

W6LYY Calling CQ AIRPLANE "GUBA"!

NOVEMBER 25c

RADIO NEWS

COMBINED WITH
All-Wave Radio

THIS ISSUE:

**OLICE-TYPE
obile Xmtr.**

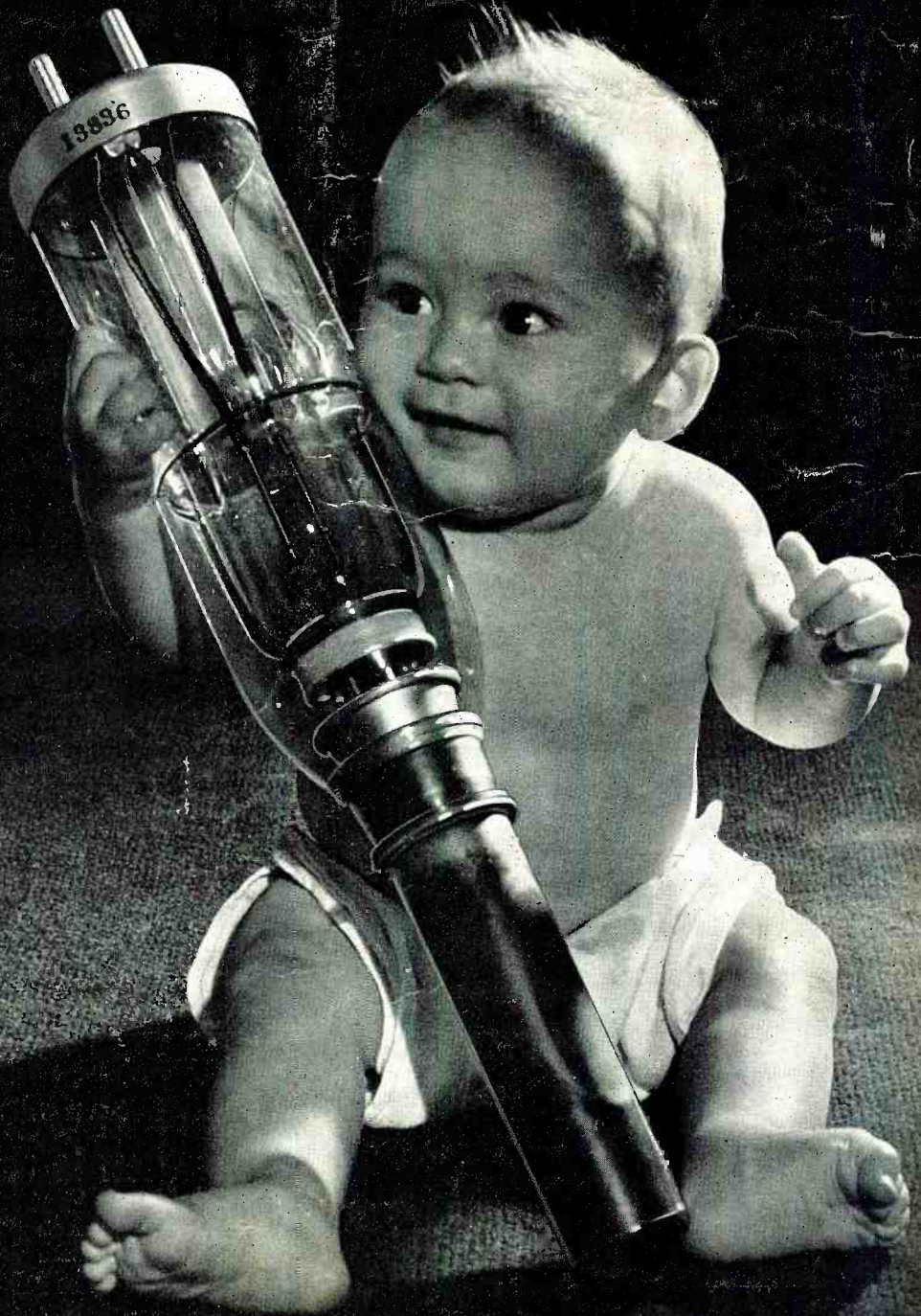
**EST-POCKET
C. RECEIVER**

**HREE TUBE
hone Xmtr.**

**For the DX Fan:
SPATARI
adio Language**

**QRD? de
GY**

**LOW ANGLE
RADIATORS**



**THE LEADING
PHOTOGRAPHIC
MAGAZINE**



**BIG
NOVEMBER
ISSUE**

Every month **POPULAR PHOTOGRAPHY** is packed with brilliant features and unusual pictures by outstanding authorities. Articles too, on how-to-make-it and how-to-do-it

NOW ON SALE AT ALL NEWSSTANDS



J. E. SMITH, President, National Radio Institute
Established 1914

The man who has directed the home study training of more men for the Radio Industry than any other man in America.

Be a Radio Expert

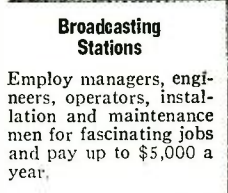
Many make **\$30 \$50 \$75** a week

I will train you at home for many Good Spare Time and Full Time Radio Jobs



Set Servicing

Fixing Radio sets in spare time pays many \$5, \$10, \$15 a week extra while learning. Full time repair pays as much as \$30, \$50, \$75 a week.



Broadcasting Stations

Employ managers, engineers, operators, installation and maintenance men for fascinating jobs and pay up to \$5,000 a year.



Loud Speaker Systems

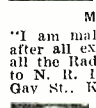
Building, installing, servicing, operating public address systems is another growing field for men well trained in Radio.

HERE'S PROOF THAT MY TRAINING PAYS



\$50 Monthly in Spare Time

"I work on Radio part time, still holding my regular job. Since enrolling seven years ago, I have averaged around \$50 every month." JOHN B. MORISSETTE, 809 Valley St., Manchester, N. H.



Makes \$50 to \$60 a Week

"I am making between \$50 and \$60 a week after all expenses are paid, and I am getting all the Radio work I can take care of, thanks to N. R. I." H. W. SPANGLER, 126 1/2 S. Gay St., Knoxville, Tenn.



Operates Public Address System

"I have a position with the Los Angeles Civil Service, operating the Public Address System in the City Hall Council. My salary is \$170 a month." R. H. ROOD, R. 136, City Hall, Los Angeles, Calif.

Lesson on Radio Servicing Tips—FREE

I want to prove that my Training gives practical, money-making information, is easy to understand—is what you need to master Radio. My sample lesson text, "Radio Receiver Troubles—Their Cause and Remedy" covers a long list of Radio receiver troubles in A.C., D.C., battery, universal, auto, T. R. F., superheterodyne, all-wave, and other types of sets. And a cross reference system gives you the probable cause and a quick way to locate and remedy these set troubles. A special section is devoted to receiver checkup, alignment, balancing, neutralizing and testing. Get this lesson FREE. No obligation. Just mail coupon.



Radio offers you many opportunities for well-paying spare time and full time jobs. And you don't have to give up your job, leave home or spend a lot of money to train to get those jobs—to become a Radio Expert.

Get Ready Now for Jobs Like These

Radio broadcasting stations employ engineers, operators, station managers and pay up to \$5,000 a year. Fixing Radio sets in spare time pays many \$200 to \$500 a year—full time jobs with Radio jobbers, manufacturers and dealers as much as \$30, 50, \$75 a week. Many Radio Experts open full or part time Radio sales and repair businesses. Radio manufacturers and jobbers employ testers, inspectors, foremen, engineers, servicemen, and pay up to \$6,000 a year. Automobile, police, aviation, commercial Radio, loud speaker systems are newer fields offering good opportunities now and for the future. Television promises to open many good jobs soon. Men I trained have good jobs in these branches of Radio. Read how they got their jobs. Mail coupon.

Why Many Radio Experts Make \$30, \$50, \$75 a Week

Radio is young—yet it's one of our large industries. More than 28,000,000 homes have one or more Radios. There are more Radios than telephones. Every year millions of Radios get out of date and are replaced. Millions more need new tubes, repairs. Over \$50,000,000 are spent every year for Radio repairs alone. Over 5,000,000 auto Radios are in use; more are being sold every day, offering more profit-making opportunities for Radio experts. And RADIO IS STILL YOUNG. GROWING, expanding into new fields. The few hundred \$30, \$50, \$75 a week jobs of 20 years ago have grown to thousands. Yes, Radio offers opportunities—now and for the future!

Many Make \$5, \$10, \$15 a Week Extra in Spare Time While Learning

The day you enroll I start sending Extra Money Job Sheets; show you how to do Radio repair jobs. Throughout your training I send plans and directions that made good spare time money—\$200 to \$500—for hun-

dreds, while learning. I send you special Radio equipment to conduct experiments and build circuits. This 50-50 method of training makes learning at home interesting, fascinating, practical.

I Offer You This Professional Servicing Instrument



Here is the instrument every Radio expert needs and wants—an All-Wave, All-Purpose, Set Servicing Instrument. It contains everything necessary to measure A.C. and D.C. voltages and current; to test tubes; resistance; adjust and align any set, old or new. It satisfies your needs for professional servicing after you graduate—can help you make extra money fixing sets while training.

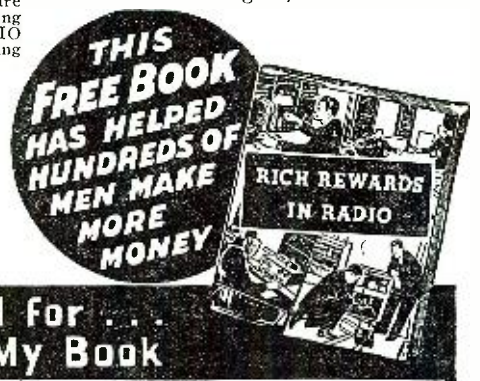
Money Back Agreement Protects You

I am so sure I can train you to your satisfaction that I agree in writing to refund every penny you pay me if you are not satisfied with my Lessons and Instruction Service when you finish. A copy of this agreement comes with my Free Book.

Find Out What Radio Offers You

Act Today. Mail the coupon now for "Rich Rewards in Radio." It's free to any fellow over 16 years old. It points out Radio's spare time and full time opportunities and those coming in Television; tells about my training in Radio and Television; shows you letters from men I trained, telling what they are doing and earning. Find out what Radio offers YOU! MAIL COUPON in an envelope, or paste on a post-card—NOW!

J. E. SMITH, President
Dept. 8MR, National Radio Institute
Washington, D. C.



This Coupon is Good for One FREE Copy of My Book

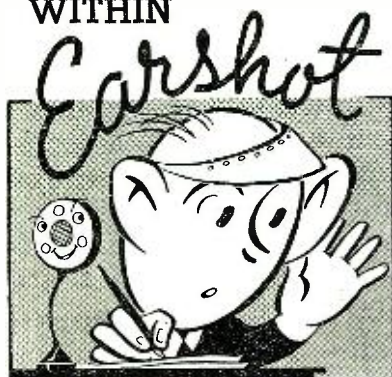
J. E. SMITH, President, Dept. 8MR
National Radio Institute, Washington, D. C.

Dear Mr. Smith: Without obligation, send me free the Sample Lesson and your 64-page Book "Rich Rewards in Radio," telling about spare time and full time Radio opportunities, and how I can train for them at home in spare time. (Please write plainly.)

NAME..... AGE.....
ADDRESS.....
CITY..... STATE.....

14-N1

WITHIN



OF THE EDITOR

Ross A. Hull

IT is with a great deal of sorrow that we learn of the passing of Ross A. Hull, Editor of **QST**. Ross lacked only his last papers towards becoming a citizen of this country, but he had every attribute of the real American. Gentlemanly and kind, and a demon for industry in everything he did, Ross A. Hull was supremely happy whenever he was tinkering around his rig, or doing some development work on his hobby—Ultra High Frequency Radio.

A graduate of the University of Sidney, Australia, Hull associated himself with the American Radio Relay League in 1924, successively becoming Associate Editor and then Editor.

His work was always superlative, and the world of Ham Radio has lost a good friend with his passing.

So long, Ross.—Editor, Engineer, Gentleman, and Ham!

WELL, another summer has gone into limbo, and the cool, crisp air of autumn brings foot-ball games, frost on the pumpkin, and golden leaves over the countryside. Best of all it returns the clear, static-free air that makes the evening's trick at the old rig a pleasure again, with the DX rolling in across the seven seas.

In a way we did enjoy the past season because it was full of activity. It had a definite beginning with the R.M.A. Parts Show in June and a definite end with the ARRL National Convention in September. In a laughing manner we might say that what the manufacturers started the hams finished. Which is as it should be—business before pleasure! But seriously, though, much was accomplished to bring the radio industry out of the depression in which it was bogged down in June.

The summer saw a number of interesting things happen in radio. Television programs were started by NBC in New York, and Howard Hughes used the radio to keep in touch with civilization throughout the fastest round-the-world trip on record. In the many foreign crises, radio has done

(More Earshot on page 54)

NOVEMBER
1938

Vol. 20, No. 5



INCLUDING *All-Wave Radio*

The Magazine for the radio amateur experimenter, serviceman & dealer

Contents

Cover photograph by Frank Fenner, Jr.

| | |
|---|----|
| CQ Plane "Guba" | 6 |
| A Vestpocket Receiver | 8 |
| Radiopix | 10 |
| Serviceman's Experiences | 12 |
| A Three Tube Fone Transmitter | 13 |
| The Ham Maker | 14 |
| Technical Book and Bulletin Review | 14 |
| Bench Notes | 15 |
| Mobile Police-Type Ham Transmitter | 16 |
| An Efficient Tuner for a P.A. System | 18 |
| What's New in Radio | 20 |
| A New \$350,000 Transmitter | 21 |
| Radio News Seal of Approval | 22 |
| Build the "Ham-Amp" | 23 |
| QRD? de GY | 24 |
| How Radio Serves the Great North | 25 |
| The National QSO Page | 26 |
| W1XAL's Modern Radio Course | 30 |
| Simple Low Angle Radiators | 31 |
| A 6 Tube Compact .5-40 MC Superheterodyne | 32 |
| "SIRELA"—A Universal Radio Language | 34 |
| A Dual-Powered Mobile P.A. System | 37 |
| International Listening | 38 |
| Radio Gadgets | 39 |
| World Short Wave Time Table | 40 |
| Short Wave Flashes | 42 |
| Special Broadcast Programs for the DX Fan | 44 |
| Questions and Answers | 46 |
| Ultra-Short Wave Antenna Coupling | 53 |

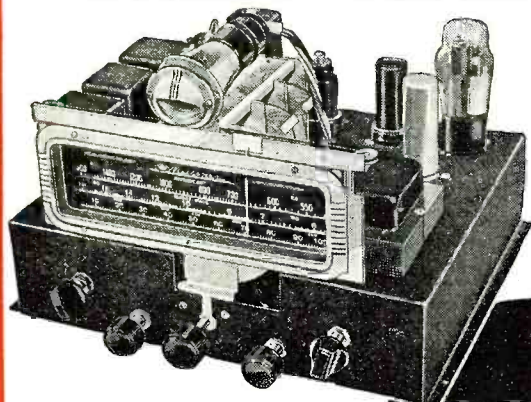
Copyright, 1938
ZIFF-DAVIS PUBLISHING COMPANY
Member of the Audit Bureau of Circulations

RADIO NEWS is published monthly by the Ziff-Davis Publishing Company at 608 S. Dearborn St., Chicago, Ill. William B. Ziff, Publisher; B. G. Davis, Editor; A. F. Maple, Executive Assistant; Karl A. Kopetzky, W9QEA, Managing Editor; E. Stanton Brown, Associate Editor; Herman R. Bollin, Art Director; John H. Reardon, Circulation Director. New York Office, 381 Fourth Ave. Subscription \$2.50 per year, single copies, 25 cents; foreign postage \$1.00 per year additional, except Canada. Entered as second class matter, March 9, 1938, at the Post Office, Chicago, Illinois, under the Act of March 3, 1879. Contributors should retain a copy of contributions. All submitted material must contain return postage. Contributions will be handled with reasonable care, but this magazine assumes no responsibility for their safety. Accepted material is subject to whatever revisions necessary to meet requirements. Payment will be made at our current rates upon acceptance and, unless otherwise specified by the contributor, all photographs and drawings will be considered as constituting a part of the manuscript in making payment.

IT'S FUN TO BUILD A

MEISSNER KIT!

7-TUBE AC 2-BAND "UTILITY" SUPER



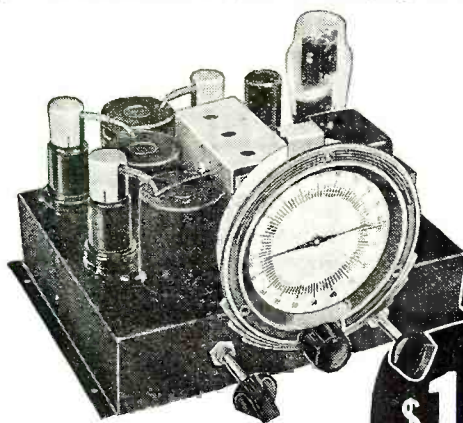
\$23²⁵

This Meissner Kit is an exceptional value. A full-size radio receiver with all the latest features—yet anyone can build it in just a few evenings. Only a screw-driver, pliers and a soldering iron are necessary.

This model includes 7 tubes, 2 bands, 3-gang condenser, Ferrocart (iron-core) I.F. channel, diode second detector, sensitivity control, automatic volume control, audio volume control, full vision calibrated dial—and gives 4.25 watts undistorted output!

Ask your Parts Jobber for Meissner Kit No. 10-1104

5-TUBE AC T.R.F. KIT



\$12⁹⁰

An exceptional radio receiver that anyone can build in two evenings, time! Uses a modernized T.R.F. circuit to give "big set" tone quality and yet retain sensitivity and selectivity far superior to the ordinary 5-tube receiver.

It has a large illuminated airplane dial, tone control, 3-gang condenser, pentode output and all the latest features. Comes complete, ready for "Breadboard" assembly, less only tubes and speaker. Or already-punched, heavy-gauge chassis base can be included for a slight extra cost. And it is fully guaranteed to operate to your complete satisfaction!

Just ask your Parts Jobber for Meissner Kit No. 10-1106. If he does not have it in stock, just write the factory. We will tell you where you can get it.



Meissner

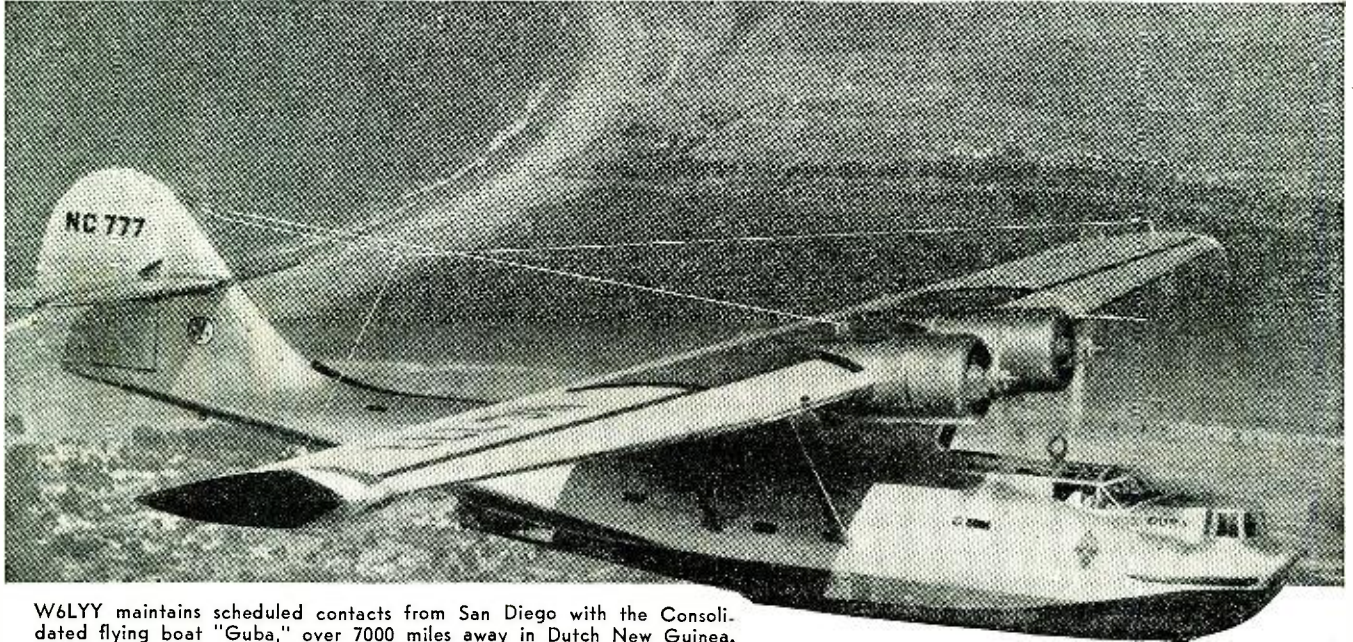
MT. CARMEL, ILL.

"A FAMOUS NAME FOR TWO DECADES"

MAIL THIS COUPON!

Meissner Manufacturing Co.
Mt. Carmel, Ill. Dept. N-11
Please send me full details on
Meissner Kits.

NAME _____
STREET _____
CITY _____ STATE _____



W6LYY maintains scheduled contacts from San Diego with the Consolidated flying boat "Guba," over 7000 miles away in Dutch New Guinea.

CQ Plane "Guba"

by HAROLD KEEN
San Diego, California

"CALLING PK6XX! W6LYY calling PK6XX! W6LYY calling flight crew of the *Guba!*"

Not the playful jabbering of an errant ham, but an insistent call crackling out over 7000 miles to a tiny group of scientists and aviators huddled in one of the world's remote and strange places.

"W6LYY calling flight crew of the *Guba!*"

Heavy silence—then from the receiver comes a burst of sound:

"Hello W6LYY. Hello Barney. PK6XX answering from Hollandia! How are you, Barney? How are you out there in California?"

A smile creases the lean face of B. F. ("Barney") Boyd. He settles comfortably into his wheelchair, brings the radiophone closer to him, and begins a conversation which, for distance and regularity of schedule, is unique in the world of communication.

Every Saturday night at about 10:30 p.m. (Pacific Standard Time), Barney's powerful hands grip the wheels of the only conveyance in which he can move about freely, and he heads straight for his ham shack, once quite bare but now literally bulging with ultra-modern equipment.

Waiting in Hollandia, Dutch New Guinea, 7000 miles from Barney's transmitter in San Diego, are a group of weather-beaten, sun-bronzed men. It's 6 o'clock Sunday evening in Dutch New Guinea, and another week of blazing an air trail through the tropical, mysterious island is about to start for them.

Standing alongside Raymond Booth, the radio operator, is Richard Archbold, wealthy 30-year old heir to an oil fortune,

who is leading a two-year expedition into the New Guinea wilderness for the American Museum of Natural History.

Booth's powerful transmitter has just contacted W6LYY.

"Tell Barney that *Guba* has been behaving perfectly," Archbold says. "And tell him to stand by for a 1500-word message to the New York newspapers. Our bosses at the Museum are probably itching to know how far along we are."

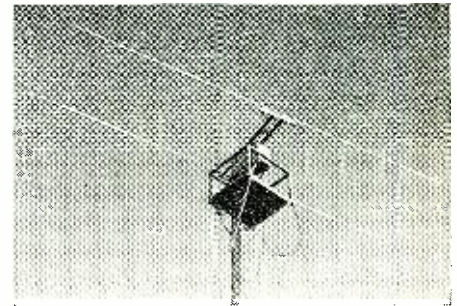
"*Guba's* been a well-mannered gal," Booth complies for the benefit of Barney Boyd. "Yes, sir, she's the best-actin' plane I've ever had the pleasure of taking radio bearings from."

Barney Boyd chuckles. The Saturday night ritual was well on its way. Both W6LYY and PK6XX were functioning perfectly and there was no more than the usual interference. And swinging idly at its moorings nearby, in Hollandia's Humboldt Bay, was the \$250,000 *Guba* (Papuan dialect for "Sudden Storm"), largest privately owned plane in the world.

By this time, Mrs. Boyd has entered the shack, a sort of enclosed sun-porch facing into the back-yard of the pleasant little bungalow on the eastern outskirts of San Diego.

She is W6PGE, and her own 220-watt transmitter is in the same shack. The

Though bound to a wheel-chair, Barney Boyd, W6LYY, reached the peak of Hamdom in three and one-half years and was chosen for a unique service in radio.

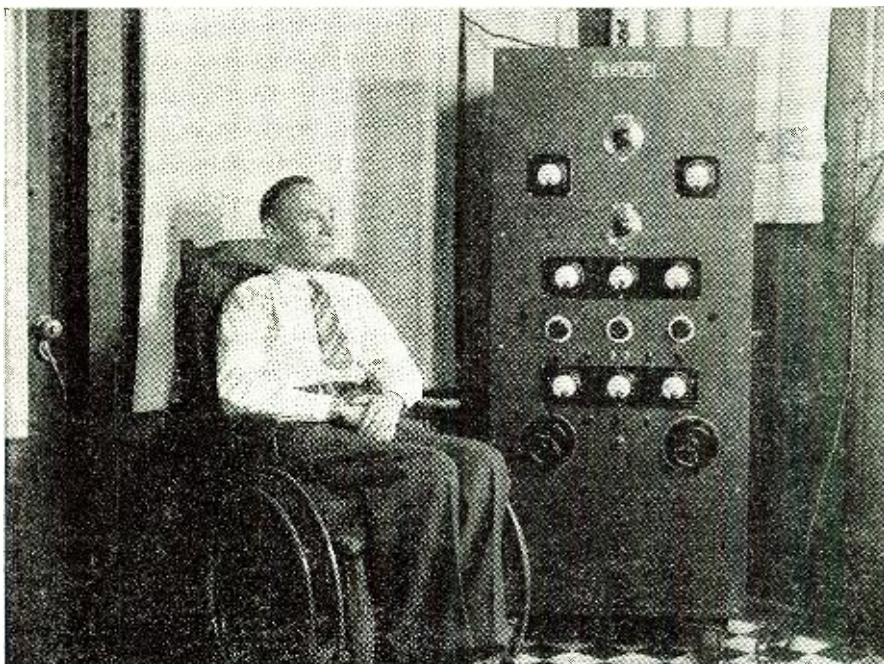


Barney uses this two-element, rotary beam antenna for maintaining "Guba" contacts.

"missus" takes a lively interest in the proceedings, as words are flung from Orient to Occident and back again, as conversation leaps from one side of the world to the other.

The story of Barney Boyd is an inspiration to the "shut-in," the physically disabled. Radio has given new meaning to life for this World War veteran who has been spared only the use of his arms in a wheel-chair existence.

About 3½ years ago, Barney Boyd, suffering an old spinal injury, became paralyzed from the waist down. The only way he could get around in the future



The controls of Barney's 1 kw. rig are so placed that they can be most easily reached by him from his only means of conveyance. At 10:30 p.m. Saturdays he contacts the "GUBA."

would be in a wheel-chair. Facing virtual isolation from the outside world, Barney came to discover the tool which would place him in the very whirlpool of everyday existence.

He was initiated into the brotherhood of radio "hams" by a fellow war veteran, Howard Breedlove (W6JRM) of La Mesa, Calif.

No amateur applied himself more diligently than did Barney Boyd. He acquired a modest rig, then qualified for Class A privilege.

Until last year, he was just one in thousands of hams, enjoying the companionable chattering which kept him from lapsing into perpetual boredom.

Then, as it does to many an amateur, came Barney Boyd's opportunity to perform a public service.

A spell of "unusual" weather inundated Southern California. When the natives got over their surprise, they discovered that virtually all means of transportation and communication were crippled.

The channels open for news distribution were swept away with the mounting floods.

This was where the hams of Southern California heroically met the emergency. And Barney Boyd was one of them.

He contacted an amateur in Los Angeles. Arrangements were made for a messenger to rush Associated Press dispatches to the Los Angeles amateur, who in turn would relay them to W6LYY in San Diego. Another messenger stood by to deliver the news to the "starving" San Diego press. For 24 hours, through the peak of the flood disaster, Barney's radio shack was the bottleneck through which Associated Press news flowed into San Diego until normal communication outlets were restored.

Having kept the presses running, Barney receded from the limelight and resumed his role of "just another ham."

Along came Richard Archbold. This extremely wealthy research associate of the

American Museum of Natural History had spent a cool quarter-million for a giant twin-motored flying boat in which he proposed to transport scientists and natives from Humboldt Bay, on the Dutch New Guinea seacoast, far inland to Lake Habema, two miles high and inaccessible by foot. From this point the explorers were to beat a path up the slopes of lofty Mt. Willhelmina, in search of rare biological specimens, meanwhile receiving food supplies from Archbold's plane, *Guba*, by parachute.

The youthful scientist-aviator had dismantled his own portable 500-watt rig, W2BVB, which had served as a base radio station in La Mesa during a transcontinental non-stop flight from San Diego to New York.

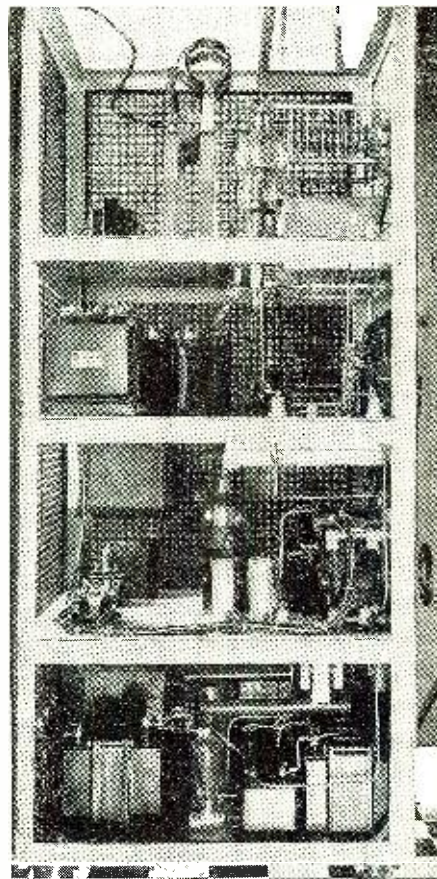
He began searching for a San Diego amateur suited for operation of a permanent base station on the Pacific Coast throughout the two years of the New Guinea expedition.

Introduced to Boyd by fellow amateurs, Archbold "hired" him on the spot. Barney proved he could handle the job, even with his ordinary equipment, during two transcontinental flights made by the explorer in the *Guba* early this year. He maintained contact a great deal of the distance between San Diego and Miami, Archbold's eastern destination.

Last May, one month before Archbold and a crew of five took off from San Diego on their spectacular flight to Dutch New Guinea, via Hawaii and Wake Island, a new k.w. transmitter was installed in Barney's shack. In three and one-half years, the disabled war veteran had achieved amateur radio's pinnacle.

This is the rig that enables Barney Boyd to maintain a regular weekly communication schedule with Dick Archbold and Ray Booth in Dutch New Guinea.

The attractive cabinet is 5½ feet tall and two feet square. The radio frequency section consists of 6L6 oscillator, 807 first



Rear view shows the open arrangement of the parts so Barney can reach them all.

buffer, and a pair of 814's, in parallel, as a second buffer, driving a pair of Eimac 250 TH's in push-pull.

Modulation is Class B by a pair of 250 TH's. Speech is by Thordarson, with 15 watts output, which is connected to the modulators by a 500-ohm line.

The transmitter is operated by remote control. There is Variac control for both the filament voltage and the voltage to the exciter, modulators, and final amplifier.

The transmitter is designed for 10, 20, and 75 meters, the exciter being taken on the small Temco transmitter with some slight alteration in design.

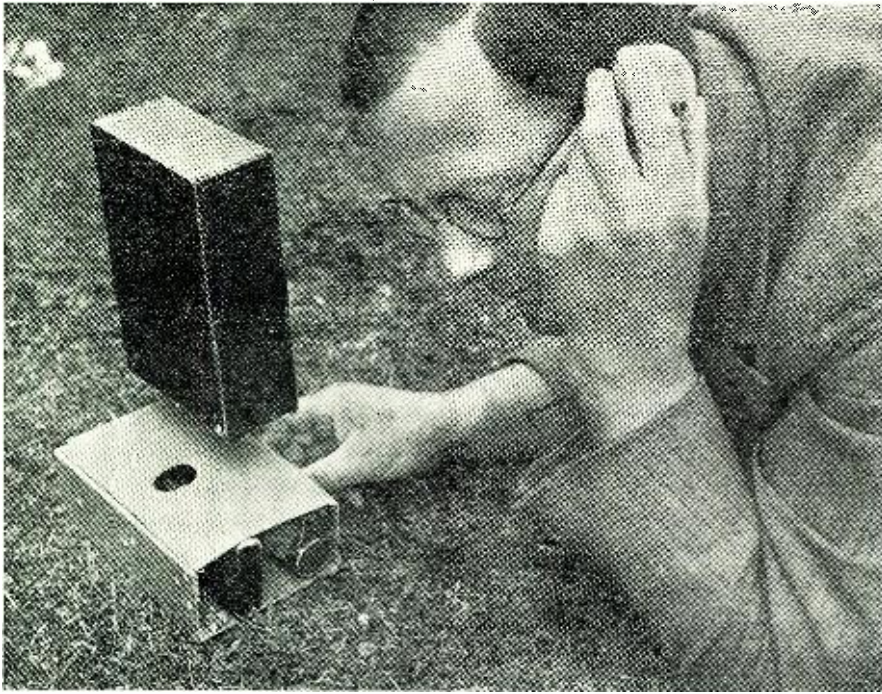
The transmitter's first deck contains the power supply for the modulators and the final amplifier; the second contains the two general radio Variac controls, the Class B modulators and the bias supply for the final amplifier; on the third deck are the exciter and its power supply; and the fourth deck holds the final amplifier.

Unlike any transmitting antenna on the west coast, Barney Boyd believes, is the one installed for him in his back yard by workmen of Consolidated Aircraft Corp., builders of the *Guba*.

It is a general rotary antenna used both for transmitting and receiving. It rests 40 feet above ground on a power pole and is a.c.-operated from the transmitting position.

The antenna consists of two elements, a radiator and a director spaced about 7-feet, 7-inches apart. A catwalk around the top enables the making of adjustments.

(Contact page 59, please)

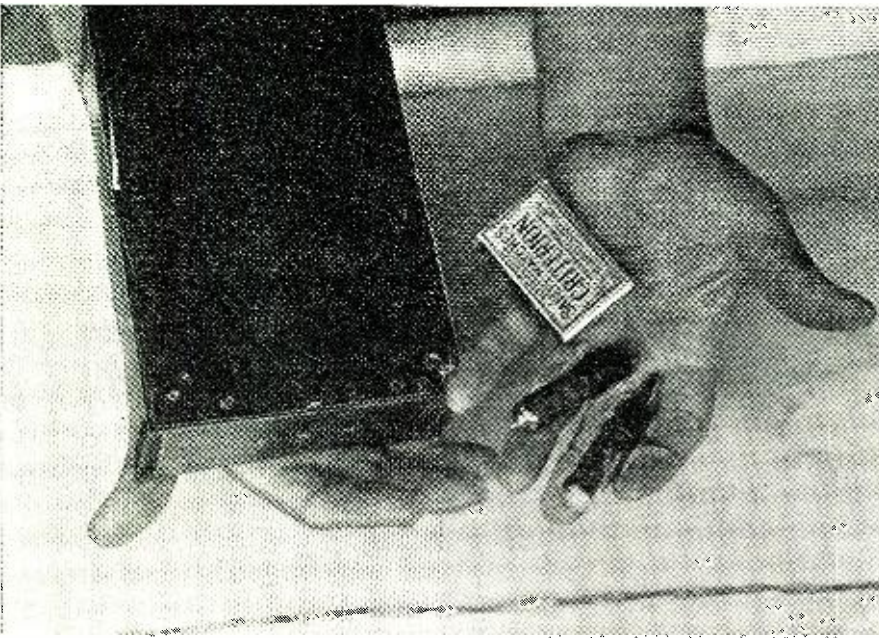


The English receiver in actual field use. The uses for this type receiver are many. ←

It is not often that a foreign made rig catches our fancy, but this English portable, compact receiver presents an unusual power supply. It is efficient and does a very fine job on local broadcast signals.

A VESTPOCKET RECEIVER

by G. BRADFIELD
Pritlewell, Essex, England.



THIS receiver is not just an example of the craze to make smaller and smaller portables. It is designed to fulfill definite requirements in the portable field and to overcome shortcomings of existing apparatus. An incentive to the design was that the receiver is specially suited for use as a non-mains operated stand-by.

The fundamental requirement was a self-contained (i. e. frame aerial) receiver capable of receiving without aerial or ground within a radius of about 100 miles for weather and news reports, etc., but not requiring a vibrator or storage battery with its charging problems.

The secondary requirement was for the receiver to be as tiny and light as possible, yet capable of operating, at least intermittently, for many hours without attention.

Finally the battery required must be cheap and readily obtainable; in fact, that particularly universal $4\frac{1}{2}$ volt battery used so much in flashlights. In this way, the usually available flashlight could be used as the storeplace for the battery until the emergency arose for the portable to be used.

The receiver developed can be seen from the photographs to be quite small. Compare the size of the match-box and hand shown side-by-side with the set. This small size could only be obtained by the use of small tubes, the HIVAC Types XD and XL which are also shown in the photograph. (*These are English tubes, but American counterparts are available. Ed.*) The ordinary $4\frac{1}{2}$ volt flash lamp battery is used and is housed in a clip-in case so that renewal is only the matter of seconds. The frame aerial is built in the lid of the receiver and the single earphone and lead used fits into a recess in the instrument so that the whole apparatus packs up as a self-contained unit into the frame aerial case itself. The use of a detachable frame aerial which is connected to the receiver by plugs yields an aerial of high efficiency and reduces likelihood of self-oscillation due to interaction of the aerial and output stage.

The steps taken to fulfil the somewhat conflicting requirements for a set of this description were briefly as follows:

Firstly, a small power unit was designed for stepping up the $4\frac{1}{2}$ volts supply to

The receiver fits into the top-loop. Compare the tubes, receiver and the matches.

Not as haphazard as it looks, the arrangement of the parts is deliberately made. →

around 30 volts for h.v. supply. Second, a sensitive two-tube receiver was designed to work off the frame aerial and use $4\frac{1}{2}$ volts total battery. Finally, the two were combined in such a way that no interference occurred from the power pack to the frame aerial and receiver proper.

In the power pack an alternating current is self-generated by a microphone button mounted on a small moving-iron unit (such as were once used for cheap loud speakers). (A microphone "hummer" can be used, also. Ed.) This alternating current is passed through a transformer primary, stepped up and full-wave rectified by a full-wave rectifier, then smoothed by a choke and two condensers. The filaments of the tubes are in series and interference from the common d.c. source, (the $4\frac{1}{2}$ v. flash lamp battery) is prevented by supplying them via a choke and smoothing with an electrolytic condenser. The choke resistance is chosen to be sufficient to drop the battery voltage to the required 4 volts. The drain from the battery is approximately 60 ma. for the power pack and 60 ma. for the filaments. This is quite a reasonably low value for such a battery.

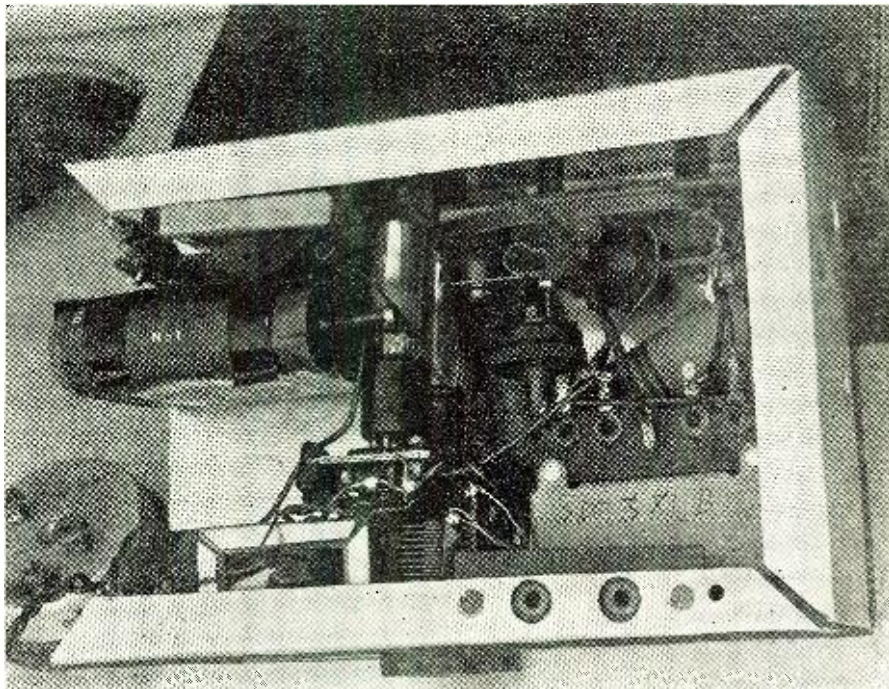
The type of power pack using a multi-contact break such as the microphone button (or "hummer." Ed.) has many advantages over an ordinary vibrator. For one thing, the latter requires a relatively high driving power, around $\frac{1}{2}$ watt at least, for its mechanical movement. In the microphone button type of vibrator this driving power is down to about a quarter of this amount. Second, the break of transformer feed current is not sudden so that there is very little interference generated by the vibrator, an important point on a small portable. Third, the mechanical noise is lower and finally the frequency of the a.c. is higher, thus simplifying smoothing.

All the components for the power pack were reasonably small in size though the experience gained would enable their size to be reduced considerably in a future design.

The receiver itself picks up its signals on its frame aerial. This frame winding is situated within the walls of the lid of the receiver. It consists of 40 turns tapped to ground at 7 turns, i. e. 33 plus 7 turns total. Each turn is $7\frac{3}{8} \times 4\frac{7}{8}$ and the 24 gauge d.s.c. wire used is space wound to a width of $1\frac{3}{8}$ ". The wire may be held in place with Scotch tape, or it may be sewed through holes in the lid.

The frame is connected to the receiver so as to act as the tapped inductance of a Hartley circuit. The detector is leaky grid connected with an h.f. choke in the anode circuit. This tube is a HIVAC Type XD detector. The audio transformer in the plate circuit of this tube is of the mumetal type but, owing to the fact that the anode current is only a fraction of a milliamp, the reduction in inductance due to d.c. polarization is not excessive. The use of mumetal of course enables this transformer to be extremely small and compact.

The output tube is a HIVAC Type XL and runs at about $\frac{1}{2}$ milliamperes plate cur-



rent. A single 2000-ohm earphone is used in series in this latter circuit.

Considerable care was required in the arrangement of the two chokes, the vibrator unit and the audio transformer to avoid interaction. In the final assembly this did not cause any trouble at all, nor will it if the illustrations are followed.

The performance of the receiver as a whole was excellent, considerably exceeding expectations.

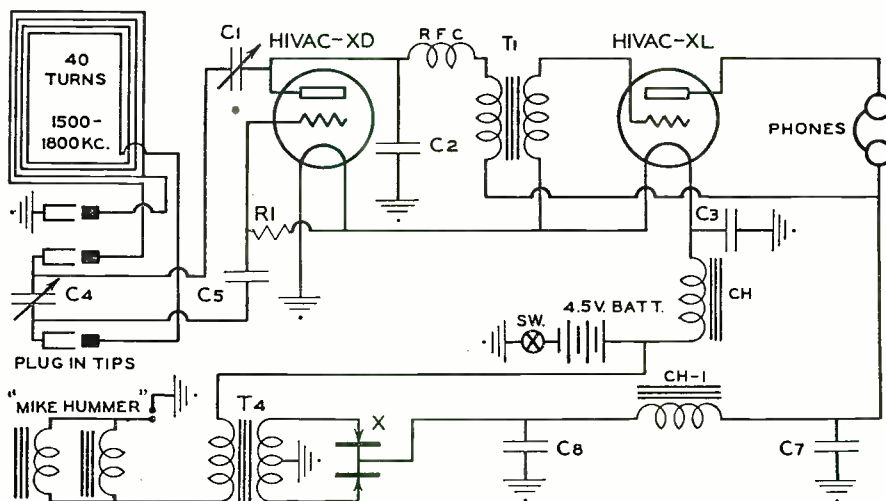
Whether or not this receiver would be of any use to the amateur has not yet been discovered but there seems not to be any reason why that shouldn't be entirely possible. Of course, its use in the ultra high frequency bands may present difficulties because of the low sensitivity of the pickup

loop. This might be overcome by introducing regeneration or even super-regeneration. However for such bands it should work, locally on 160 meter 'phone. Considerable experimentation on these lines would have to be done, but the reward might surpass the effort expended.

The use of this type of receivers is certainly indicated for the military where compactness and light weight is of primary importance. It may also be used for work with the loop as a "homing" device for small craft; though how sensitive the loop would be for that purpose has not been said.

One thing is sure, once you will have built up one of these receivers, you will find it has innumerable uses.

—30—



Circuit diagram of the English B.C. Receiver.
The American derivative will use other tubes.

C₁—25 mmfd
C₂—0.001 mfd mica
C₃—50 mfd, 12v. electro
C₄—75 mmfd
C₅—0.001 mfd mica
C₆—5 mfd paper 400v.
C₇—2 mfd paper 400v.
R₁—1 megohm $\frac{1}{2}$ w.

T₁—3:1 audio
T₂—step up transformer (Vibrator type)
CH—30 hy choke
CH₁—30 hy choke
RFC—2.5 mh r.f. choke
X—full wave dry rectifier
SW—D.P.S.T.

RADIOPIX

A page devoted entirely to timely pictures of radio in all its phases.



Fred E. Herman
W9TME

Dr. R. W. White
W3GXO

Ray J. Palmer
W9CK

W. Ben Wimberly
W5BEN-9

Alvin (Al) Cox, Jr.
W9UAQ

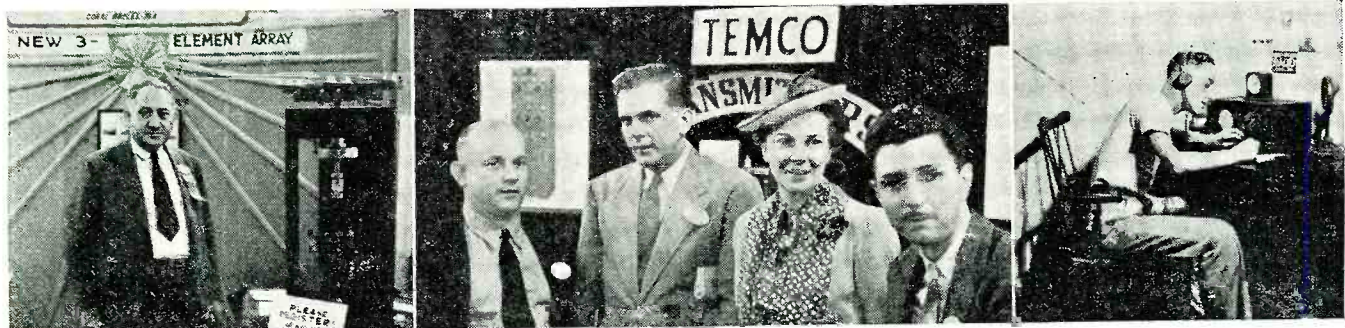
A. D. Mayo, Jr.
W9QWQ



(Right to Left) Dr. James M. B. Hard, XEIGE and M. J. McKee, W9ARK at the ARRL Show.

The Texas Dewdrop, Mary G. Palmer, W5DEW, who was most popular.

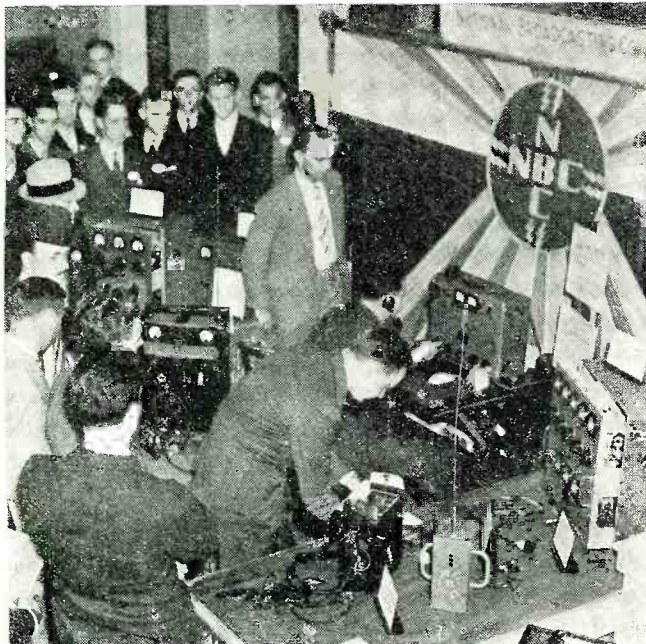
William J. Halligan, W9WZE, talking to Sandy Cahn of RN staff at the ARRL Chicago Show.



Ed Jenkins, of General Radio Antenna Co., demonstrates rotaries.

(Left to Right) Unknown; Dr. Bob Wisheart, W9VTG; Mrs. W9VTG with Eugene Van Sickle, W9KJF photographed by Hamphotog Mort Kahn.

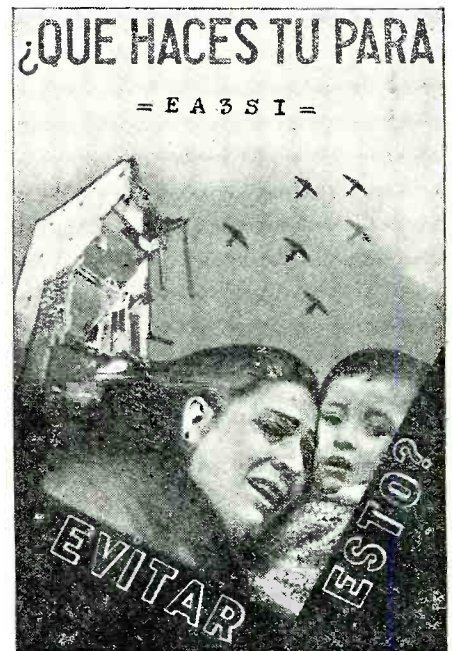
Short wave listener, Gene Keenan catching the elusive DX signals.



The NBC booth at the ARRL National Show was always filled with hams learning how the commercials work their UHF Xmtrs.



W2ECR received this most interesting QSL card from EA3SI thru censored mail. Translation is, "What do you do to aid the evacants?" EA3SI is on 14mc and his QRA is Barcelona, Spain.



