

June, 1950

40 Cents

45c in Canada

# QST

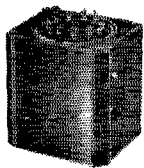
devoted entirely to

# amateur radio

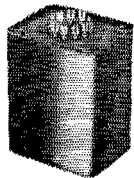


Coming Up! ANNUAL A.R.R.L. FIELD DAY, JUNE 24TH-25TH

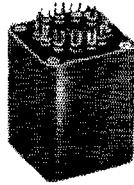
# COMPONENTS FOR EVERY APPLICATION



**LINEAR STANDARD**  
High Fidelity Ideal



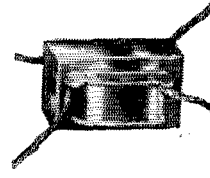
**HIPERM ALLOY**  
High Fidelity . . . Compact



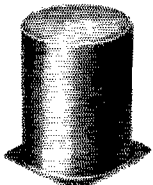
**ULTRA COMPACT**  
Portable . . . High Fidelity



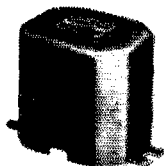
**OUNCER**  
Wide Range . . . 1 ounce



**SUB OUNCER**  
Weight 1/2 ounce



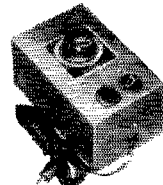
**COMMERCIAL GRADE**  
Industrial Dependability



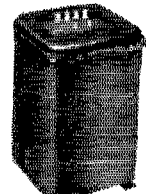
**SPECIAL SERIES**  
Quality for the "Ham"



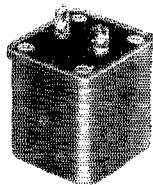
**POWER COMPONENTS**  
Rugged . . . Dependable



**VARITRAN**  
Voltage Adjustors



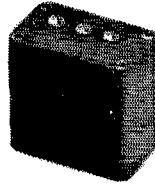
**MODULATION UNITS**  
One watt to 100KW



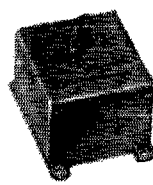
**VARIABLE INDUCTOR**  
Adjust like a Trimmer



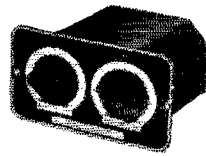
**TOROID HIGH Q COILS**  
Accuracy . . . Stability



**TOROID FILTERS**  
Any type to 300KC



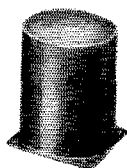
**MU-CORE FILTERS**  
Any type 1/2 - 10,000 cyc.



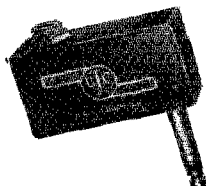
**EQUALIZERS**  
Broadcast & Sound



**PULSE TRANSFORMERS**  
For all Services



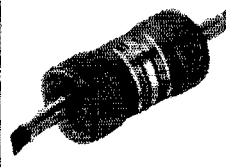
**SATURABLE REACTORS**  
Power or Phase Control



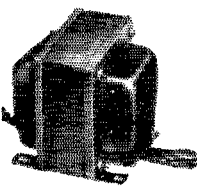
**PLUG IN ADAPTER**  
Impedance Matching



**FOSTERITE**  
Grade 3 JAN Components



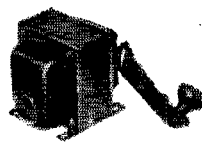
**CABLE TYPE**  
For mike cable line



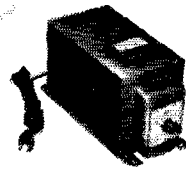
**VERTICAL SHELLS**  
Husky . . . Inexpensive



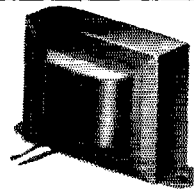
**REPLACEMENT**  
Universal Mounting



**STEP-DOWN**  
Up to 2500W . . . Stock



**LINE ADJUSTORS**  
Match any line voltage



**CHANNEL FRAME**  
Simple Low cost

*United Transformer Co.*

NEW YORK - 100 W. 42ND ST. NEW YORK 17, N.Y.  
 EXPORT DIVISION - 100 W. 42ND ST. NEW YORK 17, N.Y. CABLE: UTRECO

# NEW HIGH-PERVEANCE PAIR



for a new performance "high"  
as frequency multipliers!

**H**ERE are two beam power tubes that outdo corresponding types in perveance. With relatively low plate and screen voltages, you draw high currents.

How high? Either Ken-Rad tube is rated for a total plate current of 100 ma!

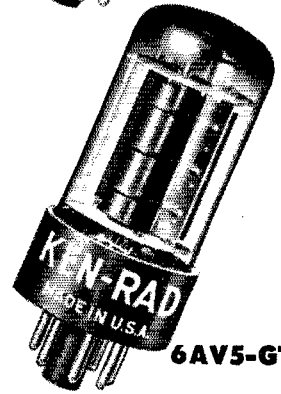
Plate dissipation is substantial, too—11 w. Still better, the tubes will work beautifully with only 100 v on the plate, which means that inexpensive transformerless power supplies (such as those employing selenium rectifiers) can be used. Wrap up these features, along with new-design slick performance generally, and you have a real package of quality . . . and value. For *you'll be paying low receiving-tube prices, remember!*

The 6BQ6-GT and 6AV5-GT are similar electrically. Difference is one of design—the plate lead of one tube connects to a cap on the bulb, that of the other comes out at the base. This gives you a good external-lead pattern when you choose to alternate a series of the tubes as multipliers, with the top of one wired to the base of the next, etc.

Both types serve as horizontal sweep-amplifiers in television, so both are proved in commercial service. See these tubes at your nearby Ken-Rad distributor or dealer. They're new; they're better . . . you'll want them!



**6BQ6-GT**



**6AV5-GT**

## MAXIMUM RATINGS

Both Tubes (Design Center)

D-c plate supply voltage	550 v
D-c screen voltage	200 v
Plate dissipation	11 w
Screen dissipation	2.5 w
Plate current	100 ma

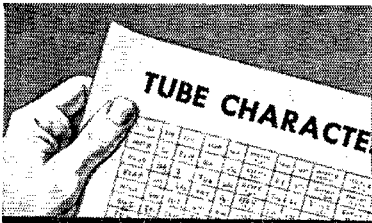
FOR KEN-RAD QUALITY  
LOOK BEYOND THE DATA SHEET!

182-JA27

# KEN-RAD *Radio Tubes*

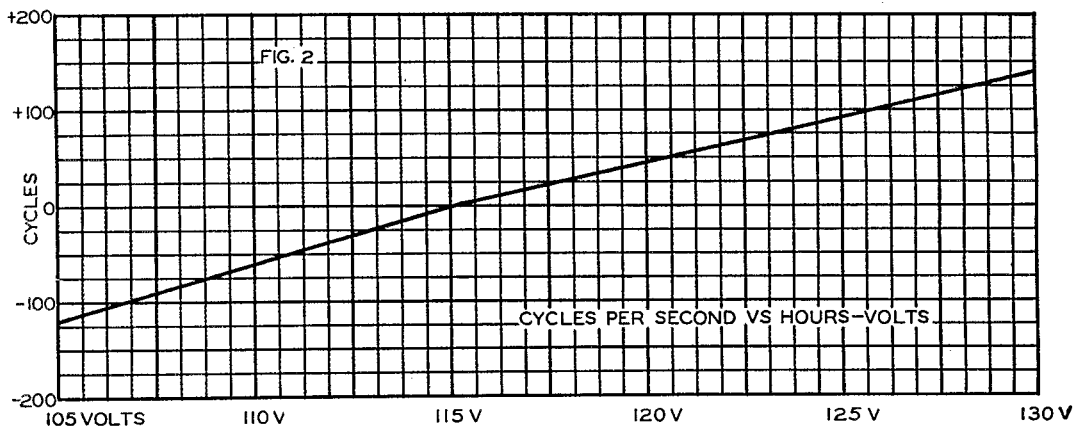
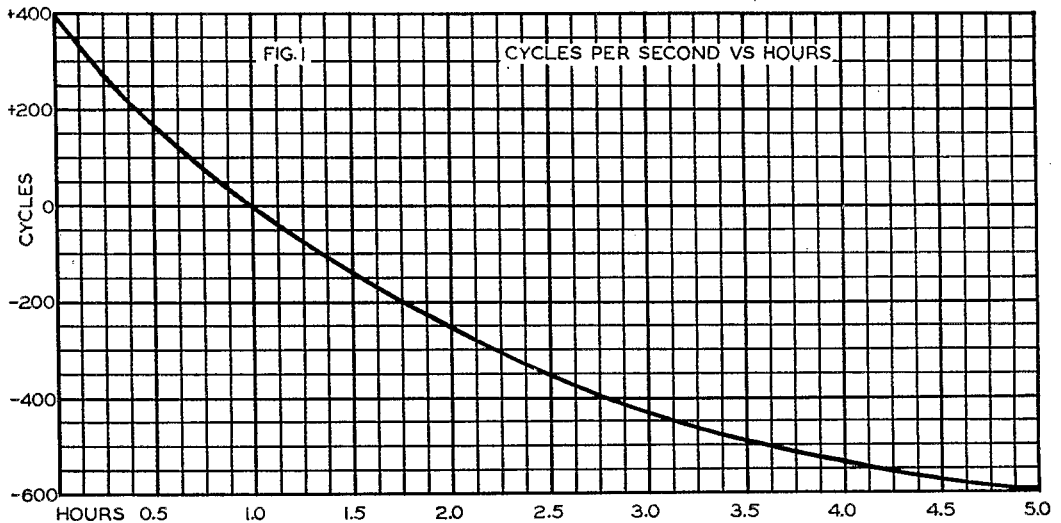
PRODUCT OF GENERAL ELECTRIC COMPANY

Schenectady 5, New York



YOUR PREFERRED SOURCE FOR AMATEUR TUBES IS YOUR NEARBY KEN-RAD DISTRIBUTOR OR DEALER

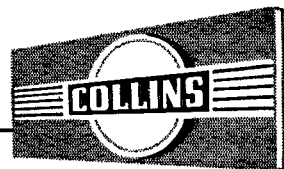
# SSSC Receiver of the Year



We picked a standard Collins 75A-1 receiver at random and tested for over-all warm-up drift (Fig. 1 above) and permanent line voltage variation effect (Fig. 2). All measurements were taken at 28,000,000 cycles, with the BFO on to indicate performance for C-W or SSSC. Instantaneous line voltage changes due to power surges cause no appreciable beat note variation.

These graphs tell the story behind the success so many 75A-1 owners report in receiving SSSC.

FOR RESULTS IN AMATEUR RADIO, IT'S . . .



**COLLINS RADIO COMPANY, Cedar Rapids, Iowa**

11 West 42nd Street, NEW YORK 18

2700 West Olive Avenue, BURBANK





**JUNE 1950**

VOLUME XXXIV • NUMBER 6

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# hallicrafters

## portable is ALREADY going places!

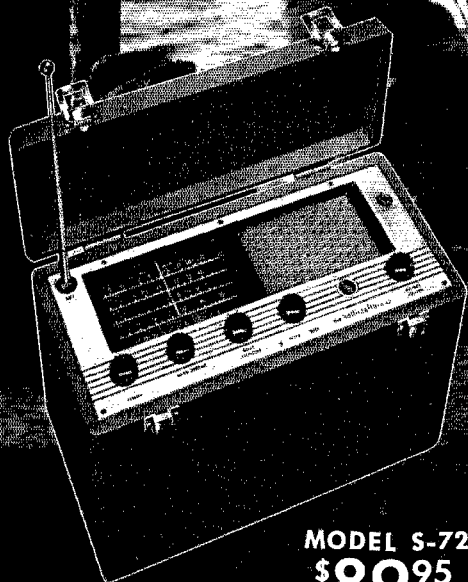
### Amazing new all-purpose portable receiver

Extra sensitivity for weak signal areas . . . extra performance for good Ham operation.

One r-f, two i-f stages. Separate 3-gang bandspread tuning. Two built-in antennas—62-in. collapsible whip for short-wave plus loop for broadcast. 540 kc to 31 Mc in 4 bands. 8 tubes, plus rectifier. Space for 'phones. AC, DC, or battery pack.

### NEW LONG-WAVE VERSION S-72L

Covers airways, ranges, control towers, marine beacons. 175-420 kc, 540 kc to 12.5 Mc. All other features of the S-72. **\$99.95**



MODEL S-72

**\$89<sup>95</sup>**

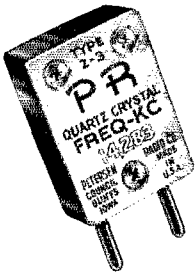
# hallicrafters

*"The Radio Man's Radio"*

4401 W. Fifth Avenue, Chicago 24, Illinois

# NETS

***FOR PLEASURE!.. Says W2KZT***



Channel operation is old stuff. We have had "nets" since the days of the spark gap. Lately, though, new phases of net operation are developing . . . particularly on VHF.

John Osterberg, W2KZT, writes: "There is a growing demand among hams for local nets on six, two and higher bands. A group of us in this vicinity are considering going on the same frequency with a sort of 'channel' arrangement on two meters. Whenever we are in our shacks we will leave our receivers on net frequency . . . immediately available for a call from any of the gang."

Yes, sounds like a lot of fun . . . and handy, too. A very stimulating sideline to regular operating.

Spot frequency net operation for portable mobile offers interesting possibilities as well. A specific frequency on eighty or ten would be mighty handy when operating from the car . . . especially cross-country.

Whatever your plans for channel operation . . . PR is prepared to furnish groups of crystals for spot frequencies on short notice. Take your net problem to any PR jobber. He will get you PR Crystals in a jiffy for any integral frequency within amateur bands — AT NO EXTRA COST.

20 METERS, Type Z-3, \$3.75 • 40, 80 AND 160 METERS, Type Z-2, \$2.75



# Crystals



USE **PR** AND KNOW WHERE YOU ARE

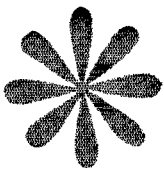
PETERSEN RADIO COMPANY, INC.  
2800 W. BROADWAY • COUNCIL BLUFFS, IOWA

## Section Communications Managers of the ARRL Communications Department

**Reports Invited.** All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio Club reports are also desired by SCMs for inclusion in *QST*. All ARRL Field Organization appointments are now available to League members. These include ORS, OES, OPS, OO and OBS. Also, where vacancies exist SCMs desire applications for SEC, EC, RM, and PAM. In addition to station and leadership appointments for Members, *all amateurs* in the United States and Canada are invited to join the ARRL Emergency Corps (ask for Form 7).

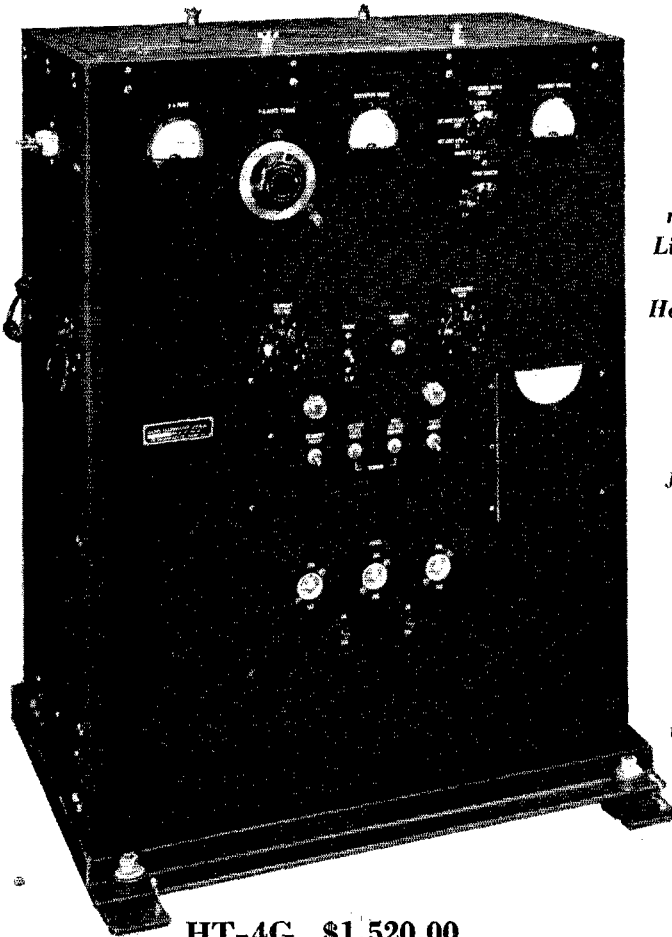
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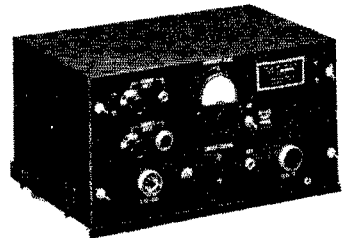
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HT-4G...\$1,520.00

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*All transformers hermetically sealed. Shock mounted for mobile use. Complete with tuning units and output coil sets for 2 to 18 Mc (coils for 28-30 Mc available separately). 450 Watts CW, 300 AM phone. Ask wherever Hallicrafters communications equipment is sold or write to the factory for a spec sheet.*



Speech Amplifier  
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# THE AMERICAN RADIO RELAY LEAGUE, INC.

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

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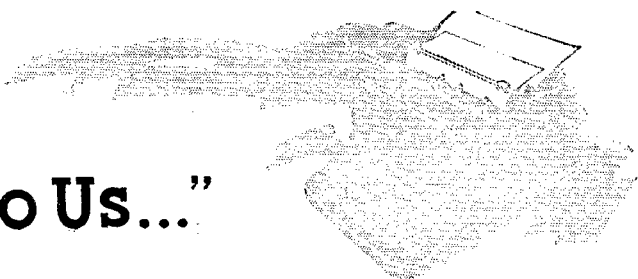
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# "It Seems to Us..."



## GETTING THE MOST . . .

In this day of experts and specialists we are always being told how to get the most out of something, whether it's the shirt with the frayed cuffs that trail whiskers of thread, or Angus, our rich uncle who thinks water is bad for the stomach.

Although the advice may be perfectly sound, like cutting off the frayed cuffs above the elbow to get a simply peachy Hollywood effect or being sure that Uncle Angus' will is properly drawn before putting arsenic in his drinks, we do get fed up with being told all the time how to do it.

And now, out comes the gang at Headquarters with a series of articles, beginning in July *QST*, on getting the most out of ham radio. What's the idea? Isn't ham radio supposed to be fun?

Yes, ham radio is fun. And that's why the series is being written.

Now, of course we do want to add to our knowledge of electronics, we do try to increase our code speed until we can rattle a bug at 35 per and nonchalantly copy press a line behind, we do knock ourselves out to get that last message off the hook, and we are rightfully proud that all branches of the armed forces consider us, the amateurs, to be one of the country's greatest assets if war should come.

But it is doubtful that any one of us became a ham because of these things, important though they are. Most of us were first attracted by amateur radio and are still held by its fascination because of just one thing: we can talk to someone. Sure, we rebuild our stations and antennas, we experiment with different types of emission and in different frequency bands. But why? So we can communicate better. Amateur radio is the hobby of communication.

Exchange of thoughts has always been of primary interest to man and certainly it is more interesting when this mutual understanding is accomplished over a distance. Reception of a message from a far-off person, whether on clay tablets, papyrus, birch bark, or paper, has always been an occasion of moment. How-

ever, it takes time for the answer to get back even when fast planes carry the word. How much more exciting it is if the exchange of ideas can be made with no waiting.

The progressive uses of smoke signals, drums, semaphores, heliographs, the telegraph, the telephone, mark milestones of progress. Radio communication in its many forms represents the greatest forward step of all. Is it any wonder that we radio amateurs believe our hobby is the most fascinating, the most interesting, the most enjoyable of all? The desire to communicate is an inherent part of the make-up of mankind.

Does this hobby of ours demand much money? Certainly not. Oh, yes, sometimes the seat of operations does rest on a cushioned swivel beside the console control desk which matches the pine-paneled room. But it's more likely to be on that old chair from the attic, the one held up by three legs and a discarded transmitter chassis, with the location of the not-too-clean equipment ("Don't ever dust my radio station, dear—you might get killed") causing bed-making to be pretty tough.

Collecting is fun, whether of stamps, coins, antiques or butterflies. So is photography, both still and movie. Operating model airplanes, cars, or railroads has many devotees. There are thousands of home workshops. Yet, how often the philatelist, the photographer, the bookshelf-maker and all the rest must turn an envious eye on us hams. Ours is a hobby of constant action.

When the coins are classified, there's not much left for the numismatist to do. And who wants to see the pictures that the photographer spent so much time and effort in getting? True, the model planes and model trains move, although mostly in circles. But to us, the fun of building the station and the satisfaction of making it work are only the beginning. The big thrill of talking to other amateurs in the next block, the next state, the other end of the country, even the far corners of the globe, is ours. It's ours to command, and to command today, tomorrow, next year, any time. No matter what the time of year or



the hour of the day or night, we can — by using the proper frequency band — always talk with somebody, somewhere.

Let's remember that phrase "by using the proper frequency band." Maybe the 10-meter 'phone man shuts off the rig in disgust because, to him, there's nothing doing on the air. The band is dead. But on 80-meter c.w. the stuff is really pouring in. Fifty-watt stations are working across the continent and a few Europeans are coming through, besides. Or perhaps the 7-Mc. 35-w.p.m. fellow who scoffs at 'Phone Hounds would be a lot happier in a 75-meter round table when 40-meter signals have that hollow sound. And DX on 20-meter c.w. might be a welcome change from sitting in front of a 'speaker and listening to the too-well-known voice of a 144-Mc. nightly performer a few miles away.

Unfortunately, many of us get in an operating rut. We forget how great is the panorama of amateur operating possibilities extending before us. We hams don't have just a few frequencies. We have our choice of any frequency in many entire bands of frequencies. Here's 160 meters. Few of us have tried it since the war. It might furnish a kick. Next comes 80 meters with rag-chewing and organized traffic handling available, and the adjoining 75-meter 'phone band, a more intimate segment filled with voices of fellows — and girls — who talk to each other night after night, but who are always happy to welcome a newcomer. Forty-meter c.w. is the next higher frequency band — 300 kilocycles of it in which we can work every state and a good bit of DX, besides. Now comes 20-meter c.w. for the real DX Hound, with 20-meter 'phone for his more articulate brother. Ten-meter 'phone, from DX corner to the high end, is next and the brasspounder in his little segment can often add a new country, too. Six meters? "Aw, that's no good," we might say — but let's not sell it short. More and more stations are making WAS on this band, and no one gets a bigger kick out of ham radio than the 6-meter guy when there's an opening. Two meters is the next band available, and the gang with easily-constructed and rotated beams is in there every night and having a lot of fun. Next — but how many bands do we have, anyway? We've already taken a brief look at seven of them and nothing was said about 11 meters nor the sometime-in-the-future 15-meter (21-Mc.) assignment. And there are still more. The 220-Mc. band and the 420-Mc. band are in almost daily use. Some of the boys are experimenting in the 1215-Mc. band and in other higher-frequency assignments, where they work with real microwaves.

However, it's not just a question of whether to operate c.w. or 'phone, nor of which band to

work. There's another consideration: how to use our time on the air. Of course, the basis of ham radio is casual conversation, rag-chewing. But there is much more we can do.

ARRL offers many awards, some easy to earn, some difficult, all of them interesting. Certain foreign certificates of performance are well worth earning.

Who hasn't tried his hand or tonsils at knocking off a few foreigners at one time or another? There's no more enthusiastic gang in ham radio than the DX Hounds.

And as for contests, well, lots of us just live from one contest to the next. Snappy operating, intelligent handling of equipment; contest operating calls for both of these.

Handling traffic. Let's not forget that word "Relay" in the name of our amateur organization, the American Radio Relay League. Relaying of messages is basic, it's important, but more than that, it's a lot of fun.

Emergency operation. We are justly proud of the Amateur Emergency Corps, the League set-up for emergencies. It is nation-wide, carefully organized and ready to operate when disaster strikes.

So, some activities are competitive, some are wholly cooperative. Naturally, we try to get a higher score in the SS Contest than our friend in the next state. What? Old Joe has 110 confirmed? Boy, we'll catch him if we have to stay up all night for the next month. But all of us have had those same rivals test with us for hours, help us with the new rig or mast, send a QSL when we needed it.

All these subjects will be covered in the coming *QST* articles announced elsewhere on this page. We hope you like them. We hope you find them interesting. But, most important, it is our sincere desire that the series will do what it is being written to do: help you to have more fun in the best hobby of all — help you to get the most out of amateur radio.

### ***Starting in July QST . . .***

. . . an interesting and informative series of operating articles dedicated to "getting the most out of amateur radio." Look for these titles in the issues to come:

*The Basic Procedure of Amateur Operating  
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Organized Traffic Handling  
ARRL Field Organization  
Operating in Emergencies  
How To Handle a Message  
TVI and Public Relations  
General Operating  
Keeping a Log  
Working DX  
QSL Cards  
Contests  
Awards*

• Planned and written by the ARRL Hq. staff.

# Amateur Television—A Progress Report

BY EDWARD P. TILTON,\* W1HDQ

TELEVISION is not exactly new to amateur radio. Though most of us paid little attention to TV until the "I" was added, making television our Number One Menace, the facts are that enterprising amateurs have been playing with this branch of the electronics art for a matter of 25 years or more. Doubtters are referred to files of *QST* dating back to the '20s for proof that there was amateur television before many of our present-day amateurs were born.

The methods they used bore little resemblance to the techniques employed today, to be sure, but hams were sending and receiving pictures (or trying to) a generation ago. *QST* carried many articles on television from 1925 on, and there was plenty of interest — for a while. But the work was being done by the motor-driven scanning disc method, and it was doomed to failure. Though many dollars and man-hours were spent on the problem, nobody succeeded in developing mechanical systems that were completely practical. As early as 1928, a *QST* author<sup>1</sup> was pointing out the possibilities of electronic television, using the then rare-and-expensive cathode-ray tube. The days of the scanning disc were numbered.

\*V.H.F. Editor, *QST*.

<sup>1</sup>"Radiovision," Dewhirst, Sept., 1928, *QST*, page 15.

<sup>2</sup>"Television — What About It?" Hull, Nov., 1931, *QST*, page 20.

By January, 1929, The Old Man was ready to write "finis" to the story of television by mechanical means, and he did just that in one of his terse classics called "Rotten Television." With his faith in man's ability to accomplish anything he sets out to do, Hiram Percy Maxim was sure that television would be made practical, but his keen insight in such matters told him almost at once that mechanical scanning was not the way to do it, and he said so, in no uncertain terms!

But predicting the coming of electronic television and bringing it about were two quite different matters. The cathode-ray tube was a laboratory curiosity, and it was to remain so for some years to come, so far as most of us were concerned. Though it had become fashionable, by 1931, to say that "Television is just around the corner," a careful survey by Technical Editor Lamb and Associate Editor Hull resulted in a statement by the latter<sup>2</sup> that cathode-ray technique was promising, that higher-definition television was on the way, but that the "corner" was still a long hike away, for the average amateur or potential home-receiver owner.

Not until 1937 was the heading "Television" to appear again in the *QST* yearly index. By then the problems involved in electronic television were gradually being solved. Usable components were beginning to appear, and television



This is the way Robert Sutherland, W6UOV, Oakland, Calif., handles TV transmission and reception. His hand rests on the monitor scope in the top section. Camera control and power supplies occupy the next two decks, with an APS-13 receiver just visible at the bottom of the picture. The camera in the foreground has its case removed to facilitate test and adjustment. A coaxial amplifier unit for higher power output is now being tested. It appears in the photo at the right.



Bob Melvin, W6VSV, Berkeley, Calif., with his TV set-up. The top deck is the 420-Mc. transmitter, with an 832-A in the final stage. Next below is a sync generator, with the camera control and power supplies, in that order. Bob says that this is a more elaborate set-up than is necessary for good amateur picture transmission. The sync generator, with its 30 tubes, has been found dispensable, for all practical purposes. On the shelf at the right is the 4X-150-A coaxial amplifier of W6UOV.

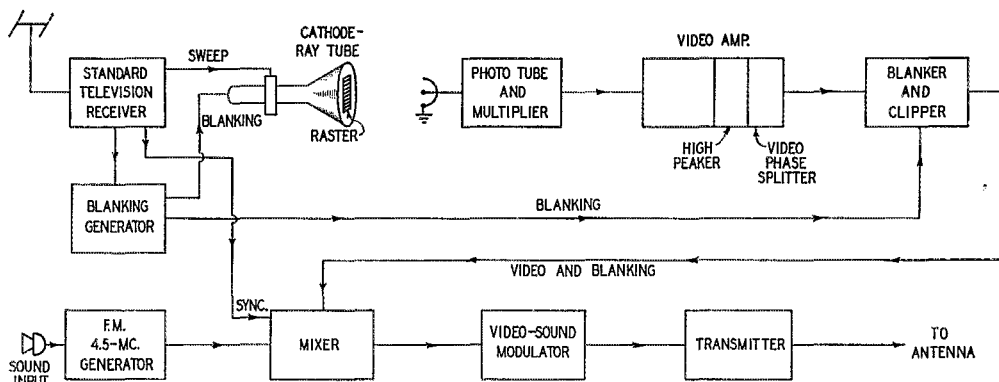


Fig. 1 — Block diagram of the television system used by W2LNP.

experimental work loomed as a possible field for the more advanced (and financially well-fixed) amateur. Again, *QST* devoted considerable space to television articles, leading off with a memorable series of seven by Marshall Wilder, W2KJL, beginning in December, 1937. For more than two years almost every issue of *QST* carried something on television, but it was mostly concerned with the receiving end. The generation of a television picture for transmission was still considered to be beyond the radio amateur, until moderately-priced iconoscope tubes were introduced for amateur use in 1940.

Television transmitter and camera design were treated extensively in *QST* for 1940, and on September 27th of that year what is believed to have been the first two-way television communication between amateur stations took place. W2USA, operating from the Communications Building in the New York World's Fair, maintained simultaneous sight and sound contact with W2DKJ/2, in the Daily News Building in New York City, the stations operating on 56 and 112 Mc. Ten major television articles appeared in *QST* in 1940, but they failed to stir appreciable response within amateur ranks, except on the part of a few exceptionally well-qualified engineer-amateurs, and the balance of the prewar period saw interest lagging.

The highly-involved and expensive process involved in getting on the air for actual television communication was just too much for most of us, and progress in amateur television slowed to a standstill until well into the postwar period. Meanwhile, thousands of amateurs and would-be amateurs had been exposed to cathode-ray techniques in one form or another during the war, and another generation of hams, brought up on radio and electronics, was coming along. Television receivers were becoming commonplace fixtures in many homes, and electronics schools were grinding out TV technicians by the hundreds. These factors, combined with the availability of most of the needed components on the surplus market, gave amateur television the push

that it had always needed, and the period since 1948 has seen more amateur TV activity than existed in all previous years combined.

From several cities in this country and abroad has come news of progress in amateur television, and, unlike the prewar work, much of the effort has been concerned with transmitting. The trend, in this country, has been to use transmitting systems that would tie in with those employed in commercial services, so that ordinary home television receivers could be used for amateur work by the addition of a simple converter. In this country amateur TV is limited to the frequencies from 420 Mc. up, because of the bandwidth involved, but in some European countries there has been experimentation with the r.f. sections operating in the 2-meter band. So that interested parties may know how the problem is being attacked in various places, we present a summary of the work now going on and the methods being used.

#### TV in the Bay Area

Perhaps the first amateur to put a standard RMA television image on the air was W6JDI, Burlingame, Calif., who was transmitting a monoscope test pattern as far back as May, 1948. In November of that year he was received successfully by Bob Melvin, W6VSV, Berkeley, a distance of 25 miles or so. The W6JDI transmitter was a pair of 8012s operating on about 423 Mc., modulated with the RMA standard 525-line picture, interlaced 2 to 1, making it receivable on a standard home television receiver with a 420-Mc. converter.

The work of W6JDI was featured in the San Francisco *Call-Bulletin* of December 16, 1948, with the operator, Clarence Wolfe, jr., receiving attention as the first person to transmit television successfully in the Bay area. His work antedated the appearance of commercial television in that region by about 9 months.

He was followed in December, 1948, by W6WCD, San Francisco, who was also being received in Berkeley by W6VSV. W6WCD was

transmitting a 262½-line noninterlaced signal, 60 frames per second. He started with a modulated-oscillator r.f. section, changing soon to crystal control.

The first live pictures were transmitted by W6VSV, in March, 1949, using an RCA 5527 iconoscope and an *f* 1.9 lens in the camera equipment. Bob also started with a 6J6 oscillator, changing to an 832 tripler, with crystal control, eventually followed by an 832 amplifier, on 423 Mc. He uses 262½-line noninterlaced scanning, at 15,750 and 60 cycles. The picture is receivable on home TV sets equipped with 420-Mc. converters.

Pictures are clear and stable, despite the lack of a sync generator. Bob has built a sync generator, but he feels that this complex equipment (his has some 30 tubes) is not required in amateur work, the receiver locking nicely on the blanking pulses. Indoor shots are made easily using two No. 2 photoflood lights. Best DX for W6VSV-TV is W6CGG, San Mateo, who receives the picture over a path of some 25 miles.

A particularly interesting feature of W6VSV's transmissions is the combination of sound and video on the same frequency. His transmitter oscillator is frequency-modulated slightly, to give an f.m. deviation of about 20 kc. at 420 Mc. The video is grid-modulated a.m. Using a standard TV receiver there is no ill effect on the picture quality from the frequency modulation for the sound. The audio is picked up by a separate 420-Mc. receiver having f.m. detection. A 923-A surplus job is used for receiving the sound, and no video modulation is present in any type of f.m. receiver that has a satisfactory limiter to remove the video a.m. Alternatively, the sound is transmitted separately on 144 Mc. The equipment of W6VSV has been used in a number of successful demonstrations at hamfests, schools, and public meetings of various kinds.

Another Berkeley TV enthusiast is Milton Cooper, W6QT. Milt also uses a camera with a 5527, using circuits provided with the tube, but with minor changes. His camera design is similar to that of W6VSV, except that the latter has his in several units, while the W6QT camera is a single assembly. The transmitter r.f. section is an

SCR-522, with the output stage tripling to 432 Mc. This drives two additional 832s as cascaded amplifiers. The second 832 straight amplifier adds considerably to the output, and the stability is good. This is occasionally used to drive an APT-5 cavity oscillator which has been converted to amplifier service, running 100 watts input.

Other TV stations actually on the air in the Bay area include W6RXW, W6UOV, and W6VQV. W6MTJ, W6AQV, and W6WGM are working on TV gear, and others are expected soon. W6UOV is working on a tripler-amplifier using 4-X150-A tetrodes, with the hope of putting out a more powerful TV signal. Antenna systems used in the TV work are mostly 16-element jobs, with horizontal polarization.

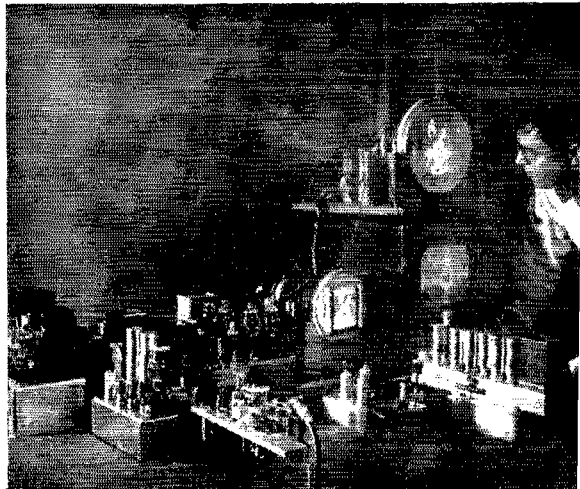
### *A Novel Way To Get Started*

The cost and complexity of TV gear has so far left most amateurs convinced that television is not for them, but ways are gradually being found to cut corners. While not even the most rabid video enthusiast would yet say that TV technique has reached the beginner stage, there have been several ideas developed recently for bringing the transmission of television nearer to the abilities of the average experienced ham. One such simplified system has been developed by J. R. Popkin-Clurman, W2LNP. It was demonstrated by him, to a capacity crowd, at a recent meeting of the Amateur V.H.F. Institute of New York.

Ray simplifies matters for the ham who would like to transmit transparencies (film negatives or positives, movies, diagrams, visual messages) without going into the complexities of camera design and construction. He also lets a local TV station, and a standard TV receiver, do some of the work. The system used by W2LNP is shown in block-diagram form in Fig. 1. The photograph shows the complete set-up under actual operating conditions. A standard TV receiver is tuned to a local station and the lead from the receiver video amplifier to the cathode-ray tube is disconnected and the output of the amplifier is fed to a blanking generator. The output of the blanking generator is applied to the receiver cathode-ray tube, the raster of which is used as a light source.

In the simplest form of picture transmission a

Photographed in a darkened room to show the equipment in actual operation, J. R. Popkin-Clurman, W2LNP, demonstrates his system for transmitting and receiving amateur TV on 420 Mc. Ray is adjusting the pick-up unit containing the photo tube and video amplifier. Opposite this is the cathode-ray tube with a transparency mounted on its face. At the upper right is the receiver tube, showing the system fidelity. The 420-Mc. transmitter and converter are in the foreground. The video modulator blanking, sync and sound mixers (shown as three units in the block diagram) are combined on the small chassis at the left front. At the rear are power supplies and a unit containing sweep circuits, high-voltage supply, and sync and blanking generators. This is not required if a television receiver is used as outlined in the text.



transparency is placed directly on the face of the cathode-ray tube, which for this purpose can be almost any type, including the war-surplus P-7 phosphor radar jobs. Light from the raster, passing through the transparency, is picked up by a photo tube and multiplier and fed to a video-amplifier unit that includes a high-frequency peaker and possibly a video phase inverter. The latter is used only if it is desired to transmit negatives in positive form. After a clipper and blanking inserter and a mixer the signal is ready for the modulator and transmitter. Sound and video are transmitted on the same channel by frequency modulating a 4.5-Mc. oscillator and modulating the 420-Mc. transmitter simultaneously with this and the video, by means of the video-sound modulator.

The signal thus transmitted has all the characteristics of a commercial video transmission, and may be received on any standard home television receiver equipped with a 420-Mc. converter. In the absence of a local TV station it is merely necessary to derive the sync and blanking from the receiver's own sweep circuits. In this case the picture will have only 262 lines, noninterlaced. It retains the same horizontal resolution, but the vertical resolution is reduced. In this type of operation it is desirable to sync the vertical to the 60-cycle power supply, to reduce hum effects.

The photo tube is the 931-A multiplier type widely used as a noise source in radar jammers such as the APT-5, and thus available on the surplus market. In the noise-generator applications use is made of the extreme amplification capabilities of the tube, but in this case the maximum gain is not employed. If the tube's noise level is reached it will show up as snow in the picture. The output of the photo tube is fed into a series of video amplifiers, one of which is a high-frequency peaker. This is necessary to compensate for the build-up and decay times of the cathode-ray tube's phosphor screen.

The r.f. section of the transmitter used by W2LNP is a crystal-controlled job with an 832 amplifier in the final stage. The receiver has a crystal mixer and a 6J6 oscillator, followed by a cascode amplifier working into a home television receiver operating on Channel 3. The channel used for the i.f. should be one that is not in use

locally, and should be in the low TV band for best results.

This system may be adapted for transmission of movies. A film-projector light source is removed, and the photo tube installed in its place. A 60-cycle synchronous motor is used to drive the film sprocket and the film is run at 30 frames per second instead of 24. It is necessary to blank the raster during the film pull-down time. Pictures of live subjects may also be transmitted by projecting the light from the raster on the subject and collecting the reflected light with a condensing-lens system for the photo tube. Considerably greater light is needed than for transparencies, and a 5TP4 or a 5WP15 projection cathode-ray tube, with its associated high voltage, is suitable.

### *The British Amateur Television Club*

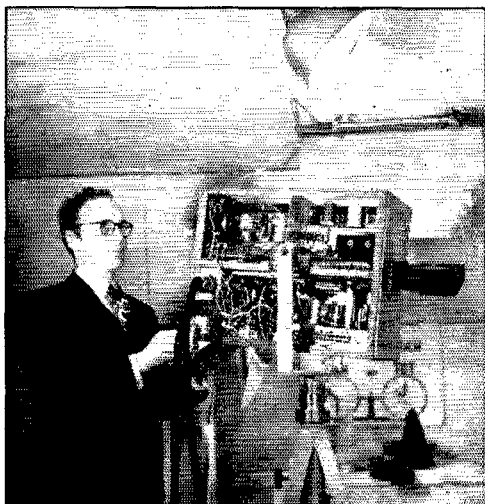
Ham TV activity in England is being coordinated through an informal organization known as the British Amateur Television Club, Mike Barlow, G3CVO, secretary. Standardization of equipment to tie in with BBC transmissions (405 lines, double interlaced, 200 lines, noninterlaced, positive modulation, sound transmitted separately) is urged. Permission for use of the 420-Mc. band for TV is being requested of the GPO at this writing.

The club publishes a small mimeographed magazine, *CQ TV*, containing the latest news and technical information. Members are active on many ham bands, and schedules are kept on 3780 kc. each Saturday at 9 and 10 P.M. for the express purpose of discussing TV problems. Two issues of *CQ TV* we have at hand contain news of the doings of Gs 3GBO, 3CVO, 2DUS, 2FXA, 5ZT, 3ETI, and numerous TV experimenters who do not have transmitting licenses as yet. Several are reported ready to go on the air when 420-Mc. TV permission is granted. A suggestion contained in their paper might well be followed in this country: that amateur TV work be carried on in that part of the 420-Mc. band not harmonically related to the 144-Mc. band. The 420 band is certainly wide enough for all of us, and this division (TV below 432 Mc., regular communication above) would help to make full use of the assignment, and keep us out of each other's hair.

A late addition to our file of amateur TV photographs is this shot of PA0XN-TV, Haarlem, Netherlands. The operator at the left is A. F. van Aggelen, PA0XN, making adjustments while an assistant checks the received picture. The rig is on 144 Mc., running 100 watts to a pair of 4-65As, driven by an ARC-5 exciter. Racks, from bottom to top: high-voltage power supply, regulated supply, switchboard with filament transformers, exciter and sync unit, pulse mixer and shaper, control tubes, line-amplifier mixer and modulator, and final stage.



**QST** for



TV camera built by members of the Groningen, Netherlands, section of the VERON, contains an electronic view-finder, video preamplifier, 5527 iconoscope, pulse and sawtooth generators, and a blanking and sync mixing unit. The camera operator is Lou Foreman, PAØVT.

#### *Amateur Television in the Netherlands*

In early 1948 a group of members of the Groningen section of the Amateur Radio Society of the Netherlands (VERON) started construction of a television station. This project was undertaken in order to provide a demonstration set-up for a large fair held in Groningen in September of that year. As the result of considerable effort on the part of PAØs BE, BF, GWT, VT, TB, WL, and ZX the job was done on time, and 15,000 visitors saw the amateur television station in actual on-the-air operation, many of them being given an opportunity to see and talk with friends who were at the camera position.

Duplex radiotelephone communication was maintained on 2 and 80 meters, between the camera and receiver positions, separated by 400 yards, and at times when no live talent was available the camera was left focused on an exhibit housed in a huge coffee pot, one of the landmarks of the fair.

The camera equipment used an RCA 5527 iconoscope, with sequential scanning, 250-line definition, 50 frames per second. Associated circuits and controls (shading, blanking, sync generator, and mixing) and an electronic view-finder, all at the camera position, enabled one operator to handle the job at that end. The transmitter was a 100-watt job, operated on 59 Mc. by special permission of the Netherlands licensing authority. The receiver was a converted Gee navigational-aid set.

Picture quality was good under sunlight conditions, and fair at night, when spotlight illumina-



Grouped around a homebuilt amateur TV receiver at Groningen are Henry de Waard, PAØZX, Harry Beenen, PAØBE, and Dick Lemstra, PAØTB. With this unit the 144-Mc. television transmissions from PAØVT have been received over distances up to 23 miles. (Photos by PAØUSA)

tion was used. Work on the equipment after the exhibition improved the nighttime picture quality, and the range was extended to as much as 25 miles. The gear was demonstrated at the annual PAØ conference at Utrecht later in the year.

In January, 1949, it was necessary to change over to 145 Mc. for transmitting, as the 59-Mc. frequency was discontinued as an amateur assignment. The 145-Mc. rig using an 829 final, grid-modulated, was used for a demonstration at another fair in August, 1949, this time at Winschoten, and has since been in operation at PAØVT. He has added a control unit containing three cathode-ray tubes, permitting monitoring of the signal before and after transmission, and inspection of the r.f. envelope.

Transmissions are made each Saturday evening between 2000 and 2230 local time. Talks and demonstrations by visiting amateurs are featured, and test patterns are transmitted at other times. Reception is good at distances up to 30 miles, and a number of receivers have been built especially to pick up these transmissions. Sound is transmitted on 29.6 Mc.

Thus, it appears that amateur television is now well under way, the moves in this direction having been made more or less simultaneously in many widely-separated areas. The necessary equipment is now available, interest is growing, and a new chapter in the history of amateur radio is being written. If you are helping to write it let us know what you are doing in the TV field, and how you are doing it, in order that the story of ham TV can be properly told in *QST*.

# An All-Band Mobile Antenna System

2 to 160 Meters with One Installation

BY S. S. PERRY, \* WIBB

SINCE 1936, WIBB has been working portable and mobile, using all available bands, both c.w. and 'phone. The most important single factor in successful work has been found to be the antenna.

Last summer and fall I made quite a project of trying out and making comparative tests of many of the mobile antennas that have been described in the last several years, plus some of my own design. The purpose was to develop an antenna that would best answer my own requirements for efficient all-band mobile operation.

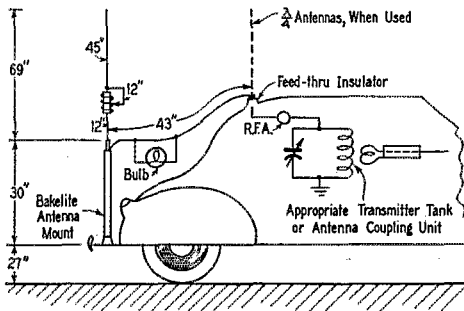


Fig. 1—The WIBB center-loaded all-band mobile antenna installation. As an alternative to feeding through an insulator in the roof of the car, the connection to the coupling circuit may be made through the bakelite tubing mount, when the transmitter is mounted in the car trunk.

For operation on 2, 6 and 10 meters a quarter-wave whip mounted as high and in the clear on the car as possible, and fed with coaxial cable, is ideal. On the lower frequencies a loaded whip is very suitable. Without going into a lot of detail regarding the tests, suffice to say that a center-loaded antenna was found to measure up best to my requirements.

The antenna that developed from a long series of tests is shown in Fig. 1 and the photographs. The mount is a 1 1/4-inch o.d. by 3/4-inch i.d. bakelite tube, 30 inches long, fitted with a Johnson No. 70 3/8-inch jumbo jack into which 3/8-inch antenna rods can easily be plugged. This bakelite mount is screwed on with standard iron-pipe fittings to a steel bracket bolted under the bumper guard.

The loading coil consists of 200 turns of No. 22 d.s.c. tinned wire tapped every 5 turns with a small soldering lug, and given two coats of lac-

quer. The coil is wound on a 12-inch length of 1 1/4-inch o.d. by 1-inch i.d. bakelite tubing. Plugs made from 1-inch diameter brass rod, 5/8 inch long, are fitted into both ends of the tube and fastened in place. These plugs have jumbo jacks mounted on them. The supporting 3/8-inch antenna rod plugs into the bottom, and a standard broadcast adjustable auto whip antenna plugs into the top.

The entire assembly may be taken apart in seconds. This type of installation does not mar the car, and lends itself well to either trunk feed or roof feed through a top insulator. The latter is used in my case. The horizontal feed wire from the roof insulator is supported part way by a 1-inch bakelite tube, to help it clear the car body.

Tests were made with vertical feed from the trunk up through the antenna support, using a remote antenna tuning unit in the trunk, in comparison with feed through the roof insulator with the horizontal wire. Practically no difference in field strength was observed, although such differences as were noted favored roof feed.

To assist in quick tuning and visual indication of radiation, a pink-bead 2-volt 60-ma. flashlight bulb is clipped over a portion of the horizontal feed wire to indicate current. The bulb is also helpful as a rough check on modulation. An r.f. ammeter, located in the antenna lead inside the



The all-band mobile antenna consists of a whip, center-loaded with a multitapped coil, mounted on a bakelite standard. In WIBB's installation the lead from the transmitter is brought through an insulator mounted above the rear window.

\* 36 Pleasant St., Winthrop, Mass.



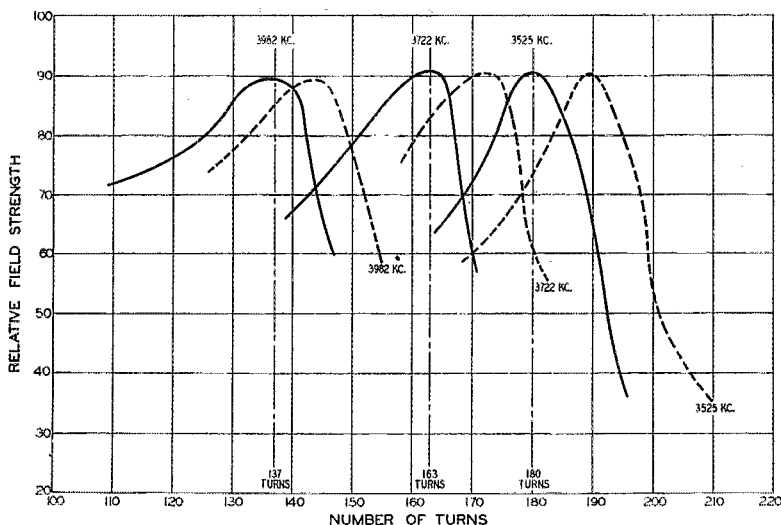


Fig. 2 — Relative field strength as a function of number of turns in the loading coil. The solid curves are for the tapped coil described. Dashed curves were taken with an untapped coil, to determine if the taps introduced undue loss.

car, also is very useful, although not essential, for tuning purposes.

### Frequency Range

This antenna operates on any band simply by cutting turns in or out of the loading coil.

