of Kierulff and Co., has recently returned from a trip through the Middle West and reports a favorable outlook for the coming months in the radio business. Mr. Kierulff visited Chicago, Detroit and other mid-western cities, contacting the radio industry and attending to business matters.

CRYSTAL MIKE TURNER TYPE "G"



Licensed under patents of
The Brush Development Co.

The Turner Type "G" sets the standard for performance and quality. It is now available for Push Pull input, which permits the use of lines up to 150 feet in length. It also eliminates the possibility of line pickups. It is stocked by all leading West Coast jobbers. For further information see your jobber or write direct to:

The Turner Company
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M. D. EALY, Authorized Triumph Distributor
1214 Venice Blvd. PProspect 9810 Los Angeles

TRIUMPH HANDBOOK

(Continued from page 22)

the generator preset to the correct I.F., proceed to adjust the input to the set by means of the attenuator and multiplier until a deflection is shown on the output meter. Now adjust the trimmers on the I.F. coils to increase the receiver response, from time to time reducing the input signal strength to maintain the same meter reading as originally shown, which should be somewhere near 2/3 full scale. When no further increase of receiver output can be made by adjustment, the I.F. stages may be considered tuned. Due to circuit differences the oscillator stage may require some slight adjustment as a final check, in which case feed a broadcast frequency signal to antenna and ground and adjust the oscillator trimmer condenser for maximum output. Never make any further adjustment of generator frequency once you have begun adjusting trimmers since the generator output is the all important reference point. When feeding an I.F. to a first detector grid, be sure to tune the receiver across the broadcast band to locate a spot at which no heterodyne whistle from the set's oscillator can cause incorrect readings. There are usually 5 or 6 such points on the average superheterodyne.

I. F. REPEAT POINT CHECK:

It sometimes happens that the intermediate frequency of a superheterodyne receiver is so situated as to be close to the carrier frequency of a regular radio station. For example, some supers employ a 456 K.C. I.F. and there are a number of commercial, code stations at 450 K.C. Such a receiver, operating near the station, will probably receive code "all over the dial" while the station is operating. Obviously, the interference is being picked up directly by the I.F. stages which accounts for the fact that the code cannot be tuned out. To correct this situation, readjust the set to a different intermediate frequency. A change from 456 K.C. to 465 K.C. is usually made in such cases. Sometimes 470 K.C. can be reached by increasing the frequency of the oscillator (reducing the oscillator trimmer capacity) and then readjusting the I.F. trimmers to resonate the coils at 470 K.C. It is, of course, necessary to retrack the R.F. end after such adjustments.

PEAKING FOR LOW WAVE RECEPTION:

All wave superheterodyne receivers are not uniformly sensitive to all frequencies within their range. It is sometimes de-

sired that peak sensitivity be available for the better reception of certain low wave stations and with a good signal generator this is readily accomplished.

Determine first at what frequency peak sensitivity is desired. Adjust the signal generator to that frequency and tune the set to resonance with the generator as indicated on the output meter and proceed to adjust the trimmer condenser in the oscillator circuit of the set. Some receivers are equipped with a separate trimmer condenser in the oscillator circuit for the purpose of such adjustment. When no further variation of the trimmer causes an improvement in output meter reading, the set is peaked for the frequency to which the generator has been set. Due to capacity and inductance effects in the generator attenuator, it is difficult to attenuate high frequencies to low levels. An easy way of overcoming this is to use a harmonic of a signal which can be attenuated readily. Harmonics up to the 30th are useable although it is unnecessary to go as high as this for the usual short wave adjustment.

NEW R.F. METER FOR DIATHERMY

Triplett Electrical Instrument Company are now manufacturing a thermo-couple type R.F. milliammeter in the range of 0-4,000 ma. This range being the most commonly used in diathermy equipment. Undoubtedly many of the readers of the "Technician" who have been constructing high frequency diathermy equipment, will be pleased to know that this new reasonably priced meter is now available. We understand that Electric Products Service, local factory service for Triplett instruments, now have these meters in stock.

EALY PROMOTED

Thomas B. Pritchard, California Sales Agent for Arcturus Radio Tubes, announces the appointment of Mr. M. D. Ealy as Arcturus Tube Consignment distributor for Los Angeles and Orange Counties. Mr. Ealy has been with Pritchard in the capacity of salesman of Arcturus Radio Tubes for a number of years and is well known and well liked by the trade. We congratulate Mr. Ealy upon this advancement and wish him the best of success.