RADIOPIX

A page devoted entirely to timely pictures of radio in all its phases.



Leonard H. Goldman
W9FUH

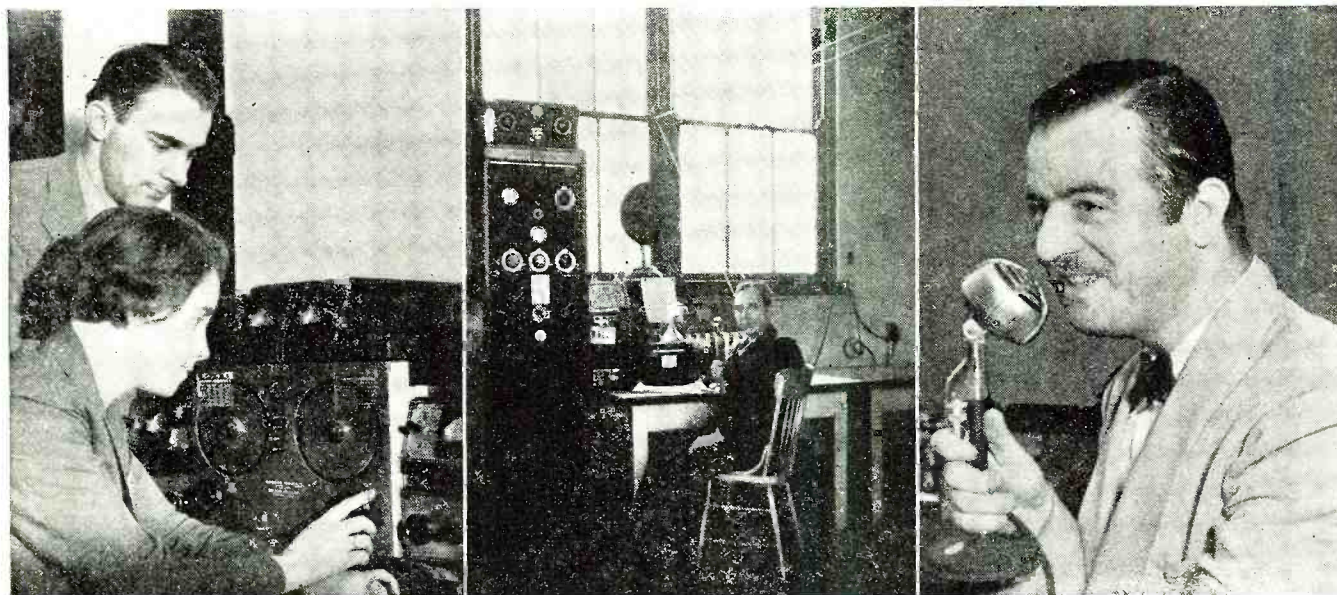
William E. Ableman
W9VFH

Thomas Bohnsack
W9PEQ

E. G. Shalkhauser
of R.M.E.

Richard Laycock of
Howard Radio Corp.

Jim Freeman
W8MEY



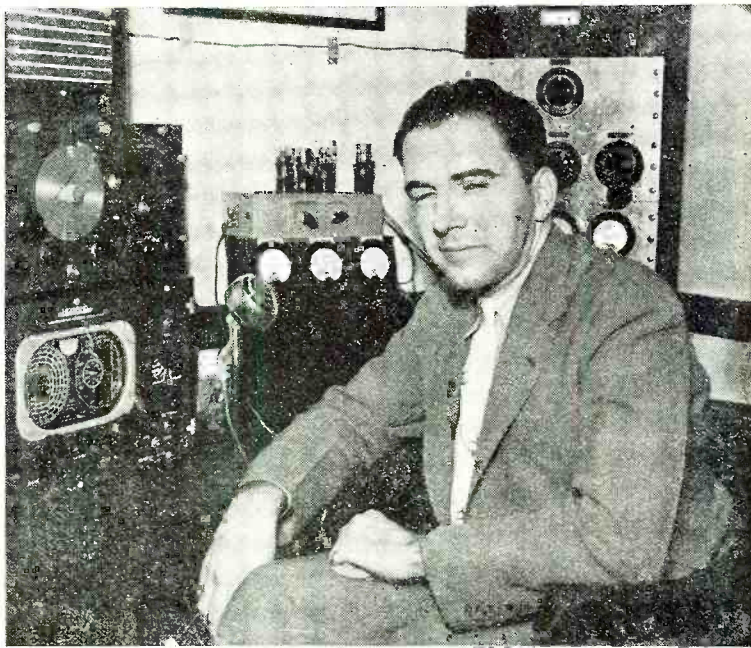
Ed Rogers, W9YUR, and his pretty XYL try out the new Dual Diversity Receiver. Ed showed her how to bring in 20M. dx.

Darwin (Dar) Appleton, W9LBJ, at the controls in the Proviso High School shack. W9LBJ teaches at Proviso, and is Coach.

Bob Zurke, No. 1 swing pianist of the USA, has taken up ham radio for relaxation. "Ham radio is fb," says Bob.



English portable television transmitters make use of the long collapsible ladder to telecast spot news. Van to right houses the transmitter.



After three hectic convention days, Mort Kahn, W2KR, Prexy of TEMCO, was too worn out to keep his eyes open when his picture was taken at the shack of W9QEA. Perhaps the home-made Xmtr blinded him. Hi!

Serviceman's Experiences

by LEE SHELDON

Chicago, Illinois

Radio repairmen should stick to their own racket. The author gets into trouble when he forsakes his soldering iron for a slide rule, and puts a clam on the air.

ONE morning, because I was so eager to develop a new invention, I beat my partner into the shop. When he arrived, I was busy at the work-bench.

"Know what I'm doing?" I asked, briskly.

Al looked at me as if he had just been challenged to a duel, and replied: "Last month it was a short wave receiver attachment to translate foreign programs into English before they reached the speaker. Before that it was a console with rubber legs so dog bites wouldn't show. No, I don't know what you're doing. Do you?"

It is often very difficult for me to pursue my scientific talents with a partner like Al in the store. I tolerate his abuse only because I know how he must feel, having as a business associate one with such superior mentality.

"You do not take the right attitude toward new ideas," I told him, with quiet dignity. "If Salutary Sales & Service is to advance, we must extend our activities into other fields. I intend, by an intelligent use of my spare time, to find a means of so doing."

"Listen, Brain Department," he said, in that coarse manner, "there are still many harvests in our present field, but we won't reap them until you get the thresher running. Take the truck out and mow 'em down. Your experiment is nothing but a useless form of fence-jumping."

"Far fields are greenest," I countered.

"Sure," he replied, "but why should we gamble on the green? We make the most profit in the business we know best—receiver repairs—and I have noticed each of your departures from routine is accompanied by a decrease of increment. Go out and get to work!"

"All great inventors were persecuted," I reminded him, "and I shall continue to search for some device which will convince even you—"

"Nuts!" he shouted. "Get going!"

Although I left in the truck, my spirit was not broken by such old-fashioned ideas. I determined to do some important radio pioneering at the very first opportunity, but I didn't expect to find it in Nick's restaurant, where I stopped for coffee. I'll tell you how it happened, if you are interested in knowing how great inventions are conceived.

The customer on the stool next to mine ordered an oyster cocktail. While we watched the clumsy counterman struggle to open the obstinate shellfish, the customer nudged me, and said:

"I could do better with the handle of a

broom. Look at him! He pries, he wrenches; he cracks the shell in four places; the oyster is down—no, the oyster is up. He pokes his knife in. The poor thing, nearly shredded, dies at the hand of a brutal assassin."

The counterman held each morsel of meat under the water tap to wash out pieces of shell. The native juice was lost.



"Hasn't that been invented before, dear?"

Then, breathing heavily, he laid the remains before my new acquaintance, who said:

"Congratulations. It was a great fight, and I enjoyed your every foul. Now, take these corpses back and give them a decent burial!"

"You ordered oysters," the waiter said, reproachfully.

"And they were oysters," the customer admitted, "but only before you tried to peel them. Take them away; they are unappetizing, and have no more flavor than a desk blotter."

Nick came from the cash register. The customer, addressing him as a court of appeals, continued: "I was raised on an oyster ranch just off the Massachusetts coast. Let me describe the proper shucking method. An oyster can be opened by either force or heat. With the former method, the shells are pried apart deftly, and, while thus agape, the upper adductor muscle—which connects the meat to the shell—is cut. The top shuck may then be twisted off, and the bottom adductor is cut. The oyster proper should not be disturbed.

In order to be appealing, it must appear fresh, untouched, and dying in natural repose. When the operation is properly performed, the mollusk is contented, unruffled, and does not fight fate.

"If heat is applied, the shells open slightly after the soul has departed; but the meat, of course, is cooked before you see it. Raw oysters are obtained only by force. On exceptionally large specimens, a knife is useless as a wedge. Instead, the upper cover is walloped with a bungstarter. The oyster, shocked and indignant, raises its lid to get the license number, and—zut!—the adductor is severed."

"If they could be raised with zip-pers—" I suggested.

"Say, who is this guy?" the customer asked Nick.

"Don't mind him," Nick replied, "he's only a radio man."

"If he's so smart, why don't you have him build you a radio oyster opener? You need it in here!"

"Well, radio does everything else," Nick admitted, turning to me. "Think you could make one?"

I studied the problem intensely over the week-end. Why not heat shock, induced in the adductor muscle by means of a concentrated high frequency field from a vacuum tube oscillator? The shell, being non-conductive, would not rise in temperature; the hinge muscle, relaxing after the shock of sudden eddy currents, would permit electrical access. Eureka! The fish, losing control, would release his shells as if they were operated by a spring latch, and any untrained restaurant employee could finish the job leisurely!

I imagined Al's surprise when I delivered my first machine to Nick; his reluctant tribute to my ability when the orders poured in. The A.S.P.C.A. would strike a medal to commemorate the patent. Of course, there was one legal feature: such a device would be a radio transmitter. In the name of public service, I would apply for a frequency allocation!

No data was available concerning the conductivity of oysters. I stopped at a fish store to buy some the first thing Monday morning, preparing for an experiment. Realizing there was no *r* in *Monday*, and not being patient enough to wait four days until Thursday, I bought clams instead. Clams and oysters are sisters under the skin.

When I arrived in the shop, Al sensed something unusual, and said: "You're up

(Follow experiences on page 66)

BENCH NOISES



More Power to You

HAS the line voltage in your area been changed? If it hasn't, it will be; there is a general trend under way from 115 to 120 volts. The New York area has been using 120 for some time; Chicago finished the final step of its 5-volt boost last December. Nearly half of the country is yet to be moved upward. While I, as a repairman, do not *hope* for an increased number of set failures as a result, I am keeping myself apprized concerning conditions in my territory, and am standing by to handle any work which might be necessary.

The method of change varies little between power companies. Starting with the 115-volt level, periodic boosts are made every month or two until 120 is reached. Consumers are usually notified of the change by means of a printed slip accompanying their light bill. It is probable that few of these notices are read. They are too easily mistaken for washing-machine ads to command attention during their quick trip from envelope to waste-paper basket.

The various State Commissions allow a certain excursion from the level in use. In one section, a 5% over-voltage and a 4% under-voltage are specified as the limits. It is probable that your power company stays within these limits as a matter of operating policy, except when unusually severe load or supply conditions are met. Regardless of the *range*, it is important for the serviceman to know what maximum voltages he is working with from day to day in his territory.

Random voltmeter readings are of little value. In order to get a true picture of the voltages at various points in, say, an area of ten square miles, a recording voltmeter would have to be run continuously in perhaps ten or more locations for long enough in each location to get an average typical curve for the daily maximum in each section. The instrument would have to be accurate, and have little operating inertia to record sharp rises or drops. When the observations were completed, the results would not have justified the bother and expense.

The top daily voltages encountered are the important ones for the repairman to know. First, call your local power company, and ask what the line voltage is supposed to be. (If you think this is a waste of time, ask any five servicemen, in an area which has been raised, what line voltages he comes across during a routine day. Few know for sure. In my case, the rise had been made two months before I learned of it. So check on it—a new level may have sneaked in without your knowing it.)

After you know your rated voltage, make

by LEE WARD

Service Manager, San Francisco, California

checks in customers' homes for comparison with those at the *same time of day* in your shop. This can be done with little or no bother during your usual daily travel, and a few weeks' systematic data will soon show you if any of your service sections are lower or higher than those in your shop.

Watch out especially for sections which are higher than the reading in your store location. Most of us have had the embarrassing experience of making a replacement, testing in the shop, and delivering the chassis, only to have the set fail as soon as it was installed. The cause can usually be traced to the presence of a lower voltage on the repair bench outlet.

If you are in a 5%-4% area that has been changed, remember that the 115-volt equipment, when being operated on 120 volts, can be subjected to an *allowable* maximum of 126. This is equivalent to a 13% overload, and, although it be the operating policy of your power company to keep well within the 5% margin of 120 volts, you should know how wide this margin *actually* is. The *minimum* 4% below 120 volts is at 115—exactly the rating of the old equipment. In other words, no matter what range the power company

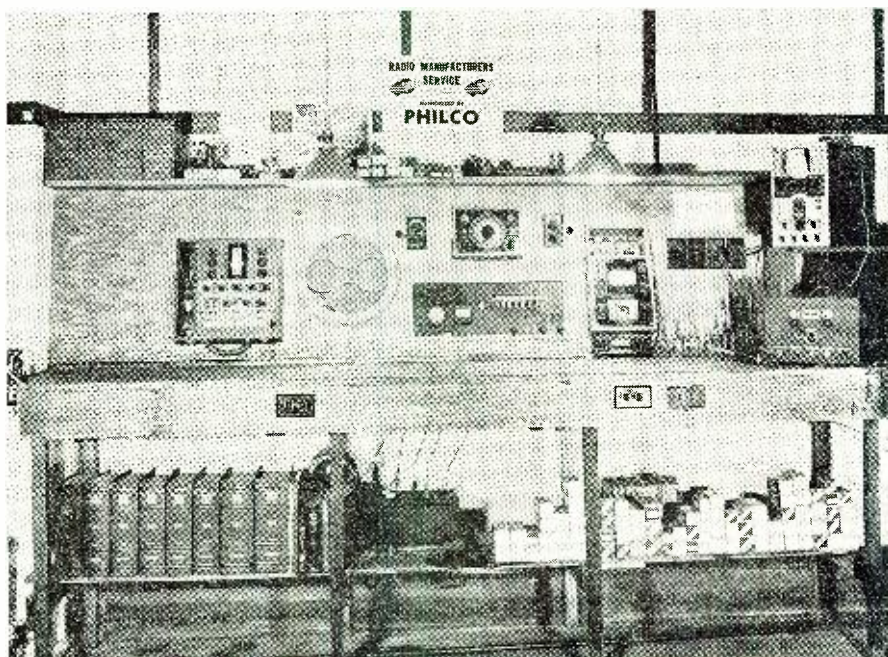
allows, it is always *above* the rating of a 115-volt set.

This is a condition worthy of note, especially when repairing a cheap receiver. Some of them, because of miserly engineering practice in choice or assembly of parts, contain power transformers which, even at the 115-volt level, operate at a temperature just below the point of conflagration.

In the better sets, where power transformers have a more generous tolerance, failures might occur in the remaining apparatus on account of increased voltages from the secondary windings. One distributor, handling a very good line, reports that, while there has been no increase in the number of power transformer replacements following the use of 120 volts, there has been an increase in the number of filter condenser replacements. Another large sales-service company, after replacing more than the usual number of burned-out tubes in its "guarantee" sets, now installs voltage reducers.

Although factual data is difficult to obtain, it is certain that more heat and voltage failures will occur in a given number of sets running hotter than in the same number running cooler. Heat and voltage failures walk hand-in-hand, and cannot be considered separately.

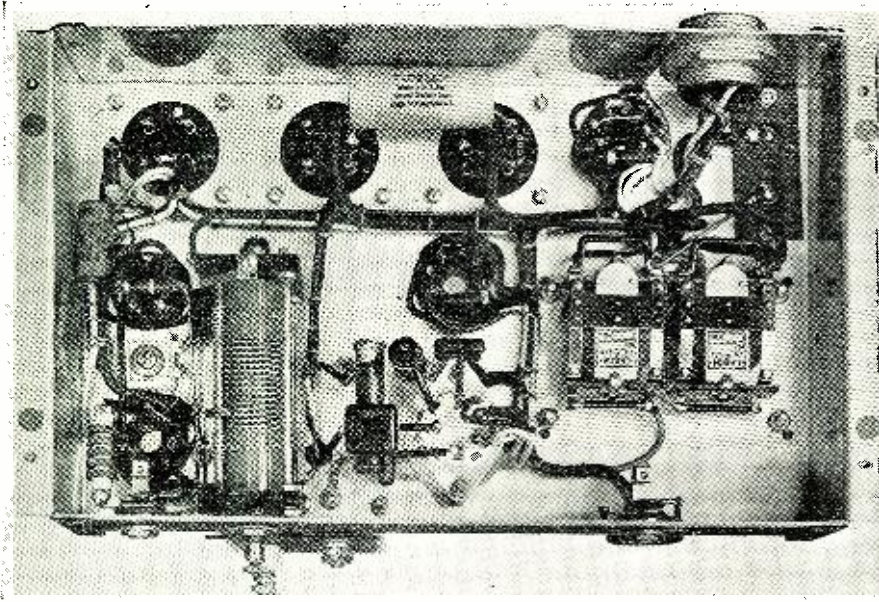
(Continued on page 63)



The neat, well arranged service bench shown above was constructed by Stanley Henry of Beaver City, Nebraska. The power panel in the center consists of a 5-watt amplifier, a heavy duty power pack supplying up to 600 volts, battery connections and charging equipment, and connections for the universal speaker. All instruments are portable.

Mobile Police-Type

By HARRY HARRISON, W9LLX
Chicago, Illinois



Underside the chassis shows a commercial transmitter. Note the tunable inductance.

I HAD always thought that the amateur radio constructionist had "something on the ball" in the way of specialties and niceties of design. I had been led into that idea by the ego each and every ham acquires from a long life of building rigs. Starting years ago, I have designed and built many transmitters, most of them big, ungainly things that had this or that "hot" touch and this or that refinement. My customers, when I built them for other hams, were always satisfied, and when I built rigs for myself, they had the very latest gadgets and controls. Yes, sir, I had quite an opinion of my own work! Hi!

Of late I have specialized on portable rigs. Last year I carried one over the Rockies to the West Coast and back, and enjoyed the contacts all along the way; and this year, benefiting from my previous experience, I had decided to build something so sound, so different that no commercial rig could approach it. The transmitter I finally took with me I described in the June issue of *RADIO NEWS*. It seemed to me that it had everything. But on the trip, I finally blew a transformer, and later the rig seemed to fall apart from the beating that it took. Therein I learned the first lesson. Portables must be rugged.

At the recent ARRL Convention I had ample opportunity to swarm all over the TEMCO portable and believe you me, I learned much. So much, in fact, that I borrowed one of the rigs and took it apart to see what made it tick. I found that it was just the thing—with modifications, that any ham could wish for on five or ten meters.

In the first place it was current saving, and only the car battery was needed to give a full ten watts output, or twenty watts input. Then, when the rig was not in use,

the only things that were drawing current were the filaments. The Genemotor was dead, and what I found also, was that with the use of Class B modulation, that the current was only at peak under 100% modulation, falling off in a curve depending on the amount of speech input.

Examining the circuit I found that it contains a 6L6 crystal oscillator with an inductance tuned plate circuit. Without the use of the condenser in the plate circuit of this tube it is possible to hit 56 mc. as well as 30 mc. with a ten meter rock. There at least was one saving of which I had not thought. Stability had been taken care of by eliminating the use of a Tri-tet oscillator, and I found that this circuit was as stable as the proverbial Rock of Gibraltar (though I hear that that venerable Rock is not so stable this year!).

Feeding the output of this circuit into an 807 made a fine power amplifier circuit. In five meter work the 807 operated as a doubler and was modulated. Believe it or not, it is entirely possible to modulate a doubler without the slightest trace of frequency modulation, if one is careful enough to keep within the modulation limits.

The unusual part of the 807 part of the rig was the combined tank and Collins π network which made it easy to match any antenna, although only a vertical one was used. Tuning condenser C7 tuned the tank; and tuning C9 the Collins π network. Simplicity itself!

The audio circuit left nothing to the imagination. Just straightforward audio work. A split 6N7 acting as an input-amplifier tube feeding into another 6N7 Class B modulator which developed enough power to modulate the final 20 watts input to a full 100%.

Now to the niceties of which I was as

innocent as a newly born "lid." The tuning device of the 6L6 crystal stage was designed to be continuously tunable over the entire coil length. Not along one side of the coil as a slider would suggest, but along the entire length of that coil.

The method used was as follows: The coil is mounted between two bakelite ends and the coil form is blocked at either end with a wooden plug. Into one end, a short piece of bakelite is set at dead center. This is one bearing. At the other a metal shaft, only long enough to get a good hold in the block of wood, is placed. This shaft protrudes through the outside panel and a knob is mounted on it. The tuning is then done by turning the coil on its lengthwise axis. Contact is maintained on the wire wound over the coil form by a minute wheel, much the same as can be found in the junior op's *Mekano Set* or *Constructor Set*. Freely revolving on a metal shaft, alongside the coil form and supported at both ends by blocks of bakelite, with a sliding contact maintained on the shaft itself, the little wheel runs along the wire, and shorts out that part of the coil between itself and one end. I admit I never had thought of that one. Guess the commercials still have a couple of tricks up their sleeves!

But that is not all. To prevent the wheel from running off the coil, two little springs are soldered to the shaft, and placed in such a position that when the wheel runs up to the end of the coil it cannot go any further. The wheel keeps jumping back one turn of wire and so does not run off. Darn clever, these Chinese! The wheel shorting device can clearly be seen in the illustration of the underside of the chassis on this page.

Next thing that I saw where the commercials have easily maintained their superiority was in the design of the chassis. No wasted space there; no sir! Placing the Genemotor on the same chassis with the transmitter was not an accident either. Careful consideration was at the bottom of that too. When I wanted to test my last portable, I had to take out the rig itself, the batteries (since I had none in the shack) and the generator. Not so this job. Just lift the chassis off the base plate where it is fastened with airplane type holders, and taking a six volt "hotshot" dry cell, the rig can be bench-tested with ease.

Alongside of the genemotor was the 807 tube and separated from it by a shield which supported the final and Collins π network was the crystal stage. The controls were: top, Collins antenna tuner, and next below, the tank condenser control. Further down is the control for the tunable inductance. Continuing the saving of space, directly inside the baffle shield piece, is the antenna changeover relay, eliminating long leads and making the connections very

Ham Transmitter

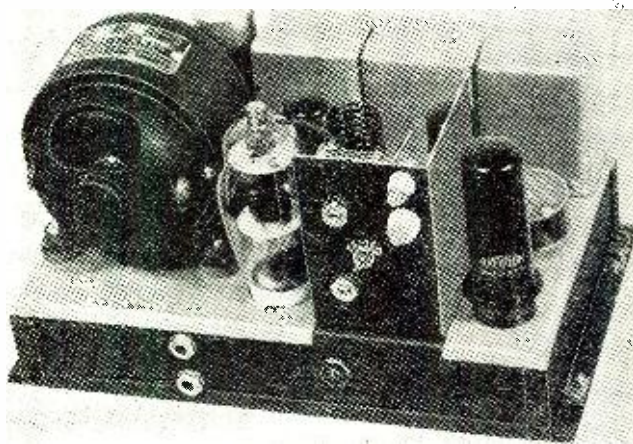
The intimate details of a commercial mobile transmitter are easily adaptable for ham use. The author, who has had much experience with portables, explains where the ham may use some of the commercial features to his advantage.

simple. Just hook the antenna to the top post, the receiver to the next post, and the ground to the third, and there you are!

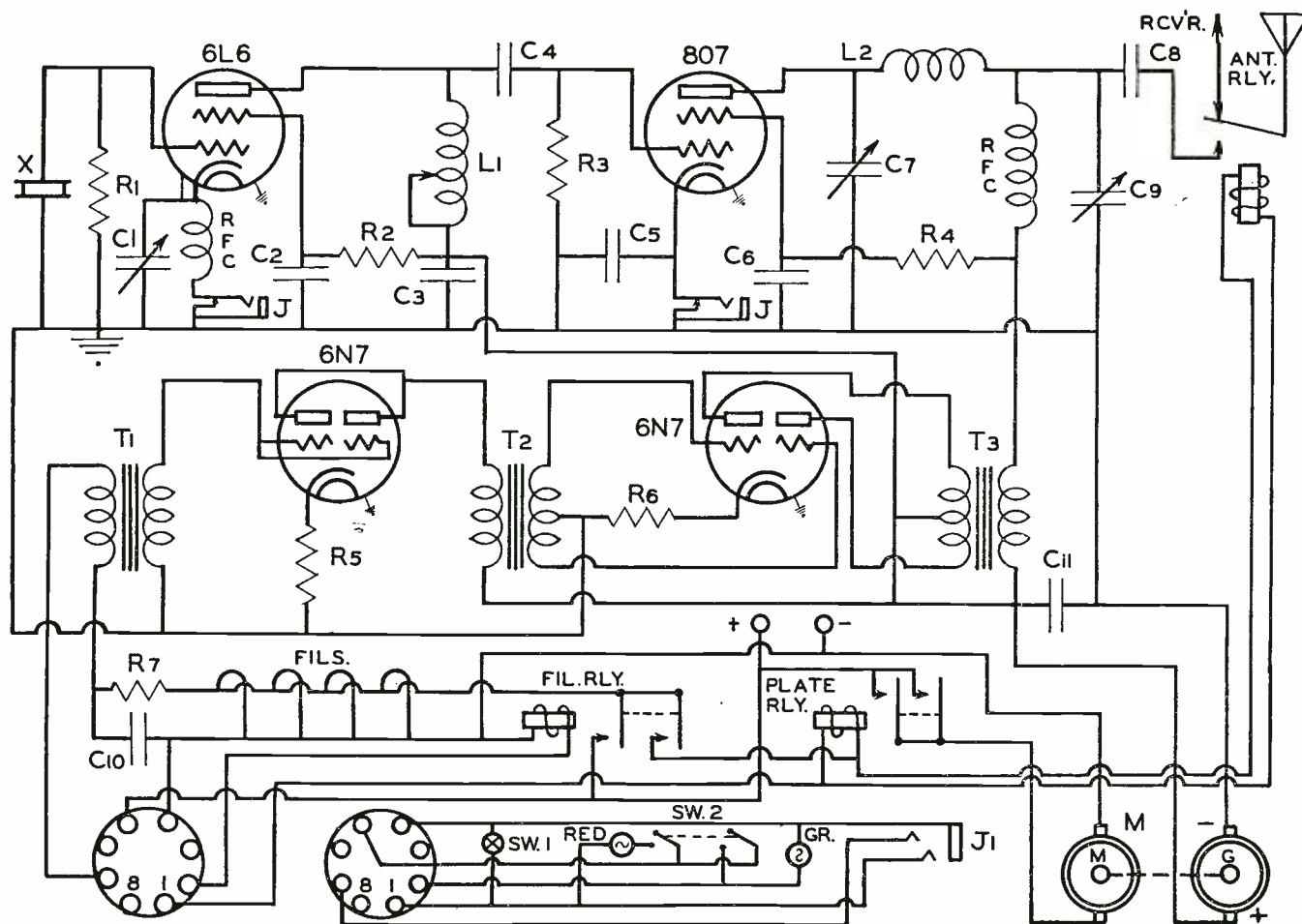
The audio system is mounted across the back of the chassis in a line. First comes the input tube, the microphone transformer, the interstage transformer and finally the modulation transformer. This last is placed so that short leads will result to the final amplifier and 6N7. Interaction between transformers? Only in ham rigs, my boy! Here there is ample shielding just where it is needed and the result is letter-perfect audio response. The modulator tube is just behind the final 807.

Jacks are provided for measuring the various important channels and once adjusted, all controls are lockable, a good point to remember.

(Build on page 47, now)



Generator, audio, and r.f. circuits all on one chassis.



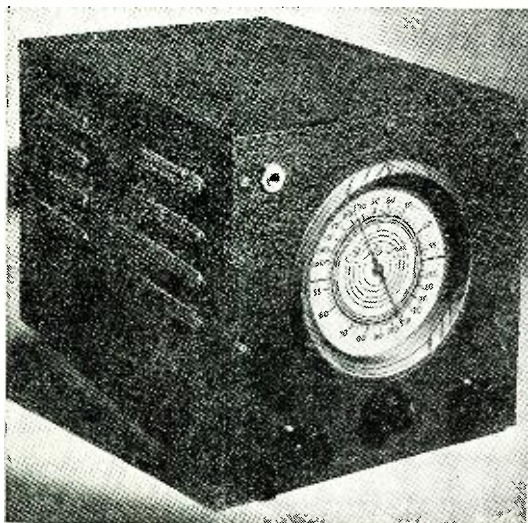
Circuit of the Police type Mobile Transmitter.

C₁—Padding Condenser
C₂—.002 mfd. mica
C₃—.002 mfd. mica
C₄—100 mfd.
C₅—.002 mfd. mica
C₆—.002 mfd. mica
C₇—50 mfd.
C₈—.002 mfd. mica
C₉—75 mfd.
C₁₀—10 mfd. electro

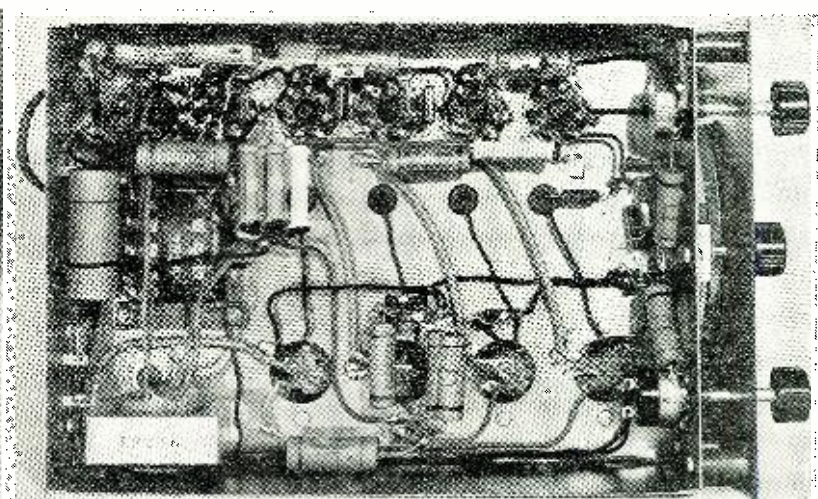
C₁₁—8 mfd. electro
R₁—100,000 ohms
R₂—50,000 ohms
R₃—50,000 ohms
R₄—20,000 ohms
R₅—500 ohms
R₆—100 ohms
R₇—500 ohms
T₁—Temco S-7440
T₂—Temco S-7441

T₃—Temco S-7442
Fil. Rly.—Leach No. 1024
Pl. Rly.—Leach No. 1027
Cont. Rly.—Leach No. 1024
M—Pioneer Dynamotor—Type G, No. 7207
SW₁—D.P.S.T.
SW₂—4 P.S.T.
J₁—Mike Jack
L₁—16 Turns No. 14 wire, 1" coil form
L₂—8 Turns No. 12 enam. wire, 1" coil form

AN EFFICIENT TUNER



Simplicity of control, including a 'phone jack make this P.A. Tuner the ideal for use by the serviceman.



The parts connected to each tube are grouped around that socket to give the best reception afforded by short leads and feed-back free operation on local signals.

AN efficient radio tuner for Public Address application is something more than "any old receiver which will tune to and through the broadcast band." It is frankly an objectively engineered instrument, built specifically and therefore functionally for P. A. service to meet the particular requirements which program distribution facilities involve. It need not be an expensive item; as a matter of fact, the average job is neither costly nor complex, since it is called upon to do no more than pick up program stations in the broadcast band and produce an audio signal of sufficient level to drive any succeeding amplifier to proper output—something which a very simple set-up employing very few parts *can* be made to do.

First, to list briefly its more general required features or characteristics, it must be fairly sensitive and have reasonably good DX range. Local service tuners may, in most instances, do the pick-up job properly—but not all P. A. installations are located in metropolitan areas served by "at-hand" network and similar broadcasters. Second, it must afford distortionless, high-fidelity reception of all programs—a requirement involving maximum practical band-width acceptance (no cutting of sidebands), selectivity enough (on the other hand) to prevent contingent-channel interference and cross-talk, optimum modulation capability in the detector, and means of effecting a suitable match when used with any available amplifier. It should of course feature facilities for headphone monitoring and for tone and output level adjustment; and one would expect it to be of compact construction, adaptable to either portable or rack-and-panel application.

It need *not* incorporate a superhet circuit. A TRF layout, *properly* designed, will provide ample sensitivity and selectivity, will feature full modulation band-width acceptance within channel limits, and will have no background signal hiss—something peculiar to the superhet and

sometimes quite objectionable in high-fidelity reception.

Physically, the tuner is quite compact and certainly portable—cabinet dimensions being $8\frac{3}{8}'' \times 8\frac{3}{8}'' \times 13''$. In non-portable layouts, by the way, and particularly in assemblies of dual-channel design, two of these units may be mounted on one standard 19-inch relay panel—and operated simultaneously without interference one with the other, TRF design of course precluding any necessity for local oscillator circuits, which in contingent superhet tuners might cause considerable trouble.

The coverage is limited to the standard broadcast band—the actual frequency range being from 530 kc. to 1600 kc. Tuning and tracking is very precise—and related to a calibrated four-inch dial scale.

The Circuit

Four tuned stages are employed—antenna, the two r.f., and detector—with variable condensers in gang for single-dial control. The detector—a diode—provides both an AVC voltage and an a.f. voltage related to signal. The two-section a.f. tube, with its two output circuits, makes possible simultaneous headphone (monitoring) output and amplifier feed, the monitoring circuit, when in use, in no way affecting the operation of the other.

Consider first the detector circuit. Here we use a diode, its paralleled plates connected to the high side of the last r.f. transformer's secondary *through* a small mica capacitor—rather than conventionally, which is to say directly. The return lead for the secondary winding is then grounded, the effect being to provide for a tuned circuit here which will track with those preceding it. The diode, which with a conventional arrangement would have considerable shorting effect on the secondary and in such a way as to make tracking here extremely difficult (and which would take considerable power from the third 6K7 stage, lowering the gain of that stage) has its own input circuit—in terms

of physical make-up, a resistor connected from the plates to the high side of the effective 250,000 ohm load component.

The audio component of the rectified signal develops across 200,000 ohms of the load leg and is coupled to the volume level potentiometer, which controls the input to *both* grids of the 6F8G dual-triode, 50,000 ohms of the load being used to limit the amount of a.f. voltage available. The d.c. component of that signal is used for purposes of AVC, the total voltage developing across 200,000 ohms being applied to the first two r.f. stages and one-half that voltage being applied to the third. Note, by the way that .0001 mica capacitors are shown wired from plates to ground in the first two 6K7 circuits; this practice is desirable when the tuner is used largely for local signal reception (though gain remains high enough for extended range pickup) and if for no other reason than to prevent any possible circuit oscillation.

The 6F8G plates, unlike the grids, are not paralleled but work into separate output circuits—one for headphone monitoring, one for tuner feed to the amplifier. Monitoring does *not* affect the output in any way; neither the quality nor the level of the signal supplied the amplifier is changed by headphone plug-in.

Terminals 1 and 3 provide a 10,000 ohm match to the amplifier input, terminals 2 and 3 a 2,500 ohm match. Terminals 4 and 5 parallel the monitor circuit. Connections to 200 or 500 ohm lines may be successfully made to terminals 2 and 3—but advisable practice (this really goes without saying) would of course be to provide a more accurate line match by means of a suitable transformer, its high impedance primary tied to 1 and 3.

Layout

The four-gang condenser centers along the chassis, with the transformers (r.f.) to the right and the associated tubes to the left of it. The 6H6 is *forward* in tube line-up, the 6K7 in the first tuned circuit

for a P.A. SYSTEM

by RAYMOND P. ADAMS
Girard, California

The author describes an efficient radio tuner for use with a P.A. System to amplify local broadcasts. This unit will also make a fine broadcast receiver when connected to a good amplifier in the home.

toward the rear and nearest the glass 6F8G. Power components—rectifier, power transformer, and filter condenser are at the back.

The potentiometers for volume and tone control are assembled on the front chassis drop, the one to the left and the other to the right of the tuning dial. The phone jack is on the front panel, which is extended forward from the chassis sufficiently far to provide for ample dial-face clearance.

Wiring and Construction

Matters of assembly are, for the most part, fairly obvious to the reader who has studied the circuit and under-chassis diagrams; and those of wiring are made clear with similar study. However, a few pointers might facilitate exact reproduction and provide for proper tuner performance on "first test," so perhaps we had best present these pointers or suggestions here—with apologies to the more advanced and practiced builder to whom they may seem unnecessary—but with our advice to the general reader that they be borne carefully in mind.

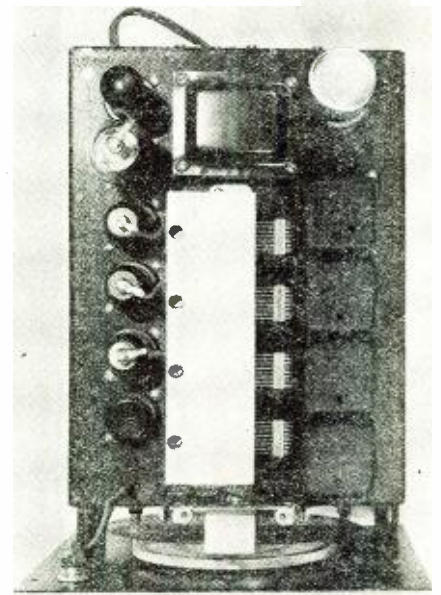
Mount the small parts—sockets, terminal strips, and the like—first. Solder each

socket-saddle to the chassis at some convenient point.

Remove the flat strips between mounting bolts on the power transformer (these strips afford a tight press on the laminations), mount the transformer as indicated, then replace the strips *below* chassis.

Install the grommets for the gang condenser stator or grid leads (lower). Bend the lower stator lugs until they clear the chassis, solder 2½-inch long pieces of green braid covered stranded wire to the upper stator lugs, then install the condenser shield on the tuning unit, bringing the grid leads through the shield openings provided and terminating these leads with grid-cap clips. Mount the condenser on the chassis, after connecting the lower lugs to the green leads (short direct tied) from associated r.f. transformers.

Remove the plate leads from the r.f. transformers and replace with pieces of braid-shielded wire, stripping the braid back an inch or so at each end of the wires. Connect these new leads in circuit properly. See to it that the shield material makes no other than chassis contact, and solder the shield material to chassis at both



The tuning condensers are covered to eliminate dust. IF transformers are on right.

socket and each of the transformer points.

The chassis serves as one common lead for the filament circuit; connect the No. 2 lug of all but the 5Z4 socket to it. Connect the 6F8G grids together by means of an appropriate length of green-braid covered stranded wire—from the number 5 terminal of this tube's socket up through chassis to the grid cap.

Mount the tuning dial *last*—fastening it to the chassis by means of a single mounting screw. With the dial pointer set in line with the horizontal scale markers and with the variable condenser plates at full mesh, tighten the hub-screws on the shaft.

Check and re-check for proper wiring continuity.

Alignment and Operation

Close the line switch (on the tone control) and check for these voltages (to chassis):

- A. Common screen supply bus—75 volts.
- B. R.f. plates—240 volts.
- C. 6F8G plates—120 volts.

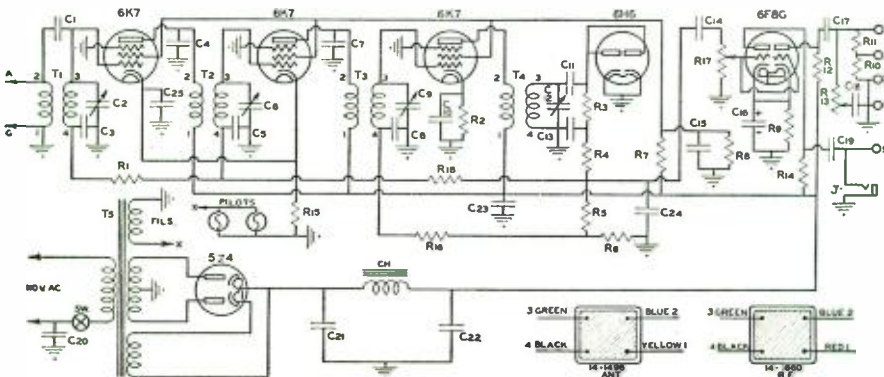
The total "B" drain will measure 27 ma. if the receiver is properly wired and all tubes are drawing correct power at these potentials.

Tuned circuit alignment is made at one point—at about 1400 kc. If an accurate adjustment is effected at this one frequency, the tracking will hold true across the band. No bending of outside condenser plates should be necessary.

As we have advised before, the .0001 mfd. mica condensers from plate to ground in the first two 6K7 circuits should not be removed unless maximum sensitivity is required of the tuner. In most tuner applications the sensitivity and gain will be entirely sufficient with the condensers in place.

To operate the unit, connect to your amplifier, matching the two assemblies properly at the screw terminals and employing a transformer if necessary. If no transformer is available and the matching requirements are not precisely known, experi-

(Tune in page 56, please)



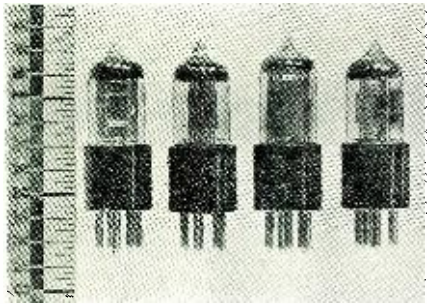
Circuit diagram for the P.A. Tuner.
(Meissner PA-6)

C₁—Integral with coil
C₂, C₃, C₄, C₁₂—4 gang 365 mmfd., Meissner 21-5123
C₅—.05 mfd.
C₆—.0001 mfd.
C₇—.05 mfd.
C₈—.0001 mfd.
C₉—.05 mfd.
C₁₀—.01 mfd.
C₁₁—.0001 mfd.
C₁₃—.00025 mfd.
C₁₄—.05 mfd.
C₁₅—.01 mfd.
C₁₆—10 mfd., 25 v.
C₁₇—.25 mfd., 400 v.
C₁₈—.01 mfd.
C₁₉—.01 mfd., 400 v.
C₂₀—.01 mfd., 400 v.
C₂₁—8 mfd., 300 v. electro.
C₂₂—.01 mfd., 400 v.
C₂₃—.00025 mfd.
C₂₄—.01 mfd.
R₁—100,000 ohms

R₂—400 ohms
R₃—100,000 ohms
R₄—50,000 ohms
R₅—100,000 ohms
R₆—100,000 ohms
R₇—40,000 ohms, 1 watt
R₈—40,000 ohms, 1 watt
R₉—400 ohms
R₁₀—2,500 ohms
R₁₁—25,000 ohms
R₁₂—25,000 ohms, 1 watt
R₁₃—25,000 ohm pot.
R₁₄—25,000 ohms, 1 watt
R₁₅—400 ohms
R₁₆—500 ohms
R₁₇—500,000 ohms
R₁₈—500,000 ohms pot.
CH—30 Hy., 40 ma.
T₁—Meissner 14-1496 coil
T₂, T₃, T₄—Meissner 14-7860 coils
T₅—Power trans. (250 v.d.c. 30 MA)
JW—D.P.S.T.
J—Monitor jack

What's **NEW** in Radio

Hytronic Laboratories, the research division of the Hytron Corp., Salem, Mass., announces a series of new miniature tubes, named "Bantam, Jr." They are $1\frac{1}{8}$ " from top of glass to bottom of base and the bulb is $9/16$ " in diameter. New uses are provided for them in hearing aids for the deaf, feather-weight receivers, weather balloon instruments, and fields requiring a



miniature amplifier of small dimensions and light weight. They have a drain of .070 amp. at 1.4 filament voltage and are available in a triode, input and output pentode, and can be supplied with or without bases.

Littlefuse Laboratories, 4238 Lincoln Ave., Chicago, Ill., is now producing a new model of their Tattelite Tester. This little instrument tests for live or open circuits, blown fuses, defective condensers and resistors, tell whether current is a.c. or d.c., indicate grounded lines, and approximate voltage.

Newark Electric Co., 323 W. Madison St., Chicago, Ill., has issued their 1938-1939 Amateur Radio Catalog. The book, devoted entirely to amateur radio equipment, offers a very complete list of parts, keys, communication receivers, tubes, transmit-

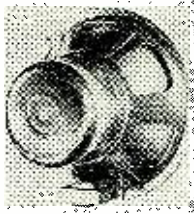


ter and modulator kits, test equipment, antenna equipment, speakers, PA equipment and accessories, and many other items of particular interest to the ham. Free upon request.

A new antenna coupling transformer which makes possible the conversion of existing antenna installations to provide all features of the noise reducing RCA Victor Magic Wave Antenna when used in conjunction with the proper receiving coupling transformer, has been introduced by the RCA Parts Division. Up to 16 radios may be operated at one time from a single an-

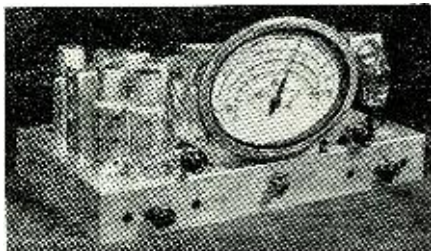
tenna using the new coupling unit together with associated distribution and receiver transformers.

Jenson Radio Mfg. Co., 6601 S. Laramie Ave., Chicago, Ill., is now offering a 12-in. P.M. speaker in five models. They vary in sensitivity, power handling capacity, and response characteristics. The company is also constructing a new laboratory that will add 6,000 sq. ft. of floor space and the most modern acoustical laboratory facilities.



Speedway Mfg. Co., Cicero, Ill., announces a matched drill and grinder set. It consists of a $1/4$ " drill which operates at 100 r.p.m. and is rated for its size in steel. The grinder operates at 20,000 r.p.m.

Glenn H. Browning (formerly of Browning-Drake) has formed the Browning Laboratories, Winchester, Mass., which is specializing on kit receivers and tuners for the amateur and experimenter. The Browning 83 kit receiver, which has been recently designed and placed on the market, covers 540 to 2200 kc. in four bands and



claims extremely low noise level, sensitivity, and high quality reproduction. A series of amateur tuners covering 10-20-40-80- and 160-meter bands are also available. They are all band switching assemblies with electrical band spread.

A new small size tube tester weighing 7 pounds, known as Model 333, has been announced by the Simpson Electric Co., 5218 W. Kinzie St., Chicago, Ill. Double filament switching is provided for testing special tubes such as 5X4G, 5Y4G, 6A5G, 6P7 and others. No adaptors or special sockets are required. It will also test ballast tubes, gaseous rectifiers or the OZ₄ type, pilot lamps, and Christmas tree bulbs.



General Transformer Co., Chicago, announces a new portable 6 volt battery transmitter designed for use in rural areas where power lines are not available and also as a portable-mobile or emergency

transmitter. Metal tubes are provided in the rig to ensure ruggedness. The current drain is 9 amps. fully loaded with key down and 1.4 amps. at standby.

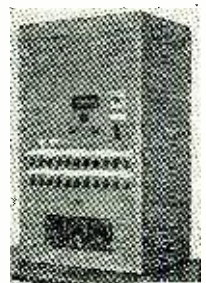
The Raytheon Production Corp. is now producing RK-62, a gas filled triode which may be used as an extremely sensitive detector of high frequency signals. The tube is ideal for remote control apparatus and is operated in the standard self-quenching super regenerative circuit in which the usual phones are replaced by a sensitive relay and a low capacity bypass condenser.

Wholesale Radio Service Co., of New York City, has issued its new 1939 fall and winter "Master" catalog. The 188 page book lists the full new line of Lafayette receivers, sound equipment and PA systems, recording equipment, phono-radio



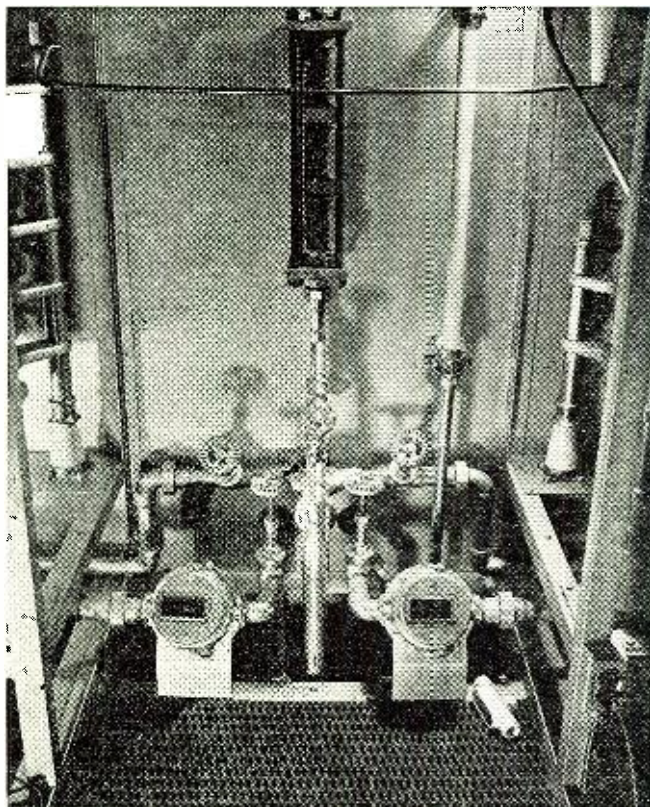
combinations, short wave receivers and transmitters, test equipment, accessories and parts for the serviceman and set builder. A feature of the catalog is two perfected television kits for the experimenter.

A desk-type-panel system for use in schools having 30 rooms or less has been introduced by Bell Sound Systems, Inc., Columbus, Ohio. Features of the system are high quality radio, talk-back for intercommunication, 24 watt amplifier with bass and treble compensation, provision for phonograph attachment, audible monitor, and master switch for each panel of ten switches.