For example, the antenna resonates and puts out good field strength on 28 Mc. as a quarter-wave whip with all turns shorted. As a center-loaded antenna on 14 Mc. it covers the band with from 5 to 10 turns, the remaining turns being shorted. On 7 Mc. it resonates with 35 to 60 turns, and on 3.5 Mc. with 135 to 190 turns.

For 1.8 Mc. a second loading coil consisting of 325 turns of No. 24 enameled wire, likewise wound on a 1 1/4-inch bakelite form, is plugged on top of and in series with the regular tapped antenna coil by means of jumbo jacks and 3/8-inch plugs. Using this 325-turn coil, plus 140 additional turns of the regular tapped antenna coil, the antenna resonates at 1820 kc.; with 80 turns it resonates at 1880 kc.

For 50 and 144 Mc. (and occasionally for 28 Mc.), flexible 1/2-wave whips are plugged directly into the antenna feed-through insulator. These are fed directly with coaxial lines, by-passing the antenna tank circuit. Thus even the v.h.f. bands are covered with one system.

The one disadvantage of this antenna — which in practice is not too disadvantageous — is that its tuning is very sharp. The number of turns in the coil for a given frequency is quite critical. A typical resonance curve for the same antenna at three frequencies in the 3.5-Mc. band is shown in Fig. 2. These curves show that unless provision is made for changing the number of turns, it is essentially a one-frequency antenna.

While some fellows may find it perfectly satisfactory to use only one frequency, most will want to be able to change frequency within the band

with fairly good radiation efficiency, particularly if they work mobile c.w. as well as 'phone — or if they use VFO, which is necessary for low power and is surely coming for mobile operation. With the tapped coil it is easy not only to change bands, but to move to any point within a band, by moving the antenna-loading inductance clips to the predetermined correct number of turns for the particular frequency chosen. To facilitate quick changing, in the author's case every 50th tap is painted red, every 10th tap blue, and every 5th tap left plain tin color.

It is possible to QSY a little above or below any particular frequency for which the antenna is tuned "on the nose," without changing taps or taking too much of a field-strength drop, provided the frequency is not changed too much, as may be seen from Fig. 2.

If you do not want too many taps, one each for the low, middle and high portions of the band may be used. This does not lend itself well to adjustment or changing from one band to another where various combinations of turns are necessary, but would be satisfactory for one band. However, I believe that the flexibility secured by making the taps every 5 turns is well worth the time and effort necessary.

### Operating Adjustments

As indicated in Fig. 1, the antenna is coupled to the transmitter through a parallel-tuned circuit capable of tuning through the operating frequency. This circuit is coupled either inductively or through a coax link to the output tank circuit of the transmitter. For initial tuning, disconnect the antenna from the coupling tank, resonate the final tank circuit by tuning for the usual dip in plate current, and then tune the coupling tank to resonance as indicated by an upward kick in the plate current. Then attach the antenna and



Close-up of the loading coil. The taps are soldering lugs bent around the wire every 5 turns and soldered in place.

retune the coupling tank for maximum antenna current. The final-amplifier tank may also require slight retuning at this point.

There is some interlocking between the number of turns on the loading coil and the tuning of the coupling circuit; that is, if the number of loading turns is changed through a small range the system can be brought back to resonance by retuning the coupling circuit. However, maximum field strength is obtained at only one setting of the tap on the loading coil. The antenna at W1BB was originally adjusted by checking with a field-strength meter while the taps and coupling-circuit tuning were varied. It was found that maximum field strength always resulted when the current in the antenna was maximum, and that maximum current always was obtained at one particular setting of the loading tap, even though the system could be resonated at other tap settings. An 0-1 r.f. ammeter should be sufficient with average mobile power when the meter is connected between the coupling circuit and the lead wire.

#### Notes on Loading Coil

The question was raised at one radio club meeting where I gave a talk on this antenna as to whether there was a loss in the shorted turns, so a check test was run on a coil without taps, peeling off turns until resonance was obtained. The dotted curves in Fig. 2 show that the field strength was the same in either case and the only effect was to require more turns for resonance on a given frequency.

Several tests also were run with large-diameter air-wound loading coils, instead of the small-

diameter close-wound coil, to determine if such coils would be more efficient. The differences were very slight, and the conclusion was that as long as the coil resonates, the size or type of winding does not matter very much.

The question of the effect of rain on the coil was raised at another meeting. The usual type of weatherproof cover, made by slipping a close-fitting bakelite tube or sleeve over the winding and cementing it at top and bottom, would make the antenna a single-frequency affair, because no taps could be brought out. Although no difference in performance in rainy as compared with dry weather had been noticed, it was decided to run further tests to settle the point. First, resonance and field-strength checks were made on 3982 kc., 3722 kc. and 3525 kc. with the tapped antenna dry. Next it was immersed in lukewarm water for 10 minutes to soak it thoroughly. After this the same tests were repeated. During these tests the coil was sprayed frequently with an atomizer to keep it wet. The differences in field strength were entirely negligible and there was no change in the number of turns needed for resonance.

#### Performance

The antenna has given gratifying results using my homebuilt 30-watt all-band mobile transmitter. Local and medium-distance contacts are reliably good. In addition, good contacts up to 250 miles on 1.8 Mc. and 450 miles on 3.5 Mc. have been made. Foreign DX has been worked on 14 and 28 Mc. With more operating time to catch conditions at their peak, even better results are possible. The system has definitely solved W1BB's all-band mobile antenna problem.



For 160-meter work a second loading coil is plugged in to resonate the system.

# An Impedance Bridge for Less than Ten Dollars

*Economical R, L and C Measurements*

BY BEVERLY DUDLEY \*

• The author describes this device as "an experiment in economics," but it is more than that. It is an instrument that more than earns its small cost in its ability to measure, with all the accuracy generally needed, the fundamental circuit quantities with which we are daily concerned in amateur work.

KNOWLEDGE of the magnitudes of electric-circuit components is necessary for the design of any electrical or radio equipment, and is also highly desirable for the majority of service and maintenance work in these fields. Laboratory equipment for determining the magnitudes of resistance, capacitance, and self- and mutual-inductance for general as well as specialized uses is available. In many cases, however, such relatively expensive measuring equipment cannot be justified on an economic basis, particularly if measurements are to be made only occasionally and high precision is not required. Study showed that measuring equipment which would meet the needs of radio amateurs and service men reasonably well could be designed

\* 22 Temple St., Belmont 78, Mass.

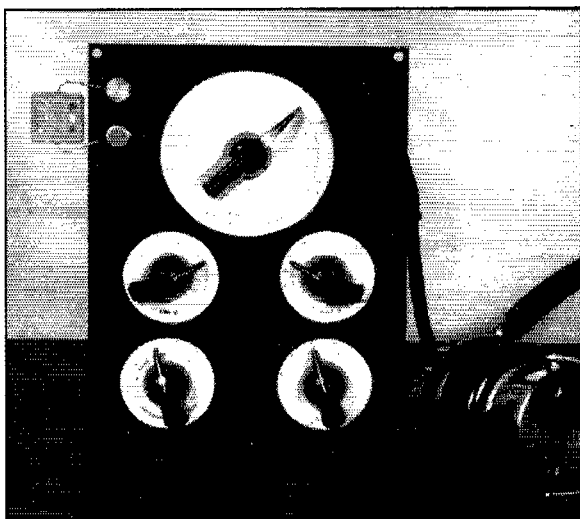
for home construction at a fraction of the cost of commercial laboratory equipment. Of several impedance bridges which were designed and built with this objective in mind, that described here represents the best combination of low cost, reasonable accuracy, and wide range, when cost must be kept to the absolute minimum.

The low-cost impedance bridge is neither unique nor unusual in its electrical circuitry. The design and construction does represent an experiment in economics, however, since every effort has been made to reduce the cost to a minimum without detracting too much from the general utility of the instrument. Some of the desirable features that may be expected in high-quality laboratory units had to be sacrificed in the interest of economy. Nevertheless, when it is realized that the bridge measures resistance, capacitance, and inductance over a range of values of a million to one, and that the total cost for new (not surplus) parts available on the open market can be well within ten dollars (including source and detector), it would appear that measuring techniques can be brought within the financial reach of all who have need for them. Although the low-cost bridge is hardly a precision instrument, measurements over most of its range can be made within a few per cent if rea-

◆

The low-cost impedance bridge set up for measurements. The large knob and pointer at the top sweeps over a scale calibrated directly in the significant figures of resistance, inductance and capacitance. The location of the decimal point is given by the setting of the range switch in the lower right-hand corner. The switch in the lower left-hand corner selects the appropriate bridge circuit for measurement of  $L$ ,  $C$  and  $R$ . The two controls at the center are phase balancing adjustments used in the measurement of  $L$  and  $C$ .

◆



sonable care is exercised in its construction, calibration, and use.

### Bridge Design

The impedance bridge is an example of the four-arm impedance bridge network which is thoroughly treated in Hague's *Alternating Current Bridge Methods* (page 51, 5th ed.).<sup>1</sup> If a complex impedance is inserted in each arm of the bridge, as shown in Fig. 1, the magnitude of the real and quadrature components of the impedance in Arm 1 is found from the relation

$$Z_1 = \frac{Z_2 Z_3}{Z_4}$$

Proper adjustment of the bridge for the condition of balance requires that the resistive and reactive components of the four arms must, individually, satisfy the above equation of balance. By making the impedances of the different bridge arms of suitable kind and value, useful arrangements for the measurement of  $R$ ,  $L$ , and  $C$  can be made.

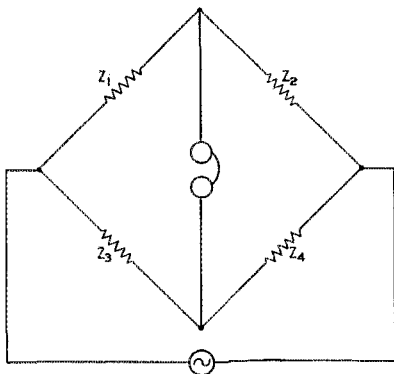


Fig. 1 — Schematic diagram of four-arm impedance bridge, with generalized impedances in each arm.

If all the arms of the bridge are resistance elements, as shown in Fig. 2A, we obtain the well-known Wheatstone bridge. Since no arm contains reactive elements, the conditions of balance merge into the single relation

$$R_1 = \frac{R_2 R_3}{R_4}$$

The unknown resistance,  $R_1$ , may then be conveniently measured in terms of a calibrated variable or adjustable resistor,  $R_2$ , and the fixed ratio arms ( $R_3/R_4$ ).

A convenient bridge for the measurement of good quality capacitors is the series-resistance De Sauty bridge, shown in Fig. 2B. It can be

shown that, when the De Sauty bridge is balanced,

$$C_1 = \frac{C_3 R_4}{R_2}$$

and

$$R_1 = \frac{R_2 R_3}{R_4}$$

are the conditions which must be simultaneously satisfied. If  $f$  is the frequency of the alternating current supplied to the bridge, then it can be shown that the dissipation of the unknown capacitance in Arm 1 is

$$D = \frac{R_1}{X_1} = 2\pi f C_1 R_1 = 2\pi f C_3 R_3$$

in terms of the known capacitance,  $C_3$ , which is assumed to be loss-free and, in any event, should be of good quality.

For the measurement of inductance, the Hay and Maxwell bridges are particularly useful since inductance is determined in terms of a known capacitor whose capacitance may be fixed. Determination of inductance in terms of a capacitance (instead of another inductance) has the advantage of eliminating the magnetic field in the bridge standard.

In the Hay bridge, shown schematically in Fig. 2C, it can be shown that, for coils whose  $Q$  is 10 or more, the equations for balance reduce (with negligible error) to the simple forms

$$L_1 = C_4 R_2 R_3$$

and

$$R_1 = \frac{R_2 R_3}{R_4}$$

The quality, or  $Q$ , of the inductor is given by

$$Q = \frac{1}{2\pi f C_4 R_4}$$

So long as measurements are restricted to coils whose  $Q$  values are 10 or more, a convenient inductance bridge can be made by having  $C_4$  fixed, and by making one of the resistors in an adjacent arm continuously adjustable.

The Maxwell bridge, shown schematically in Fig. 2D, is suitable for the measurement of low- $Q$  inductors. The two equations of balance are

$$L_1 = R_2 R_3 C_4$$

and

$$R_1 = \frac{R_2 R_3}{R_4}$$

These equations are the same as for the Hay bridge when the latter is limited to the measurement of high- $Q$  inductors. In the case of the Maxwell bridge, however, the quality or  $Q$  of the coil is given by  $Q = 2\pi f C_4 R_4$ .

<sup>1</sup> Published by Sir Isaac Pitman & Sons, London; in New York, Pitman Publishing Co., 2 West 45th St.

For the bridge networks enumerated, it will be observed that the balance equations for  $R$ ,  $L$ , and  $C$  are independent of the frequency and waveform of the energy supplied to the bridge. It will also be observed that the equations for  $D$  and  $Q$  are dependent on frequency. Except that a capacitance appears in all, the equations for  $L$  and  $C$  are expressed in terms of branch arm impedances which are independent of those in the equations for  $D$  and  $Q$ . For the measurement of resistance and inductance, the value of  $R$  or  $L$  is directly proportional to  $R_2$ . In the De Sauty bridge the measured value of capacitance is inversely proportional to  $R_2$ . Thus if  $R_2$  is the calibrated variable resistor selected for measurement purposes, the calibration scale for capacitance will be inverted with respect to the calibration scales for measuring inductance and resistance.

### Bridge Construction

A wiring diagram of the composite impedance bridge is shown in Fig. 3. The circuit element to be measured is connected to the terminals marked  $R$ ,  $L$ ,  $C$ . When a telephone headset is plugged into the jack,  $J_1$ , a tone is applied to the bridge by a battery-operated buzzer through  $S_1$ .  $S_2$  selects different resistors in decimal multiple or submultiple values for determining the range of the measurements. A two-circuit switch is selected for  $S_3$  so that the nominal resistance standards may be connected to one circuit and the corrective resistors, mentioned later, may be connected to the other. All measurements of the magnitudes of circuit constants are made in terms of the calibrated resistor,  $R_2$ , and the range resistors,  $R_3$ . For the measurement of  $C$  and  $L$ , the quadrature balance is made by adjusting one of the variable resistors in Arm 4.

When  $S_2$  is set to Position 1 the bridge is connected as a Hay bridge and in Position 2 the circuit is connected as a Maxwell bridge. The bridge is so designed that, with a tone of 1000 cycles per second, the Maxwell bridge is used for coils whose values of  $Q$  lie between 0.1 and 10 at that frequency, whereas the Hay bridge is used for coils whose values of  $Q$  lie between 10 and about 1000. In either case, the bridge is

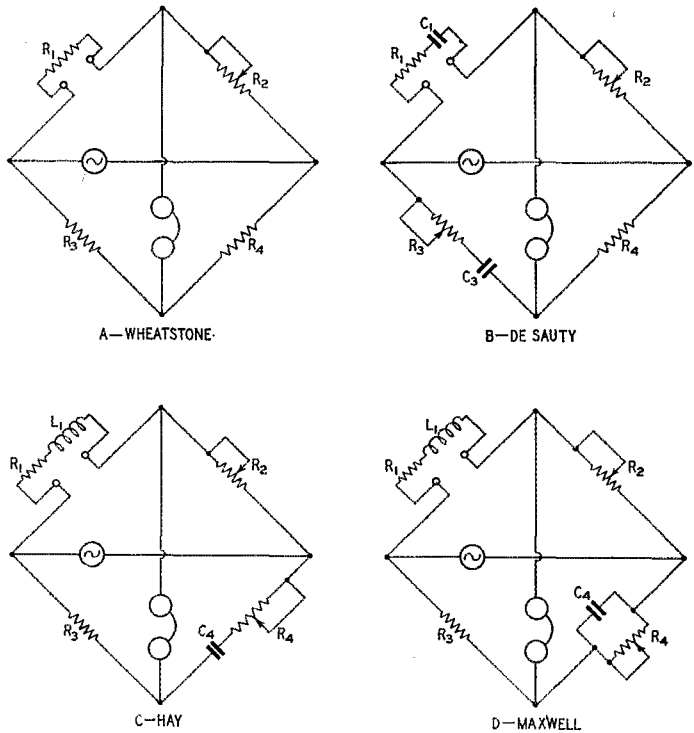


Fig. 2 — Fundamental circuits of the bridge types discussed in the text.

designed to measure values of self-inductance over the range of 100 microhenrys to 10 henrys.

The bridge is connected as a Wheatstone bridge when  $S_2$  is set to Position 3. In this case values of resistance between 1 ohm and 1 megohm may be measured.

Capacitance is measured by setting  $S_2$  to Position 4, when the network is connected as a De Sauty bridge. For this connection, the range is from 10 micromicrofarads to 10 microfarads. If the tone source is 1000 cycles per second, null balance may be obtained for capacitors whose energy dissipation ( $D = R_1/X_1$ ) lies between 0.001 and 0.1 at that frequency, covering the range of capacitor losses usually encountered in good quality units.

As judged by convenience of operation and precision of measurement, it is desirable that the variable resistors have a taper such that, for any position of the shaft, a specified change in the angle of rotation results in the same percentage change of resistance rather than the same change in absolute value of resistance. Variable resistors having logarithmic (or audio) taper meet these requirements and are available in resistance ranges of about 100 to 1. Over a 10-to-1 range, as used in this impedance bridge, square-law variable resistors also provide quite a satisfactory type of calibration scale, similar

to the D scale of an ordinary slide rule.

For the measurement of inductance and capacitance, the capacitance of the fixed standard capacitor,  $C_4$ , should be precisely known. This capacitor should be a high-quality mica unit. It is desirable that the capacitance of this standard be as near the design value as possible, but this is not a necessary requirement if one is willing to use a separate calibration scale for each type of impedance ( $R$ ,  $L$ , or  $C$ ) measured.

To a large extent the precision of the bridge depends upon the precise calibration of the variable resistors (especially  $R_2$ ), and also upon the precision of the fixed resistors used as ratio arms to extend the range of measurements. Of course it is possible to purchase precision fixed resistors for the bridge arms, but the cost can be greatly reduced by using ordinary composition or wire-wound resistors with 10 per cent tolerance, and correcting them to the design values. Such a procedure requires the temporary use of a Wheatstone bridge of fairly high precision, and this should be available in towns and cities since high school physics departments now have such equipment.

If the measured resistance is less than the desired design value another resistance may be added in series with the first to bring the combination to its proper design value. For those units whose resistance is greater than the design value, the proper resistance can be obtained by using a supplementary resistor in shunt with the nominal standard. If  $R_s$  is the resistance of the standard resistor, as called for in the design, and if  $R_n$  is the actual measured resistance of the unit whose nominal resistance is  $R_n$ , then the resistance of the corrective resistor may be designated

TABLE I

Components Used in the Low-Cost Impedance Bridge

$R_2$	10,000-ohm volume control (Mallory type G) . . . . .	\$0.73
$R_{2A}$	2000-ohm volume control (Mallory type C) . . . . .	0.73
$R_{2B}$	150,000-ohm volume control (Mallory type UM-502) . . . . .	0.73
$R_{2A}$	820 ohms, $\frac{1}{2}$ watt . . . . .	0.10
$R_4$	10,000 ohms, $\frac{1}{2}$ watt . . . . .	0.10
$R_{3A}$	10 ohms, $\frac{1}{2}$ watt . . . . .	0.10
$R_{3B}$	100 ohms, $\frac{1}{2}$ watt . . . . .	0.10
$R_{3C}$	1000 ohms, $\frac{1}{2}$ watt . . . . .	0.10
$R_{3D}$	10,000 ohms, $\frac{1}{2}$ watt . . . . .	0.10
$R_{3E}$	100,000 ohms, $\frac{1}{2}$ watt . . . . .	0.10
$R_{3F}$	1 megohm, $\frac{1}{2}$ watt . . . . .	0.10
	$\frac{1}{2}$ watt resistors for correcting resistors in Bridge Arms 3 and 4, 7 @ \$0.10 . . . . .	0.70
$S_2$	3-circuit 4-position switch (Mallory type 3234J) . . . . .	0.68
$S_3$	2-circuit 6-position switch (Mallory type 3226J) . . . . .	0.68
$J_1-S_1$	Jack, filament lighting (Mallory type 702B) . . . . .	0.44
$C_4$	0.0005- $\mu$ fd. mica (C-D type 1D5D5) (2 @ \$0.35) . . . . .	0.70
$B$	High-frequency buzzer (Signal) . . . . .	0.88
	$1\frac{1}{2}$ -volt dry cells, size D (4 @ \$0.05) . . . . .	0.20
	Binding posts (2 @ \$0.05) . . . . .	0.10
	Panel, 5 x 6 $\frac{1}{2}$ x $\frac{1}{2}$ " . . . . .	0.50
	Wire, screws, solder, miscellaneous . . . . .	0.25
	<b>Total</b> . . . . .	<b>\$8.12</b>
	Telephone headset, 2000 ohms . . . . .	1.50
	<b>Grand Total</b> . . . . .	<b>\$9.62</b>

as  $R_c$ . For resistors  $R_n$  and  $R_n$  in parallel, the resistance required to correct the equivalent combination to the standard value,  $R_s$ , is

$$R_c = \frac{R_n R_s}{R_n - R_s}$$

When commercial resistors of 10 per cent tolerance were corrected as outlined above it was found that the fixed resistors nearly always could be corrected to within  $\frac{1}{2}$  of 1 per cent of the design value, using only two resistors, each with 10 per cent tolerances.

It is convenient, but not absolutely necessary, that the capacitance standard be closely adjusted to the design value of 0.0100 microfarad. It is necessary that its capacitance be precisely known, however, if precise measurements are to be made of inductance and capacitance. A calibrated variable condenser of about 500- to 1000- $\mu$ fd. maximum capacitance can be used to measure  $C_4$  as outlined in the section on "Calibration." In the absence of accurate means for measuring the capacitance of this standard, the bridge itself may be used to select (from a group of units) that capacitor having the most probable design value, as is outlined under the section on "Calibration."

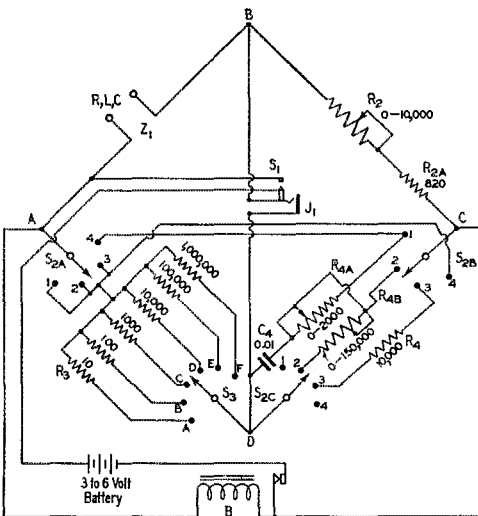


Fig. 3.—Circuit diagram of the low-cost impedance bridge. Component values are given in ohms and microfarads. See Table I for parts list.

Two 0.005- $\mu$ fd. mica capacitors connected in parallel were used as the capacitance standard for the low-cost impedance bridge. Two such units were slightly less expensive than a single capacitor of 0.01- $\mu$ fd. nominal capacitance. Moreover, there was the possibility that any deviations from rated capacitance of one unit would compensate, more or less, for errors in the other so that the combination would be closer to the design value than a single unit. If the capacitance is sufficiently close to the design value, the same scale calibration which serves for the measurement of resistance will also serve to measure inductance. However, an inverse calibration scale is required for the measurement of capacitance.

The variable resistor for measuring  $R$ ,  $L$ , and  $C$  is a 10,000-ohm unit with logarithmic or audio taper. A fixed resistor of 800 to 900 ohms is connected in series with it so that the combination of the two has a range of resistance of from about 850 ohms to almost 11,000 ohms. A calibration for this resistor, showing the resistance as a function of shaft rotation, should be made as accurately as possible, preferably using the Wheatstone bridge which was also used to measure the resistance of the fixed resistors.

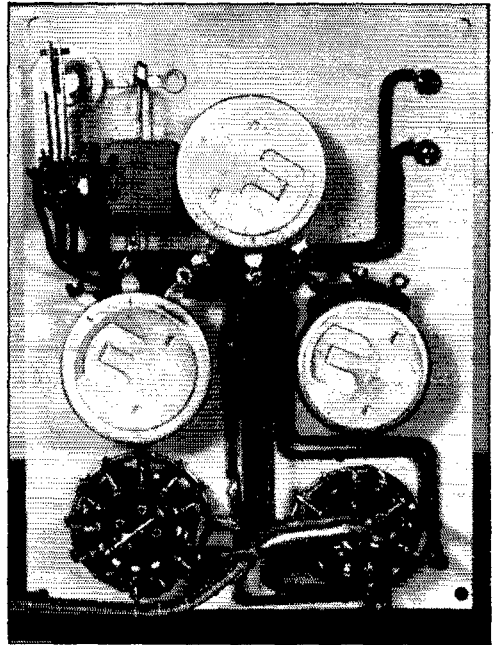
The 2000- and 150,000-ohm resistors for making the quadrature balance need not be precisely calibrated. Suitable calibration scales for them may be made using an ordinary ohmmeter.

A high-frequency buzzer such as is often used for code practice is used as the tone source, and is operated by three or four small 1½-volt dry cells connected in series. The buzzer has the advantage of low cost, quick starting, and portability, but has the disadvantage of vibration and the generation of acoustic noise. To reduce vibration and acoustic noise to a minimum, the buzzer may be mounted on suspension springs and housed in acoustic muffling, with flexible leads between the buzzer and bridge proper. With such an arrangement some acoustic noise may be heard when the bridge is balanced, but it is usually easy to separate air-borne sound from that coming through the headset.

It is convenient, if possible, to adjust the buzzer to have a tone of 1000 cycles per second. If a 1000-c.p.s. source is used, the 2000- and 150,000-ohm variable resistors may be calibrated in terms of  $Q$  or  $D$  instead of in terms of resistance as was done. The tone of the buzzer, even when suitably adjusted, varies with the voltage of the battery. For this reason and because measurements of  $D$  and  $Q$  depend on frequency no attempt was made to make calibration in terms of energy storage or dissipation.

#### Calibration

If  $R_2$  has not been previously calibrated by means of a Wheatstone bridge, it may be calibrated by connecting a calibrated variable resis-



Internal construction of the bridge. The buzzer and battery were removed when this view was taken so that the bridge components can be seen clearly. The bakelite panel on which the parts are mounted measures 5 by 6½ by ½ inches. The standard capacitor,  $C_4$ , is between the 'phone jack and the measuring resistor,  $R_2$ , at the top. In the center, the variable resistor at the left is  $R_{4A}$  and that at the right is  $R_{4B}$ . The range switch,  $S_3$ , is at the lower left, and the circuit selector switch,  $S_2$ , is at the lower right.  $R_4$  is mounted on the latter switch.  $R_{2A}$  is between the two variable resistors at the center.

tor or resistance box across the bridge binding posts. If possible, calibration by this means should be made with the range switch set on Position C or D (for measuring values of resistance from 100 to 1000 ohms or 1000 to 10,000 ohms, respectively), and suitable checks made at other settings of the range switch and measuring dial.

In the absence of more precise methods, the bridge may still be calibrated reasonably well by using a good ohmmeter or noting the position of the pointer when commercially-available resistors are connected across the binding-post terminals. Calibration points for a number of resistors (whose resistances are approximately known) should be made and, if possible, several independent checks with different resistors of the same nominal rating should be made. A curve may then be plotted showing the resistance as a function of angular rotation. The purpose of making such a curve is to smooth out any irregularities and arrive at the most probable values of greatest accuracy. From such a curve, a suitable calibration scale may be plotted.



In similar manner, by connecting the bridge for the measurement of capacitance a calibrated variable capacitor across the bridge can be used to provide the capacitance scale. Such capacitance calibration need not be worked out in complete detail, however, if the resistance scale has been properly prepared, since the resistance and capacitance calibration scales are inversely related. The value of capacitance at any point on the scale will be related to the value of the resistance at the same point on the scale by the relation

$$C = K/R$$

where  $K$  is a constant. If the capacitance standard in the bridge is exactly 0.01 microfarad, the value of  $K$  will be some power of 10. It will have some other value if  $C_4$  differs from its design value. The value of  $K$  may be found by making measurements of several fixed condensers whose capacitances are known approximately, and observing the value of the resistance calibration scale at which balance is obtained. Once the value of  $K$  is determined in this way, the capacitance calibration can be determined readily from the previously-determined resistance calibration. In working out such a calibration several check points should be made with condensers of different capacitance without changing the range switch. Four fixed capacitors whose nominal capacitances are 0.001, 0.002, 0.002, and 0.005 microfarad, for example, may be used to check the 10 major calibration points on the scale, by suitably combining them in different parallel combinations.

When the capacitance-scale calibration is thus determined, the calibration for inductance measurements is automatically fixed since the  $L$  and  $C$  calibration scales are inversely related. If the standard resistors and standard capacitors are properly selected, there should be no appreciable difference between the scale calibrations for resistance and inductance measurements; if not, three scale calibrations may be required.

#### Operation of the Bridge

In operation, the circuit element whose impedance is to be determined is connected to the pair of binding posts in the upper left-hand corner of the panel. A headset, plugged into the telephone jack in the upper right-hand corner, applies audio tone to the bridge. The selector switch,  $S_2$ , is then set to the  $R$ ,  $L$ , or  $C$  position as required for the measurement of resistance, inductance, or capacitance, respectively. For resistance measurements, the bridge is balanced for null point by varying  $S_3$  and  $R_2$ . A similar procedure is followed for the measurement of capacitance, except that the quadrature balance resistor,  $R_{4A}$ , must also be varied to attain a sharp null. For measuring inductance, quadrature balance resistor  $R_{4B}$  is used for low- $Q$  coils

and  $R_{4A}$  is varied to obtain a sharp null for high- $Q$  coils. The magnitude of the resistance, inductance, or capacitance is determined by the setting of the large pointer and knob; the setting of the range switch determines the position of the decimal point, or the order of magnitude of the measurement.

Readings to two significant figures can be made over any portion of the main dial calibration, and to three significant figures over some portions. The order of magnitude of a measurement may be determined from the table below:

Range	Inductance	Resistance	Capacitance
A	0.1- 1 mh.	1- 10 ohms	100- 10 $\mu$ fd.
B	1- 10 mh.	10- 100 ohms	1000-100 $\mu$ fd.
C	10- 100 mh.	100-1000 ohms	0.01-0.001 $\mu$ fd.
D	100-1000 mh.	1K- 10K ohms	0.1- 0.01 $\mu$ fd.
E	1- 10 h.	10K- 100K ohms	1-0.1 $\mu$ fd.
F	10- 100 h.	100K-1000K ohms	10-1 $\mu$ fd.

It is usually beneficial to ground the lower binding post when making measurements, so that point  $B$  (Fig. 3) is at ground potential. When balance is obtained, point  $D$  will then also be at ground potential.

For the measurement of very small values of resistance, for which it may be difficult to obtain a sharp null in the headset, the buzzer may be disconnected and the battery applied between points  $A$  and  $C$  of the bridge. Then measurements may be made with greater precision using a D'Arsonval galvanometer or possibly a "magic eye" indicator tube as the bridge detector. The same procedure may be used for other resistance measurements, of course, although it may be necessary to increase the voltage across the bridge to perhaps 50 volts when making measurements in the highest resistance range.

Normally there is no difficulty in measuring capacitance, although stray capacitance should be kept to a minimum, particularly for measurements of about 1000  $\mu$ fd. or less. The bridge is suitable for measuring capacitors of reasonably good quality, but if there is need to measure capacitors of high loss, this can be done by substituting the 150,000-ohm variable resistor for the 2000-ohm rheostat in the De Sauty bridge.

The measurement of iron-core inductors sometimes presents a problem in that a sharp null may be difficult to attain. Under such conditions it has been found beneficial to reduce the a.c. power supplied to the bridge and, if necessary, employ an audio amplifier between the output of the bridge and the headset detector. The a.c. output of the buzzer is several volts, a major portion of which may be applied across the iron core inductor. Under these conditions the permeability of the iron may vary appreciably throughout the a.c. cycle, and if it does the balance point may be expected to be quite broad.

In general, the performance of the bridge has been found to be quite satisfactory within its

(Continued on page 100)

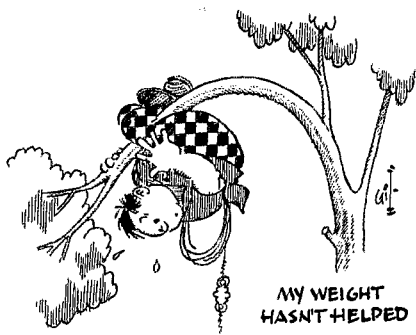
# So You Don't Get Out Very Well!

BY CHARLES R. AMMERMAN,\* W3MLN

**M**ANY TIMES in the past few years I have read articles about super antennas: 50-element 2-meter beams, 8-element 10-meter beams, 4-element plumber's delights, Vs, rhombics, and even 80-meter beams. I have also read how to put up invisible antennas, underground antennas, and apartment-house antennas.

Every time I read one of these masterpieces I suddenly realize, with a sinking feeling in the pit of my stomach, that I have *never* had a good antenna. However, this has by no means stopped me from enjoying amateur radio, and I believe relating some of my experiences may be interesting to those who want to see how the other half lives.

There are several reasons why my antennas have not been good. In the first place, most of my operating has been done since the war, and in those few years I have lived in eight different houses, for periods of from one week to two years. In the second place, my weight is not far below 250 pounds — not far enough, in fact, to make me agile in climbing trees, chimneys, roofs,



telephone poles, etc. In the third place, I am neither carpenter nor plumber nor reasonable facsimile thereof. And my wife thinks things should look "nice." My transmitter is low-powered; it runs about 30 watts crystal-controlled 'phone or c.w. to a 6L6GA in the final. I am not a DX hound, and my favorite band, unfortunately for the antenna business, is 80-meter c.w. This requires about 130 feet of wire for a half wave, and this has been out of the question in every location so far.

Some of the antennas I have used, with varying degrees of success, have been: a 10-meter dipole

fed with 50 feet of coaxial line, a 7-Mc. Zepp with 32-foot feeders zigzagged down the side of the house, an end-fed 32-foot wire run through doorways on the third floor of a house plus 60 feet of insulated wire lying on the roof, a 10-meter quarter-wave vertical in the shack (which gave bad r.f. feed-back), and a few other miscellaneous affairs. These are not very prepossessing affairs for my favorite band, although some did yield reasonable results on 7 and 28 Mc.

Working with these lash-up antennas has made me examine my operating a little more closely, and the resultant conclusions may serve as a guide to others who find themselves in similar apparently-handicapped situations, because it is possible to get out adequately with low power and a poor antenna.

## Operating

Operating procedures make a lot of difference when you are putting out a weaker-than-average signal, as the result of low power, a poor antenna, or both.

The operating frequency is important in that you should be in a well-populated but not too-crowded section of the band. When activity is high, get near the middle. When activity is sparse, go nearer the edge (lower). VFO would be handy but is not necessary. I feel that certain frequencies, particularly those on which the armed forces had many stations, are good to steer clear of. For example, I think everyone has a 7010-kc. crystal, or so it seems when I use mine. Frequencies that end in a 5 or 0 are likely to be a net frequency and consequently unusable during certain hours.

Break-in operation has proved extremely valuable.

Calling CQ is usually a waste of time.

When the band is crowded it is very difficult to make contact with a station more than 10 kc. away from your frequency.

Listen a second or two before you call any station, to see what your competition is. Listen for the weak stations. Strong stations calling CQ are answered by lots of fellows; then usually they work one of the stronger ones calling them. Weak CQs may be answered only by you. Of course, in order to take advantage of this principle, it is necessary to have a fairly good receiver and be able to use it properly, to squeeze out the last possible db. of signal-to-noise ratio. On c.w. I operate with sharp crystal most of the time.

Use sense in choosing the band to operate on. I

(Continued on page 100)

\*% Department of Electrical Engineering, The Pennsylvania State College, State College, Penna.

# Six-Meter Coils for the HRO

BY LOREN G. WINDOM,\* W8GZ

**T**HE National HRO and HRO-7 can be made to do quite well on 50 Mc. All that is necessary is to convert a coil set from some other band to the 50-Mc. band. Probably the best answer is to secure one of the new Type 7AA coil sets for the 28-Mc. range, and convert your present 28-Mc. coil set to 50 Mc. The 7AA coil set is a worth-while improvement, in any case. With the regular coil set for the 28-Mc. range in place, the writer's frequency standard gave an S-meter reading of S5 at 29.7 Mc. With the new 7AA coil set the same signal is over S9, and images are greatly reduced.

No changes need be made in the receiver itself, so anyone who attempts the work to be outlined below need have no fear that he will spoil his receiver's performance on the rest of the coil ranges. Take any high-frequency coil set, remove the units from the shield cans, and unsolder and remove the present coils. The shields and coil assemblies come off when the screws holding them are loosened; it is not necessary to remove the screws completely. If the parts are removed carefully it will be possible to restore the coil set to its original state later on if it is desirable to do so for any reason.

If the coil set to be converted is the usual dual-purpose coil (general coverage and bandspread) there will be three trimmers in each section. Remove the trimmer mounted on the bracket inside the can, leaving the two that are side by side, as shown in Fig. 1. The unit converted by the writer was a general-coverage (only) set for the 7-Mc. range. This type of coil assembly has but one trimmer in each section, so another had to be added, as shown in the photograph.

The coils for 50 Mc. are made as follows:

- 1st r.f.:* Grid coil — 5 turns No. 14 enameled.  
Antenna coil — 5 turns No. 18 d.c.c.  
Windings coupled end to end, at cold end.
- 2nd r.f.:* Grid coil — 4 turns No. 14 enameled.  
Coupling coil — 5 turns No. 18 d.c.c., with one turn interwound in cold end of grid coil.
- Mixer:* Grid coil — 4 turns No. 14 enameled.  
Coupling coil — 5 turns No. 18 d.c.c., with two turns interwound in cold end of grid coil.
- Oscillator:* 5 turns No. 14, tapped at 1 turn from cold end.

\* Reynoldsburg, Ohio.

<sup>1</sup> "Noise-Generator Technique for the V.H.F. Man," *QST*, August, 1949, p. 20.

<sup>2</sup> *ARRL Handbook*, 1950 ed., p. 409

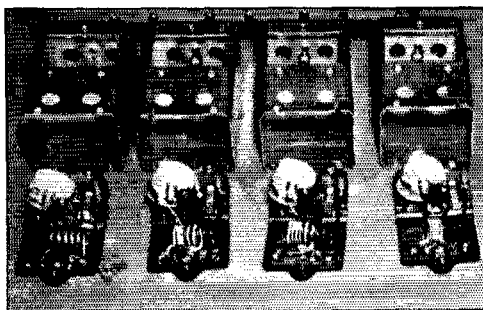
All coils are  $1\frac{3}{32}$  inch in diameter. No. 14 coils are spaced one wire diameter, No. 18 coils close-wound.

These coils are self-supporting, and are soldered to the terminal lugs with the shortest possible leads, after first being sure that the trimmers are wired to the proper lugs, as shown in Fig. 1. This conforms with the connections used in the 7AA coil set.

## Alignment Process

To align the coil units set all trimmers at approximately half scale. Feed a 50-Mc. signal into the receiver and, with the HRO tuning dial at 50, adjust the left-hand (band-set) trimmers of each stage in the following sequence: oscillator, mixer, 2nd r.f., 1st r.f. The oscillator should be on the high-frequency side of the signal. There is some pulling of the oscillator frequency as the mixer is adjusted, so this is best done by listening to background noise, or a noise generator,<sup>1</sup> rather than to a signal. Adjust each stage for highest S-meter reading or loudest background noise.

Next set the signal source to 54 Mc., and the HRO dial to 450. Slowly and carefully adjust the left-hand (band-set) trimmer on the oscillator until the signal source is tuned in. Be sure that the oscillator is on the high side of the signal frequency. If more capacitance is needed to tune in the signal at 54 Mc., increase the setting of the right-hand (bandspread) trimmer. If less capacitance is required, decrease the setting of the bandspread trimmer. Repeat this process, working on the oscillator only, until 50 Mc. comes out at 50 and 54 Mc. comes at 450 on the main tuning dial.



The 50-Mc. coils for the HRO. From left to right they are the oscillator, mixer, second r.f., and first r.f. The trimmer mounted on the bracket at the left of each assembly is required only if the coil set to be converted is the general-coverage-only type.

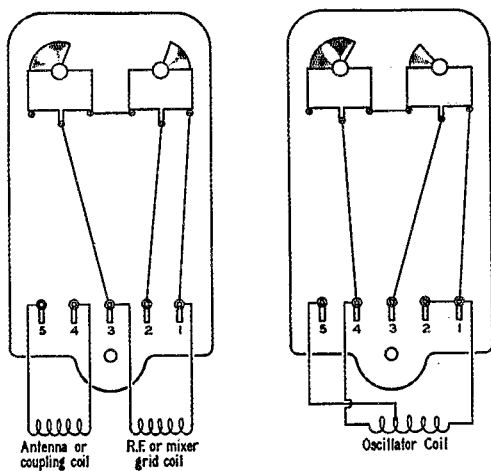


Fig. 1—Diagram of the coil-and-trimmer assemblies, showing the connections corresponding to the photograph.

Next move to the mixer and adjust that stage in the same way. Remember that the mixer is more readily adjusted by listening to random noise than to a signal. Because of the pulling effect of the mixer on the oscillator frequency, it will be necessary to make some slight readjustment of the oscillator when you are working on the mixer.

Following the same procedure, but now using the signal source, adjust the second r.f., and finally the first r.f. trimmers. This alignment is a slow process, but when it is performed carefully it will result in excellent tracking over the entire band. Final adjustment of the mixer and r.f. trimmers can be done with a noise generator,<sup>1</sup> if desired.

It will be noticed that the suggested alignment procedure is the reverse of that usually employed, wherein the receiver is aligned first at the high-frequency end of the band and then at the low. The suggested procedure is desirable in this instance because some HRO receivers will go into oscillation around 53 Mc., and it is much easier to cure this condition by working from the stable low-frequency end.

If oscillation develops, try the following remedies: If your HRO is an old model with a center-tapped heater resistor, disconnect this resistor and ground one side of the heater circuit at several points throughout the receiver. By-pass the other side of the heater circuit to ground at several points, using 0.01- $\mu$ fd. disc-type ceramic condensers. It may be necessary to add similar by-passes in the screen and plate circuits, particularly in the second r.f. and mixer stages. No set rule applies to all receivers; try one by-pass at a time until the trouble is corrected. Two or three will usually take care of it.

Do not let the comments relative to oscillation

worry you. The writer has never experienced any trouble below 52 Mc., and with present occupancy of the 50-Mc. band you can get going on 50 Mc. and cure any oscillation at the high end whenever you get around to it.

A preamplifier such as the Millen R9-er or the 6J6 outfit<sup>2</sup> suggested in the *ARRL Handbook* will be helpful in bringing up weak signals, but even without such an amplifier the HRO does at least as well on 50 Mc. as any of the all-band single-conversion receivers now on the market. Image rejection is low, of course, as would be expected with single conversion and a 455-kc. i.f., but this is not a serious problem, so long as use of the 6-meter band is largely confined to the first few hundred kilocycles at the low end.

The important point is that we need more 50-Mc. occupancy, and here is an easy and inexpensive way around the receiver problem. Let's get going!

### WWV-WWVH SCHEDULES

THE technical radio broadcast services over WWV, Beltsville, Md., and WWVH, Maui, T. of H., were revised effective Jan. 1, 1950. Except in certain details, these services of the National Bureau of Standards do not differ greatly from those given in the past.

The revised services from WWV include (1) standard radio frequencies of 2.5, 5, 10, 15, 20, 25, 30 and 35 Mc., (2) time announcements at 5-minute intervals by voice and International Morse code, (3) standard time intervals of 1 second, and 1, 4 and 5 minutes, (4) standard audio frequencies of 440 cycles (the standard musical pitch A above middle C) and 600 cycles, (5) radio propagation disturbance warnings by International Morse code consisting of the letters W, U or N, indicating warning, unstable conditions, or normal, respectively.

The audio frequencies are interrupted at precisely one minute before the hour and are resumed precisely on the hour and each five minutes thereafter. Code announcements are in GCT using the 24-hour system beginning with 0000 at midnight; voice announcements are in EST. The audio frequencies are transmitted alternately: The 600-cycle tone starts precisely on the hour and every 10 minutes thereafter, continuing for 4 minutes; the 440-cycle tone starts precisely five minutes after the hour and every 10 minutes thereafter, continuing for 4 minutes. Each carrier frequency is modulated by a seconds pulse which is heard as a faint tick; the pulse at the beginning of the last second of each minute is omitted.

Station WWVH, recently established in Hawaii by the National Bureau of Standards, broadcasts on an experimental basis on 5, 10 and 15 Mc. The program of broadcasts on the three frequencies is essentially the same as that of WWV. Reception reports indicate that WWVH is received at many locations not served by WWV, thus extending the area served by standard frequencies and time signals. Time announcements in GCT are given from WWVH every five minutes by International Morse code only.

SWITCH  
TO SAFETY!





June, 1925

... Delegates from 23 nations have met at Paris to form the International Amateur Radio Union. A constitution has been written and adopted and the following officers have been elected: Hiram Percy Maxim, u1AW, president; Gerald Marcuse, g2NM, international vice-president; M. Jean G. Mezger, f8GO, and Frank D. Bell, z4AA, councillors-at-large; and K. B. Warner, u1BHW, international secretary-treasurer.

... Technical Editor Kruse describes Traffic Manager Schnell's new tuner, a design doing away with such undesirable as left-handed dials, scales on tickler and rheostat controls, moving coils, complicated panels, fixed wavelength range, uncushioned sockets, and interlocking controls.

... Methods of adjusting the oscillator transmitter for optimum stability and output are reviewed by Assistant Technical Editor John M. Clayton.

... The Rag Chewers Club has been formed to promote friendly conversation between amateurs and do away with the "CUL 73" type of QSO

... NRRL, operated aboard the U.S.S. *Seattl* by Lieut. J. E. Schnell, of ARRL Hq., reports scores of amateurs heard and worked while en route from San Francisco to Honolulu.

... 3VX, Audubon, N. J., using a pair of 201-A tubes at 400 volts, has worked New Zealand z4AG on 40 meters.

... Cmdr. Donald B. MacMillan announces ambitious radio plans for this year's Arctic expedition. A second ship under the command of Cmdr. Eugene F. MacDonald, jr., president of Zenith Radio Corp., will accompany the *Bowdoin* party, as will radio-equipped amphibian aircraft. John Reinartz, u1XAM, will sail with the expedition as radio operator.

... With the advent of "real c.w." emphasizing the need for steady notes, the harmful effects of swinging antennas, poor connections and insulation, wavering plate and filament voltages, and overheated tubes are considered in detail.

... A short-wave antenna successfully employed on Zeppelins during the war is described by Greenleaf Whittier Pickard.

... Irving B. Smith's 3OT, Ambler, Penna., Joaquin Augusty's 4JE, San Juan, P.R., and Noel G. Baguley's g2NB, Newark, England, are presented as stations-of-the-month.

... F. Austin Lidbury of the ARRL Experimenters Section analyzes current wavemeter calibration practice. He recommends giving special attention to kilocycle error, not percentage error, when using the instruments on our new 20- and 5-meter bands.

### VOICE OF AMERICA BROADCASTS

The Voice of America Broadcasts for amateurs, as reported in the August, 1949, and January, 1950, issues of *QST*, are continuing on a weekly basis, but on a changed frequency schedule. The broadcasts to the Far East and Latin America are at 1345 GCT Sunday on 9515, 9570, 9650, 11,730, 15,130, and 17,830 kc. This broadcast is relayed in the Far East by transmitters on 920, 11,790, 11,890, 15,250, 15,330, and 17,780 kc. The broadcast to Europe is at 1915 GCT on 15,270, 17,780, and 21,500 kc., and is relayed in the European area by transmitters on 7200, 9700, and 15,230 kc.

## Packaging the Basic 'Phone Exciter

BY ROBERT W. BRADLEY,\* W1FIN

BEING bitten by the "Basic 'Phone Exciter" (*QST*, Jan., 1949) bug, it was decided to use this unit as the basis for a more compact design suitable for the foundation of a kilowatt all-purpose transmitter. After a little preliminary doodling, it was decided that the use of miniature tubes would permit mounting all the components on a 3 × 22-inch plate. By restricting the wiring to one side of the panel, servicing and adjustment could be made more convenient. The plate could be mounted on a subpanel with the controls projecting through a hinged panel, thus allowing ready access to the wiring.

The miniature-tube equivalents of the metal tubes used in the original exciter are shown in Fig. 1. For c.w. work, the heater circuit is opened to all tubes except the 6AU6 crystal oscillator and the 6AU6 carrier amplifier, and the exciter is keyed in the carrier-amplifier control-switch circuit (*S*<sub>3</sub> in the original article).

The constants and alignment frequencies for the audio phase-shift network were taken from the description in *G.E. Ham News* (Nov.-Dec., 1948), since this later network requires no electronically-regulated power supply for satisfactory operation but only about 200 μfd. of output filter capacity.

The arrangement of the components on the mounting strip follows the block diagram closely, and little trouble should be experienced in identifying the various parts. The close positioning

\* 44 Beach St., Marblehead, Mass.