NEW HUGHES HEIR

Emmett Hughes, well known and well liked in the radio trade of Southern California, early Wednesday morning, May 15, became the father of an 8 1/2 pound baby boy. It certainly seems that 'Old Man Stork' has been plenty busy in the radio fraternity lately. Up until press time of this issue of the "Technician" there was no definite information available as to the name to be applied to the new son and heir. It is not definitely known as yet whether or not Emmett will raise his son to be a radio man or a gentleman.

CAN ELECTROLYTICS

Set manufacturers are calling for better grade components, according to S. I. Cole, President of Aerovox Corporation. "In current orders from set manufacturers we note a growing demand for hermetically-sealed metal-can electrolytics, instead of the paper-box type," states Mr. Cole. "Not only is this true of the larger, better grade sets, but also of the smaller, low-priced sets. The enviable record of hermetically-sealed metal-can electrolytics in field service is doubtless responsible for the definite shift to this type.

"The greatest condenser replacement market today is for paper-box electrolytics. Thousands of original units are being replaced weekly, as contrasted with relatively few hermetically-sealed electrolytics in cans. Because we pioneered the latter, we are naturally pleased to have our judgment now confirmed by the experiences with millions of sets in use. And although we are meeting the call of the service trade for paper-box electrolytic replacements we continue to recommend most emphatically the hermetically-sealed metal-can electrolytics for the most economical and satisfactory service."

SHERWOOD JOINS CARDWELL

Charles M. Sherwood, well-known radio executive, has been appointed general sales manager of the Allen D. Cardwell Mfg. Corporation, pioneer manufacturers of variable condensers.

For six and a half years Mr. Sherwood was Eastern sales manager of F.A.D. Andrea, Inc., and contributed notably to the success of that company. He was one of the founders of Shipowner's Radio, Inc., in 1919, and was an active amateur as far back as 1910. He brings to the Cardwell Company an unusual background of knowledge and experience that he will apply to the promotion of the firms products.

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Repaired or Calibrated
Shunts or Multipliers made up

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Let us show you how the new Model 500 Condenser-Bridge Analyzer will soon pay for itself in time, labor and call-backs saved.

PACIFIC RADIO EXCHANGE, Inc.

729-31 South Main Street

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NEW AUTO SET

The Mission Bell Radio Mfg. Company announces a new five-tube automobile receiver of outstanding performance. This set features high gain, good tone quality, ruggedness and trouble-free operation. It uses a very attractive remote control unit and has undergone severe tests before being offered to the trade. The Mission Bell Company, recently moved into new larger quarters on Venice Blvd., now maintains an auto radio installation department for the convenience of its dealers. They invite your inspection of the new quarters and merchandise.

"SUCCESSFUL SERVICING" VERY POPULAR

"Successful Servicing", the monthly house organ published by John F. Rider, Publisher, is becoming evermore popular with service technicians and dealers. A large number of men have availed themselves of the opportunity of receiving this valuable service paper free of charge. All that is necessary to place your name on the subscription list is to send a request in a letter or on a post card to John F. Rider, Publisher.

NEW SERVICE BOOK

The new book for radio service engineers, entitled, "Modern Radio Servicing," written by Alfred A. Ghirardi and Bertram M. Freed, seems to fill a very definite need of service technicians and engineers. It contains the latest, most up-to-date tips and angles of the servicing business and with its supplement, "Field Service Data," forms an indispensable source of information for technicians. "Field Service Data" gives invaluable intermediate frequency tables, unique trouble-shooting dope and many other useful tables.

WE ARE PROUD TO ANNOUNCE OUR APPOINTMENT As Authorized Distributors for the Complete Line of

Triumph Precision Test Equipment

The new Triumph Model 500 Condenser Bridge-Analyzer is really the answer to a service technicians dream—a laboratory instrument that will analyze and measure all component parts of Radio Receiving equipment at a price you can afford.

Come in and see our new store and let us demonstrate the "500." It will pay for itself.

ZACK RADIO SUPPLY COMPANY

1000 South Broadway VAndike 4196 Los Angeles

NEW PARAMOUNTS

The Los Angeles Radio Manufacturers' stores announce a complete line of improved 4, 5, 6, and 10 tube radio sets under the trade name "Paramount." These sets are priced to allow dealers and technicians to meet competition very satisfactorily. This company invites your inspection of their extensive stock of sets and supplies.

NEW WESTINGHOUSE METERS DISTRIBUTOR

Electric Products Service, prominent local meter and test equipment sales and service organization, announce they will distribute the new Westinghouse line of meter equipment. They will carry a complete stock in this line of meters and will have available to the trade, all the more popular types at all times.

NICHOLS WITH PACKARD-BELL

Charlie Nichols, well-known in the radio trades and formerly an engineer with Jackson-Bell and Mission Bell, is now located as a service engineer with the Packard-Bell Company.