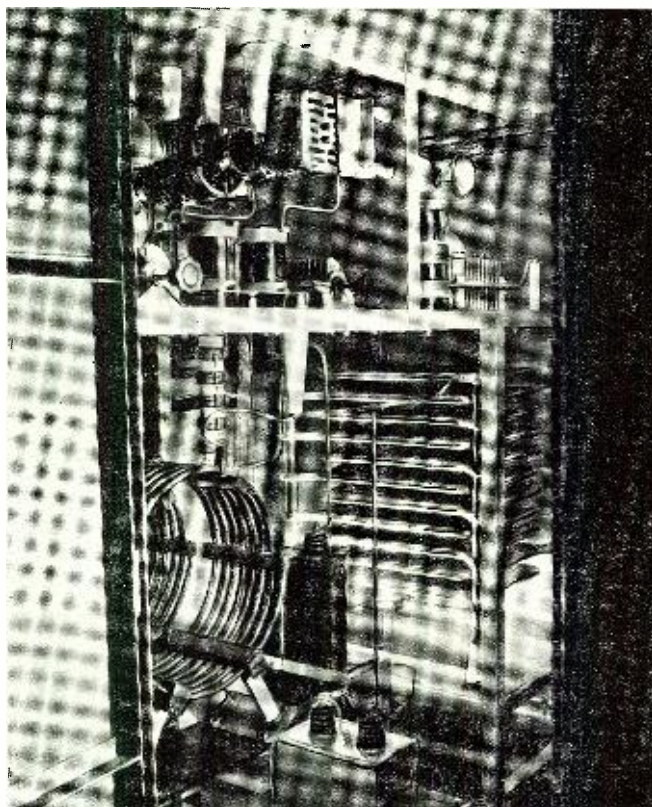


Two new types of Pyranol capacitors, one designed for use in television transmitting sets and the other for radio transmitting sets, have been announced by the radio transmitter division of the General Electric Co.

Service Instruments, Inc., 404 Fourth Avenue, New York City, has published a 16-page booklet on the Rider Chanalyst, the new test instrument which was recently announced to the industry. The new book-
(More new equipment on page 52)



Dummy antenna and water circulating system of the new transmitter. When water pressure falls, transmitter is automatically cut off.



Peak amplifier assembly showing the tuning elements associated with the two \$1650 final amplifier tubes. Antenna is 490' tower.

A New \$350,000 Transmitter

by A. B. CAVENDISH
Torrence, California

THE new \$350,000 KNX transmitter at Columbia Park in Torrence, California, was dedicated in September by Donald W. Thornburgh, CBS vice-president in charge of Pacific Coast operations.

Completion of this new 50,000 watt broadcasting plant closely following dedication of the new CBS studios at Columbia Square in Hollywood, establishes Columbia's Pacific Coast headquarters as the most modern and complete radio station in the world.

The new facilities represent an investment by CBS of approximately \$2,000,000, and both the studios and the transmitter incorporate the latest devices of radio accomplishment.

The 37-acre plot on which the new KNX transmitter is located, was originally a land grant by the King of Spain to Juan Jose Dominguez, one of the early California Dons.

Soon after construction started on the transmitter, the city fathers of Torrence passed a resolution designating the site as *Columbia Park*.

"We are extremely proud of our new Columbia 'Workshop,' which is new from the basement of the studio building to the tip of the 490-foot transmitter tower," declared Thornburgh.

The new transmitter bids to become one of southern California's showplaces, resem-

bling in exterior design a country club, more than a broadcasting plant. The new white and red concrete building sits back from the highway approximately 30 yards, facing a lawn landscaped with trees and flowers.

Some two hundred yards to the rear of the transmitter building, stands the 490-foot triangular tower, from whence KNX-CBS programs will radiate. Located only 4 miles from the Pacific ocean, CBS programs will have the advantage of transmission over salt water in both northerly and southerly directions, which is expected greatly to enhance the clarity of the signal, according to James Middlebrooks, CBS liaison engineer, in charge of construction.

Of general interest is the Columbia policy of welcoming visitors to the new plant. As they enter the doors of the new building, two showcases on either side of the hall will display interesting mechanical contrivances.

Straight ahead is the doorway to the

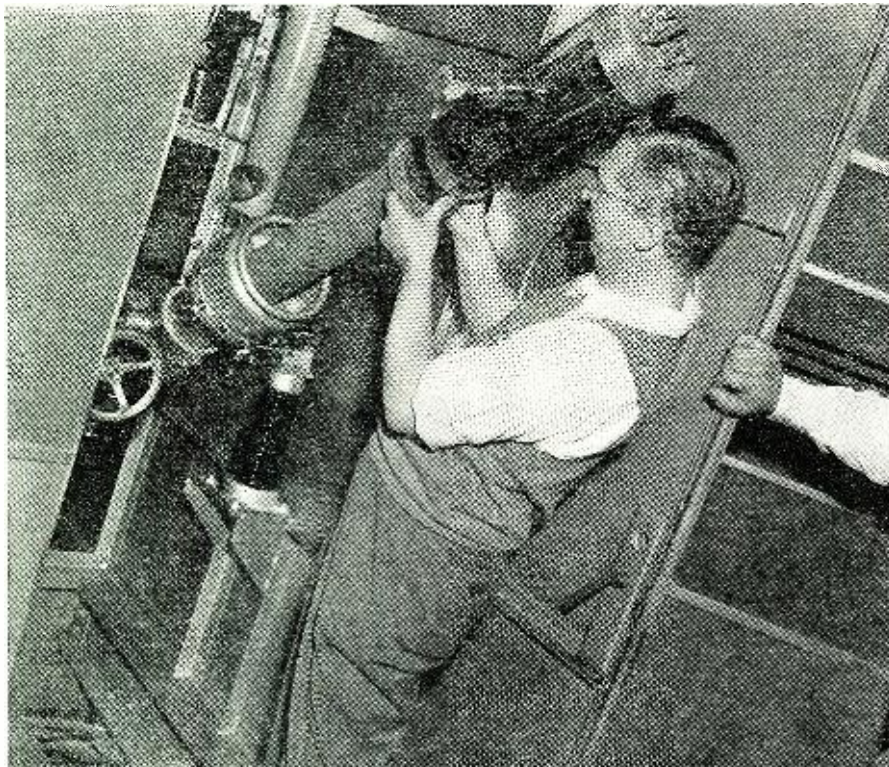
polysided room which houses the new Model 50 D, 50,000 watt transmitting apparatus. A 40-foot panel of modern design, almost bisects the room, and in front of the panel stands a control console at which the operation engineer is stationed.

A walk, bordered by a railing and by a glass shield to the rear of the panel, leads completely around the room, so that practically all of the mechanical operations of the transmitter may be seen by a visitor.

To the rear of the panel, there is a well to the foundation floor of the building, which gives full view to the equipment in operation, with the exception of the large transformers, which are housed in a concrete vault for safety purposes.

Two wings branch off the central section of the building. One provides office space for engineers, and the other includes a laboratory, a storage room, and a complete bachelor apartment.

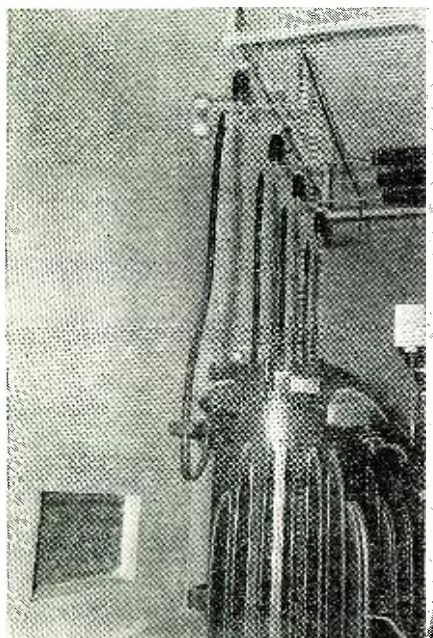
The new KNX transmitter, located at 190th street and Hawthorne Boulevard, was



Engineer inserting one of the \$1650 final amplifier tubes in its water jacket.

designed by the architectural firm of Parkinson and Parkinson, under the supervision of Middlebrooks. The William Simpson Construction Company were the contractors, and it is equipped with RCA apparatus throughout.

The building, according to Middlebrooks, is probably the sturdiest of its kind in America. It is practically disaster proof, and in case of emergency insures Los Angeles of communication with the outside world. The structure is built in two sections separated by a 6-inch expansion joint



Power transformers for the \$350,000 rig.

and will withstand a far greater lateral shock than has ever been recorded. Middlebrooks believes that the building could be rolled over on its side, and still hold together.

In case of emergency, the transmitter is so designed that it could operate independent of outside sources. It has its own well and water supply, and the water is utilized to both cool and heat the plant. In case of a power interruption in the two lines, each of which carries 16,500 volts, a 185 horsepower gasoline engine is installed to supply automatically 50,000 watts of power. Also a receiving set is provided, so if the telephone lines which carry the programs to the transmitter from the studio were cut off, the programs could be short-waved to the transmitter, and rebroadcast.

Every precaution has been taken for the safety of employees and visitors. Every piece of steel and metal in the building has been grounded. Also, each door leading to live electrical lines has been equipped with both an automatic electrical, and a mechanical switch, which grounds the power. A fence, approximately 50 yards in diameter, was erected around the base of the tower to keep persons at a safe distance from possible shock.

The entire transmitter building is of functional design, and includes the most recent developments in radio science, some of which have never been used before, such as the negative feedback, which reduces harmonic distortion and carrier hum to a minimum. This transmitter, Middlebrooks predicts, will operate at 75 per cent efficiency, as compared to 26 per cent for the average plant, and will radiate programs with a higher fidelity than the modern radio set is designed to receive.

-30-

RADIO NEWS ANNOUNCES ITS Seal of Acceptance

FOR many years, now, the serviceman and the ham has purchased equipment being guided solely on the integrity of the salesperson or the advertising matter which has come to their attention. There has not been any yard-stick against which to measure the product. It is to the credit of the radio manufacturers that they have been most careful in telling only the truth about their products, but with the ever increasing numbers of manufacturers who are entering the field, it was felt that some service could be done for our readers were there some other method of double checking these statements.

To that end, RADIO NEWS takes great pleasure in announcing that it has established its SEAL OF ACCEPTANCE, to be awarded to manufacturer's products wherever they have requested its issuance and its products have been tested and been found to come up to the claims that the manufacturer makes for them. What it amounts to is this. RADIO NEWS will take the claims *made by any manufacturer* for his product and test the article to check them.



RADIO NEWS SEAL OF ACCEPTANCE.

No attempt will be made to go outside of his claims, and the tests will be restricted to those claims only.

By this we mean that if, say, a condenser is claimed to withstand 400 v. d.c., the RADIO NEWS testers will put only 400 v. d.c. on it, and not a volt more. If it will stand the 400 volts, it would be given a SEAL OF ACCEPTANCE.

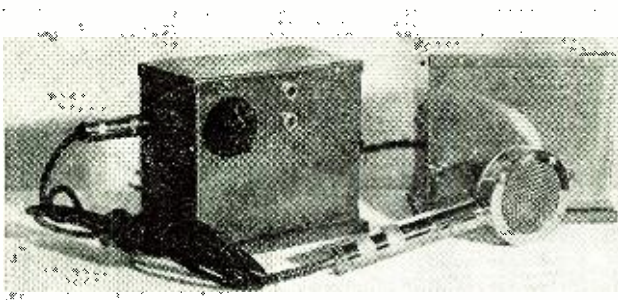
While application for the SEAL OF ACCEPTANCE is wholly voluntary, we have already had applications from over 35 firms, and the SEALS will be awarded as soon as we can get the applications completed and the tests completed.

When buying, look for the RADIO NEWS Seal of Acceptance!

-30-

Build the "Ham-Amp"

by J. F. GORDON
Great Falls, Montana



Two units comprise the Ham-Amp, one houses the amplifier and the other the power supply, thus minimizing A.C. hum pickup.

With this little unit, a P.A. System designed for double button mike, can be used with a low-output crystal mike or pickup. It is really a general all-around compact high-gain amplifier.

THIS little amplifier was first built to adapt an Astatic crystal microphone to a modulator unit which only provided for the use of a single or double button carbon microphone. Since its construction, however, it has been used for practically everything a small, high gain amplifier could be used for. The frequency response is gratifyingly flat throughout the usable part of the audio frequency range. Push-pull output is used. The input impedance is 7 megohms, which is standard with crystal microphone manufacturers. By using this impedance input, the high impedance transformer output of the velocity, or dynamic, microphones can be coupled directly without the loss of any frequency response.

Construction of Amplifier

Since it is not practical to have the gain control on the input stage, it is on the second stage. The input stage consists of a 6F5 which is coupled to the two 6C5's in push-pull by a combination of transformer and resistance coupling in the middle of which is the constant impedance volume control. A lot of the parts used in the building were picked at random out of the junk box. The first choices, such as the input transformer, which is an orphan with no markings, does a fine job working into the 6C5's and so has never been changed for a more expensive one. The case which houses the amplifier is an old shield can removed from a discarded Temple receiver.

The 6F5 makes a good first stage because it is readily adaptable to resistance coupling and has a high amplification factor. The two 6C5's make nice output tubes because they can handle the full output of the 6F5 and have the advantage of being compact, too. Since the same luck might not hold for everyone in picking up the right im-

pedance push-pull input transformer it might be wise to purchase this rather than pull it out of the junk box. Quite a bit can be done with most any input transformer here, though, since the capacities C_2 and C_3 can be varied for the best results. Of course the ratio of this transformer has considerable to do with the gain of the amplifier.

Assembly of the parts are such that all leads are extremely short. The input jack is located directly next to the grid of the first tube and the output jacks are on the next side, so that there is less chance of coupling between the input and output leads. Both the volume control and jacks had to be wired above the subpanel since it was necessary to slide the amplifier into the case from the top and then bolt them in afterward. Its more or less of a problem to get all the parts including the input transformer under the subpanel but it can be done. The output transformer (UTC CS-27) is located on top of the subpanel which is made of thin aluminum with the ends turned at right angles so that they touch the bottom of the cabinet.

Construction of Power Supply

The power supply is housed in the same kind of shield can as the amplifier. Power transformer, is a midget receiver transformer. The rectifier can be either a 5Z4 or 5W4. The filter is of the "Brute Force" variety and consists of three midget chokes and all the electrolytic filter condensers there was room for in the can. This turned out to be 48 mfd. The rectifier tube is mounted horizontally at the top which allows the heat to escape without overheating the electrolytics. Small pieces of mahogany fit nicely to the bottom and improve the appearance of the power supply and amplifier. They are covered on the bottom with felt to pre-

vent their scratching any surface.

Some Uses for the Amplifier

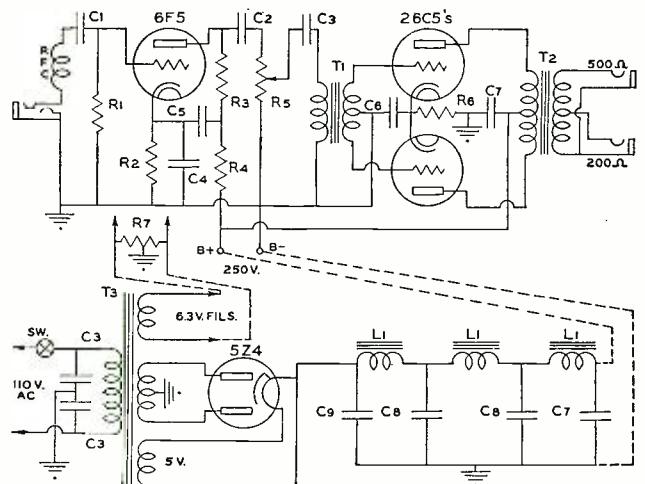
It increases the gain of the ordinary low gain amplifier so that more sensitive, high fidelity microphones of the low level type, such as the crystal, velocity, and dynamic, can be used without changing its circuit or adding clumsy equipment.

Its 200 and 500 ohm output can be worked into corresponding lines.

Same outputs can also be worked into single and double button microphone inputs of amateur or commercial transmitters to improve voice quality without making any change in equipment. The r.f. choke in the input stage helps to eliminate feedback through this source.

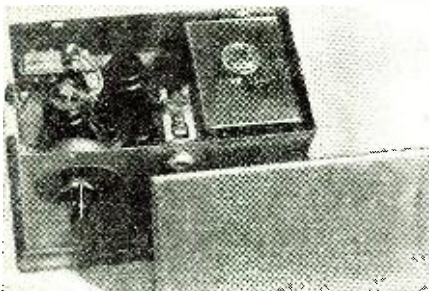
It makes a splendid vertical or horizontal sweep amplifier for one to three inch cathode ray tubes.

By using a pair of headphones on the output one can make a quick effective test for sensitivity of crystal microphones. It is often necessary to get out cumbersome equipment, in fact most small sound service shops have to set up a whole public address (Fade in next page, please)



The circuit diagram of the Ham-Amp.

R.F.C.—National R₁₀₀ R₁—30 ohms, 1 w. C.T. wire wound hum control
 T₁—3:1 ratio PP audio input trans. C₁—.01 mfd. 200v. paper
 T₂—UTC CS-27 or equivalent C₂—.1 mfd. 400v. paper
 T₃—Midget receiver trans. (pwr.) C₃—.1 mfd. 400v. paper
 L₁—Midget filter chokes C₄—12 mfd. 25v. electro.
 R₂—7 meg., 1 w. C₅—8 mfd. 325v. electro.
 R₃—5,000 ohms, 1 w. C₆—8 mfd. 25v. electro.
 R₄—250M ohms, 1 w. C₇—8 mfd. 450v. electro.
 R₅—2,250 ohms, 1 w. C₈—12 mfd. 450v. electro.
 R₆—500M ohms, 1 w. C.T. Volume Cont. C₉—10 mfd. 450v. electro.
 R₈—530 ohms, 1 w.



Tubes grouped together opposite the output transformer gives hum-free response.

system to check the popular crystal microphone. The "Ham-Amp" is always accessible instantly for work of this sort.

It was a big help during the construction of a transformer coupled speech amplifier, which through necessity had to operate within the field of the plate transformer of the high voltage transmitter power supply.

Each audio transformer was connected to the "Ham-Amp" one at a time and the big power supply turned on. The transformers were then turned to the position on the sub panel which afforded the least hum pickup before they were bolted down. There was no appreciable hum in the output of the finally assembled speech amplifier although it was well within the field of the big transformer.

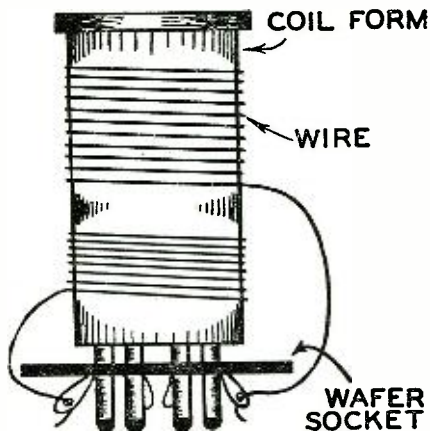
There are many more uses to which this amplifier may be put. Its push-pull output, hum free, quiet operation, practically flat characteristic, high gain, and compact construction make it indispensable.

-50-

Adapter for Determining Coil Frequency

In winding plug-in coils it is general experience to find that the prescribed number of turns in theory is not the number needed in practice. After the coil had been assembled with the leads soldered in the prongs, the tuning range is, unfortunately, either above or below the frequency coverage desired. Here is a little adapter that has proven an excellent aid for trying turns before making the final solder connection.

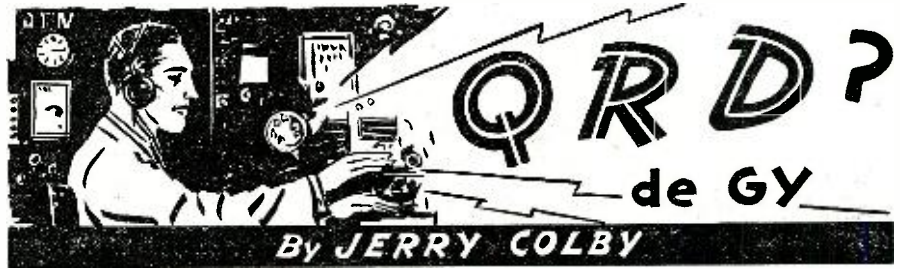
Using this adapter, wind on more turns than are called for, and solder all leads to their respective prongs except one lead



of the secondary coil as shown in the sketch. The adapter consists of a thin wafer socket. Push the prongs of the coil form into this socket as far as they will go, then temporarily connect the loose lead of the coil to the proper adapter connector.

Now push the coil into the regular socket so that the prongs of the coil-form just make contact. In this way you will have freedom for working along the "cut and try" method without removing the coil from the socket. Remove one turn at a time then check for band width until the correct number is reached for the desired frequency. When this is determined, remove the adapter and run the lead down through the prong and solder in place.

-50-



HIYA, fellows. Yeh, here we are again, and it was sure pleasant to hear all your good wishes on returning to our old stamping grounds, RN. After all the years that we tried to keep you acquainted with the latest infor "from the Rocky coasts of Maine to the sunkist shores of California and from the Great Lakes on the north to the Gulf of Mexico in the South," and acted as your faithful sleuth-hound and your glorified msgnr boy, it is with a deep sense of gratitude to know that it was appreciated.

But now that the amenities are over and we settle down to the double-bottoms, I again pass the remarks that I voiced in 1932 (how time do fly?) quote this column is of you, for you and by you. We ask you to take advantage of its space and editor, me. We're not kidding! We want you to write in and ask us to answer the questions which have been keeping you awake, or whom you're trying to locate, or what have you. And you're all herewith duly and solemnly elected "superior sleuth-hounds" to send in all the info on "what goes on" in your neighborhood with special emphasis on new methods of operation and "whodunit." So let's go.

* * *

QUITE a trifle of aqua has meandered under the viaduct since we last conversed with you and we wish to add our condolences to the wife and family of Brother William McCarty whom we remember well as one of the charter members of the ARTA, chief opr for many years of the SS Lurliner and a real honest-to-goodness shipmate. The loss of his life in the true traditions of the radiop, going down with his ship, the ill-fated Hawaii Clipper, was mourned by all. To honor him, ACA Local 9, Point to Point Div. at SanFrisco unanimously elected him, posthumously, honorary President of the local. It is but a small tribute to the man, his intense tireless efforts for the union and his knowledge of the radio art, but it was thoughtful.

* * *

AT AN informal hearing proposing the new rules for radiop licenses known as FCC docket No. 5218, we are happy to report that not only was everybody there but also, the two radiop voices, CTU Mardiv and ACA, actually agreed together in disapproving most of its suggestions. (There's hope for the radiop when factional disputes are forgotten in the interests of the men these organizations serve.) In reference to the clause "physical, moral and mental fitness" which leaves it entirely in the power of the regional Radio Inspector to decide whether men are fit to qualify for a license or renewal of same; doesn't that give any RI too much of a bat? And as for examinations for renewal of licenses at stipulated intervals, we have always advocated this type of policeman to keep radiops on their studying toes.

But we do not think a "practical" examination should be given inasmuch as this also would give an examining RI the chance to put a man through the paces of an engineer, if he wanted to discriminate against him. A written exam should certainly be able to show up a man's knowledge and his past practical experience should be sufficient on which to judge his technical ability. We do not say an RI would do anything not in accordance with Hoyle, but there is always the possibility of the "human element" entering into anything. We also believe a longer period than three years should be the duration of a license. So when the new hearing is held, we hope our suggestions will be added to the testimony which will be given. And if you think so; too, why not let the FCC know about it?

A NOVEL idea formed and executed by the San Pedro Marine Local 7 ACA, has gone a long way towards keeping the men happy and the "wolf" from the nipa shack. Due to the list of men who were waiting for assignments being too long to immediately place them, they designated a few of the short run ships as "relief ships." As one man came off another took his place. So that eleven men were able to make an average of twenty-one days pay, or about \$75.00 per month. We hope this example may be followed by others so that "staggering watches" will aid them all.

* * *

UNDER Public Law No. 808, Section 2 . . . "nor shall any licensed officer or seaman in the deck or engine department be required to work more than eight hours in any one day; but these provisions shall not limit either the authority of the master or other officer of the obedience of the seaman when in the judgment of the master or other officer, the whole or any part of the crew are needed for maneuvering, shifting berth, mooring, or unmooring, the vessel or the performance of work necessary for the safety of the vessel" . . .

So, when an FCC inspector cited Fred M. Howe of Local No. 2, ACA, for failure to observe more than an eight hour watch on a coastwise vessel, Brother Howe asked the FCC whether they intended to enforce radiops to observe such orders, FCC replied: (Quote) Attention is invited to Section 368 of the Communications Act . . . The radio installation, the operators, the regulation of watches, transmission and receipt of msgs, and radio service except as they may be regulated by law or international agreement, or by rules and regulations made thereof, shall in the case of the US be under the supreme control of the Master. (Unquote.)

It would therefore seem that as in Section 1 of the Communications Act, and in the phrase included therein reading . . . "For the purpose of promoting safety of property and life through the use of radio and wire communication" it's a simple case of "when is safety not safety," and or vice versa with FCC holding the ball.

* * *

THE ACA Marine Pacific Coast reports that all agreements with off-shore and coastwise shipping companies have been renewed again. There were a few cases where skippers told ops they were required to do clerical work, etc., but the union stepped on that idea at the start. So all's serene on the western front.

* * *

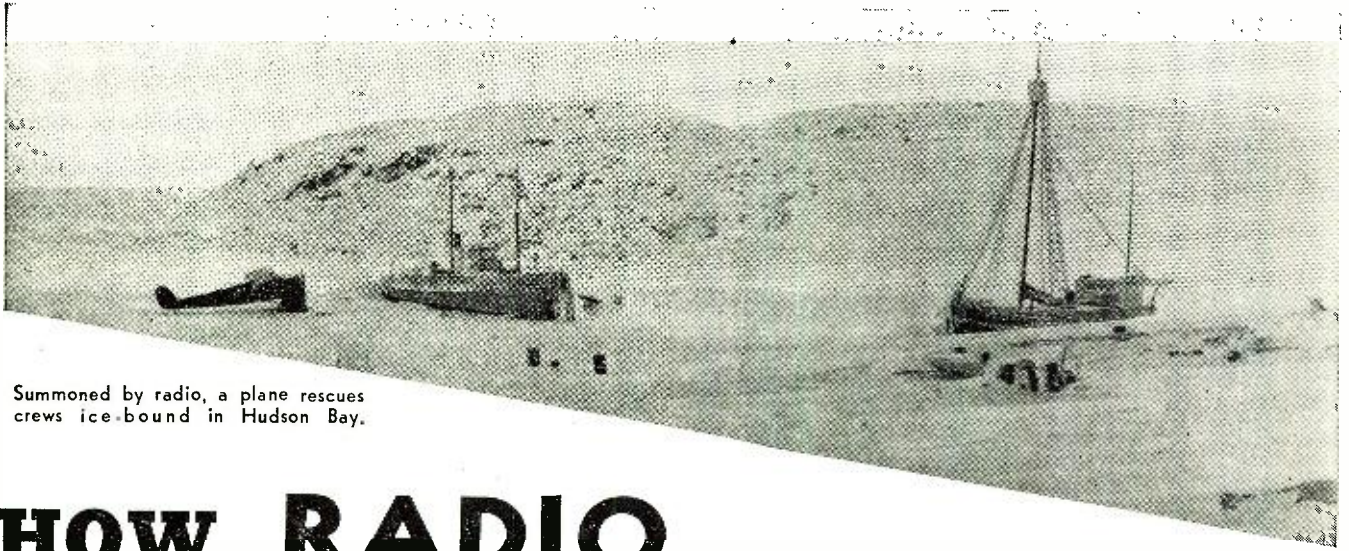
THE CTU Mardiv is continuing to carry on and have taken larger offices at their New York City location. They have also opened a Gulf office for their members down in that vicinity. They report a few NLRB cases up before the board with high expectations to win their demands.

* * *

HOW times have changed! From the crummy, close quarters of the radiop "vintage of 1920," to the beautifully appointed modern apartment of the radio office of today! This long step forward has been achieved by ops of the PanAmPet's new vessels now being constructed. The brass-buttoned gadget on this type of vessel has a private room, modern furniture, an adjoining bath shared by one other officer, and spacious locker space for his personal belongings. What, no air-conditioning?

* * *

AND now our coasting reporters report: Both coasts very quiet in shipping and therefore quite a few men on the beaches. (QSY to page 57)



Summoned by radio, a plane rescues crews ice-bound in Hudson Bay.

HOW RADIO SERVES THE GREAT NORTH

by T. H. INKSTER
Goderich, Ontario, Canada

Doctor, life saver, everyday workman, are but a few of the important roles played by radio in making life and commerce possible in the North.

HOW would you like to live a "million miles from nowhere," with only never-ending snow fields and mountains rising into the mysterious northern lights like ghosts for company? Many men have lived alone in the great lone land of eternal silence. And in so doing became rich, with many going *bushed*. (In the vernacular of the North, one who loses his mental equilibrium is referred to as *bushed*.) Today men can live alone in the high north and like it; thanks to radio.

But a few years ago "moccasin telegraph" was the chief means of communication in the North. Like the grapevine telegraph of the Civil War, messages were passed

across the country with surprising rapidity and correctness. Radio stations for transmitting and receiving messages are now located at mining centers and all important points, and almost every white resident has a receiving set. The northerner talks about radio sets just as most people "outside" talk of automobiles. At Fort Norman, recently, one of the operators asked if we would care to read a message he was relaying across the country. *It was in Eskimo!*

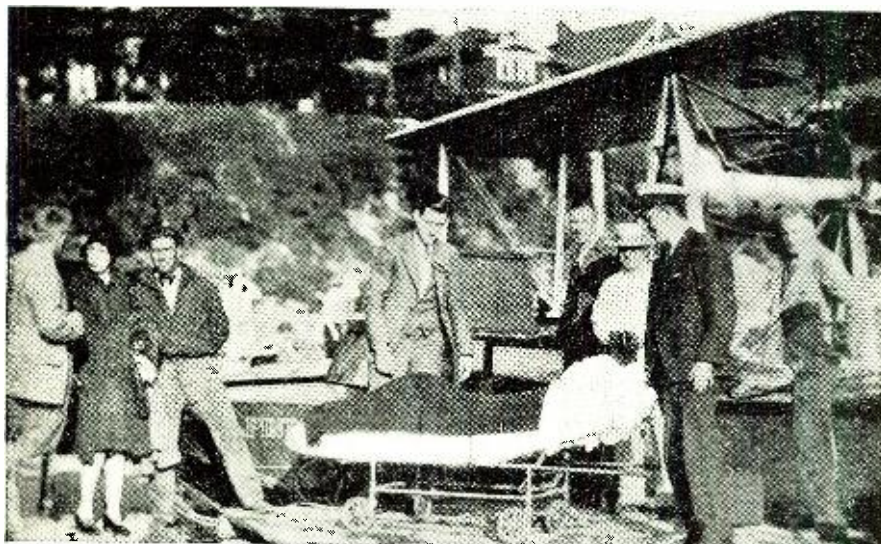
In the Eastern Arctic, where there is no airplane service and where the supply ship with mail and requirements calls but once a year, radio has been a godsend to the

isolated trader, trapper, and prospector. He now keeps abreast of world events by radio, and from several radio stations letters from friends and relatives are read.

Radio has altered the fur trading policy. The trapper listens to price quotations and trades accordingly. Where yesterday the trader had everything to gain and nothing to lose, he now conducts his business like a merchant outside.

Due to the long distances of travel in the Canadian North, airplanes were not, until recently, equipped with radio, since even the lightest set would cut down the payload—the only means of revenue. On a thousand mile jaunt from Edmonton to Great Bear Lake, with the rate often as high as one dollar per pound, this is understandable. However, every plane forced down in a remote area caused a far-flung search for the missing pilot, and the airpotation companies eventually realized that radio-equipped planes, even with a lesser payload, provided cheaper and better service. Today the WX, or weather flash, from an operator 400 miles north, tells the pilot that the sky is overcast and that his ceiling is 4,000 feet with visibility of the best.

So many mercy flights, made possible by radio, have been made that they are no longer news. The rescue of Vic Ingraham is typical of what northern fliers are constantly doing in saving human life. In the fall of the year, the motor ship *Speed* caught fire while crossing Great Bear Lake. The captain, Vic Ingraham, suffered severe burns
(Continued on page 66)



A patient has just been flown out of the northern wilderness for hospital treatment.

THE NATIONAL QSO PAGE

DOG NAMED TERRY LAW JOINS ARRL

LAST month we showed that a four-year-old boy, Joel Davis, by subscribing to a radio publication (*QST*) suddenly found himself automatically made a member of the ARRL, with a certificate of membership and everything. Young Master Davis did not perpetrate a fraud on the League by becoming a member. He had never heard of the League. He didn't ask to be a member. He was simply made a member without either his knowledge nor consent.

This month we are presenting another interesting circumstance in regard to what membership in the League may or may not mean. As a further test, we entered a subscription to this same magazine (*QST*) in the name of an Irish Setter dog, named Terry Law, owned by Miss Carol O'Brien. Terry Law is a pedigreed animal, but even he must have been surprised when he discovered that his subscription to this radio magazine (*QST*) entitled him to the distinction of membership in the ARRL without any request being made either by his mistress nor by himself. The dog, Terry Law, found himself in receipt of a similar handsome membership certificate as the infant Joel Davis—in other words he was a full-fledged member of the ARRL.

From some aspects this is more than a funny situation, but its humorous side is heavily eclipsed by the sad fact that it indicates something completely rotten in amateur radio affairs. It is bad enough for people seriously interested in amateur radio to find themselves in the same company with dogs like Terry Law and four-year-old infants like Joel Davis. What's worse, is the fact that Terry Law or Joel Davis or anyone like them—probably even a centipede, a parrot, or a bullsnake in someone's barn—can, by the simple procedure of subscribing to a radio magazine named *QST*, automatically become members of a League which should demand careful qualifications for membership. This would appear to indicate that membership in the ARRL is based on a subscription to a radio magazine (*QST*).

In other words, it seems that the League is a mere adjunct to a radio magazine, and that a subscription to that magazine is the only qualification demanded for membership.

This is brought out further by the fact that ham engineers like Harry Harrison, W9LLX, and George Barnich, W9KQH, were both refused membership in the ARRL simply because they did not wish to subscribe to the radio magazine, *QST*.

This would appear to be a formidable situation, and a mighty unpleasant one as far as the force and power of the League is concerned. How can the FCC or the other important governmental bodies which govern the ham's destinies take a league seriously which creates members out of dogs and four-year-old infants (without their solicitation or consent) and which may have its membership stuffed with all kinds of similar dead-weight. It is a safe guess that if some philanthropist wanted to subscribe to this radio magazine, *QST*, in the name of 50,000 white Leghorn chickens, the actual hams would find themselves still further out-numbered in the membership of the ARRL.



ARRL MEMBERS WILL BE SURPRISED TO FIND THAT A DOG TERRY LAW (SHOWN BELOW) HAS BEEN MADE A MEMBER OF THEIR HAM LEAGUE.



Joel Davis, 4 years old, who subscribed to a magazine and was made ARRL member.

While not all members have a vote in the elections of Directors, still in figuring the strength of the League as a representative body, the *entire membership* is taken into consideration, including, now, dog Terry Law and infant Joel Davis.

All of this means that the League and all that it stands for, lays itself open to serious question in responsible quarters, and that if this process is not stopped soon, its actual influence could easily be nil. What is needed is a real ham organization restricted to qualified persons only, or at least to those who can actually qualify under the aegis, "a bona fide interest in amateur radio." What is needed is a real ham organization that can truly state (and be believed in that statement) that they represent the interests of the American Radio Amateur, and not be suspected of being a mere adjunct to some commercial enterprise.

We have a high regard for *QST* as a publication. We think it is a worthy contemporary, ably edited, and if we were asked we would urge all persons interested in radio to read its columns in addition to our own and those of other radio publications. But when it appears that an organization such as the ARRL, which should be utterly independent, and should possess complete and rigid qualifications for membership, has become so involved with a radio publication, that it appears that qualified radio engineers unwilling to subscribe to this publication cannot join the League and associate themselves there with other qualified and competent radio engineers, then it appears that something must be radically wrong.

The hams have a right to expect the League to be virile, and to have the primary attention of its well-paid officers. Something must come first—and it should be the ARRL, not the magazine. But when members are judged upon one qualification only: "Do you subscribe to *QST*?"—when topnotch hams are refused membership in the League and Irish Setters have membership foisted on them,—something is completely screwy!

A weak League is worse than no League. In a weak League the wishes of the minority are foisted on the majority. A weak ARRL has no power, no push, and no right to recognition as the mouthpiece of 50,000 American Amateurs. Let us first discover what is needed to strengthen

the League, and then let's all pitch in and fight The Last Battle For the Hams. But let's fight to WIN.

A PLAN IS COMING!

WE are pleased to report that a plan is being worked on by a group of dispassionate, but interested hams which will be presented to the ham fraternity for their discussion and approval. If sufficient hams do approve it, it will be offered to the FCC for action. The Plan will be reported here as soon as it is perfected.

TRIVIA?

OUR contemporary, *QST*, has just made the statement that "most of the changes" in our amateur regs by the FCC "are trivial." Since when can we call *any* deliberations of the FCC "trivial"; and how do the Federal Communications Commission members them-

selves feel about the hams referring to their activities in such unfriendly terms?

It would pay us to follow suit of our broadcasting brethren who feel that anything that the FCC does is *important*. Firstly what may appear trivial today, may be most important tomorrow, and it is a poor policy to lull the hams with such a statement. Rather let the League scrutinize each and every change in the ham regs most carefully to see that they do not have far-reaching effects which might at some later date become unbearable, and even inimical to the ham's very existence.

A QST REBUTTAL

BREAKING a long, long silence, *QST* in its September issue, insists that we misquoted "an ARRL official" when we said in *RADIO NEWS*, August, 1938, p. 36, that K. B. Warner had stated that, "You boys had better go after your WAC now, because in four years there won't be any WAC, or words to that effect."

Firstly, again we reiterate, and unequivocally, that the statement *was* made, and by Warner, and that over two hundred hams heard it. Check with them.

Following the article in *QST* further, we note with satisfaction that while attempting to tell the membership that we misquoted Warner, the statement is made,

... "we do believe that we must expect that at the Rome conference, a strong attempt will be made by European administrations to liquidate amateur radio in these two bands." ... (Italics ours.)

Reading further, we see the statement that: "... the U. S. Government would reserve these two bands for the American ham, and that the European amateur would be the only one to suffer." ...

Then *QST* draws this conclusion from that state of facts:

... "But stop and think what it would mean to us if we retained the bands but the European nations filled them up with non-amateur stations of high power!" ...

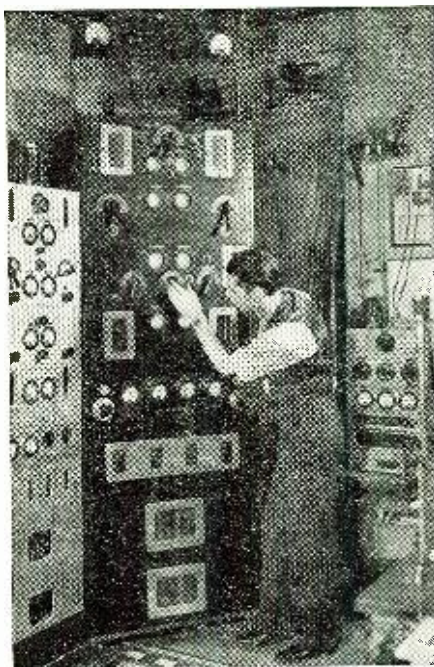
How can *QST* try so hard to convince us that (1) we will keep the bands for the U. S. ham, and (2) even if we keep them, what use will they be to us, and then make the statement in the August, 1938, issue, as follows,

... "Moreover, our signals, at the optimum paths over which we communicate to get through our own QRM, will have plenty of punch to override broadcasting interference, so our cue is not to get out of this end of the band (7200-7300kc) but quite the contrary. And if some of our high-power ham rigs just happen to get on some of the frequencies used for broadcasting (as they inevitably will), that also is just too bad. We'll blast 'em off the air! We'll mow 'em down!" ...

What has happened to Warner in just one month? Has some European power "told him off?" If we can "blast 'em off" of 7200-7300kc, why can't we "blast 'em off" of 20M and 40M? Why does Warner say one month that 7200-7300kc, even though lost in Europe to the broadcasters, will be OK for us here, and the next month say that if we don't lose both bands in question, that we will not be able to use these frequencies anyway, because of the European high-power broadcasters in them. What has happened to make Warner change his mind?

We'll give you our opinion—one being shared with thinking hams whose number increases each day. *The ARRL doesn't know what to do about it!* Caught in the maw of an ever awakening membership who are going to demand more and more in the way of ACTION from the League, and at the same time giving the FCC repeated boots, the ARRL is in somewhat of a dilemma. The solution is

ALTHOUGH THESE TWO MEN WANTED TO JOIN THE LEAGUE TO HELP KEEP THEIR HOBBY, THEY WERE REFUSED MEMBERSHIP BECAUSE THEY WOULDN'T SUBSCRIBE TO A RADIO MAGAZINE RUN BY ARRL.



Harry Harrison, W9LLX, above, who is author-engineer and serviceman, and George Barnich, W9KQH (left), who is a factory radio inspector, were both refused membership in the League because they wouldn't subscribe to a radio magazine it runs.

this. *Get going on that "housecleaning job" before it is too late.*

Let us briefly review the situation for you. First the FCC censured Segal, ARRL attorney, by suspending him for a period of three months, then the League in the face of this gives him a Vote of Confidence and sends him to Cairo to consult with and associate with a member of the very body that censored him. Next the League reports that it was unsuccessful in saving 7200-7300kc for the European amateur, and that the European powers are going to put broadcasting into that channel. Then the League tells us that that won't make any difference because we can "blast 'em off the air!" Following that the League tells a body of hams that they had better get going on WAC because they are about to lose 40 and 20 meters. Then they tell us that *we* won't lose these frequencies, only the European nations' amateurs, but that we will keep those bands. And then they tell us that if we do keep them we couldn't use them anyway. Finally they say the FCC enacts trivial changes in our regulations. What sort of a shindig is this? A well muddled situation! The answer must be obvious to many. *We are going to lose those bands.* And the ARRL is doing nothing about it because, probably, they do not know what to do; at least we haven't seen anything, yet!

Supporting our statement that the U. S. ham is practically an unknown person in Washington, is the statement of FCC Chairman McNinch made before the Atlantic Division Banquet on June 25, 1938, when he said, "Indeed, until I became Chairman of the Federal Communications Commission, I my-

self did not know much about the work of the amateurs." ...

True it is that the Senate can do little *officially* for the ham, but it can refuse to ratify appointment to the FCC, and refuse to send delegates to the Rome convention who do not have the best interests of the amateur at heart. You may believe us, that no delegate ever went to any convention of international importance, uninstructed. Such instructions come from the executive branch of our government and thus indirectly from the legislative body.

Therein lies the potential power of ARRL: to influence, and educate, the members of the Senate and the House of Representatives that the American amateur is the bulwark of any democracy. Not only is he the bulwark because he indulges in the greatest boon of Democratic Government—free speech—but he is the reserve in time of national emergency.

This was more than ever borne out with the curtailing of the hams in every country wherever a dictatorial form of government came into power.

Are you, an American Amateur, with the rich heritage of Valley Forge, New Orleans, Gettysburg, Antietam, Cuba, and Chateau Thierry, going to let ham radio become the tool of dictators to such an extent that we as Americans are prevented from enjoying our hobby because some European Dictator wants to disseminate seeds of hate, oppression and murder over the very channels in which we, as hams, did most of the development? Or are you going to get after that director of yours, get after the League and after your fellow hams to support our American ideals by pushing the fight to retain our hobby right to the very desks of every Senator, every Congressman, every member of the FCC, even the President himself? We prefer to think that you will do the latter!

Finally the League closes its weak rebuttal with the statement, ... "The ARRL may be counted upon to continue, as always, its best efforts on behalf of its members." ... How about the greater part of the hams who are not members of the League? Will the ARRL desert them, or will it foist its ideas on them? In an editorial in the June, 1938, issue of *QST*, it says, ... "No movement on the part of a minority to impose however superficially meritorious a plan on the majority has ever succeeded." ... The League has accepted a semi-public trust to speak for *all* the hams, although admittedly it numbers a minority in its membership. If we are to take the statement of Warner as true, that the League is going to do its best, may we know what it proposes to do, so that there may be time for discussion among amateurs and a workable plan satisfactory to the majority may be evolved?

Let us make one thing clear to the hams. The officers of the ARRL are not PAID to philosophize, to make excuses nor give reasons why the frequencies have been taken from us. With their salaries of over \$51,600 per annum, they are supposed to be high-powered, competent, industrious men, whose sole purpose in being in the positions that they hold, is to further the interests of the American Ham. The hams are those who may, if they feel so inclined, offer a philosophical treatment of a condition which the officers must, as PAID employees of the League, treat with ACTION, not words. Talk is cheap. We've had lots and lots of words, mouthings, and sonorous senilities as to why this or that scheme wouldn't work, or why this or that Nation took what it did from us, but what we have had nothing of is—ACTION. If those in the position of executives and officers of the ARRL are *unable* to accomplish the very thing for which they receive their pay—and it's in the higher brackets, too—then let's get rid of them and get someone in who is worth "his salt" and "can pull his weight

\$1,000 REWARD FOR INFORMATION

DURING the entire period that we have been publishing, we have endeavored to set a high standard for our magazines. We felt that a publication should serve as more than a mere advertising medium, and that it is the duty of a publisher to render a direct service to those readers whom the publication serves. We have always been vigilant, in consequence, in our efforts to protect the best interests of our readers, feeling in particular that free and open discussion was the healthiest and the fairest method wherever some question arose affecting the interests of the body of our readers.

On some occasions this attitude has threatened us with material loss. On others, it has exposed us to campaigns of slander. If we needed any proof that our attitude was exactly right, and well taken, it was quickly furnished by the false, misleading, and malicious rumors which were soon circulated in an effort to discredit our editors, and to draw attention from the real issues involved.

On another of our publications, our publishing company has been ferociously attacked as being a Fascist agent. At almost the identical time another malicious attack was made on the character of one of the editors of RADIO NEWS, in an attempt to brand him as a "red"

or radical, and to make it appear, by a clever confusion of issues, that RADIO NEWS had some untoward and unAmerican purpose in its editorial policies. We know that this dastardly whispering campaign exists. We have been in receipt of anonymous letters making these same scurrilous and underhanded attacks.

None of these things will deter us in the least. We are determined to bear faith with our readers. As long as there is a free press in America we will be guided only by what we consider the best interests of the readers we serve, and not by the selfish interests of others who might attempt by these and other means to intimidate us.

The charge that our organization has any Fascist or Communist connections, no matter how remote, is, of course, ridiculous. Actually, we have no political tie-ups of any kind, and subscribe to no slogans except that of "America, first, last and always." There is, moreover, no member of our staff who is in any way connected with either Fascist, Communist, or any other kind of subversive political group.

Those who are unable to withstand the honest clarity of our policies, and who have resorted to this under-handed campaign of cowardly lies, are hereby on warning that we are not going

to allow that, either, to go unchallenged. The introduction into American business life of the same type of slanderous material used to besmirch the character of opponents, such as now degrades the very name of Europe, demands that its authors here be rooted out and exposed. This we intend to do. As our first action in this matter, we are offering a reward of \$1,000 for information leading to the arrest and conviction of any person or persons guilty of this kind of slanderous utterance.

The hams are simply asked to watch out for, and to identify, the sources from which this mean and unAmerican material is emanating. Keep a vigilant eye open, and ask all other hams to do the same, so that these cowardly and dishonest creatures who are attempting to work their havoc from the shadows can be quickly identified. All you have to do is to send the information on to me, personally. All replies will be held in strictest confidence.

In the meanwhile, the hams may be sure that RADIO NEWS will continue with the same courage and faithful spirit to serve their best interests, irrespective of any attempts at intimidation, from whatever source.

WILLIAM B. ZIFF, Publisher

in the boat." *Certainly at this crucial time, what we need most of all is ACTION.*

If the League has a plan—any plan—let it reveal it now! To wait, may make it too late! And if the League has no plan, we, the American Amateurs, must provide one for it. This can only be done by putting aside all petty grievances and striving towards the common goal—"Save the Bands for U. S." If anybody has a plan of ACTION he thinks will work—send it along and we'll publish it! The hams have said, "Let George do it," too long. "George" couldn't do it; and it's up to us now. If you want to keep a great American institution alive,—get going!—The Editors.

CORRESPONDENCE

ARRL PURGE

Dear Sirs:

Wish you all the luck in your "purge" of the ARRL. If 20M is taken from the hams, I might as well dispose of my receiver.

(Sgd) M. W. Soplop, Allegany, N. Y.

■ We are not engaged in a "purge." We are trying to awaken the hams to their plight and the threatened elimination of amateurs to below 2½ M. if steps are not taken to protect their rights by the League.—The Editors.

CAN'T SEE ANYTHING WRONG

Dear Sirs:

... I don't see what concern you have in the League. Ever since the War the League has been successful and I don't see that there is anything radically wrong with it myself.

... If, as you say, the League is asleep and they are not doing their duty, and in a few years there will be no hams, neither will there be any League since they depend on the amateur for their income. Now common sense would tell you that the League or any other organization of its sort, would not tolerate a situation of that sort for the very obvious reason that they would be unable to survive.

In your latest edition you made quite an article on the salaries of the League officials. When a man has enough ambition to be successful and is fortunate enough to

be, in these hard times, I think that it is a very bad policy to criticize his wages—after all that's his affair. And the reason that the men that they have got in there are such high paid men, as you say, is that men of that caliber are the type that are needed to run an organization of that sort.

(Sgd) Richard Davis, W1LDC.

■ We're very sorry, W1LDC, if you cannot see our side of the situation. We suggest that you continue to follow these pages and write us again in about 90 days. There will be developments which will show you where the amateurs can do themselves much good by going to their respective ARRL polls and electing, not their friends, but a first class group of hard-working Directors. These Directors, if they are on the job, can clean up the League from within. But first, you—the ARRL membership—must elect them.—The Editors.

PLACES BLAME ON HAMS, THEMSELVES

Dear Ed.:

Never have I read any radio publication that I derived as much enjoyment as I did from your August RADIO NEWS. It had everything any ham ever got but above all you hit a keynote that will, I hope, set agog all hamdom. Namely, a general awakening to the fact that we will have to fight for ham radio if we are to continue getting our rightful enjoyment from it.

I feel that the ARRL, lax as it is in its representation of amateur radio, is not wholly to blame. We as members have taken for granted that "It Can't Happen Here" and have gone along in our own quiet way, flaring up only at some QSO party or ham fest, then crawling back into our shell of self satisfaction. Now with you fellows putting something on the ball maybe there will be forthcoming some workable plan whereby we, as individuals, will be shown the way that we can bring pressure on those upon whom we depend for our hobby protection.