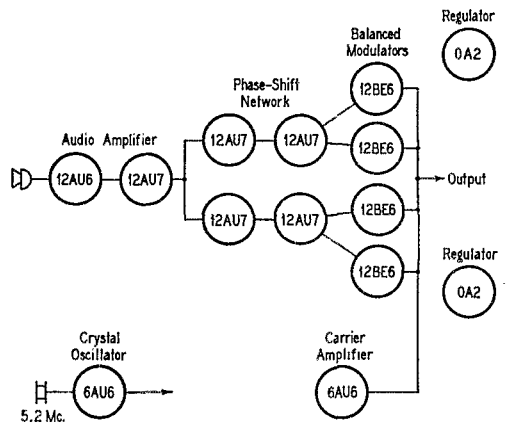
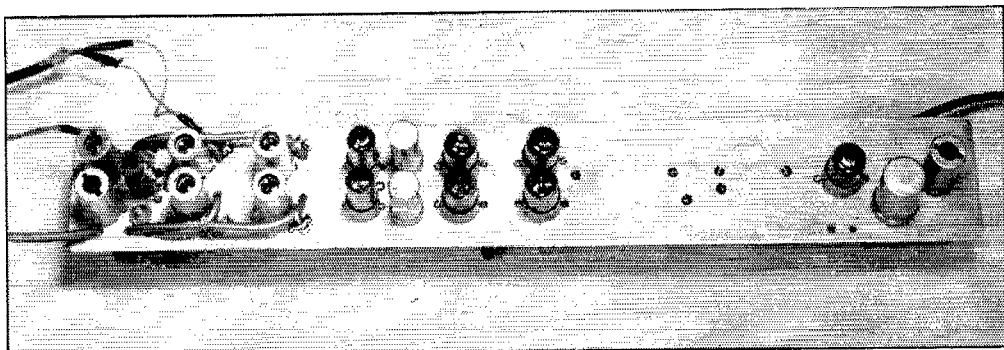


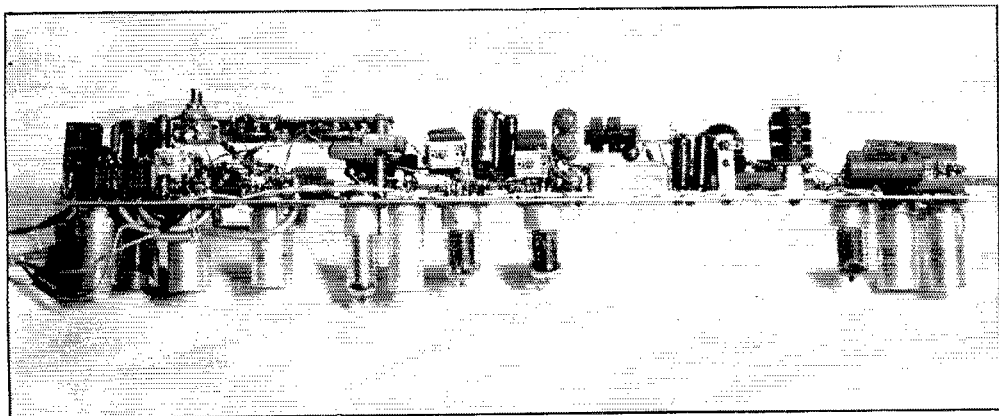
Fig. 1 — Block diagram of the miniature tubes used in the basic 'phone exciter.

of the coils in the r.f. phase-shift circuit ( $L_1$  and  $L_2$  of the original) resulted in almost enough mutual coupling, and required the addition of only a single-turn link coupling. All alignment procedures were as described in the original article.

We have some recommendations for anyone building this or a similar unit. Be sure to look up the "Feed-Back" on page 39 of March, 1949, *QST*, and remember that  $C_{42}$ ,  $C_{43}$ ,  $C_{48}$  and  $C_{49}$  in Fig. 4 of the original should be  $680 \mu\text{fd.}$ , not 10 times that value as erroneously specified.



Top — The basic phone exciter, built with miniature tubes and mounted on a  $3 \times 22$ -inch panel. The four center tubes are used in the audio phase-shift network.



Side — The output portion of the exciter is at the left-hand edge, the audio at the right. The chokes at the right are part of the audio filter.



Bottom — The carrier-amplifier gain control and switch, and the audio gain control, are connected to the unit through shielded wires, and mount on a control panel.

# A Four-Tube Bandswitching Circuit for Mobile Rigs

18 Watts 'Phone on 10, 20 and 75

BY WALLACE L. LINN,\* W9LHF

**T**HE amateur who spends most of his available operating time in an automobile or small apartment often is confronted with a problem in keeping the rig compact and at the same

\* Colonel USAFR, member MARS active reserve. % P. R. Mallory & Co., Indianapolis, Ind.

time devising one that is workable on more than one band. Multiband rigs invariably end up three or four times too large to be accommodated or operated conveniently in restricted space.

Fig. 1 shows a simple circuit that has worked out very successfully in a mobile installation. A

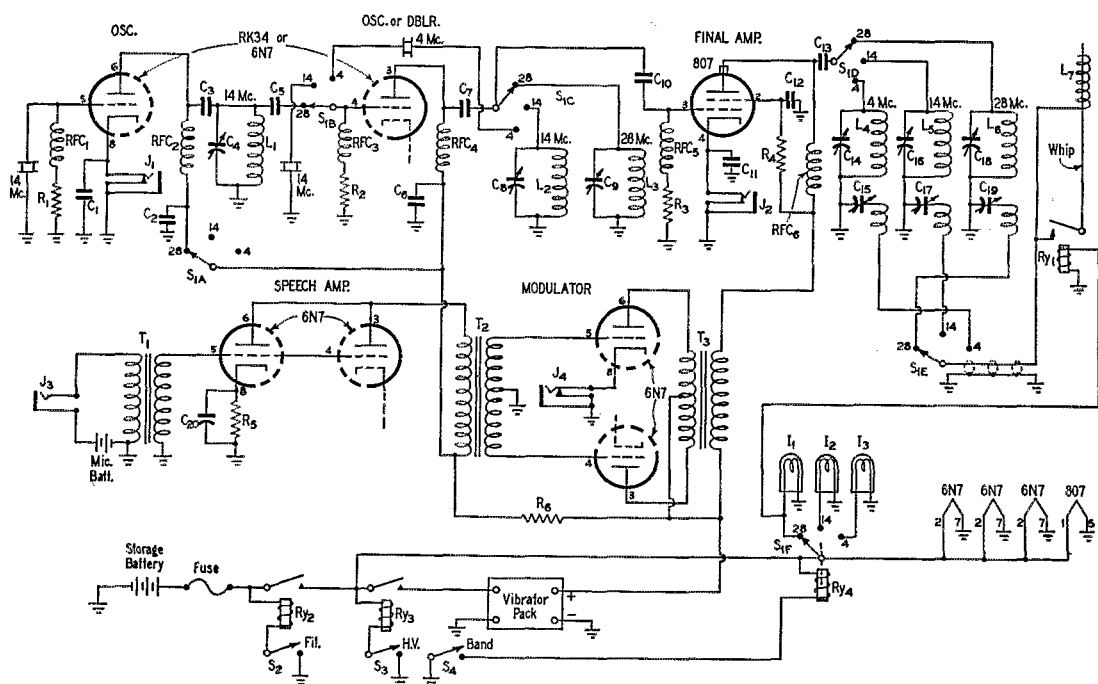


Fig. 1 — Circuit diagram of the four-tube mobile transmitter.

C<sub>1</sub>, C<sub>2</sub>, C<sub>3</sub>, C<sub>6</sub>, C<sub>7</sub>, C<sub>11</sub>, C<sub>12</sub>, C<sub>18</sub> — 0.002- $\mu$ fd. mica.

C<sub>4</sub>, C<sub>9</sub>, C<sub>18</sub> — 25- $\mu$ fd. air trimmer.

C<sub>5</sub>, C<sub>10</sub> — 100- $\mu$ fd. mica.

C<sub>8</sub>, C<sub>16</sub>, C<sub>19</sub> — 50- $\mu$ fd. air trimmer.

C<sub>14</sub>, C<sub>15</sub>, C<sub>17</sub> — 100- $\mu$ fd. air trimmer.

C<sub>20</sub> — 10- $\mu$ fd. 25-volt electrolytic.

R<sub>1</sub>, R<sub>2</sub> — 50,000 ohms, 1 watt.

R<sub>3</sub> — 25,000 ohms, 1 watt.

R<sub>4</sub> — 5000 ohms, 5 watts.

R<sub>5</sub> — 2000 ohms, 1 watt.

R<sub>6</sub> — 2000 ohms, 5 watts.

L<sub>1</sub>, L<sub>2</sub> — 15 turns No. 18, 1-inch diam., 1 inch long.

L<sub>3</sub> — 7 turns No. 18, 1-inch diam.,  $\frac{3}{4}$  inch long.

L<sub>4</sub> — 65 turns No. 24, 1 $\frac{1}{2}$  inches diam., 1 $\frac{1}{2}$  inches long, 10-turn link.

L<sub>5</sub> — Same as L<sub>2</sub>, 5-turn link.

L<sub>6</sub> — Same as L<sub>3</sub>, 3-turn link.

L<sub>7</sub> — 64 t. No. 18,  $\frac{3}{8}$ -inch d., 11 inches long (see text).

I<sub>1</sub>, I<sub>2</sub>, I<sub>3</sub> — 6.3-volt dial lamp.

J<sub>1</sub>, J<sub>2</sub>, J<sub>4</sub> — Closed-circuit jack.

J<sub>3</sub> — Open-circuit jack.

RFC<sub>1</sub>, RFC<sub>2</sub>, RFC<sub>3</sub>, RFC<sub>4</sub>, RFC<sub>5</sub>, RFC<sub>6</sub> — 2.5-mh. 100-ma. r.f. choke.

Ry<sub>1</sub> — 6-volt antenna relay.

Ry<sub>2</sub>, Ry<sub>3</sub> — 6-volt relay, 20-amp. contacts.

Ry<sub>4</sub> — Bandswitch-actuating solenoid and control mechanism (see text).

S<sub>1</sub> — 6-section 3-position rotary switch (see text).

S<sub>2</sub>, S<sub>3</sub> — S.p.s.t. toggle.

S<sub>4</sub> — Momentary-contact switch (push button or similar).

T<sub>1</sub> — Carbon-microphone transformer.

T<sub>2</sub> — Input transformer: Class A to Class B 6N7 grids.

T<sub>3</sub> — Class B output transformer: 10,000 ohms to 5000 ohms, 10 watts.



total of only four tubes is required for both r.f. section and modulator. The normal input to the final amplifier is 18 watts with either a.c. or dual vibrator-pack supply. It is designed to operate in the 10-, 20- and 75-meter bands by means of a switching system that can be remotely controlled.

### Circuit

With the bandswitch in the 10-meter position, the first triode section of the RK34 (a 6N7 may be substituted) operates as a triode crystal oscillator with a 20-meter crystal. The second section of the tube operates as a doubler to 10,  $C_9$  and  $L_3$  being switched to the plate circuit of the doubler. When the switch is turned to the 20-meter position, a second 20-meter crystal is connected across the input of the second section of the RK34. This second section then operates as the 20-meter oscillator with  $C_8$  and  $L_2$  as the plate tank circuit. For 75-meter work, a 75-meter crystal is switched to adapt the second section of the oscillator tube to a Pierce circuit, eliminating the necessity for an oscillator tank circuit for this band. Separate pretuned tanks and output-link circuits are switched in the output of the 807. The links feed a coaxial line to the base of the antenna. One section of the bandswitch,  $S_{1F}$ , serves to operate panel lamps as remote-control band indicators.

The modulator is quite conventional, consisting of a carbon microphone, a 6N7 driver with paralleled elements, and a 6N7 Class B stage. Metering jacks in the cathode circuits provide a means of checking the adjustment.

### Antenna

For mobile operation, a standard 100-inch telescoping whip is used. For low-frequency operation, an 11-inch section of  $\frac{3}{8}$ -inch o.d. polystyrene tubing is wound with 64 turns of No. 18 wire and this is slipped over the top section of the whip, as shown in Fig. 2. A hole is drilled in the whip adjacent to the bottom end of the polystyrene tubing and an insulated lead from the bottom end of the winding is fed down through the hollow antenna to a relay at the base. For 28-Mc. operation, the relay shorts the coil lead to the base of the antenna which is not grounded. Checks on S-meter readings at a distance have shown the performance of this antenna to compare surprisingly well with that of half-wave antennas.

### Control System

In a mobile installation, the control switches and the indicator lamps are located on the dashboard or steering column, while the rest of the equipment is placed in the trunk. If the car battery is used, the vibrator pack as well as  $Ry_2$  and  $Ry_3$  should be placed near the battery.  $S_2$  closes  $Ry_2$  which turns on the filaments.  $S_3$  closes  $Ry_3$  which turns on the vibrator pack.

$S_4$  is a momentary-contact switch. Each time this switch is closed,  $S_1$  moves ahead one contact. It will be noticed that when  $S_{1F}$  is in the 10-meter position, it closes the circuit to  $Ry_1$  which shorts the whip to the loading-coil lead.

### Construction

The author found it possible to assemble all of the necessary components on a  $7 \times 11$ -inch chassis fitted with a standard  $7 \times 12$ -inch cabinet panel. The modulator components are lined up along the back edge, while the remainder of the chassis space is devoted to the r.f. section.

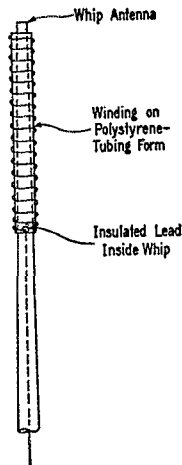


Fig. 2 — Sketch showing how the top-loading coil is placed on the top of the whip antenna for low-frequency operation.

The bandswitch is a rebuilt Mallory type 175C. The sections are spaced out on long lengths of threaded rod so that each can be placed close to its associated circuit, and they are ganged by means of a shaft made from  $\frac{1}{4} \times \frac{3}{32}$ -inch steel strip, similar to the original shaft. The shaft is coupled to a solenoid stepper which can be remotely controlled (in this case a station-change switch from a Philco automobile receiver). Since all tank circuits are preset, no panel dials are necessary. Once set with a screwdriver, the tank condensers should need readjustment only for radical changes in frequency within any band.

### Adjustment

Since separate tank circuits are supplied throughout, the initial tuning procedure is straightforward. For each position of the bandswitch, the active tank circuits are resonated by watching for the characteristic dip in cathode current. After the output tank circuits have been adjusted to resonance, the link-line tuning condensers should be adjusted to load the final amplifier, in each case checking back to make sure that the output tank circuit is at resonance.

In the first week of operation, all districts were worked from the car with this rig, utilizing the best band considering the time of day. To date 47 of the 48 states have been QSO-ed.



# Military Amateur Radio System



## *MARS V.H.F. Teleprinter Relay System To Serve East Coast States*

Organization has passed the planning stage and a v.h.f. teleprinter relay system linking Mitchell Air Force Base, New York, as the northern terminal, the Pentagon Building as the southern terminal, and intermediate points, is expected to go into operation this summer. Once established, this link will provide reliable communication completely free of the atmospheric disturbances usually encountered on the lower frequencies.

The basic type of equipment for the project, surplus SCR-522s, has had fairly wide distribution to MARS members under ConAC along the Eastern Seaboard. Capt. Charles C. Mouckerezi, W2BRJ, MARS director for Continental Air Command, has issued approximately 40 of these in the First and Ninth Air Force areas. The relay stations will be issued two 522s and antenna equipment so that by using receive and transmit frequencies suitably separated, the output of the receiver may be fed into the modulator of the transmitter without danger of blocking. These relay stations are presently under construction at Baltimore, Wilmington, North Philadelphia, Trenton, and Brooklyn.

Primary emphasis has been placed on v.h.f. operation on frequencies between 135 and 150 Mc., utilizing military as well as amateur frequencies. When in the amateur bands, the system pioneered by John Williams, W2BFD, using 2125 and 2975 cycles for two-tone operation, will be utilized and when on military frequencies the

f.s.k. method will be employed using the GI exciter known as the 05/FR. However, six meters will not be neglected and its use over this particular link will get special study.

## *Study V.H.F. Tropospheric Propagation*

The two- and six-meter activities mentioned above will serve as an important adjunct to tropospheric propagation studies now being conducted by the Naval Research Laboratories. AIR at the Pentagon will make automatic tape transmissions every hour from 55 to 57 minutes after the hour and will receive from 58 to 60 minutes, using the 50- to 54-Mc. spectrum. Two-meter transmissions will begin at 01 to 03 after the hour and receiving periods will be 04 to 06 after the hour.

Tape transmission of "V V V V V V DE AIR 10 sec dash [400-cycle tone modulation]" will occur on both bands, the exact frequencies to be announced. Received signals will be taken on a tape recorder and any calls will be answered at 10 minutes after the hour on six meters and at 20 minutes after the hour on two meters.

Multielement parasitic arrays will be used on both bands. They will make two complete revolutions for each of the transmissions and recorded receptions. Present beams are horizontally polarized but further construction will go into the studies of vertical and circular polarization.

The above information may be used for DX openings in the v.h.f. bands and to select one frequency or another for possible direct communication with Mitchell Air Force Base as well as amateur stations, A1, A3, or teleprinter, every hour on the half hour.

Construction of the transmitters began in mid-April with T/Sgt. Harry T. Simms, W4HBD, as chief holder of the soldering iron and Maj. Rawleigh H. Ralls, W4RB, chief MARS, Air Force, looking over his shoulder. The two-meter rig will borrow a major part of W4AO's design

*(Continued on page 100)*



Capt. Charles C. Mouckerezi, W2BRJ, MARS director for Continental Air Command and spark plug for MARS v.h.f. teleprint, watches S/Sgt. Dennis E. Bull, No. 1 operator for K2AIR-AP2AIR, as he communicates with the ground station in one of the first air-ground v.h.f. teleprint operations.

**QST for**



# Happenings of the Month

## BOARD HIGHLIGHTS

The Board of Directors of the American Radio Relay League, Inc., met in annual session May 5th and 6th at West Hartford, Conn. Every director was present for these two full days of discussion and action on League affairs and amateur problems. One of the highlights of the meeting was the granting of authority to the West Seattle Amateur Radio Club and the North Seattle Amateur Radio Club to hold an ARRL National Convention in Seattle sometime during July or August of 1951, a centennial year for that city.

The League has a new Vice-President — Wayland M. Groves, W5NW, long-time director of the West Gulf Division, who on the third ballot won over the incumbent, 10 votes to 8. There was a rising vote of appreciation to the retiring Vice-President, J. L. McCargar, W6EY, for his long service to the League and amateur radio. In a hotly-contested election for President, which went to thirteen ballots, in each case with identical tie results of 9 to 9, George W. Bailey, W2KH, was declared reelected for another two-year term after the opposing candidate, Goodwin L. Dosland, WØTSN, withdrew his name.

Three new committees were appointed by the Board to handle special problems, and funds were appropriated for their expenses. In the feeling that over the years miscellaneous amendments have been made to the Constitution & By-Laws for specific purposes without considering their relation to the document as a whole, the Board appointed a Constitution Revision Committee, consisting of Mr. Noble, chairman, and Messrs. Brabb, Collett, Dosland and Matejka, to study a revision of the C&BL and report their conclusions six months prior to the next annual meeting; this committee was further assigned the task of considering the report of the Communications Department Committee, a study of procedures in SCM elections, and the proposal (Mr. Brabb's, which May *QST* erroneously reported as Mr. Canfield's) to deny certain voting rights of the President, Vice-President and Canadian General Manager.

ARRL's Board also set up a Membership and Publications Committee, consisting of Mr. Doyle, chairman, and Messrs. Griggs and Hill as members, to study means of increasing League membership and a possible new League magazine for beginning amateurs. In this connection the directors approved in principle the holding of a "tripod" membership contest to obtain 10,000 new Full Members by three teams: the "Maxims" to consist of the directors and affiliated clubs, the "Handys" to consist of the Communications Department field organization, and the "Warners" to consist of Hq. staff members.

A third new committee created by the Board is one to study the advisability of forming three permanent standing committees, one each to advise the Board on the basic functions of the Secretarial, Communications and Advertising Departments at League headquarters; the membership of this study committee is Mr. Collett, chairman, and Messrs.

Key and Roberts. To its present Planning Committee (Mr. Noble, chairman, and Messrs. Groves and Johnston) the Board assigned several tasks: studying the feasibility of a non-exclusive f.s.k. teletype assignment in 7250-7300 kc.; the possibility of expansion of "160-meter" privileges; and, after adopting a motion recognizing the growth and increasing importance of amateur mobile operation, instructed the committee to study and report within 90 days on mobile suballocation matters, *QST* meanwhile to urge all amateurs to give voluntary priority to mobile operation in 29.6-29.7 Mc.

Canadian dues were reduced to \$4.25 annually, payable in U. S. funds, and Newfoundland and Labrador were added to the administrative territory of the League in Canada under the Maritime Division. Morris County, N. J., was transferred from the Atlantic to the Hudson Division. The Board expressed its gratitude for the continued service to amateur radio, performed by the League's volunteer *QSL* Managers, and authorized the disposal of unclaimed cards in the file longer than one year. The Board adopted a resolution commemorating twenty-five years of service to the League by Communications Manager Francis Edward Handy, and commended the Hq. staff for its production of the new edition of *How to Become a Radio Amateur*. The Headquarters was directed to study the possibility of setting up a Technical Scholarship award for a deserving young amateur, looking toward employment at Hq.; to establish liaison with the Federal Public Housing Authority in connection with regulations governing antennas and antenna masts in housing projects; to furnish alternate directors with the same type of lapel pins and certificates now furnished directors; to produce log sheets for sale in loose-leaf form; and to improve TVI and BCI problems by increasing emphasis in *QST* on public relations.

After hearing an extended report by the Secretary on developments in the international communications regulatory picture, with particular reference to amateur problems which may be involved in the forthcoming Extraordinary Administrative Radio Conference in The Hague this September, the Board appropriated \$10,000 for expenses of League participation on behalf of the amateur service. Provisions were continued for reimbursing certain travel expenses of SCMs and *QSL* Managers, and authorized organizational trips for SECs were increased to a total of ten per section per year. The Board closed out the Building Fund, instructing that the Treasurer increase the amount of U. S. Government bonds in the League's general portfolio to \$100,000, any additional surplus to be available for other investments under general Board policy. The Finance Committee, reappointed as Mr. Reid, chairman, and Messrs. Canfield and Noble, was instructed to study the feasibility of establishing an advisory budget to be made available to the Board at each annual meeting.

Minutes of the meeting will appear in July *QST*

# A Noise Limiter for the HRO-M

*Simple Adaptation to Prewar and Wartime Models*

BY R. W. H. BLOXAM,\* GM6LS

THERE ARE a lot of very pretty receivers nowadays; at least they look good to us over here as pictured in *QST* advertising. From the nice reports we get from some of their users on 28 Mc. we gather that they sound pretty good too, Stateside.

Receivers of the super-duper class cost big money, however. Some of them bring about as much as the finest grand piano costs over here — when the cash is converted to the QRP poundsterling anyway! But who would say that there is less craftsmanship and technical skill in their creation? Albeit, there are many hams on both sides of the Atlantic who cannot afford both to eat and to possess one of these Rolls-Royce receivers, and perforce they contrive to receive their quota of QRM on older and cheaper equipment.

Designed in the '30s, the HRO-M is still a very good receiver, available at knock-out prices in the U. K. Becoming the joyful owner of one, we rapidly discovered that its fine performance was liable to utter ruination by every car that crawled up our hill in bottom gear, and by XYLs working in relays around the locality all seemingly bent upon mowing the last vestige of pile from their carpets!

From numerous chats across the Ditch we gather that quite a few American hams use the older editions of the HRO also, and that some suffer the same QRM pains — at least, we have been asked from time to time for details of the noise limiter which finally overcame all our woes.

## Circuit

There have been various noise-limiter circuits put forward, some simple, some complex, some which work, and some others. The circuit shown in Fig. 1 is fairly simple, and it has proved to work well on two HRO-Ms — mine, and another GM's.

The arrangement is a rather well-known form of the series limiter, and no innovation is claimed.

\* 15 Corstorphine Hill Road, Edinburgh 12, Scotland.

Rather, this article is intended to show the practical application of the theory explained in the *Handbook* as applied to a typical receiver. The noise limiter is similar to that employed in a well-known commercial receiver of more recent design than the HRO-M, and is capable of application to most superheterodynes.

Installation involves a minimum of change to the HRO circuit, and not much work, so that if the small subchassis is prefabricated the average ham can complete the fitting in a single evening.

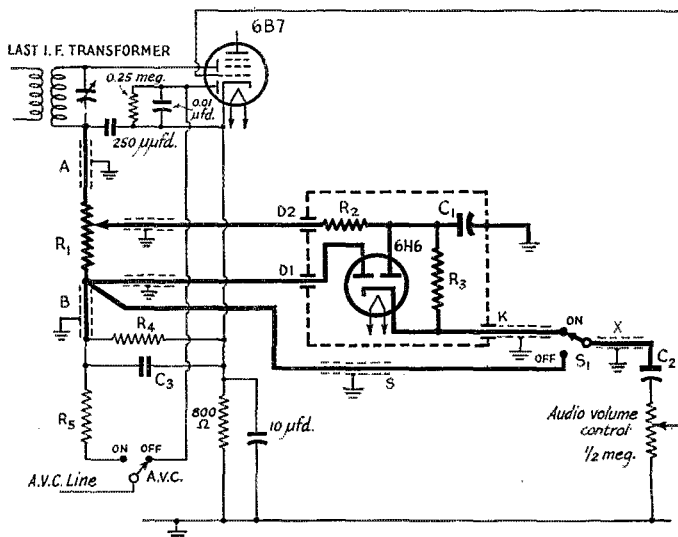


Fig. 1 — Circuit diagram of the noise limiter for early- and wartime-model HRO receivers.

### New components:

- C<sub>1</sub> — 0.1- $\mu$ fd. paper.
- R<sub>1</sub> — 0.5-megohm potentiometer.
- R<sub>2</sub> — 0.17 megohm,  $\frac{1}{2}$  watt.
- R<sub>3</sub> — 0.56 megohm,  $\frac{1}{2}$  watt.
- S<sub>1</sub> — Noise-limiter switch — s.p.d.t. toggle.

### Components already in receiver:

- C<sub>2</sub> — 0.1- $\mu$ fd. paper.
- C<sub>3</sub> — 100- $\mu$ fd. mica.
- R<sub>4</sub>, R<sub>5</sub> — 0.5 megohm,  $\frac{1}{2}$  watt.

The additional wiring and components are shown in heavy lines, for clarity. All the rest is the standard HRO circuit.

The 50,000-ohm potentiometer, R<sub>1</sub>, replaces a 50,000-ohm  $\frac{1}{2}$ -watt resistor (which is the only component removed from the last i.f. transformer second-

ary. This resistor is designated " $R_{13}$  — Diode Filter Resistor" in the *HRO Manual*, and since the only other 50,000-ohm resistor in the receiver is associated with the h.f. oscillator, it is easy to identify alongside the 6B7 socket.

The 0.1- $\mu$ f. condenser,  $C_2$ , feeding audio to the top end of the audio volume control, connects normally to the bottom end of the 50,000-ohm resistor, which also joins to  $R_4$  and  $R_5$ .

The connections to  $C_2$  and the original 50,000-ohm resistor are made to a small tag board, from which the former is lifted off and the latter removed, the tag providing an anchorage for the new shielded wires required to connect to  $R_1$  situated on the front panel of the receiver.

### 6H6 Subchassis

A very small subchassis is made from a piece of thin dural sheet cut to the dimensions given in Fig. 2 and bent to shape. This chassis will fit between the antenna-terminal block and the first h.f. coil block. It is secured by two screws through the lipped ends, and lies over an existing slot in the main chassis.

Three grommeted holes are made in the end of the subchassis nearest the front of the receiver, and a larger hole toward the front of the side remote from the antenna.

The resistors  $R_2$ ,  $R_3$ , and condenser  $C_1$  are wired to the octal socket underneath the subchassis. Heater terminals of the socket are connected by a flexible twisted pair passing down through the existing slot in the chassis, connecting to 6.3 volts at the heater terminals of the output-tube socket.

Apart from the 6H6 heater connections, seven wires are involved in connecting up, all of which should be small shielded flexible wire covered with insulating sleeving to prevent accidental shorts by the braid. Wires  $K$ ,  $D_1$ , and  $D_2$  connect from the 6H6 socket.  $A$ ,  $B$ , and  $X$  pass through the subchassis and the slot in the main chassis, whence they connect by the shortest route to the tag point by the 6B7 socket. The remaining wire is  $S$ , between the switch and  $R_1$ .

### Noise-Limiter Controls

The potentiometer  $R_1$  and the single-pole change-over switch mount one above the other between the S-meter and the tuning dial of the HRO, the switch being at the top, with  $R_1$  beneath it in the same vertical line. The drilling distance from the top edge of the front panel to the center of the switch is  $2\frac{3}{32}$  inches, whilst that from the panel edge to the center of  $R_1$  is 4 inches. The vertical line on which these controls lie is  $4\frac{7}{8}$  inches to the right of the left-hand edge of the panel.

### Operation

The potentiometer provides control of the threshold at which limiting action commences,

but seldom needs to be moved, and the limiting action is self-compensating with changes of carrier level. It is somewhat a refinement, and if desired can be omitted, in which case the original 50,000-ohm resistor would be retained and shielded leads run from each end of it to the 0.47-megohm resistor and Diode 1 of the 6H6.

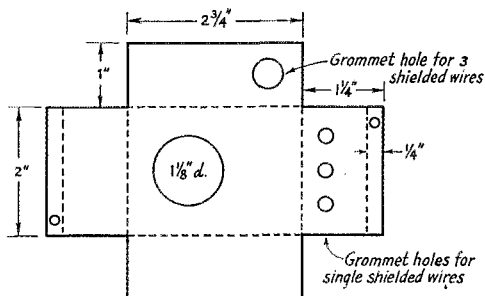


Fig. 2 — Sketch of the subchassis for the 6H6 diode.

Unlike some noise limiters there is very little loss of gain when the limiter is switched into the circuit. About  $1\frac{1}{2}$  steps increase on the 0-10 audio volume control restores the signal to what it was without the limiter.

The limiting action is really good. On 7 Mc., auto ignition at 30 to 50 yards is cut out entirely. On 14 Mc., there is almost complete cutting, whilst on 28 Mc. there is a slight background through which most 'phone signals can be copied, but if the limiter is switched out, even strong signals are drowned in a roar.

Vacuum-cleaner noise and similar motor QRM are reduced to a low background with the sharp edges removed, and 28-Mc. 'phone is readily copied. When tuned "off carrier," the noise rises, but this is generally immaterial. Slight distortion of the signal is inevitable at high modulation levels caused by clipping of the modulation peaks, so that the limiter is switched off except when necessary.

If you are troubled by ignition and vacuum-cleaner QRM this noise limiter really works — let 'em all come!

## Strays

A note from one of Uncle Sam's typically cooperative postmasters prompts us to repeat this reminder: Clubs (and individual hams) should file a list of calls and QTHs with their local post office to expedite delivery of QSLs addressed with only the call and city.

Not so many years ago the "peanut" radio tube was thought to be quite small. But, these were large by today's standards for miniature tubes. Nevertheless, in turn, the latter tubes are giants compared with the Air Force's new tube which is dwarfed by a match head. Ten of these tubes will easily go into a thimble. — *Ohmite News*

# A Low-Cost Audio Filter

BY G. FRANKLIN MONTGOMERY,\* W3FQB

**T**HIS ARTICLE is not intended for the amateur who is already using selective audio for c.w. reception, but rather for one who has considered building an audio filter but has put it off because he thinks a satisfactory audio filter is (a) too complicated, (b) too expensive, or (c) too time-consuming a project.

The most convenient filter is one that requires connections only to the audio output of the receiver; this means no power connections and therefore no tubes. In addition, for the most usable selectivity in c.w. work, the response curve of the filter should be reasonably broad at maximum, with steep skirts, as opposed to one that is sharply peaked. These requirements naturally sound like a bandpass filter, and a good bandpass filter suggests expensive high- $Q$  toroidal inductors. I decided to see what could be done, junkbox style, with ordinary power-supply chokes.

Considerable experimenting with two such chokes and a handful of assorted capacitors led to the arrangement shown in Fig. 1. The circuit was designed to operate from the 4000-ohm output of a BC-348 receiver into a pair of headphones of 15,000 ohms impedance. Other im-

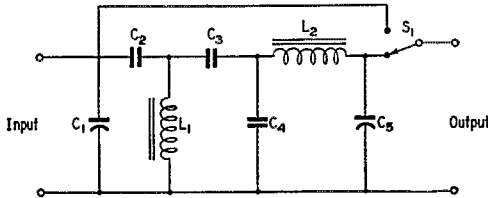


Fig. 1 — Circuit diagram of the audio filter.

- C<sub>1</sub> — 0.1- $\mu$ fd. paper.
- C<sub>2</sub> — 0.01- $\mu$ fd. mica.
- C<sub>3</sub> — 0.0015- $\mu$ fd. mica.
- C<sub>4</sub> — 0.015- $\mu$ fd. mica.
- C<sub>5</sub> — 0.05- $\mu$ fd. paper.
- L<sub>1</sub>, L<sub>2</sub> — 6.5-henry choke (Thordarson T-20C52).
- S<sub>1</sub> — S.p.d.t. toggle.

pedance levels may require coupling transformers or a different design. The s.p.d.t. toggle switch by-passes the filter for normal reception. Fig. 2 is a graph of the measured transmission loss, plotted in db. *versus* frequency. With the filter connected in the output of a BC-348, it is difficult to tell whether the crystal is in or not; although the crystal selectivity of the BC-348 is not extremely sharp, this test gives some idea of the effective audio selectivity of the filter.

The peak of the filter response occurs at 550 cycles. This frequency was chosen after operating

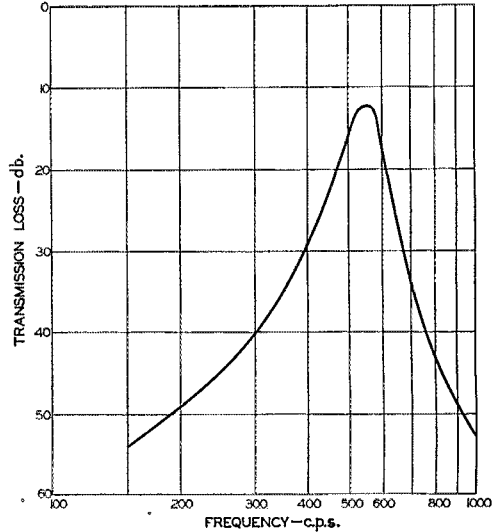


Fig. 2 — Selectivity curve of the audio filter.

for an hour one evening with a surplus FL8A filter. I may be alone in this, but a filter with a peak frequency as high as 1000 cycles conditions my ears to the point of hearing signals with the receiver turned off.

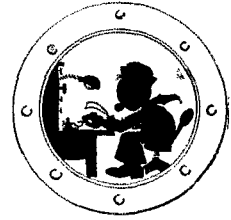
One precaution should be observed in building the filter. Even nominally identical chokes differ in inductance because of manufacturing variations, and to obtain the best selectivity the two capacitively-coupled sections should be tuned to the same frequency by adjusting C<sub>2</sub> or C<sub>4</sub>. A suitable procedure is to connect the filter in the receiver output, tune in an unmodulated carrier with the receiver c.w. oscillator turned on, and rock the receiver tuning back and forth while trying slightly different values of either C<sub>2</sub> or C<sub>4</sub>. A size will be found that will give the sharpest selectivity and the strongest tone at maximum. If either C<sub>2</sub> or C<sub>4</sub> is far from the correct value, it will be possible to detect two definite peaks. Also, C<sub>2</sub> and C<sub>4</sub> may be increased or decreased slightly to shift the peak frequency to individual taste.

There is nothing special about the particular chokes listed here; measured on an impedance bridge, they had an inductance of about 6.5 henrys and a  $Q$  of about 12 at 1000 cycles, but half a dozen other filter chokes tested were found to have similar characteristics. Above all, the filter can be built and adjusted in an evening, without recourse to anything but the junkbox.

\*4557 South Chelsea Lane, Bethesda 14, Md.



# United States Naval Reserve



**A** NEW PLAN for training Naval Reserve communications and electronics personnel, recently adopted, changes the title "Naval Reserve Electronic Warfare Program" to "Naval Reserve Electronics Program." Regularly-established units are termed "Electronics Companies" and "Electronics Platoons." Naval Reservists associated with the program are called "electronics personnel" and receive training in two major categories: (1) operational and (2) technical. A radioman, for example, falls within the operational category, while an electronics technician is in the technical group. The word "warfare" is no longer used.

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The Chief of Naval Operations has ordered that the designation "Combat Information Center" as used in Article 0930, U. S. Navy Regulations 1948, shall be used throughout the naval service. The use of other designations, such as "Command Operations Center" (COC), is discontinued. It's CIC again!

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The Navy Department is revising the boundaries of certain U. S. Naval districts to make them coincide with Army and Air Force areas. Transfer of Ohio and Kentucky from the Ninth Naval District started on April 1st. Ohio moves to the Fourth Naval District, Kentucky to the Fifth. Naval Reserve activities in these states remain under Ninth District jurisdiction until July 1st when the transfer will be completed.

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K5NAZ, Naval Reserve Training Center, Lubbock, Texas, and K4USA, MARS-Army station in the Pentagon, Washington, were participants in an interesting 28-Mc. 'phone contact on March 10th. Rear Adm. Ellis Zacharias, USN (Ret.), visiting at K5NAZ, talked with Mrs. Zacharias in Washington via this amateur radio circuit. K4USA provided telephone patch to the Zacharias's home. Amateur

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Like father, like daughter! *Left:* Lieut. R. L. Simpson, USNR, W6FCX, commanding officer, Electronics Company 12-39, Sonoma, Calif., enlists his daughter Nancy Virginia as a WAVE in the Naval Reserve. Nancy attends weekly drills with Dad's unit. *Right:* Lieut. Cmdr. M. M. Hasse, USNR, W0DKJ, commanding officer, Electronics Company 9-116, Aberdeen, S. D., accepts daughter Gertrude into the Naval Reserve. Gertrude is attending the University of South Dakota in Vermillion, where she hopes to affiliate with Electronics Company 9-184.

radio is not new to Adm. Zacharias; his son, Ens. Ej Mj Zacharias, jr., USN, is W3KCF.

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A Coast Guard-Navy Air-Sea Rescue Plan at Bay City, Mich., received its first test on February 16th when thirteen fishermen were marooned on an ice floe in Saginaw Bay. In accordance with prearranged procedure, the Naval Reserve Training Center acted as communications center. First call for assistance passed from the State Police to the Training Center, which notified the Coast Guard Auxiliary, an organization of boat owners and private pilots who act on a volunteer basis. The Coast Guard provided boats, while three auxiliary planes soon arrived on the scene. The Naval Reserve Training Center continued to pass information by radio and telephone, and also supplied medical personnel and first-aid equipment. Actual rescue was made by a former B-17 pilot in a small float-type plane.

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With other communications cut off in what observers called "the worst blizzard in South Dakota history," the radio station at Naval Reserve Electronic Facility 9-157 provided emergency contact for the city of Huron. Operations were a joint effort of Naval Reserve personnel and the Huron Amateur Radio Club. The call W0QDN was used, with W0ILL, W0NGM, W0PVE, W0TBH and W0YPC as operators. W0QDN operated from 9:30 A.M. March 7th to 2:30 A.M. March 8th, serving as net control station on 3.85-Mc. 'phone and 3720-ke. c.w. Traffic was handled for Northwestern Public Service, Northwestern Bell Telephone, CAA, several Huron business firms, the State Police, and numerous individuals. Messages also were handled for three railroads. The intensity of the storm is described by Lieut. Edward J. Byrne, USNR, commanding officer of the Huron unit: "At the height of the storm, it was a major task to cover even one city block without a halt . . . it took me nearly an hour to go from my office to the drill quarters, two and a half blocks away. . . ." W0QDN's contacts during the emergency operations included W4POF, W9DUA UVA, W5KDM, K0NRU, W0AGL AZR BJV BLK CJS DB DKJ DYM EYW GCP GQH GWU HAT HDO HWS IBI IWB IYN IYZ IZA KOY KQO KSS MMQ MZD MZJ OLB ORE PHR QDN QIQ RQV SAT UFL UVL VQC VT YDT YYU ZRA ZSH ZUS ZXW

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Naval Reserve Training Centers at Fargo, N. D. (K0NRT) and Duluth, Minn. (K0NRN) were active in emergency operations when an early-March blizzard and ice storm struck their areas. Hundreds of towns and cities were with-

(Continued on page 102)



# 1950 ARRL Field Day Rules

*Annual Test for Emergency-Powered Stations, June 24th-25th*

**I**F YOU don't have your gear in shape, there's still time to ready it for the 1950 ARRL Field Day. Old hands won't have to be told that the FD packs more solid fun and enjoyment into a week end than any other event in the ARRL Activities Calendar. To newcomers we'd like to explain that this annual activity is a test of emergency-powered stations in the field operating under conditions often approximating those likely to be encountered in an actual emergency. Unlike most other amateur operating activities, this has grown to be largely one in which radio clubs and other organized groups function as teams in setting up and operating single- or multi-transmitter stations independently of normal power facilities. It is a spectacular demonstration of amateur radio's ability to provide communications useful in times of emergency. But even if you can't arrange to participate as a member of a Field Day group, you're urged to get into the FD. If you're the proud possessor of a mobile rig, or if you have gear that can be set up afield, get out alone or with a friend and enjoy the fun. You'll find hundreds of stations on the air manned by thousands of brother amateurs eager to hook up with you!

The procedure used in making Field Day contacts is simple: The general call on c.w. is "CQ FD" and on 'phone "Calling any Field Day station" or "CQ Field Day." During contact give the station you're working a signal report and the name of the ARRL section in which you're located, then stand by to receive similar information. Score your contacts according to the rules listed below and send a report of your FD activities to ARRL Headquarters.

The rules covering operation in this Field Day are practically the same as those of last year with two exceptions: First, a station operating afield may claim 25 points credit for only one Field Day message origination; some participants interpreted last year's rules to allow more than one 25-point origination. Second, the multiplier of 1.5 formerly applied to FD scores from the Northwestern, Pacific, Rocky Mountain, Southwestern and West Gulf Division scores is no longer allowed: all participants will compute their scores by the same method. The published results of this FD will list scores according to the number of transmitters in simultaneous use in each class; under each classification they will be further broken down by call areas in order that you may compare the results of your efforts with those of other participants in your particular geographical area.

## 1950 Field Day

Starts 4:00 P.M. Local Standard Time,\* June 24th  
Ends 4:00 P.M. Local Standard Time,\* June 25th

\* Not Daylight Time

There is the opportunity to add a substantial number of points to your score for originating a special Field Day message addressed to your SEC or SCM. Study the rules carefully to learn how you may earn this bonus. The FD message is an important part of FD operations: it will give you and other participants practice in handling traffic, and it will convey information to your SEC or SCM that will enable him to evaluate emergency facilities in your section. Don't send your FD message out of your state or League section; normally it should be transmitted to a station in your state or section in order that your SEC or SCM will receive it as soon as possible.

Convenient reporting forms on which to list your FD contacts and make the necessary score computations are available upon request from League Headquarters. You may of course make up your own report forms, but please be certain to include all the information required by the rules. Mail reports on or before July 18th. The 1950 Field Day promises to be the liveliest yet held. Don't miss it!

## Rules

1. **Eligibility:** The Field Day is open to all radio amateurs in the sections listed on page 6 of this issue of *QST*.
2. **Object:** For portable and mobile stations to work as many stations as possible; for home stations to work as many portable and mobile stations as possible.
3. **Conditions of Entry:** Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Contest Committee.
4. **Entry Classification:** All entries will be classified according to number of transmitters in simultaneous operation. They will be further classified as follows: "A," club or non-club group portable stations; "B," unit or individual portable stations; "C," mobile stations; "D," home stations. Thus a club group running three transmitters simultaneously will be in the 3A classification, or a mobile station with one transmitter will be in the 1C classification.  
*Portable stations* are those installed temporarily, for FD purposes, at sites away from customary fixed-station locations. Portable equipment or units must be placed under one call and the control of one licensee, for one entry. All control locations for equipment operating under one call must lie within a 1000-foot diameter circle.  
*Club or group participation* is that portable-station work accomplished by three or more licensed operators.  
*Unit or individual participation* is that portable-station work accomplished by either one or two licensed operators.



*Mobile stations* are complete installations including power source and antenna, mounted in or on vehicles and capable of being used while in normal motion. If they utilize antenna supports not normal or suitable for use during motion, installations must be classified as portable instead of mobile. Each mobile entry call must be different from any other FD station participating.

*Home-station participation* is that work by fixed amateur stations not operating portable or mobile.

5. **Field Day Period:** The Field Day starts at 4:00 p.m. Local Standard Time (not Daylight Time) June 24th and ends at 4:00 p.m. Local Standard Time (not Daylight Time) June 25th. All contacts must be made during this period. Class C stations may cross a time-zone line but may not receive credit for more than 24 hours of operation if they do so.

6. **Bands:** Each 'phone and c.w. band is regarded as a separate band. The following (and additional u.h.f.-s.h.f. bands) constitute separate bands: A1: 1.800-1.825 1.875-1.900 "east" or 1.900-1.925 1.975-2.000 "west," 3.5-4.0, 7.0-7.3, 14.0-14.4, 26.96-27.23, 28.0-29.7, 50-54 and 144-148 Mc. A3: 1.800-1.825 1.875-1.900 "east" or 1.900-1.925 1.975-2.000 "west," 3.85-4.0, 14.2-14.3, 26.96-27.23, 28.5-29.7, 50-54, and 144-148 Mc. (In Canada and Cuba, their respective 'phone bands apply.)

The use of more than one transmitter at one time in the same band is not allowed.

7. **Exchanges:** Signal reports and ARRL section (or specific location) must be exchanged in proof of contact.

8. **Valid Contacts:** In Class A, B and C, a valid contact is a completed exchange with any amateur station. In Class D, a valid contact is a completed exchange with any station in Class A, B or C. Cross-band contacts are not allowed. Contacts by mobile stations may be made in motion or from any location(s). A station may be worked more than once only if the additional contacts are made on different bands.

9. **Field Day Message:** Special credit will be allowed to Class A, B and C entrants for originating by radio a message addressed to the SEC or SCM (see address in *QST*, p. 6) stating the number of operators, the field location, and the number of AEC members at the Field Day station. Only one message may be originated for such special credit.

#### 10. Scoring:

*Points:* Each valid contact counts 1 point.

Credit for handling messages may be obtained as follows: 25 points for originating one Field Day message to SEC or SCM, 1 point for originating any message thereafter, 1 point for receiving a message and 1 point for sending a message onward by radio. There will be a deduction of 10 points for omission of handling data or for defects in form. Copies of all messages originated and relayed must accompany Field Day reports.

#### *Multipliers:*

*Power:* Output-stage plate input under 30 watts: 3. Output-stage plate input over 30 and under 100 watts: 2. Output-stage plate input over 100 and under 1000 watts: 1.

*Independence-of-Mains:* All radio equipment independent of commercial power source: 3. All radio equipment not independent of commercial power: 1.

*Battery Power* (applies to Classes B and C only): 1.5. The battery capacity or size shall in all cases be adequate to permit one hour's continuous operation of the station. Charging batteries from commercial mains while batteries are connected to transmitter or receiver voids the "independence-of-main" and "battery power" multipliers.

Multipliers do not apply to Class D entries.

*Final Score:* The final score equals the total "points" multiplied by the "power multiplier" multiplied by the "independence-of-mains" multiplier (multiplied by the "battery power" multiplier, if applicable). Where different multipliers apply during the Field Day period, points are multiplied by the multiplier in effect at the time the points were earned.

11. **Club Aggregate-Mobile Scores:** Entries under Class C may be combined to form a "Club Aggregate-Mobile Score." The club name must be noted on the individual reports, and the club secretary must submit a claimed aggregate score. Credits to the extent supported by the reports submitted to ARRL will be allowed. Only bona fide

members of the club, residing in the club territory, may contribute to the aggregate-mobile club listing.

12. **Reporting:** Mail reports or entries on or before July 18th. Reports must show bands used, dates and contact times, calls of stations worked, signal reports received and sent, and ARRL sections or locations of stations worked. Reports must also show power inputs and sources of power, location of station, number of persons participating, and score computations.

### A Sample Score

Assume a Field Day station operating in Class A, with independent power and less than 30 watts input. If 40 valid contacts are made, 1 Field Day message originated, and 1 Field Day message relayed (received and sent on), the score would be computed as follows:

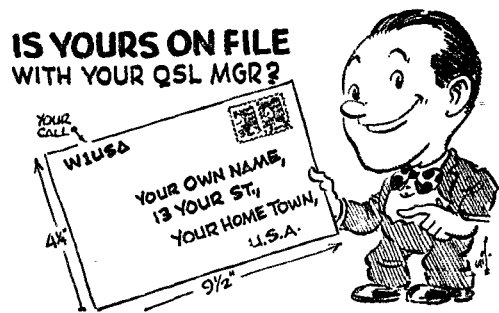
40	(contacts)
25	(message origination)
+2	(message relay)
67	points
×3	(power below 30 watts)
201	
×3	(independent power)
603	CLAIMED SCORE

If the above station were using battery power, the claimed score would be:  $1.5 \times 603 = 904.5$ .

### FEED-BACK

During the course of development of the beginner's superhet receiver described in the March issue, several tube types were tried to find the most suitable i.f. amplifier. When the 6SG7 was finally chosen, the dual connection to the cathode was overlooked. While the wiring arrangement shown is correct for the 6SK7 and 6AC7, there should be no connection to Pin 3 when the 6SG7 is used, since this connection shorts the gain control.

It should also be mentioned that in building this receiver the manufacturer's instructions accompanying the Millen b.f.o. unit cannot be followed. The brown-and-white wire should go to ground, while the black-and-white wire should go to C14.



# On the Air with SINGLE SIDE BAND



IF SOME s.s.b. stations show up in Asia and South America, the first two-way s.s.b. WACs should be made before the year is out. The first VK/North America two-way was reported by W4INL, who worked VK7DH on April 8th for a solid 40 minutes. VE7VP worked VK2CP on April 17th for the first VK/VE two-way s.s.b. QSO. The Tasmanian station runs 100 watts to the 813 final of his 20-meter phasing rig, and 2CP uses p.p. 809s and a filter job. W4INL is well on his way toward the WAC, aided by the 700 watts and a 3-element beam. He was in on the first 3-way with Europe, as you may recall. VE7VP is active on both 20 and 75.

Idaho is well represented in the s.s.b. ranks by W7CUG and W7GTN. CUG at Stibnite uses a phasing system and 100 watts to an 811 on 75, and GTN at Boise is running around 300 watts peak to the p.p. 813s tail end of his phasing job. For frequency control, GTN finds a BC-696 with regulated 150 volts on the plates to be very satisfactory. This drives an exciter patterned after the one described in the November, 1949, *QST*, which is followed by a 6AK6-6AG7 combination into the 813s.

W7FFP at Everett, Wash., has been using s.s.b. since May, 1948, when he worked KL7QH on 75 with only a 6SK7 in the output (distance 2050 miles!). He is now using a phasing rig with 6AC7 oscillator, two 6SA7 modulators, 6SL7 carrier-canceling amplifier, and 6SN7 audio amplifier. This feeds a 6SK7-813 combination.

W7IKY reports that W7EAZ is on 75 in Seattle, but we have no dope on the rig.