LANG AT EXPOSITION

When the Pacific International Exposition opens in San Diego on May 29, Freeman Lang will be represented by Archie Goldman. Mr. Lang has been awarded a service contract after the management investigated the services available by several firms. The Freeman Lang services will be available to all exhibitors and concessionaires with public address equipment, remote control apparatus and personal consulting facilities.



"That Sylvania Manual is swell . . . glad I bought it."

Take a tip from this radio man . . . Send for your copy of this handy service book today . . .

That's right . . . Just a dime for this valuable booklet that's crammed with useful information for every radio service man. 35,000 have sent for it already and a lot of them have written in to tell us they're glad they clipped this coupon!

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are always ready to learn more about them. 104 pages of information about tubes . . . descriptions of them with complete circuit applications. Helps you with actual problems that you might run into any day.

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**RADIO TECHNICIANS OF
SAN DIEGO**

(Continued from Page 21)

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Keith Geren has suggested that in repairing speakers, it is advisable to put rubber cement between the vibrator and the magnets to keep them from touching one another on adjustment. This doesn't distort the quality of the speaker, as the cement turns to rubber and merely forms an insulation as well as keeping the vibrator in adjustment.

The May 15th meeting of the R.T.S.D. scheduled to be held at Vincent's Dining Room will be just about coincident with press time of this issue of the "Technician." However, Paul O'Connor of J. W. Miller Company has been scheduled as the guest speaker and will discuss the complete line of Miller products.

Let you fellows in Los Angeles forget, you are all invited to attend the California Pacific International Exposition to open in the City of Sunshine on May 29th. San Diego has been preparing this Exposition for a considerable time and we hope to see you there some time this summer.

NAVY—C.R.E.I.

A large number of naval men, realizing the value of advanced training, have enrolled for the C. R. E. I. course of radio engineering. The West Coast Representative, Mr. Edw. H. Guilford, reports that his contacts with naval men have been most pleasant and encouraging. These men take their training very seriously and all of the many that have enrolled are progressing rapidly.

DRESSEN PROMISES ARTICLE

Don Dressen, new member of the Radio Specialties' staff, promises a technical article to appear in a future issue of the "Technician." Don, very well known by the trade and respected not only for his pleasing personality but for his extensive technical knowledge, will, we are sure, prepare an article of outstanding interest to service technicians and engineers. Look for it in a future issue.

THE SERVICEMAN'S



HERE'S SOME
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Complete descriptions and illustrations of latest 1935 testing instruments and servicing methods (including use of cathode-ray oscilloscope in servicing.)

Trouble-shooting table of Symptoms and Remedies for over 500 different common receivers.

1935 auto radio installing and servicing—together with ignition wiring diagrams.

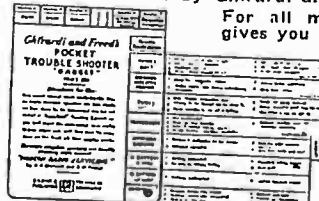
Elimination of electrical noise and interference in broadcast, all-wave and auto-radios.

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For all major receiver symptoms it gives you all possible trouble sources (275 in all). Keep one in your pocket—it will save you "headaches" & wasted time. Get yours today—it is only:

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The Supplement, **FIELD SERVICE DATA** gives you the invaluable intermediate frequency tables and the unique trouble-shooting dope, together with other useful tables, and answers to numerical problems in **MODERN RADIO SERVICING**.

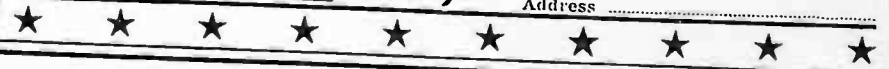
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AVC and QAVC circuits and servicing problems.

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of the Day!*
**MODERN
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Together, these two books are the only complete work of their kind ever published. They cover every phase of servicing as it is practiced today, written in simple, clear, easy-to-understand language and illustrated with innumerable diagrams, photos, charts and tables. There's a free circular that tells you the whole story about their contents. BE SURE TO SEND FOR IT TODAY!

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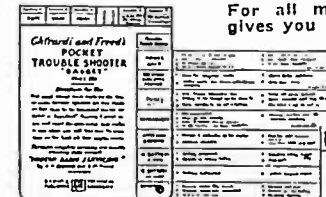
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For all major receiver symptoms it gives you all possible trouble sources



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() Please send me your free circular on MODERN RADIO SERVICING and its supplement.
() Enclosed find \$5.00 (for one in your pocket) plus \$1.50 (for the combination Offer described above).
() Enclosed find \$..... for Trouble-Shooting Gadgets at 25c each.