We have all been lax and I hope that your efforts to show us our shortcomings will make ham radio a more enjoyable pastime. **BUT IN ORDER TO ACCOMPLISH ANYTHING IT WILL TAKE MORE THAN A**

GENERAL FAULT FINDING CAMPAIGN, YOU WILL HAVE TO PRODUCE SOME PLAN THAT ANY HAM CAN FOLLOW, WORKING AS AN INDIVIDUAL WITHIN A UNIT. WHEN THIS PLAN COMES I BELIEVE THE BATTLE WILL BE WON. After all 43,000 hams, all with an efficient unit of communication, should be able to protect their interests.

Amateur radio needs more like you because your last issue has proven to me that you ARE for the hams. Lots of luck.

(Sgd) Henry J. Boldt, W9WKL.

■ We think you have hit the nail on the head, W9WKL! For our workable plan, see October issue of National QSO Page. We welcome any plan that has the interest of the hams at heart.—The Editors.

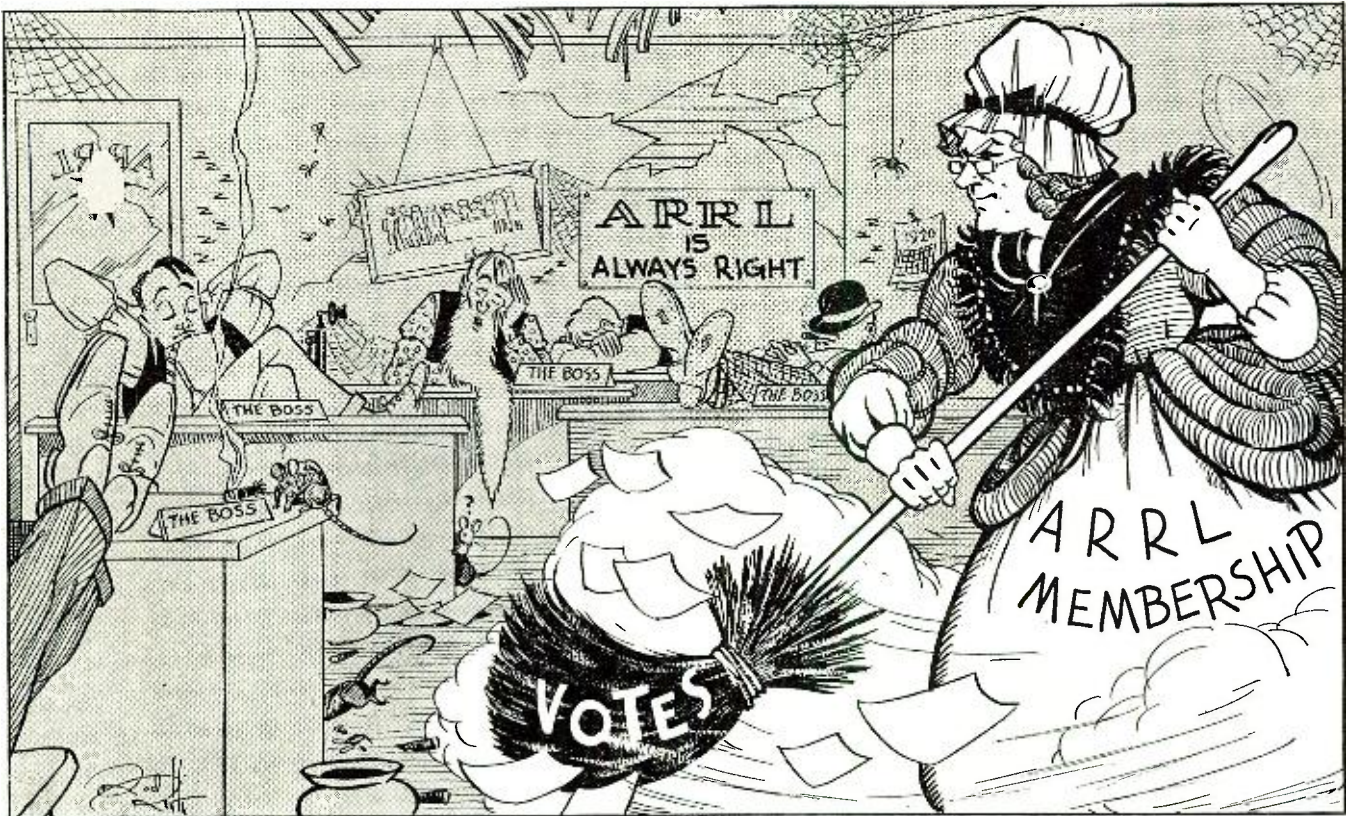
SUMNER B. YOUNG ANSWERS QST

Dear Sir:

On page 20 of the September, 1938, issue of "QST" appears an editorial entitled "Cairo and Rome." After explaining that the United States Amateurs, in the Editor's opinion, may not be "liquidated" out of the 40 and 20 meter bands at Rome, but that European Amateurs will probably lose the right to use these slices of the radio spectrum, the statement is made: "... But stop and think what it would mean to us if we retained the bands but the European nations filled them up with non-amateur stations of high power! The usefulness of the bands would be seriously impaired, perhaps almost totally destroyed, and DX would be a scarce article. So it is our opinion that the Rome Conference constitutes a pretty serious threat against the future usefulness of these bands. But not because we would lose them in the United States; our worry is Europe, where the influence of the United States Government does not extend. ..."

Then the Editorial proceeds to state that the United States Senate may ratify a Treaty which the Executive branch of the Government has negotiated, or that it may choose to withhold such ratification, but that the Congress of the United States may not instruct the Executive branch as to what kind of a Treaty it shall negotiate. From this

LET'S MAKE IT A CLEAN SWEEP!



premise, the conclusion is drawn that there is no practical use in approaching Congress on behalf of the United States Amateurs. The one qualifying statement is, that . . . "While it is conceivable that the Senate might in some undisclosed fashion indicate in advance to what it would or would not give its consent for ratification, this would be extremely unlikely. . . ."

Granting that it is the function of the Executive branch of the Government to negotiate Treaties, and that the Congress of the United States may not give that branch binding legal instruction as to what kind of a Treaty to negotiate; and granting, further, that in the case of Amateur Radio interests, it may be unlikely that the Senate would indicate to the Executive branch, in advance, just what new features of curtailment, embraced in a Rome-negotiated Treaty, it would refuse to ratify, it still seems to me that it may be well worthwhile to contact the Congress on behalf of the "Hams."

First of all, the unexpected may happen, and the Senate, through one of its Committees (perhaps the Foreign Relations Committee) might give the Executive branch informal expressions of opinion as to what type of Treaty it would like to see negotiated at Rome. It seems inconceivable to me that the Executive Arm of the Government makes a practice of negotiating important Treaties without at least obtaining some idea of what the Senate will or will not ratify.

In the second place, if by any chance we neglect to bring to the attention of Congress the merits of Amateur Radio and the danger which threatens it from abroad, a long time before the Rome Conference opens, the American Delegation may consent to a Treaty which "liquidates" us out of the 20 and 40 meter bands, and the Senate will go ahead and ratify it, as is. There will be no time to "educate" the Senators before the deed is done.

How do we know that the American Delegation will fight for us through thick and thin? People grow weary from continual hammering, and long-drawn-out controversy. And there frequently comes a time when politicians give up one contention, or sacrifice

somebody's interests, in order to get the opposition to agree to something which as the time when the "deal" is made, seems more desirable or expedient.

We may be sacrificed in Rome, if two things are not undertaken to serve as counter-balance against this unpleasant possibility: (1) A much more systematic and widespread cultivation of favorable opinion among the general public; and (2) A demonstration to members of Congress of the merits of Amateur Radio in the United States, with a view to convincing them that it should be preserved against all further domestic or foreign encroachment.

Both of these undertakings would involve sustained and extremely well-directed efforts, and would involve considerable expense. They might even involve the payment of income taxes by the American Radio Relay League, Inc., on the ground that these efforts were designed to influence legislation through the use of propaganda or other means. However, to my mind, these efforts should be made.

However skillful our efforts to prevent losses may have been of late years (they were blundering and inadroit in earlier times, without any doubt—see *RADIO*, October, 1935, pages 8, 9, 28, 29, 32) the fact remains that at these International Conferences, we always have LOST, and never gained. . . .

That being so, it is at least reasonable to suppose that if we continue along the same old course, we will continue to lose. . . .

. . . Personally, I think the time has come when we should respectfully disregard the advice of our *unsuccessful* ARRL "experts," and insist that new courses of action be followed. . . . (*Italics, ours.*)

Hasn't this thing gone far enough already? How about a change?

(Sgd.) Sumner B. Young, LL.B., W9HCC.

■ Thank you, Counsellor Young, for stating our cause so lucidly. We cannot think of anything to be added to W9HCC's excellent suggestion.—The Editors.

JOURNALISTIC FEUD?

Sir:

Having read the last two issues of your magazine with interest, particularly the *National QSO Page* in the August issue, I feel called upon to offer a few random remarks.

First, concerning the losing of our amateur 40 and 20 meter bands. The agitation for moving the amateurs out of these bands is entirely confined to some foreign countries, principally Germany, Italy and Japan. Naturally these countries have some support in their desires from other less powerful European and Asiatic countries. However, in North and South America, our governments are upholding our rights rather than trying to undermine them.

It is undoubtedly true that amateurs in many foreign countries WILL lose the use of 40 and 20 meters and possibly the use of all their presently used bands. This should not affect us in the Americas, particularly in the United States. Even if certain foreign hams do lose their bands, we stand very little danger of losing out because to cite an example, at the Cairo conference the American delegates stated that if any move were made to molest the American amateur bands, our Congress would not ratify the treaty.

In other words, as far as we American hams are concerned, there is very little to fear. The possibility of losing any of our bands is remote. Now, why all the ruckus about forcing the ARRL to lobby in Congress for our benefit? There's not a thing in the world that the ARRL or any American ham or any magazine editor can do to prevent any foreign country from confiscating any amateur band it chooses.

The best way to support and help the ARRL to become a better organization is to become a member. The vast majority of critics of the League are non-members who don't know what it's all about and who do a lot of weeping and wailing but never anything constructive. Your outburst concerning the League looks on the surface to be an attempt to build circulation through creating a journalistic feud and giving a shot in the arm to weak-minded hams who

need a magazine to do their thinking for them. From your remarks concerning W9VOD'S radiogram (which was not "Drivel," but very good advice), I imagine you will either fail to print opposition letters or continue writing driving editors' notes.
K. S. Williams, W6DTY.

Frankly, W6DTY, there is something in what you say. But if the American Amateur does not awaken from his 20 year sleep, into which he has been lulled by the ARRL; if he does not take it on himself to do something to perpetuate his hobby by protecting it at Washington and abroad, he will be,—to use Mr. Warner's word,—"liquidated."

With the collapse of the ham frequencies, he must become extinct, and with his demise the industry catering to him will have no reason for being. We are a part of that great industry, and we will find ourselves out of existence together with the ham, if corrective steps are not taken to place his status on a basis which will be enduring.

Since the ham is PAYING the officers of the ARRL for service along these lines, we feel that he has right to know how much or how little he is getting for his money. We do not agree that a second league is indicated at this time, but we do believe that the present one must be given "a shot in the arm" to make it function as it was intended that it should.

That is what we are trying to do.—The Editors.

DEPLORES LOSS OF AMATEUR SPIRIT

Dear Sirs:

Since the days of T. O. M. and the Retty-snitch and Wouff-Hong and since Hector's pups began to growl there have been attacks on the League.

Wake the League up, it's a do-nothing bunch. We can do better. The Executives are being paid too much. The bands are going to be grabbed up. Greedy commercials have their grasping hands constricting on our bands. Well, from the junk going over the ham bands today that would be no loss. The real spirit behind amateur radio is rapidly dissolving. Instead we are becoming a group of selfish cliques, intent on getting what we can for ourselves.

One of the first effects of this is evidenced by direct and indirect attacks on the League.

The funny thing about this is that half the attackers are not members of the ARRL and have no intention of joining it.

(Sgd) S. S. Wolfe, W9ZFFZ.

To a great extent you are quite right, W9ZFFZ. The old ham spirit has been rapidly falling off. It was to resurrect this old time feeling, to revive the pioneer morale that we inaugurated this page. We urge all hams to join the League and once inside, help with the gigantic task of cleaning out their own house, and making it tenable again. It can be done!—The Editors.

BACKS OUR DRIVE

Dear Sir:

Just a line to let you know I'm backing your drive to renovate the ARRL 100%. Keep up the good work and some day we'll have a real amateur radio organization in this country.

(Sgd) A. Mirsolis, W8RPT.

Thank you, W8RPT, for your letter of confidence in us. May we suggest that the best backing we can get is for you to spread the good word, and if you are not a member of the ARRL, then join up, and get others to join so that the League can be cleaned up by the members themselves.—The Editors.

ARRL MEMBER EXPRESSES HIS VIEWS

Dear Sirs:

First let me state that I am writing this strictly as an ARRL member, notwithstanding my title. Now I wish to compliment you for publishing the brief summary of the personnel of the Directors, Officers, and Executives of the League—QST in September RADIO NEWS. In the past I have made repeated attempts to have HQ publish such a summary in QST as I believed all League
(QSY to page 60)

WIXAL's Modern Radio Course

THE story of WIXAL's Modern Radio Course, which for several years has provided amateurs and radio enthusiasts throughout the world with invaluable basic education in radio theory and practice, and which is swinging into its third consecutive season this October, is as unusual as it is interesting. The Course owes its inception to sheer accident—but it has been no accident that each succeeding season has seen its enrollment rolls double.

In the fall of 1934, Dr. C. Davis Belcher, present supervisor and lecturer for the Modern Radio Division of WIXAL's *World University of the Air*—as the station has come to be known among prominent educators—lectured for the Division of University Extension of the Massachusetts Department of Education. In the course of his lectures, Dr. Belcher often conducted his classes at WIXAL's transmitting laboratories, so that his students might study the excellent equipment there in connection with their extension work.

Several times during his lectures, Dr. Belcher experimented with broadcasting the actual technical information which he was giving to the small group of students gathered at the transmitting laboratories. Thus, by pure chance, parts of Dr. Belcher's lectures seeped out over the shortwaves. To his surprise, he soon began to receive dozens of letters from shortwave listeners throughout the country, asking him more about his course, and how they might enroll. From this unusual incident, the Radio Course took root and grew to its present proportions—with students enrolled in nearly all states of the Union, Canada, and in foreign countries.

This year's operating schedule includes a lecture each Monday evening at 8:00 p.m., Eastern Standard Time, on a frequency of 6.04 megacycles, beginning the first Monday in October (October 3), and continuing for thirty-two successive Monday evenings at the same time, same frequency, until June 12, 1939. The 6.04 megacycles frequency is designed to give American listeners the best reception. The Course will be repeated each Friday evening at 5:00 p.m., Eastern Standard Time, on 11.79 megacycles, by transcription.

In connection with his radio course, Dr. Belcher has prepared a series of four illustrated booklets, each designed to cover eight lectures of the course. These booklets, containing blueprints, circuit diagrams, and other material invaluable to the student, are available from the World Wide Broadcasting Foundation, Boston, Mass., for the cost of the printing and mailing. This is in keeping with the station's non-profit, non-commercial character, for it carries no advertising or commercial programs, and is designed solely for the benefit of the listener. The price of the course is moderate—one dollar for each set of diagrams, or three and a half dollars for the complete course, which includes the four booklets. Students enrolling in the beginning for the entire course will receive a complementary binder, designed to hold all the lecture notes. All supplementary



Dr. C. Davis Belcher at the mike of WIXAL from which the radio course is broadcast.

literature is available at WIXAL, The University Club, in Boston, Massachusetts.

The broadcast schedule of the course is listed below.

| Monday 8:00 p.m. EST | Friday 5:00 p.m. EST | Each Lecture Lasts 1 Hour |
|----------------------------|----------------------------|--|
| Oct. 3 | Oct. 7 | No. 1 Evolution of Radio |
| Oct. 10 | Oct. 14 | No. 2 Structure of Vacuum Tubes |
| Oct. 17 | Oct. 21 | No. 3 How Radio Communication Operates |
| Oct. 24 | Oct. 28 | No. 4 Atoms and Electrons |
| Oct. 31 | Nov. 4 | No. 5 Operation of Vacuum Tubes |
| Nov. 7 | Nov. 11 | Advanced: Beam Power Tubes |
| Nov. 14 | Nov. 18 | No. 6 Alternating Current |
| | | No. 7 Amplifier Principles |
| | | Advanced: Single Signal Receivers |
| Nov. 21 | Nov. 25 | No. 8 Speech Amplifiers |
| | | Advanced: Directional Antennae |
| Nov. 28 | Dec. 2 | REVIEW SECTION ONE |
| Dec. 5 | Dec. 9 | No. 9 Rectifiers |
| Dec. 12 | Dec. 16 | No. 10 Radio Frequency Oscillators |
| Dec. 19 | Dec. 23 | No. 11 Crystal Oscillators |
| Dec. 26 | Dec. 30 | No. 12 Radio Frequency Amplifiers |
| Jan. 2 | Jan. 6 | No. 13 Radio Telegraph Transmitters |
| Jan. 9 | Jan. 13 | No. 14 Plate Modulation |
| Jan. 16 | Jan. 20 | No. 15 Grid Modulation |
| Jan. 23 | Jan. 27 | No. 16 Radio Telephone Transmitters |
| Jan. 30 | Feb. 3 | REVIEW SECTION TWO |
| Feb. 6 | Feb. 10 | No. 17 Transmission and Reception |
| Feb. 13 | Feb. 17 | No. 18 Detection |
| Feb. 20 | Feb. 24 | No. 19 Autodyne Receiver |
| Feb. 27 | Mar. 3 | No. 20 Tuned Radio Frequency Receiver |
| Mar. 6 | Mar. 10 | No. 21 Superheterodyne Receiver |
| Mar. 13 | Mar. 17 | No. 22 Superregenerative Receiver |
| Mar. 20 | Mar. 24 | No. 23 Radio Waves in Space |
| Mar. 27 | Mar. 31 | No. 24 Automotive Volume Control |
| Apr. 3 | Apr. 7 | REVIEW SECTION THREE |
| Apr. 10 | Apr. 14 | No. 25 Automotive Frequency Control |
| Apr. 17 | Apr. 21 | No. 26 Antenna Systems |
| Apr. 24 | Apr. 28 | No. 27 Direction Finding |
| May 1 | May 5 | No. 28 Frequency Measurement |
| May 8 | May 12 | No. 29 Facsimile Transmission |
| May 15 | May 19 | No. 30 Cathode Ray Tube |
| May 22 | May 26 | No. 31 Television Transmission |
| May 29 | June 2 | No. 32 Television Reception |
| June 5 | June 9 | REVIEW OF SECTION FOUR |
| June 12 | June 16 | REVIEW OF ENTIRE COURSE |

(Schedule Subject to Change)

Simple Low Angle Radiators

by M. P. FIELDMAN, W9ETP
Chicago, Illinois

By following the author's explanation of the theories on antennae, every ham should be able to build himself a DX sky-wire.

DURING the last few years, the importance of antenna systems for facilitating long distance communications has been brought relentlessly to the attention of the amateur. Novel antenna arrays that increase the strength of a transmitted signal many times that which could be accomplished by merely raising the transmitter's power, (and at much lower cost) have been developed in endless numbers. Today it is generally realized that the station radiator is the most important factor in effecting long distance communication. It is not uncommon to hear of flea power stations with efficient antenna arrays working rings around high power stations with ordinary antenna systems.

For the average amateur, it is probably unfortunate that the antenna systems which afford the most appreciable gain are highly directive in the horizontal plain and require no inconsiderable space for their erection. These long wire systems are extremely effective in fixed preselected directions and, for the average amateur who desires general coverage, several such antennas must be employed. The terminated rhombic, or diamond, which is doubtlessly the highest gain antenna system within practical reach of the amateur, is uni-directional, so one is necessary for each desired direction of transmission. The V beam is bi-directional, so fewer of these systems are needed for the same coverage as compared to the terminated rhombic.

It is true that antenna gain can be had with somewhat less pretentious systems in the form of half wave elements phased to provide a given horizontal directivity. Most of these systems give comparatively small gain in respect to their long wire cousins and usually are applicable to but single band operation. However, the physical dimensions of the half wave element arrays allow themselves to be made rotatable to afford omni-directive operation.

Although many amateurs are availing themselves of the gratifying results obtainable with some form of directive antenna systems, to the majority of amateurs who are not blessed with the space to harbor the long wire systems, nor the desire to undergo the mechanical construction required by the rotatable systems, improving their antenna gain is something like the weather, they feel that they can talk a lot about it, but can't do anything about it.

Most of these amateurs are limited to the use of the usual back yard variety of antenna systems, such as the single wire feed Hertz or the zepp systems with sixty-seven

foot flat-tops. They are entirely dependent upon these systems for all their transmitting activities on three or four bands and find that, although they cannot compete with stations using beam antennas in regard to signal strength, they get good coverage in most directions. If only something simple could be devised applicable to these ordinary antennas that would increase their effectiveness, most of the amateurs in this category would jump at the chance to make the improvement, providing it is within the scope of the physical space available.

In directing attention to the vertical radiation properties of antennas, instead of attempting to design another system with horizontal gain, means have been found to alter the angle of radiated power of ordinary antennas to a vertical plain that makes that amount of power most useful for long distance communication. No claim of originality is made by the author for the underlying principles responsible for the following antennas to be described as the experiments were inspired by a previous article by E. H. Conklin. ("Antenna Gain Without Horizontal Directivity," *Radio*, May 1937.)

Transmission tests made by the large communication companies revealed that the most useful vertical angles of radiation for long distance communication lie within a range between thirteen to fifteen degrees on frequencies near fifteen megacycles. That statement is not an adamant rule as the exact vertical angles of maximum useful radiation over a given distance are affected by such factors as sun spots, season of the year, time of the day, etc., and are subject to variations. But it is entirely safe to assume that the most useful vertical angles of radiation on frequencies between seven and thirty megacycles lie within a range of zero to thirty degrees for DX work.

Now take the case of the half wave horizontal antenna at a height of one-half wave length above ground. It has been found that such an antenna gives the vertical radiation pattern of Figure 1A, depicting that the maximum radiation occurs at a 32.5 degree angle above the horizon. For long distance communication, where the most desirable angles lie substantially below this value, the exact angle depending upon fre-

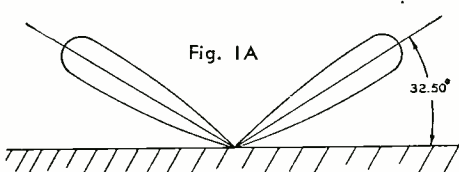
quency, time of the day, season, sun spots, etc., it is immediately apparent that much of the power would be uselessly radiated at a high angle with this type of antenna.

Experience has proven that merely raising the height of the half wave antenna to three-fourths wavelength or more above ground greatly improves the ability of the antenna to put a strong signal into a distant point. Figure 1B shows what happens when the antenna is three-fourths wavelength above ground. Here we find that the pattern has split into two planes of radiation with possibly sixty per cent of our power being wasted at high angles useless for DX. The improvement in the DX ability noticed by using this higher antenna is produced by that comparatively small portion of energy radiated in the smaller lobe at the low angle of twenty-one degrees. This represents quite a waste of power at the higher angles which are only effective for local coverage. The higher the antenna is raised above the ground, the lower becomes the angle of the smaller lobe, but it would be much better to employ a system whereby all of the radiated energy could be molded into a single low angle pattern and at reasonable heights above ground. To elevate the ordinary half wave antenna two or more wavelengths above ground merely to get a small portion of its radiated energy at a low angle is an inefficient gesture, considering the kind of giant masts necessitated and amount of power wasted at the high angles.

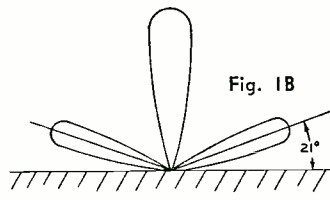
If we could but produce a vertical radiation pattern with all of the power in a single low angle lobe and at customary antenna heights of one-half to three-fourths wavelengths above ground, we will have an antenna system of very pleasing characteristics for general DX work.

A system has been evolved whereby such an antenna becomes a reality. By merely placing another antenna, identical with the one already employed, a distance below the original antenna and feeding it in phase with it, the deed is accomplished. It is preferable to have the two antennas spaced one-half to three-fourths wavelength, or more, apart, one directly above the other, although the spacing is not a critical value

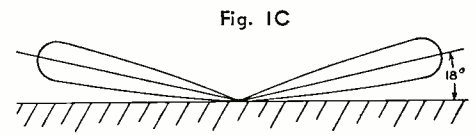
(Radiates further on page 64)



Vertical pattern of a half-wave antenna radiating an even half-wave off ground.

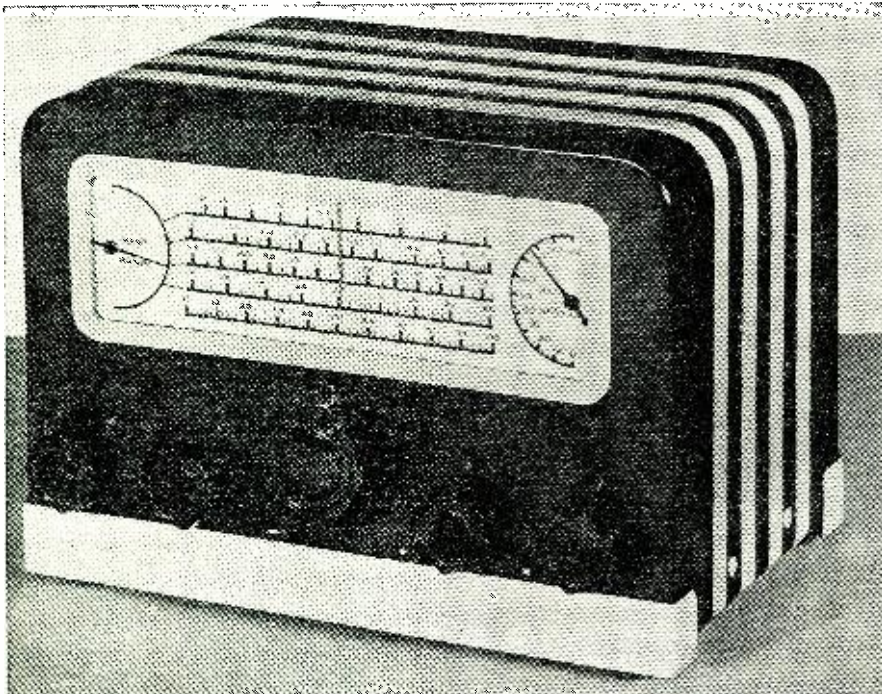


Vertical pattern of a half-wave antenna placed three-quarters wave off ground.



Vertical pattern of a double antenna as described by the author. Note low angle.

A 6-Tube Compact 5 40 MC



The commercial counterpart of the author's set is compact and easy to operate.

FOR quite sometime, an efficient yet low priced communication receiver covering from 40 mc. to 540 kc. has been sorely needed. The receiver herein described was designed to fill the needs of many services. Requirements of the airport and police for fixed point service and the versatile needs of the amateur were all taken into serious consideration at the outset.

For police and airport use a receiver is usually left on for long periods of time. Power consumption, frequency drift, heat rise and reliability are all serious problems. Compactness was one of the most difficult problems to solve. As a result of the size, many new components had to be designed, built and tested. From its original layout on paper to its final form six months later ready for use, many models were built and discarded.

Panel Layout

The front panel controls are as follows. Bottom row of switches left to right B.F.O. off-on, send-receive, A.V.C. off-on, a.c. power off-on. The control knobs left to right B.F.O. Pitch control, band switch, main tuning control, audio level, and band spread condenser.

The dial which is silver plated to contrast with the black numerals for easy reading, has the four main scale calibration with a log scale at the bottom providing for accurate reset against the bandspread scale at the right. The band range scale, of course, is operated simultaneously with the band switch.

Mechanical Layout

The chassis in its final form is 5½" from front to back, 11" long by 2" deep. The height of the front from bottom of base

to top of dial plate is 6½". The chassis is copper plated and lacquered to prevent corrosion. The front panel has been made an integral part of the base to provide the utmost in rigidity. At either end near the top of the dial plate and between the back and front plate are located the pulleys over which operate the cord drive for the main tuning condenser and also for the band spread condenser. These pulleys are mounted on brass bushings securely staked at both ends on the front and back panel to prevent any sideplay. Also between the front and back dial panels are located the brass shafts which also act as pulleys for the band spread and band range pointers.

The main tuning condenser operates through a gear and 2" pulley to provide a tuning ratio of 6½ to 1. The tuning condenser is mounted on brass bushings through rubber collars to prevent any audio coupling from the speaker back to the oscillator section of the condenser gang that might result in an audio feedback. Three mountings are provided for the gang in the chassis base and two additional in the upright back panel.

The entire r.f. and oscillator coil assembly consisting of coils, trimmers and pad-ders is mounted on its own assembly plate and band change switch which is then mounted by means of the bandswitch to the front panel. This method of mounting allows a more careful assembly of the heart of the set which is, of course, the coil system. Rather than having to solder in places that are not only difficult to get at with an iron but also hard to see, the complete assembly is wired and tested for alignment and efficiency before mounting in the set. One of the greatest advantages of this

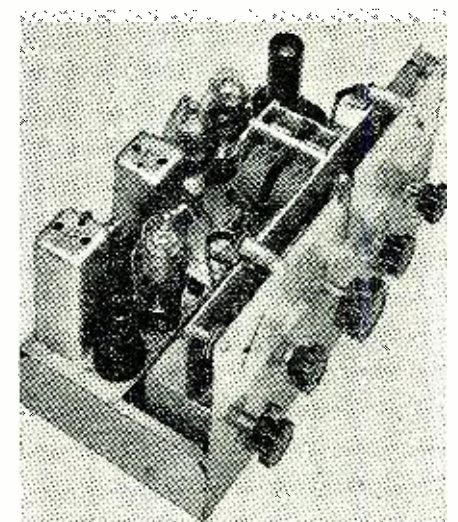
method of mounting is the neater and better soldering. The BFO coil and associated adjustment are mounted by means of the coil shield through two spade bolts to the front panel.

The various control switches at the bottom of the front panel are a new development. Not only do they provide a very nice wiping contact but also are very easy operating. They are securely riveted to the chassis base on ¼" brass bushings. Bayonet type dial light sockets are used and are mounted with sliding clips to allow ease in replacement.

Tension controls on the cable consists of an ⅛" x 1" annealed expansion spring. From the top and bottom view of the receiver can be seen the power transformer which is mounted with the greater part underneath the top of the chassis. This was necessary in order to mount the 5W4 rectifier in the top of the transformer case and yet allow good air circulation between the 5W4 and the top of the cabinet.

All other parts can be readily seen and their method of mounting readily noted. Special notice should be given concerning the relationship in mounting of the filter condensers and transformer for reduction of heat. Heat, of course, is the deadly enemy of electrolytics thus they are mounted away from the power transformer.

The cabinet itself is 7½" high by 6⅞" deep by 11¾" long. It is made of one piece heavy drawn, welded copper plated steel. The finish is in telephone black and the bottom and top trimmings were silver plated and lacquered to prevent tarnish. The inside of the cabinet is lined with acoustic felt to prevent any resonance effect that a metal cabinet would otherwise have. This also improves considerably the base response of the speaker. The dynamic speaker is bolted to the top of the cabinet and is connected to the chassis by means of a four prong speaker plug through a

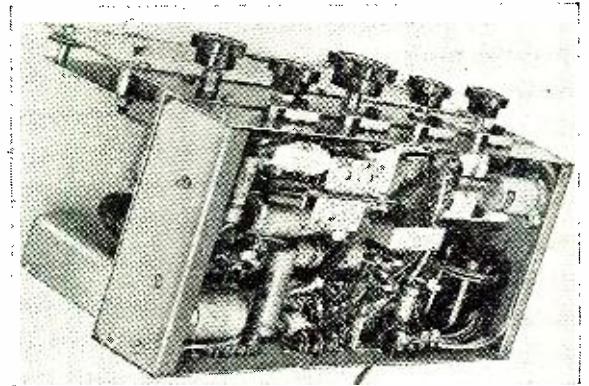


"Behind scenes" in commercial version.

Superheterodyne

by RICHARD F. LAYCOCK, ex-W9HXT
Howard Radio Co., Chicago, Illinois

With the trend in receivers definitely towards compactness, the author describes this latest addition to small rigs. It covers all bands from 550 kc. to 40 mc. and is an excellent communications receiver.



Chassis view shows placement of all parts.

cable and the socket is mounted between the 41 output tube and the main tuning condenser gang.

The Circuit

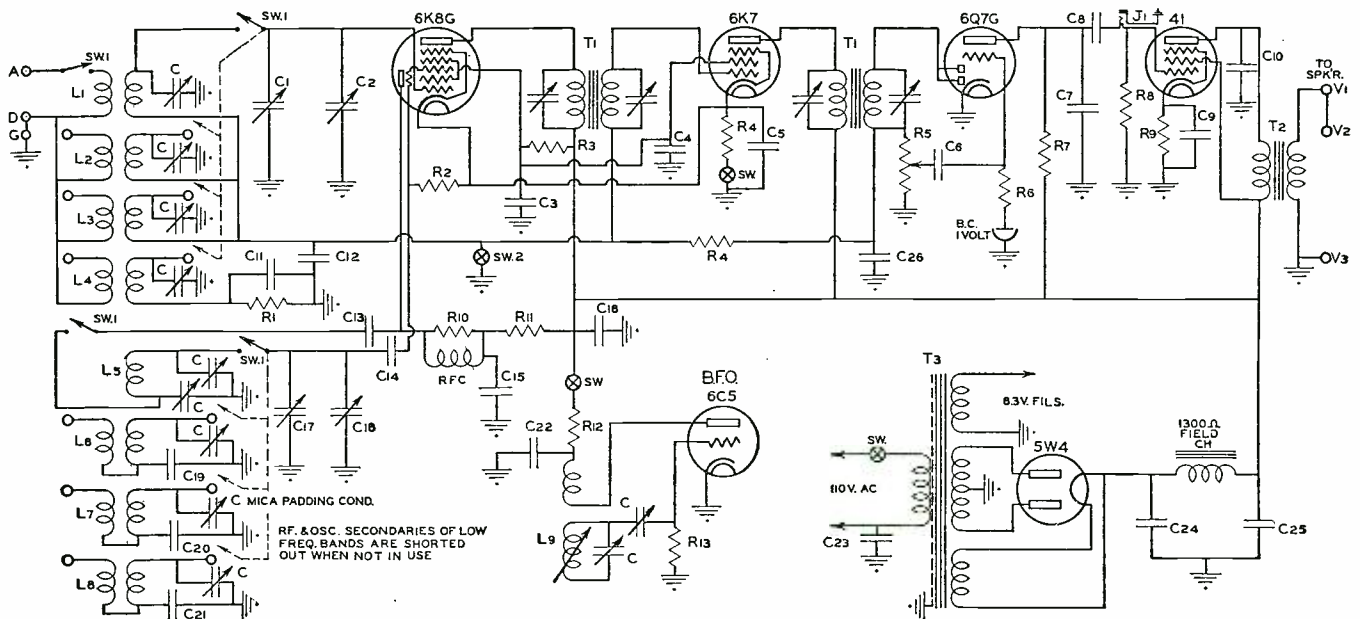
The circuit used in this set is neither unorthodox or tricky. All oscillator, r.f. and i.f. circuits are highly efficient and stable. Every advantage is taken to produce a good sensitivity over all bands and a fairly sharp i.f. system. As has been stated in many articles on design of intermediate frequency amplifiers they may be made as sharp or broad as needed. There is no trick in a razor sharp amplifier. It can be designed

to reject nearly all sidebands or admit everything out to 10,000 cycles. Inasmuch as this receiver is to be used mainly for communication work a fairly sharp i.f. amplifier was designed. High "Q" coils are used, wound on Ferrocart iron cores. Rather than use the two low gain i.f. stages, one stage was designed with very good gain and introduced a slight amount of regeneration making it highly efficient.

Referring to the schematic drawing: The antenna input system allows either a doublet or straight Marconi type to be used. All coils of both the antenna and oscil-

lator circuit are shorted and grounded out when not in use. As will be noted, the fourth band or ten meter band does not have an A.V.C. return on the antenna coil secondary. This is because every possible amount of gain is needed here. Below the set of antenna coils are shown the oscillator coils. It will be noted that on both antenna and oscillator coil assemblies separate coils are used throughout each band and each has its separate secondary isolating trimmer. A variable padding condenser is provided for the broadcast band with

(Continued on page 51)



Circuit diagram for the superhet.

C₁, C₁₇—402 mmfd.
C₂, C₁₈—12.5 mmfd.
C₃—.05 mfd.
C₄—5 mfd.
C₅—.25 mfd.
C₆—.02 mfd.
C₇—.0003 mfd.
C₈—.02 mfd.
C₉—10 mfd., 25 v.
C₁₀—0.006 mfd.
C₁₁—.001 mfd.
C₁₂—0.05 mfd.
C₁₃—0.002 mfd.
C₁₄—0.002 mfd.
C₁₅—5 mfd.

C₁₆—.25 mfd.
C₁₉—0.0015 mfd.
C₂₀—0.004 mfd.
C₂₁—0.0009 mfd.
C₂₂—0.02 mfd.
C₂₃—0.05 mfd.
C₂₄, C₂₅—10 mfd. electro.
C₂₆—0.0003 mfd.
R₁—100,000 ohms
R₂—40,000 ohms
R₃—12,000 ohms
R₄—150 ohms
R₅—500,000 ohms
R₆—1 megohm

R₇—250,000 ohms
R₈—500,000 ohms
R₉—600 ohms
R₁₀, R₁₁, R₁₂—10,000 ohms
R₁₃—50,000 ohms
T₁—IF trans., 465 kc.
T₂—8,000 ohms to V.C.
T₃—Pwr. trans., 365 each side of center tap
CH—1300 ohm field
C_H—1300 ohm field
SW₁—Integral with B.S. arrangement
SW₂—D.P.S.T.
SW₃—D.P.S.T., AVC
L₁ to L₈—Howard 430 coils
RFC—2.5 Mil. Hy. choke
J—Closed circuit phone jack

BEGINNING this month, RADIO NEWS presents to its readers a series of articles setting forth SIRELA, the Spatari Radio Language. Devised by Professor Carlo Spatari, this new universal language is coming into use on short wave stations throughout the world. This new universal language permits your conversing with those speaking a foreign language, either by word of mouth or through the mails. The advantages of the Spatari Radio Language are:

- 1—Requires no memorizing.
- 2—Uses but 8 syllables known to many nations.
- 3—Allows you to think in your own language.
- 4—Therefore allows you to use your own grammar.

That this universal language does convey ideas clearly has been tested in a number of ways. Tests were made over WBNX in New York City. Four listeners heard a Spatari message spoken. Each wrote down the words, still in Spatari. Then, each used a dictionary made for his own particular language and with it rewrote the message in his own language. Within a few minutes, the French observer read his message back in French, the Italian read it back in Italian, followed by the Spaniard and the German, each in his own language. Thus, one English speaking announcer had transmitted his thoughts in a single sentence which was understood in four different languages. The announcer used fewer syllables than required in English.

During the forthcoming months, RADIO NEWS will publish further articles on Spatari which is equally valuable to the DXer, the Ham, and the commercial broadcasting station.

SHORT wave listeners have long been plagued with a restricted ability to identify foreign stations broadcasting only in their native tongue. This same language difficulty has come to the fore in requesting verification cards of foreign stations.

In an effort to solve this language difficulty, not only for the purpose stated above, but also with respect to the transmission of news reports and oral programs of all sorts, Professor Carlo Spatari of New York City, has introduced a universal language for radio use. This new language, known as the Spatari Radio Language, or SIRELA, consists of combinations of only eight syllables based on the notes of the musical scale. Professor Spatari claims that other universal language systems have not been adopted because they have not been phonetically adaptable to all tongues. The notes of the musical scale—DO, RE, MI, FA, SO, LA, SI, BO—are unvariable throughout the world. Hence, their pronunciation in almost every language is the same.

The new language is actually a code, each code word being translated into a phrase or sentence. Thus a few code words can convey a message several sentences long. The basic elements of the language combine to make almost one million word combinations. These are determined from the coding and decoding book which has been published.

In this particular article we are reproducing but one page and part of another as being most adaptable to short wave lis-

"SIRELA" - A

by E. STANTON BROWN
Associate Editor, RADIO NEWS

Professor Carlo Spatari has invented a universal radio language which permits all nationalities to understand the same message simultaneously. Hams, DX'ers, and broadcasters are beginning to use it.

teners. Other pages will be published from month to month until the entire book has appeared.

At the present time there are twelve Central and South American stations which have signified their intention of making announcements in Spatari and verifications have already been received making use of this new universal language. TG-1, TG-2, TGWA of Guatemala City; HI4V, Dominican Republic; "El Prado," Riobomba, Ecuador; HC2CW and HC2AW, Guayaquil, Ecuador; YV6RA and YV6RB, Ciudad Bolivar, Venezuela; YV2RA and YV2RB, San Cristobal, Venezuela; and HJ1ABE, Cartagena, Columbia have all stated their intentions of using the Spatari language. TG-1 and TG-2, Guatemala City, have had QSL cards printed in the Spatari Radio language.

the first three were received by the following: Captain George A. McDermott, Staten Island, N. Y., from HI4V, San Fco. de Marcoris, Dominican Republic; to Miss Mary Scalsee, Astoria, N. Y., from HC2CW, Guayaquil, Ecuador; and to Mrs. Virginia Oliver, Philadelphia, Pa., from TG-2, Guatemala City, Guatemala.

For correspondence between short wave listeners and foreign stations the basic syllables are grouped in combinations of four. For example REBOMIDO is made up of the four syllables RE-BO-MI-DO. The first two syllables denote the column in which the code word is found. The third syllable locates the particular group containing the code word. The last syllable indicates the code word after which can be found its translation.

By way of further explanation, note that
(Please turn to page 36)

Among verifications received in Spatari,

EXAMPLE OF A VERIFICATION REQUEST

| | | | | |
|------------|---|-------------------------|-----------------|--------------------------|
| REBODORE | DOMIDORE | REBODODO | RE FASO MI SIRE | |
| REBODOMI | SO LA SI REDO MI SO SI MIRE SO LA FADO LA SOMI LA | | | |
| REBOSOFA | | REBOSOSI | | |
| REBOLADO | ROY R. NEIRA | | REBODOBO | <input type="checkbox"/> |
| | | | REBOSIDO | <input type="checkbox"/> |
| | | | REBORELA | <input type="checkbox"/> |
| REBOLARE | | | REBOSIRE | <input type="checkbox"/> |
| REBOLAMI | | | REBOSIMI | <input type="checkbox"/> |
| REBOLAFIFA | <input type="checkbox"/> | | REBOSIFA | <input type="checkbox"/> |
| REBOLASO | | | REBOSISO | <input type="checkbox"/> |
| REBOLALA | <input type="checkbox"/> | | REBOSILA | <input type="checkbox"/> |
| REBOLASI | | | REBOSISI | <input type="checkbox"/> |
| REBOLABO | | MILAMIDO RE BO SIMILADO | REBOSIBO | <input type="checkbox"/> |
| | | | REBODODO | <input type="checkbox"/> |

(This space reserved for Station Call Letters, address, etc.)

COPYRIGHT 1937, BY CARLO SPATARI, INTERNATIONAL COPYRIGHT SECURED PRINTED IN U.S.A.

The translation of the verification request shown above is as follows: "Verification requested from radio station (DOMIDORE) HJ4ABB, 6,110 Kilocycles, 49.10 meters, Apartado 175, Manizales, Columbia, South America. Time Zone T-1. Greetings: Dear Director (or whom it may concern), I would appreciate a verification of the program heard at 1:00 Antemeridian Universal Radio Time Wednesday second June. On the program I heard the following: Your station's regular identification slogan. Your station's regular musical identification. Your station's extra identification signal in sound. Station announcement followed by talk in Spatari. Persons were talking. Talk in your native language. A woman was singing. Man and chorus were singing, followed by Grand Opera. A military band was playing, followed by semiclassical music. Gramophone record of vocalist singing, followed by your National Anthem and close down. Check my report with station log and if correct verify reception. Thanking you in advance, I am sincerely yours, ROY R. NEIRA." HJ4ABB would read this same message from their Spatari code book.

UN VERSAL RAD O LANGUAGE

- 1**
DOBODO —QUESTIONNAIRE CRITICISM
DOBODODO—In answer to your request the following is my opinion:
 " " **RE**—You should give more: (See General Program Data)
 " " **MI**—You should have less: (See General Program Data)
 " " **FA**—I hope you will change the following: (See General Program Data)
 " " **SO**—I do not like you: (See General Program Data)
 " " **LA**—I like you: (See General Program Data)
 " " **SI**—I do not like the: (See General Program Data)
 " " **BO**—I like best you: (See General Program Data)
- 2**
DOBORE —QUESTIONNAIRE CRITICISM
DOBOREDO—I like your entire program.
 " " **RE**—I dislike your entire program.
 " " **MI**—Have no suggestions or criticism.
 " " **FA**—Think you could stand more: (See General Program Data)
 " " **SO**—Think you could stand less: (See General Program Data)
 " " **LA**—Why don't you try: (See General Program Data)
 " " **SI**—Atmospheric conditions are annoying.
 " " **BO**—Your recent changes are a great improvement.
- 3**
DOBOMI —QUESTIONNAIRE CRITICISM
DOBOMIDO—Your recent changes are very bad.
 " " **RE**—You should broadcast earlier in the evening.
 " " **MI**—You should broadcast later in the evening.
 " " **FA**—Stations better than yours are in:
 " " **SO**—Stations not as good as yours are in:
 " " **LA**—Your programs on a whole are fair.
 " " **SI**—Your programs on a whole are good.
 " " **BO**—Your programs on a whole are bad.
- 4**
DOBOFA —VERIFICATION
DOBOFADO—Your station was working an amateur of:
 " " **RE**—Your station was talking to station:
 " " **MI**—I heard the following message in the Spatari Radio Language:
 " " **FA**—As I tuned in I heard the following in the Spatari Radio Language:
 " " **SO**—As I tuned in I heard the following:
 " " **LA**—I heard the following:
 " " **SI**—The words that I heard in your language were:
 " " **BO**—I heard a name and I think it was as follows: (J)
- 5**
DOBOSO —VERIFICATION
DOBOSODO—I did not understand the following:
 " " **RE**—The talking on your broadcast was too fast.
 " " **MI**—The talking on your broadcast was too slow.
 " " **FA**—I tuned in at the end of your program and heard only:
 " " **SO**—Following message in the Spatari Radio Language:
 " " **LA**—Following talk in your own language:
 " " **SI**—Your program came in very clear.
 " " **BO**—Your program was indistinct.
- 6**
DOBOLA —VERIFICATION
DOBOLADO—Atmospheric conditions annoy me.
 " " **RE**—Atmospheric conditions do not annoy me.
 " " **MI**—They are most annoying at: (K)(Give U.R.T.)
 " " **FA**—They are as bothersome on wavelengths above meters: (K)
 " " **SO**—They are not as bothersome on wavelengths above meters: (K)
 " " **LA**—My exact location is: (K)(Give latitude, longitude, etc., from Page BO, Group 46.)*
 " " **SI**—Reception is best at: (K)
 " " **BO**—I use a homemade set.
- 7**
DOBOSI —VERIFICATION
DOBOSIDO—My set is made by: (give name of m'f'g.)
 " " **RE**—It has tubes: (K)
 " " **MI**—I spend the following number of hours listening to you: (K)
 " " **FA**—The most convenient time for me is: (K)
 " " **SO**—The station sending the best verification cards is:
 " " **LA**—I also listen to shortwave radio stations:
 " " **SI**—Quickest verification card replies come from:
 " " **BO**—I prefer to listen to radio station in:
- 8**
DOBOBO —LOCATION
DOBOBODO—Am situated in a wooded region.
 " " **RE**—Am situated in a mountainous region.
 " " **MI**—Am situated near the sea shore.
 " " **FA**—Am situated in a humid region.
 " " **SO**—Am situated in a dry region.
 " " **LA**—The altitude in feet is: (K)
 " " **SI**—Sea level.
 " " **BO**—Above sea level.
- 9**
REBODO —VERIFICATION REQUEST AND IDENTIFICATION
REBODODO—Greetings: Dear Director (or whom it may concern) I would appreciate a verification of the program heard at: (K (first give time then month and date.))
 " " **RE**—Verification requested from radio station:
 " " **MI**—On the program I heard the following:
 " " **FA**—Your National Anthem.
 " " **SO**—Your station's regular identification slogan.
 " " **LA**—Your station's regular musical identification.
 " " **SI**—Your station's extra identification signal in sound (expressing bird, horn, code, whistle, etc.)
 " " **BO**—In accordance with your request I am pleased to report your program.
- 10**
REBOTE —TALKS AND TURN OVER
REBOTEODO—Station announcement. (followed by)
 " " **RE**—I heard the following talk in Spatari:
 " " **MI**—Talk in Spatari. (followed by)
 " " **FA**—I heard talk in foreign language: (followed by; give name if known).
 " " **SO**—Persons were talking. (two persons or more)
 " " **LA**—For other remarks please turn over the other side.
 " " **SI**—Talk in your native language (followed by)
 " " **BO**—Talking (man or woman, followed by)
- 11**
REBOMI —SINGING
REBOMIDO—A man was singing. (followed by)
 " " **RE**—A woman was singing. (followed by)
 " " **MI**—Man and woman were singing. (followed by)
 " " **FA**—Woman and chorus were singing. (followed by)
 " " **SO**—Man and chorus were singing. (followed by)
 " " **LA**—Grand Opera. (followed by)
 " " **SI**—Mixed Voices singing. (followed by)
 " " **BO**—Young persons singing: (both sex and more than one singer.)
- 12**
REBOFA —MUSIC
REBOFADO—A military band was playing. (followed by)
 " " **RE**—Dance music playing: (followed by)
 " " **MI**—Popular music: (followed by)
 " " **FA**—Religious music: (followed by)
 " " **SO**—Selection: (followed by)
 " " **LA**—Semi-classical music: (followed by)
 " " **SI**—Orchestra playing: (followed by)
 " " **BO**—Classical music: (followed by)
- 13**
REBOSO —SOLOIST, RECORDINGS, AND SIGN OFF
REBOSODO—Instrument soloist playing: (followed by)
 " " **RE**—Gramophone record of music: (followed by)
 " " **MI**—Gramophone record of vocalist singing: (followed by)
 " " **FA**—The program finished exactly at: (K)
 " " **SO**—Electrical transcription. (followed by)
 " " **LA**—Your National Anthem and close down.
 " " **SI**—Your station (!) sign off exactly at: (K)
 " " **BO**—Station close down.
- 14**
REBOLA —I AM A LISTENER, OPERATOR, ETC.
REBOLADO—Check my report with station log and if correct verify reception. Thanking you in advance, I am sincerely yours:
 " " **RE**—I am the owner and operator of Amateur radio station:
 " " **MI**—I am a member of:
 " " **FA**—I am a short wave listener.
 " " **SO**—I am the owner of amateur radio station:
 " " **LA**—My radio receiver was made by me. (if not, after combination place name of maker.)
 " " **SI**—The number of tubes on my receiver is: (K)
 " " **BO**—I am the operator of amateur radio station:
- 15**
REBOSI —VOLUME, QUALITY, AND WEATHER
REBOSIDO—Your radio station volume was bad.
 " " **RE**—Your radio station volume was fair.
 " " **MI**—Your radio station volume was good.
 " " **FA**—Your broadcasting quality was bad.
 " " **SO**—Your broadcasting quality was fair.
 " " **LA**—Your broadcasting quality was good.
 " " **SI**—The weather was bad.
 " " **BO**—The weather was fair.
- 16**
REBOBO —WEATHER AND CORRESPONDENCE
REBOBODO—The weather was good.
 " " **RE**—In accordance with your request, please send me gift promised in your program.
 " " **MI**—Your program was just like a local station.
 " " **FA**—I did not receive an answer to my correspondence of: (K)
 " " **SO**—Your gift received. Many thanks.
 " " **LA**—I must congratulate the management of the station for the splendid programs.
 " " **SI**—Your correspondence received. Many thanks.
 " " **BO**—With my best wishes, I am sincerely yours:
- 17**
MIBODO —VERIFICATIONS FROM STATIONS
MIBODODO—Verification of program from our radio station:
 " " **RE**—Greetings to:
 " " **MI**—This is to certify your correct reception of signals from our radio station on date: (K)
 " " **FA**—This certificate signed on: (K)
 " " **SO**—This station will not verify any more reports after: (K (when no date is given it means that the station does not verify.))
 " " **LA**—We appreciate your verification request and its interesting information. Many thanks, yours truly,
 " " **SI**—Suggestions regarding improvement of transmission are always welcome.
 " " **BO**—Experimental short-wave broadcasting transmission of:
- 18**
MIBORE —OPERATION AND NEWS
MIBOREDO—We operate on Short and Long-wave.
 " " **RE**—Time of operation is as follows: (K)
 " " **MI**—Transmissions: (on, at, in) (K)
 " " **FA**—We operate on Short-wave on: (K)
 " " **SO**—We operate on Long-wave on: (K)
 " " **LA**—Program at: (K)
 " " **SI**—News in the language of: (give combination of country from pages BO22-23.)*
 " " **BO**—News in Spatari.
- 19**
MIBOMI —PERTAINING TO THE SPATARI RADIO LANGUAGE
MIBOMIDO—The new edition of the Spatari Radio Language is ready for distribution. Order your copy now.
 " " **RE**—Order your copy from the same address as that listed in the present volume.
 " " **MI**—The cost, postpaid in foreign countries is \$: (K)
 " " **FA**—Write to the Spatari Language Foundation, P. O. Box 36, Woolsey Station, Astoria, N. Y., U. S. A.
 " " **SO**—This correction applies only to the people speaking the language of: (give combination of country from pages BO22-23.)*
 " " **LA**—An automatic apparatus for taking call letters and messages in the Spatari Radio Language is ready for sale.
 " " **SI**—Broadcasts with the new edition of the Spatari Radio Language will start at 12 noon (U. R. T.) on: (K)
 " " **BO**—Announcements of the date changing broadcasts to the new edition of the Spatari Radio Language will be made on: (K)
- 20**
MIBOFA —SPATARI LANGUAGE CORRECTIONS
MIBOFADO—This station will have a broadcast to correct, add and etc., items in this book from: (K)
 " " **RE**—Correct on page: (K)
 " " **MI**—Column: (K)
 " " **FA**—Group: (K)
 " " **SO**—Line: (K)
 " " **LA**—It should read as follows: (J)
 " " **SI**—The address of the publishers of this book has been changed to: (J)
 " " **BO**—Correct after combination just heard, the following: (J)
- 21**
MIBOSI —ADDITIONAL INFORMATION
MIBOSODO—Additional information will be given in the language of: (give combination of country from pages BO22-23.)*
 " " **RE**—For the listeners of: (give combination of country from pages BO 22-23.)*
 " " **MI**—For the listeners of the world.
 " " **FA**—A book pertaining to amateurs.
 " " **SO**—A book pertaining to: (J)
 " " **LA**—This is a talk in the language of: (give combination of country from pages BO 22-23.)*
 " " **SI**—The talk will be about: (J)
 " " **BO**—This radio station will have talks in the Spatari Radio Language.