A new Canadian station is VE3ADB in London, Ont., using a filter job at 7 kc. out of a 6SN7 balanced modulator, then heterodyning twice to reach the operating frequency. The output stage is an 807, but an 829B amplifier is in the works. A similar 7-kc. filter is used in the receiver for selectable-sideband reception.

Mece Kamke, W2ESP, at Packanack Lake, N. J., went in with both feet and uses a W2UNJ phasing rig and a pair of 813s peaking at 500 watts. Electronic voice control on the rig makes it easy for him to join the rest of the gang using similar automatic-switching systems. An extra dividend was the elimination of TVI when Mece went to linear operation of the 813s final.

Charles Weaver, W2AZW, in New Providence, N. J., has been on s.s.b. since October, 1948, when he tried it on 10 meters. Most of the 10-meter

operation was with carrier in to raise the stations, and quite a bit of spudework acquainting the gang how to tune in s.s.b. was accomplished. Two-ways were made with W5NRP on several occasions. Now AZW is on 75, where his best two-way DX is W7IKY. The transmitter is a filter job at 10 kc. that heterodynes to 110 and 1710 kc. before reaching the band in use. The output stage is a pair of 813s driven by an 829B, with the peak power running around 400 watts. Voice control and bandswitching are used.

W2LKN has run up over 150 different contacts with his 100-watt s.s.b. rig and a dipole, with VK4DO the best DX. . . . W6AMY worked W2SHN, W2UNJ and other East Coast stations on 75 with his pair of 1625s. . . . OZ7T and G2NX have both been offering European s.s.b. contacts to the W gang, with most of the 20-meter activity taking place on Sundays around 14.2 Mc. and 2100-2300 GCT. OZ7T finds a new exalted-carrier adapter fine for the reception of all types of 'phone and c.w. signals. . . . W6MNN has worked two-way s.s.b. with all call areas. . . . W3ASW has worked 50 different s.s.b. stations, in 18 states and 2 VE areas.

If you can dig up the issue in the library, read "The Single-Sideband System Applied to Short-Wave Telephone Links," by A. H. Reeves in the September, 1933, *Proceedings of the Wireless Section of the Institution of Electrical Engineers* (England). You may get a few ideas from the article but, in any event, it is interesting reading for any s.s.b. enthusiast.

— B. G.

## Silent Keys

IT IS with deep regret that we record the passing of these amateurs:

W1AGI, William C. Nielson, Newport, R. I.  
 W1DIG, Myers E. Reed, jr., Woolwich, Me.  
 W1FYE, William E. Dayton, Bridgeport, Conn.  
 W2QZM, Robert R. Robb, Tenafly, N. J.  
 W3RUS, William H. Hupe, Pittsburgh, Penna.  
 W4FXV, John R. Sorsby, Rocky Mount, N. C.  
 W5AO, William N. Nelson, New Orleans, La.  
 W6CUE, N. C. Pickard, Modesto, Calif.  
 W6IHV, Willis B. Clarke, Fresno, Calif.  
 W6OJ, ex-W1AKG-W1QD-W2KDF-W9OG, Sylvester K. Heffernan, Hollywood, Calif.  
 W7FMQ, Earl E. McKinney, Medford, Ore.  
 W8CZF, Rolland R. Meeks, Canton, Ohio  
 W8NQZ, Maj. Arthur L. Huff, USAF, Granville, Ohio  
 W8SKK, Merle M. Kincaid, Leavittsburg, Ohio  
 Ex-8UK, Mrs. Ruby A. Poad, Cleveland, Ohio  
 W9MUZ, Joseph B. Maloney, Chicago, Ill.  
 EL5B-W4NAZ, Jesse D. Bell, Roberts Field  
 HK1FQ, Victor Dugand, Barranquilla  
 KH6ET, ex-K6BJJ, Jack A. Costa, sr., Paunee Maui  
 VP9J, Frederick H. Cadwallader, Hamilton  
 ZL1AA, C. Norman Edwards, Auckland

# Tower and Rotator Techniques

## Part II†—A Rotator, Direction Indicator, and Control Unit

BY LOUIS H. HIPPE,\* W6APQ

**A**FTER the ham constructs his beam antenna and a perch for it, the next consideration is a means of rotating the array to the desired azimuth and some sort of indicating device to enable the operator to track his beam from the operating position. These two ends can be accomplished either electrically or mechanically, whichever suits the requirements of the operator. At W6APQ an electrically-operated method of rotating the beam and an indicating device were constructed, using war-surplus materials still available on the market at nominal cost.

The mechanism for rotating the beam is enclosed in a weatherproof sound-deadening box. This is important; unless steps are taken in this direction the drone of the motor can be heard for several hundred feet. Mounting the rotator in the base of the tower affords ample room to work on the mechanism without having to hang from the top of the tower or resort to safety belts. Details of the housing and the mounting of the parts therein may be seen in the photographs.

The box to house the unit is built of five-ply waterproof (outside) plywood. Outside dimensions are 16 by 20 by 32 inches. The inside is fully lined with Fir-Tex (Celotex) and rug-pad felt to dampen vibration and muffle the noise set up by the motor.

In constructing the door for the motor housing, cleats are fastened to the inside edges of the box, so the door panel will fit flush with the outside edges. The cleats should be lined with strips of inner-tube rubber to waterproof the box. The inside of the door panel is lined with Celotex or felt also. Large screws are used to fasten the door panel in place.

A propeller-pitch feathering motor was selected to rotate the beam antenna. With all the motors on the market specifically offered for this purpose, the propeller-pitch motor is probably best for the job. It is built of the finest materials and has a gear reduction ratio of 9576 to 1, giving it a tremendous reserve of power.

The motor will operate on from 10 volts minimum to 30 volts maximum, a.c. or d.c., and is reversible. At 24 volts the outside gear will turn

at  $\frac{3}{4}$  r.p.m. If that is too slow the speed can be increased by a simple operation. Inside the gear housing section there is a large plate with four holes in it. The edge of this plate is turned down to form a flange and the inside of this flange has gear teeth cut in it. By using a hack saw on the plate and sawing from hole to hole, the outside rim gear can be separated and removed from the assembly. This will double the speed of the outside hub gear, thus providing extra versatility in the motor since it can be run at two speeds by controlling the motor voltage. At 10 volts the speed will be slow enough to provide scanning of the band. At 30 volts the antenna can be quickly rotated to the desired azimuth.

The conversion of the motor to continuous operation is simple and can be done in an hour or two. Follow each step in careful sequence and you'll have no trouble.

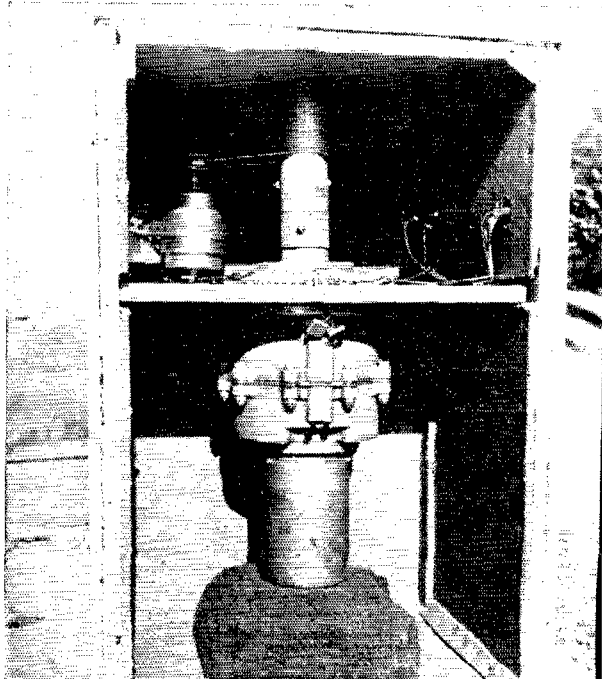
- 1) Remove the lead balance weight located under the small plate on the outside of the motor.
- 2) The motor cover is held on by three machine screws which in turn are safety-wired. Remove the safety wire, the three machine screws, and the motor cover.
- 3) Remove the small rectangular locking lug by removing the safety wire and machine screws which secure it.
- 4) With an iron-bar and a hammer remove the back half of the exposed brake plate by tapping

\* 10636 Victory Blvd., North Hollywood, Calif.

† Part I of this article appeared in May QST.

◆  
Interior of the rotator housing. Note the sound-proofing applied to all interior surfaces.

June 1950



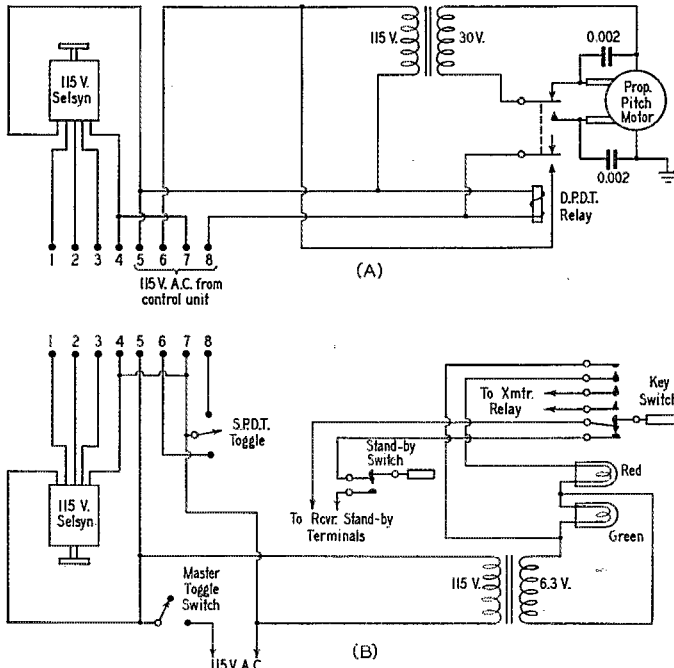


Fig. 5—Schematic diagrams of the rotator (A) and direction-indicator (B) units.

it in a counterclockwise direction, and lift out the brake shoe from the gear.

5) Remove the cotter key and nut from the motor shaft. Use patience for it may come off a bit hard.

6) Remove the small gear from the shaft by tapping on the end of the shaft with a soft-nose hammer while applying pressure under the gear with a lever.

7) Lift out all of the remaining brake assembly by removing the three nuts from the inside of the brake plate.

8) To prevent chattering, short out the two contacts that lead to the solenoid cell with a piece of heavy wire. These are the two nuts that are close together on the edge of the assembly into which the brake unit was formerly seated.

9) Replace motor cover and secure it with the three machine screws.

10) By using the two terminals that are closest together on the outside of the case, and the case itself for the common connection (ground), the motor can now be operated. Using one of the terminals and ground (motor case) the motor will turn in one direction. Using ground with the remaining terminal, the motor will rotate in the opposite direction. Do not remove these terminal wires from their channels in the case casting; this helps to act as a shield. The leads from the relay and the transformer (Fig 5.) can be connected to the motor by digging the wax out of the terminal points. This will bare a brass screw head which

can be used to hold a solder lug for the power connections. Forget about the two wires on opposite sides of the motor as they are connected to internal switches and have no use in our plans.

11) The motor should be by-passed to keep it electrically quiet. This can be done as described on page 65 of November, 1948, *QST*, or it may be done with 0.002- $\mu$ fd. mica condensers on the outside of the case. I used the latter method and it works beautifully; no noise is apparent on any band.

The large beveled gear on the top outside of the motor should be carefully removed and kept as it affords an opportunity to make use of the radial thrust bearing built inside the gear housing and which can be seen when the gear is lifted off. To the top of this gear we had a pipe flange welded which takes a 2-inch pipe nipple 6 inches long. The

nipple and flange were also welded together for strength and to prevent loosening.

The antenna is connected to the motor through a drive shaft which consists of two parts. The lower section is a piece of thick-walled aluminum pipe 2 1/4 inches o.d. and 8 feet long. The lower section fits nicely over the pipe nipple and rests on the flange. The nipple and aluminum pipe are fastened together with two 10/32 galvanized bolts which pass completely through the two pipes at right angles. The upper 12-foot section telescopes inside the lower pipe for a distance of 1 foot and the two sections are held together with either 10/32 galvanized bolts or self-threading screws. The upper pipe then threads into a pipe flange bolted to the antenna boom. This makes a neat installation and allows the antenna to be lowered to the top of the tower by simply removing the bolts that hold the upper and lower sections together, disengaging the two sections and letting the upper section of the rotating mast slide downward until the antenna boom rests upon the platform at the tower peak.

Once the motor has been converted for continuous operation it can be mounted inside the padded box housing. A piece of 1- by 12-inch pine is cut to fit across the inside of the box. Cut a hole in the center, by using the motor top as a template, to allow the top gear to project through. The motor should then be bolted to the 1 by 12 with three carriage bolts. A small platform made of short pieces of 2 by 6s is built on the bottom

of the box at center for the motor to rest on. The platform is padded with felt to dampen all vibration. The unit is held in place by four 3-inch flat-head wood screws which pass through the sides of the rotator enclosure and engage the wooden motor mount. This provides a shelf with plenty of room to mount the transformer, relay and synchro indicator, as shown in the photograph.

An eight-terminal Amphenol connector was used for the power cable to the rotator. The connector is waterproof enough to prevent moisture from creeping to the inside of the cabinet. The female socket was mounted on an aluminum plate, and between this and the side of the box where it was to be mounted was inserted a rubber pad cut from an inner tube. Rubber cement was applied to both sides of the rubber so when the socket plate was fastened to the box with round-head wood screws and drawn up tight, the joint became watertight.

A 3-inch hole is cut in the center of the top of the box to accommodate the drive shaft. To waterproof this section, and still provide for rotation, a piece of inner tube of ample dimension was cut and taped to the drive shaft so that it formed an inverted funnel over the hole. A circle with a 3-inch hole in the center was cut from outside plywood and nailed and glued to the area around the hole in the box, providing a dam to prevent water from running into the interior of the box. Even during the most severe rainstorms there has not been a drop of water seeping into the housing unit.

Several quarter-inch holes were drilled in the bottom of the box to provide ventilation and equalization of humidity. This will prevent the metal parts inside the cabinet from collecting condensed moisture. The outside of the rotator box was given the same paint treatment as the tower.

The rotating unit should be connected as shown in the diagram, Fig. 5. Once these connections have been made and tested the unit is ready for mounting in the base of the tower. First, a platform must be built which is sturdy enough to support the weight of the unit, rotating shaft, and beam antenna. This was done by cutting two lengths of 2 by 4 which were leveled and bolted to the legs of the tower. These provide a supporting base for two 2-by-6-inch planks which are placed across them and spiked into position. The cabinet containing the rotating unit is then centered on this platform and secured to it by means of four angle-iron pieces and 1-inch flat-head wood screws.

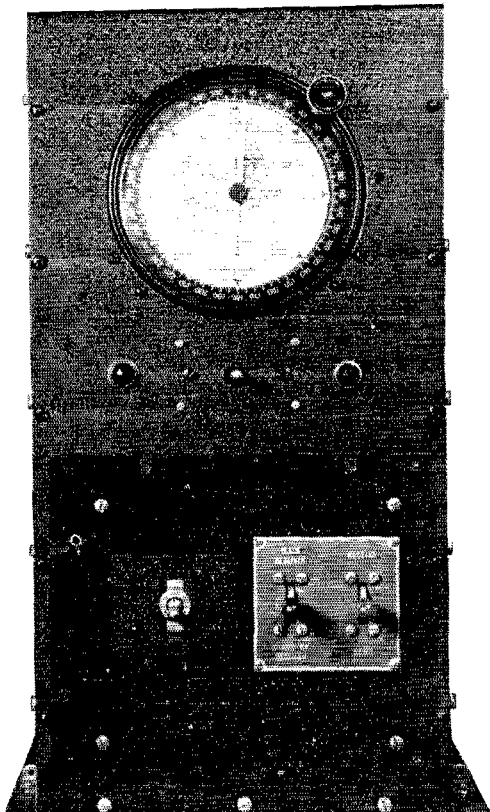
After the cabinet has been mounted and secured, the rotating shaft is assembled and fastened as described previously. With the antenna in position it can now be rotated with ease; all that remains is to construct the indicating unit for the operating position.

### *Direction Indicator and Control Unit*

The azimuth indicator and station control panel are built into the cabinet of the BC-306 antenna loading unit for the BC-375 transmitter. The size and shape of this aluminum crackle-finish cabinet make it ideally suited for housing a control unit. Besides having plenty of room to mount the synchro motor, relays, transformer, etc., there is also space in which to build such auxiliary equipment as a monitor or the master controls for the entire station.

As is no doubt usual with those who have purchased surplus equipment, we had the BC-306 unit kicking about the shack for some time only because we were able to own it for less than a dollar. It was not until WGABM made us a present of a Signal Corps control unit, RM-38-A, that the two pieces of equipment suggested the unit that is shown schematically in Fig. 5.

To start with, the BC-306 was stripped of all parts and the front panel modified to suit the new requirements. A 5-inch indicator dial from a Model 1-82 radio compass indicator was installed at the top of the panel where it was clear of all controls.

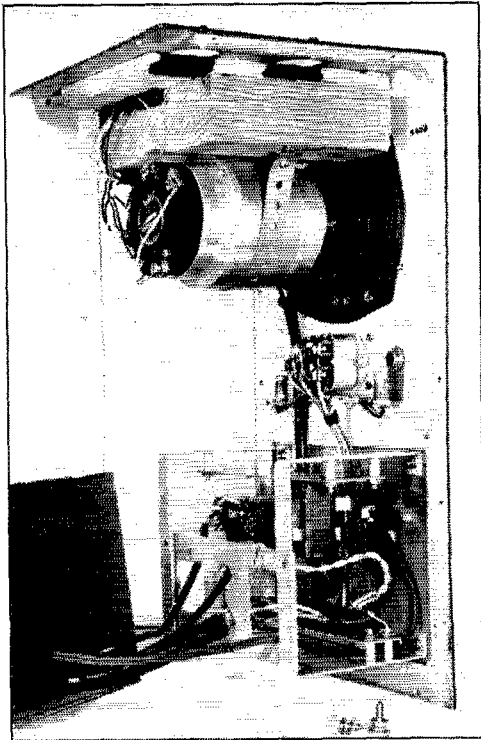


Front view of the direction indicator and control unit, built entirely of surplus components.

From the round section just removed from the dial-indicator hole, a rectangle 2 by 2½ inches was cut, to mount the master control switch and at the same time cover the hole in the RM-38-A control-unit panel in which was formerly mounted a double 'phone jack.

The RM-38-A was stripped of all parts, and its panel used as is without further cutting or drilling. It was painted, however, to cover the olive drab and to conform with the finish of the BC-306 cabinet. This was done with an atomizer of the type used by artists to blow fixative on charcoal drawings. These may be purchased at the local art store for a quarter. The black lacquer was thinned out pretty well, stirred thoroughly, and strained through cheesecloth to remove any lumps. Then with lung power the lacquer was blown on the panel. After the BC-306 cabinet was cut and drilled it, too, was given a coat of lacquer by this same method to cover any scratches or white lettering. It isn't hard to spray small areas by this stunt if the lacquer is thinned out sufficiently, and the finished job looks better than an attempt at brushing.

The control unit was reassembled by remounting the frame, terminal strip, and switches. Where the resistor strip was formerly mounted,



Interior of the control unit, showing the method of mounting the indicator synchro.

a small 6-volt transformer was installed to operate the panel lights. The wiring diagram is shown in Fig. 5.

If the 24-volt synchro motor that originally came with the 1-82 radio compass indicator dial is used, no consideration for mounting the motor shaft to the dial center need be given. It is only necessary to install a small 24-volt transformer to make the motors operative. If, however, the heavier 115-volt synchros are used it will be necessary to mount and center the motor firmly in relation to the dial.

First, a coupler was fastened to the shaft of the motor, and in the exact center of the coupler was soldered a piece of steel wire upon which to mount the indicator pointer. This wire must be on dead center to avoid any possibility of wobble when the motor turns.

Before centering the motor shaft with the center of the indicator dial, procure a small reproduction of a great-circle map (centered on your locality) and mount it to the face of the indicator dial with Duco cement. One of the great-circle maps reproduced in various publications may be photostated to the correct size (3¾ inch diameter) for a nominal fee at any blueprint establishment. Work fast and apply the Duco cement to the back of the map print, then quickly place it in position on the dial. Use a clean soft cloth and press the print firmly onto the dial until the cement has dried. This only takes a few minutes and will prevent the formation of blisters on the map surface. When the cement has dried thoroughly prick the center of the map with a large pin for the wire that mounts the indicator hand to pass through.

Turning the panel upside down and working from the rear, it will be seen that a piece of quarter-inch plywood and a piece of 2 by 6, stacked, will raise the motor just a bit above center. This allows for a rounded channel to be cut in the 2 by 6 with a large half-round file, to seat the synchro and prevent it from slipping. The wood may be filed a small amount at a time until the motor is exactly aligned with the center of the dial. The whole can then be drilled to take four long round-head wood screws to fasten the wood blocks to the top of the panel section. When the motor has been checked for perfect centering, it can be held in position with a piece of electricians' grounding strap and a couple of wood screws. This makes it comparatively easy to adjust the indicator synchro to track with the beam, by loosening one of the strap screws sufficiently to allow the synchro motor to be turned to the desired point.

The switch and panel lights can be mounted in position and the wiring completed as per the diagram. To facilitate coupling of the device, either the Jones plugs that are supplied with the RM-38-A control unit or standard socket plugs may be used.

# June V.H.F. QSO Party

JUNE 3RD-4TH

## Certificates for Leaders

THIS is an invitation to all amateurs who can work any or all v.h.f. bands (50 Mc. or above) to use 'phone, m.c.w. or c.w. between 2 P.M. local standard time (EST, CST, MST, PST) Saturday, June 3rd, and midnight local standard time Sunday, June 4th. The League announces an early-June V.H.F. Party as a chance for all v.h.f. operators to try for new QSOs and DX. See what new stations and states can be worked. Try out your new antennas and gear. Mark your calendar today. You will find out where you can work with your signals in a period when many others of the v.h.f. clan will be superactive. Don't miss the chance for more v.h.f. fun and results.

### On Taking Part

"CQ contest" is the call to get in touch with other contestants. Exchanging signal-strength and readability reports is suggested but not required. When you work another v.h.f. amateur, you must give him the name of your ARRL section. Page 6 of this issue gives reference to each of the League field-organization ARRL sections and serves as a convenient check-off list. ARRL staff members are not eligible for awards. You compete only with amateurs in your own ARRL section for the certificate award.

Count 1 point for successfully-confirmed two-way exchanges of section information on 2 or 6 meters. A one-way exchange does not count. When two-way exchanges are accomplished with your transmitter on the 220-, 420-, 1215-Mc. or higher band, you may record 5 points per QSO.

### Multiplier

The sum of station points earned is multiplied by a section multiplier. Each time a new section is worked two-way it adds one to the multiplier. *The multiplier grows by one if you rework this same section on another band.* (Scoring differs in this respect from other ARRL competitions to encourage everyone to make use of as many v.h.f. bands as possible.) A simple tabulation with points and section list is all that is required. A card to Headquarters will bring the simple form on which to report; or your own similar tabulation will be accepted.

### Rules

- 1) Name-of-section exchanges must be acknowledged by both operators before either may claim the point(s).
- 2) All claimed contacts must fall in the contest period and must be on authorized amateur frequencies above 50 Mc., using permitted modes of operation.

3) Contest score must represent points earned from operation exclusively within a given ARRL section.

4) Fixed-, portable- or mobile-station operation under one call and by one operator is permitted.

5) The band your transmitter is on determines whether a QSO counts 1 or 5 points. Cross-band work shall not count.

6) A "contestant" is a single operator working without the help of any other person. Results may be presented with names of all participating persons, for listing, but only single-operator scores will be considered for certificates.

7) Scoring: 1 point for completed two-way section exchanges on 50 or 144 Mc.; 5 points for completed two-way section exchanges on the higher v.h.f. bands. The sum of these points will be multiplied by the number of different ARRL sections worked; i.e., those with which at least one point has been earned. Reworking sections on additional bands for extra section credits is permitted.

8) A contact per band may be counted for each different station worked. Example: W1SNK (E. Mass.) works W1EIO (Maine) on 50, 144 and 220 Mc. for complete exchanges. This gives W1SNK 7 points (1 + 1 + 5 = 7) and also 3 section-multiplier credits. (If more Maine stations are subsequently contacted on these bands they do not add to the multiplier but they do pay off in additional contact points.)

9) Each section multiplier requires actual completed exchanges with at least one station. The same section can provide another multiplier point only when contacted on a new v.h.f. band.

10) Award Committee decisions shall be accepted as final.

11) All reports must be postmarked no later than June 21, 1950, to be entered for awards. (See p. 55, May, 1948, QST, for form or a message to Hq. will bring a mimeographed blank for report on this contest.)

### Reporting

Submit contest logs to Headquarters immediately, even if your score is small, to help in cross-checking the claims of others.

— F. E. H.

## CODE-PROFICIENCY AWARDS

Have you received an ARRL Code Proficiency Certificate yet? Twice each month special transmissions are made to enable you to qualify for the award. The next qualifying run from W1AW/WØTQD will be made on June 15th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters. Frequencies of transmission from W1AW will be 1887, 3555, 7215, 14,100, 28,060, 52,000 and 146,000 kc. WØTQD will transmit on 3534 kc. The next qualifying run from W6OWP only will be transmitted on June 4th at 2100 PST on 3590 and 7248 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the five speeds transmitted, 15 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening, Monday through Friday, at 2130 EST. References to texts used on several of the transmissions are given below. These make it possible to check your copy.

Date	Subject of Practice Text from April QST
June 1st:	A "Constant Modulation" 'Phone System, p. 11
June 4th:	Qualifying Run, 2100 PST, from W6OWP only
June 5th:	A Two-Stage Transmitter for the Beginner, p. 14
June 7th:	Key Clicks and Receiver Bandwidths, p. 34
June 13th:	A 2-Meter Station for the Novice, p. 42
June 15th:	Qualifying Run, 2130 EST, W1AW, WØTQD
June 16th:	50 Years of Progress . . . , p. 48
June 19th:	The World Above 50 Mc., p. 50
June 21st:	A High-Frequency Crystal Filter, p. 58
June 27th:	On the Air with Single Sideband, p. 60
June 30th:	With the AEC, p. 68



# The World Above 50 Mc.

CONDUCTED BY E. P. TILTON,\* WHDQ

**P**REPARED COPY for a June *QST* is always a problem for your V.H.F. Editor. With the quick change of season that is imminent at copy deadline there is also a complete shift of emphasis in v.h.f. work. The events of the month just coming to a close are associated with winter and early spring, yet the date at the bottom of the page and the thoughts in every v.h.f. enthusiast's mind are suggestive of summer. So let's look ahead, this time, for just a moment.

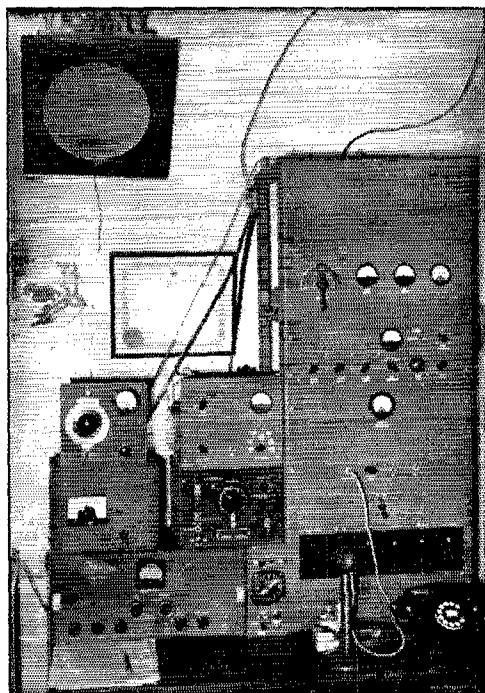
Why all that urge to have gear and antennas in top form; to get the family lined up for a week end without the OM? Yes, it's the June V.H.F. Party, scheduled for the 3rd and 4th. Coming right at the peak of the v.h.f. season, this one should be fun for everyone. It's at just the right time for club groups to try out their v.h.f. set-ups for the coming Field Day, and there is better than a 50-50 chance that the weatherman and the gods of the ionosphere will dish up some hot propagation for us.

The rules (*see preceding page*) are simple, and reporting is a cinch. Talk it up on the air, and at the club. Polish up that gear for 220 and 420, for those extra-point contacts, and be sure to work both 6 and 2. Study the rules, have some of the reporting forms on the operating table, to be filled out as you go along. Get set for the opening gun, ride the contest period for all it's worth — then *send in your report*. Let's make this one the best yet!

Now for a quick look back over the doings of April. The 6-meter gang got off to a good start with an aurora session on the night of the 1st, but the South American opening of the following day was the exclusive property of stations in the southern part of the country. W4s in southern Florida and W5s in Texas and Louisiana had a field day. HC2OT, Guayaquil, Ecuador, worked W5s JLY, VY, ESZ, FSC, XE1GE, XE1QE, W5s IYG, JBW, DSB, QIO, JLY and VY, in that order, between 2:32 and 4:40 p.m. EST. Most of these stations also worked a number of LUs and OA4BG during the same period. HC2OT worked PZ1A the following evening.

There was aurora in northern U.S.A. on the 5th and 6th, and the band was open from the southern part of the country to South America again on the 6th and 7th, the territory and time being very similar to the opening of the 2nd. The first 50-Mc.

contact between the Hawaiian Islands and Ecuador came at 8:50 p.m. EST April 7th, when HC2OT and KH6NS connected, racking up country No. 15 for HC2OT. KH6NS had worked LUs 6DO, 1BV, 9EV, 4DI, 5BM and 5BK between 7:35 and 8:40 p.m. EST, and remained in contact with HC2OT for an hour, during which both parties checked frequently for signs of other signals. HC2OT worked KH6NS again on the 8th at 8:50 p.m. EST, and 6 was open to PZ1A and XE1GE the same night. The only other openings observed by HC2OT in April were to LU and YV5 on the 12th and to LU on the 21st.

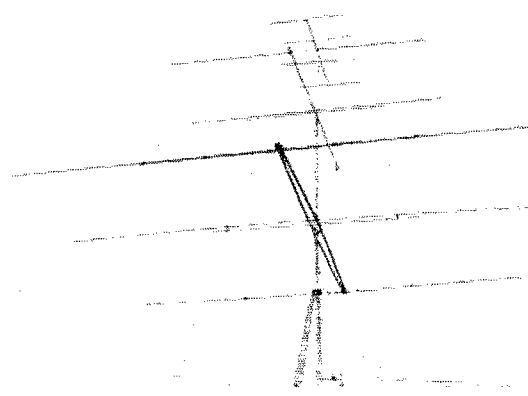


If you've worked VE3 on 6 or 2 meters the chances are good that you've heard the signal from this neat layout at VE3ANY, Lakeview, Ontario. The rack at the right contains power supplies, modulator, and an all-band rig with an 813 in the final. Between the rack and the 520-R is the control panel and beam direction indicator. On top of the receiver are a BC-221 and the v.h.f. transmitter. The latter has an ARC-5 exciter with an 829B final. Converters for 2, 6 and 10 meters are located at the left.

\* V.H.F. Editor, *QST*.



T-matched 3-element arrays are used at VE3ANY for 10 and 6. The 2-meter job has 4 elements, with a folded-dipole radiator.



LU9EV, near Buenos Aires, lists the following heard or worked between 2:04 and 4:10 P.M. EST on the 8th: XE1GE, W5JLY, W5BDT, W4FNR, W5VY, W4VV, XE1QF. This appeared to be an  $F_2$  opening, but the customary evening activity (presumably  $E$ -layer) brought in YV5AC, YV5AB, and PZ1A, from 7:28 to 8:30 P.M. Other activity reported during April by LU9EV includes openings to various South and Central American countries on the 10th, 11th, 12th, 13th, 14th, 17th, 21st, 23rd and 25th.

CE1AH, back on the job in Chuquicamata, Chile, after a sojourn in the States, took up her 50-Mc. watch on the 23rd. Her first 1950 50-Mc. contacts were made on the 25th with LU9EV and PY3BW, at 7:51 and 9:07 P.M. EST respectively.

The first shots of the sporadic- $E$  open season in North America were fired on April 15th. W6OB, Compton, Calif., worked W5VY at 8:20 A.M. PST, followed by W5JLY at 8:35. W7KOP, Sinclair, Wyo., was worked by W6OB and W6ANN between 9:05 and 9:35 A.M., and W7FLQ, Spokane, Wash., came in at 1 P.M., working W6OB, W6BQR, W6MVK and W6FPV. The afternoon of the 16th gave W0ZJB, Gushland, Mo., his first 1950 workout. W2MEU reports that several New Jersey W2s were on the eastern end of this one. W6IPI, Olmitz, Kans., reports working W7FLQ between 12 and 12:45 P.M. CST. Looks almost like a double-hop set-up.

### Around the World on the V.H.F. Bands

*Lima, Peru* — April 2nd was a big day for OA4BG. Beginning at about 2 P.M., John heard a carrier that seemed to peak from the west, shifting to north. When the signal was identified as LU5BM and the beam swung around to the Argentine, the signal disappeared. Turning back north, John raised LU5BM at 2:18, followed by LU3BD at 2:31. XE1QE was heard at 2:44. LU5CK, W4IUJ, W4FNR and LU8BQ were worked between 2:45 and 3:11. W5VY, W4IUJ, W40GC and LU9MA were heard in the next 20 minutes, and several W4 and LU contacts were repeated until 4:06, when the W signals disappeared. The LUs remained in weakly until about 5 P.M. During all this time they were readable only with the beam at OA4BG aimed north. This was the first instance that John has heard both LU and W signals simultaneously, and the prevalence of pronounced rebound effect indicates that the m.u.f. must have been well above 50 Mc. for several hours.

*Barranquilla, Colombia* — If 50-Mc. contacts have not been made with Colombia every night for the past three months, it is not the fault of HK1CA and HK1DX. The chart of 50-Mc. observations by LU9EV, printed in this department last month, indicates the consistent nature of the efforts of these two. The log of HK1DX through April 18th shows activity daily with DX as follows: LUs on the 1st, 4th, 10th, 11th, 12th and 13th. No other countries were heard during the period, and there were 12 days when no DX was identified. Since he came on the air on 50.06 Mc. in February, Ted has worked Peru, Argentina and Ecuador. He has heard LUs working Costa Rica, Mexico, Venezuela and U.S.A., but has heard nothing of any of these countries to date.

*Caracas, Venezuela* — Though it was possible to work into Buenos Aires almost nightly (see last month's chart) and into Guayaquil and Lima less frequently, YV5AC has had almost no luck with other areas despite daily activity on 50 Mc. He has worked YV1AV, Maracaibo, 300 miles to the west, on rebound, and has heard HK1CA and HK1DX, 530 miles in the same direction, also by rebound from the north. Jerry's log for April shows only contacts with the Argentine, on the 4th, 8th, 10th, 11th and 12th. These were all made between 7:30 and 9:30 P.M. EST. Practically every contact made by YV5AC in 1950 has been between these hours, but it is not from lack of trying at other times. Jerry has a 4-over-4 stacked array, a low-noise converter, and plenty of perseverance.

*Columbus, Ohio* — Word from W8WEN has it that ZS9F, Bechuanaland, is hearing 50-Mc. signals from this country. No other details are available. We'd like to believe it!

*Mayaguez, Puerto Rico* — 50-Mc. signals from LU, HK and TI were heard on the evening of April 10th by KP4CA. Wanted: some KP4s on 50 Mc.! It has long been felt that the West Indies would be ideal territory for a good 50-Mc. man, yet nobody has ever been sufficiently hopped up on the idea to try it.

*West Palm Beach, Fla.* — W4IUJ cites the March 26th contact with OA4AE made by W40GC of Miami as an outstanding example of beginner's luck. This was OGC's first day on 6, and he was using only a folded-dipole antenna.

On April 1st, W4IUJ had a short contact with OA4BG at 2:14 P.M., the signal staying in for only 8 minutes. The 2nd was red hot, however, with OA4BG starting things off at 2:55. LUs were in until 5:15, their signals being exceptionally strong and steady between 3:50 and 4:30 P.M. The signal of W4FNR in Ft. Lauderdale showed considerable rebound effect during the best of things. W4FNR worked the same group of LUs, and in addition reports reception of HC2OT and W5VY on the 6th, and an unidentified c.w. signal from the south on the 7th.

*San Antonio, Texas* — Early April was a busy period for W5VY. On the 2nd Pat worked HC2OT, LUs 9MA, 6DO, 5BN, 3BD, 5CK, HC2OT again, and LU8JI, between 1:45 and 4:10 P.M. CST. He caught HC2OT and LU9EV again on the 6th in a short opening beginning at 1:45 P.M. Another string of LUs and HC2OT were worked on the 7th and again on the 8th in afternoon openings. Signals during these periods seemed to be real  $F_2$  stuff; very strong, and with a fade similar to that noted on 10-meter signals. On the night of the 8th the band reopened at 8:55 P.M. and signals had typical sporadic- $E$  qualities: rapid fading, almost a flutter, and relatively low levels compared with the daylight strengths. This evening session brought in LU9MA, LU1BV and LU5CK.

In between keeping the 6-meter band hot, Pat has found time to get 750 watts on 2 meters. He wants it known that the 144-Mc. gang down his way are now horizontally polarized, and ready for business.

*Detmold, Germany* — In a try for some real 2-meter DX, DL3AU will be transmitting on a 24-hour schedule from June 25th to July 2nd. The transmitter runs over 400 watts on 144.6 Mc. DL1SI and DL1SJ will be on 20 looking for reports of DX reception of the 2-meter signals of DL3AU.

*El Paso, Texas* — In an effort to find out what is the best antenna for 144 Mc., W5MLV surveyed the antenna situation and found that with W5s QVG, LWL, FAG, MLV, NA1, ESZ, CYS, JOT, BGI and ECJ all active on 2, there

was no duplication of antennas in the crowd! They range all the way from a 24-element at W5QFG and a 16 at W5LWL, down through 5-over-5, helix, 4-over-4-over-4, 3-element, to a folded dipole. The only agreement is on polarization — horizontal. W5JOT has a 250-watt rig with 826s in the final, and he holds the local record, having worked Hot Springs, New Mexico, 100 miles. W5a EGI, ESZ, PMX and MSW are also working on 420 Mc.

**Sault Ste. Marie, Mich.** — A "good" location can be wasted if its advantages from a tropospheric standpoint are nullified by a geographical position such that few fellows aim their antennas toward it. Sault Ste. Marie would seem to have what it takes, from a propagation standpoint. Situated near the junction of three of the Great Lakes, it should enjoy some fine tropospheric propagation, but W8III and about ten others in the area have not made out so well on 144 Mc. to date. He has 200 watts and a 16-element horizontal array, so he should have no trouble in working out when conditions are right. A circle that includes Toronto, Buffalo, Toledo, Chicago and Milwaukee should be workable, so fellows within that range are asked to remember the boys up there when the bending is good.

**Laramie, Wyoming** — Southeastern Wyoming and adjacent parts of Nebraska and Colorado are the scene of increasing activity on 144 Mc. The first Nebraska-Wyoming 144-Mc. QSO was made on March 19th by W7MVK/Ø and W7OWZ of Cheyenne. WØFRQ at Ft. Collins and WØACA of Denver provide Colorado contacts, and W7MVK and W7OWZ have portable and mobile set-ups. W7OBC at the University of Wyoming is on at Laramie.

**Collierville, Tenn.** — Crossband duplex operation is being done by W4HHK on 144 Mc. and W4BOR, Memphis, on 220 Mc. The latter is running 25 watts input to an 832A, crystal-controlled. This worked out so well that W5NYH, Lexington, Miss., tried it, too. On the afternoon of April 23rd contact was made (137 miles) on 144 Mc., and W5NYH went to 220 Mc. Using an HFS with a 6J6 neutralized pre-amplifier, W4HHK was able to hear him at once, though signals were weak and fading. Signals were none too good on 144 Mc. either, so another try was made that evening, when 2-meter signals were better. This time it was possible to work duplex in fine style. On the morning of the 24th at 7 o'clock conditions were still good on 220, though nothing extra on 144. Both stations are using 16-element horizontal arrays on 220, and two-way work will be attempted soon.

### The World Above 420 Mc.

Greatly encouraged by his success in working G3EJL over a 119-mile path, as reported last month, G5BY is spending a lot of time on 420 Mc. Their first two-way QSO was made on c.w. on March 28th, with G3EJL running RST 449 to G5BY's 559. On April 6th two-way 'phone contact was made at 1923 GCT, with signals peaking at S7, fading to S3 to 4. At 1956 the same day G5BY heard G3ABH at Poole, Dorset, 85 miles distant, calling G3EJL. Later cross-band contact, with G5BY on 145 Mc., was made with G3ABH running S3 to 4 off the back of his 5-element fixed array. Several crossband and two-way QSOs were had with G3EJL on the 7th, between 1738 and 1935 GCT, with signals at both ends peaking at S9 toward the end of the period. This is with inputs of 18 watts at G3EJL and 20 watts at G5BY, both to tripler stages, crystal-controlled. With a new 15-element Yagi-type array, G3ABH was coming in S4 to 5, and he was still audible, S3, when he turned his beam around toward G3EJL at 2210.

Adjustment of coaxial circuits is made easier by using a bright idea suggested by W5QXH. Noticing the ease with which the pneumatic-tube service carriers used in a department store may be opened and closed, he looked further into their construction and availability. He says that they are available in steel or brass, and the latter may be silver-plated readily. Chances are that a friend in a department store might be able to supply worn or damaged units, he suggests. Those sliding covers are just the thing for making the inner conductor of a coaxial assembly accessible!

Having worked his way up via 420 and 1250 Mc., W6CFL, Los Angeles, is now up to 2400 Mc. — almost. Using a lighthouse cavity similar to that described by W2RMA in February, 1948, QST, Tuck is having trouble getting into

the band. The signal is heard 5 miles away by W6NLZ, who is using a surplus APR5 receiver, covering 1000 to 3000 Mc. He would like to see information on cavity oscillators for 1250 Mc. and a simple wavemeter of the tin-can variety for 2400 Mc. He finds playing around with the microwaves most fascinating, and is only sorry that he didn't get started on it a lot sooner.

Have you missed the 50-Mc. WAS box and the 2-meter standings the past few months? The reason they've not appeared is that there has been very little change in them since last fall. They will be resumed next month — provided all you fellows who have been working new ones send the information in. Take time out now — list the states you've worked on 50 Mc., and the states, call areas, and best DX you've worked on 144 Mc. A postcard will do the trick — better write it out, right now.

### 3rd Annual V.H.F. Sweepstakes — Final Club Scores

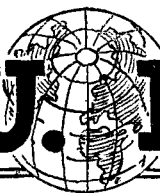
Club	Scores	Winner
Amateur V.H.F. Institute of New York	36,379	W2LVQ
York Road Radio Club (Penna.)	29,447	W3KKN
South Jersey Radio Assn.	25,484	W2BY
Frankford Radio Club	23,284	W2SAI
Midwest V.H.F. Club (Ill.)	4534	W9TKL
Hartford County Amateur Radio Assn.	2536	W1QBH
Two Meters & Down Club (Calif.)	2130	W6NGN
The DX Club of Penna.	1818	W3OXO
San Mateo County Amateur Radio Club		
Club	1561	W6GCG
Hamilton Radio Club (Ont.)	898	VE3ANY
Milwaukee Radio Amateur Club	804	W9LJV
West Side Radio Club (Ont.)	794	VE3AIB
El-Ray Amateur Radio Club (Mass.)	676	W1JLI
Hampden County Radio Club (Mass.)	574	W1RFU
Rochester V.H.F. Group	484	W2ZUX
K B T Radio Club (N. Y.)	478	W2SSS
Tuboro Radio Club	346	W2JSV
Mercer County Radio Assn. (Penna.)	342	W3LNA
Halifax Amateur Radio Club	12	VE1QZ

### Strays

Eight popular models of war-surplus f.m. radio equipment are described in a third simplified manual just issued by the Office of Technical Services. Like its predecessors (see March QST, page 62), Volume III provides the basic diagrams, parts, values and voltages of the equipment listed. The new manual covers the following assemblies: BC-603 and BC-923 receivers, BC-604 and BC-924 transmitters, BC-620 and BC-659 receiver-transmitters, BC-605 interphone amplifier, and PE-97-A plate supply. These assemblies include the BC-683, SCR-508, SCR-528, SCR-538, SCR-603, SCR-628 and SCR-808 receivers, the BC-684 transmitter, the SCR-509, SCR-510, SCR-609 and SCR-610 receiver-transmitters, and the DM-34, DM-35, DM-36, DM-37, DM-47, DM-64, DM-65 and DM-66-A dynamotors.

Copies of PB 100043, *Schematic Manual for Surplus Electronic Equipment, Volume III, F.M. Receivers and Transmitters*, 44 pages including diagrams and cumulative index, are available from the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., for \$1.00. Orders should be accompanied by check or money order payable to the Treasurer of the United States.

# I.A.R.U. News



## QSL BUREAUS OF THE WORLD

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For service on incoming foreign cards, see list of domestic bureaus in *QST* under the heading, "A.R.R.L. QSL Bureau" (page 59, May *QST*).

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**Burma:** B.A.R.S., P.O. Box 611, Rangoon  
**Canal Zone:** Canal Zone Amateur Radio Association, Box 407, Balboa  
**Canton Island:** Francis T. Blatt, KB6AG, % CAA, Canton Island, South Pacific  
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**Chile:** Radio Club de Chile, Box 761, Santiago  
**China:** K. L. Koo, P.O. Box 409, Shanghai  
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**Cuba:** James D. Bourne, Lealtad 660, Habana  
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**Ecuador:** Victoriano Salvador, P.O. Box 2536, Quito  
**Eire:** R. Mooney, "Eyrefield," Killiney Co., Dublin  
**Ethiopia:** Robert Newberg, ET3AE, Box 145, Addis Ababa  
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**Gibraltar:** E. D. Wills, ZB2I, 9 Naval Hospital Road  
**Great Britain (and British Empire):** A. Milne, 29 Kechill Gardens, Hayes, Bromley, Kent  
**Greece:** C. Tavaniotis, 17-A Bucharest St., Athens  
**Greenland:** 1385th AAF Base Unit, APO 858, % Postmaster, New York, N. Y.  
**Grenada:** VP2GE, St. Georges  
**Guam:** G.R.A.L., Box 100, Guam, Guam, Marianas Islands  
**Guatemala:** Manuel Gomez de Leon, P.O. Box 12, Guatemala City  
**Haiti:** Roger Lanois, % RCA, P.O. Box A-153, Port-au-Prince  
**Hawaii:** A. H. Fuchikami, 2543 Namaau Dr., Honolulu  
**Hong Kong:** Hong Kong Amateur Radio Transmitting Society, P.O. Box 541, Hong Kong  
**Hungary:** H.S.R.L., Postbox 185, Budapest 4  
**Iceland:** Islenzkir Radio Amatorar, P.O. Box 1080, Reykjavik  
**India:** Amateur Radio Club, India, P.O. Box 6666, Bombay 20  
**Israel:** See Palestine  
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**Morocco:** *Tangier International Zone only:* EK1MD, Box 57, British Postoffice, Tangier  
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**Peru:** R.C.P., Box 538, Lima  
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**Trieste:** Via Italy  
**Trinidad:** Edgar H. Borde, 52 Mueurapo Rd., Port-of-Spain  
**Uruguay:** R.C.U., Casilla 37, Montevideo  
**U.S.S.R.:** Central Radio Club, Postbox N-88, Moscow  
**Venezuela:** R.C.V., P.O. Box 2285, Caracas  
**Virgin Islands:** Richard Spenceley, Box 403, St. Thomas  
**Yugoslavia:** S.A.J., Post Box 48, Belgrade

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## 16th ARRL DX Contest

### High 'Phone Scores

Listed below are the figures that tell the story about the top performers in the 'phone section of the 1950 ARRL International DX Competition. Although they probably give some idea of the final outcome, all scores, contact totals and multipliers quoted are *claimed* by the contestants. Careful checking will be necessary before the final results, scheduled for a later issue, can be announced.

Highest claimed score from each of the W and VE call areas: W1ATE 243,004, W2RGV 108,864, W3BES 204,919, W4DCQ 246,720, W5ERD 36,295, W6RM 135,486, W7MLJ 12,825, W8REU 194,187, W9EWC 135,876, W0PRZ 97,812, VE1KN 2376, VE2NI 41,652, VE3AUJ 71,712, VE4RO 60,384, VE5JG 5985, VE6AP 1827, VE7EL 74,307, VO2N 8775. Contact totals above 350 were reported by W1ATE 514, W4DCQ 514, W3BES 481, W8REU 441, W4DQH 417, W8HUD 404, W4LXE 402, W6RM 386, W6ITA 380, W4KXY 374, W8KML 372, W3LOE 359, W3DHM 351. Top multipliers: W4DCQ 160, W1ATE 158, W8HUD 155, W3LOE 152, W8REU 147, W4DQH 144, W3BES 143, W8KML 140, W4KXY 139, W3DHM 136, W4LXE 134, W9EWC 134, W8HRV 128, W4OM 127, W6ITA 127.

Outside W/VE, the following submitted the highest claimed scores from their respective countries: CE2CC 99,072, CM9AA 170,430, DL4LN 50.1 2, EA4CM 84,741, FA3JY 18,755, F8SK 111,264, G2PU 149,760, GW3UH 42,842, HB9CX 12,000, KH6IJ 105,409, KL7ZM 11,844, KP4DU 27,621, LU5AD 32,488, PA0RU-34,692, PK4DA 34,976, OK1HI 26,880, ON4CC 42,528, OZ7G 38,164, SM5UM 107,040, TG9AG 52,416, VP2GG 20,640, XE2W 120,393, ZL1MQ 26,390, ZS6B 21,373, YS2AG 80,640, I1RB 91,770. Top reported contact totals: G2PU 1040, F8SK 976, SM5UM 892, CM9AA 874, I1RB 805, KH6IJ 749, CE2CC 702, VP2GG 645, XE2W 637, EA4CM 60, YS2AG 568. High multipliers: CM9AA 65, XE2W 63, CE2CC 48, G2PU 48, TG9AD 48, YS2AG 48, EA4CM 47, KH6IJ 47, SM5UM 40.