* Page numbers refer to pages in the Spatari Radio Language code book.

NOTE: The MIBOLA, MIBOSI, and MIBOBO groups of this column will be given next month. These groups have to do with replies to questionnaires sent out by broadcasters.

SEE NEXT PAGE FOR COLUMNS J & K

(Reprinted by permission of Carlo Spatari and International Copyright secured.)

"SIRELA" (CONTINUED)

Column J

DO—Announcements
 RE—Abdication
 MI—Births
 FA—Change in frequency
 SO—Change in location
 LA—Change in schedule
 SI—Club news
 BO—Cloudbursts

DO—C TO F
 DODO—Contest
 DORE—Cyclones
 DOMI—Congratulations
 DOFA—Deaths
 DOSO—Disaster
 DOLA—Earthquake
 DOSI—Elections
 DOBO—Floods

RE—H TO R
 REDO—Holiday Greetings
 RERE—Inauguration
 REMI—International Affairs
 REFA—Meetings
 RESO—National Affairs
 RELA—Police News
 RESI—Politics
 REBO—Rainstorms

MI—R TO S
 MIDO—Refer to column K
 MIRE—Religion
 MIMI—Robbery
 MIFA—Snowstorms
 MISO—Storms
 MILA—Society News
 MISI—Spatari Language
 MIBO—Spatari Language Book

FA—S TO W
 FADO—Sport results
 FARE—Sports
 FAMI—Topics of the Day
 FAFA—Vital matters
 FASO—Volcanic eruption
 FALA—Weather forecast
 FASI—Weddings
 FABO—Windstorms

SO—ALPHABET
 SODO—A
 SORE—B
 SOMI—C
 SOFA—D
 SOSO—E
 SOLA—F
 SOSI—G
 SOBO—H

LA—I
 LADO—J
 LARE—K
 LAMI—L
 LAFA—M
 LASO—N
 LALA—O
 LASI—P (for O use DO)
 LABO—Q

SI—R
 SIDO—R
 SIRE—S
 SIMI—T
 SIFA—U
 SISO—V
 SILA—W
 SISI—X
 SIBO—Y

BO—SPECIAL LETTERS
 BODO—Z
 BORE—A
 BOMI—A
 BOFA—CH
 BOSO—E
 BOLA—N
 BOSI—O
 BOBO—U

Column K

DO—0 (th)
 RE—1 (first)
 MI—2 (second)
 FA—3 (third)
 SO—4 (fourth)
 LA—5 (fifth)
 SI—6 (sixth)
 BO—7 (seventh)

DO—NUMBERS AND FREQUENCY
 DODO—8 (eighth)
 DORE—9 (ninth)
 DOMI—Frequency in kc.
 DOFA—Frequency in Mc.
 DOSO—Kilocycles
 DOLA—Megacycles
 DOSI—Meters
 DOBO—Watts

RE—ARTICLES, REFER TO, AND TIME ZONE
 REDO—and
 RERE—from
 REMI—on (at, in, for, of)
 REFA—or (are, is, of, with)
 RESO—so (our)
 RELA—Refer to column J
 RESI—Change after call letter—time zone to read: (J)
 REBO—Their Time Zone is: (See column J)

MI—CHANGE, SCHEDULE, ANNOUNCER, ETC.
 MIDO—Change their
 MIRE—Schedule (for, of, on)
 MIMI—Also (on, at, in)
 MIFA—Between (after, around)
 MISO—The announcer was: (J)
 MILA—Only, (on, at, in)
 MISI—Irregular, (on, at, in)
 MIBO—This is their:

FA—DAILY & DAYS OF THE WEEK
 FADO—Daily (on, at, in)
 FARE—Sunday (and)
 FAMI—Monday (and)
 FAFA—Tuesday (and)
 FASO—Wednesday (and)
 FALA—Thursday (and)
 FASI—Friday (and)
 FABO—Saturday (and)

SO—LANGUAGES, IN A FEW—OCCASIONAL
 SODO—Day (s)
 SORE—In a few
 SOMI—Occasional (on, at, in)
 SOFA—With occasional broadcasts (on, at, in)
 SOSO—Talk in the language of
 SOLA—Talks in the Native language and the language of:
 SOSI—Today
 SOBO—Tomorrow (on, at, in)

LA—NEXT, WEEK, MONTH, YEAR
 LADO—Next
 LARE—Week (s)
 LAMI—Month (s)
 LAFA—Year (s)
 LASO—January
 LALA—February
 LASI—March
 LABO—April

SI—MONTHS
 SIDO—May
 SIRE—June
 SIMI—July
 SIFA—August
 SISO—September
 SILA—October
 SISI—November
 SIBO—December

BO—DAILY EXCEPT AND LAST
 BODO—Daily except Sunday
 BORE—Daily except Monday
 BOMI—Daily except Tuesday
 BOFA—Daily except Wednesday
 BOSO—Daily except Thursday
 BOLA—Daily except Friday
 BOSI—Daily except Saturday
 BOBO—Last (give day, week, month or year)

you would merely write down on your verification request REBOMIDO. No matter what country the broadcast came from this code word would have the same meaning for them, since they would have Spatari code books identical with yours, except that the meanings of the code words would be printed in their own tongue.

You will note that after the meanings of some of the code words appear the symbols (J and K). These refer you to the two columns headed **Column J** and **Column K**, in order to complete the message begun by the code word which bears the symbol.

For example, let us take the code word REBOLASI. Using the method already outlined we find that this word decoded is, "The number of tubes on my receiver is (K)." It is then necessary to refer to **Column K** to complete the sentence. Let us suppose that your receiver has eight tubes. Under **Column K** we find that the code word for 8 is DODO. The completed code message would then read as follows: REBOLASI DODO.

If you wish to simplify the Spatari language still more, you may use a system of abbreviations in order to save time. This is by no means necessary but, as you become familiar with the radio language through use, you will undoubtedly shift into the use of abbreviations.

This shorter method of expressing yourself in Spatari is not difficult. For the sake of brevity, when you are using more than one sentence from the same group, it is not necessary to repeat the entire combination but merely the last syllable. Suppose that you are in the REBOFA group and wish to use two code words there. Instead of writing or saying REBOFADO REBOFARE you may encode it as REBOFADO RE, which in either case would mean, "A military band was playing followed by dance music playing."

Similarly, if you wish to use code words from another group in the same column, it will be necessary to use the last two syllables. Instead of using REBOFADO REBOSOLA, it may be written in this manner: REBOFADO SOLA. Decoded either of these would mean, "A military band was playing followed by your National Anthem and close down."

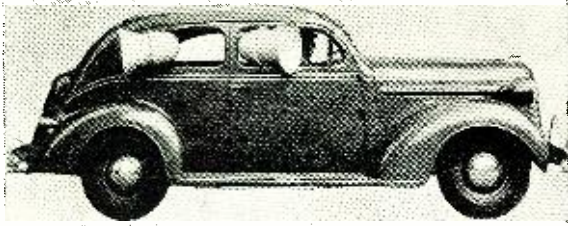
In the illustration showing a sample Spatari verification request, the message is written by the abbreviated method. Following the translation given under the illustration, you will have an opportunity to see just how the abbreviations are used. Check the translation of the verification request with the coded message shown in the illustration and with the code words in the columns. Doing this once or twice will fix the system firmly in your mind and you should have no difficulty thereafter.

You will note that in the translation of the coded message of the verification request illustrated here, that reference is made to "Antemeridian Universal Radio Time." Space will not permit an explanation this month of the universal time system Professor Spatari has devised to be used in conjunction with the radio language. Next month, however, we will deal exclusively with the Time Zones and will publish the necessary charts.

each column of code words contains those beginning with the same two syllable combination. In the first column all code words begin with DOBO; in the second column all code words begin with REBO; and in the third column they all begin with the two syllables MIBO.

Let us now take the code word used above, REBOMIDO, locate it, and determine its meaning. Noting that it begins the two syllable combination REBO,

we know that we shall find the word in the second column. The third syllable of the code word is MI, thus placing the word in the group of eight code words all beginning with REBOMI. The last syllable, DO, identifies the particular word of this group as REBOMIDO. The meaning of this code word is, "A man was singing." Therefore if you wished to tell the station to which you had been listening that a man was singing at the time you were tuned in,



The two speakers pointed in opposite directions excellent audibility and sound coverage both to front and rear.

is of the male type with eight prongs. The two power connector cables terminate in female, octal plugs. In the a.c. plug terminals 1 and 8 are used as the a.c. conductors with no connections to the other six. In the 6-volt battery plug terminals 2 and 3 are tied together (to decrease their resistance to the relative high current flow) for the negative conductor, and 6 and 7 for the positive side. Terminals 4 and 5 are likewise connected together to complete the genemotor output circuit only when this plug is on. This isolates the genemotor winding from the high-voltage output of the a.c. power supply when the latter is in service.

A switch is required to switch the filaments and phono motor depending on which source of power is used. Here again the system is fool-proof because the unit will not operate if this switch is in the wrong position, and no harm is done should this occur inadvertently.

An important element, from the standpoint of safety, is the provision of fuses in both supply circuits. The one in the primary circuit of the transformer also serves as the "hi-lo" voltage selector. Slipped into one pair of clips it provides for operation from line voltages between 105 and 115; in the other pair for higher line voltages between 115 and 125. This fuse is reached through the hole under the turntable and the d.c. fuse is of the protected panel type and located on the control panel.

When operating from a battery, current economy is always a consideration and a stand-by switch has been provided for use at such times as the amplifier is not in actual service but must be ready for instant use. This switch cuts off the genemotor and the phono motor but leaves the filament current on. In addition there is a separate switch for independent control of the phono motor, cutting it off when the phono channel is not in use.

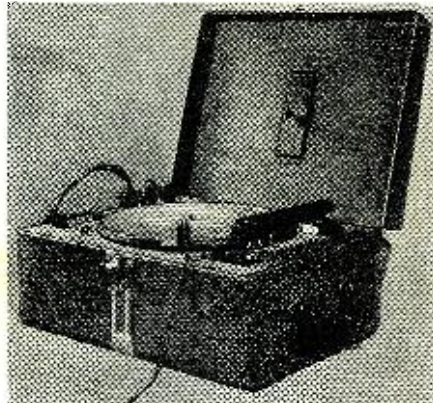
In the circuit, a 6J7 serves as a pre-amplifier in the microphone input channel. The output of this and the crystal phonograph input are fed into the two grids of a 6N7 which, with its two plates tied together, serves as a mixer. The grid circuits of this tube include the volume controls for the two channels. The next 6N7 serves as a voltage amplifier and phase-inverter, thus permitting the use of resistance-capacity coupling between this and the following 6E6 dual-triode stage in which the triode sections are push-pull connection to provide adequate power to drive the four type 79 triodes in push-pull parallel in the output stage. The two sections

79 are connected in parallel, making the output stage the equivalent of eight connected in push-pull parallel. An

vapor tube serves as rectifier.

the power supply, amounting to 45 watts or more and representing a drain on the battery of something over 8 amperes for this stage alone. To avoid this inefficiency, the final stage is operated Class B and the result is that the plate current drain is negligible with no signal. When a signal is present the drain varies in proportion to the signal and the total current drain is only a fraction of that required for Class A.

The output circuit terminates in two octal sockets connected in parallel to permit the use of two speakers, each with its own plug; or other combinations including additional speakers, lines, etc. The socket prongs provide output impedance values of 2, 4, 8, 16, 250 and 500 ohms directly. Other impedance matching values



The portable turntable can be set up for operation on the rear seat of the P.A. car.

may also be obtained if desired, through proper inter-connections.

The controls and connectors in the top panel, starting from the upper left corner are: Two speaker plugs, power plug, pilot light, d.c. fuse receptacle, genemotor stand-by switch, master on-off switch, 6-110 volt changeover switch, microphone jack, master tone control, microphone volume control, phono volume control and phono motor switch (combined). The phonograph has a speed regulator and scale.

The microphone and phonograph inputs can be used simultaneously and by means of their two volume controls can be mixed in any proportions or faded in and out.

Amplifier frequency response is flat within plus or minus 3 db. from 50 to 10,000 c.p.s.; hum level 58 db. below 30-watt output; total battery drain, no signal, 18 amperes; microphone channel usable gain (150,000 ohm input), 122 db.; phonograph channel usable gain (150,000 ohm input), 87 db.

This amplifier should be a distinctly valuable piece of equipment for any P.A. specialist, or serviceman.

-30-

International Listening

by GEORGE M. LILLEY

DOWN on the short wave end of the radio dial the other evening (6:00 p.m., E.S.T.) a station rambled in that called itself, "The Gateway to the Desert." It spoke first in an oddly accented version of French, then suddenly switched to English and a discussion that hinged on Moors and desert tribes.

Now, to my mind, half the excitement on the megacycles comes from hearing these weird stations that you can't identify. But this signal ups and ends the tension and announces clearly as can be: "Alo, Alo, Radio Biserte!" Then it says: "Algeria is speaking to you and we wish to hear from you who are hearing us. Send reports to Radio Algiers, North Africa." That is the first station we have heard announce clearly from Africa since Addis Ababa jumped over interfering Italian waves in 1936—darn it!

* * *

Casual mention about the weather by announcers on shortwave stations always holds an interest it seems. The Reykjavik, Iceland, fellow, when his Sunday afternoon radiation (12.23 megs.) gets through, refers to windy nights now. In Budapest the station invariably makes remarks when nights are stormy.

The weather-mentioners via the DX waves are virtually all in countries where the climate is a little hard, or where it seems so. Cuba and tropical stations, you'll notice, seldom utter a word.

The English are chronic weather watchers and such phrases as "It's cloudy in London tonight and there is every appearance of a heavy fog," are frequent with the English sign-offs.

* * *

All Cuban stations—the 20-odd sum of them—sound alike . . . Wonder why the English sports announcers in giving the Rugby scores always say "naught," instead of "nothing?" . . . Prague, in the heart of the Continent, has a funny fascination about its programs that some of the other cities—London and Paris—lack . . . Australian shortwave stations are often more difficult to tune in on the West Coast than in Eastern America. A strange combination of "Heavyside layers," jumb frequencies and such technical things . . . The metallic sing-song of Japanese signals makes them the easiest to identify.

* * *

Trans-Atlantic phone conversation, once an attractive lure, seldom, it seems, can be heard intelligibly anymore. The big commercial transmitters have completely cloaked their waves in scrambling devices that makes them so much gibberish. Most listeners haven't caught a good phone conversation in the last year.

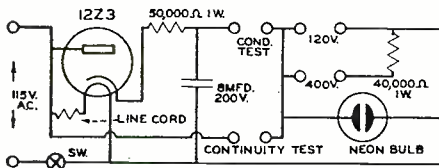
Several of the crack liners with ritzy patrons once furnished the most interesting ship-to-shore chatter. Indeed much of it was first-rate gossip, but the ships, too, have all adopted inverted speech equipment. Only occasionally are they caught off guard, usually in the 9.3 megacycle bands near 7

(Continued on page 45)

"RADIO Gadgets"

Low-Cost Tester

Here is a condenser and continuity checker that one can build and use for many tests that are commonly employed by a radio serviceman. The device uses a half-wave rectifier to change the current from a.c. to d.c. A resistance cord drops the line voltage to 12 volts for the required filament voltage to the 12Z3 tube. A simple filter system comprises a 50,000 ohm watt resistor and a 200 volt, 8 mfd. condenser. The neon lamp can be either the 1/2 or 1 watt size. When testing the condition of condensers a pair of test prods



should be plugged into the jacks marked "condenser test." For testing resistors or other parts for continuity the test prods should be plugged into the jacks marked "continuity test" as shown in the diagram.

It will be noted that the condenser under test is in series with the neon lamp and the power source and following the general procedure employed in this method of testing it will be possible to determine if the condenser is normal, leaky, or short-circuited.

When one wishes to check the presence of voltage, or the polarity of the line, he must first turn off the power supply of the tester, then connect the test prods into the proper terminals as indicated on the drawing. One set of plugs are marked for voltages up to 400 volts, the other jacks are marked for voltages to 120 volts. The size of the resistor "R" depends upon the neon bulb. A resistor of about 40,000 ohms will answer this purpose. The neon lamp can be calibrated by the eye.

Although there have been a number of these neon checkers described in the past the experimenter will appreciate the low cost and simple design of this instrument.

Changing the Crystal Frequency

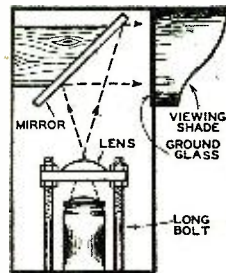
If you wish to raise the frequency of your crystal, the procedure is not so difficult as you might imagine. Ordinary kitchen cleanser, such as Old Dutch or Bon-Ami powder, will act as an excellent grinding material. Place a small amount of the powder on a piece of plate glass and use just enough water to make a thin paste. Then simply polish down the crystal by rotating it in the paste solution, pressing down firmly in order to obtain an equal amount of pressure over the entire surface of the crystal. Do not attempt to grind too much, but after a minute or so, wash the crystal and test it in the oscillator.

To lower the crystal frequency, apply India drawing ink to both surfaces with a small brush or mark them evenly with a lead pencil. Frequency response can usually be lowered from 10 to 30 KC. The lead pencil method has the advantage that one can merely erase a few kilocycles when this is desired!

Projection Device for C.R. 913 Tube

Amateurs, experimenters, and servicemen are familiar with the CR913 tube, because of its application, low-cost, and adaptability to compact design in cathode-ray oscilloscopes. Here is a kink whereby the image of this tube can be enlarged to at least 3 inches in diameter with good detail.

Obtain, from an old camera or second-hand shop, a plano-convex lens with a speed of about f 6.3. Next, secure a mirror about 9" square. Then purchase from a camera shop a groundglass screen, 4x5 inches. With this material at hand, install and mount the parts as shown in the drawing.



The tube should be placed in a vertical position. The lens is mounted 1" to 2" above the tube by means of two long bolts. The mirror is mounted on the wall of the cabinet by a wedged shaped piece of wood. This mirror should be placed at a 45 degree angle and it is mounted approximately 4" above the tube. Place the groundglass screen 4" to 5" from the mirror and over the 3" hole prepared for it in the side of the cabinet.

Exact focal distance can only be found by experimenting with the lens and the screen. A shadow box is necessary in order to observe image detail.

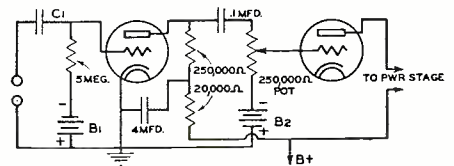
Twin-Triodes in Cascade

Twin-triode tubes such as the 53, 6A6, 6N7, and 79 are well known and popular when used with the two triode sections in parallel or in push-pull, but are not generally used with the two sections in cascade as shown in the drawing, because of the tendency toward motor-boating. This is unfortunate because with the two sections cascaded in a resistance coupled circuit, voltage gains of from 700 to 2000 can be obtained with the single tube; or in terms of decibels, from 57 to 66 db.

The reason for the tendency toward motor-boating is that all of these tubes unfortunately have a common cathode. That is, each section has its own grid and plate, but there is only one cathode for

both. This means, where cathode bias is used, that there is coupling between the first and second plate circuits, regardless of the size of the cathode by-pass condenser.

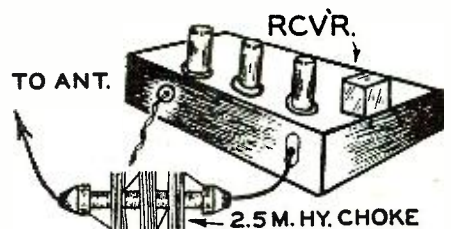
The simple remedy is to avoid this common coupling by using individual bias voltages on the two grids. Only two to three volts of bias is required for each and the biasing source may, therefore, conveniently be either flash-light cells (the smallest type will do), or better still the Mallory bias-cells. The latter are preferred because they never required replacement and are extremely small.



The two sections enclosed in the one envelope are shown in the conventional cascade form for simplicity. The coupling condensers and resistors are of the usual values and C_1 is necessary only when the microphone or other input is of a type which constitutes a closed circuit, and avoids shorting the bias battery or cells. The bias cells are shown at B₁ and B₂. If the Mallory bias cells are used they do not require by-passing but flash-light cells should be by-passed with 25 mfd. condensers.

Phone QRM

Many an amateur who has had no QRM difficulties whatever while operating on cw, finds that when he tries phone interference is caused in nearby broadcast receivers. Such complaints come, in many instances, from the owners of up-to-date modern receivers, and therefore, according to regulations, it behooves the amateur to aid in removing the interference. In most



instances, a wave trap or other complicated tuning device is unnecessary and a simple method for eliminating this trouble is to place a 2.5 millihenry RF choke in series with the antenna lead to the broadcast receiver as shown in the accompanying drawing.

Saving Time with Muffin Tins

Anyone who plays around with radio construction soon accumulates a variety of bolts, nut screws, and miscellaneous small hardware. Likely as not this motley collection is dumped into a cigar box or coffee can and when a screw of a certain size is wanted it is necessary to rummage through the whole mess to find it.

One or more muffin tins, having from six (Build further on page 56)

SHORT WAVE FLASHES

BY CHARLES A. MORRISON
and JOHN D. CLARK

IN order to give complete and useful information, two authorities on short wave conduct this column. Charles A. Morrison supplies information of interest to readers everywhere in his section entitled *Short Wave Flashes—General*. All frequencies in Mr. Morrison's column are in *megacycles* and all time is *Eastern Standard Time*.

John D. Clark conducts his column specifically for short wave listeners residing on the Pacific Coast, where reception differs considerably from the rest of the United States east of the Rockies. Mr. Clark's data is based on reports from listeners in all parts of the Pacific Coast area. In this section of *Short Wave Flashes* entitled *Short Waves for West Coast DX'ers*, all frequencies are also given in *megacycles* but all time is *Pacific Standard Time*, for the West Coast short wave listeners.

SHORT WAVE FLASHES—GENERAL

by CHARLES A. MORRISON
(All Times are Eastern Standard)

SATURDAY, October 22nd, from 10:00 to 11:30 p.m., over TGWA (9.685), and TGWB (6.04), of Guatemala City, Guatemala.

Tuesday, November 22nd, from 9:00 to 11:00 p.m., over HC2RL (6.635), of Guayaquil, Ecuador.

Thursday, November 24th, from 9:00 to 10:00 p.m., over T14NRH (9.695), of Heredia, Costa Rica.

Short Wave Previews of 1940 Olympic Games

Short wave programs previewing the 1940 Olympic Games, to be broadcast on Sundays, from 2:45 to 3:00 p.m. over W3XAL (17.78), and the NBC-Red network, will originate in the following countries: from France on Oct. 16th; Holland on Oct. 23rd; Norway on Oct. 30th; Sweden on Nov. 6th; Hungary on Nov. 13th; England on Nov. 20th; Poland on Nov. 27th; Canada on Dec. 4th; Switzerland on Dec. 11th, and U.S.A. on Dec. 18th.

20th Anniversary Celebrations of the Czechoslovak Republic

Gala programs celebrating the 20th Anniversary of the founding of the Czechoslovak Republic, will be radiated on Monday, October 24th; Tuesday, October 25th; Thursday, October 27th, and Friday, October 28th, from 7:55 to 10:55 p.m., over Prague stations OLR5A (15.23), OLR5B (15.32), OLR4A (11.84), or OLR4B (11.76).

New Frequencies Allotted for U. S. Short Wave Stations

The FCC has notified the Bureau of the International Telecommunication Union, Bern, Switzerland, that the following ten additional frequencies are being reserved for use by stations of the United States, in the new bands decided upon in the recent Cairo Conference: 6.17, 6.19, 9.55, 9.67, 17.83, 21.57, 21.59, 21.61, 21.63, and 21.65 mc.

Attitude of the BBC Towards "Verifications"

Verifications of reception of the Daventry stations have never been issued. The reason for this policy, which is quite unpopular with dx'ers, is expressed by Sir Noel Ashbridge of the BBC as follows: "It is impossible for anyone at the transmitting end of a broadcasting service to definitely say that a certain listener, somewhere on the other side of the world, has received a certain program. The programs from Daventry are frequently relayed by local broadcasting stations. An-

other difficulty is that our programs are published in advance. The extra staff which would be required to produce a satisfactory check would not really be justified at the expense of some other activity which would be of greater value." In closing he said, "I hope this will not be regarded as lack of courtesy, and I want to say that we still want your reports on reception of Daventry. We take pleasure in acknowledging them all, and in dealing with any specific technical point that may be raised."

New Short-Wave Stations (On the Air)

CHILE—CB1185 (11.85), "El Mercurio," re-lays CBI38 of Santiago.

EL SALVADOR—YSP (10.4), "La Voz de Cuscatlan," 150 watts, relays broadcasting station YSP (780 kc), daily from 7:30 to 8:30 a.m., 1:00 to 3 p.m., and 7:00 to 11:00 p.m.

JAPAN—JZO (10.27), inaugurated on August 15th, operates daily from 8:00 to 9:30 a.m. in parallel with JZJ.

MARTINIQUE—A Fort-de-France station, not "Radio Martinique," is being heard on a frequency of 5.95 mc, irregularly from 9:00 to 10:05 p.m., according to August Balbi of Los Angeles, California.

NEW ZEALAND—Jim Forest of Dunedin, New Zealand, reports ZME, a government land station on Sunday Island, near the high frequency side of the 7 mc band, may be heard irregularly.

POLAND—SP19 (15.12), and SP25 (11.74), of Warsaw, are operating in parallel with SPW and SPD daily from 6:00 to 9:00 p.m., with antennas beamed on South America.

SWITZERLAND—The new government transmitter at Bern (15.365), is still testing frequently between 6:45 and 7:45 p.m. Announcements in several languages including English are made every quarter hour.

TURKEY—Ankara (15.195), is being heard afternoons from approximately 1:30 to 5:00 p.m. but best reception is obtained from about 4:00 p.m. to 4:30 p.m. at which time DJB (15.2) puts its powerful carrier wave on the air. The announcer is a woman and the musical selections are usually of a classical or oriental nature.

U. S. A.—NBC has received permission to operate a new 35 kw transmitter at Bound Brook, New Jersey, on a frequency of 17.78 mc.

U. S. S. R.—The mystery Moscow station on 15.18, which is heard daily from 3:00 to 4:00 p.m., signing-off with the *Internationale*, has been identified by Richard Verbrugge of Detroit, Michigan, as RV26. This call was given frequently in English when the station was testing between 2:45 and 3:00 a.m.

VENEZUELA—"Estudio University" (5.835), power 2½ kw, with studios at El Paraiso, Estudios Univero Building, Caracas, operates daily from 6:30 to 7:30, 10:30 a.m. to 1:30 p.m. and from 3:30 to 10:00 p.m.

(Under Construction)

BULGARIA—A 20 kw transmitter; now under construction by the government, will be inaugurated early in 1939.

GREECE—A new 10 kw transmitter is to be constructed by the government near Athina.

IRAN—An order has been placed by the government for two 20 kw transmitters which will be erected near Teheran. The call letters will be EQB. and EQC, and they will operate on 6.155 and 9.68 mc respectively.

Notes of Interest

ALASKA—WXA (11.51), Juneau, has been heard testing near 11:00 p.m., on the Pacific coast.

BULGARIA—Broadcasts from LZA (8.465), Sofia, have been suspended and this station will in the future be used for telegraphy purposes only.

BRAZIL—PRA8 (6.015), Pernambuco, is being heard after 4:00 p.m. irregularly.

CANARY ISLANDS—Verifications are once more being issued by EAJ43 (10.37) of Tenerife. These feature a picture of General Franco.

COLOMBIA—The Lation station being heard in the vicinity of 11.92 to 11.97, is believed to be HJ3ABH, "La Voz de RCA Victor" of Bogota. . . . According to Louis Ambrosius of Louisville, Kentucky, only verifications bearing the post-mark of Bucaramanga, Colombia, can be considered as valid confirmations of reception of HJ7ABD (9.63), Bucaramanga, that station notifies him. . . . K. Easterbrook of Galetta, Ontario, Canada, writes that HJY (18.44) of Bogota, Colombia, is testing late afternoons.

CUBA—The power output of COCX (11.74), Havana, is soon to be increased to 5 kw.

ENGLAND—The news bulletin in transmission IV. from Daventry, is now being read at the revised time of 1:00 p.m.

FRANCE—TPA4 (11.713) is now broadcasting in parallel with TPA3 (11.885), daily from 6:00 to 8:15 p.m.

HAWAII—KQH (14.92), Kahuku, usually comes on the air Saturdays at 11:30 p.m., a half-hour before the "Hawaii Calls" program is scheduled to start. For preliminary tests with KEI (9.49), of Bolinas, California.

JAVA—G. C. Gallagher of San Francisco, Calif., reports that PLE (18.8), Bandoeng, has been heard lately near 2:00 a.m. and 9:20 a.m. . . . Billie Byrd of Little Rock, Arkansas, writes that PLP (11), Bandoeng, is being heard with excellent strength between 5:30 and 7:00, or 7:15 a.m.

MEXICO—XEBR (11.826), is now broadcasting mornings from 9:30 to 11:00 a.m. The signature selection is *Over the Waves*.

NEW GUINEA—A new station, VHSU, Salamaua Air Radio, has been heard testing on 8.07, 6.54, and 2.6, between 5:30 and 8:00 a.m., according to Ashley Walcott of San Francisco, California.

U. S. A.—The orange network of Pan American Airways, operating between Seattle, Washington, and Ketchikan, and Juneau, Alaska, works on 16.44, 12.33, 8.22, 5.165, 3.082, 2.986, and 1.638 mc. . . . VP3THE official verifications now being issued from Radio City, New York, are folding postal-cards, bearing three photographs of the transmitter set-up in the jungles of British Guiana and interesting facts about the expedition, and signed by the "Two Homesick Explorers" . . . The "Pillar of Fire," a religious organization in Zarephath, N. J., has requested permission from the FCC to erect a 5 kw transmitter to operate on 6.03, 11.83, and 17.78. . . . W3XAU, Philadelphia, has been granted permission by the FCC to add a new frequency of 15.27. . . . Similar to the chimes of Westminster which precede the striking of London's Big Ben, NBC's distinctive chimes now sound before the striking of a large ornamental clock which adorns the facade of the International Building in New York City.

U. S. S. R.—Soviet stations are being heard on 15.04, 15.08, and 15.18, up to sign-off daily at 4:00 p.m. . . . A station believed to have been RTZ in Irkutsk, Siberia, relaying the same program as RKI in Moscow, was heard by Earl Roberts of Indianapolis, on a frequency of 14.79, from 2:00 to 2:30 p.m. . . . Receptions of Moscow stations RAN, or RKI are not verified with standard QSL cards. Glossy postal cards depicting various scenes in Moscow are used for this purpose.

VENEZUELA—According to Miss Jean Plimpton of Milwaukee, Wisconsin, YV1RH (6.365) of Maracaibo, is again verifying all reports sent direct to that station.

Transmissions of Interest

Daily—8:30 to 9:00 p.m., program for residents of Jamaica, over HH2S (5.925), Port-au-Prince, Haiti; 10:30 to 11:00 p.m., "Bucaramanga Mild Coffee Hour," consisting of English news, exchange news, reading of letters from listeners and interesting facts about Colombia, over HJ7ABD (9.63) of Bucaramanga, Colombia.

Mondays—at 5:30 p.m., foreign listeners mail bag, over W1XAL (11.79) of Boston, Mass.; at 10:30 p.m., "Review of Central European Affairs," over OLR4A (11.84), or OLR4B (11.76), of Prague, Czechoslovakia.

Tuesdays and Thursdays—8:30 to 9:30 p.m., relay of Paris Mondial, over "Radio Martinique" (9.7), Fort-de-France, Martinique.

Tuesdays, Thursdays and Saturdays—6:00 to 6:30 p.m., "The Monitor Views the News," over W1XAL (11.79), of Boston, Mass.

Fridays—8:30 to 9:00 p.m., domestic listener's mail bag, over W1XAL (6.04) of Boston, Mass.

Sundays—7:00 to 8:00 p.m., "The Hour of Mexico," sponsored by the Mexican Department of Education, over XECR (7.38), XEWW (15.16), XEUZ (6.117), XENA (6.172), and XEBT (6).

Revised Schedules

AUSTRALIA—VK2ME (9.59), Sydney, Sundays 12:30 to 2:30, 4:30 to 8:30, and 9:30 to 11:30 a.m.

CANADA—CJRO (6.147), and CJRX (11.72) of Winnipeg, are reported to be broadcasting as late as 4:00 a.m. on Sunday mornings.

JAPAN—Overseas hour for Eastern America, over JZK (15.16) of Tokio, daily from 8:00 to 8:30 p.m.

U. S. A.—W3XAL, Boundbrook, New Jersey, on 17.78, daily 9:00 a.m. to 9:00 p.m., and on 6.1, from 9:00 p.m. to 1:00 a.m. . . . W2XAD, Schenectady, New York, on 21.5, daily from 8:00 a.m. to noon; on 15.33, daily from 12:15 to 6:00 p.m., and on 9.55, daily from 6:15 to 10:00 p.m.; over W2XAF, Schenectady, New York, on 9.53.

Frequency Changes

CHINA—XGX, Hankow, now near 9.29 to 9.3. **CUBA**—COBC, variable between 9.98 and 10.035 . . . COCQ, Havana, to 9.67.

ECUADOR—HC1GQ, Quito, to 9.185.

FRENCH INDO-CHINA—"Radio Hanoi," Hanoi, to 11.9.

PANAMA—HP5G, "Ron Dalley," Panama City, to 11.895.

PORTUGAL—CSW3, Lisbon, to 9.67, where it is badly QRM'ed by LRX, Buenos Aires.

Data

BURMA—Progress is being made under plans for State broadcasting in Burma. Sound-proof studios have been fitted up in the Central Telegraph building in Rangoon, and the first program by Burmese musicians and singers was recently broadcast. Transmissions are on 6.007, and 3.488.

CHILE—CB1180 (11.97), "Sociedad Nacional de Agricultura," Santiago, relays CB57, daily from 8:00 to 11:00 p.m.

FINLAND—OFE, on either 11.78, or 15.19, broadcasts daily from 1:05 to 3:00 a.m., and from 9:00 a.m. to 12:05 p.m., while OFD (9.5), broadcasts from 12:15 to 5:00 p.m.

FRENCH INDO-CHINA—"Radio Hanoi" (11.9), operating daily to 9:30 a.m., signs-off with "La Marseillaise." First part of program is in Chinese or Annamite, while last two, or three hours is in French. Identification is "Ici Radio Hanoi."

INDIA—Latest complete and accurate schedules for short-wave stations in India, as furnished by John DeMyer of Lansing, Michigan, and James Pratt of London, Ontario, Canada, are as follows: In Delhi: VUD2 (9.59), and VUD3 (15.16), daily from 1:30 to 3:30 a.m. and from 8:30 to 11 p.m.; VUD2 (4.995), and VUD3 (9.59), daily from 7:30 a.m. to 12:30 p.m.; VUD4 (15.29), a new transmitter, is also testing; VUB2 (9.55), Bombay, daily from 1:30 to 3:30, 7:00 to 10:30 a.m. and from 9:30 to 10:30 p.m.; VUM2 (4.95), Madras, inaugurated on June 16th, daily 7:00 to 10:30 a.m. and VUC2, Calcutta, inaugurated on August 16th, on 9.53, from 2:06 to 4:06 a.m. and on 4.88, from 7:06 a.m. to 12:06 p.m.

PANAMA—HP5G (11.895), P.O. Box 1121, Panama City, operates daily from 8:00 to 11:00 p.m.

PHILIPPINES—Ashley Walcott of San Francisco, California, reports that KZGH of the Philippines Long Distance Telephone Company of Iloilo City, 400 watts, operates daily from 6:00 p.m. to 10:00 a.m. It utilizes five different frequencies in its circuits with Manila, Cebu, ships at sea, and other Philippine stations. Frequencies heard in the U.S. have been 2.73, 5.445 and 6.755 mc.

PORTUGAL—The government station at Lisbon operates as follows: over CSW4 (11.84), daily 6:00 to 8:00 a.m.; over CSW3 (9.67), from noon to 2:00 p.m. for India, and Mozambique; from 5:00 to 6:00 p.m. for Europe, and from 6:00 to 8:00 p.m. for N.A. and S.A. and over CSW2 (11.04), daily from 2:15 to 4:15 p.m. for Portuguese Guinea, Angola and Cape Verde I.

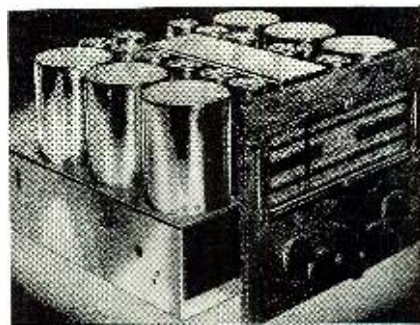
SAINT KITTS—(6.384), Basseterre, now operates weekdays from 4:00 to 5:00 p.m.; Wednesdays from 7:30 to 8:00 p.m.; and Saturdays from 11:00 p.m. to Sundays 6:00 a.m. irreg. Since December 20, 1937, VP2LO has issued over 7,000 QSL cards. Those now in use are being issued in the following basic colors: blue, rose, mauve, pink, and cream. The call is in maroon, and the station data in blue.

STRAITS SETTLEMENT—ZHP, "Singapore Calling," Singapore, now on approximately 9.69, is being heard daily from 5:45 to 9:45 a.m., sign-

(More DX on page 48)

New SCOTT PHANTOM Offers RAZOR - SHARP Variable SELECTIVITY

**Practically Two Radios in One
.. a DX Set for Long Distance..
A Wide Range High Fidelity
Set for Tonal Perfection**



**MAGNIFICENT TONAL REALISM
ON ALL WAVE BANDS**

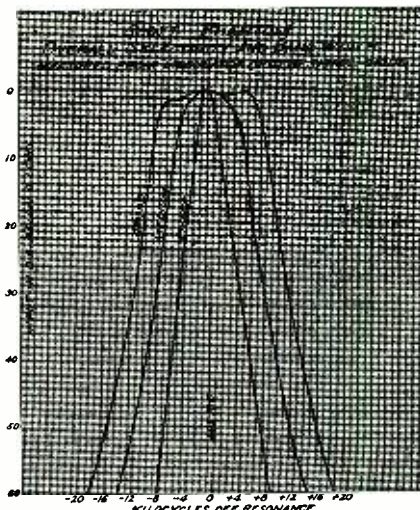
Until you have actually heard a program from a high quality broadcasting station or one of the newer High Fidelity recordings reproduced by SCOTT PHANTOM, it is impossible to realize the tremendous difference there can be in radio receivers. Entirely new advanced radio engineering principles have practically eliminated electrical interference from vacuum cleaners, oil burners, etc. Greater antenna response on all wave bands plus additional noise reduction are obtained from a new SCOTT Super-Double Doublet Antenna System. Tube hiss and still quieter reception of weak signals from distant foreign stations result from new circuit arrangements.

CUSTOM BUILT TO ORDER ONLY

SCOTT RADIOS are hand crafted with remarkable skill and fine watch precision, in scientific Laboratories for performance impossible with factory, mass-production receivers. *Yet, they cost no more!* For 15 years they have been purchased for personal use by internationally famous musicians, Kings, Princes, Presidents, DX enthusiasts, and critical layman listeners in the U. S. and 148 foreign countries.

30 DAY HOME TRIAL

Experience, yourself, the amazing performance of the SCOTT Phantom in your own home. 30 Day Trial anywhere in the United States. Guaranteed 5 years. NOT SOLD THRU STORES. Send the coupon for full information and special 30-day offer.



**WIDER FIDELITY AND SELECTIVITY
RANGE**

When extreme selectivity is not required and the finest possible reproduction is desired, the selectivity control can be switched to broad position and the receiver instantly adjusted so that it will pass all frequencies up to 8500 cycles. *We believe the new SCOTT PHANTOM offers a greater Fidelity and Selectivity range than any other radio now available to the general public.* In fact, the overall frequency range equals or exceeds the tonal range of every standard broadcast band station on the air.

Now Ready!

A brand new Scott Custom Built 12-tube receiver, incorporating new advanced Scott features . . . one of ever bought! Chassis to be priced as low as . . . **\$99.50** plus tax, at Chicago

GET ALL THE FACTS NOW!

E. H. SCOTT RADIO LABORATORIES, INC.
4440 Ravenswood Ave., Dept. 5T8, Chicago, Ill.

Please send set of curves, all facts, and Special Limited Offer on the new SCOTT PHANTOM.

Name.....

Street.....

City.....State.....

STUDIOS: NEW YORK-DETROIT-BUFFALO-CHICAGO-LOS ANGELES



LICENSE FOR RADIO CONTROLLED AIRPLANES?

Dear Sir:

I have become interested in model airplanes which are controlled by radio. Will you answer whether I must have any sort of license to operate one of these planes, or not.

(Sgd) D. L. Josephs,
Western Springs, Ill.

A license to operate a transmitter **MUST** be obtained before **ANY** transmitter can be used, whether it be for a model plane or otherwise. In addition, an operator's license is required also. Both are obtainable from the Federal Communications Commission, Washington, D. C., after taking a code test and a theoretical examination. It would be better to contact a local amateur who might be willing to assist you in your experiments. He would not charge you for the work, since he cannot take any money for the operation of his equipment.—Ed.

AMATEUR INTERFERENCE

Dear Sir:

There is an amateur next door who interferes with my radio set which is the very latest type you can buy. He has put in wave traps, and done everything in his power to clear the matter up, but I still can hear him to the detriment of certain programs which I wish to hear. Most important to me is a religious program which is on the air every Sunday morning at 10 a.m. our time. What are my rights in this matter? I would like to know them before I do anything about this further.

(Sgd) Mrs. John J. Casey,
Hartsdale, N. Y.

Your rights are very simple. The amateur **MUST** stay off the air during the one program you desire to hear. In addition, the program that you are interested in seems to fall within the "quiet" hours imposed by the government on the ham when he cannot eliminate the interference from a modern set. I am sure that the amateur in question will cooperate with you 100% so that you may hear the devotional program you want. We have always found that hams are generally very fine people, and can be reasoned with.—Ed.

LIKES BALANCE OF R. N.

Dear Sir:

Concerning the new **RADIO NEWS**, I think that it's the best yet. It certainly covers everything that anybody interested in radio would be interested in. Every time I pick it up, I find something new in the line of news or information that I know must be of value to many more besides myself. I've been getting **R.N.** at the newsstands for years; in fact, way back when everybody was making their own radios. I thought that it was good then and it has certainly improved with the passage of time. I think it the best radio mag on the market. Keep up the good work.

(Sgd) Al Chartrand,
Dorchester, Mass.

Thank you, Mr. Chartrand. We will try and be worthy of your confidence.—Ed.

SPECIAL BROADCAST PROGRAMS FOR THE DX FAN

THIS issue inaugurates the 1939 Broadcast DX Season. According to all theory advanced by the DX experts, the forthcoming season should be a big improvement over the last year. They base their optimistic forecast on the ever increasing power of foreign stations, better receiving equipment, and the constantly improving conditions which we can expect. Their contentions sound logical to your editor, so with the required sensitivity and selectivity we can all make a bid for those prize "veris."

During the coming months this Corner will provide a complete schedule of special DX programs, dedicated not only to **RADIO NEWS** but to all DX organizations. It will also list frequency checks and special attention will be given to notes from readers and clubs. The latest data will be presented on new stations, revisions in power, frequency, and other matters of interest to the DXer. To secure and present such material properly, **RADIO NEWS** hereby extends an invitation to clubs and all those connected with special programs, to send in the data so as to help make the information as complete as possible. Observers are requested to send in reports on the number of stations verified, also their preference for the kind of material they would like to have presented in this department.

DX Calendar

Listed below are the special DX broadcast programs dedicated to **RADIO NEWS**. Tune in on these special broadcasts and do not fail to send in your report to the station. Give them complete information. Practically all of the stations listed will be pleased to verify reports. The schedule is shown in *Eastern Standard Time* and all hours are *A.M.* unless otherwise indicated.

| Day | Hour | Call | State | Kc. | Kw. |
|----------|-----------|------|-------|------|-----|
| 11 | 5:35-5:50 | KGMB | T. H. | 1320 | 1. |
| 14 | 5:30-5:45 | KWYO | Wyo. | 1370 | .1 |
| 14 | 4:20-4:35 | WRAC | Pa. | 1370 | .1 |
| NOVEMBER | | | | | |
| 8 | 5:35-5:50 | KGMB | T. H. | 1320 | 1. |
| 11 | 5:30-5:45 | KWYO | Wyo. | 1370 | .1 |
| 11 | 4:20-4:35 | WRAC | Pa. | 1370 | .1 |
| 12 | 4:05-4:20 | WJBO | La. | 1120 | .5 |
| 12 | 3:50-4:05 | WGAR | Ohio | 1450 | .5 |

WISHES US LUCK WITH AWR

Dear Ed:

Your surprising combination with **AWR** inspires me with mixed emotions. Regret at the demise of one which served me well, and relief and pleasure that I am now a **RADIO NEWS** subscriber.

AWR's contributors knew radio, but it is necessary to use appropriate words; and I don't think they'd dare try undisciplined pen work with you.

Best of luck in these shoal waters of publication. God grant you courage, wisdom and tact in dealing with amateur moss backs.

Sincerely yours,
(Sgd) Granville P. Waller,
Kirksville, Mo.

Your letter touched us deeply, Mr. Waller. We are inclined to agree that some of the hams are "moss backs" as you say, but perhaps the "worm will turn" and the old fighting spirit of the pioneer ham come to the fore, again. Anyway, we hope so.—Ed.

—30—

PERIODIC PROGRAMS

Frequency Checks and Dedications to DX Clubs and **RADIO NEWS**

Wednesdays—

4:35-4:50 a.m., 1500 kc., KDAL, Duluth, Minn., .1 kw. (IDA).

Saturdays—

2:45-4:00 a.m., 780 kc., CHWK, Chilli-wack, B. C., 1 kw. (URDXC).

Sundays—

12:45-1:00 a.m., 1280 kc., KLS, Oakland, Calif., .25 kw. (URDXC) (tips).

2:45-3:00 a.m., 1010 kc., CKWX, Vancouver, B. C., Canada, .1 kw.

3:00-3:30 a.m., 1410 kc., CKMO, Vancouver, B. C., Canada, .1 kw.

3:30-3:45 a.m., 750 kc., KMTR, Los Angeles, Calif., 1 kw. (tips).

Monthly—

1st day of each month, 3:00-4:00 a.m., 1260 kc., KTOC, Savannah, Ga., 1 kw.

1st Sunday of each month, 4:00-4:30 a.m., 1340 kc., KGDY, Huron, S. Dak., 25 kw.

2nd Monday of each month, 5:20-5:40 a.m., 1250 kc., WAIR, Winston-Salem, N. C., .1 kw. 4:20-4:35 a.m., 1310 kc., KVOX, Moorehead, Minn., .1 kw.

2nd Tuesday of each month, 5:00-5:30 a.m., 1370 kc., KRMC, Jamestown, N. Dak., 1 kw. 5:00-5:20 a.m., 1210 kc. WSAY, Rochester, N. Y., .1 kw. (NNRC).

2nd Wednesday of each month, 3:40-4:00 a.m., 1310 kc., KAND, Corsicana, Texas, .1 kw. (NNRC).

2nd Thursday of each month, 4:00-4:20 a.m., 1330 kc., KRIS, Corpus Christi, Texas, .5 kw. (NNRC).

2nd Friday of each month, 4:00-4:20 a.m., 1370 kc., WBTM, Danville, Va., .1 kw.

2nd Saturday of each month, 4:35-4:50 a.m., 1310 kc., KTSM, El Paso, Texas, 1 kw. (FC).

5th day of each month, 3:00-3:30 a.m., 1370 kc. KTEM, Temple, Texas. (FC).

New Stations and Revisions United States

| Call | Kc. | Location | Power |
|------|------|------------------|--------|
| WCOV | 1210 | Montgomery, Ala. | 100 W. |
| KBKR | 1500 | Bager, Oregon | 100 W. |
| KVIC | 1310 | Victoria, Texas | 100 W. |
| KTFI | 1310 | Tulsa, Oklahoma | 250 W. |

Notes from Readers and DX Clubs

The following interesting and helpful information is taken from the National Radio Club DX News. Station WLLH, Lowell, Mass., 1370 kc. tests the first Friday of the month from 1:30-2:00 a.m. *EST.* They will verify all correct reports of reception. Enclose return postage. Station KITE, Kansas City, Mo., will verify. They are planning a number of special after-midnight programs.

The "Tune-In" Bulletin, official organ of N. Z. DX Radio Association reports that Auckland holds all the prize DX trophies. Here are a few of their loggings which indicate rightful possession—Stations KIEM, KGGM, WDSU, KQW, ROW, MJ—all in the U. S. A.

—30—

International Listening

(Continued from page 38)

or 8 p.m. Scrambled waves do not travel as well as cleared modulations and the mixer is thrown off at times when a ship is far out at sea.

Sunday remains the peak morning for tuning-in the trans-Pacific programs. VK2ME, Sydney, always has been a favorite near 7 a.m. (9.58 megs.), while PLP (11.00 megs.) at Bandoeng, Java, and a station or so from China or Japan are apt to stray in. These, of course, in addition to several improvised Oriental war stations testing and a number of trans-Pacific phone transmitters that appear to use Sunday mornings for experimental work. KKH, the 16-meg. Hawaiian station owned by RCA is often around until noon or later, and then Manila at 7 a.m.—9.57-megacycle KZRM.

* * *

Much ether ballyhoo, strangely familiar, twists back out of shortwave skies. Occasionally listeners are able to hear a station at Singapore and the advertising of several American products reminds that they might be listening to an early evening program from home—the toothpaste, the mouth anti-septic and all that.

KZRM, Manila, a number of Asiatic stations, and scores of broadcasters in the West Indies and South America derive a surprising portion of their revenue from the manufacturers who feature the big programs on the American airlines. Europe's big commercial broadcaster is "Radio Luxembourg," which also plugs American products. And PCJ and PHI, the big shortwaves of the Dutch, plan going commercial soon.

* * *

"A Thief in the Night—Or Daylight Robbery" was a typical English melodrama heard recently by way of the international dial. And it served to recall previously written opinions that one accustomed to the fast tempo of American radio productions must suffer a little before enjoying the works of the BBC.

Radio dramas many times start slowly there and lack the sensational and super-climax stuff with which we are familiar. The casts usually are made up of stock workers for the corporation and their names are featured only in a hurried manner at the end of the program. The play is the thing and star ballyhoo as a rule is just something overlooked in England.

A typical quip is this one from the broadcast in mention: Hicks, the butler, calling the local police sergeant says, "There's murder been done here."

And the sergeant replies, "Strike my life! Is anybody been hurt?" In a heavy cockney accent, such lines do hold a laugh for the eavesdropping American, but for some reason the average radio program does not resemble the more subtle English shows.

* * *

Heard on a recent 5:30 p.m. (11.75 GSD) program from London: "And now a gramophone record by that brilliant American pianist . . . Fats Waller." Of all things!

I'm glad I waited for this FREE CATALOG!

1939 LAFAYETTE RECEIVERS
The biggest radio values of them all! Sleek, new, styled to the minute beauty — clear, powerful, realistic reception — perfected touch tuning — Lafayette 1939 combines all the extra-value features you'd expect to find only in much higher priced sets. Listen to Lafayette before you buy any new radio. Select from 50 brilliant models described and illustrated in our new FREE catalog.

PARTS, TUBES AND KITS
Whether you build it yourself or fix it yourself, this book has everything you need. Parts — tubes — hard-to-get items — the most complete line of receiver kits in radio. Use our FREE catalog for easy, economical shopping.

PUBLIC ADDRESS EQUIPMENT
Lafayette P.A. is doing smash business everywhere! This year, there is a Lafayette unit for every sound purpose. New performance . . . the same old thriftiness. See the complete P.A. line in our new catalog. Special List Price P.A. Catalog for servicemen. Write to P.A. Division.

HAM EQUIP'T & APPARATUS
Save important money on quality ham equipment! Select your favorite transmitter . . . all the accessories you need, from this value-packed radio catalog.

7 branches to serve you
WHOLESALE RADIO SERVICE CO. INC.
NEW YORK, N.Y. • CHICAGO, ILL. • ATLANTA, GA.
100 SIXTH AVENUE • 901 W. JACKSON BLVD. • 265 PEACHTREE STREET
BOSTON, MASS. • BRONX, N.Y. • NEWARK, N.J. • JAMAICA, L.I.

BUY BY MAIL OR IN PERSON
Either way, you benefit. Delivery service is rapid. Our staff understands your problems.

VALU-BILL Says:
Just paste 'er on a penny post-card and mail. If you don't say it's the best one cent investment you ever made, we'll refund your money! Don't wait. Send for it today!

WHOLESALE RADIO SERVICE CO., INC.
100 Sixth Avenue, New York, N. Y.
Rush FREE 1939 Catalog No. 73-2L8

Name _____
Address _____
City _____ State _____



FROM
1 to 1,000 AMPERES!

P. R. MALLORY & CO. INC.
MALLORY

Magnesium-Copper Sulphide

RECTIFIERS

Because of their efficiency, long life, compactness and low cost, Mallory Magnesium-Copper Sulphide Rectifiers are widely used in a variety of devices ranging from battery chargers, "A" eliminators, motion picture exciter lamp and arc power supplies, to heavy-duty electroplating equipment requiring a thousand or more amperes.

Their increasing use opens up a new and profitable field for the serviceman. The same high quality and precision design has been built into a line of Mallory Replacement Rectifiers for this field.

See the Mallory-Yaxley Radio Service Encyclopedia, 2nd Edition, for complete list of recommended rectifier replacements.

Information on special or heavy-duty rectifiers will be supplied on request. Address Rectifier Application Division.

P. R. MALLORY & CO., Inc.
INDIANAPOLIS INDIANA
Cable Address—PELMALLO



QUESTIONS and ANSWERS

R. G. N., Philadelphia, Pa.: Is it necessary to use a buffer stage ahead of the final amplifier stage or is it permissible to double in this driver stage?

Answer: The answer depends on a number of considerations. It is usually desirable to have the oscillator stage separated from the final by at least one tube. Thus when working "straight through" (that is, when operating on the 80-meter band with an 80-meter crystal), for instance, a buffer is desirable to isolate the crystal stage. Where one or more doublers are employed, as when working on 20 meters from an 80-meter crystal, they serve to isolate the crystal stage sufficiently and a buffer is therefore not needed unless the final doubler will not supply enough grid drive for the final stage in which event another tube will be needed. This tube would be commonly called a "buffer" although actually its sole function would be that of an amplifier or "driver."

F. C. H., Miami, Fla.: I've been hearing a lot about this so-called "death-ray" which is supposed to kill bugs and parasites on grain and wonder if this could be used on the trees in our orchard. Can you give me any information on this subject?

Answer: The "death-ray" is simply a rather powerful short-wave transmitter, 250 watts or more, operating at some frequency between 3 and 30 megacycles. When grain is passed through a strong high-frequency field, germs and bugs are killed but the grain is unaffected. This same method is also used experimentally for purifying water. It would not be practical to attempt to treat an orchard in this manner because each bough and twig would have to pass through this electrical field. We understand that considerable experimental work on such apparatus was done at Rutgers University.

M. A. S., Hartford, Conn.: Is there any objection to using twisted-pair feeders for receiving on the 5-meter band? I am using a "J" antenna.

Answer: Many hams claim to get good results from a twisted-pair transmission line but actual tests have shown that losses are far higher with twisted-pair than with any other type of transmission line. The same principles apply to both receiving and transmitting antenna system so for best results use a spaced pair properly terminated. The only advantages of twisted-pair are that such a line is simple and convenient to install and is unobtrusive. Such points are of paramount importance to the BCL but not to the true Ham.

F. N. D., Erie, Penna.: I have occasion to use dry-cell batteries in a portable receiver. These I test with a 50-ampere meter but the "B" batteries represent a problem to test because I do not know what they should read on the

ammeter, but more important, I have heard that they cannot be tested in this manner.

Answer: Neither "B" batteries or dry-cell "A" batteries should be given short-circuit tests with an ammeter as such an instrument connected across a battery represents an almost direct short. The only safe way to test either type of battery is to subject it to normal drain (as in normal operation in your portable receiver) and measure the voltage. When the voltage is less than two-thirds of normal discard the battery.

S. B. C., Muscatine, Iowa: I have a transceiver using a type 19 tube in a unity-coupled circuit. Can you suggest any other tube of lower A-battery drain which would operate as well or better?

Answer: Try the RK-43. This tube has a rated power output of 2.9 watts as against 2.1 watts for the type 19, yet the RK-43 requires only 1½ volts at 0.120 amps for filament supply. Grid resistor in a unity-coupled circuit should be from 6,000 to 7,500 ohms.

R. E., Atlantic City, N. J.: Listening to the amateurs on the different "Ham" bands I have noticed that in a great deal of their conversation they use certain "Q" terms, the most popular of which appears to be QRM. Please advise the meaning of these terms and if there is a list available kindly state where I can obtain it.

Answer: The abbreviations you have reference to are a part of the international "Q" code. There are something like 63 of these abbreviations and they are extremely helpful in international radio communications. The term comprises a question and an answer or statement as for example the one you refer to: QRM (question) Are you being interfered with? (answer) I am being interfered with. —A complete list of these terms are contained in the Radio Handbook and the A.R.R.L. Radio Amateur's Manual.

S. R., Trenton, N. J.: I measured my two 45 volt "B" batteries while my set was in operation and found them both reading around 33 volts. Should they be discarded. My reception is not so good.

Answer: B batteries reading about 35 volts should be replaced. Do this and your reception should be normal.

D. C., Cleveland, Ohio: Is a doublet type aerial directional? If so, should it be broadside or pointed toward the station to be received?

Answer: A doublet antenna is directional and it receives the greatest signal energy from a direction broadside to the plane of the doublet.

C. E. C., Cincinnati, Ohio: Can I use any harmful effects to my set? I have tried it with good reception results but in connecting the wire to the ground clamp there is considerable sparking until the lead is tightened.

Answer: Connect a small condenser between the antenna terminal of the set and the lead to the radiator; or leave the radiator connection off entirely.

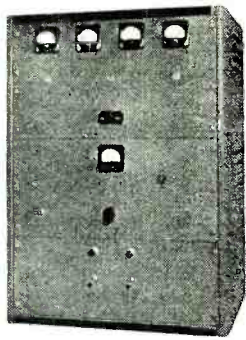
Police Type Xmtr

(Continued from page 17)

The remote system is interesting. It is the usual "push to talk" one, with the receiver "off" whenever the transmitter is "on." Duplex can be arranged if the receiver can be run on another frequency.

Two switches are used to put the transmitter in a condition to go on the air. The first lights a green light and closes the filament relay which in turn puts the filaments on. The second puts the final on by putting the juice on the generator, if the push-button is depressed. This button is located in the handset which is habitually used with this type of rig. Once ready, it is only necessary to depress the button to change over the antenna from receiver to transmitter, close the power relay and you are on the air. That's the way the commercials do it. And we hams can certainly take a few lessons!

About the ruggedness, so important in portable rigs. I talked with the local police and I was told that it is not the rough roads that kill a rig. Everyone drives



TEMCO Station Xmtr

slowly over bumpy roads. It is the smooth highways that finally does the "ole" xmtr in! Continuous vibrations of tires, small in magnitude but continuous in operation, break out everything but the finest connections. This not only indicates that heavy soldering

must be used, but short stubby leads which are not as subject to vibration moments, are the order of the day. Wherever there are long leads, lacing must be used, something which I neglected to install—and for which I suffered a breakdown at the very time when I wanted to have that QSO the worst.

All bolts and nuts should be safetied with lock washers. Transformers must be designed for overloads, and for vibration as well. Putting them into solid shields and pouring the shield cans full of tar, wax, or other insulating material helps a lot. All connections should be color-coded for quick repair, and every ham can take that advice whether he builds this portable or some kilowatt rig. Lots and lots of time can be saved if the connections are color-coded and the combination pasted into the rig cover together with a hook-up. You can forget that circuit diagram after a few days of not looking at it, and it's very difficult to retrace your steps.

When the chassis is as small as it is in this rig, a ground bar need not be used, and each circuit grounded to the chassis with a soldering lug lock-washed and bolted to it.

Electrolytic condensers deteriorate rapidly with moisture and heat. They should be mounted away from heat producing ele-

ments such as tubes or resistors. Also they should not be mounted above the chassis because they are then in the open where they may be unprotected from moisture.

After this description, I can't think what else the ambitious ham would need to build the rig. I have not given dimensions since every ham will want to incorporate some of his own ideas on the subject. Follow the hints here and make it commercial. Funny thing about those commercial laddies, they seem always to be able to deliver the goods when they need it. Not that they don't have breakdowns, because they do, but usually they are Johnny-on-the-spot when

they are wanted, which is quite often.

In building, remember that simplicity is the mother of efficient operation. It is not the complicated rig that necessarily works the best, but that transmitter which is carefully thought out and designed. The commercial boys have always been those to do that. So should we.

-30-

**WHO ARE THE VIGILANTES?
ASK ANY HAM!**

**Here is YOUR
RADIO
Education!**

Every phase of Radio, Electricity, Television, Sound and Cathode-Ray Tubes made crystal-clear by A. A. Ghirardi in his fascinating, readable style. Never before has profitable radio study been such a delightful pastime.

**Complete Radio Physics Course
in one handy volume**

Your Big Chance **\$4.00**
At This Low Price!
Now **Only** No Further Payments

YOU need no longer be held back from a radio career because you could not spend the time or money to take a course in radio and electricity. You need not stay back in a hum-drum boring job because you lack the background for the good position just ahead! Here, in a single volume, is all you missed—and more. Here are the essentials demanded of every radio technician by modern broadcast stations, radio service organizations, manufacturers, sound-film studios, etc. Never before has profitable radio study been such a delightful pastime!

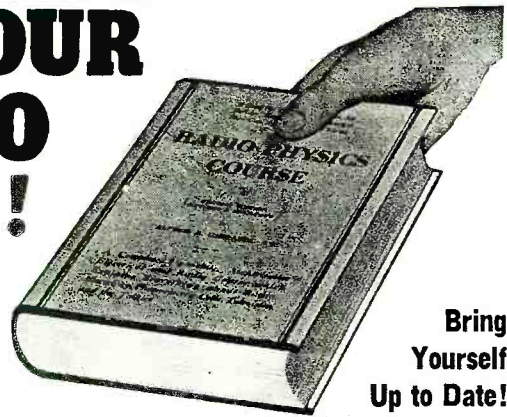
Ghirardi's **Radio Physics Course** is as easy to read as your daily newspaper. A few minutes a day spent with this amazing volume will quickly transform you into a well-trained radio man. Prepare yourself for advancement, more money, a congenial occupation, a satisfying profession and the respect of your friends by this simple means which is sheer pleasure, more fun than ballgames or movies.

**Many So-Called "Experts" Do Not Know
Half That Is In This Fascinating Volume**

Radio Physics Course is a miracle of condensation. Thirty-six volumes packed into 972 pages, complete with review questions for self-study. 508 helpful illustrations, with schematic diagrams, charts, photos, etc. Never before have the basic facts about Sound, Speech and Music been so clearly and usefully presented. Never before have the fundamental principles of Electricity been so easy to master and so practical to use. No knowledge of mathematics is required, nor does it matter whether or not you have had any previous electrical training. This great book was written especially to teach you radio in your own home.

The whole science of Radio unfolds before you, from elementary theory right up through the latest developments and applications, in word pictures and graphic diagrams so vivid you cannot ever forget them. The story of Television becomes a living drama, with its technical problems so clearly set forth you will understand them better than do many of the "old-timers." The intricacies of Cathode-Ray Tubes and Photoelectric Cells are explained away so simply you will wonder how they could ever puzzle you. The facts about Public Address Systems, Sound Motion Pictures, Phonograph Pickups become tools in your hands, tools with which to work in building your future in the coming specialized profession of Sound Engineering.

Testing and Servicing; Automobile, Aircraft and Marine Radio; Short-Wave Reception; and invaluable Appendixes complete this huge, comprehensive Radio Course, making it the greatest bargain in radio



**Bring
Yourself
Up to Date!**

**Fill in the gaps in your RADIO EDUCA-
TION—Get Yourself a Solid Foundation!**

36 Volumes In 1

- | | |
|---|---|
| 1. Radio Broadcasting System, 2. Sound, Speech and Music as related to Broadcasting, 3. Electron Theory, Electric Current, 4. Electrical Units, Ohm's Law, Resistance, 5. Electrical Circuits, Batteries, 6. Magnetism, 7. Electro-mechanics, 8. Electro-magnetic Induction, 9. Inductance and Inductors, 10. Capacitance and Condensers, 11. Alternating Current Circuits, 12. Electric Filters, 13. Electrical Measuring Instruments, 14. Electromagnetic Radiation, 15. Radio Transmission, the Broadcasting System, 16. The Receiving Station, Detection with Crystals, 17. Elementary Study of the Vacuum Tube, 18. Vacuum Tube Characteristics, 19. Construction Features of Vacuum Tubes, 20. Vacuum Tube Detector and | Amplifier Action, 21. Radio Frequency Amplification, 22. Superheterodyne Receivers, 23. Design of R.F. Amplifiers and Tuning Coils, 24. Audio Amplification, 25. Loud Speakers, 26. The Battery Operated Receiver, 27. The Power Supply Unit, 28. Electric Receivers, 29. Automobile and Aircraft Receivers, 30. Phonograph Pickups and Sound Amplifier Systems, 31. Short-Wave Reception, 32. Vacuum Tube Applications and Photoelectric Cells, 33. Television, 34. The Antenna and the Ten, 35. Testing and Servicing, 36. Sound Motion Pictures. |
|---|---|
- 972 pages chock-full of "meaty" information. 508 graphic illustration 856 Review Questions make self-study easy!**

education of all time! That's why it's used and praised by more radio schools and students than any other radio book in the world. It's complete! It's concise! It's easy! It's authoritative!

10-DAY TRIAL

We want you to see this book. We want you to judge for yourself, in your own home and at your leisure, just how much it can mean to you. Fill out the coupon below and mail it at once. Ghirardi's **Radio Physics Course** will be sent you by return mail. Examine the fine binding, the large, clear type; take your first Radio lessons and check yourself on the knowledge you gain. Keep and read the book ten days—then decide if you wish to own it at the amazing price of only \$4, postage prepaid.

Money-Back Guarantee — ACT NOW!

If after reading and examining **Radio Physics Course**, you are not thoroughly satisfied in every way, return the book in good condition within the 10-day trial period, and every penny of your money will be immediately refunded. You see you cannot lose! So send the coupon without delay. This is the greatest opportunity ever offered you for a complete radio education at this astounding price. You couldn't do better anywhere. Don't pass up your one big chance to get inside "the profession with a future." It all depends on what you do about that little coupon below. **FILL IT OUT! MAIL IT. AT ONCE!**

MAIL THIS COUPON TODAY

Radio & Technical Publishing Co., **Books Sent Postpaid**
45 Astor Place, Dept. RN-118,
New York, N. Y. **Anywhere!**

() Enclosed find \$4 for my copy of **Radio Physics Course**, by Alfred A. Ghirardi. (\$4.50 foreign) If not fully satisfied, I have the right to return the book, undamaged, within 10 days and get my money refunded at once.

NAME.....
STREET.....
CITY..... STATE.....

() Please send me free descriptive literature about **Radio Physics Course**.



In the future, as it is today, radio by McMurdo Silver will be the standard that signifies the ultimate advancement of radio engineering. The new 1939 MASTERPIECE, pictured above, is indicative of radio that twice has been acclaimed a champion . . . as the winner of the International DX contest with 230 verified receptions every one of stations over 5,000 miles distant . . . and, just recently, as recipient of the Grand Prix of the Paris International Exposition. With such a heritage of achievement, McMurdo Silver continues, and will continue, to custom-build radios for those who demand the best.

FOR CONVENIENCE, USE COUPON BELOW

McMurdo Silver Corporation
2900A. South Michigan Ave.
Chicago, Illinois

Send me full details on the new 1939
MASTERPIECE VI and "15-17".

Name.....

Address.....

City..... State.....

DON'T LET SERVICE WORK
GET YOUR GOAT!

Equip yourself to
MASTER THE JOB

EVERY service man who is on his toes and who expects to make anything out of service work, needs the backing of Simpson testing equipment. Here are instruments that take all guesswork out of the most complex service jobs. You ought to have the latest information on the many new Simpson developments that are making such a tremendous hit among service men everywhere. We shall be glad to send you the latest Simpson bulletins. Why not write for them?

Simpson Electric Co., 5206 Kinzie St., Chicago

—And now the New 333

Tube Tester—a smaller tube tester built to highest standards of Simpson quality, with a lot of new features, at the remarkably low price of \$26.50. Write for new circular on this amazing little tube tester.

—and the new super all-service, tube and set tester

—the Model 440 "Test-

master" There is truly nothing that you can ask for or find in any instrument that is not covered in the Model 440. No other tester selling at any price provides as many tests and ranges! At \$59.00 service men say it's the best buy on the market.

—the smallest "Pocket Type" A. C. and D. C. service Volt-Ohm Milliammeter on the market—the Model 230

At \$14.25 this is an instrument that every service man will want in his kit.



ASK YOUR
JOBBER

SIMPSON

Instruments that STAY accurate

Short Wave Flashes

(Continued from page 43)

ing-off with *God Save the King*.

U. S. A.—W4XB (6.04), Miami, 5 kw, operates daily from 1:00 to 3:00 p.m. and from 9:00 p.m. to midnight.

VENEZUELA—YV5RC (5.97), "Radio Caracas," Caracas, operates Sundays from 7:00 a.m. to 10:00 p.m. and weekdays from 7:00 to 8:00 a.m., 11:00 a.m. to 1:45 p.m. and from 4:00 to 10:00 p.m.

Amateur

DUTCH NEW GUINEA—PK6XX (14.02), base-camp station of the Archbold Expedition of the American Museum of Natural History at Hollandia, is being heard almost daily near 7:30 a.m.

NORTHERN RHODESIA—Hal Clein of Los Angeles, California, reports that VQ2HC (14.31), is being heard on the Pacific Coast, between 9:20 and 9:45 a.m. He gives his call as "Vermont, Quebec, Number Two, Honolulu, Canada."

PAPUA—VK4HN (14.32), Port Moresby, can be heard almost any week end near 7:00 a.m., calling amateurs in the United States.

PITCAIRN ISLAND—After an absence from the air for some time due to failure of power supply VR6AY (14.368) is again being heard, usually in contact with W2IXY.

TANGIERS INTERNATIONAL ZONE—CN1AF (14.285), is being heard in the United States with very loud signals near 7:00 to 8:00 p.m. Announcements are in English with very decided accent.

Last Minute Notes

Dr. Roberto Levi, owner of short-wave station HC2RL of Guayaquil, Ecuador, has notified L. E. Gardner of Cleveland, Ohio, that all correct reception reports sent in to his station will be verified. It is not necessary to enclose return postage . . . Guy Bigbee of Fort Benning, Georgia, writes that he is hearing Ankara, Turkey, daily from 6:30 to 7:00 a.m. on a frequency of 9.465. Oriental and classical selections are featured on the programs but no identification signal is utilized . . . In reply to my reception report of last January 12, 1938, your columnist has just received a very welcome QSL card from K7PQ of Ketchikan, Alaska. The card, which has the call letters in large green type, bears the legend, "Greetings from Ketchikan, The first city of Alaska, and Uncle Sam's Last Frontier." . . . Jack Buitekant of the Bronx, New York city, writes that reception reports to short wave station EA8AF (7.3), Tenerife, Canary Islands, are being verified with the same QSL card as that used by EAJ43 (10.37), of the same city.

SHORT WAVES for DXers Living on the WEST COAST

by JOHN D. CLARK

(All Times Are PACIFIC STANDARD)

THE first part of our section this month is devoted to a class of short wave listener too long neglected by the majority of radio publications. Short wave columns have catered to the DXer and to the radio amateur, overlooking almost entirely a group which forms a large majority of the listening public—namely those who enjoy good, understandable reception from the more reliable overseas broadcasters, but who have no desire whatsoever to DX in the true sense of the word.

Many listeners of this type have written in from time to time, and two questions stand out in almost every letter—"When is the best time to hear Asiatic stations," and "When is the best hour for European reception."

Asia

With one or two exceptions, reception from trans-Pacific stations is limited to the hours between midnight and 8:00 a.m., best result being obtained from 4:00 to 7:00 a.m. **AUSTRALIA** is represented by the powerful VK3ME (9.51 meg.) until 4:00 a.m., and by the still stronger VLR (9.58 meg.) until 5:30 a.m. **JAPAN'S** programs are relayed through JVN (10.66 meg.) from 1:00 to 4:40 a.m., with a special overseas transmission via JZJ (11.8 meg.) from 5:00 to 6:30 a.m. Even the **ISLAND OF TAIWAN** (Formosa) is on the air through JFO (9.62 meg.) and JIB (10.53 meg.) from 5:00 to 7:05 a.m.

THE DUTCH EAST INDIES, particularly the Island of Java, are well represented on the lower wavebands during the early morning hours. No less than fourteen different Javanese stations have been logged at one time by several Pacific Coast dialers, the strongest transmitters being YDB (9.55

meg.), PLP (11.00 meg.), PMN (10.26 meg.) and PMH (6.72 meg.). All are supposed to operate from 2:30 to 7:00 a.m. daily, to 8:00 a.m. Friday, and to 8:30 a.m. Saturday. As we go to press, however, several reports indicate that the network is not playing its sign-off selections, *The End of a Perfect Day*, and the National Anthem until 7:30 a.m. on Monday, Tuesday, Wednesday, and Thursday.

HONGKONG'S British-owned ZBW may be picked up without difficulty until 7:00 a.m. daily, and until 8:00 a.m. Saturday on 9.53 meg. Siam's HS8PJ works on 9.51 meg. Thursday only from 5:00 to 7:00 a.m., and on Monday at the same hour (with a much weaker signal) in the 19 meter band. And for programs in Russian, try the old reliable RV15 which for seven years has been broadcasting daily on 4.27 meg. between midnight and 6:30 a.m.

Transmissions from **SINGAPORE**, in the Malay Peninsula, are now received daily from 3:40 to 6:40 a.m. on 9.69 meg. **DELHI'S** powerful VUD brings native music from India with excellent volume near 5:00 or 6:00 a.m. on 9.59 meg. Slightly lower in frequency, on 9.57 meg., the programs of **MANILA'S** KZRM are relayed to America from 1:00 to 6:00 or 6:30 a.m.

Europe

Seasonal conditions have subjected Pacific Coast European reception to many changes during the past few months.

With the exception of **LONDON'S** GSG (17.79 meg.) which has been coming through lately at almost all hours of the day and night, the only truly satisfactory reception from across the Atlantic has been between the hours of 3:00 and 11:00 p.m. **LONDON'S** GSP is excellent during transmission 5 (3:20 to 5:30 p.m.), and GSD (11.75 meg.) is usually good during the last hour of the same broadcast. GSI (15.26 meg.), GSD (11.75 meg.) and GSC (9.58 meg.) are all fine throughout transmission 6 (6:20 to 8:20 p.m.), and GSD is usually OK during the first hour of transmission 1 (10 to 11 p.m.).

FRANCE is best (but still not too good) through TPA4 (11.71 meg.) and TPB7 (11.89 meg.) from 5:30 to 8:00 p.m., and through TPA3 (11.83 meg.) during the first part of the next transmission which commences at 10:00 p.m.

The new **FINNISH** broadcaster on 15.19 meg. has shown surprising strength near 10:00 p.m., and last-minute reports indicate it is the only European to maintain good volume near 7:00 a.m.

For listeners interested in **DUTCH** broadcasts, the only good bet is PCJ (15.22 meg.) Monday only, commencing at 10:00 p.m.

SPAIN, ITALY, CZECHOSLOVAKIA, RUS-SIA, and **POLAND** are all audible during their regular scheduled afternoon and evening transmissions, but signal strength is rarely sufficient to provide any truly enjoyable reception.

Late Western Tuning Tips

BANKOK, SIAM. HS8PJ (9.51 meg.) now concludes its Thursday morning transmissions at 7:00 a.m. with the following announcement: "This is HS8PJ, relaying the national station HS7PJ, on a frequency 9510 kc. We will be back on the air Monday through station HS6PJ, on a frequency of 15,770 kc. Good luck and a very good night from Siam." This would indicate that a new wavelength is now in use for the Monday broadcasts.

BANDOENG, JAVA. PLV (9.43 meg.) has resumed broadcasts of native and European music near 5:30 a.m. Phone contacts with this country are still carried out near 6:45 a.m.

DELHI, INDIA. A surprising increase in signal strength from station VUD indicates that perhaps the new transmitter has finally been put into use. Programs of native music may be heard with excellent volume near 5:00 a.m., and the station is still audible on its 9.59 meg. frequency as late as 7:30 a.m.

CHINESE PHONES. Station XTB, Shanghai, China (11.41 meg.), works with an unidentified phone transmitter in Hankow on 11.69 meg. near 6:45 a.m. quite regularly. Occasionally XTS, Swatow (11.47 meg.), XTU, Canton (12.07 meg.); XTV, Canton, (9.50 meg.); XTR, Swatow, (9.36 meg.); XTC, Shanghai (9.28 meg.); XTK, Hankow (9.08 meg.); XTW, Canton (5.91 meg.); XTD, Shanghai (5.74 meg.); XTL, Hankow, (5.48 meg.); and XGW, Shanghai (10.42 meg.) may

6-Tube Superhet

(Continued from page 33)

fixed pads on the other bands. The fixed padding condensers are within tolerance of plus or minus 5%.

Electrical band spreading is provided and is by far more efficient and satisfactory than any method of mechanical band spreading. The ideal amount of band spread is hard to obtain inasmuch as many have their own ideas on the correct amount of spread. If an additional amount of spread is wanted it is necessary merely to remove one plate from each section of the rotor section only of the band spread gang. The spread finally came out very nice.

- 28—30 mc.—160°
- 14.005—14.395 mc.—81°
- 7—7.3 mc.—130° plus 126°
- 3.5—4 mc.—540° plus 126°
- 1.716—2 mc.—360° plus 162°

The oscillator plate supply is of the shunt fed type and is coupled to the coil system through the .002 mfd. condenser. It will be noted that the plate supply of the oscillator is well filtered and stabilized by an r.f. choke and two 10,000 ohm resistors which are centertapped and by-passed to ground with a 4 mfd. electrolytic condenser. As shown in the under chassis view the ten meter coils are wound on ceramic insulation for the utmost in efficiency. The oscillator grid circuit is conventional and uses a 40,000 ohm grid leak and a 50 mmfd. grid condenser. The 6K8G provides a considerably better translation than could be obtained in the 6A8G and hence was used. The main difference lies in that the 6K8 provides a separate triode for the oscillator and is electrically coupled into the pentode side while the 6A7 employs electron coupling between the oscillator and mixer sections.

The BFO is very unique in its smooth operation. A 6C5 triode is biased in the conventional grid leak condenser fashion. The grid condenser is variable and is set when the receiver is aligned so as to provide the correct amount of blocking affect and assuring a steady oscillation condition at all times. The variable trimmer across the grid coil is aligned to the i.f. frequency which is 465 k.c. Coupling between the BFO output and the i.f. is accomplished by a link of wire between the plate of the 6C5 and the diode circuit of the 6Q7G. The plate supply for the BFO oscillator is taken from the high voltage through a 10,000 ohm resistor and by-passed with a .02 mfd. condenser. The pitch control consists of a brass rod $\frac{3}{8}$ " in diameter by $\frac{1}{2}$ " long on a shaft with a $\frac{1}{16}$ " thread operating through a collar mounted on the front panel. The BFO coil is mounted vertical to the front panel. When the brass rod is run through the air core of the BFO coil its inductance is increased or decreased and the beat note in the diode output is thus increased or decreased depending upon the position of the brass rod in relation to the coil. This provides a very effective means of pitch control. Its biggest advantages besides being a space saver, is the smoothness of operation when listening to a very weak c. w. signal. The input i.f. circuit is conventional. Despite the low frequency

i.f. used, a good image radio was obtained at all times. In the cathode circuit of the 6K7 is a switch providing "send-receive" operation by opening the grid return circuit. Screen supply for the 6K8G and 6K7 is through a 12,000 ohm resistor and well filtered by a 4 mfd. electrolytic condenser to prevent oscillator flutter. Coupling between the 6K7G and 6Q7G is through another high "Q" iron core transformer. Rectification in the diode circuit of the 6Q7G is of the half wave type for maximum audio voltage. AVC is taken from this point and applied to the 6K8G grid return through a 1 megohm isolating resistor. The .05 mfd. condenser from the 6K8G grid return to ground serves as an r.f. by pass. On through to the output of the 41 everything is conventional.

An output of 2½ watts is available with a hum level of less than $\frac{1}{10}$ milliwatt. Terminals V₁ and V₂ in the output transformer secondary which are tied together ordinarily may be opened and the voice coil of any other speaker connected here providing the voice coil impedance is somewhere between 5 and 15 ohms. The plate supply of 250 volts if rectified by the 5W4. The speaker field of 1300 ohms (measured cold) serves as a choke. Two 10 mfd. electrolytics in the input and output of the choke provide adequate filtering. Total power consumption at 117 volts is 37 watts.

For the ham or dx fan, the little receiver, which can be built inexpensively, provides an excellent stand-by or regular station equipment piece.

-30-

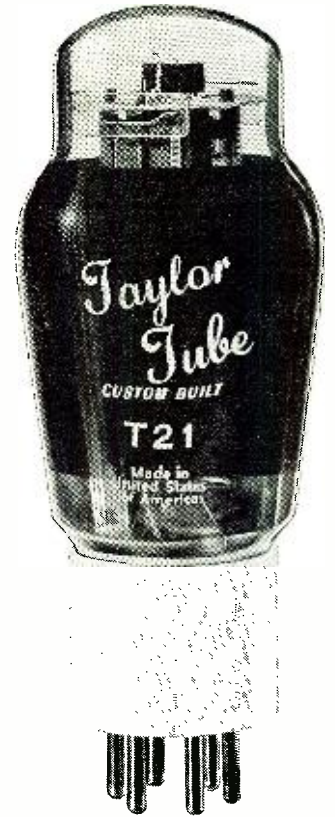
YOU ASKED FOR IT
HERE IT IS - NEW

TAYLOR
BEAM POWER TUBE
T-21

During the past two years, hundreds of amateurs have asked for a Taylor Beam tube for their Oscillator and other low-powered stages—many expressed this desire so they could be "100% Taylor Tube equipped." Taylor now presents a Beam Tube that lives up fully to the Taylor Tubes' slogan "More Watts per Dollar." Tests prove a better than average output in all R F services. The usual broad Taylor guarantee protects you—insist on Taylor T-21 for best performance. Write for complete technical bulletin.

BEAM-TETRODE, POWER
AMPLIFIER
6 PRONG ISOLANTITE BASE

| | |
|-------------------------------|-----------|
| Max. Plate Dissipation | 21 watts |
| Max. Screen Dissipation | 3.5 watts |
| Heater Voltage | 6.3 volts |
| Heater Current | 0.9 amp. |
| Grid to Plate Capacity | 1.4 mmf. |
| Output Capacity | 11.5 mmf. |
| Input Capacity | 11.5 mmf. |
| Max. Plate Voltage | 400 volts |
| Mutual Conductance | 6000 ohms |
| Amp. Factor | 135 |
| Max. Plate Current | .95 m.a. |
| Max. Screen Current | 8 m.a. |



T-21
 ACTUAL SIZE OVER 5 INCHES HIGH

OVER 10,000 T-40's & TZ-40's SOLD
IN EIGHT MONTHS
 Tried and proven by thousands of amateurs.
 Truly the *Wonder Tubes* in performance.
 The tops in value in all types of R F service.
ONLY \$3.50 EACH

\$1.95

RECOMMENDED BY LEADING PARTS DISTRIBUTORS

"More Watts Per Dollar"
TAYLOR TUBES, INC., 2341 WABANSIA AVE., CHICAGO, ILLINOIS

HOWARD

presents

DX ON 10 METERS

with

ELECTRIC BAND SPREAD



**Model 430
Six Tubes
4 Bands**

29.95
NET

The SCOOP of the National A.R.R.L. CONVENTION

• Here's the greatest value in the communication field for only \$29.95. A hand-built Howard with the custom-parts, fine engineering and spectacular performance features of communications receivers selling for twice the price or more. Check these outstanding features: 4 Bands—broadcast to 10 meters inclusive, Ceramic Coils, Iron Core I. F. Transformers, Electrical Band Spread, Excellent 10 Meter performance and eleven additional communications features.

How can we do it?

Participating in volume buying on Howard Household Receivers—making more of our own parts than competitors.

Send (on coupon) for complete technical information and name of the nearest jobber where set may be inspected.

* Pacific Coast and export prices slightly higher.

AMERICA'S OLDEST RADIO MANUFACTURER

FREE For Complete Technical Details Send This Coupon

Howard Radio Company
1735 Belmont Ave., Chicago, Ill.

Gentlemen: Send me Booklet No. 450.

My name is.....

Address

City..... State.....

What's New in Radio

(Continued from page 20)

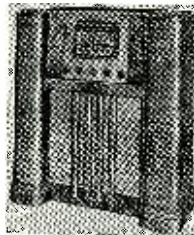
let gives a complete account of the Rider Chanalyst and gives a clear picture of the need, development, and application of the instrument.

International Resistance Co., Philadelphia, announce IRC Type MC high frequency power resistors. Excellent characteristics at ultra-high frequencies of 75 mc. and up are made possible by an adaptation of the IRC metallized coating applied to a ceramic tube. These new resistors are suited for transmitter dummy loads and rhombic antenna terminations.

A new line of service and testing equipment to be made available to General Electric radio tube dealers has been announced by the G-E tube sales section, Bridgeport, Conn. In the lines are an oscillograph, a tube checker, a multimeter, and a signal generator.

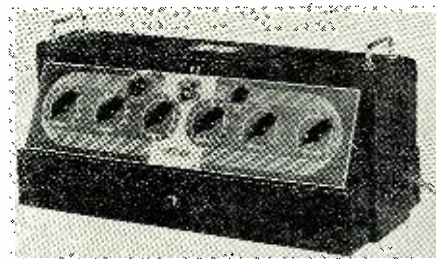
The new Pattern 10 Bridgemaster, introduced by John Meck Instruments, Chicago, is a new service instrument for condenser, resistor tests. A feature of the instrument is the application of a polarizing voltage of proper value for testing all electrolytic condensers at rated voltage.

The Crosley Radio Corp. has announced two new radio consoles, the 1128M and the 828M. The former is an 11-tube, 3-band superheterodyne receiver. It is provided with eight push buttons and also has a large radio log dial. The tuning range covers 535 kc. to 22,000 kc.



The 828M is a 3-band superheterodyne receiver with eight all-working tubes. It is also provided with eight push buttons. Police, amateur and foreign bands are plainly shown on the dial.

A new PA amplifier of the base or semi-portable type, Model 855-R, has been announced by Operadio Mfg. Co., St. Charles, Ill. It incorporates the latest proven designs built around the new beam power

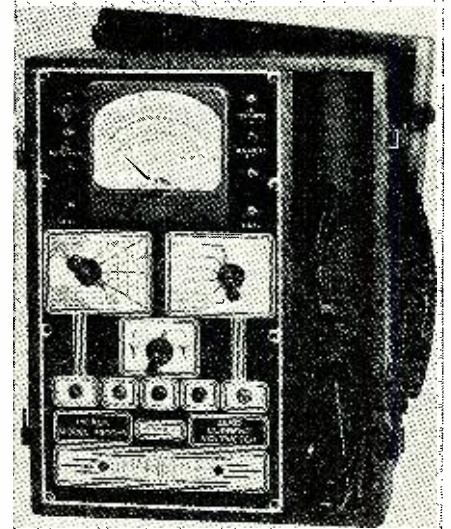


tubes, with volume expansion, volume compression, electronic visual overload indicator, electronic visual output level indicator, and provision for the remote controller.

Audak Company, 500 Fifth Ave., New York City, announces that new catalog sheets are available giving detailed specifications of the new Audak line of Micro-

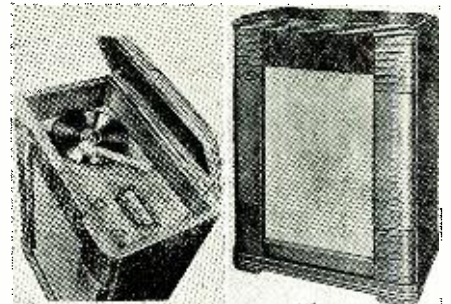
dine Pickups, relayed frequency type as well as the new compensated Microdyne type. Copies available upon request.

The Hickok Electrical Instrument Co., Cleveland, is now producing the Model 4900 S Zero Current Voltmeter. This instrument indicates d.c. volts at infinite ohms



per volt as well as a.c.-d.c. volts, ohms, a.c.-d.c. milliamperes, microfarads, decibels, and henries.

The Crosley Radio Corp. has entered the domestic radio-phonograph combination with two popular priced models. One, a console model with push-button tuning and



the other is a portable model, also with push-button tuning. Both models play up to 12-inch records at 78 rpm. The tuning range of 540 to 1725 kc. covers the broadcast band including police calls at the high end of the band.

Bell Sound Systems, Inc., previously located at 61 E. Goodale St., Columbus, Ohio, has moved to a new plant which will serve as factory and general offices located at 1183 Essex Ave., Columbus.

Westinghouse Electric and Mfg. Co. announces its 37 lines of panel instruments covering industrial and radio applications. The lines provide for the measurement of Direct Current, Rectox types, Thermocouple types and Alternating Current. All instruments are dust and moisture proof.

ULTRA-SHORT WAVE Antenna Coupling

by S. GORDON TAYLOR
New York City, N. Y.

In theory all ultra-short wave transmission lines of the non-resonant type, either spaced-pair or twisted-pair, are free from standing waves. Practical experience, however, shows that a great many such systems are definitely not non-resonant at all. There are numerous ways for checking for standing waves, such as moving a field-strength meter along the feeders, moving a neon bulb along them, or bridging a thermo galvanometer across a short length of each feeder wire at several points $\frac{1}{4}$ wave apart.

All of these methods apply to transmitting antennas only, or to receiving antennas excited for the purpose by a husky oscillator tuned to the frequency at which the antenna is supposed to resonate.

A simpler method of checking, and one that can be used with receiving antennas without excitation, other than that of signals picked up from the air, is suggested by a recent experience. A 5-meter crystal-controlled transmitter was connected to supposedly non-resonant feeders having an impedance of approximately 460 ohms. With the tank circuit employed in this particular transmitter a two-turn antenna pick-up coil should have provided ample coupling but actually even a four-turn coil would not load up the rig properly.

Later it was necessary to move the transmitter while rearranging the furnishings of the "shack." It was placed about four feet further from the window, thus increasing the feeder length by this amount. To my surprise the transmitter loaded up beautifully with a two-turn coil only partly meshed with the turns of the tank coil! The answer was easy. There were standing waves on the feeders and at first they terminated at a voltage loop and therefore a point of very high impedance. When the feeders were lengthened four feet ($\frac{1}{4}$ wavelength at five meters) their termination was at a current loop and therefore low impedance. The feeders or transmission line still had standing waves on it, of course, but this time was properly terminated and functioning as "Zepp" tuned feeders. They were undoubtedly less efficient than a properly matched non-resonant line, especially during wet weather when severe losses were sustained through leakage across spreaders, which happened to be located at or near voltage loops on the feeders. At least the feeders were not radiating (due to their close spacing and the fact that the two sides were balanced) and the transmitter did load up properly with a reasonable amount of coupling.

This same sort of check can be made on a receiving antenna by adjusting the antenna coupling coil to provide maximum pick-up of signals, then increasing or decreasing the feeder length a quarter wave (a foot at a time) and again adjusting the coupling. If the same degree of coupling is required in all cases it is a good indica-

tion that the feeders constitute a non-resonant line. If the coupling required is different, then the feeders are mismatched and the constructor has the alternative of making them work properly as a non-resonant line or of adjusting their length so that proper transfer of energy into the receiver is obtained with rather loose coupling.

If the receiver happens to be one in which the antenna coupling cannot be adjusted, the best match can be obtained by varying the length of such "tuned" feeders by a total of four feet, a few inches at a time, until the length for best signal strength is obtained.

-50-

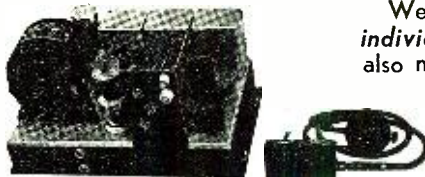
✓ See your Jobber
about the new Brush Mikes
\$23.50 list
Super level—minus 46 db

Watch for further announcements



THE BRUSH DEVELOPMENT CO.
3311 Perkins Ave. Cleveland, Ohio

TEMCO HELPS INDIANA CRUSH CRIME!

Model 10-A, 10 watts output,
ultra high frequency mobile
transmitter

We invite your inquiries concerning your individual communication problems. TEMCO also manufactures a complete line of Radio Communication Equipment for marine, amateur, broadcast and point-to-point services. All of which are completely described in a 16 page illustrated catalog which is available upon request.

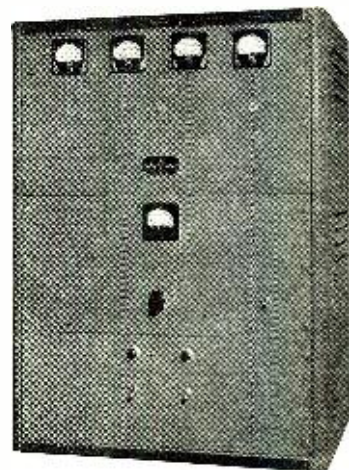
We invite your inquiries concerning your individual communication problems.

Police Radio Station WDPS, Shelbyville, Indiana, is typical of the many progressive police departments which have installed complete TEMCO Police Radio Systems.

The 100 watt headquarters transmitters and the associated crystal controlled receivers shown in the illustration above can be used in conjunction with the Model 10-A mobile transmitter to afford a complete 2-way communication system between headquarters and patrol cars.

TEMCO Police Radio Systems are fully protected against patent infringement under A T & T Patent license agreement.

Model 100-C,
100 watts output, single frequency police headquarters transmitters



TRANSMITTER EQUIPMENT MFG. COMPANY, I C.

130 Cedar Street,

Dept. RN11,

New York, N. Y.

Cable Address: TEMCOMAN, NEW YORK

\$50, \$75, \$100 A WEEK IN TELEVISION?

Yes, It's NOW Being Done!

Big money is being earned in Television right NOW . . . TODAY! We can PROVE this! Get your share. Television offers you a fascinating, new, uncrowded field, with unlimited money-making opportunities. Don't be one of those who will say, "I wish I had." ACT NOW!

TELEVISION IS ON THE AIR!

Already there are 18 Telecasting Stations in America. Programs are being broadcast. Television Receivers are on sale. Tremendous progress has been made. The above facts are definite indications that TELEVISION HAS ARRIVED. Now is the time to get in on the ground floor. Train for your future in Television in which you may earn \$1500 to \$7500 a year. A.T.I. is now training more men for Television than any other organization of its kind. A complete Television Receiver and Transmitter included with training at NO EXTRA COST!

Send Coupon For Free Details!

We want to put the "evidence" right in your hands. It costs you nothing to investigate. This may be the turning point in your life. "Get out of that rut." Step up into Television!

AMERICAN TELEVISION INSTITUTE

433 E. Erie St., Chicago, Illinois, RN 1138

Gentlemen: Please send me your Television book, literature, and complete details. It is understood that all this is free. No obligation. Nothing to pay.

Name Age

Street

City State

Within Earshot of the Editor

(Continued from page 4)

its share in bringing burning details to the American public at all hours, and also radio has been used by the foreign dictators to further their ends, notably in Austria, where Hitler blanketed the country with his dogmas before marching in. It is being used in Czechoslovakia at this writing, but the results may only be known by the time that this issue hits the street.

In the realm of Police radio, the FCC assigned new and greater frequencies, and the Press was similarly rewarded, while the Amateur was filched of 100 kc. of his 40 meter band in Europe.

Technical development was furthered by the design of new modulators, and some unusual equipment came on the market. A new type of receiver was brought out and many new types of portable transmitters were announced.