### Strays

A new 4th edition of the popular "Hytron Reference Guide for Miniature Electron Tubes" has been announced by the Hytron Radio & Electronics Corp., Salem, Mass. The publication describes all miniature tubes marketed to date, regardless of brand, and includes 123 miniatures (41 new types) and 70 base diagrams. Larger prototypes of miniatures also are listed. Amateurs may obtain a copy of the guide, which is free, by writing to Hytron.

### HAMFEST CALENDAR

**ALBERTA** — Friday, Saturday and Sunday, July 14th, 15th and 16th, at Waterton Park. Meet the Glacier Eagle at the Glacier Waterton International Peace Park Hamfest. For hamfest particulars contact Dr. Joseph J. Dobry, VE6DR, secretary.

**CALIFORNIA** — Sunday, June 11th, at Coyote point, San Mateo. Sponsored by the San Mateo County Amateur Radio Club. Activities for OMs, XYs and junior ops. Hidden-transmitter hunts on 2 and 75 meters will be featured, with worth-while prizes. Dig out your extra gear for the "auction and swap" table. Bring the family and a picnic lunch for a glorious outing. Admission free!

**GEORGIA** — Sunday, June 18th, at Lithia Springs Golf Club, Austell. Sponsored by the Keenahochee Amateur Radio Club of Marietta. Displays, contests, v.h.f. transmitter hunts, entertainment for Ys, XYs and small fry. Adult tickets \$2.50; youngsters under 12 will be provided with dinner at cost (\$1.00). For more information write Secy.-Treas. Bob Hudson, W4MCM, 155 Hedges Street, Marietta, Ga.

**ILLINOIS** — Sunday, July 16th, at Weldon Springs State Park, 4 miles east of Clinton, just off U. S. Route 51 or State Route 10. This is a picnic for all the family. Positively no charge! Bring your own basket lunch. Fresco soft drinks. "White elephant" sale. Sponsored by the Cenois Amateur Radio Club, the Central Illinois Radio Club of Bloomington, Inc., the Clinton Radio Club, the Twin-Cities Radio Club, and the Sangamon Valley Radio Club. "Free for all — all for free."

**ILLINOIS** — Sunday, June 11th, at Pleasant Valley Park, on Route 91, 1 1/2 miles south of Dunlap. Sponsored by the Peoria Amateur Radio Association. Fun for all! Tickets purchased in advance, \$1.50. For reservations write to PARA, 1018 W. McClure, Peoria, Ill.

**INDIANA** — Sunday, June 18th, at Turkey Run State Park, 35 miles north of Terre Haute, on State Route 41: Indiana Radio Club Council Picnic. Program starts at 10 A.M. CST and will feature the annual awarding of a plaque to Indiana's outstanding amateur. Make plans now to attend.

**MAINE** — Saturday, July 29th, at the Eastland Hotel, Portland — Second Annual Downeast Hamfest, sponsored by the Portland Amateur Wireless Association. A gala program has been arranged. Vacationists and their families are invited to attend. Advance reservations are available at \$3.50 per person from Manley W. Haskell, W1VW, 15 Hemlock Street, Portland, Maine.

**NEW YORK** — Friday, June 9th, 6:30 P.M., at 71st Regiment Armory, 34th Street & Park Ave., New York City — Sixth Semi-Annual Dinner Meeting of the Quarter Century Wireless Association. Famous hams of yesteryear will be guest speakers. Entertainment and fun for all. Reservations \$3.50 per person. Nonmembers should communicate with John DiBlasi, W2FX, 259 West 14th Street, New York City.

**WYOMING** — Saturday and Sunday, July 15th and 16th, at Camp Carey B. S. Camp on Box Elder Creek, 10 miles south of Glenrock. Glenrock is 25 miles east of Casper on U. S. Route 20. Staged by the Wyoming hams. No tickets needed. Cabins, water, and firewood available. Come prepared to camp, or stay in Casper. Speakers, program, and entertainment "as you make it" — all with a real Western flavor. For details write Frank A. Wolf, W7EUZ, 3222 Dillon Ave., Cheyenne, Wyo.



# How's DX?

CONDUCTED BY ROD NEWKIRK, \* W9BRD

## How:

If there were such a character as a DX Rip Van Winkle who slept, say, from 1940 to 1950 (lucky guy?) and then awakened for an eager listen over twenty meters today we daresay one of his first observational comments would be:

"Say, what happened to the 'DX Fist?'"

And then, we suppose, he'd wonder wherein all this nondescript surplus stuff came from — you know, the gear that hams work three months to "convert" properly when they might whip up their own more applicable versions from parts in half the time.<sup>1</sup>

But Rip was first curious about the vanished DX Swing and after he made the inquiry so were we. Thus Jeeves was given his portfolio as Minister of Fistical Research and instructed to bring back nothing but the facts.

Seems, however, there weren't any. Doggoned thing just up and died without being so polite as to leave even a Dodo-Birdian footprint. Still, not unlike the complete and mysterious demise of the Mesozoic reptilian monsters, the development does invite conjecture.

The advent of the electronic key? Naw. Spontaneous general desire to sound like tape? Come, come, now. More QRM? Ah, that could be it. There is a bit more competition today and, come to think of it, the only fellows who did work out consistently with that lullaby rhythm were possessed of signals that protruded on the bands like the proverbial injured hitchhiking digit.

Because the QRJ of this soothing sending style coincides with a similar decrease in the quantity of really gooey primary keying heard nowadays, it may be safe to assume that the severity of postwar DXing competition is forcing everybody to put out more readable signals. Furthermore, this is an era of QRQ and attempts at a bug DX Swing always did seem unsatisfying.

It is to be regretted that the ham newcomer of today misses something intrinsically traditional in not being required to master that code-within-a-code which served as such a unique trade-mark of the veteran DX-chaser in days gone by.

## What:

The low-frequency gang are vacationing now (probably beating their heads against the 20-meter wall) but a few of the more persistent adherents are reporting DX on eighty. W2NSD and others of the A3 gang have been trying to stir up a little 75 'phone DX activity on Sunday mornings.

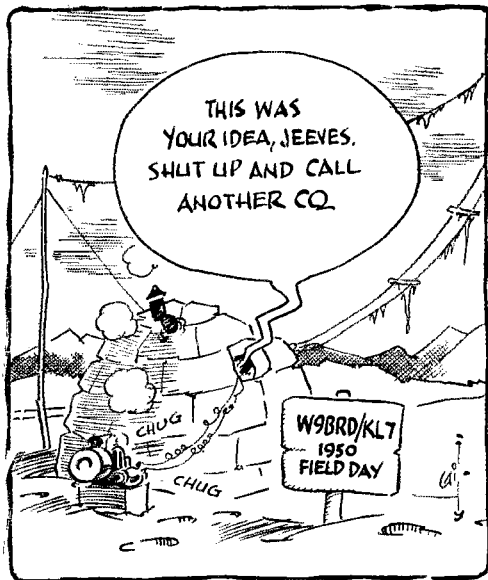
\* DX Editor, QST. Please mail reports of DX activity to W9BRD'S home QTH: 1517 Fargo Ave., Chicago 26, Ill.

<sup>1</sup> The Boss has been bitter like this ever since he tore into our BC-348 without a schematic. — Jeeves

for one thing. After working JA2AZ, the boys tackled ZI2BE with good results. Others worked: SM5UM, DL4LN, LX1JW, F9BO, HB8J, OZ7SM, GW2UH, XF1A and assorted Gs. CN8MI and TG9AD were heard and CN8EI (3705), ZS1JZ (3740) and TA3GVU are reported active . . . . . On c.w., LX1JW and CT1SQ allowed W4BRB to reach the 79-country mark and the University of Maine contingent at W1YA, under the able leadership of W1QIQ, wound up with FA8IH (3511), FA8CR (3512), PY2AJ (3530), VP5BF (3511), VP6SJ (3578), SV0WH (3540), EK1AO (3511), SP5PZ (3560), CT1BV (3518) and ZL1BY (3503) . . . . . It might be well to bear in mind that while we have heavy QRN up here the gang in the Southern Hemisphere can now more easily hear our end of proceedings.

HK5CR (7093) still prefers *forty* and is a sure bet for a Colombian QSL. W4MLE finds him still seeking New Mexico daily at 0600-0630 and 1900-2000 EST . . . . . The band was particularly lucrative of late at W7MQY: ZS5DE (7012), KR6CA (7060), OX2AB (7061), VS1CW, VS6AE (7049), KX6BA (7042), OA4BR (7045), VK6DJ, W6VKE/KG6 (7022), VR2AS (7038), KM6AP (7030), HL1BQ, CE2DY and JA8 2FM (7025), 2HB, 3AF (7028) and 9AD (7036) . . . . . FKSAB's hefty signal on 7006 kc. came back to W8PMJ. FK8s AC and AD also are regularly heard on the low edge . . . . . Traffic work beacons W5LAK from the trials of DXing but John has added MD7DC (7042), EA6AF (7020), GC2BMU (7027) and SV0WJ (7023).

As expected, HC8GRC threw the band into a turmoil on the *twenty* range. The Guayaquil club group helped fatten a lot of country totals on both 'phone and c.w. Most frustrated group of DX men to be heard from: those who worked shipboard HC9GRC (en route to the Galapagos) and missed out on the terra firma proceedings. Once again, those who had an ear for official bulletins from W1AW were given a head start in the pursuit; HC2OT passed the good word to W1HDQ on 28-Mc. 'phone



..... W5FXN has been gaining good stuff in Austin: VK3AMR/VK9 (14,042), VS6AC (14,052), FY7YA (13,998), DU6IV (14,085), UA9FR (14,045), PK1TM (14,040), PKZZZ (14,100), ZD2DCP (14,045), 4X4RE (14,032) and 4X4CR (14,050). Jim expresses dubious curiosity about a PK1AH and ZL5AA, "Am not a new country — no QTH, no QSL." ..... CR4AC (14,038) sneaks through to the West Coast around 1700 PST according to W6AM, and FM8AD still regularly performs around 14,033 kc. .... W5QPH reports sporadic but entertaining wee-hour openings on 20 in southern Texas when the band is open only to the Pacific for the mob farther north, and W6EYR recommends VK9JC (14,010), FK8AC (14,006), EG4AK (14,000), FM7WE (14,130-14,040), PZ1QM (14,000), IS1AHK (14,020), VP5BF (14,070), VR5PL (14,100), HZ1AB (14,100), HR2HZ (14,060), 3V8AB (14,020), CT3AA (14,120) and UO5KAA (14,000) ..... The PVRC membership twisted W4VE's arm enough to cause him to erect a beam and Doc no longer has to fall back on the old "Well, I did okay for a dipole" line. Victims immediately pounced upon were VS1CW (14,030), SP5ZPZ (14,006), VQ2AB (14,105), PK4DA and F9QV/Corsica ..... Still recuperating from his last KS4AI session, W5KWY crept nearer to DXCC with FK8AA, FE8AB (14,040), CR7LZ, VS6JH, CR6AQ (14,050), KB6AM, ZB2I, I1BCB/Trieste, KR6CI and VR2BU while W5CEW kept busy with EA6EG, ZS7EC, MD4GC, VK1AJT, SPIKM and CR10AA which boosts A1 to 153 worked ..... Treading cautiously in the new QTH, W9NN caught others besides PJ5FN, CN8BK, CT1BI and TF3AB with his indoor doublet, and out in Lincoln W0VDC converted the 8JK into a parasitic job for VUS 2BK (14,020), 2AT (14,060), VS's 1DL (14,038 t8), 6BO (14,015), DUs 1DR (14,060), 1NL (14,020), 9JO (14,030), CP1AQ (14,109), KR6DW (14,048), OE5AR and UD6AH ..... The "Where" section proved to be good for something other than mere QSLs when W5QGD spotted an old buddy listed as JA7AH. Harvey has been changing QTHs



While going native in a big way, Cal Graf of JA2FM and W5LFM manages to keep in consistent touch with the homeland via JA2FM. Most JAs hit the power lines for the limit but Cal does quite all right with 85 watts of c.w. on four bands.

## Galapagos Islands Expedition — Final Score

Here, courtesy of John Reed, HC2JR, is the final tabulation of contacts made by the Guayaquil Radio Club Expedition to the Galapagos Islands. Leaving Guayaquil on April 20th, 116 contacts were made as HC9GRC, maritime-mobile en route. Setting up for business in the Islands on the night of April 21st-22nd, and operating on all bands 3.5 through 50 Mc. for the next week, a total of 2116 stations was worked. The recapitulation shows 792 contacts were made on 14-Mc. 'phone, 2 on 7-Mc. 'phone, 742 on 10-meter 'phone, and 2 on 11. On c.w., 578 stations were worked, mostly on 14 Mc. The countries total was 68, and a preliminary check indicates 44 states worked. Regular schedules were kept on 50 Mc., but no signals were heard.

regularly and that isn't conducive to an easy DXCC. His latest: HH2W, HR1PA and YS1MS ..... EA9BB (14,000), ZS7B, LX1AS and AG4AG are recent prizes at W4MR and W6EAY is informed by DU1NL that HS1SS still haunts 14,080 with regularity. VP5BF (14,010) and PK1RI (14,050) were also worked ..... YN1AA (14,015) enraptured W8YGR and W5LAK clicked with F8JFC (14,065), ZD2FAR (14,098), CR6AI (14,062), CE7AK (14,090), CR9AG (14,090), VP8AI (14,010), VQ4BB (14,015), VU2DF (14,054) and PJ5FN (14,070) ..... We hadn't heard from KH6PM for some time but that was probably attributable to FG8AD (14,105), GC2FZC (14,045), HLIUS (14,050), PK3JT (14,005 t7), VRIA (14,100 t7), VK9WL, VQ3SS (14,100) and British ship MN5GL (14,000 t7). Fred notes that KX6BA may be VR1C ere many weeks have passed.

Via the voice method, W1QDE & Co. collected DUVVS, 4X4BL, ZC6s DO, UNJ, JA9IJ (14,180), VK9AB, SV5UN, GD3ENK, KW6AO and PK4DA while W2TXB, forsaking c.w., managed YK1AC, ZS3Z, ZP5BL, ZD1KO, PJ5RX and LX1SI ..... At XE1AC we find MD7HV (14,311), YO7WL (14,335), ZC6DH (14,326), ZD1SS (14,318), 3V8BB (14,387), OE1FF (14,302), PK3LC (14,170), PK4ZZ (14,145), PK7HR (14,190), TA3GVU (14,195) and EA6AP (14,321) as late entries ..... VE1FQ, XE1AC and W9RBI mention working VR5GA (14,151) and Ross further mentions VS6BE (14,305 VFO) and the ill-fated KV4AAT on 14,350 kc. at Beef Island of the British Virgins ..... W3LTU has choice quality in M1B (14,178), VR5PL (14,360), VK9AB (14,320), CR4AC (14,130) and FY7YA (14,385) ..... Dropping the key for a spell, HP1BR chinned with FF8PG, VS6AM and PK3LC while W6GPB added VP3HAG and YS2AG.

While not the most reliable band in the world this time of year, ten remains a most interesting one. ZP3AW, ZP5IB, VQs 4AC, 4ASC, 4NSH, 4RF, 5ALT, VP2GG, CR4AC, KG6s FAA, USA, FM7WE and SV5UN entertained W2ZVS while neighbor W2AEB was nailing down MD7HV, MP4BAB, MS4A, XZs 2KN, 2PM, 2SY, PKs 1UA, 4KS, ZD2JHP, CR7s AD, AH, VU2CQ, CT2AE, CR5UP and AP2G ..... W1EKU picked up XZs 2EM, 2GM, PK4DA, VS1AX, TF3MB (28,250) and others previously mentioned and is reportedly spending time trying to build up the TV signal of WRGB, 145 miles distant. He should be glad there almost isn't any! ..... MP4BAO on Bahrein (28,140) and SV5UN (28,470 VFO) answered W9RBI and W1QDE managed UB5BV (28,025) and XZ2SY (28,300) ..... W6RET/6 has been hearing AE3US or AE4U on 28,312 kc. and W1SGQ witnessed

WISGH's hooking of VQ4SGC on a mere ten-watter . . . . . W2ZOS found SVØWF and FF8FP to his liking while W4PJU, after having spent several months on ten, is up to 105 countries. Fancy ones on the list: VS7PS, HZ1AB, MF2AA, ZB1H, ZSs 8A, 9F, 9J, ZA1AA, ZK1BA, M3SC and KJ8AF.

P.S.: At last reports the 28-Mc. c.w. band was still there. Does anybody work it any more? That is, folk other than the PX2AQ raised by W4VE, we mean.

### Where:

While a few other addresses have been individually specified by them, most of the new crop of YU3s appear willing to receive cards via the listed bureau at P. O. Box 180, Ljubjana, Yugoslavia. . . . . The ZP3AW listed below is presumed to be a new licensee and not to be confused with the former holder of the call where QSL purposes are concerned.

CR4AC	Radio Marconi, Praia, Cape Verde Islands
CR7UAC	Goncalo Velazim, Aeradio, Quelimane, Mozambique
FY7YA	Box 89, Cayenne, French Guiana
HC2KU	Ken Godwin, % Panagra Control Tower, Guayaquil, Ecuador
HH2ES	P. O. Box A9, Port-au-Prince, Haiti
HH5V	Plantation Dauphin, Cape Haitien, Haiti
I1NMC	Box 361, Rome, Italy
KG6SF	QSL to 426 East 18th Street, National City, Calif.
KH6ACZ	Box 12, FPO, San Francisco, Calif.
KM6AQ	Navy 1504, FPO, San Francisco, Calif.
KP4FU/KV4	P. O. Box 114, Christiansted, St. Croix, V. I.
MB9BM	(via RSGB)
MD4AR	P. O. Box 386, Mogadishu, Italian Somaliland
OK6PAC	(via CAV)
PK1TM	J. Bakker, Djaln, Ruysdeal 14, Bandoeng, Java
PK1UA	Kalidjati, West Java, Indonesia
PK1VT	W. M. F. Timmermans, Djaln Tjipinang Dempedak 13, Polonia, Djatinegara, Djakarta, Java
PK3LC	Box 77, Soerabaja, Indonesia
PK5WR	BPM, Wonekroma, Soerabaja, Indonesia
PZ1QM	(via PZ1A)
T12AP	Box 1582, San Jose, Costa Rica
VK9JC	(via W1A)
VP3FJ	Atkinson Field, British Guiana
VR5GA	P. O. Box 60, Tonga Islands
VS9AA	S. G. Abbott, Officers' Mess, RAF, Khor-maksar, Aden
WØHBY/KG6	QSL to Box 100, Agana, Guam
XE3M	Avenia Colon 508H, Merida, Yucatan, Mexico
YN4VN	W. H. Barry, Puerto Cabezas, Nicaragua
YU3FMA	Box 48, Belgrade, Yugoslavia
ZE3JD	120 Salisbury St., Salisbury, Southern Rhodesia
ZP3AW	% U. S. Embassy, Assuncion, Paraguay

These with all due thanks to W1s EKU, HDQ, ODW; W2s AEB, CJX, GT, TXB; W3ITW; W4MR; W5s FXN, GEL; W6s AM, BES, EYR, GPB, TI; W9s CFT, SHG; ON4AZ; VE1FQ. If you should chance to come across a DX station mail QTH absent from the *Call Book* and not having appeared in these lists, how about divvying up? Same need not be of startling rarity — you may be instrumental in allowing the kid down the street with the fiat 807 to confirm his only KL7, you know.

### Tidbits:

Here we go again! OA4DO, whose call has since been altered to OA4BN (for Bob North), volunteers word that his latest change in location puts him 14,350 feet over sea level and figures this should top the best that CFIAM can

do. Bob has added enough fancy gear to qualify his station as a ham's paradise and frequents 14- and 28-Mc. 'phone bands regularly, 1730-1900 and 2000-2300 (EST), plus week-end afternoons. P.S. — We're expecting to hear from some soaring AC4s or HB9s any day now as additional claimants to the WHH (World's Highest Hamshack) title . . . . . W2QAI finds that ZL2ABI (28,080) is a priest of the Catholic faith and the latter looks forward to possible contacts with any other church-affiliated amateurs. ZL2ABI has been putting through a consistent signal on ten 'phone around 1900 EST . . . . . A QSL



FK8AB needs no introduction to the country-hunting W corps and you may like a look at him plus the rig that has been responsible for some of the 7- and 14-Mc. bedlam in recent months. That tanned bicep looks ample enough to deal personally with any DX Hoggie that Johnny might encounter!

from W8DEN to the PZK bureau brought response to the effect that illegitimate use has been made of the call SP1AR. The real SP1AR has not been active since '39 and would like any information pertinent to the pirating addressed to Jan Ziembicki, Bielawa (near Dzierzoniow), Ogrodowa 9, Poland . . . . . SV5UN of Rhodes has been intermittently active under various operators, the present being one Olle Hagerbrant of Sweden. Olle is 26, single, and an SSA member although not holding an SM call. He has held several adventurous radio jobs and has been with the UN since 1948, finding opportunity to put such amateur calls as ZC6UNT, ZC6UNJ and AR8UN on the air. QSLs will reach SV5UN care of United Nations, Island of Rhodes, Greece . . . . . If you haven't been chinning yourself on the grapevine you may want to know that the prefix FK88 goes for the French occupational zone of Austria as FK88AR tells W1FH via W1RWS. Also, JAØ takes over for Iwo Jima . . . . . W1LKE has it direct from Guatemala that TG9s AG, AN, AB, BC, FC, UV and FU are bad log-space investments. For instance, at last count there were 256 unclaimed cards for TG9FU . . . . . FM7WE assures W4PJU that FM5 7WR and 8MX are mirage men, too, as FM5 7WE, 8AA and 8AD are the only Martinique licensees on the island. FM8AA is inactive at present for a logical reason — no rig — and old FM8AC now radiates from French Guiana as FY7AC . . . . . JA2AD has temporarily closed down and George is busily at work straightening out the QSL records. Over

1300 cards have been sent out but if you haven't received yours, put the QSO data on a penny postal and ship same to Capt. G. H. Fogarty, Box 172, APO 994, % PM, San Francisco, Calif. . . . . G2MI edifies us with word that ZC6JJ is sending out a complete duplicate set of cards for all contacts he has made. Repeated requests have convinced him that many of the original batch ran astray . . . . . KP4s IV, JT and IA help hold down the brass pounding at the Naval Air Station, Roosevelt Roads, and Bill of KP4IV fears that he will have to return to the Mainland to work his WPR as he has been far too busy helping others turn the trick. In a few months Bill expects to be making use of a W3 call in the D. C. area . . . . . W4CEN deserves a hand after putting in over nine hours of operating time to copy the 1950 log and other QSL, QSO data from FMSAD. W4AZK reiterates that a self-addressed penny postcard should be submitted along with your FMSAD-bound QSL for quick return service. Those individuals not having followed this course must of necessity have their FMSAD copies delayed indefinitely. It has been the diligent effort of W4AZK that now accounts for Martinique being on the confirmed side of the ledger in so many logs—bravo, Dave . . . . . The street facing W4MR's abode is being revamped into a main traffic artery through town, moans Al. W4s AJT, GG, HEH and MR made a DX night of it at the Greensboro club headquarters after getting the heap on 20 with the aid of 4HEH's exciter. Billowing smoke from the 813-buffer plate-supply tranny broke up the party at 0300 during a UB5 QSO and the boys sacked in only to be kept awake by the T2 snores of W4HEH. They are debating whether to forget to bring him along on Field Day or to try a brute-force filter on his output . . . . . VS9AA searches for WAVE contacts on 14-Mc. c.w. during our afternoons, haunting the low edge with 35 watts. His QSLs will come through upon the arrival of blank stock from England. Other active Aden VS9s: AF, AH and AL. VS9AL has finished his Middle East assignment and is shortly returning to G-land . . . . . HP1BR completed quite a rebuilding job and now has 63 'phone countries on 10 and 20. Bob will soon have 250 watts on tap and is currently wondering how to collect his EL7A and CR5UP pasteboards . . . . . Midway may become rarer than all-get-out before long. The KM6 gang has been putting out word that commercial installations are being shifted to Canton and other islands . . . . . All cards for KS4AI contacts should go to Ralph W. Bird, W5KWY, Route 1, La Coube, Louisiana, and not to Swan Island. Ralph may go back to Swan next spring but is gunning for a stateside DXCC for the present. KS4s AC and AN continue to keep the place on the radio map and will stay there for a year or so. KS4AD will rejoin them in the fall and KS4AM has recently returned to the Mainland . . . . . CR4AC works at installing a landline system on Sao Vicente Island in the Cape Verde group as told to W6AM. Don was advised to QSL to Jose Alfonso Vincent, Cape Verde Islands, but the address listed in the "Where" section is also apparently okay . . . . . After two years in the U. K., VS1BX has returned to Malaya. W6TI passes along his mail QTH as Victor H. Thorue, Braddell Hill, Singapore 11, Malaya . . . . . PK2WR has changed his spots to PK5WR and informs W5GEL that all cards received will be assiduously answered . . . . . W9SHG prevailed upon VP1AA for information concerning VP1AC but the story was not encouraging. VP1AA is holding a multitude of confirmations destined for the fellow but has never otherwise heard of him. The PM7WR that has universally been branded as phoney passed out the QTH "Lycee Schoelcher, Fort-de-France, Martinique" to W9SHG . . . . . From W2GT we hear that F88MH has returned to France and supplied himself with a stack of blank cards for the confirmation of all Dakar QSOs. You may address him during the immediate future to Maurice Henry, ex-F88MH, BP46, Hyeres (Var.), France . . . . . In an interesting letter to W2TXB, OY3IGO related a few of his troubles, starting with an accursed 220-volt d.c. main. This exasperating soup supply drops to 185 volts at night. He expects to have 220 volts of a.c. available sometime in 1951. Meanwhile, OY3IGO is still trying to work a W on 'phone although many Europeans

have been contacted with power under 30 watts. In closing, OY3IGO mentions LJ2K as being the call of a navigation school at Trondheim (QSL to NRRL) . . . . . "Over here in ON4 we feel that by now every DXer has QSO'd Belgium and has an ON4 QSL as DX gets harder for us. . . ." Thus spake ON4AZ. Perhaps we should let him borrow a W9 prefix for a spell to tip him off on how *really* tough things can get. ON4AZ is especially interested in tracing W7LZJ C6 for obvious reasons . . . . . Something new in a certificate award is being offered by the Far East Amateur Radio League, "WAJAD." To be eligible for the WAJAD sheepskin one must work at least one station in each of the JA call areas on either 'phone or c.w. and submit confirmations from same to the Secretary, FEARL, APO 500, %PM, San Francisco, Calif. All contact dates must be subsequent to January 1, 1949, and here is boundary date for your Japmap: JA2, Tokyo (area); JA3, Nagoya; JA4, Osaka; JA5, Hiroshima; JA6, Matsuyama; JA7, Kumamoto; JA8, Sendai; JA9, Hokkaido; JA0, Iwo Jima. [Say, Boss, what will they offer us for CAJAD? — *Jeeves!* Probably a Thomas Susan slip, wise guy . . . . . Snooping through the Northern Calif. DX Club's *D X'er* we see that KXGBA (W6PZ) is attempting arrangements to operate

(Continued on page 106)

## A.R.R.L. QSL Bureau

Send the QSL manager for your call area a stamped self-addressed envelope.

- W1, K1 — Frederick W. Reynolds, W1JNX, 83 Needham St., Dedham, Mass.
- W2, K2 — Henry W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.
- W3, K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia, Penna.
- W4, K4 — Johnny Dortch, W4DDF, 1611 East Cahal Ave., Nashville, Tenn.
- W5, K5 — L. W. May, jr., W5AJG, 9428 Hobart St., Dallas 18, Texas
- W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.
- W7, K7 — Mary Ann Tatro, W7FWR, 513 N. Central, Olympia, Wash.
- W8, K8 — William B. Davis, W8JNF, 4228 W. 217th St., Cleveland 16, Ohio
- W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wisc.
- W0, K0 — Alva A. Smith, W0DMA, 238 East Main St., Caledonia, Minn.
- VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.
- VE2 — Austin A. W. Smith, VE2UW, 6164 Jeanne Mance, Montreal 8, Que.
- VE3 — W. Bert Knowles, VE3QB, Lanark, Ont.
- VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.
- VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
- VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.
- VE7 — H. R. Hough, VE7HR, 1785 Emerson St., Victoria, B. C.
- VE8 — Jack Spall, VE8AS, P. O. Box 268, Whitehorse, Y. T.
- KP4 — E. W. Mayer, KP4KD, P. O. Box 1061, San Juan, P. R.
- KZ5 — C.Z.A.R.A., Box 407, Balboa, Canal Zone
- KH6 — Andy H. Fuchikami, KH6BA, 2543 Namauu Dr., Honolulu, T. H.
- KL7 — Box 73, Douglas, Alaska





# Correspondence From Members -

The Publishers of *QST* assume no responsibility for statements made herein by correspondents.

## LARSON E. RAPP

1109 S. Country Club Dr., Schenectady, N. Y.

Editor, *QST*:

I greatly enjoyed Rapp's article in the April *QST* entitled "50 Years of Progress — A Report on Amateur Radio." In the interest of keeping the record clear, however, I feel that Larson missed one very important effect which, for the lack of a better name, I will call the "signal strength depending on who gets who first."

To give a concrete example of this you may have noted that in DX contests, normally the 'phone station gives his number to the W amateur first. This greatly simplifies the problem for the W amateur, as he merely takes the signal report from the 'phone amateur, adds the integer one, and thus automatically has the signal report which he gives to the 'phone station.

If on the other hand, because of some circumstance, the W amateur is forced to give his number to the 'phone station first, the signal report is always given as the integer 9.

I have made a small study of this effect and I have even tried differential equations on it, but I have been unable to come up with any suitable formula to explain this behavior.

— George H. Floyd, W2RYT

54-55 69th Lane, Maspeth, L. I., N. Y.

Editor, *QST*:

Mr. Rapp's vigorous approach to the question of progress was very fine. However, my experiments seem to indicate that signals, in order to experience the "DX amplifying effect," need not actually originate at a DX point. The use of a rare call itself seems to trigger this phenomenon.

I suggest you devote more time to research on this effect. My hypothesis is that the train of call letters activates a different layer of the ionosphere, one layer for each call area, and therefore the DX areas, being less worn down by constant usage, will reflect signals much more strongly. If this is true, then we should immediately consider changing all call letters and giving the ionosphere a rest.

— Upton Downs, W0OPS, via W2ZDE

## DX OPERATING

Lihue, Kauai, Hawaii

Editor, *QST*:

The U. S. amateur often has been accused of being an all-around bad operator. This is the impression one gets from reading various correspondence.

Having sweated through another International DX Competition and being on the other end of the line, I am convinced that the average U. S. ham is a smart operator, more so than we care to give credit for. He is highly adaptable, resourceful, and quick to take advantage of an opening. What more beautiful sound is there than a mass of Ws jockeying for position when a rare DX station comes up?

— K. Nose, KH6IJ

Ramon Falcon 4923 Dto. B., Buenos Aires, Argentina

Editor, *QST*:

Sportsmanship — ouch!

99% of my QSOs on c.w. are with Ws and Ks. Even if a fellow comes in only RST 347 I'll try for him. That means asking for a string of "V"s in order to tune the receiver right on the nose. QSV, however, is the illuminated sign for

the high-power boys to start banging again and moving closer to zero beat. The other fellow hasn't even said GN, when general calling starts right on zero beat. That's unfair and shows little sportsmanship. I'll contact anybody I hear on the air if my time (and XYL) permits. So pound it into the hard heads of those undisciplined W hams: A QSO is a QSO until I finish SK.

— Gert Mosler, LU7CW

## KILOWATTS ANONYMOUS

30 Getzville Rd., Snyder 21, N. Y.

Editor, *QST*:

I suggest the formation of an organization to be known as "Kilowatts Anonymous." It will be devoted to the salvation of hams who are "drunk with power" and to others more inexperienced who believe that a "full gallon" is the ultimate in amateur radio.

As a former kw. man, I know that there must be thousands like myself who have tried high power and discovered its many disadvantages. We would like to share the fruit of our experience with would-be kilowatts and so reveal the false glamour of "going the limit."

The logbook at this station indicates a difference of approximately one unit on the S scale when reducing power from 1000 watts to 225. Recent tests on 40-meter c.w. with 54 stations show that only one of these operators could detect any difference in signal strength between 225 watts and 110 watts, and this particular operator claimed that 110 watts was louder!

Any recruits for "Kilowatts Anonymous"?

— Harry O. Braun, jr., W2PYD

## S.S.B.

Editor, *QST*:

Seems to me the a.m. boys (at least on 20) are letting us single-side-banders down and that's not good. Some do it deliberately and others of course don't know. The worst offenders seem to be the playboys with the super-duper kilowatts and beams. Not that I mind these two items; it's just that superior brush-off they give you. Mind you, not all are guilty, as I have had nice contacts with quite a few gentlemen. It's not that they don't hear your signal; they complain about it.

After all is said and done, we are only doing this, we think, for progress and betterment of ham radio in congested 'phone bands — not to show off our technical talents (of which I have absolutely none). I would like to feel rewarded for my feeble efforts by more and more contacts rather than have the feeling of having wasted my time and some of my cigarette and beer money.

— Jack Heidt, W2LKN

## JUNIOR SECTION

4575 Lacombe Ave., Montreal 26, Que.

Editor, *QST*:

I am twelve years old and an active amateur, being a regular member of the Swing-Shift Net.

The idea occurred to me that it would be a good idea to  
(Continued on page 106)



# Hints and Kinks

For the Experimenter



## IMPROVED B.F.O. CIRCUIT FOR THE SX-42

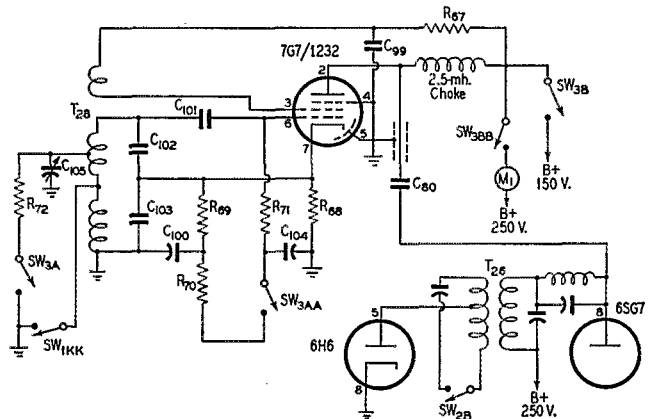
THE c.w. performance of the SX-42 receiver can be improved materially by the changes illustrated in Figs. 1 and 2. Before the modification was made, c.w. signals sounded meek and chirpy, and there was considerable "pulling" of the b.f.o. frequency when strong signals were being received. Revised methods of b.f.o. injection were tried, but none proved as effective as the change described below.

In the original circuit, a 7A4 triode serves the dual purpose of b.f.o. and f.m. tuning amplifier. The change consists of substituting a 7G7/1232 pentode for the 7A4, thereby gaining the advantages of using an electron-coupled oscillator. This resulted in less pulling, good stability, and the ability to tune through zero beat without any roughness appearing on the signal.

The physical construction of the 7G7/1232 makes rewiring the b.f.o. circuit a simple operation. The only parts needed are the tube and a 2.5-mh. r.f. choke. No test equipment is needed, and the only readjustment necessary is that of the b.f.o. transformer. The change in no way impairs the functioning of the tuning-indicator circuit.

A step-by-step procedure for making the change is as follows: (1) Remove the two wires

from Tie Pin 3 of the 7A4 socket. Do not disconnect the wires from each other. (2) Disconnect one end of the b.f.o. coupling capacitor,  $C_{80}$ , from Pin 5 of the 6H6 a.m. detector. (3) Connect the loose end of the b.f.o. coupling capacitor,  $C_{80}$ , to Pin 8 of the 6SG7 second i.f. amplifier with a short piece of wire. (4) Remove wire from Pin 2 and solder it to Pin 3 of the 7A4



IMPROVED CIRCUIT

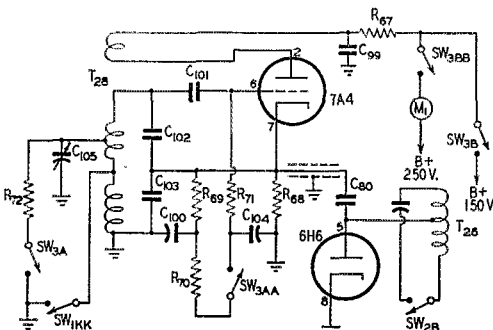
Fig. 2 — Revised b.f.o.-f.m. tuning circuit in the SX-42. An electron-coupled oscillator circuit is substituted for the original triode oscillator. Wiring changes are much simpler than the diagram makes them look. The only added part is the 2.5-mh. r.f. choke. Symbol designations shown are taken from the original diagram.

socket. (5) Remove the  $C_{80}$  shielded lead from Pin 7 of the 7A4 socket and solder it to Pin 2. (6) Connect Pins 4 and 5 of the 7A4 socket to ground. (7) Connect the 2.5-mh. choke between Pin 2 of the 7A4 socket and the B-plus side of resistor  $R_{67}$ . (8) Insert the 7G7/1232 in place of the 7A4, set the "Reception" control to a.m., and tune the receiver to a carrier. (9) Set the c.w. "Pitch" control to zero, set the "Reception" control to c.w., and set a.v.c. switch to "Off." (10) Retune the b.f.o. transformer for proper zero beat by adjusting the tuning slug on top of  $T_{28}$ , b.f.o. transformer.

— Lt. Wilfred N. Caron, USAF

## A HANDY TOOL

A VERY HANDY GADGET to have around the shop is a large darning needle, or a small knitting needle, with an alligator clip soldered on the blunt



ORIGINAL CIRCUIT

Fig. 1 — The original circuit of the combined b.f.o.-f.m. tuning indicator circuit in the SX-42.

end. The sharp end of the needle is perfect for cleaning out the holes in soldered terminals or making room for "just one more wire." The alligator clip is useful for holding small washers, nuts, wires, etc., in difficult places. With a little experimentation with a file, the jaws of the clip can be made to release merely by pulling it straight out.

— Arthur W. Rash, *KL7SO/5*

### ANTENNA FEED-THROUGH PANEL

Fig. 3 illustrates a device I am using to feed my antennas through the wall of the house without defacing the wall or modifying the window glass in any way. It is designed primarily for the ham who is renting, and consequently can make no modifications to the property; and who, by virtue of his profession, has to move around a great deal.

The material used is plexiglas salvaged from an obsolete aircraft, but the commercial product is readily available in most art stores at a nominal cost. It is more flexible and far easier to machine than polystyrene. The two end pieces are made of wood.

It differs from the usual windowpane feed-through panel in that it is made to fit the window frame and sill closely, and in that it may be adjusted to fit almost any window. Thus it allows

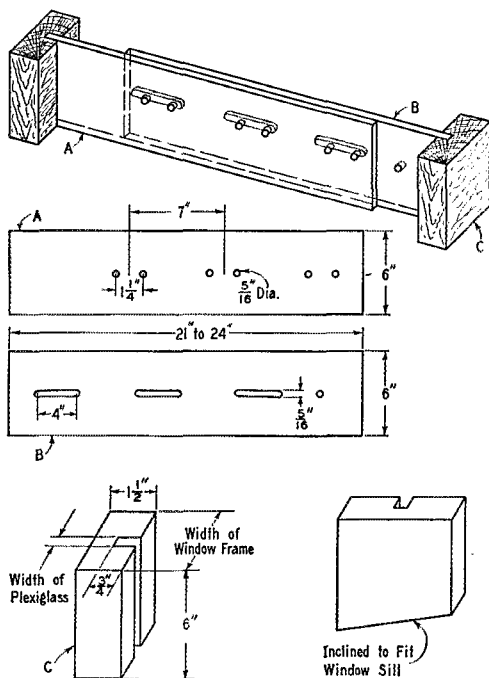


Fig. 3 — A "portable" feed-through panel for bringing the antenna leads into the shack. Adjustable to fit windows of several sizes, it is a neat way to eliminate an ordinarily messy problem without defacing the window or its frame.

not only changing from house to house, but changing the position of the rig within the house.

The method of construction and use is evident from the drawing. Dimensions are only approximate. They can be modified to fit the individual case. The hole and groove diameters are for the small feed-through insulators. If larger ones are used, there is ample room for repositioning the holes and enlarging the grooves. Not shown in the drawing, but yet of practical value, are several pieces of rubber weather stripping cemented to the tops and bottoms of each of the panels, extending to the ends of the wooden blocks. This provides a weather-tight seal.

— Arthur W. Coffland, *W1RVE*

### PROTECTION FOR MODULATION TRANSFORMERS

In a few minutes' time and with little cost you can eliminate your worries about the possibility of blowing your expensive modulation transformer by operating it with no load on the secondary. The circuit is shown in Fig. 4, and it is well worth while when you consider the low value of shorted "audio iron."

The parts required are few, namely a single-pole double-throw relay which has one contact normally closed. Almost any relay will do so long as there is one set of contacts in the closed position when the coil is not energized. A 6-, 12- or 24-volt relay is preferable to a 115-volt unit, and an a.c. relay is slightly preferable to a d.c. type. In addition, you'll need a small tubular condenser of at least 8  $\mu$ fd., rated for at least twice the operating voltage of the relay coil, and a couple of good insulators to mount the relay above chassis ground. These should be able to stand at least twice the highest d.c. encountered

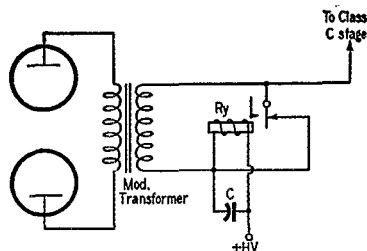


Fig. 4 — Protective circuit to eliminate danger of blown modulation transformers due to loss of load. The relay is shown in the unenergized condition.

Connect the protective device as shown in Fig. 4. The relay coil is in series with the supply voltage and the low side of the secondary of the modulation transformer. The current drawn by the final amplifier will energize the coil, causing the armature of the relay to open the circuit that normally shorts the secondary. The condenser is

(Continued on page 106)



# Operating News



F. E. HANDY, WIBDI, Communications Mgr.  
JOHN E. CANN, WIRWS, Asst. Comm. Mgr., C.W.  
GEORGE HART, WINJM, Natl. Emerg. Coördinator

J. A. MOSKEY, WIJMY, Deputy Comm. Mgr.  
L. G. McCOY, WHCP, Asst. Comm. Mgr., 'Phone  
LILLIAN M. SALTER, Administrative Aide

**Radio Club Progress.** Eighty new clubs were affiliated with ARRL in the last calendar year. Returns from the annual survey of all affiliated clubs now enable us to present the Club Honor Roll of clubs having 100 per cent ARRL membership. One common note of progress in the reports of many groups was the appointment of a TVI/BCI committee. Such are now in successful operation in nearly 50 per cent of all clubs reporting — in just about *all* the larger communities. See Jan., 1950, *QST*, page 62, for detailed suggestions if your club is interested in committee work of this type. Clubs are now in many cases an integral support to the AEC in their city. Individually-owned dynamotors and vibrator packs for emergency work are 16 per cent more numerous than a year ago. One-third of the licensed radio amateurs in all clubs belong to the ARRL Emergency Corps.

**Don't Miss the ARRL FD, June 24th-25th!** Every Field Day offers a chance to enjoy intensive training in cooperative planning and operating. The values in fraternalism and plain fun are tops. The FD combines a crack at radio work in the open, with as much experience in camping out as you want to arrange. Don't overlook this chance to check off some contacts with your pet mobile rig, from the individual standpoint, even if you sign up to become part of a group operating portables in the multi-transmitter class. There's a separate mobile listing for this as ARRL wants to bring the importance of *mobiles* to the attention of every participant. They are desirable to supplement fixed stations and portables in emergency, having the power of deployment and quick assignment to emergency-important spots in community plans, even above that accorded portables. Summer vacation plans will hardly be complete without mobile radio or portable "sets with handles" along too. But whatever your gear — don't miss the June 24th-25th Field Day for some operating tests!

**Code-Proficiency Program.** All readers who have not yet done so are urged to note the dates of the next Qualifying Runs (see Activities Calendar). Send in a full minute of the text copied by ear from the stations scheduling these runs. It will be a pleasure to certify your work

and add your name to the roster of many thousands of other amateurs who have made an official record of their top ability in this line.

An over-all increase of 20 per cent in the number of Code Proficiency Certificates issued was recorded in 1949. The program increased in popularity even though the number of endorsements after initial certification fell off somewhat. This is the third consecutive year new highs in CP issuances have been recorded. Hearty thanks are due W6OWP and WØTQD for their consistent efforts in transmitting the monthly proficiency runs, supplementing WIAW schedules to make certification more readily available to all amateurs. Over 15,000 amateurs have now earned ARRL CP certifications. How about yours, OM? Try your hand at the next Qualifying Runs, W6OWP's June 4th, WIAW's and WØTQD's June 15th!

This most popular ARRL program independently of the certifications has brought hundreds of letters from prospective amateurs at the time, the sought-after FCC tickets have been received, expressing thanks for the variety of tape sent speeds and night-after-night assistance in making "copy" available. Only about 7 per cent of the amateurs interested in the program have an interest in the highest speeds transmitted.

**Your Ideas for Mobile Club Credit for Future FDs, Please.** FD rules have to be kept *simple*. Nevertheless we're looking eagerly at all schemes that might tend to popularize mobile work and dedicate FD more to its primary purpose. It would be desirable to get all ham operators who have mobiles to register them in the AEC, and on this annual occasion to give their mobiles a whirl for FD listing of results. Can someone propose a good plan for a close tie-in between club or group scores (Class 1) and a quota of mobile operations, for *next* year? A straightforward fixed credit not to exceed 50 points earned before multiplier per complete separate mobile, no passing around the legal control of the mobile station permitted understand, and not over an aggregate of 300 such points per claimed score submitted. . . . How would that sound? Would it set something stirring in the building and testing of mobile rigs? It would be one way to get nearer to that proper

balance of objectives that our National Emergency Coördinator sees desirable for Field Day and is talking about in his "With the AEC" copy for this month. So far as "winning" the FD is concerned, we wish that every amateur would accept our viewpoint that every amateur who tries out a portable or emergency rig, batteries or otherwise, and makes it work to establish contact afield with even one station is a Field Day winner. 73 and BCNU in the FD.

—F. E. H.

### WIAW SUMMER SCHEDULE

(Effective June 1, 1950)

(All times given are Eastern Standard Time)

*Operating-Visiting Hours:*\*

Monday through Friday: 1130-0600 (next day)

Saturday: 1900-0230 (Sunday)

Sunday: 1600-2200

\* *Exceptions:* On week days from June 5th through 30th and from September 18th through 30th the station will not open until 1730, to provide for attendants' vacations. WIAW will be closed from 2400 July 3rd to 2400 July 4th in observance of the Independence Day holiday. A mimeographed local map showing how to get from main state highways (or from Hq. office) to WIAW will be sent to amateurs advising their intention to visit the station.

*Official ARRL Bulletin Schedule:* Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules:

*Frequencies:*

C.W.: 1887, 3555, 7215, 14,100, 28,060, 52,000, 146,000 kc.

'Phone — 1887, 3950, 14,280, 29,000, 52,000, 146,000 kc.

Frequencies may vary slightly from round figures given; they are to assist in finding the WIAW signal, not for exact calibration purposes.

*Times:*

Monday through Friday, 1600 by 'phone.

Sunday through Friday, 2000 by c.w., 2100 by 'phone.

Monday through Saturday, 2330 by 'phone, 2400 by c.w.

*General Operation:* Use the chart below for determining times during which WIAW engages in general operation on various frequencies, 'phone and c.w. Note that since the schedule is organized in EST, certain morning operation periods may fall in the evening of the previous day in Western time zones. Alternate frequencies, as indicated by footnote, will be used when conditions do not permit use of certain scheduled frequencies. On Saturdays and Sundays during which official ARRL activities are being conducted, WIAW will forego general-contact schedules in

favor of participation in the activity concerned (see Activities Calendar).

*Code-Proficiency Program:* Practice transmissions at 15, 20, 25, 30 and 35 w.p.m. on Tuesdays and Thursdays and at 9, 13, 18, 25 and 35 w.p.m. on Mondays, Wednesdays and Fridays are made on the above-listed frequencies, starting at 2130. Approximately ten minutes of practice is given at each speed. Next certificate (qualifying run is scheduled for Thursday, June 15th.

### A.R.R.L.-AFFILIATED CLUB HONOR ROLL

It is a pleasure to present the latest Honor Roll of all the affiliated clubs whose *entire membership* consists of members of the League. The listings of clubs with 100 per cent ARRL membership are in accord with the Board policy of such special recognition. In the following this has been determined from information supplied us in the 1950 affiliated-club questionnaire or Annual Information Survey conducted as required by the Board. Some clubs report having membership drives currently. In view of this there will be an additional QST Honor Roll listing later this year. It will include any affiliated societies whose questionnaires did not provide the necessary complete information at this time as well as those who may qualify for the listing on completing their membership program.

- Bartlesville Amateur Radio Club, Bartlesville, Okla.
- Cahokia Amateur Radio Club, East St. Louis, Ill.
- Central Illinois Radio Club, Bloomington, Ill.
- Chattanooga Amateur Radio Club, Chattanooga, Tenn.
- Connecticut Wireless Association, West Hartford, Conn.
- The 56-Mc. Minutemen, Medford, Mass.
- Jersey Shore Amateur Radio Assn., Long Branch, N. J.
- Kingsport Amateur Radio Club, Kingsport, Tenn.
- Laramie Amateur Radio Assn., Laramie, Wyo.
- Muscle Shoals Amateur Radio Club, Florence, Ala.
- Narragansett Association of Amateur Radio Operators, East Greenwich, R. I.
- North Shore Radio Club, Long Island, N. Y.
- Old York Road Radio Club, Elkins Park, Pa.
- Order of Brass Pounders, Chap. No. 3, Kansas City, Mo.
- Pendleton Amateur Radio Club, Pendleton, Ore.
- Pioneer Radio Club, Fremont, Nebr.
- The Providence Radio Assn., Inc., Providence, R. I.
- Reading Radio Club, Reading, Pa.
- Ridgewood Radio Club, Ridgewood, N. J.
- Society Radio Operators, Chicago, Ill.
- South Lyme Beer, Chowder and Propagation Society, West Hartford, Conn.
- T-9 Radio Club, Danvers, Mass.
- Valley Radio Club, Eugene, Ore.
- Walla Walla Valley Radio Amateur Club, Inc., Walla Walla, Wash.

### WIAW GENERAL-CONTACT SCHEDULE

(Effective June 1, 1950)

WIAW welcomes calls from any amateur station. Starting June 1st, WIAW will listen for calls in accordance with the following time-frequency chart.