The ARRL was shaken up by a clean-up-your-own-house campaign; and the many hams spent the vacations in traveling around the country meeting other hams with whom they had been in contact throughout the previous winter. The summer saw this magazine come into new hands, and the absorption of All Wave Radio Magazine with it.

The Institute of Radio Engineers proclaimed, and made official, new symbols for those widely varied circuit diagrams, and a contemporary magazine of ours changed its name and went "ham."

The summer saw the FCC hard at work changing the broadcaster frequencies although the new ones have not yet been put into effect; saw the beginning of the use

of the 96 mc. band for airplane operations; and the further development in radio-controlled model airplanes.

All in all it has been a swell summer, the tempo has definitely increased, and the sole question is, whether it will continue at the same encouraging high pitch.

* * *

Ham Radio than 1000 hours on the air by any average ham.

We ought to get busy and make amateur radio so common-place that it would be accepted as a necessity by John Q. Public. That way we would be sure of the retention of our bands. We might even get a few more!

* * *

RAY HUTCHENS of the Chicago Office of R.C.A. Communications was in the other day and put us a poser. We pass it on to you, and to the first person who mails us the solution we offer a free one year's subscription to R.N. Here it is. "Why is it that while a dash is three times as long as a dot, it only takes twice as long to send a dash as it does to send a dot?" We puzzled over that one for a long time, and finally had Maestro Hutch give us the right answer. We think that it makes a good one for the CW boys to mull over. What say, gang? Let's see who's the winnah.

* * *

IN response to hundreds of letters requesting it, we have good "ole" GY with us again. His column "QRD? de GY" starts again in this issue, and will continue as long as there is a demand for it. We suggest that all commercial ops co-operate with GY to make his column the best info spot on record. Send in all your dope to him care of the mag. and we'll see that he gets it, regardless of where he may be—and he gets around quite a bit. So here's "hello" to GY, may he be with us a long time!

* * *

WITH the advent of autumn, we are once again opening our office to the public on Friday evenings from 8:00 p.m. on until the last person leaves. The meetings were very fb during the spring and many local and visiting hams and dx'ers availed themselves of the opportunity to come in and meet others who had the same interests. The bicker sessions were enlightening and many, many things were brought up for discussion and much accomplished with the chin music. Come in some evening and get acquainted. We use that means of keeping in touch with our readers and getting their impressions from them first hand. We hope we'll BCNU!

* * *

SINCE we have changed the cover to black-and-white cover pictures, the thought occurred to us that there must be a great number of amateur photographers who have taken interesting shots which would be suitable for a cover. If it's radio, and interesting, send it along. We offer a prize, monthly, of a year's subscription to R.N. for every cover pix accepted. Be sure and send along the negative with the print so that we can enlarge it if we have to. Generally speaking, we work from 11" x14" prints, but if the negative is clear and contrasty, we can make the enlargement ourselves and save you that money. Mail your pix carefully, and include return postage if you want them back.

* * *

OUR "Ham Chatter" column has suffered badly from the lack of material. Don't you fellows want to have such a column? Well, then why not send us in the items. Write us and tell us what DX you have been working, what new equipment you have bought, or built, and who has been a visitor at your shack. Send us dope on

BE SURE YOU SEE THIS BIG NEW CATALOG!

Ask your Jobber to show it to you
Get the equipment you need to do
more business . . . better business this
year FREE with your purchases of
NATIONAL UNION
RADIO TUBES & CONDENSERS



For nearest Distributor's name write:
NATIONAL UNION RADIO CORP.
Newark, New Jersey

TRAIN FOR ELECTRICITY
 "Learn by Doing" IN 12 WEEKS
I'LL FINANCE YOUR TRAINING!
 My Big Free Book tells you how we train you in 12 weeks—to start in the growing field of Electricity, by actual shopwork on real electrical machinery—not by books or correspondence. Amazing plan enables many to get training first... then take 18 Months to pay in small monthly payments starting 5 Months from date you start school. Experience or advanced education not needed. Many Earn While Learning. Free lifetime employment service. Diesel Engines, Electric Refrigeration and Air Conditioning instruction included. MAIL COUPON for FREE BOOK and all Facts.

H. C. LEWIS, President, COYNE ELECTRICAL SCHOOL
 500 S. Paulina St., Dept. 88-91, Chicago, Ill.
 Send Big Free Book with facts on Coyne training and tell me about your "Pay-Tuition-After-Graduation" Plan.

NAME _____
 ADDRESS _____
 CITY _____ STATE _____

YOUR FUTURE IN RADIO TELEVISION
 • These growing industries need trained men for sales, service, operation. Your chance for employment and advancement depends on thorough training. National Schools offer you time-tested training. Complete, modern facilities and equipment in the largest trade school in the West.

NATIONAL SCHOOLS
 4000 S. Figueroa Street, Los Angeles

Send for free booklet that shows how you can prepare for these opportunities.

FREE BOOK

NATIONAL SCHOOLS, Dept. RN-11, Los Angeles
 Please send free Radio and Television Booklet.

NAME _____ AGE _____
 ADDRESS _____
 CITY _____ STATE _____

RADIO ENGINEERING TRI-STATE COLLEGE
 DEGREE IN 2 YEARS.

Complete Radio Engineering Course in 98 weeks. Bachelor of Science Degree. Radio (television, talking pictures and the vast electronic field) offers unusual opportunities for trained radio engineers. Courses also in Civil, Electrical, Mechanical, Chemical, Aeronautical Engineering; Business Administration and Accounting. Low tuition, low living costs. World famous for technical two-year courses. Those who lack high school may make up work. Students from all parts of the world. Enter September, January, March, June. Write for catalog. 1611-8 College Ave., Angola, Ind.

HOW TO GET A RAISE IN PAY
 Read this Book to Earn More Money

Most helpful book ever written. Self-analysis chart at end of each chapter. 38 chapters, any one worth the price. James Clayton Wilson, author. \$1.00 postpaid. 10c postage extra C.O.D. orders. Canada \$1.20 duty paid. 5 days proof this book will help you or money refunded.

DOLLAR PUBLICATIONS
 737 North Michigan Ave., Chicago

I want to get ahead. Send me your new book. \$1 attached.

NAME _____
 ADDRESS _____
 CITY and State _____

REBUILT BY WOODSTOCK BUILDER

Winner... Most World's School Contests — EASY TERMS—FREE TRIAL WRITE FOR LITERATURE DEPT. B-5

WOODSTOCK TYPEWRITER CO., WOODSTOCK, ILL.

your ham club meetings and what transpired there. Let's make that column as full as possible. The hams today need greater cohesion, and a "Ham gossip" column is one of the best ways to keep the boys together. How many of you are going hunting this fall with your portable transmitters as well as your guns and fishing tackle? How about letting us hear from you about your experiences?

 WITH mixed feelings we note that W9TSN has announced his candidacy as Representative to U. S. Congress from his district in Chicago. We hope that "Dos" makes the grade in the election as well as he did in the primaries. Then we can be sure of having a ham in Congress, and "Dos" might even be able to get us a few more kilocycles,—if he knows where there are any lying around sort of lost-like. Hi! Good luck to you, W9TSN, and if you do get to Washington, see that every Congressman knows who the Ham is, and what he needs to keep his hobby. We're counting on you for that!

 WE would like to report that the Receiver Contest went over with a terrific bang, and the judges are hard at work picking the lucky winner. We expect to announce his name very soon and publish the winning article. We had not known that there were as many hams, dx'ers, and experimenters who were such good writers. Nor did we expect the vast range that they wrote on. We have received entries on every subject from transmitters to some very new and unusual whoop-de-doodles which will tax our men to the utmost in judging the contest. Congratulations to all who participated. It was fb. In the December issue we hope to announce a new and entirely different contest. The prizes have not yet been decided, but they will be at least as good as those offered before. Watch for this contest—something in which everyone can compete!

 THE best country in which to operate is Iraq where there are two hams. One is King Ghazi and the other a British Army officer. What no B.C.L. trouble?

 AN interesting sidelight on our neighbor Mexico is that their laws provide that all broadcasts (including that of their amateurs) must be in good Spanish!!

 TALKING about the QRM situation. It does not exist in Anglo-Egyptian Sudan. There are as many as three (count 'em) amateurs in that country of over a million square miles. For that matter, Norway has only 120. One of the longest named associations of amateurs is that of Finland, which is called "Suomen Radiomatoorilitto." Its official magazine is called "Radio OH," which may or may not give you an idea!

 COMES now the winter season, and most of the hams will be rebuilding their rigs. We think it would be a smart thing for every amateur to build at least one emergency rig. If you can't use it yourself, there may be opportunity to lend it to some government agency. We recall the last big Ohio Flood, when there was an acute shortage of transmitters and receivers. All of the latter should have the broadcast band included. 73—W9QEA.

New! PUSH-BUTTON TESTING

• Mutual Conductance Per Cent Scale

• Rotating Chart Shows Correct Buttons to Push

Model 1616

ONLY \$73.34

DYNAMIC MUTUAL CONDUCTANCE Tube Tester and Volt-Ohm-Milliammeter

Many misleading names indicate a Dynamic Mutual Conductance Circuit... Triplett's is a true dynamic mutual conductance tester in every sense of the word.

Push-button control gives a new order of simplification. The buttons are clearly marked on chart at base. Just rotate the chart to the tube to be tested—then the button to push is indicated in line under each row of push buttons. What could be simpler?

A second revolutionary improvement is the arrangement of the measuring circuit of the dynamic mutual conductance test for amplifiers and power tubes. The tube tested not only shows GOOD or BAD, but the percentage of mu to the 100% good condition also is indicated. In critical sets this permits the service dealer to pick his tubes with confidence... Diodes and rectifiers are tested for emission according to the latest approved engineering standards. Ballast tube continuity test. Gas test also included.

Rotate chart to Volt-Ohm-Milliammeter setting—push button for D.C. scale: 0-10-50-250-500-1000 Volts at 1000 Ohms per Volt; 0-10-50-250 M.A.; 2 to 500 Ohms—300,000 Ohms—1/2 Megohms—3 Megohms; 0-10-50-250-500-1000 A.C. Volts at 400 Ohms per Volt; decibel chart furnished to 42 db's. (Ohmmeter is line powered.) Uses two interchangeable plug-in type rectifiers, simplifying replacement in case of unintentional damage.

Installed in attractive, all metal case with lustrous finish. Removable cover. For portable or counter use... sloping panel.

SEE IT AT YOUR JOBBERS

Model 1615—Dynamic Mutual Conductance Tube Tester only with Push-Button Testing. Dealer Price... \$63.34
 Model 1610—Emission Type Tube Tester with Push-Button Testing. Dealer Price... \$39.00
 Model 1611—Emission Type Tube Tester with Push-Button Testing and Volt-Ohm-Milliammeter. Dealer Price... \$49.50

BE SURE TO ENTER TRIPLETT'S \$500.00 RADIO SERVICE PUZZLER CONTEST!
 Get Entry Blank from Your Local Jobber

TRIPLETT Precision ELECTRICAL INSTRUMENTS

The Triplett Electrical Instrument Co.
 1511 Harmon Drive, Bluffton, Ohio

Please send me more information on

Model 1616 Model 1615
 Model 1610 Model 1611
 Details on Radio Service Puzzler Contest

Name _____
 Address _____
 City _____ State _____



E. H. RIETZKE PRES. OF CREI

Insure your future!

Start training now in
**PRACTICAL RADIO
ENGINEERING**

Do you ever sit down and "look your job in the face"? Are you satisfied with your present position—or anxious to get ahead? Today, you can't afford to be satisfied, because rapid new developments mean that Radio wants only men who are **TECHNICALLY TRAINED**.

BETTER MEN GET BETTER JOBS! Right now is the time to start training—so you won't be left behind when others go ahead. CREI offers you home-training that will equip you to keep pace with, and insure your future in Radio.

NEW BOOKLET . . . Just off the press!

Write for the CREI "TESTED PLAN"

Write today for free 48-page catalog. An interesting booklet about Radio and the chances for your success.



**CAPITOL RADIO
Engineering Institute**

MAIL THIS COUPON TODAY!

CAPITOL RADIO ENGINEERING INSTITUTE
Dept. RN-11, 3224 16th St., N.W., Washington, D. C.

Please send me a personal copy of the new illustrated 48-page booklet—"A Tested Plan for A Future in PRACTICAL RADIO ENGINEERING."

Name

Address

City

RN-11

RADIO-CONTROLLED GAS MODEL AIRPLANES GO TO WAR

Uncle Sam's Army Air Corps now is working to perfect a radio-controlled gas model suitable for anti-aircraft practice. Cooperating with private model-airplane and radio equipment designers, the Army already has laid definite plans for this novel but practical innovation's adoption. Read the story behind that story in the big

**NOVEMBER ISSUE OF
POPULAR
AVIATION
NOW ON SALE**

P. A. Tuner

(Continued from page 19)

ment somewhat with the connections until maximum power transformer and minimum distortion are effected. The audio control should of course be employed to raise or lower the effective output on any one station (or on metropolitan stations in general where the AVC works to bring their signals to comparatively equal tuner output) until radio input to the amplifier is the desired amount and comparable in level with inputs from any phono pickup or microphone pre-amplifier in use. This initial tuner adjustment, whether it is from time to time and as circumstances require changed or not, will in any event give the operator an idea as to how much input the radio must give to effect full—or any desired—amplifier output and will, or should, obviate any necessity for manipulation of the amplifier's master gain control when the input is switched over for broadcast program service.

Applications

In closing, may we mention some of the more obvious and conventional PA—as well as a very few non-public address-applications for this particular unit.

1. As a portable radio-input tuner for use with portable or semi-fixed public address assemblies, and to be carried about along with amplifier, speakers, phono turntable, and microphone as more a functional than an accessory part of the array.

2. As a radio-input tuner for the permanent rack and panel installation. With or without its cabinet, it may be conveniently mounted on a standard 19-inch panel, which may be provided with facilities for convenient switchover.

3. As a basic radio-program unit in the more complex school, hospital, or similar assembly. The physical construction of this instrument is such as to permit the placement of *two* tuners on one panel, while the circuit is such as to prevent tuner interaction when two or more units are simultaneously operated.

4. As a bedside quiet set—in the home or in the hospital, or wherever high-quality headphone reception of broadcast programs is called for.

5. As a perfect instrument for use by individuals who either have no all-wave set at their disposal or who enjoy a little short-wave DXing in the later hours of the night when the family has retired and operation of the regular receiver is strictly "taboo." The tuner itself, of course, won't provide for other than broadcast station reception; but used in conjunction with an inexpensive short wave converter it will permit the pick-up of any signals within the converter's tuning range (converter sensitivity permitting), and with excellent image rejection, as the i.f. (tuner) channel frequency may be varied from 530 kc.s (a good value with inputs down to 20 meters) to 1600 kc.s (affording good image rejection with input frequencies as high as 28 or 56 megacycles).

6. Lastly, as an i.f. channel and headphone amplifier for use by the amateur interested in 5 and 10 meter reception in particular, and for the same reasons we

have just given. It incorporates no means of attenuating or suppressing the man-made noise so bothersome at the ultra-high frequencies, and it has no beat-frequency oscillator stage to facilitate the reception of continuous-wave signals; but it does an excellent job, particularly when we are interested in 'phone transmissions and when noise effects are minimized by good location. Not only is the image problem more or less done away with, whether the converter employed with it is provided with an r.f. stage or no, but i.f. acceptance is broad enough to pass through and make intelligible some of the "wobbling" modulated-oscillator 5-meter signals which many amateurs persist in putting on the air—signals which the average superhet by reason of its compromise (usually 456 kc.s) and generally sharply peaked i.f. frequency cannot hold or make understandable, let alone receive without image interference.

[Complete kit for this tuner is available.—Ed.]

-30-

Radio Gadgets

(Continued from page 39)

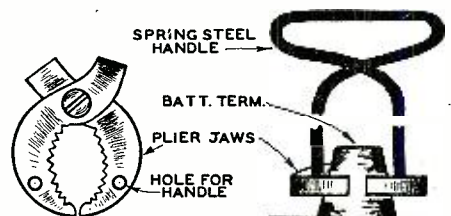
to twelve cups each, can be purchased in the five-and-dime stores and these provide a means for orderly storage of this hardware. Just how it will be sorted out depends on the amount of it. Perhaps one cup will hold all 6/32" screws, another 8/32" screws, two more the corresponding nuts, etc. If several of these muffin tins are required they can be nested and placed in some out-of-the-way corner where their contents will not be spilled.

Soldering Iron Rest

While there have been a number of ideas suggested in this column for soldering iron holders, the following kink is recommended for its extremely easy construction and the fact that it doesn't cost a cent to make. Take an empty wire or solder spool, preferably a solder spool of the one pound size. Bend two sides at the hub as shown so that they will form a base. Next bend out the top side very slightly, just enough to form the rest. If desired two holes can be drilled in the base for fastening the holder to the bench.

A Battery Post Cleaning Tool

Most of us know the old trick of cleaning off a corroded storage battery post by turning a pair of pliers about it a few times. Presented herewith is a post cleaning tool,



using the same idea, considerably dressed up.

An old pair of pliers had its handles de-horned as shown. Then a hole was drilled in each jaw. A handle of spring

READ CODE Like an Expert

SEND **CODE** Like an Expert
Learn Quickly at Home—Get Real Speed

It's easy, fascinating, to become a good op. with the NEW ALL ELECTRIC MASTER TELEPLEX CODE TEACHER to help you. Only instrument ever produced which records your sending in visible dots and dashes—then sends back to you at any speed you desire. Also sends practice work, recorded by an expert. That is why so many schools



teaching code prefer Master Teleplex, why thousands agree this method is surest and quickest. We furnish Complete Course, lend you Master Teleplex, give you personal instruction with a MONEY-BACK GUARANTEE. **FREE BOOK** Low cost. Send today for booklet RN11, no obligation.

TELEPLEX CO.
72-76 Cortlandt St. New York City

Now! BALLAST REPLACEMENT made AMAZINGLY SIMPLE!
Only 4 standard types of Amerite AC-DC Regulators will replace 90% (over 100 types) of AC-DC Ballast Tubes now in use!
WRITE FOR CHART A.R.
New Low Price \$1.00 List
AMPERITE 581 BROADWAY, N. Y. **AMPERITE** AUTOMATIC REGULATORS

HANDY RECORD FILE

Holds fifty 10 or 12 inch discs. Keeps them separated by cloth-covered dividers. Designed to fit into small corners. Sections are numbered and index card provided so that any disc can be quickly selected. Simple, attractive, well built. 10 x 14 1/2" \$3.95. Two for \$7.50.

HAYNES-GRIFFIN
373 Madison Avenue, New York City
Write for Catalog of Phonograph and Record Accessories

EASY TO PLAY EASY TO OWN

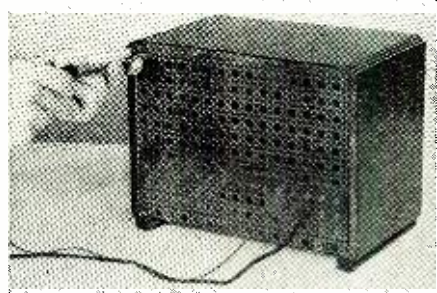
You've always wanted to play this fascinating instrument. Now there is no reason to delay. For now there is a genuine DEAGAN Marimba (including complete, easy lessons) at the lowest price in history. To write for details TODAY means a LIFETIME of pleasure, profit and popularity!
J. C. DEAGAN, Inc., 2188 Deagan Building, CHICAGO

Learn to **MOUNT BIRDS**
Tan SKINS, Make Up FURS
Both Taxidermist. We teach you at Home. Mount Birds, Animals, Pets, common specimens. Save your hunting trophies; decorate home and den. Make genuine KROWE LEATHER, tan and make up furs for sparetime profit. 48 pages—tells all about it. Hunters, get this wonderful book. It's Now Free. Send postal card TODAY. State your AGE. N. W. SCHOOL of TAXIDERM Y, 3578 Elwood Bldg. Omaha, Nebraska **FREE BOOK**

steel rod, or heavy wire, was then fashioned after the style shown in the sketch. The legs crossed each other so the tension tended to close the legs together if the handle was lifted upward. These legs were then riveted into the holes in the plier jaws.

It was then a simple matter to open the jaws, push them down over the post and let them close on it. By rotating the tool and lifting on it slightly, the toothed jaws cleaned the post thoroughly in two or three turns.

A Good Idea for Servicemen
One tedious job for the serviceman is in scroll sawing a ply-wood rear protective cover for the sets which have this type of opening. Metal chair caning, which can



be cut to shape with tin snips will be found to serve very nicely, instead of the thin, easily broken wooden panel. Rubber grommets protect aerial and power line cords.

QRD? de GY
(Continued from page 24)

Things opening up on the Gulf with a few new vessels being taken out of drydock and overhauled. Ambitious lads please heed this warning: Because of overstocked Alaskan and Tuna Fish markets about 90% of these fleets have been laid up. So lotsa men already waiting for assignments. We hope this is understandable and men won't come from the interior or other ports without first quizzing this column. But the Pacific coast advises a decided cheerful outlook for the winter if there is no lockout in the meantime.

A **NOTHER** new field has opened up for the radiop who is waiting for a billet. Radiotelephony is jumping ahead by leaps and bounds because it is necessary for the installation of apparatus to be made by a licensed second class ticket holder, you ops are eligible. Also, adjustments and repairs must be made by a licensed man. Many of the smaller craft are going in for this in a big way . . . so get a look-in. Any further info on this subject, please drop us a card.

SO toodleoo and cheerio. Here's special 73 to Merv Rathborn, Louis J. Kleinkaus, Hoyt Haddock, Karl Baarslag, S. P. Jordan, Maury Schatt and all the others who pulled for the column. Now don't forget: CQ CQ CQ de GY, Broadcast, Airways, PtP and ships at sea. Let's hear from you all. Do you want to hear about your old buddy? He gets RADIO NEWS! Do you want to get the latest info on laws and conditions? We'll let you know! Would you like something you read in RADIO NEWS explained further? Write us, we won't fail you! That's the idea, gang. This is your column . . . get going and send in the latest happenings, anecdotes, etc. . . . Your old shipmates will want to hear it too. And now that we savvy each other, how's to take out the Joe-pot and "berl" it . . . so with 73 . . . ge . . . GY.

It's Yours—It's FREE
Modell's
FIFTIETH ANNIVERSARY CATALOG and BUYERS GUIDE
1889
RADIO SPECIALTIES
VACUUM CLEANERS
ELECTRIC CLOCKS
ELECTRIC SHAVERS
CAMERAS
LIONEL TRAINS
1939
NEW YORK, N.Y. CHICAGO, ILL. ATLANTA, GA.
CHOCK FULL OF HUNDREDS OF STANDARD BRAND PRODUCTS

Our New 1939 50th Anniversary Catalog

is just coming off the press. It's chock full of new 1939 model **RADIOS**—over 400 of them, many of them illustrated; Midgets, Consoles, Table models, Chair models, etc., that sell from \$1 to \$1,050, made by Nationally known manufacturers of standard make radios, such as RCA Victor—Philo—Zenith—Stromberg—Carlson—Emerson—G. E.—Crosley—Westinghouse and many others. Then there are over 700 other items, **ELECTRIC SPECIALTIES** for the home, such as electric refrigerators, stoves, lamps, vacuum cleaners; electric irons, clocks, toasters, percolators, roasters; electric razors, electric trains; cameras, movie cameras, typewriters, bicycles, etc., etc., etc.

Then we also have a new department—**RECORDS & RECORD PLAYERS**. Over 250,000 records, 10 inch double face electrically recorded. Swing numbers, waltzes, dance, vocal, instrumental, hill billy, old time, sentimental, etc., recorded by some of the best known record artists, at only 12 for \$1 or 25 for \$2, and electric record players for as low as \$7.85. All this is found in our new 1939 catalog.

This **GOLDEN ANNIVERSARY** catalog of 100 pages is really an encyclopedia on Radio and Electric Specialties. It not only gives you an array of wonderful bargains, but it shows you how to make a good income devoting your spare or full time without any experience being necessary or the investment of one penny.

Remember every article we offer is brand new, absolutely perfect, guaranteed and shipped in the original factory sealed carton. As we sell only well known branded merchandise, the manufacturer, who cannot afford to take chances with his reputation, stands back of everything they make, therefore you are not taking any risk in buying standard brand merchandise at **MODELL'S**. As Christmas is approaching, you will find many people looking for gifts. The Modell's 50th Anniversary catalog is just full of ideas and suggestions for gifts for many occasions.

If you sincerely want a catalog that will show you all the latest Radios and Electric specialties—a catalog that will show you how to make money, mail the coupon below to our nearest branch and we will send you the "1939 Golden Anniversary" catalog.

DO IT TODAY
Modell's
Since 1889
58 Cortlandt St., New York, N. Y.
56 W. Washington St., Chicago, Ill.
57 Forsyth St., Atlanta, Ga.

MODELL'S, Dept. G-19,
58 Cortlandt St., New York City, N. Y.
Send me your new 1939-Golden Anniversary combined Radio & Electric catalog No. 412 with agents' commission plan.

NAME

ADDRESS

CITY..... STATE.....

PASTE COUPON ON PENNY POSTCARD

I CAN MAKE YOU A RADIO EXPERT
Quicker, Easier with the New
SPRAYBERRY
Personalized
TRAINING IN RADIO




Get my
FREE BOOK

I ACTUALLY SET YOU UP FOR A BUSINESS OF YOUR OWN

Here's the finest, most up-to-the-minute Radio Education available anywhere. Specially designed to give you intense, practical, quick training... for a money-making career in the fast moving Radio Industry. All subjects covered, including Television, Electronics, Radio Set Repair, etc. Previous experience is unnecessary. You get my personal instruction every step of the way.

I equip you with **BIG, PROFESSIONAL OUTFITS** for doing interesting experiments and handling profitable spare-time service jobs. I'll show you how to get these jobs while you're learning. My Course is Sold Under an Iron-Clad, Money-Back Agreement.

SPECIAL SERVICEMAN'S COURSE
 Advanced training for those already in Radio. Complete details of this and fundamental Course, features, etc., described in my 44-page **FREE BOOK**. Send for your copy today.



Mail Coupon Now

SPRAYBERRY ACADEMY OF RADIO,
 F. L. Sprayberry, President
 125-L University Place, N. W.,
 Washington, D. C.

Please send me **FREE** copy of "How to Make Money in Radio."

Name..... Age.....
 Address.....
 City..... State.....

(Mail in envelope or paste coupon on postcard)

What Is Science Fiction?

It is the reality of the future, manifested in the dreams of the present. All great inventions were foreshadowed by fiction. Jules Verne wrote "Twenty Thousand Leagues Under The Sea" and created a submarine in fiction. Today that submarine is an actuality, and amazingly faithful in all detail to Verne's vessel. The dreams of today are tomorrow's realities. If you believe in man's future, then why not read the magazine of science fiction? Read of the logical inventions of the future as imagined by the top writers of today, the writers with vision, presented in an entertaining manner in story form, in

The MAGAZINE THAT POINTS THE WAY TO FUTURE FACT

AMAZING STORIES

BIG DECEMBER ISSUE
 Now on Sale at All Newsstands

Technical Book and Bulletin Review

(Continued from page 14)

principles are discussed and the sources of power and signals, instruments and measurements are described in detail. Other sections deal with ultra high frequency work and there is a collection of useful symbols, abbreviations, formulas, laws, curves, and tables. The book covers all that is necessary for advanced work but does not presuppose a great deal of technical knowledge.

PRACTICAL WIRELESS SERVICE MANUAL, Edited by F. J. Camm, 288 pages, size 5½ x 8. Published by George Newnes Limited, Tower House, Southampton Street, Strand, W.C.2, London, England.

Designed to meet the needs of servicemen, this book covers the essentials of servicing in a most complete manner. There are informative chapters on types of testing instruments, measurement of resistance, voltages, and capacity, calibration, and covers the common and uncommon faults of receivers together with their determination and rectification. An excellent book for the beginner and a valuable reference for the professional serviceman.

WARD'S 1938 RADIO CATALOG, Montgomery Ward and Co., Chicago, Illinois.

The new edition of this catalog sets forth broadcast receivers, communication receivers, transmitter and receiver kits, radio parts, microphones, testing instruments, inter-office communication systems, speakers, auto radios, hearing aids, P.A. systems, etc. Free upon request.

BLILEY ELECTRIC Co., Union Station Bldg., Eric, Penna.

This company has issued a new catalog covering General Communication Frequency crystals, holders, and ovens for frequencies from 20 kc. to 30 mc. Radio engineers, experimenters, and physicists will find this publication of value. Price 10 cents.

THORDARSON TRANSMITTER GUIDE, No. 344-C, Thordarson Electric Mfg. Co., 500 West Huron Street, Chicago, Ill. Price. 15c.

Transmitters from 100 watts to 1000 watts are covered in this booklet, as well as portable transmitters, and 5 and 10 meter transmitters. The book is intended as a practical work-book for the radio amateur. In addition much technical data is contained on modulation principles, Class B driver ratios, and other phases of transmitter operation and construction.

ALLIED RADIO CORPORATION, 833 W. Jackson Blvd., Chicago, Ill.

The 1939 catalog of Allied is now off the press. It lists the line of Knight receivers, radio parts, reference books, farm power equipment, generators, communications receivers, keys and microphones, antenna kits, transmitter, transceiver, and receiver kits. Free upon request.

STANCOR REPLACEMENT TRANSFORMERS, Guide and Catalog, Fourth Edition. Standard Transformer Corp., 1500 North

Halsted St., Chicago, Ill.

A new catalog listing Stancor's Universal Replacement Transformers. Audio transformers, chokes, and power transformers are set forth under an alphabetical listing of receivers by manufacturers' names and set model numbers. Free upon request.

BUD RADIO, INC., Cleveland, Ohio.

This company has issued a new 8-page catalog listing the complete line of Bud Junior and Senior type transmitting condensers, Deluxe single and dual condensers, and several types of neutralizing units. Free to readers.

TECHNICAL APPLIANCE CORP., 17 East 16th Street, New York City.

This company introduces a new manual on the Taco Community Master Antenna System. Complete data with typical installations are outlined for multiple set operation in apartment houses, hotels, hospitals and private dwellings.

TRANSMITTER EQUIPMENT MANUFACTURING Co., Inc., 130 Cedar Street, New York City.

Amateurs and station engineers will be interested in the new Temco 15 page catalog listing their complete line of transmitting equipment designed for both commercial and amateur use. Requests for free copies should contain station call.

RADIO CLUB OF AMERICA, INC., 11 West 42nd Street, New York City. Volume 15, No. 4, May 1938.

Papers recently delivered before the club, by well known authorities in their field, and presented in this volume include an Analysis of All-wave Receiving Antenna Systems by Julius G. Aceves; New Paths to Guide Centimeter Radio Waves, by G. C. Southworth, and Television and the Radio Engineer, by Albert F. Murray.

WIRELESS TRANSMISSION FOR AMATEURS, Edited by F. J. Camm, 139 pages, size 5x7½. Published by George Newnes, Ltd., Tower House, Southampton Street, Strand, London, W. C. 2, England.

Designed for the aspiring radio amateur, this book has been compiled from a number of articles which have appeared in *Practical and Amateur Wireless* and covers the subject from the fundamental principles up through the design, construction and operation of a transmitter.

WIRELESS SERVICING MANUEL, by W. T. Cocking, 278 pages, size 5x7½. Published by Iliffe & Sons, Ltd., Dorset House, Stamford Street, London, S. E. 1, England.

Written for the person who already has a good knowledge of radio, this book treats with location and cure of defects in receivers, including a chapter on television receivers.

-30-

**WHO ARE THE VIGILANTES?
 ASK ANY HAM!**

IT IS IMPORTANT

that you use dependable electrolytic condensers for the new receiver or for replacement. Use ILLINOIS condensers because they are non-corrosive, full capacity, more compact, and hermetically sealed—unaffected by heat, cold, or extreme humidity. Ask your jobber for ILLINOIS Electrolytic Condensers and write today for the free ILLINOIS catalog.

ILLINOIS CONDENSER CO.
1160-D North Howe St. CHICAGO, ILLINOIS

SEND FOR FREE CATALOG No. 9E

TRANSMITTING BLEEDERS

ADJUSTABLE TYPES
EXACT DUPLICATE
VOLTAGE DIVIDERS
5 & 10 WATT PIGTAILS
ATLAS RESISTOR CO.



423 BROOME ST., NEW YORK, N.Y.

HEADSETS

Amateurs! Are you getting the best results possible from your short-wave set? You're not! Try a TRIMM COMMERCIAL . . . that's what's missing from your rig.

Write Dept. R-211 for folder

Radio Mfg. Company.
TRIMM 1770 W. Berneau Avenue,
Chicago, Illinois.

COMPLETE DYNAMIC TESTING

Direct, quick, practical instruction for complete 24-point check of all receivers with cathode ray, easily mastered by anyone who can read a circuit diagram. Without it, you're behind the times! Get your copy TODAY!

50c

FREE WITH ANY C-B INSTRUMENT

Clough-Brengle Co., Chicago, Ill., U. S. A.

WRITE

for catalog #40 . . . most complete QUALITY line of low, medium and high power transmitting and receiving condensers and accessories.

THE ALLEN D. CARDWELL MANUFACTURING CORPORATION
83 PROSPECT ST., BROOKLYN, N. Y.

BLILEY CRYSTALS

10-20-40-80-160 METER BANDS \$3.35 UP
BLILEY ELECTRIC CO., ERIE, PA.



CLEAR SOUND REPRODUCTION

Quality materials and the highest order of manufacturing skill produce Amer-Tran Transformers. Their reliability is known throughout the world. Write for free bulletin 1002.

AMERICAN TRANSFORMER CO.
178 Emmet St., Newark, N. J.

PHOTO ENLARGER \$5.94

A REAL Photo Enlarger that does fine work. Focuses automatically. Also COPIES and has a Contact Printer and Retouching Table. Interesting circuit res. Only \$5.94 complete. Lens included.
IDEAL-H, 122 East 25th St., New York

Photshop CARNIVAL OF CAMERAS!

Our Fall "CARNIVAL OF CAMERAS" offers you outstanding values in cameras, equipment, lenses and supplies. Prices are non-competitive. Liberal trade-in allowance. Money back guarantee.
Send for new "CARNIVAL OF CAMERAS" catalog . . . No. ready.
18 E. 42nd St. Dept. E-9 136 W. 32nd St. New York, N. Y.

CQ Plane "Guba"

(Continued from page 7)

The transmission line is EO1 cable. National HRO is used for the receiver.

During the week, Barney Boyd may talk to Singapore or Capetown, but it's Saturday evening and Dutch New Guinea that interest him primarily. And for the next two years, this disabled War veteran, confined to his wheel chair, will have a ring-side seat at the unfolding of scientific history in a region where no white man ever has trod. On him rests the responsibility of summoning aid should any emergency arise requiring the immediate dispatch of equipment or personnel from the United States. Through him will be relayed all the messages, business and personal, coming out of the faraway wilderness.

And Dick Archbold and his fellow explorers, though 7000 miles away from America, are as close to it as Barney Boyd to his transmitter, which sends out his call across the seas:

"CQ Guba! W6LYY calling flight crew of the Guba—!"

-50-

U. S. Gets New Frequencies for International Broadcasting

BEGINNING September 1, 1939, Article 7 of the Cairo General Radio Regulations becomes effective as among nations which have ratified those new regulations by that time. The table of allocation contained in this article provides for certain additional frequencies to be allocated for long distance broadcasting service (termed International Broadcasting in the United States).

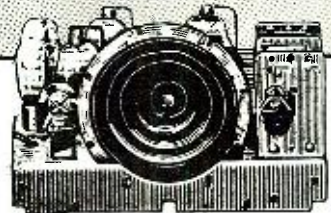
The Federal Communications Commission has made an engineering study of the present and proposed allocations in the new international broadcasting bands, and as a consequence has notified the Bureau of the International Telecommunication Union, Bern, Switzerland, the following ten additional frequencies for use by stations of the United States in the new bands: 6170, 6190, 9650, 9670, 17830, 21570, 21590, 21610, 21630, and 21650 kc.

Pending ratification of the Cairo Radio Regulations, and until at least September 1, 1939, applications for the frequencies listed above will be considered by the Federal Communications Commission on the basis of Paragraph 1 of Article 7 of the Madrid Radio Regulations for the type of service known under the Rules and Regulations of the Commission as "International Broadcast," and to be operated on a temporary basis in accordance with all the rules governing that service until a more permanent policy is adopted.

Because of the existing congestion in all of the bands allocated for international high frequency broadcasting, applications for frequencies other than those listed above, or other than those now allocated to stations of the United States will not be in order.

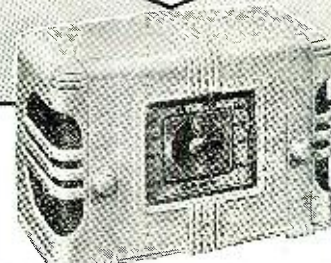
-50-

CAST YOUR EYES ON THESE LAFAYETTE BUYS!



A couple of hours is all it takes to assemble this 4 tube TRF Broadcast Receiver. Uses 1-39, 1-36, 1-38 and 1-IV tubes. All parts furnished, including 5" magnetic speaker. Chassis is drilled and punched with all necessary holes. Specially matched coils and condensers. Operates on both AC and DC. Complete specifications.

YOUR \$4.95 COST



Performance, tone quality, beauty—Lafayette "midget" Model C-39 has all three! And the price is remarkably low for so much extra-value. Features: 7 tube performance on 5 hi-efficiency tubes. Automatic Volume Control, new Wave Trap, 6" Dynamic Speaker. Smart plastic cabinet in Ivory, Walnut. See it in our catalog.

WALNUT \$9.95 ONLY

FREE

Whether you build your own or buy complete, this catalog has everything you need in radio. Mail coupon for your FREE copy today.

WHOLESALE RADIO SERVICE CO. INC.
NEW YORK, N. Y. • CHICAGO, ILL. • ATLANTA, GA.
100 SIXTH AVENUE • 201 W. JACKSON BLVD. • 203 PEACHTREE STREET
BOSTON, MASS. • BRONX, N. Y. • NEWARK, N. J. • JAMAICA, L. I.

WHOLESALE RADIO SERVICE CO., INC.
100 SIXTH AVENUE, NEW YORK, N. Y.

Rush FREE 1939 Catalog No. 73-2LA

Name.....
Address.....
City..... State.....

PASTE COUPON ON PENNY POSTCARD

Readrite
RANGER

EXTRA-EXTRA

SEPARATE PLATE TESTS ON DIODES AND RECTIFIERS... BALLAST TUBE TEST



Positively Checks Radio Receiving Tubes According to Latest Recommendations of Tube Engineers.

NEW MODEL 432— ONLY \$21.60

- Separate Plate Tests on Diodes and Rectifiers
- Neon Short and Leakage Tests
- Ballast Tube Continuity Test
- Uses Attractive Triplett Direct Reading Instrument 3" size. (GOOD-BAD) Scale
- Line Voltage Adjustment
- New Improved Low Loss Switch

Complete in attractive, sturdy quartered-oak case; suitable for counter or portable use. Sloping etched panel of silver and black.

Model 431 checks all receiving tubes. (No ballast test) Tester uses dependable Readrite Meter Quartered-oak case same as for Model 432. Dealer Price.....\$15.90

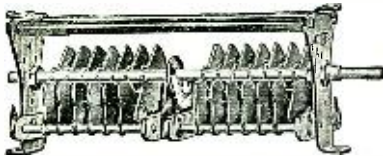
READRITE METER WORKS

1115 College Avenue Bluffton, Ohio

Get better results with

Bud Ultra High Frequency

CONDENSERS



Here's WHY it's better:

- EQUALIZES** input and output impedance of tube. Provides perfect electrical balance.
- REDUCES** high frequency resistance present in ordinary end contact type condensers.
- MINIMIZES** parasitic and R. F. regeneration trouble.
- ELIMINATES** self-inductance by use of 6 insulated tie rods.
- NEUTRALIZES** easily at U. H. F.

Send for FREE Catalog RNC118, or enclose 10c for Log and Data Book RN118.

BUD

BUD RADIO, INC.
CLEVELAND, OHIO

The National QSO Page

(Continued from page 30)

members would be interested in knowing what type of men were representing us at the Board meetings besides our own respective Director but HQ followed its age-old policy of telling the members as little as possible, concerning the League.

However, on the list of QST executives you left out "Chief Assistant Secretary" A. L. Budlong, assistant secretary Byron Goodman and a few other assistants of one capacity or another. Furthermore on checking up on the salaries as published quarterly in QST, I find, instead of \$51,600.00 annually, the following salaries listed:

October 1937 QST—page 21. \$22,642.89
January 1938 QST—page 102. 23,688.91
April 1938 QST—page 66... 25,700.34
July 1938 QST—page 27... 24,457.76

A sizable sum for an organization that can only claim a world-wide membership of approximately 24,000. (According to Standard Rate & Data Service, Sept. 1938 issue, Business Paper Section, p. 193, net paid circulation was 41,724. Not all of this is membership, since newsstand copies are counted in, but do not represent members.—Ed.)

The cartoon is very apropos and certainly depicts the happenings of past conferences. Mr. Warner's editorial in August QST concerning 7200-7300 kcs. reminds me of the little Pekinese dog who, after the big St. Bernard has carried off the pup's bone, stands at the gate taking the part of the pup's protector, and barks furiously.

Now the question is... how to inject some intestinal fortitude into the spine as well as to stimulate the sleep-fogged brain of the only organization that is in a position to properly and aggressively represent us?

This will have to be done by the Board of Directors as it is their duty to lay all aggressive plans and to see that they are properly executed by the executives of the League.

Now, a second question arises... how to obtain directors with the necessary foresight, intelligence, and "individualism"; who will be honest with their constituents and refuse to surrender the independence of the division to HQ; who will ask "why" instead of accepting the word of HQ? By Education!!!

Third, how can we obtain this education when the pages of QST are like the newspapers of certain foreign countries supporting "isms" telling only one side and very little of that? The board minutes do not tell how our directors conduct themselves. I have a letter in my files written by President Woodruff in which he states that it is impossible to get a true picture of what transpires at board meetings from the minutes. For years I have introduced resolutions at our division convention, and they were always unanimously adopted, asking for a complete and unaltered verbatim stenographic report of the proceedings of board meetings, but the board has always rejected them. (These minutes to be available to members.)

The only means by which all members can be given proper information is through a national publication and it must be *straightforward* and ACCURATE. Then when election time comes around in the various divisions, the issue should be clean-cut between candidates. . . . TO CLEAN OUR HEADQUARTERS AND PUT OUR HOUSE IN ORDER OR NOT TO DO SO.

My faith in the intelligence and ability of a majority of the League members to sift the facts for themselves makes me believe that in ONE election our house will have been put in order.

(Sgd.) Elbert J. Amarantes, W6FBW, Alternate ARRL Director, Pacific Division.

■ Thank you, W6FBW, for your letter. You have stated what we have been fighting for, very clearly. We have written to each incumbent Director asking what his policies will be in the forthcoming election in his own Division. We will publish the results,—if any of the Directors will consider answering. That will serve to let the hams know what

they may expect from their trip to the polls.—The Editors.

SAYS BAND LOSS IS BENEFICIAL

Dear Sir:

... My only comment is that the cartoon (August QSO Page) does not do justice to the ARRL.

It seems to me that our traffic cop has not been as sound asleep as the drawing would indicate. In fact I will go so far as to say that what we have lost has benefited rather than harmed our position since it removed some of the undesirable features of our activities and forced us to develop our equipment in such a manner so that we could continue our activities in the reduced space which remains. . . .

(Sgd.) R. C. Corderman, W3ZD, WLMD, ARRL Emergency Coordinator, Washington Area.

■ While the fact that we have been restricted to smaller bands may have had a bearing on our development of those bands, still we also developed them for the very persons who would now take them from us. It still remains a fact, as you admit, that we have never WON or GAINED anything at any conference, we have always lost. Don't you think that we ought to have a NEW DEAL at Headquarters in a last effort to establish the hams on a firm footing so that they will not lose everything in 1942? Don't you think that by cleaning house that some good will come of it from within the ARRL? We think that you will see our point, if you will but give it careful consideration.—The Editors.

OK'S OUR CAMPAIGN

Gentlemen:

Congratulations on the splendid article "The National QSO Page" of the August issue of RADIO NEWS. You have started something. I think it's time that the Amateurs wake up and find out what's going on. We need something like this.

Some of the Amateurs around here are already talking this thing up and I think it will bring results.

This is my first copy of RADIO NEWS and if this is your attitude I'm with you 100%.

Yours for continued success and hoping something can be done before it's too late. (Sgd.) Norman Orth, W9YAR.

Dear Editor:

I have only been in "ham" radio for about three months so my opinions may not count for much. However, I feel that I'm entitled to my opinion concerning the ARRL, so I'm going to speak my little piece.

I am not a member of the ARRL and until it becomes a much better organization I don't intend to be. I had the money order all made out and ready to mail when I found out that any Tom, Dick, or Harry, whether he was a ham or not, could join the League by mailing in the necessary amount of money. I tore up the money order.

In the first place, in order that the ARRL should be truly representative of ham radio it should be restricted to hams: A plumbers' union composed of automobile mechanics would not be very successful as a plumbers' union. The official magazine of the League should be an open forum for all members and their ideas. At present QST isn't any more representative of ham radio than Film Fun is. The members of the board should be elected for their interest in ham radio not for their ability to talk or "because he's a great guy."

The time has come for immediate action and if the ARRL cannot or will not give us this action then I'm in favor of throwing it out the window and starting a new League for hams who are interested.

And now that I've had my say, if there are any hams who think along the same lines as this "lid" I would be glad to hear from them, either by mail or on the air.

(Sgd.) Cyril J. Statt, W8RYL.

Dear Sirs:

Glad to see someone getting after the ARRL. One club, the Bridgeport Amateur Radio Association, ARRL affiliated—has been trying to get something done in the ARRL since 1936.

(Sgd.) Julian E. Greenbaum, W1LIG.

■ To the gentlemen above, who together with many, many others sent in their approval of our campaign, our deepest thanks. We are keeping the campaign in "high gear" so that the hams will get busy before it is too late.—The Editors.

BACK BONES—NOT WISH-BONES!

Dear Sir:

I have been following your articles and those of your correspondents on the ARRL situation; I have tried to be an unprejudiced observer, and I believe you are on the right track.

Actions speak louder than words, always. According to Warner's own prophecy, we radio amateurs are now definitely on the defensive as concerns our privileges, and that is a bad position to face. Yes, we are behind the "8-ball" right now.

We want a league that will support us successfully. With a full measure of success. We want a League with a personnel as much interested in our future rights as it is in its salaries.

I realize that criticism comes easily; that the League did the best it could at Cairo. Nevertheless, the results are not satisfactory in my opinion, since our forty meter band is already invaded, and our other valuable, though narrow, channels are already threatened gravely. I am not heroic enough to stomach the dose of having to play the defensive for what little we have left. Yet all of us amateurs have been led into a position that requires us now to play the game only that way.

The Amateur Fraternity as a whole, comes in for a share of the blame also. Too many have only wish-bones and no back-bones. Too many are without spines when it comes to really doing something to protect the very privileges which they cherish.

You of RADIO NEWS are conducting this clean-up campaign, and I am glad to commend you on your stand. I hope your circulation will increase ten fold on account of it. The great American Amateur Fraternity will profit by it, and so will everyone connected in any way with amateur radio be benefited by your campaign if it is successful. You will be doing many a good turn. May there be found enough amateurs, interested in their grand hobby, grand because it is useful to humanity, to the extent that they will support the cause you are championing. More power to you!

I am a busy man, but I will find time to do something for the cause, in my own small way.

I am personally interested in a League whose individual members as well as its leaders have some fire in them. It is an American League we Amateurs need; a League whose members, one and all, even if it must be a new League, have the spirit of '76 in them. Wake up, you sleeping potential leaders. It is high time for us to cease being afraid of our shadows. We are on the defensive, and our ranks are sadly in need of leaders with spunk and good judgment. (Sgd.) J. A. Terstegge, W9LQE.

■ Yes, sir, W9LQE, you surely called the turn when you said that too many had wish-bones and not enough had back bones! If we can give them the urgently needed back bones, then the League will be improved, and with it the status of the American Ham.—The Editors.

AN ARRL MEMBER ASKS HIS DIRECTOR FOR HIS PLATFORM

Dear Sir:

I have been reading the past few issues of RADIO NEWS with a great deal of interest, particularly the August and September issues. I fully and wholeheartedly endorse your campaign. . . .

My position with regard to the League I think is quite clear to anyone who has contacted me on any of the Amateur bands. I have been a member of that body for many more years than I can recall now. I have seen the League grow. . . .

I am enclosing a copy of a letter to my incumbent director which I hope you will see fit to publish, and I shall be very glad to furnish you with a copy of his answer. (Up to Sept. 22, 1938, none had been received. Ed.) However, it is but a start and I feel that if more fellows will frame these and similar questions to their director, and force them to publicly take a stand on the questions so placed to them, that we stand a great chance to salvage what the late great Maxim wanted to leave as his heritage to the youth of America.

I can only urge you to carry on the good fight, and to expose the present situation to the fullest, to a point where the League will be compelled really to stand "of, by and for the amateur." For never forget your two dollars and a half and mine pays these stupendous salaries and legal retainers, and what do we get for it? I demand to know and will fight till the truth is told.

(Sgd.) LLEWELLYN BATES KEIM, W2IKV.

33 Sunset Drive,
White Plains, N. Y.,
September 8, 1938.

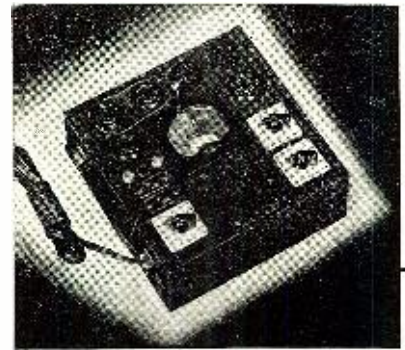
Kenneth T. Hill, Esq., Director,
Hudson Div., American Radio Relay
League,
115 Willow Street,
Douglaston, Long Island, N. Y.

My dear Ken:

On Page 19 of the September, 1938, issue of QST appears the notice of a forthcoming election in this, the Hudson, as well as other Divisions. It is a natural supposition that you are to be a candidate to succeed yourself, and in this connection I am writing you for some very pertinent information.