EST	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
0015-0200 <sup>1</sup>	7215	.....	3555	7215	3555	7215	3555
0200-0300	.....	.....	← 3950 or 14,280 kc. (Tues.-Fri.) <sup>2</sup>	.....	.....	.....	14,280
0300-0400	.....	.....	14,100 <sup>3</sup>	7215	14,100 <sup>3</sup>	7215	14,100 <sup>3</sup>
1130-1200	.....	.....	28,060	.....	.....	28,060	.....
1200-1300	.....	.....	← 29,000-kc. 'phone (Mon.-Fri.)	.....	.....	.....	.....
1500-1600	.....	.....	← 14,100-kc. c.w. (Mon.-Fri.)	.....	.....	.....	.....
1600-1700 <sup>1</sup>	.....	.....	← 14,280-kc. 'phone (Mon.-Fri.)	.....	.....	.....	.....
1800-1900	14,100	3950	7215	14,280	7215	14,280	.....
2015-2100 <sup>1</sup>	3555	146 Mc.	52 Mc.	52 Mc.	14,100	7215	.....
2100-2130 <sup>1</sup>	52 Mc.	52 Mc.	3950	14,280	52 Mc.	14,280	.....
2230-2330	.....	3950	7215	3950	1887	14,100	.....

<sup>1</sup> Starting time is approximate. General-contact period begins immediately following transmission of Official Bulletin.

<sup>2</sup> Operation will be on either of the frequencies stated, depending on propagation conditions, expediency and general activity.

<sup>3</sup> Alternate frequency, 7215 kc.



### A.E.C. TIP-OF-THE-MONTH

Many AEC organizations have found that civic dignitaries observing their operations are more impressed by first-hand observation of the mobile units in the field than by standing around at message centers or net control points. Mobility is getting to be more and more the keynote to flexibility in emergency communications work. For best results in AEC work, use more mobiles, and to impress skeptical officials, "give 'em a ride in a mobile!"

Here it is June again, and everybody is talking about Field Day, the activity of the year in which more amateurs and more equipment participate than in any other activity. Clubs all over the country are talking it up, arguing about it, getting their gear ready, making their plans, even in some cases preparing and installing their antennas.

We have read quite a bit of correspondence concerning Field Day and sat in on a few discussions, most of them controversial, concerning the rules and what you can and cannot do, and how the best possible score can be made for a particular group — and it got us to wondering; what is this Field Day, anyway? Is it a contest? Is it a picnic, a "good time" for all the gang, an outing? Or is it a test of emergency facilities?

Well, of course different groups and individuals have different objectives, but in general it is all three. Depends on what you go out for. This is an age of specialization in which it is difficult to keep a number of objectives in mind, and therefore some groups go out to run up a higher score than anyone else, some go out just for the fun of going out and being a bunch of fellows together and not shaving for a couple of days and "roughing it," and some of the more emergency-conscious groups emphasize emergency preparedness.

You think you know what we're getting at, do you? Well, you're wrong! We're *not* going to make a plea for more attention to the emergency angle. Our plea is for a *better balance* among all three of the primary objectives, all of which are worth while and all of which should definitely be a consideration in making Field Day plans. If you emphasize one consideration at the expense of one or more of the others, you are not getting the most out of one of our greatest institutions. How about a "well-rounded" Field Day this year, gang? Emergency, fraternity, rivalry!

Illinois SEC W9QLZ reports emergency work by several Illinois amateurs during an early February ice storm which damaged telephone and telegraph lines in and around Rosiclare. W9IBS was called upon by the several mining companies and officials to furnish emergency communications for the affected area, and performed creditably for three days until normal communication facilities were restored. The success of the operation was attributable, in large part, to the fine cooperation of PAM W9UQT, W9KCX, W9HAB, W9WNM and W9PBR. Approximately fifteen messages were filed and handled from W9IBS carrying vital data for the various agencies served. Orchids to W9IBS for his key rôle, and thanks to the above-named and other assisting amateurs for their help.

Late in the afternoon of March 21, 1950, near Memphis, a high-voltage power wire fell across telephone, telegraph and railroad communication wires, damaging equipment as far away as 72 miles and cutting off Somerville, Tenn., from all wire contact with the outside. W4PXW was asked to help. With the aid of W4FWX he established contact with W4DI in Memphis on 2 meters. W4HHK in Collierville and W4BAQ in Memphis also reported into the net and kept the circuit open until midnight, and during the next day on 2, 75 and 160 meters until 1900, at which time the wires were again in service.

On January 4th, Capt. "Kurt" Carlsen, W2ZZM, who is master of the freighter *Flying Enterprise*, was about 400 miles off the Virginia Capes, headed for Norfolk, when the child of one of the passengers on board fell seriously ill. W2ZZM put his 20-meter rig on the air and raised W0WEH of Minneapolis. The child's condition was explained and W0WEH immediately contacted Dr. Cherry Cedarleaf of the Northwestern Hospital for instructions and treatment. Dr. Cedarleaf diagnosed the child's condition as acute tonsillitis and prescribed penicillin and sulfa. Later in the day the child had recovered considerably and was out of danger and the father was so grateful he was put on the mike and thanked both Dr. Cedarleaf and Kaefer, W0WEH.

### DAKOTA EMERGENCY

In the period March 6th throughout March 9th, several areas in the northern Midwest suffered severe blizzard and windstorm conditions, centering in the Dakotas and Minnesota. As usual, amateurs sprang into action to relieve communications outages which were so widespread that FCC declared North Dakota, South Dakota and Minnesota an emergency area and invoked Section 12.105 of the regulations to assure QRM-free operation within this area.

Our first report comes from Nebraska, where W0FMW informs us that on March 6th strong winds accompanied rain, which later became snow. The storm raged with such intensity that at several points telephone and wire communication failed, and electric power was very unstable. The newly-formed Nebraska 160 Emergency Net went into action in its first test under actual emergency conditions. Because of the intermittent failure of commercial power, most of the net members operated on emergency power. Having previously made arrangements with the 75-meter emergency net, the 80-meter traffic net and various key



The City of Los Angeles held a simulated disaster drill on March 24, 1950, in which the Los Angeles AEC organization, under SEC W6ESR, participated by manning W6HGV at the Los Angeles Red Cross Headquarters. Shown standing, left to right: SEC W6ESR, SCM W6VIM, EC W6MVK and EC W6YHP. Seated are W6ZUX handling 2-meter mobile contacts, W6EUR contacting 2-meter fixed stations, and W6WKO on 10-meter phone. Operating positions were also set up for 3.5- and 7-Mc. contacts and for 10-meter mobile contacts, manned by W6BBY and W6DMJ respectively.

QST for

agencies to be served such as the CAP, the Power Company, the State Police, Western Union, Bell Telephone Company and the Red Cross, the operation was pretty much a matter of putting a prepared plan into effect. The operations ran smoothly, with much official traffic handled. Those stations participating were W0s AGE DNV FMW GHM HYR IDR KBR MJY MTI MZW TIF TIP VQR YLC YSK YWK ZJF ZPJ W4OUV/0, and K0NBJ.

The blizzard reached its climax on March 7th, in South Dakota, after an unseasonably warm March 6th. It started about 0300 March 7th with a strong wind, followed by rain and then sleet. By 0530 the sleet had changed to snow driven by winds up to 66 m.p.h. Two hundred and seventy South Dakota towns were without means of communication, and many were without power and lights. Transportation by any means was at a standstill because of the storm and lack of means of communication. This was the situation on the morning of the 7th when the South Dakota 'phone and c.w. nets were alerted.

W0QDN at Huron was put on the air at 0930, at which time several stations were already on and traffic had started. W0VQC was acting NCS, but he lost his power at 1000 and W0QDN took over until 0200 the next morning, when W0ILL assumed charge and discontinued operations at 0230. The net resumed operation at 0730 on the 8th with W0BJV as NCS until 0900, when NGM took over until speech trouble developed in his rig, after which W0ILL took over again. W0ILL continued to direct operations throughout the day until the net was excused about midnight. The bulk of traffic was handled for telephone and railroad companies.

The South Dakota C.W. Net was also in high gear, with W0s GCP and OLB alternating as NCS, most of the traffic being for the railroad. Communication service was restored at 2130.

In Minnesota, W0TSN was heard doing a magnificent job of directing emergency net operations. Many other amateurs, including members of the National Emergency Net in states surrounding the disaster area who were alerted by ARRL through W0RA, lent their assistance in keeping the critical channels clear of QRM. The following is a list of all stations who are known to have participated, although as usual it is probably incomplete: W4POF, W5KDM/0, W9s CBC DUA OOL UIT UVA, W0s AZR AJQ AGL BFF BJV BLK CPN CJS DKJ DLZ DB DYM EYW GCP GQH GWU HDO HAT HWS ILL LEI IWB IYN IYZ IZA JDO JWY KOY KQO KSS MMQ MZD MZJ NGM OLB ORE PFN PFR PVE QDN QIQ TSN TGO TBH RHG RQV SAT UFL UVR UVL VHK VQC VT YDT YPC YPU ZRA ZSH ZUS ZKW, K0NRU. W0NGM reports the dispatch of over 700 messages in South Dakota alone as an example of the kind of work that was being done.

### BRIEFS

Tears of happiness welled in the eyes of Tom Crawford, a resident of Bellflower, California, as he sat, microphone in hand, in the shack of E. T. McKee, W6BXD, at Seal Beach, California. With the assistance of amateur radio, twenty-nine years and thousands of miles were being spanned. Tom was talking with his brother, C. E. Crawford, located at Adak in the Aleutian Islands. The brothers have been in touch with each other only through correspondence, and were last together following their discharges from the Army after World War I when they met at their parents' home in Purdy, Missouri. The conversation was a long one which culminated in plans for them to meet in the United States later this year. Arrangements for this unusual contact were made by W6BXD with the cooperation of R. R. Busic, jr., KL7TU, a 1st lieutenant in the U. S. Air Force, who held down the Alaskan end of the circuit.

On Sunday afternoon, July 16th, the Ascension Yacht Club, of Norwalk, Conn., is holding an outboard marathon race from Norwalk to Execution Rocks lighthouse and return. If the weather is bad, the race will be held on July 30th. The Amateur Radio Emergency Corps of Norwalk, the Emergency Radio Group of the Norwalk Red Cross, will provide complete communications for this event by

spotting eight or ten transmitters on committee boats spaced out along the 25-mile course. The master control station will use the call W1SGZ. 'Phone operation is planned on 3916 kc., 29,680 kc., and 147 Mc. It is hoped that amateur stations in the vicinity of Long Island Sound will monitor these frequencies on July 16th and, if necessary, aid in relaying traffic from the maritime-mobiles to the finish line. Any maritime-mobile stations that may be in Long Island Sound over that week end are invited to participate in this operation. It is estimated that there will be 300 outboards racing in this 50-mile marathon.

## DX CENTURY CLUB AWARDS

### HONOR ROLL

W1FH.....231	W8HGW....221	W2BXA....217
W6VFR.....225	W6ENV....221	W6MEK....216
G2PL.....222	W3BES....220	W0YXO....213
W6EBG.....221		

### RADIOTELEPHONE

W1FH.....190	W8HGW....168	W2BXA....162
W6DL.....181	W1JGX....164	W9RBI....160
XE1AC.....176	LU6AJ....164	G2PL.....159
VQ4ERR.....170		

From March 15 to April 15, 1950, DXCC certificates and endorsements based on postwar contacts with 100 or more countries have been issued to the amateurs listed below.

### NEW MEMBERS

W6ENV.....221	SM7MS....105	W1BOD....101
G2EC.....171	W9TFU....104	W4AAW....100
G5SR.....133	CN8MZ....103	W4QT.....100
G5PP.....127	KH6PM....103	G3AWP....100
W5CKY.....121	CX1BZ....103	KL7UM....100
ZS2AT.....111	W6JU....102	W2EGG....100
W6AOD.....110	W0ERI....102	DL1DC....100
W3ADZ.....110	W2HY....102	W0TJ....100
W0MCF/C1...109	E1G6....102	W6ETJ....100
G3BKF.....107	G6XS....102	W9UAZ....100
VQ2GW.....107	W0QVZ....101	W6AX....100
W7BTH.....105	OK1SK....101	

### RADIOTELEPHONE

G2ALN.....122	ZD4AH....104	HB9DY....100
YV5AB.....116	W2MFS....102	W4LGG....100
G5PP.....113	W8BFQ....101	W5ALB....100
VE3BDB.....109	W2ZVS....100	

### ENDORSEMENTS

W3KT.....210	W9LNM....160	W8GLK....140
W2DS.....201	W8SDR....160	W8BWC....137
PA6UN.....200	W3KDP....156	M13AB....133
W3JTC.....200	W5BGP....155	W4RBQ....130
W3DPA.....200	OK1FF....155	ZS6FN....130
VE7ZM.....192	W1DQH....154	W7ENW....130
W6DI.....190	W2CNT....152	G8FW....130
W1LX.....185	OZ7EU....151	VK6SA....123
W6PB.....180	W6VE....150	W1ATE....122
W6RBQ.....180	W3HRD....150	W4AZK....121
W6BPD.....174	W4LZF....150	W2LTP....120
W6SRU.....171	W6CTL....150	ZS6A....120
W7GUV.....171	W8DEN....145	ON4GC....120
W2UFT.....170	W7PGS....144	W8DAW....120
W6FI.....170	W2RGV....143	W8MPW....116
ON4JW.....170	PY2OE....143	W6NTR....115
VO6EP.....161	W2LSX....141	HI1BR....111
VK2NS.....163	W4VE....141	IB6Y....111
W2EMW.....162	W7KTN....140	I1VS....110
W5KUC.....161	W4IWO....140	W2RQH....110
W6EPZ.....161		

### RADIOTELEPHONE

PY2CK.....151	W2RGV....122	ZS6FU....112
W5BGP.....151	CN8BA....120	W6AM....110
VE7ZM.....130	W1HX....120	I1VS....110
W1ATE.....122		

## BRASS POUNDERS LEAGUE

Winners of BPL Certificates for March traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W6CE	314	2654	2581	37	5586
W6LSN	0	1502	1379	123	3004
W7CZY	51	1323	1229	27	2630
W6ZJO	29	991	946	33	1999
W8NOH	50	502	351	141	1044
W6JZ	45	470	399	102	1016
W6DDE	612	187	138	49	986
W6AMT/6	958	10	4	7	979
W8NRE	15	527	420	3	965
W3CUL	139	384	324	50	897
W6HMM	2	442	419	12	875
W6HMM**	10	382	375	8	775
W5GZU	4	356	334	22	716
W8MN	13	360	266	67	706
W3GEG	21	305	279	3	608
W8DSE	3	295	290	12	600
W5LAK	4	286	279	6	575
W6SSW	68	247	139	94	548
W9ESJ	25	134	249	115	523
W1EMG	6	279	200	37	522
KG6PAA	287	118	47	68	520

The following made the BPL for deliveries:

W6DDE*	92	W8YFJ	60	W2BO	54
W6EKQ	89	W0RBS	60	W3DYY	54
W2OAF	85	KH6UL	60	W9JTX	53
W7ZU	81	W3FCP	58	W6DDE**	52
W9CMC**	75	W8DAE	58	W4FF	51
W7FLX	69	W3OML	57	W8TRN	51
W5ARK	61	W6CMN	57	W8GBF	50

Effective with June traffic, a message total of 500 or more or 50 or more *originations-plus-deliveries* will put you in line for a place in the BPL. The Brass Pounders League is open to all operators who qualify for this monthly listing.

\* January Traffic

\*\* February Traffic

## TRAFFIC TOPICS

In accordance with the poll of opinion of CD appointees included with the January CD Bulletin, we wish to announce two basic changes in ARRL-recommended message-handling practice. CD appointees voted 313 to 134 in favor of giving more BPL credit for originations and 340 to 112 in favor of simplifying word-count rules. After careful study of all comments, opinions and suggestions, we announce the following changes:

*More BPL credit for originations.* Although opinions varied widely on this subject, most of those who commented went along with the proposal that BPL listing be available to all stations who make 100 or more "originations plus deliveries." Therefore, effective with June traffic, BPL listing will be made on this basis, superseding the present "50 or more deliveries" requirement. *This does not represent any change in basic message count. Originations still count one point each, and deliveries one point each.* The only change is in the BPL requirement. From now on, in order to make BPL, the sum of your *originations plus deliveries* must be equal to 100 or more, or you must have a grand total of 500 or more message points per month. This new requirement goes into effect with June traffic and therefore with September QST, in which June traffic is reported. SCMs especially please take note of this change.

*Simplified word count for message check.* Suggestions for simplifying the word count were so varied that it was difficult to come up with a good compromise. Most of those who commented agreed that "extra" check was one of the greatest sources of confusion. Some thought that it would "simplify" the word count to adopt cable count instead of landline count as heretofore. A great many who commented thought we should adhere to the practice of counting words *as sent*; the only trouble with this apparent simplification is that it is often impossible to tell *how* it was meant to be

sent, especially on 'phone, and some basic rule will have to be applied to avoid abuse of this principle. So, effective June 1st, the League's recommendations for counting words in messages are simplified as follows:

The "check" of a message is a simple count of the number of words or groups in the text *as sent*. In amateur practice, no "extras" are included in the basic count, whether or not such extra words appear in the preamble, address or signature. Only the words, numbers or groups in the text are included. All such words or groups are counted as *one* in the check *if they are sent as one*. Compound or hyphenated words, names of cities, states or other geographical locations are similarly counted the way they are sent; if in doubt, or if your count does not agree with that of the sending operator, *use the dictionary as a guide*, or query him on how he counted such words as might be doubtful. If his sending is correct and his spacing accurate so as to leave little doubt, your count should agree with the check as sent.

All numbers, ciphers, mixed groups and punctuation count each as one in the check similarly, regardless of length. It is recommended amateur practice not to use punctuation, fractions or other unorthodox or seldom-used code symbols in messages as such, but rather to *spell these out* when used in the text of a message to avoid complications in checking.

A few rules have to be observed in sending words so this new principle of "counting as sent" will not be abused, as follows:

- (1) Make your spacing methodical and accurate.
- (2) Let the dictionary be your guide wherever it will cover. If the dictionary does not say, count it the way it was sent. If you cannot determine how it was meant to be sent, it will be necessary to query the sending operator if your check does not agree with his.
- (3) Do not waste time in traffic nets arguing about "how to count." The purpose of the "check" in amateur work is *only* to confirm the number of words or groups in the text. QTB is a useful signal in confirming check, but if you are *sure* you have copied it correctly, QSL the message and get on with the next one, whether or not you agree with his check. Later you can consult the dictionary to make any legitimate changes in the check for retransmission.

The principle of counting words as sent can be illustrated by a few examples, as follows:

F E Handy.....	3 words
New York City.....	3 words
Newyorkcity.....	1 word
6L6G.....	1 word
A6ZB1.....	1 word
31457224 (Army serial number).....	1 word
31 457 224 (Army serial number).....	3 words
Fifty six.....	2 words
Fiftysix.....	1 word

A rule of thumb can be applied to the new checking method: *Confirm* the check by counting *the way it is sent*; correct the check, if necessary, by consulting the dictionary (but not grammar books).

— . . . —

Our ACM 'Phone, WIICP, wishes it to be known that a series of bulletins is being sent to net control stations of all ARRL-registered 'phone nets. These bulletins will discuss net operation, message handling, emergency work and other items of interest. The purpose of this is to help the NCS to improve his net and give him the opportunity to pass along ideas of merit to other nets. If you are a 'phone net control station and have not received the first of these bulletins, pass along a message to headquarters requesting to be put on the mailing list.

— . . . —

The National Traffic System is gradually working into plans for summer operation, and hopes to be instrumental in providing a continuing good message service throughout the summer months when many traffic nets close down. At this writing detailed plans are still in a formative stage, but if your net is closing down and you expect to be on the air during the summer, even if only occasionally, report into your section net whenever you can to help take care of local deliveries. If your section net is closed for the summer,



report into your regional net. If you intend to be active all summer, your regional net manager would probably welcome an opportunity to work you into his summer plans. Following is a list of regional net managers, with the areas which their nets cover:

- First Regional Net (1RN) — W1BVR. All W1-land.
- Second Regional Net (2RN) — W2PRE. All W2-land.
- Third Regional Net (3RN) — W3GEG. All W3-land.
- Fourth Regional Net (4RN) — W4ANK. Va., N. C., S. C., Ga., E. Fla.
- Fifth Regional Net (RN5) — W4NNJ. All W5-land except New Mexico, plus Tenn., Ala. and Western Fla.
- Sixth Regional Net (RN6) — W6CE. Calif., Nevada, T. H.
- Seventh Regional Net (RN7) — W7CZY. Ore., Wash., B. C., Idaho, Mont., Wyo., Alberta, Sask. and Alaska.
- Eighth Regional Net (8RN) — W8NOH. All W8-land.
- Ninth Regional Net (RN9) — W4BAZ. All W9-land and Kentucky.
- Tenth Regional Net (TEN) — W0SCA. All W0-land except Colo., plus Manitoba.
- Twelfth Regional Net (TWN) — W5IGO. Utah, Ariz., New Mexico, Colo.
- Thirteenth Regional Net (TRN) — VE2GM. All VE1, VE2, VE3 and VO.

— \* \* \* —

The American Legion Amateur Radio Net of California comprises about 65 stations operating daily on 3975 kc. for the purpose of handling traffic and preparing for emergency work. Net control is W6GRO. This net serves also as Pacific Coast outlet for the 'Trans-Continental' Phone Net (TCPN).

### ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed in a number of Sections, as provided in our Constitution and By-Laws, electing the following officials, the term of office starting on the date given.

Arizona	James Kennedy, W7MID	April 1, 1950
South Dakota	J. S. Fosberg, W0NGM	April 14, 1950
San Francisco	R. F. Czeikowitz, W6ATO	April 14, 1950
San Joaquin Valley	E. Howard Hale, W6FYM	April 15, 1950
Missouri	Ben H. Wendt, W0ICD	April 17, 1950
Alberta	Sydney T. Jones, VE6MJ	May 1, 1950
Vermont	Burdys W. Dean, W1NLO	May 31, 1950
Louisiana	Robert E. Barr, W5GHH	May 31, 1950
Montana	Fred B. Tintinger, W7EGN	June 1, 1950
Manitoba	A. W. Morley, VE1AM	June 15, 1950

In the Washington Section of the Northwestern Division, Mr. Laurence Sebring, W7CZY, and Mr. Lewis F. Rylie, W7CKT, were nominated. Mr. Sebring received 303 votes and Mr. Rylie received 139 votes. Mr. Sebring's term of office began March 10, 1950.

In the Tennessee Section of the Delta Division Mr. D. G. Stewart, W4AFI, and Mr. Ward Buhrman, W4QT, were nominated. Mr. Stewart received 110 votes and Mr. Buhrman received 73 votes. Mr. Stewart's term of office began March 31, 1950.

### ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Sections. This notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are required on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of

the candidate should be included with the petition. It is advisable that eight or ten full member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested: (Signers will please add city and street address to facilitate checking membership.)

Communications Manager, ARRL [place and date]  
 38 La Salle Road, West Hartford, Conn.  
 We, the undersigned full members of the .....  
 ..... ARRL Section of the .....  
 Division, hereby nominate .....  
 as candidate for Section Communications Manager for this  
 Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take this initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— F. E. Handy, Communications Manager

Section	Closing Date	SCM	Present Term Ends
New Hampshire	June 15, 1950	Gilman K. Crowell	Resigned
Yukon *	June 15, 1950	W. R. Williamson	Mar. 17, 1949
West Indies	June 15, 1950	Everett Mayer	Dec. 15, 1949
Maritime *	June 15, 1950	Arthur M. Crowell	Apr. 15, 1950
Santa Clara Valley	June 15, 1950	Roy E. Pinkham	Apr. 30, 1950
Eastern Mass.	June 15, 1950	Frank L. Baker, jr.	May 15, 1950
Virginia	June 15, 1950	Victor C. Clark	June 14, 1950
Ontario *	June 15, 1950	Thomas Hunter, jr.	June 15, 1950
Idaho	June 15, 1950	Alan K. Ross	June 17, 1950
Colorado	July 3, 1950	M. W. Mitchell	Sept. 15, 1950
Canal Zone	July 3, 1950	Everett R. Kimmel	Sept. 15, 1950
Alaska	July 3, 1950	Charles M. Gray	Sept. 15, 1950
Illinois	July 17, 1950	Lloyd E. Hopkins	Sept. 30, 1950
Rhode Island	July 17, 1950	Roy B. Fuller	Oct. 1, 1950
Ohio	July 17, 1950	Dr. Harold E. Stricker	Oct. 1, 1950
Northern Texas	Aug. 1, 1950	Joe G. Buch	Oct. 15, 1950
Kansas	Aug. 15, 1950	Earl N. Johnston	Oct. 29, 1950

\* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian General Manager Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid such petitions must be filed with him on or before the closing dates named.

### A.R.R.L. ACTIVITIES CALENDAR

- June 3rd: V.H.F. Contest
- June 4th: CP Qualifying Run — W6OWP
- June 15th: CP Qualifying Run — W1AW, W0TQD
- June 24-25th: ARRL Field Day
- July 1st: CP Qualifying Run — W6OWP
- July 17th: CP Qualifying Run — W1AW, W0TQD
- July 22nd-23rd: CD QSO Party (c.w.)
- July 29-30th: CD QSO Party (phone)
- Aug. 4th: CP Qualifying Run — W6OWP
- Aug. 18th: CP Qualifying Run — W1AW, W0TQD
- Sept. 9th: CP Qualifying Run — W6OWP
- Sept. 20th: CP Qualifying Run — W1AW, W0TQD
- Sept. 23rd-24th: V.H.F. Contest
- Oct. 6th: CP Qualifying Run — W6OWP
- Oct. 14th: Simulated Emergency Test
- Oct. 17th: CP Qualifying Run — W1AW, W0TQD
- Oct. 21st: CD QSO Party (c.w.)
- Oct. 28th: CD QSO Party (phone)

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

### ATLANTIC DIVISION

**EASTERN PENNSYLVANIA** — SCM, Jerry Mathis, W3BES — CUL is looking for some good summer schedules. She has a complete AEC station now. NHI is mixing a bit of DX with her traffic. AXA has a new NC-183 and is building the QST 144-Mc. rig. The Schuylkill ARC will have a joint meeting with the Electric City RC. KEK lost his antenna in the high winds. The Abington ARA put on a demonstration of ham radio for the Abington Boy Scouts. They had two 28-Mc. 'phone rigs operating from the meeting place. ELI threatens to try the CD Party on 'phone. CAU is back at his OO business. New OOs in Eastern Pennsylvania are BYB and MFY. EU will operate on Field Day from his rhombic farm. PST's 7-Mc. folder dipole folded for the third and last time in the high March winds and he is rebuilding the whole rig from the light socket to the end antenna insulators. FVY has his WAS certificate for 28-Mc. 'phone. New officers of the Lancaster RTS are as follows: DYT, pres.; NOK, vice-pres.; OY, secy.; HJ, treas.; KBZ and LN, board of directors. These officers will be installed at the Fifth Annual Banquet of the LRTS. The LRTS 144-Mc. net drills every Monday at 8 P.M. with an average of ten stations on 146 Mc. The Frankford RC and the Potomac Valley RC of Washington held a joint meeting and dinner at Wilmington, Del. There were 42 members in attendance and a fine time was had by all. These Clubs have been rivals ever since the PVRC was formed and the PVRC is the only club to have beaten the FRC in the ARRL SS Contest. ARRL policy and politics were discussed and mutually agreed upon. A similar meeting is scheduled for next year. Give ISE, our SEC, your support in his drive for emergency preparedness. The York Road RC put AEC gear in the Jenkintown Red Cross Headquarters. The Philmont Mobile Club is cooperating with the AEC 100 per cent. The Haverstown Net is doing an FB job of organizing its territory for emergency work. Traffic: W3CUL 897, PMG 228, OML 146, WTS 93, PDJ 78, NHI 76, ELI 57, AXA 54, QEW 22, MRQ 21, CAU 4

**MARYLAND-DELAWARE-DISTRICT OF COLUMBIA** — SCM, Epps W. Darné, W3BWT — The Chesapeake Amateur Radio Club's officers for 1950 are as follows: PRL, pres.; AFM, vice-pres.; FLG, secy.; LZM, treas.; QAO, sgt. at arms. The Club has had a number of out-of-town visitors recently, and has its first licensed YL member, PJL. Subject of the March 17th meeting was "What is it?". QAU talked on a cascade preamplifier for 28 Mc. at the second March meeting. The Washington Radio Club, at its March 11th meeting, featured a talk on "Radio Controlled Model Boats" by 4GEB. At the second March meeting 4LIB and 4IP5 gave a talk and demonstration on amateur teletype. LFG spoke on a TVI-less exciter. Officers for the 1950 season of the Capitol Suburban Radio Club are as follows: MNR, pres.; KAN, vice-pres.; HVS, secy.; KNU, treas.; NOL, corr. secy. The Club had a successful year in 1949 despite many obstacles which were met and solved. A new membership drive has been launched and plans for next Field Day are progressing nicely. The Red Cross Mobile Net of the Baltimore Amateur Radio Communications Society has about twenty car units. BII is Net Control Station. The Potomac-Rappahannock Valley Emergency Net was very active during March on 3935 kc. and 146.8 Mc. Considerable test messages are handled each drill and plans are being made to test field portable gear during May. Naval Air Station, Patuxent River, Md., has a ham club license, PQT. The Rock Creek Amateur Radio Assn. at its first March meeting elected the following new officers: EUQ, pres.; LQK, vice-pres.; LYV, jr. vice-pres.; PWB, secy.; JQN, treas.; OMN, GA, and OQN, exec. comm. A talk, illustrated by slides, on the Byrd South Pole Expedition was presented by "Doc" Bryant at the second March meeting. PJL and her hubby, NKY, frequently are heard on 28 Mc. working mobile-to-home. PLC has left for foreign duty. MZA has conquered his 28-Mc. TVI. UF has been appointed Emergency Coordinator and Route Manager for the Annapolis, Md., area.

QCW has a new VFO unit, is on 3.5 and 7 Mc., and has been working considerable DX. PZ has been appointed Official Experimental Station. OPM has his gear built in back of his cocktail bar. PRZ is rebuilding his rig to a single-ended 813. PDZ is building a new rig using a pair of 4-250s in the final. CJT is on 1.7-Mc. 'phone. PTZ has new rig completed with a pair of 812s in the final. KAN, aided by KNU, successfully installed his new beam antenna on the roof. JZY did well in the DX Contest using low power. EYX has been working Europe and South America on 28-Mc. 'phone. JHW has worked 31 countries on 3.5 Mc. JIX is on 14- and 28-Mc. 'phone with 125 watts. EQK is on again after a session with pneumonia. FQZ worked 28-Mc. 'phone in the DX Contest and gradually is eliminating his TVI difficulties. OEU is active on 7- and 14-Mc. c.w. and 'phone. The Club has worked 30 states for WAS and visited TV station WAAM. QCB is active on 14-Mc. c.w. and now has his 35-w.p.m. Code Proficiency certificate. PZ and PV have been keeping a circuit of about 9 miles over tough hills, using 420 Mc. and one-half watt power. Traffic: W3GZH 352, ECP 300, UF 250, DVW 182, AKB 84, KMN 55, MCG 29, CIQ 27, BWT 17, AKR 16, IL 14, JHW 14, JZY 11, EQK 10, NNK 7, ONB 7, EYX 4, QCW 2.

**SOUTHERN NEW JERSEY** — SCM, Dr. Luther M. Mkitarian, W2ASG — New officers of the DVRA are UPS, pres.; JAG, vice-pres.; SXK, secy.; Charles Rebman, treas. The Lakeland Amateur Radio Association meets the 1st and 3rd Wednesdays of each month at Kossuth Hall, Wharton, N. J. Club call letters are VDJ and the club net is on 7084 kc. at 1300 EST Sundays. ORS is building a new 144-Mc. rig. The SJRA has a new monthly publication, *Harmonics*. YRW is the editor and WXB, ZFA, JRO, and WKI are associates. ZYX is on 160 meters. PFT is running a code and theory class for the SJRA. If interested, please contact him. BAY is a new OPS; ZVA is a new ORS. Traffic: W2ORS 43, ZVW 22, ASG 20, ZYX 18, RG 17, YSP 9, KHA 8, PFT 7, HAZ 2.

**WESTERN PENNSYLVANIA** — SCM, Ernest J. Hlinsky, W3KWL — We welcome the newly-organized Allegheny-Kiski Valley Amateur Radio Assn. and also its new emergency radio net which, from all indications, will be a tremendous help in organizing the emergency set-up planned by OMA and MPO. This net consists of OD, NTM, CVT, NXU, NRK, OFF, LPQ, FPH, GRX, TSV, KAW, NCF, GVI, SWV, KOZ, NCB, AOK, NKJ, and PPL. Up Erie way TFX comes through with news items and clippings from his weekly editorials. The Radio Assn. of Erie is planning a 3.85-Mc. 'phone net for Sunday operation. MML is trying teletype. The Lake Erie Emergency Net meets Sundays at 9:30 p.m. PIV's column on "Erie Radio Hams" in the local paper contains articles of general interest to the amateur as well as the public. Congrats to GJY for his FB section winning score in the SS. The Amateur Transmitters Assn. is going strong, and from all indications it looks like this year's Field Day will be all ATA. LFK is Field Day chairman. The Speedboat Regatta will show what can be done with amateur communications. OB has been voted an associate member of the Maritime Mobile Club. LGM reports PY is seriously ill. Write to him, gang, he will be more than glad to hear from you. ONW is taking an enforced rest and will operate his 28-Mc. rig from his bedside. KWA spent two weeks on Naval Reserve cruise. JAV can be heard on 420 Mc. The Steel City Radio Amateur Club offers a Field Day challenge. RXT, the v.h.f. man, pops up with reports that NCH and QEU are new ones on 144 Mc. ETD has 91 countries postwar, with only 80 watts input. NKM is sporting a Millen high-frequency rig. UVD is having his S-20R receiver overhauled by VNE. MIZ reports that AJN, of West Newton, is active again. IYR has his new QTH at State College. Your SCM extends apologies for his error in stating that NCD made BPL for January. It should have been GEG, the brother of NCD. LSS and MGY completed a kw. final minus TVI troubles. YA, at State College, reports handling traffic from Milton Eisenhower. KCV can be heard working the bug at YA. LQQ still is active in Smethport. Your SCM extends sincere apologies to AAX and PWQ for unintentionally reporting them as XYL operators in April QST. To whom it may concern: any misunderstandings caused by this error are hereby corrected and AAX and PWQ are restored to their natural selves, their privileges in the OM fraternity are unquestioned. Traffic: (Mar.) W3NRE 965, GEG 608, NCD 125, NUG 78, OMA 31, MIZ 26, AER 16, LSS 9, LQQ 8. (Feb.) W3YA 38.

### CENTRAL DIVISION

**ILLINOIS** — SCM, Lloyd E. Hopkins, W9EVJ — Our c.w. net (ILN) finally found a suitable frequency and now may be found on 3515 kc., Monday through Friday starting  
 (Continued on page 66)

## HRO-50

ANALYZING first reports from the field on the performance of any new piece of receiving equipment strikes us as having a remarkable similarity to the scrutiny given a young child's first report card by an anxious parent. Detecting any flaw in the mechanism at an early (st)age

and applying corrective measures before bad habits are formed seems likewise analogous and sound practice.

We have been going through just such a session on first reports on the HRO-50. Comments seem to follow a pattern and perhaps a few words of explanation here may help to answer others who might be asking the same questions.

First off — it was decided to furnish AA coil (bandspread only, 27–30 mc.) in place of A coil (bandspread 27–30 mc. and general coverage 14–30 mc. combination) as standard equipment with all table models of the HRO-50 as performance is definitely superior and, as an example, the signal-to-image ratio is about 40% greater and improved signal-to-noise ratio left no doubt in our minds about the acceptance of this substitution as both of these subjects are near and dear to the hearts of every 10-meter ham. Conversely — with rack models the standard A, B, C, D set of coils will be furnished as heretofore. In either case, however, we have no emotions in the matter and will supply one or the other upon request, at time of placing the order, and there is no price differential.

When using the crystal calibrator, the 100-kc. bar is to be considered as the frequency standard and can be zero beat with WWV by adjustment of ceramic condenser at top of the XCU unit. A single crystal unit functions for both 100 and 1000 kc. oscillations. The 1000-kc. mode of vibration is not necessarily zero beat with the 100-kc. standard, and has no adjustment. Its function is a guide post to spot 1000-kc. markers throughout the spectrum but when an actual frequency check is required the 100-kc. standard should be used for reference. Sometimes, the 100-kc. standard may be sluggish, or oscillation weak, in such cases, switch to 1000 kc. position and then back to 100 kc. position. Low-frequency crystals in airgap holders are often stubborn actors. Coupling from the XCU unit is directly to the first r.f. amplifier and there should be sufficient pickup so that 100-kc. harmonics may be heard throughout the entire frequency range of the receiver, with antenna connected.

Don't miss the 2-position switch lever on top of all four coils of the A, B, C and D ranges — it's standard on those coils and functions the same as before for bandspread operation (switch in "7" position); for general coverage operation (switch in "V" position) — no screws to lose!

Caution: Coils for previous models of HRO are not recommended for use in the HRO-50. The HRO-50 brush board is ceramic and brush contacts are riveted on the ceramic at a different height and are shaped differently to insure more positive contact. Forcing old type coils may exert sufficient pressure against the brushboard to crack it. The primary turns ratios are now different, so operation would not be optimum.

Yes, the lucite scales are *not* supposed to be secured to the coil drum by screws at *both* ends — instruction manual to the contrary! Originally, this was the intention but exhaustive tests over wide excursions in ambient temperature combined with extreme humidity conditions indicated that expansion and contraction of the scales might result in a slight buckling action. The present method of slotting the scales and fitting them into tabs at the end of the cylinder allows lateral movement and the elastic over the scales insures that the scales stay securely in place on the drum and in the track.

For your information, a test set-up of the condenser and PW-drive and pointer assembly has to date completed 210,000 complete cycles of rotation from minimum — maximum — minimum capacity of the condenser and no failure has appeared as yet.

Be that as it may — there's no test for a receiver such as one in your shack, with your antenna systems and you as the operator. Get hold of an HRO-50 and give it a real workout! You'll be agreeably surprised.

— CLARK C. RODIMON, W1SZ



at 1845 CST, ASN hopes to lick his VFO troubles shortly. NUX reports his place of work went up in flames. JMG finds enjoyment in running off *ILNuz* each month, and he is doing a great job. LLN is rebuilding some of his rig to eliminate T.V.I. FHV has moved into a new home. BUK is having trouble finding time to work the rig because of extra work at the office. IVN worked all states on 14- and 7-Mc. c.w. UBP obtained a Signal Shifter and is waiting for HRO-50. ULO expects to be on the air shortly with 400 watts. KMN reports up to 100 countries worked with 91 confirmed. NIU reports working two stations this month after a long layoff. BPU says spring work leaves him little time for hamming. ZQT is new on the LLN net and is a capable operator. SEZ watches LLN frequency after net for stragglers. LNI used six-week vacation to build a three-element beam and tower. EBX reports continued improvement in physical condition. GDI is working like mad to make DXCC. KQL reports the Sangamon Valley Radio Club feted the YLs and XYLs to a steak dinner recently. APK is having TVI trouble now that there are two sets on his block. YTV finds *ILNuz* to his liking. BRX completed new 100-ke. standard. NN is in new home, and using a 14-Mc. doubler in the house worked 27 countries in one month. 20UL spoke at several cities this month on TVI and found hundreds of hams in attendance. FJB and GRV made nice scores in the DX Contest with 212,000 and 184,788 points respectively. The Starved Rock Radio Club will hold its hamfest June 4th in the same place as last year. NOO is working over an old police rig for possible use in a new car. Recently-licensed hams in Harvey include JHW and SCQ. TMD switched QTHs. IDA is back where he started 28 years ago since his youngster enlisted in the Navy recently. SFB has returned home after a long stay on Guam. TLC has new power supply and a couple of BC-223 units. BIN plans on rebuilding his rig for MARS work. NGG is new EC. ZEN and DGY hooked some nice DX on 28 Mc. EVV is planning on higher power and VFO. HTR, sporting a new rig, runs about 100 watts on 3.5 Mc. ABF is working in Decatur at the Signal Depot. TCL is working on new house. HTE is sorting out his parts for a new rig. JPN is a new ham at Clinton. OFI returned to c.w. FLF needs one more state for WAS. DBD is at new QTH and is operating portable. KDP is building rig for 160 meters. KPS has 28-Mc. rhombic. MUD repaired transmission line and returned to the air. CJV is active on 160- and 75-meter 'phone. As reported in *ILNuz* last month, your SCM does not wish to be a candidate for reelection when nominating time rolls around this fall. The Kishwaukee Radio Club of DeKalb now is affiliated with ARRL Traffic: (Mar.) W9KQL 228, UBP 138, SXL 117, DUA 114, EVJ 114, SYZ 66, CMC 54, MRQ 48, LIN 35, CBA 32, JMG 32, PEK 25, FRP 16, JNC 14, ASN 11, BUK 9, EBX 9, FKI 9, BPU 4, IVN 4, NUX 4, ULO 4, GDI 2. (Feb.) W9CMC 169, FKI 23, JMG 10, NUX 3.

INDIANA — SCM, W. E. Monigan, W9RE — On June 18th the Indiana Radio Club Council Picnic will be held at the Turkey Run State Park, 35 miles north of Terre Haute on State Route 41. Time is 10:00 A.M. CST. The highlight of the picnic will be the award of the annual plaque to Indiana's outstanding amateur. Evansville plans a beginners' amateur class at Evansville College. JMK, NEC, BKZ, THD, ERN, LLR, AZJ, and CZY are mobile at Evansville. GFS has a new QTH. GFO has a new 28-Mc. beam and is dusting off a pair of 810s for 14 Mc. EHU has a new QTH. FJI has rebuilding troubles. JUH and JMK are new at Evansville. Don Merton was a visitor at South Bend. The Michiana Amateur Radio Club had a very successful family night dinner at the Mishawaka Community Hall. Dinner was followed by a social session and dancing. Mrs. Dewey Darling and Mrs. Stanley Johnson won the Radio Hat Contest. HUV rebuilt transmitter to avoid TVI. APJ is trying a cubical quad on 144 Mc. EMK has a wire recorder and a Hunter Cyclemaster. TT and VE3WY were visitors at the RCB/JTX shack. JVE and JUJ are new calls in Muncie. IFX plans 144-Mc. operation. DSC won first prize in the Indianapolis Radio Club Contest. Clarence Pence won second prize. T. G. Lucas third prize. TXL fourth prize. HKZ fifth prize. DPL sixth prize. FYQ and GQC had their Collins 32V-1s changed to 32V-2s and say they are FB now. DOD lost his 3.85-Mc. antenna in the sleet and will be back with s.s.s.r. DPL and RE have new Lambda modulation monitors. JAY is new in Speedway City. How's your emergency equipment? Is it ready for use if needed? Traffic: W9JTX 327, TT 265, QLW 157, BOK 133, MKM 85, RCB 80, BNF 56, RE 20, LSX 16, DKL 14, HUW 2.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: YYY. PAM: ESJ. RMs: LFK, CWZ, SZL. 'Phone Net (BEN), 3950 kc., 6 p.m. C.w. net (WIN), 3625 kc. Slow-speed net, 6:30 p.m. Regular, 7 p.m. HDO is a new member of Mancorad. BZU has a Collins VFO to a pair of 807s on 3.5-30 Mc., 'phone and c.w. LBC is active on 144 Mc. HPC and JAW acquired mobile rigs. FMH has ART-13 for mobile. With the smoke cleared from the c.w. DX fray, we find the following scores: ROM with 345 stations and 170 country multiplier, followed by RBI with 323 in 153, LNM with 303 in 147, and RQM with 276 in 140. New calls in the section include JLV, JLR, JQP, JGG, IZE, JAB, JSE, and HUW. Wisconsin's outstanding s.s.s.c. advocate is OUT. New officers of the Point Radio Club are KXXK, pres.; J.

Sloniker, vice-pres.; CFL, secy.-treas. CWK is on 28-Mc. 'phone with a converted SCR-522. VHE is building a kw. rig. DCK has a Collins 310-B3 driving p.p. 813 final. The Neenah-Menasha Club held a Charter Party with presentation of the Charter by Asst. Director FMIL. Net certificates (WIN) were issued to BZG, SFL, BZU, CBE, ELZ, CWZ, FXA, ANM, ADM, KQB, UJT, WJH, RKT, and MCY. BOA is back on with a TB8-50D, S-40A, and Skyline 28-Mc. beam. ERW is a new OO. IWT, HWY, and HYY are on 420 Mc. with 2-tube superregenerative receivers and 316-A transmitters. EPG has new Class A ticket. KXXK is a new OPS. The M. & M. Club picnic is scheduled for July 23rd at Henes Park, Menominee, Mich. ERW worked VK on 7 Mc. with 16 watts. CWZ tried 28-Mc. 'phone but decided he needs a beam with the 18 watts. ANM monitors 3950 kc. while in the shop. HDZ is experimenting with f.m. tuner. IQM and RLB are building 50-Mc. rigs. RSR built a variac. Traffic: W9ESJ 523, CBE 217, FXA 149, IQW 76, UTT 62, SFL 47, CWZ 45, SZL 44, ANM 43, HDZ 43, YCV 28, IQM 9, RKT 6, BZU 5, UFX 3, RSR 2.

## DAKOTA DIVISION

NORTH DAKOTA — SCM, Rev. Lawrence C. Strandmaes, W6JWY — Hams of the section deserve special commendation for their alertness and operating efficiency during the week of March 6th to 11th, when communications were laid low by the worst tie-up in North Dakota's history. About 50 hams handled urgent traffic on all bands from 160 to 10 meters, 'phone and c.w. The nets on 160, 80, and 75 handled traffic for the railroads, telephone and power companies, CAA, AP, etc., besides expediting urgent personal traffic. AOX and LHS are proud owners of 32V-2s and LHS says he soon will hook the output of his to a dual 10-over-20 beam. MZE and YSJ have ART-13s going on all bands. GWU announces the arrival of a 6½-lb. YL. New appointments: AZV as EC, WIQ as OBS, KZL and LHS as ORS, and LHS as OPS. Traffic: W6SSW 548, RBS 474, OCT 341, RRW 250, KZL 185, GWU 140, LHS 101, HDX 89, JWY 81, CGM 80, WQV 65, NMV 49, GJJ 41, AOX 33, SWC 14, LHB 11, GEH 7.

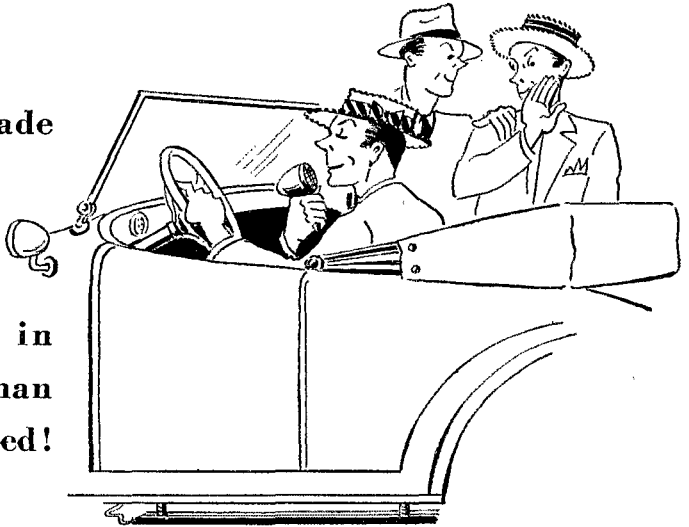
SOUTH DAKOTA — SCM, J. S. Fosberg, W6NGM — Amateurs in South Dakota had a real workout during March. After the big storm of the 7th-8th, flash floods took out track on the 26th along with wire service and the AEC again was asked for aid, which was given willingly. The storm of the 26th damaged JLI's beam, which came down for the third time. HVR got a ham ticket for use on radio-controlled models but now he can be heard daily on 28-Mc. 'phone. ZIQ is leading the race to get on 144 Mc. BLZ is engineering a 10-20 dream beam. The Pierre Amateur Radio Club set up a display, including a transmitter and receiver, at the Creative Arts and Hobby Show on the 31st. Equipment was furnished by QVY, FKE, HYY, and GZU. Operators were KSW, HYJ, and UVL. Traffic: W6OLB 256, DKJ 150, SAT 85, GCP 75, UVL 68, DB 64, PIR 57, BJV 55, QDN 48, YDT 48, ILL 44, NGM 33, VT 19, YU 12, CJS 8, IYZ 8, VQC 6, IEL 5, ZSH 5, ZUS 5, MMQ 2.

MINNESOTA — SCM, John B. Morgan, W6RA — New officers of the Minneapolis Radio Club are HZR, pres.; YPN, vice-pres.; HAM, secy.; and GOP, treas. The MRC is conducting code and theory classes at Downtown YMCA at 7:30 Thursday evenings. AXJ is a newcomer at Crosby. RXL lost his new 28-Mc. rotary and 3.5-Mc. Zepp in the recent sleet and ice storm. HEN sends in the following pearl — it's poetry: "But when the snow is snowin' — And it's murky over head — I'm QRX on M.S.N. — When I ought to be in bed." BRA and NOD are new ORS, and BBN finally signed as OPS. EA lost his big 3.5-Mc. antenna when the lake ice melted! RXL received traffic from CWB over 140 miles of carrier current line. New officers at Duluth (Arrowhead Amateur Radio Club) are JVV, pres.; KLR, secy.-treas.; QXI, program director. KYY (Asst. SCM in Duluth) is working 420 Mc. with Cardwell u.h.f. kit and a 6F4 for hearing and two 2C43 lighthouses with 6V6 modulation. BGY is back on with a wallop. FIT does a nice job of NCS on the 'phone net. FID has the EC gang in Rochester well organized. CWB visited several Twin City hams. SIM has his new electronic keyer working well. BOL has a new Meissner VFO, war surplus job. RA has gone mobile on 28 Mc. for use on extended business trips around the State. OJL has a new Lyco 600 VFO rig for emergency use. NYI, EUR, and VHE are Asst. ECs. BRA handled emergency traffic during recent storms in Minnesota — via Florida on 28 Mc. NYI has a new Micamold rig for emergency work. Picture of the month is one of BGY in the hospital surrounded by three very appreciative nurses. The two recent disaster conditions, one in the Fargo and west area, and the other Duluth and the north shore, point up the need for an alert emergency corps in every community. We have heard nothing but praise for the splendid work done by those who participated. It was a real thrill for those of us in the outfield to listen to the crisp and speedy work done by those who shouldered the infield jobs. Traffic: W6RJT 226, MXC 138, BGY 105, EA 88, LDI 82, RFL 44, RPT 43, CWB 30, UCY 22, RA 20, FID 15, HRY 13, BRA 9, BBN 5, BOL 5, FIT 4, TKX 2.