. You have expressed at meetings your partiality towards doing something favorable to securing a wider apportionment of the frequencies allowed to users of the telephone, but, when directly questioned by the writer at Schenectady, in October of 1936, at the Hudson Division Convention, you admitted turning down in a mail ballot the proposal that the ARRL appeal at that time to the Federal Communications Commission for more phone frequencies. I should like to know your present stand in this connection, and how you will vote on such a subject at any future meetings of the Board, should you be returned as Director of this Division?

In order to really know what is going on in the ranks, it would appear that the wishes of the division should be ascertained, and if the constituents were canvassed, as Mr. Fred Young has done in his division, then you would be in a better position to carry out the majority opinion of the fellows in this district. There are a great



UNIVERSAL TUBE TESTER FOR ALL TUBES

ACCURATE
DEPENDABLE
ECONOMICAL **\$13.95**
If your jobber cannot supply you, write us direct NET CASH

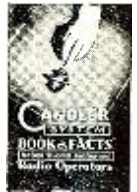
MILLION RADIO AND TELEVISION LABS.
577 N. Union St. Chicago, Ill.

Don't Let FAST CODE SCARE YOU!

Learn to read it the quick easy CANDLER WAY!

Do you have trouble reading fast code? You needn't have! Even if you have been trying for years to increase your speed without success, you'll find the Candler System helpful. With a few weeks practice the Candler way, you will make more progress than you did with months of un-directed practice. Fast code is easy when you have the proper fundamentals, when you learn sound consciousness and mental co-ordination as Candler teaches it. You will find yourself reading code as easily as you read print without strain or conscious effort. Don't hesitate. Write today for your copy of the FREE Book of Facts!

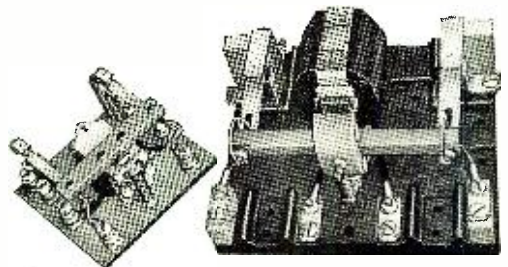
FREE! BOOK OF FACTS



Full of interesting data on code! Read what champions tell you about the Candler System!

CANDLER SYSTEM CO.
Dept. N-11, Asheville, No. Carolina, U. S. A.

RELAYS for Antenna Changeover



You need one of these relays to change automatically from sending to receiving. You will find these relays described in circular 507B. Send for a copy.

WARD LEONARD RADIO SPECIALTIES

WARD LEONARD ELECTRIC CO.
47 South Street, Mount Vernon, N. Y.

Please send me circular 507B.

Name.....

Street.....

City and State.....

Call Signal.....

Train for In 12 Weeks RADIO of Coyne

Quick, Easy Way by Practical Work on Modern RADIO, SOUND and TELEVISION Equipment



I'LL FINANCE YOUR TRAINING

Send the coupon in today and I'll send you details of my "Pay After Graduation Plan" whereby you can start paying your tuition 60 days after your 12 weeks' training period ends and then have over a year to pay the balance in small monthly payments. Get into this growing field of opportunities by the quick, easy Coyne way in 12 weeks. "Learn By Doing" on a great outlay of radio broadcasting, television, talking picture and code equipment. Coyne methods make it easy to learn. First you are told how to do a thing—then you are shown—then you do the work yourself under expert instruction. You don't need previous experience or a lot of education.

JOB HELP AFTER GRADUATION

My Employment Department helps you get a part time job to help pay living expenses while you are training. They also give you lifetime employment service after you graduate. To help increase your earning capacity after graduation—ELECTRIC REFRIGERATION Training is NOW included AT NO EXTRA COST.

MAIL THIS COUPON TODAY

H. C. LEWIS, Pres., RADIO DIV., Coyne Electrical School
500 S. Paulina Street Dept. 88-3K, Chicago, Illinois
Send me your Big Free Book and details of your "Pay Tuition After Graduation Plan."

NAME.....
ADDRESS.....
CITY..... STATE.....



FOR THE RADIO SERVICE MAN, DEALER AND OWNER

The man who enrolls for an I. C. S. Radio Course learns radio thoroughly, completely, practically. When he earns his diploma, he will KNOW radio. We are not content merely to teach the principles of radio, we want to show our students how to apply that training in practical, every-day, radio service work. We train them to be successful!

INTERNATIONAL CORRESPONDENCE SCHOOLS

Box 8281-U, Scranton, Penna.

Explain fully about your course in the subject marked X:

- RADIO
- EXPERIMENTAL TELEVISION
- SOUND TECHNICIANS
- AVIATION SECTION OF RADIO OPERATING

Name..... Age.....
Address.....

LEARN CODE RIGHT

INSTRUCTOGRAPH tapes send you typical messages. Radio or Morse, any speed. Easy, practical way to improve. Senior Model with 10 tapes and Book of Instructions \$20.25. Rented at \$3.00 first month, \$2.25 each additional month. With transformer and tube socket (oscillator unit) 25c per month additional. With key and head phones, another 25c per month. \$10.00 deposit or satisfactory references required.

Junior Model with 5 tapes and Book of Instructions \$12.00 (not rented). Complete oscillator equipment less battery \$6.50. Write for details today.

INSTRUCTOGRAPH COMPANY
Dept. NR-11, 912 Leaside Pl., Chicago, Ill. Representatives for Canada: Radio College of Canada, 863 Bay St., Toronto

WHO ARE THE VIGILANTES?
ASK ANY HAMI



number of amateurs in the second district, but by no means all of them are active, and it would appear to the writer wholly feasible to contact the entire roster; with a return postal card, to determine what this district wishes done at the coming Board meeting next Spring. I have, in talking with some of the more active amateurs, never found one whose opinion has been asked or advice sought preparatory to a Director's Meeting.

As I see it, we are entering upon the most crucial period ever faced by the amateur, be he American or otherwise. The inability of the League, after great financial expenditures of the amateur's money to keep the present limited frequencies inviolate for amateur occupancy at Cairo is but a forerunner of what will happen in 1942. If the League is to really live up to its published slogan of "Of, by, and for the Amateur" we must now face the music of that forthcoming frequency grabbing party. I ask you, as a licensed amateur of the Hudson division, to please explain just what policies you will institute at Hartford to safeguard and guarantee for the amateur his remaining few kilocycles? . . . Are you willing to further an aggressive campaign towards properly protecting the American amateur?

I have read much of late in print and otherwise about the tax-exempt status of the League, and its alleged consequent inability really to represent the Amateur in Washington. Do you favor a continuance of this policy, or don't you think it is about time that the truth were told to the American Amateurs, Members and Owners of the League, through the medium of the pages of *QST* about the exact corporate set-up of the League? If your answer to this last question is in the affirmative, will you immediately start the necessary machinery for a revelation to the amateur of what his League is doing?

The League is owned by the amateur who pays his dues thereto, but it serves all amateurs alike, both Members and Non Members. As presently constituted it represents itself as a Non Profit making body and pays postage accordingly. But then what is happening to all the money that is coming in? As a member over many years I have never been asked to meet a deficit, and the amounts of money appropriated from surplus are staggering. Does it not seem proper that at this time, in view of the crucial period which we are entering, that the League ought to have a paid specialist in international law to advise and guide its actions at Washington as well as at other points where such guidance is needed, and where we are now sort of stewing in our own juices, without accomplishing anything concrete.

In view of the present economic circumstances, and a general reduction of all salaries do you now favor a reduction of the salaries of the headquarters staff, such monies to be used for the benefit of all amateurs, in securing the services of a well trained, competent adviser? Furthermore, don't you favor the publication of the benefit of the owners of this League of a wage scale, that we may know what our supposed administrators are drawing for their work?

In connection with the finances of the League, let the fact never be lost sight of, that all this money is the Amateur's, unless the fact that *QST* is a profit making venture is admitted. In the issue of July, 1938 on Page 29, *QST* chronicles the appropriation of eleven thousand dollars (\$11,000.00) additional towards the completion of the Maxim Memorial Station. If my memory serves me well, and I believe it does, there had already been appropriated some seven thousand dollars (\$7,000.00) for this purpose. Thus about eighteen thousand dollars of the Amateur's funds have been sunk in this venture. The minutes of the Board meetings and the Executive Committee meetings chronicle the fact that some seven or seven and one-half acres of land were bought, at three hundred dollars an acre. At the outside, including legal fees, title search and so forth this accounts for about two thousand, five hundred dollars. I should like to know, as a member of the League, through the pages of *QST* exactly where this money was spent, how much of the equipment was actually bought and paid for, and how much was contributed by advertisers in *QST* and other sources. It certainly seems to me that

you, as director of this Division should want your fellow amateurs to have a full understanding of this whole affair, especially in view of the fact that we may lose more frequencies, whereupon this station will represent a great loss.

I should like also to know the justification of this expenditure. A good kilowatt rig for C.W. can be assembled for one thousand dollars, and two of these are necessary for simultaneous work on 3.5 and 7 mc. Two additional rigs of equal power, modulated for phone would come to about fifteen hundred a piece, making a total equipment expenditure of about five thousand dollars. Allowing an additional thousand for antennas and receivers, there is still some nine thousand dollars unaccounted for, and that building certainly did not cost any such sum; for a very tidy house, fully equipped and outfitted can be erected today for that amount of money,—and this is merely a station building. It would appear that the American Radio Relay League owes its members a full accounting on this point, and as a Director, I hereby ask you for your cooperation in securing same.

Again, returning to our original premise, that you are to be a candidate to succeed yourself, will you please give me the answer to the following questions, in the form of a statement of your attitude towards League affairs:

1. Do you favor the reorganization of the Headquarters personnel, to an end of bringing about a more placid spirit within the League, and with an eye towards reducing overhead expenses?
2. Do you favor the establishment of a good research laboratory for the benefit of members of the League, using the savings from reduced salaries and other economies as outlined above towards financing such a laboratory? And do you favor the League keeping its own patents for the benefits of its members without having them assigned to the benefit of one or more of its advertisers?
3. Do you favor the separation of the publication business of the League from the present status, and the reorganization of the League as a true Protective Organization devoted faithfully to the cause of the amateur?
4. Will you take a determined stand towards securing more frequencies for the amateur? . . .
5. Do you favor broadcasting from this new Memorial Station, W1AW, all the meetings of the Board and Executive Committee, on 3.9 and 14 mc. phone, so that the members can at least hear what is happening and thus keep informed of the affairs of their League? I am certain that such a move would greatly increase the active interest in League affairs throughout the country, and make the American Amateur more loyal to his League.
6. Will you clearly define your stand on the retention of Paul Segal as counsel to the League, in view of his past record, not only in League matters, but his general practice before the Federal Communications Commission.
7. Will you outline any constructive measures which you may have toward the betterment of amateur radio?

I realize this is a long letter, but I shall anxiously await the courtesy of your answer as these are vital issues and I feel I am entitled to an expression of opinion from the man who represents me at the Board of Directors of the League which I, as a member, help to support.

Thanking you for the courtesy of a prompt reply, I remain,
Yours very truly,
(Sgd.) Llewellyn Bates Keim, W2IKV

Your letter is well couched and certainly unequivocal in its demeanor. W2IKV. We commend you on your initiative in writing your Director, and hope that many, many ham-members will follow suit. As soon as the Directors know that they cannot expect support from "home" unless they "toe the mark," just that soon there will be a marked change in the ARRL situation, and for the better, too.

To all hams, we recommend that they read W2IKV's questions to his Director carefully. There is much food for thought there, and the questions should be answered not only by Director Hill, but by every incumbent or candidate for election.—The Editors.

Bench Notes

(Continued from page 15)

If the higher voltage level is in use in your neighborhoods, change transformer taps when the set is delivered; you will find many of them set for the old 115-volt level. Secondary overload is as important a heat factor as high primary voltage; check against this by noticing, with the proper primary voltage across the power transformer, whether the socket voltages are the correct ones. An overloaded transformer—at any primary voltage—can be detected by socket readings which are too low when the power transformer is too hot. If resistors fail, use the next higher wattage; condensers, the next higher voltage. In properly designed sets, the easiest way to compensate for a raised voltage is,

of course, to bring down all secondary voltages by use of the optimum primary voltage. In the cheaply-designed sets, a little good judgment will be required, as no two sets of conditions will be alike. The important fact to remember is that, regardless of good or poor design, failures are a result of increased heat and voltage.

If your town is planning a voltage boost, notify all your customers, recommending a voltage regulator, reducer, or anything you think best, for your location. Even though the immediate response might be small, your warning will be remembered later, if their set stops for any reason after the line voltage has been increased. There is nothing which reconciles a customer to payment quicker than a set failure you have prophesied.

Feverish Activity

A recent experience with a Fada 25 demonstrated the close relation between heat and voltage failures. The owner reported that his set cut off in the middle of his favorite programs, and that it would not resume operation until the following day. Our "outside man" called at his home during various times in the day when he happened to be in the neighborhood, and reported each time that the set was normal.

We finally explained to the customer the only way we could find the phantom fault would be to live with the set. We did not want to pick it up because of our previous experience with mysterious faults in other sets we picked up and tested in the shop; usually, after wasting our time, we found the trouble to be in a neglected feature in the set owner's house.

He suggested, because the receiver failed most frequently between 8:00 and 9:00 p.m., that we come to his apartment to play cards with him every night until the music stopped. He hoped, he told us good-naturedly, that we were better pinochle players than servicemen. We called at his home after we closed up one night, carrying an analyzer and a copy of Hoyle. We laid the power pack over on its side so that we could make tests, after the set stopped, with a minimum of chassis disturbance.

The Fada quit the first night. I laid down one of the highest melds I ever held in my life to follow the others to the front room. A filter condenser section was shorted; we unbolted the chassis and took it to the shop.

The next day we hooked up the set on the floor. It not only played, but continued to play without interruption during a four-day stalemate. We did not want to deliver the set without making sure we would not be installing a rather expensive filter block unnecessarily; the customer did not want to accept it until after we had given our unqualified okay. Luckily, he was one of those rare persons who realized how tricky a set can be at times, and did not require his repairman to be a cross between Steinmetz and a Hindu mystic.

It was only after we wrapped the power chassis in newspapers that the music was cut off. The filter block was defective, but the trouble did not appear until it had reached a certain operating temperature. We had, by reducing heat dissipation, simulated the operating conditions in the closed console, where the heat from the rectifier tube, assisted by the heat from the tuning

tubes below, brought the block to a temperature which probably provided a shorting path when the pitch softened.

A higher voltage in the customer's house could have caused a similar occurrence, providing the shorting path did not burn badly enough to short out all lower voltages. In this particular case, the voltages were the same in both locations, but the breakdown voltage decreased as the temperature rose.

Pet vs. Pest

A shop underling, after reading last month's mouse-in-chassis incident, offers a suggestion to set manufacturers. While it would not be wise to become too enthusiastic, for fear he might ask for a raise, the recommendation is passed quietly along to the trade for what it is worth: chassis holes should be made either too small for mice, or large enough for cats!

-50-

THE THEORY OF RADIO SERVICE WORK

Priceless Knowledge at your Command

THE PRACTICE OF RADIO SERVICE WORK

Brand NEW and it's a KNOCKOUT!

Here's the BRAINS

- ALL IN 1 BOOK**
Everything you need to know about the theory of radio service work is explained to you in this big Ghirardi book. It teaches you exactly HOW to do every step of it—and WHY. Learn up-to-date factory servicing methods from the experience of leading service organizations—condensed and simplified for you in this convenient source-book.
- BASIC FUNDAMENTALS**
Here in compact form is your complete background in test instrument fundamentals—how they work—how to use them; trouble-shooting; repair methods; and everything else essential for a thorough knowledge of modern radio servicing. Ghirardi makes it all wonderfully clear and easy to understand. With this solid foundation you will be prepared to tackle and solve the most difficult servicing problems you'll ever meet. Make yourself a better, more successful service man. Get your copy at once—with an absolute MONEY-BACK GUARANTEE. Mail coupon today!
- Test Equipment
A 420-page section, giving you the whole theory and construction of every type of test and servicing equipment. Diagrams, construction data, etc., etc.
 - Repairing
154 pages of time-saving repair methods; superlens alignment; interference elimination, etc., etc.
 - Trouble-Shooting
254 pages of latest shortcuts in tracking down all kinds of difficult receiver troubles.
 - Special Problems
442 pages on Auto-Radio installation and servicing. All-Wave sets; High-Fidelity sets; AVC and Q.V.C. circuits; Selling and Advertising; etc., etc.

Here's the DATA

- READY FOR ACTION**
New as tomorrow's radio sets is this latest Ghirardi serviceman's Handbook—a Handbook that IS a Handbook! Data—yes, it's packed jam full of just the kind of practical, time-saving servicing dope you really want in your shop—loads of indispensable, factory-checked servicing data boiled down to the real essentials—tabulated and organized for split-second reference. And right up to the minute—even for the 1939 models!
- 1st Aid for Set Troubles**
Here, right at your finger tips, are the answers to all the "tough ones." A matter of seconds to save hours of fiddling and fussing on hard service jobs. You've just got to see this new book! And you won't have to take a single chance, because with our MONEY-BACK GUARANTEE you can return it within 10 days and get your money refunded. Don't get left behind. Don't let it slide. ORDER YOUR COPY TODAY!
- Case Histories
Trouble Symptoms and remedies for over 2,000 sets, compiled from actual service records.
 - I-F Peaks
Over 12,000 listings for alignment of all superhets, old and new, including 1870 models and "orphans."
 - Auto-Radio
Interference Elimination for over 80 car models; Installation and Car Location Systems; Data Chart; Electrical Wiring Diagrams; Gear Ratios and Dial Directions of Tuning Controls.
 - Other Data
Trouble-Shooting Charts; Servicing Records; Intercommunicating Systems; P-A Systems; Trade Directories; and over 50 other charts and tables on Tubes, Wire, Grid-Bias Resistors, R.M.A. Color Codes, etc. Standard Manual Size (8 1/2x11).

IT'S NEW! RADIO Trouble-Shooter's HANDBOOK

OVER 500 pages

1300 pp. 706 illus.

MAIL NOW!

Radio & Technical Publ. Co., 45 Astor Pl., New York, Dept. RN 118.

Here is \$4 (\$4.50 foreign) for my copy of MODERN RADIO SERVICING.

Here is \$6.50 (\$7 foreign), the "Special Combination Price" for the above book, together with Ghirardi's TROUBLE-SHOOTER'S HANDBOOK (see opposite ad).

NAME.....
ADDRESS.....
CITY.....
STATE.....

Please send free literature concerning detailed contents of MODERN RADIO SERVICING. \$4

MAIL NOW!

Radio & Technical Publ. Co., 45 Astor Pl., New York, Dept. RN-118.

Here is \$3 (\$3.50 foreign) for my copy of RADIO TROUBLE-SHOOTER'S HANDBOOK.

Here is \$6.50 (\$7 foreign), the "Special Combination Price" for the above book, together with MODERN RADIO SERVICING (see opposite ad).

NAME.....
ADDRESS.....
CITY.....
STATE.....

() Please send free literature describing detailed contents of RADIO TROUBLE-SHOOTER'S HANDBOOK. \$3

Classified

Rate 15c per word. Minimum, 10 words.

CORRESPONDENCE COURSES

USED Correspondence Courses and Educational Books sold or rented. Inexpensive. Money-back guarantee. Write for Free Catalog listing 4000 bargains. (Courses Bought.) Lee Mountain, Pisgah, Alabama.

PATENT ATTORNEYS

INVENTORS . . . Protect your rights before disclosing your invention to anyone. Form "Evidence of Conception"; "Schedule of Government and Attorneys' fees" and instructions sent free. Lancaster, Allwine & Rommel, 414 Bowen Building, Washington, D. C.

PATENTS—Advice and booklet free. Highest references. Best results. Promptness assured. Watson E. Coleman. Patent Lawyer, 724 9th Street, Washington, D. C.

HOW to protect and capitalize on your invention. Write for free books answering all the questions you want to know about your patent and its commercial possibilities. Over 63 years' experience. Deferred payment plan. Write for free books today. C. A. Snow & Co., 7115 Snow Building, Washington, D. C.

PATENTS AND INVENTIONS WANTED

INVENTIONS Commercialized. Patented or unpatented. Write Adam Fisher Company, 278 Enright, St. Louis, Missouri.

RADIO ENGINEERING

RADIO Engineering, broadcasting, aviation and police radio, servicing, marine and Morse telegraphy taught thoroughly. All expenses low. Catalog free. Dodge's Institute, Elm St., Valparaiso, Ind.

MISCELLANEOUS

WANTED original poems, songs, for immediate consideration. Send poems to Columbian Music Publishers, Ltd., Dept. 293, Toronto, Can.

BE YOUR OWN BOSS! Operate used-new clothing business from store, home, auto. Up to 300% profit. Everything furnished. Catalog Free! Portnoy, 566-F Roosevelt, Chicago.

RADIO

SWISS radio amateur, who has in view to visit New York next year, would like to correspond with DX'ers. Please address your letters to: Jean Leutenegger, Alt-dorf/Uri, Switzerland.

SAVE money on radio sets, parts, tubes, etc. Send for giant catalogue. United Radio Company, Department R, Newark, N. J.

METER REPAIR—D. C. Milliammeters, springs repaired \$1.75 Change range, new scale \$1.75. Thermocouples 1 to 5 amperes \$2.50. Factory parts used, repairs absolutely guaranteed. 24 hour service. Prices quoted on all repairs. Braden Engineering Co., Dept. A, 1809 Fifth Ave., Dayton, Ohio.

HAM STUFF

BLILEY CRYSTALS: Write for free prices, descriptions. W3DED, Holland, Mich.

SPECIAL RATES FOR READERS

A special classified rate is now offered for readers (non-commercial) who wish to buy, sell, or exchange radio sets, transmitters or parts; 10 words for 50c. Extra words, 15c. Payable in advance.

Simple Low Angle Radiators

(Continued from page 31)

and may be less. The greater the spacing, the lower becomes the angle of radiation. Also the two antennas need not be exactly in parallel relationship in order to perform, although the pattern will be somewhat distorted from the ideal under non-parallel conditions.

The resultant pattern of two half wave antennas with half wave spacing is depicted in Figure 1C. The energy is all concentrated at the useful low angles and without disturbing the original horizontal directivity properties of the antenna. Thus, the usual antennas may be erected with the desired horizontal patterns plus the added feature

amplifier of the transmitter used and the single wire feeder was tapped on to a point of the tank circuit where the most efficient transfer of energy into the antenna was obtained.

The most gratifying results were enjoyed from the start. DX was worked much more consistently than before and with reports averaging two points higher in the S system.

Figure 3 presents three forms of antenna having concentrated low angle characteristics. Figure 3A is an end fed zepp, Figure 3B is a center fed type of zepp, and 3C is the single wire fed version of the double an-

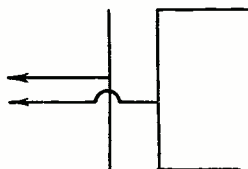


Fig. 3A
End fed double zepp.

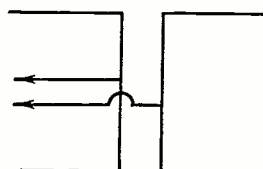


Fig. 3B
Center fed double zepp.

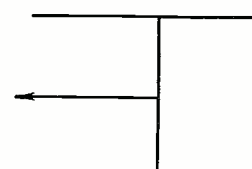


Fig. 3C
Single wire fed double zepp.

of low angle radiation. With the double antenna system, as we shall now call it, advantage may be taken of the practically omni-directional characteristics of a full wave antenna, for instance, but with concentrated low angle radiation.

The principle holds good for harmonic operation also. For example, two sixty-seven foot end fed zepp antennas spaced thirty-three feet would be very effective on seven, fourteen, and twenty-eight megacycles. Although the spacing of the antennas would be only one-fourth wavelength on seven megacycles, it would still be an improvement over a single antenna of the same kind. On fourteen megacycles, the spacing would be one-half wavelength and nearer the ideal, while on twenty-eight megacycles, the situation is even better as the spacing is a full wavelength. Besides, the very fact that the antenna is working on a harmonic in itself adds to the low angle radiation. The horizontal patterns of this antenna would be substantially the same as for a single zepp of the same length as portrayed by Figures 2A for seven megacycles, 2B for fourteen megacycles, and 2C for twenty-eight megacycles.

Possibly what might be considered the simplest form of double antenna was tried at the amateur station of the author's friend, Mr. C. L. Dwyer, W9ZPG. As his was considered the average back yard location, this was a good proving ground for the experiment. There was already erected a sixty-seven foot flat top, forty feet high, with a single wire feed connected eleven feet off center for three band operation. It was an easy matter to string another sixty-seven foot wire parallel to the original thirty-three feet below it and run a straight wire from the eleven foot off center point of one to the other. A single feeder was then connected at the mid-point of the bridging feeder and run straight away into the operating room. Figure 3C illustrates the completed antenna. A parallel tuned tank circuit was link coupled to the final

antenna. The flat tops may be one-half wave long for the lowest frequency band upon which the antenna is to be used. In all three double antennas, the feeders, or feeder, that enter the operating room for coupling to the transmitter, come from the exact center of the feeders, or feeder, that bridge the two antenna elements. This insures that the two antenna elements are fed in phase. The exact distance between the two antennas or the exact length of the bridging feeders are not critical figures, as has been stated before, although greatest permissible spacing is the most desirable. Of course, if vertical facilitations are available for great height, it would be wiser to phase more than two elements with normal spacing, than to phase only two elements with extreme spacing. The antennas of Figure 3 retain all the horizontal patterns of their single predecessors. When the center fed antenna of Figure 3B is used on its second harmonic, it will have broadside horizontal directivity in addition to low angle radiation.

For general DX coverage, the author would advise either the end fed zepp or the single wire fed double systems with the flat tops a full wavelength long for the band upon which the station is most active. With either of these arrangements, the horizontal angles of radiation would be such that effective signals would be emitted in all directions. From a full wave radiator, four lobes emanate, each at an angle of fifty-four degrees in respect to the antenna's horizontal plane, making it practically omni-directional. Figure 2B illustrates the horizontal pattern described. It can be seen that nulls occur immediately broadside to the antenna, so that antenna should be oriented so that these nulls fall in directions where the operator feels he can afford to lose some signal strength. By no means, in actual practice, are results nil in the directions of the nulls, as the radiation lobes of the antenna are rather broad and spread over a lot of territory at dis-

SOLAR

MINICAP

Newest development
in Electrolytic Capacitors
Catalog upon request

SOLAR MFG. CORP. 592-501 Broadway, New York

RADIO COURSES

RADIO OPERATING—BROADCASTING
For Gov't Licence Preparation

- RADIO SERVICING—a practical course
- RADIO AMATEUR CODE • TELEVISION
- ELECTRONICS—1 yr. day course 2 yrs. eve.

Day and Evening Classes. Booklet Upon Request.

New York Y. M. C. A. Schools
7 W. 83rd Street New York City

Trade and Technical School
Licensed by the State of New York

College Grade **ENGINEERING** Credit Courses

Accredited courses in Radio and Electrical Engineering parallel college curricula. Standard college texts basis of formal instruction. Distinguished university faculty insures academic standards of instruction and scholarship. Credits transferable to colleges for advanced standing. Bulletin sent on request.

Newton Institute of Applied Science
2021-M Raymond-Commerce Bldg., Newark, N. J.

HOME STUDY ON THE COLLEGE LEVEL

RADIO IN ITS ENTIRETY!

"B-A" serves the trade with every need in radio—complete 160-page catalog of nationally known radio receivers, public address, parts, supplies and equipment. Orders shipped same day received.

COMPLETE CATALOG AVAILABLE

BURSTEIN-APPLEBEE CO. 1012-14 MCGEE ST., KANSAS CITY, MO.

RADIO ENGINEERING

DEGREE IN 2 YEARS

Intensive, specialized course, including strong basis in mathematics and electrical engineering, and advanced Radio Theory and Design. Modern laboratory, thorough instruction. Low tuition. Self-help opportunities. Also 2-year courses in Aeronautical, Chemical, Civil, Electrical and Mechanical Engineering. Terms open September, December, March, June. Catalog.

INDIANA TECHNICAL COLLEGE
247 East Washington Blvd., Fort Wayne, Indiana

RADIO ENGINEERING

broadcasting, aviation and police radio, servicing, marine radio telegraphy and telephony. Morse telegraphy and railway accounting taught thoroughly. Engineering course of nine months' duration equivalent to three years of college radio work. School established 1874. All expenses low. Catalog free.

Dodge's Institute, Oak St., Valparaiso, Indiana

RADIO ENGINEERING

RCA Institutes offer an intensive course of high standard embracing all phases of Radio and Television. Practical training with modern equipment at New York and Chicago schools. Also specialized courses and Home Study Courses under "No obligation" plan. Catalog Dept. RN-38.

RCA INSTITUTES, Inc.
A Radio Corporation of America Service
75 Varick St., New York 1154 Merchandise Mart, Chicago

Correspondence Courses in **RADIO and ELECTRICAL ENGINEERING**

ELECTRICAL ENGINEERING Get good grasp of wide electrical field. Prepare yourself at Low Cost, for secure future. Modern course. So simplified anyone can understand quickly.

RADIO ENGINEERING Extra fine course in radio, public address, photo-electric work.

Trains you to be super-service man, real vacuum-tube technician. Experimental kits furnished. Diploma on completion. Tuition ONLY \$25. Either course, only \$25. Deferred payment plan available. Write for free copies of school catalogs, student magazines, full details.

SEND NOW!

LOW AS \$25

LINCOLN ENGINEERING SCHOOL, Box 931-A8, Lincoln, Nebr.

tances a few thousand miles away.

At this point, many readers must be wondering whether or not the more efficient types of stub feed systems can be applied to double antenna systems. The answer is yes, although the author is not emphasizing their use as such types of feed limit the antennas to single band operation. It must be borne in mind if designing stub systems of feed that parallel impedances are produced by these double antennas. However,



Fig. 2A. Horizontal pattern of 1/2 wave ant.

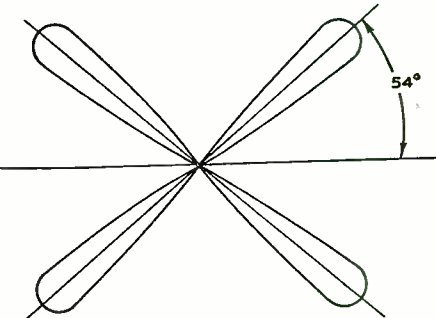


Fig. 2B. Horizontal pattern of full wave ant.

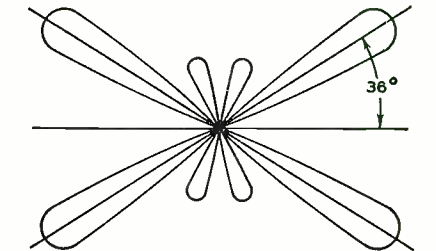


Fig. 2C. Horizontal pattern of 2 wave ant.

as the author is trying to describe antennas that are simple and suitable for multi-band operation, the usual tuned feeders are shown.

Summing up, it might be said that it is highly desirable to have the top element of the double antenna as high as possible and reasonably above surrounding objects, the lower element spaced a half wavelength or more, for the most frequently used band, below the top element, and end feed for multi-band and omni-directional operation. To reduce statements to exact figures, supposing that fourteen megacycles would be the most consistently used DX band, an antenna with six-seven foot flat top elements, thirty-three foot spacing, and zep feed, would give excellent general DX coverage on seven, fourteen, and twenty-eight megacycles.

It is felt that the double antenna allows the average amateur with the average location simple means to avail himself of low angle directivity without limiting himself to any particular area. While no claims of extremely high gain as compared to a rhombic antenna are made for the double antenna, it is a certainty that the systems described offer a vast improvement over ordinary antennas and do not require the amateur to buy a farm for their erection.

RADOLEK

EVERYTHING IN RADIO

1939 RADIO PROFIT GUIDE
RADOLEK COMPANY

Everything in radio in this Big New 1939 RADOLEK PROFIT GUIDE. Radolek has everything under one roof. When you order, you get just what you want promptly and economically. Over 25,000 Radio Servicemen now depend upon Radolek Service. Send for your copy of this big book. It will give you new ideas in conducting your service business on a more profitable basis.

Test Instruments—The most complete line ever displayed in any catalog. Latest improved models that provide every conceivable test necessary for thorough radio receiver analysis and repair. New push button tube testers that simplify and speed up testing time.

Over 12,000 Repair Parts, Tools, etc. Parts to repair any radio receiver made. All leading brands are represented. Every item guaranteed! And all at prices that SAVE YOU MONEY!

All Tubes Represented—RCA, Sylvania, Raytheon, Philco, etc. Includes Kellogg, special Majestic types and transmitting tubes.

Complete Public Address Display. New 1939 model public address amplifiers with outputs from 10 to 90 watts. Complete P. A. Systems for permanent, Mobile and Portable installations. Powerful beam power systems attractively designed and priced for greater profits.

Latest Radio Models. The super values of 1939. New Phono-Radio combinations. Automatic tuning sets with strikingly beautiful cabinets that harmonize with all home furnishings. Also new "Ham" receivers and TRANSMITTERS!

Complete Auto Radio Section. Includes vibrator replacement guide, new auto aerials at new low prices and custom panel control plates for all automobiles. And new Delco Auto Sets that are the easiest to sell with the greatest profits.

Send for **FREE** catalog

The RADOLEK Co.
601 W. Randolph, Chicago, Dept. B-23

Send the Radolek Radio Profit Guide FREE.

Name

Address

Serviceman? Dealer? Experimenter?



Users of condensers are now offered a more critical and conclusive yardstick of condenser quality, in the AEROVOX Capacity and Resistance Bridge. Combines, in a single, portable instrument, the following:

CAPACITY BRIDGE

Measures capacity 100 mmfd. (.0001) to 100 mfd. in 6 ranges; leakage; power factor to 50%, etc., of condensers UNDER ACTUAL WORKING CONDITIONS.

RESISTANCE BRIDGE

Measures resistance values of resistors and electrical equipment and circuits. 10 ohms to 1 megohm in 5 ranges.

INSULATION RESISTANCE

Measures this important factor in condensers and other devices. Meter calibrated directly in megohms. Reads up to 10,000 megohms.

VACUUM-TUBE VOLTMETER

Consists of amplifier stage and grid-leak detector. Measures minute values 0-2 volts.

PRECISION METERS

Voltmeter, also for external use, provides 0-60, 0-300 and 0-600 v. meter at 1000 ohms per volt. Also a 60 mv. at 60 ohms millivoltmeter; and milliammeter 0-6 ma., 0-60 ma.

VARIABLE POWER SUPPLY

Available directly at terminals. 15 to 600 volts continuously variable over entire range.

Ask to See It . . .

- Your local AEROVOX jobber can show you this indispensable instrument. Or write us direct for descriptive literature.



Radio in the Great North

(Continued from page 25)

while heroically but unsuccessfully trying to rescue two of the crew trapped in the cabin. After drifting for five hours in a rubber boat, Ingraham and one other survivor got ashore. Ingraham's burnt feet and fingers became frozen while he and his companion walked fifty miles to the nearest habitation. A runner was sent to the nearest settlement and a radio message for aid was dispatched. An airplane soon appeared and rushed Ingraham to Aklavik, where Doctor Urquhart amputated his gangrened fingers and feet and saved his life.

Radio has been of great assistance to the Royal Canadian Mounted Police in apprehending reckless individuals, and it played an important part in the grim search for Albert Johnson, the "mad trapper," who, within the Arctic Circle, shot Constable Newt Miller and wounded Constable King.

Now, through radio, grain can be shipped from Churchill, Canada's port in Hudson Bay, via Hudson Strait to Europe, with the ice-breaker *N. B. McLean* and radio stations advising the carriers regarding weather and ice floes.

Almost every ship disaster in the Arctic had a tragic ending until radio eliminated many hazards and reduced the risk to a minimum. Homeward bound after delivering supplies to trading posts in the Western Arctic, the staunch supply ship *Baychimo*, owned and operated by the Hudson's Bay Company, was hemmed in by ice off Point Barrow, the most northerly point of the North American continent.

After waiting in vain for an offshore breeze to move the ice out and make a channel, a strong north wind began moving the mighty ice pack landward, threatening to crush the ship like an egg shell in the enormous pressure. A radio message was sent by Captain Cornwell to Northern Air Transport at Nome, six hundred miles to the south, and a tragedy was averted. Crew and passengers, totaling thirty-nine people, were flown to safety and the valuable fur cargo was saved.

On September 5th, on her last trip from Coppermine to her base at Tuktoyaktuk, the *Margaret A* was forced to run to Letty Harbor—between Aklavik, at the Mackenzie Delta, and the mouth of the Coppermine River—to escape the ravages of an Arctic gale that wrecked another freighter, the *Hazel*. Ice formed quickly and before Captain Roberts could get the *Margaret A* under way, the ninety-foot ship was frozen.

Stanley MacMillan set out to rescue the marooned crew of the *Margaret A*. He was stormbound for a few days at Great Bear Lake. Then the priest in charge of the mission at Letty Harbor got a message through advising that flying conditions were favorable there, and he made a dash for the Arctic Coast. After waiting three days for a blizzard to blow itself out at Letty Harbor, MacMillan flew the crew of the *Margaret A* to Edmonton—1500 miles south, as the crow flies—where a large crowd had gathered to welcome them and congratulate MacMillan and his assistant, Bob Hodgins.

Oil and mineral discoveries have resulted in the Far North being cracked open, with airplanes and radio removing the barriers for the progress of commerce and industry. But radio can not be measured in such simple fashion when applied to the lonely trapper or prospector off the beaten path. To him radio means being in constant touch with civilization instead of going back to the dark ages. There is no longer a Far North. Radio has transformed that vast domain into the Near North.

-50-

Serviceman's Experiences

(Continued from page 12)

to one of your old tricks, or you wouldn't appear so alive. I can guess from that one symptom that you are on the verge of giving birth to another illegitimate brainchild. Could I, without inconveniencing you, get this chassis delivered sometime before television sets in?"

"When you hear of *this* invention, your manner will change," I said, with austerity befitting a scientist who holds his work above all personal feeling.

After I installed the repair job, I found time to call at the office of a Dr. Stone. He had medical equipment of a late type which employs a vacuum tube oscillator to induce artificial fever.

"Good afternoon, sir," I said, putting my bundle on his desk. "I want you to help me open some clams."

The doctor smiled. "Sorry," he said, "but I do not handle mental cases."

I explained my plan more fully. Raising his eyebrows in resignation, he said: "In the name of humanity, I will let you work with the diathermy equipment. But I'll be damned if the Hippocratic oath mentioned anything about clams!"

I am sorry to report failure. The clams opened, but, because the high frequency field could not be concentrated across the adductor alone, the entire inner assembly was roasted before the shells came apart. My research was turned into an unscheduled clambake.

Al was raging when I returned to the store. Four calls had come in; we had lost two of them because he could not locate me.

"Where were you?" he yelled. "We threw away half the day's profit while you were out scorching a pathway through science. If you want to stay in business with me, you'll have to promise to lay off those goofy ideas—at least until Ohm's Law is repealed!"

I felt a little guilty and crestfallen, so I promised. When Al gets so narrow-minded he thinks of business only in terms of profit, the best thing to do is agree with him.

It had been a lot of fun, though, especially while the doctor and I were on the air. If you happened to be using a short wave receiver near us that afternoon, you might have heard our 12 megacycle broadcast. If you were listening *very* closely, you would have noticed our carrier was modulated by the soupy death-rattle of a cherrystone clam.

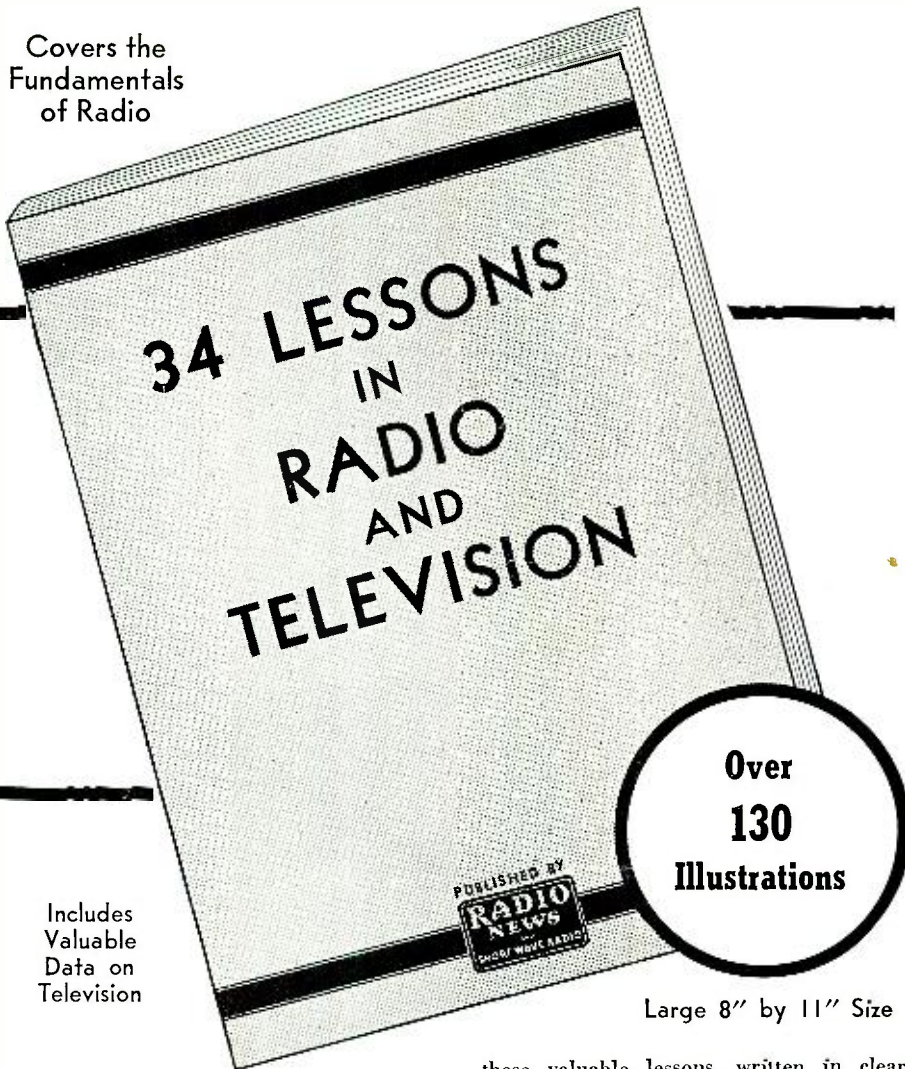
-50-

HERE IT IS

The Instruction Book
That Thousands of
Radio News Readers
Asked Us To Publish

Covers the
Fundamentals
of Radio

Given To You
FREE
If You Subscribe
For 6 Issues Of
Radio News At A
Special Low Rate



"34 Lessons In Radio And Television" will guide you, step by step, in clear, easy-to-understand language, from the elementary theories of radio and electricity to the intricate problems involved in constructing modern radio receivers. You learn how to build carefully designed, high-efficiency receivers—and understand how and why they work! You find out how vacuum tubes operate—what radio frequency, audio frequency, regeneration and automatic volume control mean and what they accomplish—how to become a radio amateur—and all of the other information you have always sought. In addition, this book gives you the necessary background data so that you will be able to build television receivers and understand how and why they work!

Includes
Valuable
Data on
Television

Over
130
Illustrations

Large 8" by 11" Size

Also, Operation of an Audio Amplifier—Fidelity of Amplifiers—Building an Amplifier-Power Unit—Regeneration—Building a Two-Tube Regenerative Tuner—Operation of Pentode Tubes—Advantages of Pentodes—Simple Tuned R. F. Receiver—Discussion of T. R. F. and Superhets—A High-Quality Broadcast Receiver—Automatic Volume Control—Oscillators and Mixers—Facts About Antennas—Photocells—Breaking Into the Amateur Game—and Code Practice Oscillators.

these valuable lessons, written in clear, easy-to-understand language, profusely illustrated with over 130 helpful photographs, diagrams and charts, *absolutely free* in connection with our special offer!

HERE IS OUR OFFER:

You can get a copy of "34 Lessons in Radio and Television" *absolutely free* by placing your subscription today for 6 issues of RADIO NEWS at only \$1. (Canada and Foreign \$1.25.) Act now! Our supply of these books is diminishing rapidly! Present subscribers may obtain the free book by accepting this special offer and having their subscriptions extended for five months.

List of Contents

"34 Lessons In Radio And Television" includes reprints of all installments of "The Radio Beginner" which appeared in RADIO NEWS from May, 1936, to June, 1937. Here is the complete list of contents: Fundamentals of Electricity—Vacuum Tubes—Reception of Radio Waves—Radio Symbols and Circuits—A Simple Diode (or Crystal) Receiver—Operation of Vacuum Tubes—Building a Simple Triode V. T. Receiver—Radio and Audio Frequency Amplification—A One-Stage Audio Amplifier—and How a Power Supply Works.

Vital Data on Television

And, of particular interest to *every* radio man: History of Television—Television with Kerr Cells—Scanning Disk Television—Cathode-Ray Tubes—The Sweep Circuit and Power Supply—Cathode-Ray Tubes in Television—Television Receiver Design—Present-Day Television in the U. S.—and Television Progress Abroad. You get *all*

MAIL THE COUPON NOW!

Radio News, Dept. 381
608 S. Dearborn St.
Chicago, Ill.

Enclosed find \$1. Enter my subscription for 6 issues of RADIO NEWS and send me a free copy of "34 Lessons in Radio And Television." (Canada & Foreign \$1.25.)

Name

Address

City..... State.....

If you are a serviceman, check here

RAD O NEWS

608 S. Dearborn St. Chicago

The S-17 SUPER SKYRIDER

Proved by Popularity

Operating Range—62MC to 545KC
2 Stages of Pre-Selection

Built-In Automatic Noise Limiter

Amateur Radio Operators have conclusively demonstrated their preference for the S-17 Super Skyrider in the past months. Almost without announcement, this model appeared in the Hallicrafters Line, to be greeted with enthusiastic acceptance by amateurs everywhere. Quickly it assumed its place as the most popular receiver of the famous Hallicrafters Line.

And no wonder—the S-17 offers complete coverage from 5 to 550 meters, Two stages of pre-selection, a Dickert Built-In Noise Limiter, 1000° Electrical Band Spread—every electrical and mechanical feature the amateur could want—all available at an extremely modest price for so much real receiver value. See the S-17 Super Skyrider at your dealer's today! Operate it! Compare the value!

5-550 Meters Continuous Coverage
2 Stages Pre-Selection
Built-In Automatic Noise Limiter
13 Tubes
Wide Range Variable Selectivity

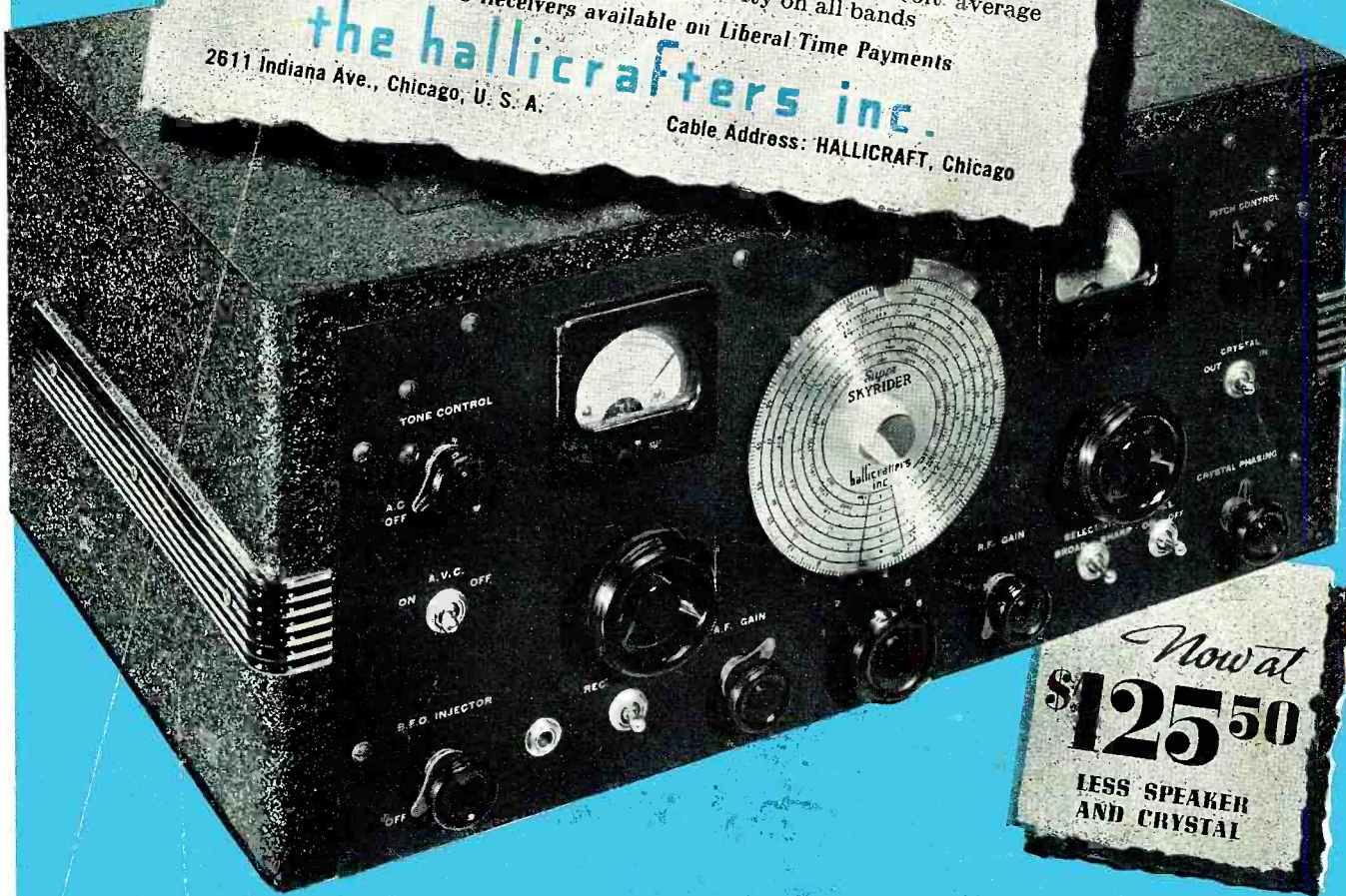
1000° Electrical Band Spread
6 Bands
"S" Meter
Better than 1 microvolt average
Sensitivity on all bands

All Hallicrafters Receivers available on Liberal Time Payments

2611 Indiana Ave., Chicago, U. S. A.

the hallicrafters inc.

Cable Address: HALLCRAFT, Chicago



Now at
\$125.50
LESS SPEAKER
AND CRYSTAL