(Continued on page 68)

# MALLORY HAM BULLETIN

**Mallory Vibrators made possible the first all-electric mobile radio ...today, more Mallory Vibrators are used in original equipment than all other makes combined!**



The design and manufacture of vibrators and vibrator power supplies is an old, old story to the Mallory organization. As a matter of fact, the Mallory vibrator story is the oldest story in the manufacture of "all electric" automobile radio sets.

For it was Mallory research and design ingenuity which made practical the first commercial "all electric" automobile radio receiver.

Those amateurs who are "20 year men" in ham radio may remember the Ajax, the Atwater Kent, the Bosch, the Colonial, the Crosley, the Crescent, the Majestic, the Motorola, the Ohio, the Sparton, the Truetone, and the Universal of 1930 and 1931 which were made "all electric" with Mallory vibrator "B" eliminators.

Today, almost 20 years later, Mallory vibrators are still the standard of comparison for measurement of vibrator performance. More Mallory vibrators have been made, have been sold, and are now in operation, than all others combined.

Right from the day the first vibrator was produced at Mallory, the Radio Amateur and the other communications services have been included in the Mallory plans. For initial tests began with amateur and police radio systems to determine the feasibility of communication from moving vehicles.

Today, you have only to look around you at the "whip" antenna systems on amateur, police, utility, or taxi cab vehicles to prove the success of those original tests. Or if you're still not convinced, a quick tune across the 10 meter band will surely remove any doubt as to the practical usefulness of mobile communications.

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## DELTA DIVISION

**MISSISSIPPI** — SCM, J. C. Wallis, W5DLA — Newly-elected officers of the Gulf Coast Club are GIA, pres.; WA, vice-pres.; QM, secy.; Treas. RGM is a new call at Kosciusko. Tom will be looking for contacts on 7250 kc. The Jackson Club has formed a code practice net, which meets every Friday at 8 p.m. on 3600 kc. FFF is NCS. OMK has 28-Mc. mobile rig in new Chevy. DLA is inactive in the early evenings because of TVI. LAK finds time for DX and has worked 124 countries to date. MUG's Section Emergency Coordinator reports show much interest is being taken in this very important activity by hams in this section. LXB now is operating maritime mobile in the Gulf of Mexico aboard an oil company seismograph boat. VX was a recent visitor to DLA. FSS visited GIA, DT, ANP, and DLA. WZ is on 3.5 and 3.85 Mc. mostly. Traffic: W5LAK 575, JHS 192, WZ 130, QYX 39, OMK 32, KYC 25, DOL 16, ANP 13, DLA 4.

**TENNESSEE** — SCM, David G. Stewart, W4AFI — The Memphis area has had a lion's share of emergency work this winter. Good work, fellows, and congratulations on your fine work. BAO, BAQ, DI, EM, HCU, HIK, IY, JWO, MHN, MRD, and PXW were awarded Certificates of Public Service by Western Union for January ice-storm work. BAQ, DI, FWX, HIK, and PXW provided emergency communications to Somerville March 21st when power line fell across telephone and telegraph lines. ORU set up at Boy Scout Exposition in Memphis and accepted traffic. ZZ is in the process of building a new shack. FX is back on 3737 kc. after moving to new QTH. ONX are proudly displaying a new Class A ticket. AEB and IKG are operating new 28-Mc. mobile rigs with great success. KMH has completed his 4-Mc. mobile installation. FCU has new 310-B1 exciter. NPS added modulator to emergency rig and gave a demonstration before the Rotary Club. LCB is chasing DX on 14-Mc. phone with 150-watt. FLW visited APC and observed his traffic-handling technique. DIY is active with MIARS and has acquired a new scope. PSB worked his first VE with an indoor antenna and 10 watts. RTN is wrestling with TVI problems. NNJ managed to pick up a few new countries during the DX Contest on 28-Mc. c.w. EQN, EJC, and ONX are experimenting with clamp tube modulation. The slow-speed net is making very good progress. Traffic: W4APC 338, NNJ 315, EFN 247, BAQ 158, ONX 36, AEB 35, AFI 32, CZL 27, HHQ 21, NPS 2, FLW 1, LCB 1.

## GREAT LAKES DIVISION

**KENTUCKY** — SCM, Dr. Asa W. Adkins W4KW0 — The Fifth Annual Mammoth Cave Reunion will be held June 18th. Bring your lunch basket or register at the Mammoth Cave Hotel individually, if you desire. A cordial invitation is extended to all hams. OBG is acting editor for WEN. KDR is debugging a k.w., 304Tfs f.m. and a.m. PDA reports beam trouble because of the high winds. LBY is QRT flying radio-controlled airplanes. He will enter the National Contest in Dallas, Tex., in July. BAZ has been RM since Sept. 1932. He will transmit a code practice run if enough will apply. Contact him. FKM is trying to eliminate TVI. Glad to hear FQQ on KYN. LMN is getting married and moving. FR is engineer at WKLO and also teaches pharmacy. The 10-p.m. KYN sessions will be doing better soon. Mammoth Cave will be a wonderful place to attend to your Field Day activities. Bring your rigs and when you are resting circulate with hams attending the Reunion. Traffic: W4BAZ 183, JQY 78, JSH 76, NBY 61, MWX 36, JCN 34, BXU 28, OYI 27, KFA 25, KWO 24, CDA 23, NWQ 17, VD 17, FKM 10.

**MICHIGAN** — SCM, Robert B. Cooper, W8AQA — SEC: 8GJH. Asst. SCM c.w., J. R. Beljan, 8SCW. Asst. SCM U.P., Arthur Kohn, 8TTY. RMS/QMN: TRN and UKV. RM/8RN: NOH. In order that the "CD" report from this section be mailed on the 7th of the month as required, some attention is requested on the part of the station operators to the mailing of their activity reports. Get them in as soon as possible after the end of the month. Your cooperation will be appreciated. New appointments: OBS to NML and OBS and OPS to J8K. The South Macomb Radio Club now is part of the Detroit Area Council of Clubs and NML reports a net operating on 29.226 Mc. at 2200. WOV reports a very active gathering on 7270 kc. at 1000 on Sunday mornings. This bids well to be recognized as another registered net in the Upper Peninsula. FJF and FFY are new amateurs in the Copper Country. 8UFR/5 reports from Biloxi, Miss., into the SRN and is a Navy code instructor. ZCH reports from West Palm Beach, Fla., as a reprieve from his OES activities. FLA, from Allegan, and FX, from Detroit, both indicate plans in progress for the Field Day activities in June. MGQ has acquired a 75A-1 receiver and is putting the rig into a rack cabinet with no TVI in mind. DQL now is Class A, and has a 20-w.p.u. sticker for his Code Proficiency certificate. UPH reports activities as 95 per cent TVing with some results. BVY has a 28-Mc. A-3 rig now on the air. LR extends a welcome to all to attend the BR/MEN Basket Picnic June 18th in Mt. Pleasant. UKV has a new mill which speeds up his message-handling abilities very well. EXZ has a 25-w.p.m. endorse-

ment for his CPC. NOH reports an SCR-522 rig making very fine contacts with MRK. DOI has a steadily-growing traffic total and is busily guiding the affairs of the Joint Council of Michigan Clubs. SWG has his new rig working break-in for QMN activities. HKT has spent some time with "Kitchen Klezner" fixing his crystals so that he may QSY up or down 28 Mc. from the QMN with the minimum of effort. Traffic: (Mar.) W8NOH 1044, DSE 600, RJC 458, TRN 405, EXZ 325, UKV 129, WXO 81, IV 75, AYV 49, AQA 48, YNG 43, TQP 41, ACW/ROV 38, YMO 36, FX 26, QBO 25, WVL 25, DAP 24, LR 20, DWB 19, YGS 18, ZWM 16, BVY 12, ZBT 7, UPH 6, ITY 5, DQL 4. (Feb.) W8LV 65, DOI 36, EXZ 33, SWG 19, MHH 17, HKT 10, OJT 10, DLZ 9.

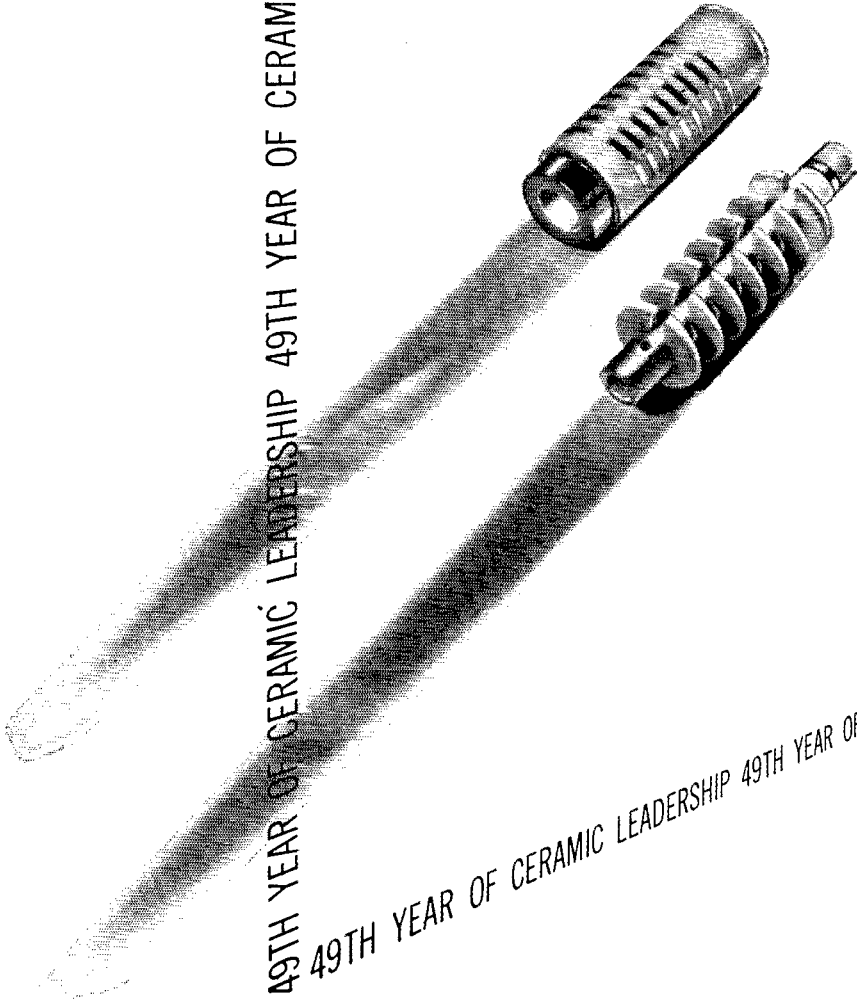
**OHIO** — SCM, Dr. Harold E. Stricker, W8WZ — Asst. SCMs, C. D. Hall, 8PUN, and Charles Lohrer, 8RN. SEC: UPB. PAM: PUN. RM: PMJ. On April 8th the Cleveland Area Council of Clubs held its hamfest. Approximately 500 were registered. Speakers were Director SFF, who gave the latest information from ARRL Headquarters; MCQ, who is general chairman of the coming Great Lakes Convention and gave us the dope on that; ENH, who spoke for the Ohio Council of Clubs and on TVI elimination; and a major from the National Guard. Cleveland clubs were asked to join the Ohio Council of Clubs. New appointments are GZ as OO and LBH and UZ as OES. JNF, our QSL Manager, who also had all the 8th district cards at the hamfest, has requested that any ex-hams drop him a line as he has several thousand cards for them. The Canton Club's equipment has been overhauled and is in good working order. The Club reports the passing of CZE on March 24th. From the *Carascope* of the CARA: The Club meeting place has been changed to the Virginia Hotel. The Ohio Council of Clubs met April 1st and elected the following: ENH, chairman; PNY, vice-chairman; EQN, secy.; and OCA, treas. The Club will meet on the air the first Tuesday of each month at 6:30 p.m. on 3860 kc. The code and theory class sponsored by the Club now meets at Central High School every Wednesday night at 7:30. WRN and UZ, both OES from Columbus, report some antenna construction for v.h.f. From the *R/R Carrier* from Dayton: ZQU spoke at the last meeting on "Proper Adjustment and Operation of the Transmitting Tetrode." On April 21st the members toured the O. E. Hutchins Plant in Dayton. ZJM was high in the Dayton area in the SS. By the way, the Ohio section turned in more scores than any other section in the last SS. New hams in Dayton are FIB and FGW. SXT is installing a new 60-foot all-steel triangular tower. There has been some mistake in several instances in the total traffic count. In the new system of count if you receive 100 messages, that counts as 100 received. That will leave the messages 3 places to go, taking it for granted that all messages are dispensed with; either messages for you, for relay, or for delivery by phone or by mail. If, of these 100 messages received, 10 are addressed to you, that will leave 90 to be relayed or delivered. If you relay 30 of them and deliver 60 of them, you make BPL. If none of the messages are for you, the total of relayed and delivered messages should add up to 100 providing you make 100% delivery. Originated messages are counted the same as always. Write to Hq. or me for the new Station Activity Report cards. DAE and YFJ made BPL on delivered messages. VZ has new SX-71 receiver. SFI reports traffic for the second month. How about ORS? STQ is building 144-Mc. equipment for emergency work. BCD has new emergency rig. AQ cleaned up the last of his TVI with low-pass filter shown in the new 1950 ARRL *Handbook*. The Piqua Radio Club is planning a u.h.f. emergency net. New officers of the Toledo Radio Club are RRZ, pres.; HWF, vice-pres.; LYP, corr. secy.; TKS, rec. secy.; Lloyd Peinert, sgt. at arms. DGG is having trouble with his 813 final. YFJ's BPL was made with 8 watts. BFH and OAC are on 160 meters now. The Westlake Amateur Radio Assn. meets every Sunday at 10:00 a.m. on 3950 kc. DZX has reported traffic for two months and has application in for ORS. Hope to get my 3.5-Mc. Zepp up soon. Traffic: W8SFP 406, DAE 349, YFJ 173, ZJM 148, CBI 132, UPB 110, OUR 82, DZX 80, SFI 50, WE 49, RN 48, WAB 41, EQN 19, JFC 17, PUN 17, TAQ 15, WZ 12, EXI 11, QIB 7, DZO 6, TKS 4, IVC 2, PNY 2, YCP 2, BFH 1, BUM 1.

## HUDSON DIVISION

**EASTERN NEW YORK** — SCM, Fred Skinner, W2EQD — SEC: CLL. Section Net certificates were earned by GTC and FZW for NYSSC operation. MQB is trying to start a movement to get the State to issue call-letter license plates when new 5-year "permanent" plates are issued. Please write your State Senator and Assemblyman. JZX has been appointed an Assistant EC for Schenectady. CLL is doing a swell job in getting additional ECs. There are lots of vacancies for community ECs so how about asking him for an appointment. ITX is back home and active as EC for Westchester County. He already has had an interesting drill run off among the Red Cross and county AEC stations. Our section is away behind on the organization of phone nets; a Phone Activities Manager could do a fine job getting things organized. Anyone around who would like the appointment? Traffic: W2CLL 214, PHO 185, RH 125, TYC

(Continued on page 70)

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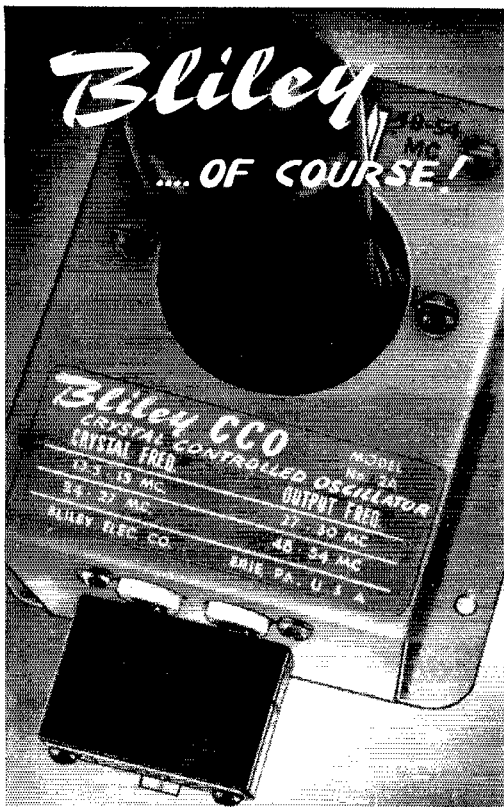
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109, EFU 57, LDS 49, GTC 47, AQF 41, EQD 28, FZW 13. NEW YORK CITY and LONG ISLAND — SCM, George V. Cooke, W20BU — ESZ, the new EC for Middle Village and Rego Park, really is going to town. Liaison with the Red Cross is under way. FI, Nassau County EC, reports another good month for the Nassau 144-Mc. emergency net. The following were regular reporters during the month: GG, TUK, QAN, YSL, MIZ, YKM, ZKY, VKS, SPV, RH, CXM, ZJJ, ZUC, GKH, WVN, DUS, RZ, SPL, BTA, ANN, JXP, FQW, IER, and FL. JXP has had his mobile rig installed in four different cars in three years. ZDE is new Regional Emergency Coordinator for USWB, Region 1. KDB is new Suffolk County EC and has appointed PDU, AJF, and MZB as assistants. Suffolk has weekly drills on 3995 and 3600 kc. and 146.8 Mc. BYF now holds Coast Guard Auxiliary call NA3AB. If you would like to sign up with a strictly non-military outfit (and get yourself some good emergency training), contact BYF for information. WHB reports no changes in AEC for Manhattan and requests c.w. emergency-minded hams to get in on 3710 kc. at 2000 on Fridays and find out how a 3.5-Mc. c.w. AEC group functions. RPZ, Massapequa EC, is working a bit on 7 Mc. AQX is Asst. EC for Massapequa. PQG is new Northern Queens EC. TYU, RM for the NLI Traffic Net which meets Mondays through Fridays at 1900 and 2200 on 3710 kc., has been on an extended field trip for the CAA. During Pop's absence OAF, ZDE, JBQ, and YIR carried on as NCSs. Staten Island AEC is being activated on 144 Mc. and 7-Mc. c.w. ZRR received first appointment on the Island as ORS, then CEV earned his ORS. ZRA worked for OO Class IV certificate. Officers of the Staten Island ARA for '50 are: GHK, pres.; RVL, rec. secy.; JNZ, corr. secy.; VKF, treas. EC, RM for TLAP, reports operation on 3630 kc., East Division at 2130 and West Division at 2300 with alternate frequencies on 3635 and 3625 kc. NMY is a new member of the Tu-Boro Club. G3BID visited KGP. AVI is active on 144 Mc. and is treasurer of Federation of I.L.R.C., with JSV as secretary. LLR, QCY, and ZAC built 28-Mc. mobiles and are working into the Tu-Boro Club's net on 29,250 Mc. Tuesdays at 1900. The Jamaica UHF Club passed a resolution calling for 144-Mc. tests between the U. S. and England, and will participate in supplying communications for a motorcycle turkey run on the Island. DVK is the latest U.H.F. Club member to get his ticket. TZU passed Class A test. NZJ is showing off a 420-Mc. vane-tuned tank job. PQQ is trustee of the U.H.F. Club's new station. PIA put a new kw. on all bands. DFT is a new ham in Islip. Suffolk's 3.85-Mc. phone mobiles are ABS, AJF, MZB, NXZ, PIA, and YGQ. KDB has the gear on 420 Mc. and asks for contacts. GSC attained OO Class III appointment. WZG secured WAS on 7 Mc. DRD is interested in NLI traffic. YFR is a new ORS in Brooklyn. Mobile tests on 3.85 Mc. proved good for QBS, VNJ, manager of the SSN Net, worked OK1AB, LA6X, and EK2AO with 12 watts on 7 Mc. in the recent DX Contest. CSO worked AC4NC, which gives him 40 zones. He expects to be in FC8-Iand during July. OAF is running a new Viking 1 and really is band-hopping. CJI is blasting the ether with a new TBS-50D. YDG received WAS and tried n.f.m. on 3.85 and 14 Mc. PF is tying in MARS with ARRL nets. YPA now is fixed, 1 at Westerly, R. I. WLS is /2 at Troy, N. Y. All AEC and traffic net members keep in mind the annual picnic to be held Sunday, June 11th, at the Bethpage State Park. Traffic: (Mar.) W2BO 340, ORU 320, EC 224, VNJ 187, OAF 166, ZDE 146, SJC 145, WHB 90, OUT 81, YIR 67, LPJ 59, JBQ 45, CSO 44, BGO 29, PF 19, TUK 19, ZRR 11, LGK 5, MZB 4, ESO 2. (Feb.) W2VNI 108.

**NORTHERN NEW JERSEY** — SCM, Thomas J. Lydon, W2ANW — A new traffic net, known as NJS (New Jersey Slow Speed), has been formed under the leadership of Bill Wright, jr., UWK. NJS meets at 7:30 p.m. on 3630 kc. Monday through Friday following the regular NNJ net meeting. This is a beginner's net and all are invited to drop in. NNJ now has a drive on for traffic men in all its nets. The attendance has been very poor lately. What say, fellows? NKD now is a full member of TLAP. NNJRA had an emergency drill in Palisades Park on March 23rd. They raised vertical antennas with balloons. Active TCPN members in the W2 area include BUX, AWW, 3JUM/2, ZQK, ZI, and LMB. ZEP has a new VFO on all bands. CWK has received his WAC certificate, BFP and VYB are rebuilding. LQP has moved back to Northern New Jersey and now is located in Bergenfield. BLL can be heard on the air occasionally. HSA is active in MARS and is building interpolating frequency standard. EWZ has completed stand-by rig. SJU is active in MARS with 6L6 rig. ZXL has a new rig on 3.5, 7, and 28 Mc. NJU moved to Long Island. Traffic: W2BKD 325, UVK 115, LMB 110, NGY 90, CUI 71, ZEP 40, NOZ 26, AWY 25, K2WAR 21, W2NUL 20, IHH 16, WOJ 15, OUS 7, BZJ 2, CJX 2.

**MIDWEST DIVISION**

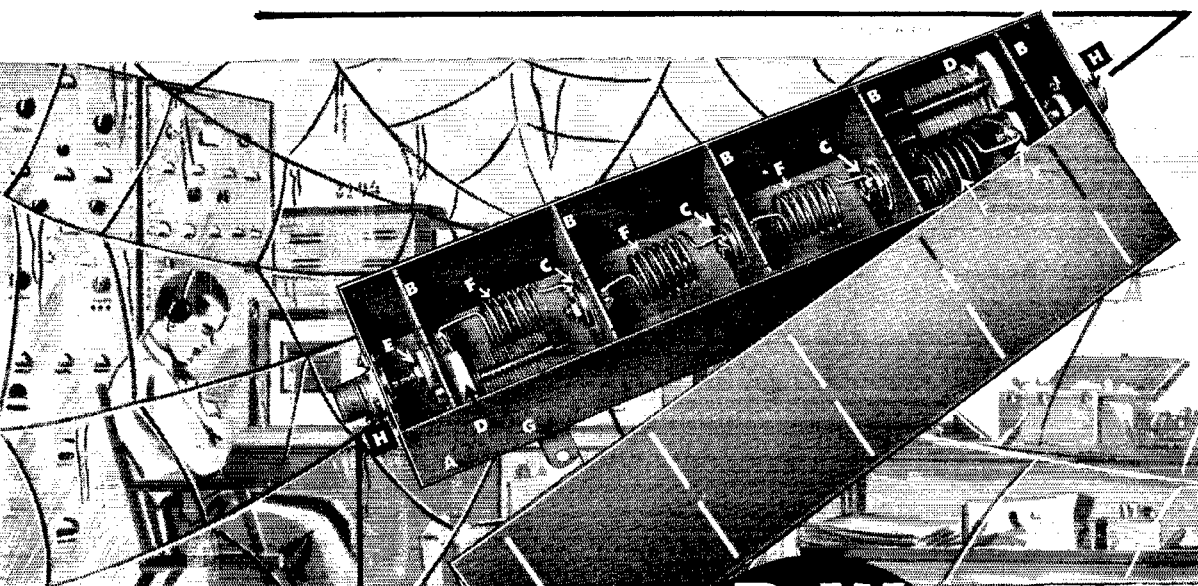
**IOWA** — SCM, William G. Davis, W0PP — During the March 7th blizzard WMU, NYX, and CNK, cooperating with the Iowa 75 Net, got through emergency traffic for the I. C. Railroad from Waterloo to Sioux City. In Iowa the c.w. and phone nets work together. QFY lost another 45-ft.

(Continued on page 72)



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City..... Zone..... State.....

tower to the wind. SCA reports TEN coming along FB, handling lots of traffic. QVA logged his ten thousandth QSO March 22nd. For a newcomer QAO handled traffic like an old-timer. HMM reports the National Traffic System doing a big business. YNW is rebuilding 813 final. RTI is building new 10-20 converter. ENS now is a member of the Sioux City Club. MCU is making with the mobile. The March blizzard got ZLD's beam. The Sioux City Club visited the transmitters at KTRI and KCOM at its March meeting. AXH gets into the church's Hammond organ. IUM has new 310-B. It's rumored Des Moines will have the 1950 Midwest Division Convention. VIS is new secretary of the Des Moines Club. PZO moved to Omaha to take a year at radio course. The Sioux City Club has accepted the challenge of the Fremont and Lincoln, Nebr., Clubs for Field Day competition. The two low-score clubs will furnish a wingding for the high scorer. The Club has been conducting code classes. A minor emergency caused by the blizzard alerted the gang in Northwest Iowa, who helped the Dakota boys handle their traffic. Traffic: (Mar.) W8IIMM 875, QAO 348, QVA 296, TIU 196, AZR 186, NYX 173, SCA 110, EFL 94, NXW 50, WNU 29. (Feb.) W8IIMM 775.

KANSAS — SCM, Earl N. Johnston, W8ICV — AHW, K.U. Radio Club's station, handled traffic for Engineer's Open House April 21, 22, and 23. GOV reports that they now have a 28-Mc. beam up and operating. TNI is on 3.85 Mc. YZF has new modulator. BGM, formerly of Joplin, Mo., is a new station in Marysville and is on 7-Mc. c.w. BNU boosted his traffic this month helping out QQQ. LYF has his new 3.85-Mc. antenna up. BNU worked two ZLs on 3.5-Mc. c.w. last month. CC, of Colby, and DYX, of Norton, have new SX-71 receivers. FDY is active monitoring for out-of-band stations. FDJ, of Linn, has been acting NCS for QKS. The High Plains Net meets at 1930 kc. on 1995 Mon., Wed., and Fri. MUN is Acting NCS since NAS blew his power transformer. FER, NCS for QKS, had hard luck last month blowing two filter condensers and a couple of by-passes in final. LP1 worked five South American stations Feb. 24th and now holds "Tropical Tramp" certificate No. 116. QQQ, the KSARC station, handled 231 messages at its Open House and had twelve ham visitors show up. TAW, of Garnett, now is Class A operating on 3.85 Mc. with 829 in final modulated with 815. UKH has a new buddy in Wilson, IWQ, formerly of Russell, and they are working on 144-Mc. rig. UQD, Beloit area, EC, is looking for new Emergency Corps members. The Kaw Valley Radio Club is working on Field Day plans. Traffic: W9CQQ 237, FER 156, WGM 137, UKH 112, FDJ 67, NLY 67, QOT 67, BNU 37, ICV 24, SKF 22, DYX 20, GJC 15, LIX 13, AHW 3, FER 2, UQD 2. MISSOURI — SCM, Ben H. Wendt, W8ICD — The Bluff Amateur Radio Society has secured a 3-kw, gasoline-powered 115-volt 60-cycle a.c. generator for Field Day and emergency use. ZS6ML and Mr. G. Catley of South Africa visited an IARC meeting. SAN is the identity of the Springfield AEC net. EBE is the EC there. CEX, ZZB, and PTG stopped in on QMF on their way to St. Louis. RAO and CEX took an airplane trip to visit PTG. While en route to Hawaii KVS spent several days in Poplar Bluff. A 10-meter beam-raising party at SOM's included IHK, PKI, QJP, CLQ, GSW, GZR, and EIK. New calls at Springfield are ANQ and AVQ. AFU and FUM received 30-w.p.m. certificates. DEQ received a 15-w.p.m. certificate. OZS and LSA now possess Class A tickets. AOB, a new call at Charleston, can be heard on 7210 kc. OAG, LSA, and XYLs maintained perfect mobile contacts while mobiling to Norfolk. Ark. PTG is happy over the performance of the 3905-kc. mobile rig. A good antenna location was obstructed by a barn so down came the barn. Ask OUD. PAE has 52 countries on his list. ARH is designing and fabricating an impedance coupler for his beam. HUQ is back on 3.85 Mc. with 35 watts. QXO is slowly recuperating from a severe heart attack. PTG is constructing mobile gear for 3.85-, 14-, and 28-Mc. operation. WAP heard ZL3LL on 7 Mc. PLJ has completed a Wellman converter. QMF is constructing a 160-meter modulator. WIS has a new Collins receiver. With the U. S. Engineers of St. Louis RBJ has a new three-element beam. EJK is running 800 watts on 14 Mc. ZVS can be heard on 14 Mc. with 300 watts. BAF has worked 105 countries with 90 confirmed. He boasts a new kw. with 833s. Appointments and renewals: GCL and NNH as ORS, YYI, QMF, and 193 as ECs. BCD as OBS. Traffic: W9QXO 324, CQZ 193, WAP 109, KCT 71, OUD 48, RYG 42, PTG 14, QMF 8, DEA 7, SOM 7, OZS 5, GCL 4, NNH 2. NEBRASKA — SCM, Scott B. Davison, W8OED — FQB is planning a new type two-band antenna. AY and KJP have been busy with their coverage of Nebraska c.w., 75, TEN, CAN, and TLL nets. FMW is NCS for 160-meter 'phone emergency net and sends code lessons in his spare (7) time. FHA holds daily schedule with his brother, HBS. ASI is a new call at Chadron. Old Man Wind finished FAN's antenna and put him off the air temporarily. CMO has been appointed OO. KJP and CBH have been appointed OPS. GMZ still is taking it easy after a long siege of illness. Net certificates have been mailed to all certified members of both the 1.9- and 3.85-Mc. nets. FHA is new EC at Chadron. DNW has push-pull 4-125As working on 50 and 144 Mc. SAI now has 500 watts on 3.5, 7, 14, and 28 Mc. ZOQ is

(Continued on page 74)

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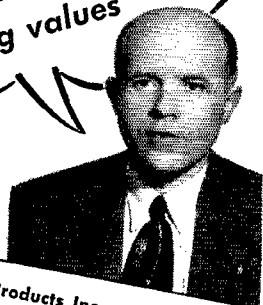
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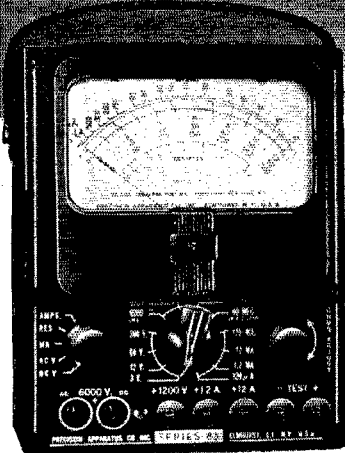
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running 450 watts to p.p. 808s. RQK has ARC-5 3.6-Mc. receiver on 3.5 and 7 Mc. BBS is planning rhombic half-wavelength below his present rhombic. The 160-meter emergency net now has 29 members on regularly. CHU is a new call at the Chadron weather station. TIP says let's have more activity on 160! AIN is active on 3.5- and 7-Mc. c.w. GJL has a new rig on 7 Mc. IXL, DMY, KJP, and AY have done a fine job in handling the c.w. net roll call. TIA has new HT-9 on 28 Mc. Your SCM and Director had a fine meeting with the QRM Club in Lincoln recently. Traffic: W9KJP 231, AY 216, FAM 166, FQB 140, FMW 100, CBH 98, DDJ 52, DMY 51, IDO 51, EKP 42, EUT 37, IDR 35, IXL 20, RQK 18, LJO 17, JED 8, IPF 7, FHA 6, NVE 6.

**NEW ENGLAND DIVISION**

**CONNECTICUT**—SCM, Walter L. Glover, W1VB— With the cooperation of Commissioner Hickey, LKF is in the process of planning a State Police network as part of the AEC set-up in the section. Ham rigs will be installed in each police barracks to supplement the regular police circuits in emergencies. CARA, of Danbury, through the efforts of KAY, PCH, and ADW, local ECs, is making the arrangements at the Ridgefield Barracks. Sounds like a good deal. OS has moved into his new house and is planning a summer antenna project to include a rhombic, rotaries, etc. IKE also has a new house under way. APA reports the fertilizer business rushing, but he still has had time to get his DX up to 121 countries. QMB is doing most of his operating with a mobile rig. ODW has new modulator with 4-6L6s in Class AB. BVB, after all his work, still gets TV1 notices from FCC, so is off the air again. RVE has joined CPN, and also is active at YU. The latter is the station of the Yale University Club, which is on the air once more. OJK is working on an emergency set-up in Fairfield. DAV, the spark plug of CN, has been missing because of illness. YBY is a new ham in Ridgefield. Your SCM is liable to be the next casualty to TVI. I'm getting surrounded. All the clubs are talking Field Day plans. Best of luck to everyone. Traffic: (Mar.) WINJM 304, KUO 241, KV 207, BDI 183, DAV 129, RWS 124, LKF 92, VB 90, BVB 73, CTI 70, LY 66, HYF 61, OS 50, QIS 36, ORP 35, VW 23, CGD 25, FOB 23, RVE 22, JTD 16, GVK 12, NBP 7, ODW 6. (Feb.) W1AW 192, QVF 50, RNT 2.

**MAINE**—SCM, Manley W. Haskell, W1VW— Pine Tree Net: RM NXX, 3550 kc., 1900, Mon. through Fri. Sea Gull Net: PAM FBJ, 3961 kc., 1700, Mon. through Fri. New OPS is FV, Westbrook. He keeps on 3.85-Mc. 'phone with a BC-191 and a 129-X and works 144 Mc. on a 522; he also is active in CAP. Sea Gull Net certificates have been awarded QIH, BOK, BDV, and FV, for long and faithful attendance. Deep Sea Dragnet certificates, issued by PU, "the Man Behind the Wheel" of Gloucester, are much sought after and admired. The Portland Amateur Wireless Assn. held a sneak preview of the new HRO-50 on March 29th. SZ gave the highlights of the new receiver. Fifty-four members and guests were present for the occasion and refreshments were served. The PAWA has voted to hold a hamfest in the city of Portland some time in the summer or early fall. After years of long and faithful service to amateur radio, NXX, RM for Maine, is stepping down so that another amateur can get the benefit of the experience that the office gives. NGV, of Richmond, a well-known c.w. man, will take over May 1st. LYC authored a fine newspaper spread of pictures and data on amateurs in the Auburn-Lewiston area in the *Lewiston Evening Journal* of April 8th. Traffic: WINGV 283, YA 167, QUA 151, LKP 130, OHT 78, IJB 66, VV 45, KLH 38, BOK 31, RQR 31, FBJ 24, MIXT 24, JAS 22, HYH 19, GE 18, COV 17, OTM 15, APT 9, AMR 9, PTL 9, IGW 7, IXC 5, KEZ 5, AWN 4, AF 3, KDE 3.

**EASTERN MASSACHUSETTS**—SCM, Frank L. Baker, jr., W1ALP—The following have had their appointments endorsed: DWO, DMS, and ILN as ORS; PXH, KNI, and JSM as OES; DW and JSM as ECs; NF as OO. BHD is a new OES. RFW, in Cambridge, has applied for OPS. STL is a new ham in West Quincy on 28 and 3.5 Mc. ON4AZ is the first one outside the country to receive the South Shore Club's certificate for working 10 members. RKD has a rig on 28 Mc. in his car. RWT, KRE, PLX, AWX, and SNN are on 144 Mc. RAB has moved to Springfield. 4NET/1 is working at WBZ-TV and lives in Caulfield. 4NET gets on 144 Mc. at MX. BGH is on 3.85-Mc. 'phone and is interested in OO work. The T-9 Radio Club held its annual Hawg Raffle in Beverly. PRI gave a talk on test equipment at the Eastern Mass. Club. HDQ gave a talk on 420 Mc. at the South Shore Club. The Brockton Radio Club had a talk on "Time Constants." NF is busy with new QTH and has low-power rig on 50 Mc. BGW made WAC on 3.5-Mc. c.w. by working TA9GVU, FA8IH, HC1PK, PA0LB, and ZLIBY. MGP writes from Shaw A.F. Base, S. C., and will be home in June. HIL is on 3.85-Mc. 'phone and is working on receiver. The Brockton Radio Club had a talk on "Uses of Rectifying Crystals." The T-9 Radio Club had a supper at Mrs. Pike's and then met at KON's for the annual meeting and ladies' night. RXT added crystal stage and switching to rig. LM is covering Maritime with BTN Net. PU is NCS for Deer Sea Dragnet and manager of ESN and Seagull Net. QIB says FES and QIS

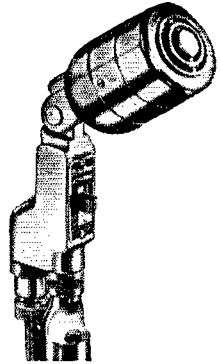
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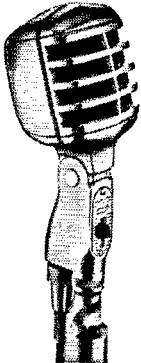
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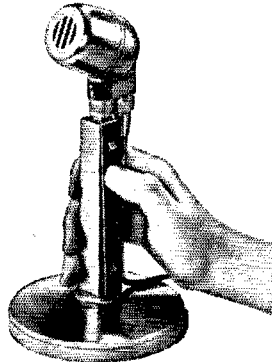
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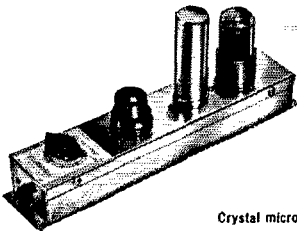
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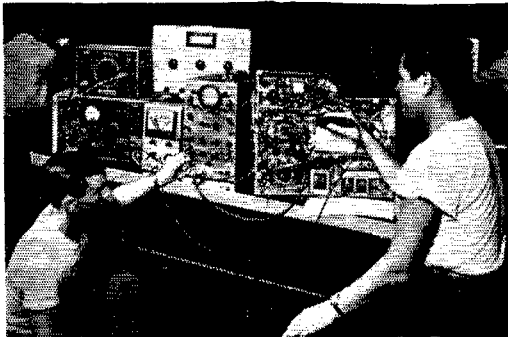
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Check if World War II Veteran

are in the CQ Chess Net. NBS is getting on the air some now. WU is making the rig TVI-proof. NWL now is Class A and is on 3960 kc. ZR keeps a schedule with 5CSU, in Dallas, Tex. KNI fixed up his TVI and is going to build a rig for the car. EK has the call WZPD-7 on 148.14 Mc., CAP frequency. STJ, a new ham in Everett, is on 28 Mc. QKW, in Revere, is on 144 Mc. OEF has a Silver-Murdo rig in his car. SNK is on 50 Mc. QWV, MEG, and WD are on 144 Mc. STH is a new ham in Lowell. NNG has Gon-Set converter in the car on 28 Mc. RZT is having trouble with modulator. SOK is a new ham in Hingham and has a rig in his car on 28 Mc. AYG spends most of his time on the 3.5-4-Mc. band. RGK has a rig in the car on 28 Mc. RKG has police transmitter on 28 Mc. with n.f.m. CBY has a kw. on 3.85-Mc. phone. ONC now is on 7 Mc. The Merrimack Valley Amateur Radio Club has about 35 members now. OLN is on 144 Mc. with five-element beam. RLT has SX-28 and is building mobile rig. SNZ has a beam on 28 Mc. and the XYL and jr. operator are studying for their tickets. SIX bought QNC's HT-9. HP built f.m. unit and is on 28-Mc. phone. PIY is building broad-band exciter. DOX has new Collins 32V-2 transmitter. BHD is working on gear for 420-Mc. television; he has completed the TV camera. DMS rebuilt his antenna tuner. CMW, another old-timer, is on 7-Mc. c.w. Traffic: (Mar.) W1EAG 522, RXT 271, JCK 128, LMI 114, PU 105, ZR 98, TY 79, QJB 49, NBS 41, BB 34, PYM 19, DMS 13, WU 12, NWL 9, DWO 6, (Feb.) WJCK 97, ZR 82, QZS 19.

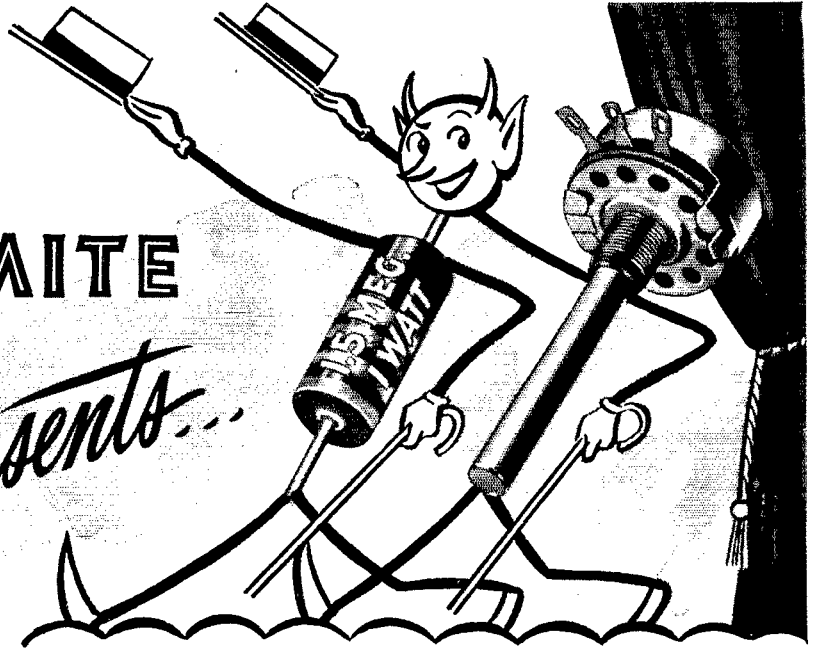
WESTERN MASSACHUSETTS — SCM, Prentiss M. Bailey, WIAZW — SEC: UD. RM: BVR. Net frequency 3725 kc., Mon. through Friday, 7 p.m. RHU keeps plenty of schedules with a nice traffic total as a result. Russ is in charge of 3.5-Mc. FD station for HCRC. RZG got his 30-w.p.m. certificate and picked up four new countries in the DX Contest. EOB has 95 countries confirmed with 127 worked. Vic is building new VFO. BVR has nice traffic total. MOK is building 420-Mc. outfit using 316A. QJN is building 3.85-Mc. phone. RIA is a census enumerator. LFA is going to Nantucket for CAA. MUN is rebuilding. EFQ visited KP4-Land. GZ landed a couple of new countries on 14 Mc. and enjoys working the maritime mobile on 28-Mc. phone. BDV has his little portable job already for his Maine vacation this summer. COI fills his card with goose eggs and says he is just an SWL at present. HNE and LAZ are busy building 3.85-Mc. mobile outfits. JLT finished up the DX Contest with a bang and five new countries. The Pittsfield and Springfield Radio Clubs already are making plans for Field Day. PYR built new VFO exciter for all bands. JYH worked 355 DX stations with a multiplier of 195 and then he collapsed. QFB is EC for Hampshire County. UD has a new emergency power pack for his 28- and 144-Mc. mobile rig. AGM had a nice vacation in Florida. The HCRC recently held its spring banquet, complete with steaks, prizes, and an evening of good fun. The Hill Top Club of Worcester is conducting emergency drills on 29 Mc. each Tuesday evening. The Worcester County Radio Association had two very interesting meetings on TVI reduction with George Grammer as the speaker. IHJ keeps schedule with ex-ICH, now W7AH Traffic: (Mar.) W1EOB 215, RHU 159, BVR 136, GZ 91, IHI 84, RZG 24, GJY 9, BDV 7, MOK 1, (Feb.) W1EOB 391.

NEW HAMPSHIRE — Acting SCM, Clifton R. Wilkinson, W1CRW — RM: CRW. CRW is off the net with harmonic troubles. QGU is back in N. H. and is heard on the net. POK, OO, reports heavy for the month of March. GMS is doing a big job with new TBS-50A and three-element workshop beam on 28 Mc. He schedules Deep Sea Dragnet at 1200 on 3961 kc. and Sea Gull Net at 1700 on 3961 kc. PVF, at U. of N. H., is writing an English Research Paper on "Founding and History of ARRL," and has not much time for transmitting but does some listening on 144 Mc., etc. Congratulations are in order to QJY and KYG on their addition. QJX can be heard on NHN almost every night. EWF reports a get-together at KN in White River Jet., Vt. He and the following attended and had a swell time: RFP, HDA, JNC, AHN, BYC, ELJ, NLO, Doc White, and others. JGI sure does well with that very low power of his, about six watts. BAL is using a new antenna and putting out a potent signal. I get swell reports from many of the gang but there are some who just send in traffic reports. Traffic: (Mar.) W1CRW 170, SAL 83, PFU 54, QJX 28, MXP 21, JGL 17, GMH 7, QGU 5, (Feb.) W1JG15 RHODE ISLAND — SCM, Roy B. Fuller, W1CJH — RM: BTY. PAM: FEB. The Rhode Island Traffic Net is active Monday through Friday at 1900 on 3540 kc. The Newport County Radio Club has voted to participate in the ARRL Field Day. The committees are JBB power, OUR transportation, BVI arrangements, and JFF coordinator. Here is a list of SEC MIJ's ECs: QLD, Cranston; OIHR, Barrington; JFF, Newport; PXL, Kingston; NCX, East Greenwich. The NAARO also is planning for Field Day with KNE in charge. ICE has a brother in Japan with the call JA7AB. He is looking for Rhode Island stations, so be on the lookout for him and contact ICE. BIL's score in the c.w. DX Contest is something never before equaled by an E. I. contestant. BTY has a big wallop now with an 810 final. The Rhode Island Legislature has a Bill in committee that would allow hams to have their calls for registration.

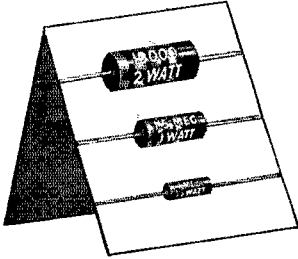
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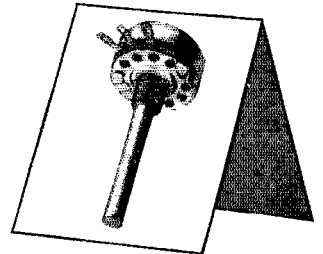
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If you like this idea, you and your friends should contact your local representative. This will help put the Bill through. HRC now is on single sideband. Look for him on 3099.5 kc. LWA is teaching code to a class of fifteen at NAARO headquarters. Traffic: WIBBN 142, BTW 87, CJH 32, QLD 29.

VERMONT — SCM, Curtis W. Dean, VLNTO — SEC: WIJEN/KINAG. RM: KRV. PAM: PZX. GMARC, Inc., held a successful simulated emergency test Mar. 29th. AAJ, MMV, PTB, QVS, RLS, RNA, RFR, RWX, and SAT have 29-Mc. mobile rigs in their cars. PTB has new beam rotator. ORO visited 2AAO recently. RNA has OO appointment. also HFS and Millen v.h.f. exciter. AHN, BYC, LLJ, EWF, JNC, NLO, RPK, SP, and SRV gathered at RW's home Mar. 27th for one of EMQ's famous spaghetti feeds. NLO recently visited BLC, BJP, CUN, ETE, IDM, IT, KJG, LYD, RLS, RNA, and SAT. MMV is busy as communications officer with the CAP. The BARC will be operating from BRO's camp in South Hero with the club call W1KOO in the annual ARRL Field Day June 24th and 25th. Section Net Certificates have been sent out to all those taking part in the e.w. and phone nets during the past winter. Traffic: WIKRY 127, OAK 51, RNZ 48, IT 30, JEN 24, HLJ 18, AVP 16, AXN 9, RNA 6, AEA 5.

### NORTHWESTERN DIVISION

ALASKA — SCM, Charles M. Gray, KL7IG — AAQ is putting out a nice signal with a Meissner 7C5-2E26-812-A and an NC-57 receiver. Also he has an ARC-5 receiver and transmitter on 3.5 Mc. CZ is back from a vacation in the States and is rebuilding, but still manages to monitor a few of the boys and send out cards. SF reports that Nome is getting a "ham club" going and the following attended the opener: BZ, SF, AAO (ex-J5AAZ), AEC, FX, and WJ, plus two prospectives. The club meets twice monthly. ABU went to the States. AB has put up a new center-fed skywire on 3.85 Mc. W7OLX/KL7 got a new call, KL7CLX, and is working on a full gallon. RU bought a new modulator for 600 watts and then the modulation transformer went out. It's back to I.m. for RU. Too bad, Jim. Traffic: KL7PE 53, OW 39, IG 23, SF 8.

IDAHO — SCM, Alan K. Ross, W7IWU — Nampa: IYG now is mobile on 50 Mc. KPM is active on 50 Mc., as well as MZG (Meridian). Moscow: GHT is studying law at the University but finds time for the Gen. Net and to print up some F'B photographic QSL cards. Kendrick: MHR paid me a visit and contacted his Dad, MGL, back home in Kendrick. He and MTP, Nampa, are very much interested in our Idaho Net on 7155 kc. so perhaps we can get going there again. We need a spark plug or two to keep it alive. In the meantime use 7155 kc. for Idaho contacts. Boise: The FARM Net is on its summer schedule, each Wednesday at 8:30 p.m. on 3935 kc. The Gen. Net still meets Mon., Wed., and Fri. at 9 p.m. on 3745 kc. ALY worked a KH6 on 3.85-Mc. mobile. GTM is on s.s.s.c. on 3.85 Mc. SHN is active on 3.85-Mc. mobile. FOF sports a new Morrow converter. JHX has a five-element Yagi on 144 Mc. Traffic: W7EMT 131, GHT 29, NH 27, BDL 23, IWU 12, APK 2.

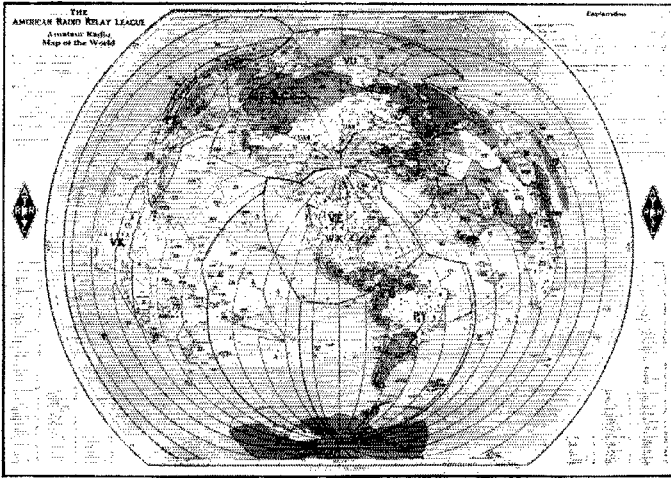
MONTANA — SCM, Fred B. Tintinger, W7EGN — The Glacier-Waterton Hamfest dates are July 14, 15, and 16 starting Friday evening at about 7:30 p.m. and winding up early Sunday p.m. The Polson Hamfest is September 23 and 24. In Missoula, Mrs. NRJ presented the OM with twin daughters. CT, our SEC, reports that the Emergency Corps membership and activity is on the increase. Any communities without an Emergency Coordinator, please contact CT for particulars and appointments. The Gallatin Valley Club holds emergency drills on regular schedules and has a program to help beginners, including ARRL training movies, talks on theory, and code practice. LHZ finished school and is with the Forest Service. MSX has new 28-Mc. beam and also works 7-Mc. o.w. NIKE, at Big Timber, and NUS, at Bozeman, keep schedules on 7 Mc. BXL is moving to Thompson Falls. The SMRA Club of Billings maintains a scrap-book of members' QSL cards. NHP, in Great Falls, wants a 7-Mc. net. Anyone interested, contact NHP or EGN. The Butte Amateur Radio Club will issue a large copper on paper certificate to anyone submitting proof of QSO with six Butte stations. Tall-story tellers watch for CVQ on about 3520 kc. Traffic: W7EGN 88, CT 82.

OREGON — SCM, J. E. Roden, W7MQJ — Astoria: COZ visited FWR and FWD in Tacoma. Baker: HAZ keeps contact with XYL JEM at home rig via 144-Mc. rig in car Bend: HHH was winner of the "Lu Littlefield" Cup for highest score in the YLRL Contest. Coos Bay: New Club officers are HIIQ, pres.; IF, vice-pres.; HOE, treas.; ODA, secy. Eugene: New Club officers are UJ, pres.; HLB, vice-pres.; MIA, treas.; LVN, secy. Grants Pass: Southern Oregon Radio Club officers are MKA, pres.; MLT, vice-pres.; MGO, treas.; ITZ, secy. Milton-Freewater: HQC lost his rotary beam in big windstorm. Klamath Falls: MYI and NOJ are new Net Controls on OSN. Medford: Rogue Valley Radio Club meets each Thursday. GLK is new Club code instructor. LNG reports Rogue Valley Section Net meets Mondays on 29 Mc. North Bend: Southwestern Oregon Amateur Radio Club is new ARRL affiliated club. Pendleton: BDN is new OPS. ADX reports the Club has new 50-

(Continued on page 80)



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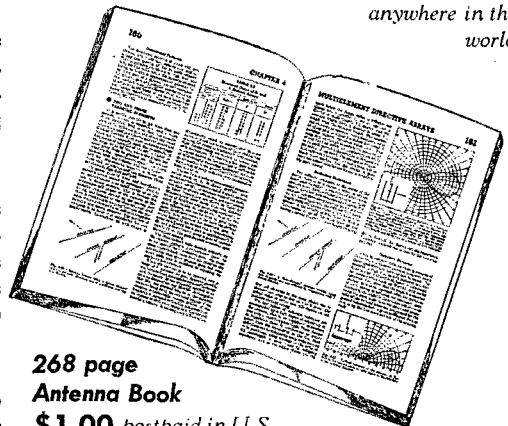
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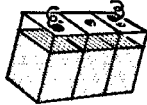


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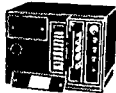
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foot telephone pole installed for new antenna. Portland: IIV is new RM for Oregon, AJN is new ORS and LJJ is new OPS. EX is new Net Manager for 144-Mc. Snake-eye Net, which meets nightly. Oswego: WEN has left 29 Mc. for the u.h.f. bands, Sweet Home: FWE is getting new OEN 7.2-Mc. channel for Sundays and holidays rolling. Tillamook: BUH is trying to find a way to key Command transmitter successfully. Traffic: W7AJN 260, ESJ 229, LT 187, IQ 135, MTW 131, JRU 121, HDN 120, GNJ 103, APF 99, IIV 99, NOJ 89, MYI 61, JOP 43, DIS 41, NOB 36, FRT 34, ADX 31, BDN 31, GZW 26, JKU 25, NQD 23, JLU 21, JVO 17, AXJ 16, BSY 16, ODA 15, AZK 10, GXO 10, JPM 9, EHW 7, JOG 5, KTF 5, NGG 3.

WASHINGTON — SCM, Laurence M. Sebring, W7CZY — SEC: KAA, RM: JJK, PAM: CKT, FWR, QSL Manager, is doing a land-office business, with FWD sending bulletins each Saturday night at 7 P.M. PST on 3695 kc. with a list of stations with cards on hand and no self-addressed envelope on file for them. JJK is new WSNet Manager. ZU is struggling with an electronic key. FLX is publishing traffic-routing guides for all the western states. KYV and the Cascade Radio Club are working on portable emergency gear. KCU now has a 25-w.p.m. sticker. JZR is DXing on 420 Mc. EPW moved to Bremerton. LJM cured his TVI, or gave it to ACF. ETO is spending more time on 28-Mc. 'phone. NWP checks in the WSNet regularly. HGC, with a new Olds '88," is taking it easy on the air. LVB is working on TVI and 144 Mc. EAU finally got on the day shift. CWN bows more than hams. FRU is playing in the local orchestra. APS spends what spare time he has on 3.5 Mc. The Valley Amateur Radio Club now owns two 2.5-kw. gas-driven generators. NZ is back on the air after a long layoff. HMQ, VARC president, worked 11 countries on four continents with 18 watts on 3.5 Mc. MTP, VARC vice-president, built a 200-watt rig for 3.85 Mc. LEC, NZM, OAB, and GJU are on 28 Mc. ATW and OIH pound brass on 3.5 and 7 Mc. OPB, Simmer, works 3.5 Mc. MPH is stirring up interest in emergency gear, while EJJ watches TV and counts VARC money. GWK is too busy keeping the rest of the gang supplied with juice to use any himself. KHL built an oscilloscope. IVJ is found on 160-meter 'phone. TYU is going to CPS. MCU works into WSNet and WARTS. KAA, the SEC, is doing a fine job getting the AEC going full blast, and working on the State Patrol Auxiliary with CMX and the ECs. IOQ is keeping the airways to Japan and Alaska hot. EYS is installing 144-Mc. gear in his plane. AXT works in WART Net. Be sure and send an envelope to the QSL Manager. Mary Ann has lots of good cards left and a new stock is arriving every day. At the present time there are thousands of cards to choose from, so get yours early. Traffic: (Mar.) W7CZY 2930, JJK 379, ZU 282, FLX 254, FWD 231, KYV 187, KCU 184, JZR 113, APS 47, EPW 44, KAA 39, FRU 36, ACF 34, ETO 33, NWP 23, LJM 19, HGC 15, LVB 7, EAU 6, CWN 2. (Feb.) W7JZR 78, AXT 11, EYS 8, GAT 3.

**PACIFIC DIVISION**

HAWAII — SCM, Dr. Robert Katsuki, KH6HJ — BW finally is moving his shack to Wahiawa and his activities as RM and NCS for the Pineapple Net will be sharply curtailed. UL, now reduced to one operator (Corn), still is going strong as one of two traffic outlets to the Mainland. After a long period of silence, PL is back on the job as our other outlet. The 75-meter 'phone net still meets every Tuesday night. The emergency mobile gang meets every Tuesday night at 8 p.m. on 28 Mc. Traffic: KH6UL 156, HJ 14, BW 12.

NEVADA — SCM, N, Arthur Sowe, W7CX — Asst. SCM, Carroll Short, Jr., 7BPV, SEC: JU, ECs: LVP, HJ, MBQ, JLV, TJV, JVV, ZT, KOA, RM: PST, OBS: JLV and MZP. New calls in Nevada are MRN, PRN, OAJ, OBW, and NPS. NNA replaces LUV as corr. secy. of the Southern Nevada ARC. SXD, BVZ, NNA, KJQ, KSU, and LVP are active on 7 Mc. JU has his big Collins rig on 27 and 28 Mc. HJ operates K7NRX at Naval Reserve. The Southern Nevada Club has 50 crystals for 29,360 kc. and the Northern Nevada Club has 30 crystals for 29,520 kc. for the emergency nets. SXD, JUO, TFF, KJQ, and NCR in the south and JLV, KTB, BYR, LKX, MAH, MLK, LXF, BIC, and CX in the north have 28-Mc. mobiles permanently installed for spot frequency emergency nets. The Naval Reserve Training Centers at Las Vegas and Reno have offered their SCR-299s with power plants for emergency use. The Nevada ARA meets the 2nd and 4th Mondays at the Naval Reserve TC in Reno. JLM was instrumental in the apprehension of a wanted man and girl as a result of QSTs on the Mission Trail Net. OAL has supplied more than 25 Nevada contacts on 144 Mc. for stations in California.

SANTA CLARA VALLEY — SCM, Roy E. Pinkham, W6BPT — The SCCARA furnished radio communication for the Red Cross First Aid Station, set up in Alum Rock Park during the Easter egg hunt held in the park. Walkie-talkies were used in outlying parts of the park contacting the First Aid tent. Portable was set up at the tent to keep in touch with the walkies and with the Chapter House in San Jose, where the Club has its station in operation. Sev-

(Continued on page 82)

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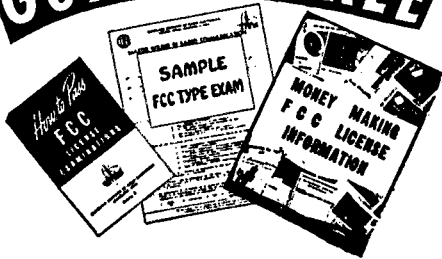
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eral of the club members took part in the park and at the Red Cross Chapter House. VIQ is enjoying mobile work on 3.85 Mc. from his installation in the Olds. HC has command transmitter fired up on 3.5-Mc. c.w. checking into the Mission Trail c.w. net each night. Harry puts out very good signal PDX, at Los Altos, now is using 803s as modulators on 3.85-Mc. rig. LZL still is QRL looking at TV. RNG is getting the mobile rig on the air. MVL also is ready to go mobile on 3.85 Mc. Frank has had lots of experience on mobile 28 Mc. in the past. The PAARA is having a pre-Field Day test trying out its emergency equipment preparing for the Field Day tests in June. The Mission Trail 'phone net came through again by alerting all its stations to be on watch for a truck used by man who left Ruth, Calif., with a fourteen-year-old girl. The truck was located by a net member in Reno, Nev., and the Reno police were called. They apprehended the man. Well, gang, this should be the last report for this writer as your next SCM should be taking over soon. Traffic: W6BPT 309, FTG 46.

EAST BAY — SCM, Horace R. Greer, W6TI — Asst. SCM, Charles P. Henry 6EJA. SEC: OBJ. RM: FDR. ECs: CX, AKB, EHS, NNS, IT, IDY, QDE, MLZ, ZHU can swing a hammer. YDP sends out FP copy of OT's operating schedules each month. The following members of the Mission Trail Net have emergency gear: AAQ, ANR, CAN, CX, CML, DUP, EPQ, FYM, GVT, JSI, HLZ, JDN, JSB, IAH, J7RU, KZF, KUP, LMF, NTU, 7NOH, OEL, PMY, QLM, QFL, QZ, VJN, VJQ, VTS, YDI, and YNM. The following East Bay hams are members of the American Legion Amateur Net: UGO, BNB, QNH, WOC, TIJ, and YTM. The Net operates seven nights each week on 3975 kc. RRH is new OPS. We are sorry that KV4AF/6 is leaving these parts and moving to Hawaii. JZ is assistant manager of RN-6. QXN still is handling traffic between RN-6 and TLAP. CX is taking a whirl at 144 Mc. DTW keeps Pacific schedules. ITH still is on radioteletype and is getting reliable two-way radioteletype circuit with KH6CK. OJW is spending sixty per cent of his time with DX. Station activity report cards are supplied appointees by the ARRL and some are sent every three months for your use. RM took first place in both the c.w. and 'phone ARRL DX Contests for the East Bay section. MEK lost his steel tower. ELW is taking things easy. OBJ is getting all set for summer week-end radio trips. GIZ is getting ready to move. QDE likes new beam. EJA is working a few European stations. IKQ has been QRL with a pretty girl visitor from Rome, Italy. CGG is rebuilding a new rig. CTL has a new receiver. DUB needs zone 19 for WAZ. TT is resting up after two contests. IT is on log book No. 9 postwar. ZUI is toying with the idea of putting up a telephone pole for a rotary beam. LDD is rebuilding 14-Mc. beam. QLI is QRL flying. DYP has a new tower. BUY is QRL work. PB is looking for something new to work. LMZ is knocking 'em over. IDY is QRL service work. UZX, RM, and VJX are keeping Hayward on the map. It seems WP has almost given up radio. MHB is getting ready for a pole-raising day. KKB needs a new beam. The San Leandro Radio Club is going great guns with keener competition. YMO will move again soon. NZJ is QRL work. YDP, ZGA, AWU, FWP, and HOB are keeping the Oakland radio station on the air. Traffic: (Mar.) W6JZ 1016, QXN 214, WII 163, DTW 138, KV4AF/6 86, W6OT 82, CX 69, TI 2. (Feb.) W6OT 118.

SAN FRANCISCO — SCM, Samuel C. Van Liew, W6NL — Phone PLAZA 5-6457. YC makes the Brass Pounders League this month with 62 deliveries. JC is assisting in establishing a traffic net for the Bay Area. Those who desire to help, please contact him. A tie-in with the Emergency Corps 144-Mc. net already is in operation. SWP is helping out on 3.5-Mc. c.w. for San Francisco but other outlets also are needed around the Bay Area on 3.5-Mc. c.w. The 144-Mc. EC Net is on every Tuesday at 8:00 p.m. handling traffic under the guidance of BYS, who is Net Control. The following is a list of the active stations at present: BYS, CDT, DZN, LVW, NGV, SWP, UOQ, URA, WGM, WPG, and ZHO. Here is a chance for you 144-Mc. boys to get some experience in traffic handling before that emergency comes when you will need all the experience and coordination a traffic net can furnish. BWL has been doing a swell job as outlet for the National Trunk Line Net and with his college studies he is a busy boy. CXO, the NRC station, has been very active in participating in many sectional emergency drills of late. Oregon, New Mexico, and the Los Angeles areas each put on a drill covering local and through traffic to NRC, Washington. All three NRC stations backed up the local nets in their simulated tests. JWF expects to make a trip to G2-Land soon to visit G2AN and the boys in that area. NL built a new ham shack — too well. Now the XYL wants another room built. Result — still off the air. The Mission Trail Net is planning a hamfest for late June or early July at the same location, "Coyote Ranch." It is with deep regret that we of this area note the death of ZM, who has spent the last few months at the Veteran's Home near Napa. Sam was a real old-timer, having a very active interest in the Mission Trail Net from away back in the 160-meter days. He also was one of the executives in the amateur net for the American Legion. Although unable to be active of late Sam was well known for his

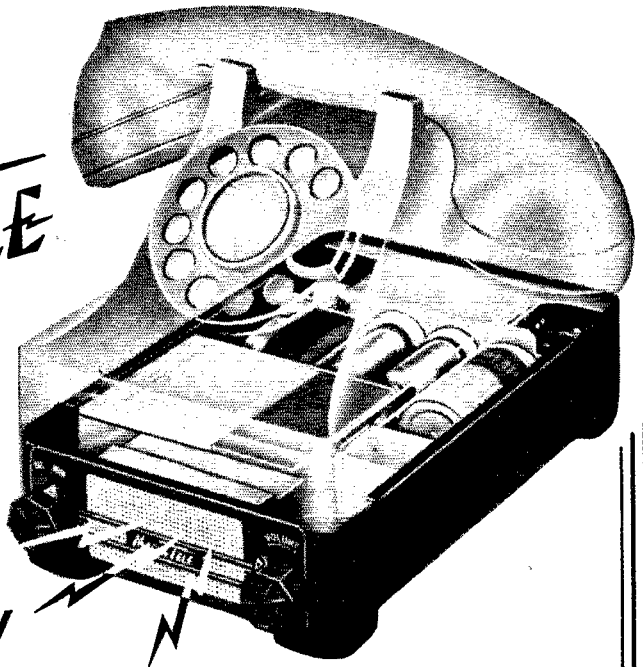
(Continued on page 84)

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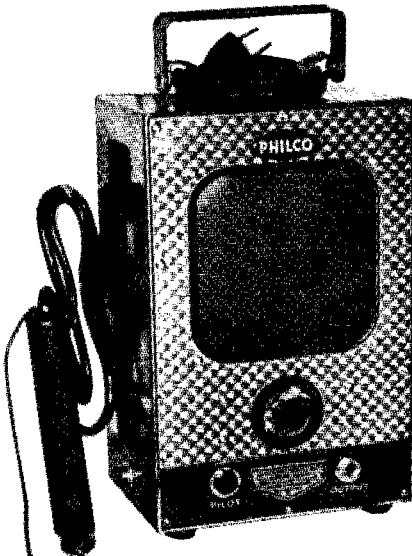
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- The MagnaTele can be adapted for use with almost any type telephone by using our Model WB-7 conversion unit.
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- SIGNAL TRACER
- MICROPHONE OR  
PHONO AMPLIFIER

Designed for FAST diagnosis of radio trouble in RF or AUDIO circuits.

Frequency coverage 60 cycles to 100 MC.

Lighted head in probe with 4 input capacities. 5" dynamic speaker and output jack for gain comparisons.

Directly locates sources of distortion or hum. Sensitive phone monitor, no connection to xmtr. required.

Input sensitivity gain 10,000, output 2 watts, variable.

Tubes: 6AQ6, 7L7, 7A5, 7Y4

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pioneer work in building up enthusiasm in various 'phone nets. He will be greatly missed for his friends were many. The San Francisco Radio Club held its monthly meeting Mar. 24th. Movies and a raffle of a television set were the order of business with refreshments and the usual raffle to wind up a busy evening. The High Frequency and Mobile Society held its meeting the second Friday of the month when further details of the new club were worked out. At its next meeting Field Day activities will be worked out for the June event. Traffic: (Mar.) KG6FAA 520. (Feb.) KG6FAA 580.

**SACRAMENTO VALLEY** — SCM, Ronald G. Martin W6ZF — Asst. SCMs: Northern Area, 6YNM; Central Area, 6CKV; Southern Area, 6SUP. SEC: KME. ECs: Met. Sacramento, AUO; Walnut Grove, AYZ; Dunsmuir, JDN; Paradise (Chico Area), HBM; Roseville, GHP. RM: PIV. OBS: AR, BTY, PAM: ZYV. OES: PIV, GHE. OOs: ZYV, BTY, GDO, YV, OPS: JDN. Sac. Emergency Net (city) NCS AUO. SVS Traffic Net, 29.4 Mc., NCS ZYV, ANCS BTY. Mother Lode Net, WSI NCS. **Northern Area:** YNM skeds his brother, VE7GV, on 3765 kc. The Mt. Shasta Amateur Radio Club has arranged to purchase \$200 worth of tools for its club station. EWG remodeled his BC-348. JDN fell heir to a barrel of 1625 tubes and now is rebuilding. CFU consistently works KL7 with 25 watts. GOO moved to Southern Cal. MFD, dyed-in-wool c.w. man, finally went 'phone on 23 Mc. with the Mt. Shasta net. REB can be heard occasionally on the low end of 3.5-Mc. c.w. **Central Area:** TSR at Orland joined 160 gang. CLG has amazing results on 144 using TV antenna. LYQ tried rhombic, 4 wavelengths on each leg, but says results weren't as good as with the Quad, KUI worked a W7 on Mt. Peavine near Reno on 144. GERC met on March 17th and considered a booth at the County Fair again this year. **Southern Area:** McClellan Field Radio Club was organized April 3rd with following officers: MYT, pres.; CVU, vice-pres.; AVK, secy-treas.; RWO, sgt. at arms. Meetings are held 3rd day of each month. First official act was dedication of the new MARS Station AF6BCI. W6BCI is the club call. EVC is now on 7- and 14-Mc. c.w. with the gallon job. GDE is new publisher of *SACV News*. ZYV is compiling new 'Phone Procedure Manual for traffic handlers. ASI raised new 60-foot pole and twin 10-20 beam. HOP is Chief Owl of the new Hoot Owl Net on 29.4. HTS handled her first traffic and skeds T14JG. GDO is on 160. MTW skeds RN6 net on Tuesday nights. AUO is new EC for Met. Sacramento Area, replacing BVK who has done a commendable job. Traffic: (Mar.) W6ZF 75, PIV 83, ZYV 52, GDE 26, JDN 25, GDO 14, HTS 5. (Feb.) W6PIV 110.

## ROANOKE DIVISION

**SOUTH CAROLINA** — SCM, Wade H. Holland, W4AZT — ADE has mobile receiver and plans high-power auto transmitter. Doc advises that IW and OAP have p.p. 813s now and that DPN has a new jr. operator. EOZ works SCAN regularly. BPD had to parallel feed d.c. to final because of so much audio, and is finishing up 75-tube receiver. Traffic: W4AZT 15, EOZ 3.

**VIRGINIA** — SCM, Victor C. Clark, W4KFC — Asst. SCM, Elias Etheridge, jr., 4KYD. SEC IWA announces the following new ECs: AIV, BIG, DRV, CSC, FV, ISE, IYI, JDS, KAK, KDL, KRX, KRZ, LBB, MLE, NKB, NBA, and WG. MLE is new OBS, NBA new OBS, JUY new OPS. New AEC members are JHI, LMB, LLU, and PPP. CVO earned VFN certificate. Richmond, Falls Church, and Potomac Valley Clubs are making Field Day plans. IPC reports the forming of new Augusta Radio Club in Staunton. LRI, Arlington Co. EC, is making progress with organization work. VE has new two-element rotary for 14 Mc. PVRC members met with members of the Frankford Radio Club of Philadelphia in Wilmington, Del., and pronounced the get-together a howling success! IA temporarily is QRT while refurbishing the basement. MWH, battling TVI, passes along some Danville information: INW has new 28-Mc. three-element rotary. JRI is active on 3.85 Mc. MAV is active on 7 Mc. The Carson family is burning up the ether with ISE on 3.85- and 14-Mc. 'phone. LPO on 7-Mc. c.w., and LPP on all bands. MLE, Culpeper, plans to try 144-Mc. radioteletype! JAD has renewed OBS appointment. PDP is active on 7 Mc. with a BC-459. KBJ is working on 100-watt mobile! CVO, JCC, IDR, and 8QYK/4 flew to IRE show in New York. EMJ modernized his receiver. PAS has new Collins 75A-1. CJS is preparing for summer operation on 14 and 28 Mc. KYD is working on TVI. MLH worked CT3AB and VP5BF on 3.5-Mc. c.w. IWA has s.s.b. rig under construction. GKY purchased an antenna site in Vienna. IYC, IYI, LNT, PHM, and WO turned in nice reports on February Frequency Measuring Test. LIM made 72,000 points in 'phone DX Tests, and IWO managed 40 QSOs using an indoor antenna. Traffic: (Mar.) W4FF 371, PYN 234, LAP 160, KVM 97, FV 89, MLE 66, KFC 64, NQV 55, IWA 48, ONV 33, CVO 28, PWX 22, KMS 21, MLH 20, NBA 19, JHI 17, KYD 15, CJS 3. (Feb.) W4KVM 44.

**WEST VIRGINIA** — SCM, Donald B. Morris, W8JM — BYV and HSC are active in the Potomac River Flood Net on 3.85-Mc. 'phone Sunday mornings. 3GEG, ex-

(Continued on page 88)

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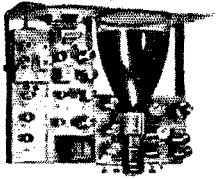
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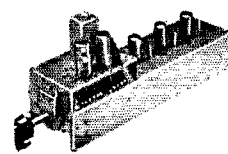
Out of my laboratory has come an entirely new Television Training...cutting months of the time required in old methods. I give all the knowledge and experience you need in weeks instead of months. I start where your present radio experience ends. The same day you enroll with me, I rush the first of many big Television kits that I will send during your training. From the first hour you are experimenting and testing practical TV circuits...and you keep right on from one fascinating experiment to another. You build the remarkable new Television Receiver-Tester illustrated at the left and useful TV Test Equipment. I give you theory, too, but it's 100% practical stuff that will make money for you in Television.

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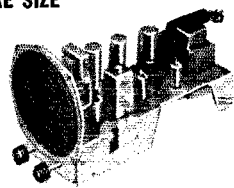
**Exclusive THREE-UNIT Construction**

You build my Television Receiver-Tester in three separate units—one unit at a time...each complete and self contained within itself. With each unit you perform dozens of important experiments—and each unit may be used in actual Television receiver servicing. In this way my training may save you many dollars by eliminating the need for costly TV Test Equipment. With these three units you can locate most TV Receiver troubles quickly and easily.



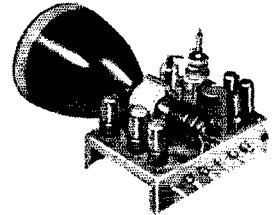
**TV Tuner—I. F. Unit**

Contains the RF amplified local oscillator, mixer and three stages of broad band IF amplification and the video second detector. The output constitutes the video signal and audio IF signal. For training, it is used to build and test video second detector, and stagger tuned IF amplifier obtaining 4.5 mc band pass. For TV servicing, it becomes a TV calibrator for IF alignment, substitute tuner, IF signal injector and second detector.



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Provides 4.5 mc IF ratio detector, low voltage power supply. For TV, it becomes the audio output, including speaker, video output and low voltage power supply for RF and IF stages. For training, it is used to build and test transformer type power supplies, audio, video, IF amplification and FM detection. For TV servicing, it is an audio signal tracer, IF signal tracer, video signal tracer and low voltage power supply.



**Video Tube "Scope" Unit**

Scope unit contains low and high voltage (6000 V) power supply for independent operation. For television, it becomes the sync, vertical and horizontal sweep circuits and their power supplies. For training, it is used to build and test most TV power supply, deflection, sweep, oscillator, and sync circuits. For TV servicing, it is a video signal tracer and sweep signal analyzer as well as substitute high and low voltage power supplies.

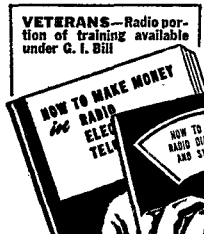
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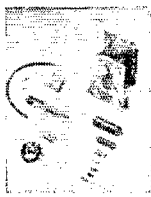
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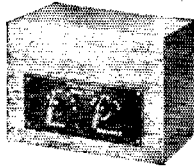
**\$9.45** 15 KV can be had with full sweep using a single 1B3 Rectifier. Type T7711 Hyback transformer, special width coil and all components are included in this deluxe hi-sweep kit. Plus schematic wiring instructions. Specify type.

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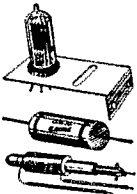
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Improve TV reception in low signal, low terrain and fringe areas by building this latest design booster. Tested to reduce noise from 3 to 5 db. Get brighter, sharper pictures you hardly thought possible. Simplified step-by-step wiring instructions.

## STOP PICTURE JUMPING Keyed AGC For 630 Type TV

This techmaster Keyed AGC Kit can be installed in about 1 hour. For any 630 type TV receiver. Keyed automatic gain control eliminates picture jumping caused by noise and overloading by strong signals. Special bracket mounts on existing holes in chassis. Operates from synch pulse — simplifies tuning and adjustment. Complete with 6AU6 tube, bracket with mounted tube socket, resistors, condenser, coil and pictorial wiring instructions. . . . . **\$4.45**



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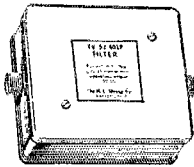
Installs in transmission line. Attenuates antenna and feed system harmonic radiation with no reduction of fundamental signal. Order TV-300-10 HW for 10 & 11 Meters. Model TV-300-20 HW for 20 meters. For use with 300 ohm transmission line. . . . . **\$10.95**

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QS-6

SCLQ, operated c.w. mobile on 3.5 Mc. during West Va. QSO Party. DYP, on 3.85-Mc. 'phone, gave several stations their first contact with Logan County since the war. Congrats to GBF and BTV for their fine traffic showing. WSL snagged the following rare DX on 28-Mc. 'phone: YK, VS, VU, ZSS, and ZS9. JM and WSL received their Worked 25 KZ certificate. JKN and ABE are active on 50 and 144 Mc. PZT has new VT keyer that cleared his thumbs. AUJ ran up fine traffic and is the possessor now of an ORS certificate. EZR, although inactive because of illness, still listens to the gang with receiver by the bed. DTL's mobile 3.5-Mc. c.w. rig works out swell. MIT's 55-foot 28-Mc. beam came down during high wind storm. CNF and HUG keep Parkersburg on the WVN Net. FMU is rebuilding because of TVI. BWK schedules 4NQY. DHT and MIS have been keeping schedules on 160 meters. PQQ, with new location and antennas up, works all bands, 'phone and c.w. Traffic: (Mar.) W8GBF 413, BTV 324, OXO 252, AUJ 203, BWK 45, DFC 40, BYN 39, WSL 14, JM 12, PZT 5. (Feb.) W8OXO 334.

## ROCKY MOUNTAIN DIVISION

COLORADO — SCM, M. W. Mitchell, W1QZ — SEC: KHQ, RMs: ZJO and LZV. MHR is new EC in Greeley. ULZ and DYS are new ORS. Correction on the Colorado Emergency frequency: It is 3890 kc. instead of the frequency reported previously. KHQ announces that the Colorado Emergency net meets Tuesdays at 1630 M, Wednesdays at 1200, and Thursdays at 1730 M. ZJO makes BPL again. He has new Select-O-lect for his NC-183. PNK passed a little time with yours truly while waiting for a plane to go to Des Moines. IA reports Colorado University is setting up a rig for traffic handling and will need contacts in Greeley, Ft. Collins, and Colorado Springs. Anyone interested in a university network for traffic, write or call IA. He reports the Public Service Co. finally got rid of most of his noise. LZV says CSSN business is picking up. MOM belatedly reports on considerable work done during the Colorado Springs fire. He handled 500 words of press between Colorado Springs and Lamar radio station KLMR. Those taking part were HER, TWN, and MOM. AJJ is a sergeant in the National Guard and heads the radio section. They are looking for contacts on 4.6 Mc., the National Guard frequency. HJX reports AXK is a new ham in Lamar. PSB has two new 50-foot antenna masts. SFS is having very good luck with 10 watts on 28 Mc. PQZ has 60 watts on 160 meters and is attending C.U. A nice bunch of report cards were received this month. Traffic: W8ZJO 1999, EKQ 187, PNK 36, FPL 24, IA 20, LZV 19, KHQ 10, MOM 6.

UTAH — SCM, Leonard F. Zimmerman, W7SP — The OAO and the UARC are planning combined Field Day operation and if advance preparation counts Field Day should be a big success in Utah this year. The 50-Mc. gang still is busy trying for W1 and W2. The FARM Net has cut to one night per week. The Utah 'phone net, with IWH as NCS, is working Tuesday at 8:00 p.m. on 3980 kc. The c.w. net, with ZZZ as NCS, is working Monday at 8:00 p.m. on 3700 kc. The UARC 10-meter net has changed frequency to 29.2 Mc. to avoid QRM from short skip. UTM has built a new VFO and he says that the Emergency Corps is coming along OK but several communities are not represented. How about it, gang? Price is represented on the c.w. net by BSE and on the 'phone net by UIB, who says his main interest is WAS on 3.5-Mc. 'phone. He should try it on 50 Mc. Hi. Traffic: W7MFQ 243, UTM 208, IWH 112, DTB 20, BSE 6, SP 5, UIB 5, KUD 4.

WYOMING — SCM, Marion R. Neary, W7KFBV — NDF (ex-6NMA) is leaving the wild and windy plains of Wyoming for the civilization of St. Louis. KUB is trying 23.5-Mc. mobile. HRM is rebuilding again with an 813 in the final. 9MVI/7 now is OBC and is instructing at Warren Air Force Base. IRX is moving to Reno (his work, you know). HLA is on 3.85-Mc. 'phone handling lots of traffic. NLH has left W7-Land for Western Nebraska. KFV can't do much good on 144 Mc. airborne, either weather or mechanical. JDB has been burning his fingers on a new all-band exciter. DXV gets across the State with a battery-powered 274N on 3.5 and 3.85 Mc. FLO has learned the art of cooking since the XYL is on crutches because of a contact, auto to auto. HDS still is riding the range for ECS. OWZ received OES appointment. Traffic: W7DXV 116, IQQ 42, G8Q 26, HLA 26, HNI 24, HDS 10, KFV 10, OWZ 8, G8 6, EVH 4, HFV 2.

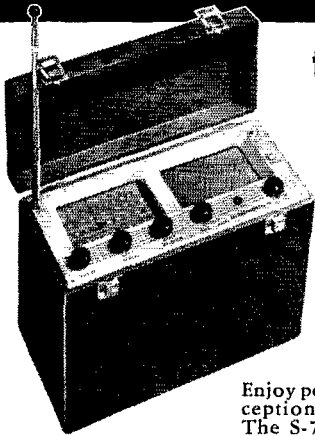
## SOUTHEASTERN DIVISION

ALABAMA — SCM, Leland W. Smith W4YE — New officers of the Birmingham Club are KVV, pres.; KNW, vice-pres.; DFE, rec. secy.; DID, corr. secy.; NQK, treas. RGQ and RHV are new hams in Birmingham. FBB is back on in Flat Creek. A new ham in Enterprise is REK, a physician. BFM still is trying to stabilize his Clapp oscillator. MEP is active at Oxford on 4 Mc. LEO is rebuilding for 14 and 28 Mc. Engineering traffic from U. of A. "Engineers Day" cleared rapidly through Alabama nets. JYB alerted the Montgomery 28-Mc. mobile net during the recent windstorm and assisted the Red Cross. OHA has Class A

(Continued on page 38)



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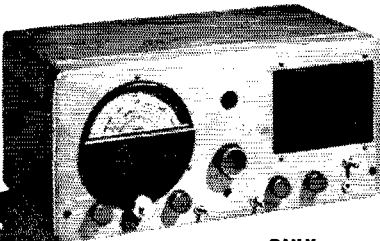
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Men qualified in RADAR, COMMUNICATIONS or SONAR give complete history. Interview will be arranged for successful applicants.

license and is invading 4 Mc. The Montgomery and Auburn Clubs sponsored a joint picnic at Chewaala State Park on April 16th. OEN has moved to new QTH. PAC has gone mobile on 28 Mc. PYD is a new ham in Gadsden. KVD is active on all bands with his p.p. 812As. RDY is a new ham at Craig Air Force Base. EWN again leads the section with a fine traffic total. KIX has new aluminum masts to support his 3.5-Mc. antenna. FGT is having trouble with his 4-Mc. mobile. Traffic: W4EWN 160, KIX 34, BFM 25, LEN 20, OAO 20, YE 20, JYB 18, K4FAG 16, W4BMM 8.

**EASTERN FLORIDA**—SCM, John W. Hollister, W4FWZ—IQV has been appointed SEC. Thanks to DQW, retiring SEC, for a fine job. DQA now is EC for Orlando. There are several services desirous of forming emergency nets. In my opinion, the ARRL AEC plan should be our first consideration. If any operators are left over after our requirements are met then we should cooperate, but not at the sacrifice of our time-tested AEC organization. New officials in the 'phone traffic net are JEP, mgr.; LMT, NCS; and WS, TCN outlet. Our director, BOL, was a welcome visitor at the JARS meeting. Daytona: The Halifax Radio Club had a nice display at the hobby show with PYA, PYB, LZT, and RCG participating. Deland: WS worked Hawaii and Japan on 3855 kc. The Deland Radio Club now is going with 10 members. Jacksonville: IZ ran up a DX score on c.w. of 101,113, with 262 contacts in 129 countries. LZM, on 28-Mc. 'phone made 22,515 points, with 133 contacts in 57 countries. HWA reports lots of 3.85-Mc. mobile operation in Jacksonville. EID has been working QN in Orlando and BYR in Lake Placid on 144 Mc. Lake Placid: BYR has regular schedules on 144 Mc. with HAD in Tampa, GFE in St. Pete, and QN in Orlando. COZ is on 144 Mc. in Lake Wales, and QCE, in Sebring, is on 144 Mc. Miami: BYF will have an ideal set-up on his 50-foot cruiser. IYT had regular schedules with K8FMC and KZ5PA. New Port Richey: KJ went to Detroit for his new Packard. Orlando: QN is testing twin-five beam against his sixteen-element job. QN reports most 144-Mc. work is by ICW. He reports LAW, IVV, FPC, and CCC are on 144 Mc. St. Pete: OJH uses 304TL in final. LTE is busy with traffic: KQR is using a very small beam on 28 Mc. PVV is using pee-wee transmitter on 28 Mc. Traffic: W4IQV 278, JEP 133, RP 87, OGI 38, KJ 37, WS 36, LMT 32, IYT 18, BMR 6, FWZ 6, BXL 2.

**WESTERN FLORIDA**—SCM, S. M. Douglas, jr., W4ACB—With the coming of spring it is a good idea for the gang to start checking up on mobile and emergency gear to be ready for summer activities. We hope that the section makes a good showing in the Field Day activity this year. Mobile rigs in Pensacola are operated by MS, HJA, NJB, QK, and PQW, while in Tallahassee OCL lost his mobile rig through a new car deal. HIZ, NJB, and DAO are reported to be working 3.85-Mc. 'phone. PTK keeps 7 Mc. hot and is building a larger rig. RCH has a Collins 32V-2 and keeps 28 Mc. warm. PRP and PBV are having TVI trouble. JV and BQR are reported as having deserted the ham ranks and are selling TV sets. OYR puts out a nice signal on 7 Mc. ACB is on 7- and 3.5-Mc. c.w. QB has a new HT-17 for portable work. NQY, LDT, GAA, OKD, and BSR keep the Tallahassee 28-Mc. net going, along with CCA in "Gawja." AXP is doing an FB job as R.M. Traffic: W4AXP 69.

**GEORGIA**—SCM, James P. Born, jr., W4ZD—The North Georgia College Radio Club call is PYM. The Club has separate transmitters and receivers on all bands, including 144 Mc. Hams in the Club at present are KGD, NNU, NWA, OVL, and QCO. OSE, ex-AER, is on 3.5 Mc. with 32V-2 and 75A-1. NS is on 3.5 Mc. FKE has a new 12-watt 'phone rig on 28 Mc. OHH has a new 813 final on 28 Mc. using screen-grid modulation. IKJ has a new 32-element 144-Mc. beam. KEV, OTA, PBR, MZO, and KXT installed OFT's 28-Mc. rig in Piedmont Hospital where he will be for some time. He is on 29.2 and 29.4 Mc. PVV is a new ham in Ashburn and is on 7 Mc. ACH works 3.5- and 7-Mc. c.w., also 28-Mc. 'phone. HU is a new ham in Savannah and works 14-Mc. c.w. JOY has a new rig on 28-Mc. 'phone with a three-element beam. The Kennehoochee Amateur Radio Club at Marietta has completed preparations for a hamfest to be held June 18th at Lithia Springs Golf Club, Austell, Ga., 17 miles north of Atlanta on U. S. Highway 78. MQN, the Atlanta Radio Club station, will be operated Field Day at Boulder Park Botanical Gardens on 3.5-, 7-, and 14-Mc. c.w. and 3.85-, 14-, and 28-Mc. 'phone. KSZ is building new ECO and 150-watt final. Traffic: W4K5Z 73, AAY 30, KGI 19, KGP 16.

**WEST INDIES**—SCM, Everett Mayer, KP4KD—The KP4 gang extends sympathy to JA on the death of his XYL. Cuba: CM2WP sends in a nice letter on activities. 2WR runs 125 watts with new rig on 14 Mc. 2HW and 2MD are new hams. 2SP modulates 807 with pair of 807s. 2CU is on 7 Mc. with 125-foot feeders on doublet. 2LM has new 815 final while 9AA is mobile on 28 Mc. Puerto Rico: W8UW now is KP4UW. JB showed up on 14 Mc. for contacts for license renewal. KV4AO visited OM KD on the way to W4 to pick up his family. LD can't find antenna to load his QRP rig. ES, CI, and JA work the Puerto Rican Expedition in Venezuela on 14-Mc. 'phone with ES making the first QSO. AJ, HU, KP, and KO report traffic. Ex-

(Continued on page 90)

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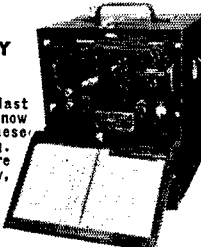
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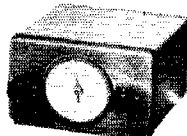
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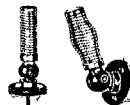
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KP4EZ got his 'phone DXCC for contacts made as KP4EZ. DJ keeps the AEC c.w. net going, with ES doing the same for the 'phone net. CB gets on 14-Mc. c.w. for ragchews. KD and his XYL visited KV4. Traffic: KP4HU 28, AJ 8, KO 7, KD 5, KP 3.

CANAL ZONE — SCM, Everett R. Kimmel, KZ5AW — PA ran up a big traffic total with messages for the Virgin Islands via KV4AA. WJ checks into Marine Corps Net, 29.4 Mc. Mon. through Fri., with southbound outlet to CPIAM and CP5FB Tues. and Thurs. EC FL, of Canal Zone Net, tunes net frequency only, but has a supply of 28,900-kc. rocks at 79 cents for those without VFOs. FL ran off an FMT for net members at recent drill, with AB at the CAA monitoring station acting as referee. Scores in parts per million error were: JQ 11, FL 12, DE 25, RM 49, BL 47, GD 63, RB 117, CG 132, and PC 134. Frequencies were in 7-, 14-, and 28-Mc. bands. Many of the KZ5 gang have new 24-hour clocks and still are using their fingers to count up time conversions. JD is VFO with an old Meissner Signal Shifter. WJ blossomed out with a pair of 4-65As. RM is now Assistant EC. QSL Manager IP wants stamped addressed envelopes from the gang. Traffic: KZ5PA 158, WJ 109, FL 41, LR 18, RM 6.

## SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Virge A. Gentry, jr., W6VIM — L Asst. SCM Irvin O. Hege, 6FYW. SEC: ESR. PAM: MVK. RMs: CE, CMN, DDE, and IOX. Good luck on Field Day, gang, and remember that we have no special multiplier this year. DDE made BPL in January and February. BUK is on 28-Mc. 'phone with 500 watts. BES visited 4KFC. New amateurs in Ontario are IDM, IGE, and IAG. Sorry to report that YCZ was injured in an auto accident. BHG wants a c.w.-only contest for 50 Mc. and above. AM has 208 countries, with 199 confirmed. YSK has 15 states on 1.9 Mc. and has worked as far east as Iowa. Stations active on 420 Mc. are NLZ, CMQ, WWP, CFL, and GTJ. CE handled all of the out-of-state traffic from K6NRK at the Orange Show. JQB reports that the Southern California Net needs more outlets adjacent to the Los Angeles area. DLR worked UA6FJ, PK6NL, XF1A, LUBEL, and KP4CA on 7 Mc. The RMs welcome GYH into the traffic ranks. CFL is ready for some 2400-Mc. contacts. QAE moved to Venice, Calif. MJ worked a J8 with 5 watts on 3.5-Mc. 'phone. OB worked HC2OT on 50 Mc. CBA and YHR were forced on quiet hours due to TVI. EYN is building a Walman converter. ZL has a Cascode converter and 100 watts to a twenty-four element beam on 144 Mc. DMJ is on 28-Mc. mobile. To stimulate 144-Mc. activity, MVK announces a cash prize of \$50.00 to the first fixed station within a radius of 60 miles of Los Angeles that has two-way contact with any out-of-state 144-Mc. land station, excluding Mexico. ESR announces that the name of the Western Area AEC has been changed to Centinella Valley Area. The Tri-County Amateur Radio Club meets the second Wednesday of each month and all are invited. The members of the Mission Trail Net had a meeting in Los Angeles. The Santa Maria, San Luis Obispo, and Paso Robles Amateur Radio Clubs had a joint meeting March 24th. The Metropolitan Radio Club operated the Amateur Radio Booth at the second Los Angeles Annual Hobby Show under the call of 6AMT/6. Of the 3029 messages taken in, 140 were handled on 144 Mc. The remainder were sent via the 3.5- and 7-Mc. nets. Messages not sent via AMT/6 were transmitted from the facilities of CMN and DDE. Amateurs participating were CMN, DDE, LDR, ELQ, FOW, CBA, MBA, MVK, YHR, WAT, and ESR, in addition to the YLRL. The AEC participated in the simulated disaster drill held by the City of Los Angeles. Mobile participants were EHB, YHP, ZUX, GVB, SK, and WBS. Operators of the Red Cross AEC station, HGV, were EC MVK, EUR, and ESR. COZ reports that all ragchewers are invited to join the "Gabby Gravediggers" net. DGA has a new 3.5-Mc. antenna for traffic work. The Southern California DX Club tossed around the contest rule situation at its April 6th meeting. ECG sponsored a picnic at Munz Lake Mar. 19th with at least 100 attending. A 3.5-Mc. mobile contest was held, with prizes given for best quality, signal strength, and installation. There were 29 mobile units in the contest. Traffic: (Mar.) W6CE 5586, DDE 986, AMT/6 979, YLZ 370, CMN 324, GYH 174, ANT 119, FMG 58, QAE 56, BHG 52, KSX 48, FYW 30, JQB 24, MU 22, TFC 10, COZ 7, AM 6, DGA 3. (Feb.) W6DDE 223, LYG 190, YLZ 155, YSK 1. (Jan.) W6DDE 420.

ARIZONA — SCM, Gladden C. Elliott, W7MLL — FGG reports that 144-Mc. contacts have been established between Tucson and Phoenix, with KWO, MIW, and MIV putting 8-6 signals into Tucson with 15 watts input. RJN, at Casa Grande, is being heard in both Tucson and Phoenix on 144 Mc. 144-Mc. schedules are being run on Tues., Fri., and Sat. at 8 P.M. OEI is on 3.85-Mc. at Kingman. OEG is on 28 Mc. in Phoenix. QNC is on 160 meters. OEF is 28-Mc. mobile at Davis-Monthan Field. OFE is on 28 Mc. in Phoenix. NAP is mobile on 28 Mc. in Phoenix. OGV is a new Phoenix call on 7 Mc. NFL has a half-kw. on 3.5 through 28 Mc. KWB is on 27 Mc. with teletype. LQB is building beams for the Phoenix boys. MTZ has a new receiver and

(Continued on page 98)

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416 433 446 483 497 509 522	377 387	394 405
418 434 447 484 498 511 523	379 388	395 408
419 435 448 485 503 512	380	396 409
420 436 462 487		397 411
422 437 468 488		400 each
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452.777 533.333	Standard	Xtals without
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6006 6773 7906 8273	5677 5873 6440 7306 7640
6040 6840 7925 8306	5708 5875 6450 7340 7673
6073 6873	5708 5900 6473 7373 7706
6075 6906 each	5725 5906 6475 7406 7806
6100 6940	5740 5925 6506 7440 8173
6106 6973	5750 5940 6540 7473 8340
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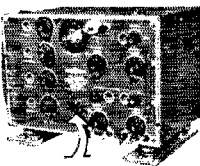
2045 2260 2415 3215 3510 3580
2105 2282 2435 3237 3520 3945
2125 2300 2442 3250 3550 3955
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200 25	2.65	1.05
20x20x20 150		
20 25	2.85	1.14
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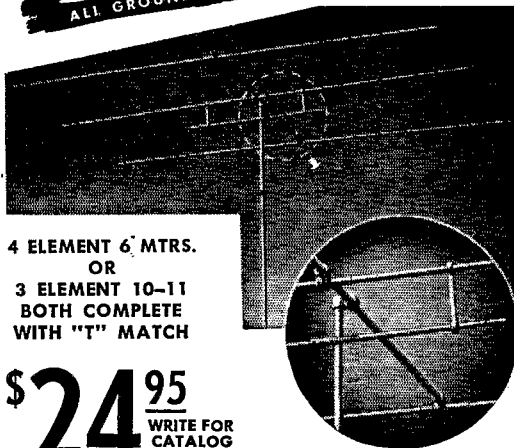
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beam. JUY has a Gon-Set built in his new car. LBN is working DX while convalescing. KWL is back in Phoenix and on 28 Mc. MAE reports 281 active amateurs in Arizona. KRW reports the Mesa group handled 291 messages at the County Fair. BH is organizing an Arizona net on 7115 kc. NBZ handles messages for Phoenix at PTA meeting. NNO and NNT are on 7-Mc. c.w. in Tucson. Best of luck to our new SCM, Jim Kennedy, MID. Thanks a lot for the co-operation from all of you during the past four years.

### WEST GULF DIVISION

**NORTHERN TEXAS** — SCM, Joe G. Buch, W5CDU — Been hearing plenty of activity on 160 meters. Too bad we cannot use it on a 24-hour-a-day basis. NRY is teaching math and geology at Odessa Junior College. Odessa now has 30 licensed hams with "Soupy," our Director, and family representing 10 per cent of the total. PRN, of Mesquite, is another victim of TVI. IWO is ironing out transmitter difficulties. LGY has been vacationing in Houston. AWT and IGU placed first and second in the 28-Mc. WAS Contest. AWT made a nice showing in the SS Party. AW is worried — he was first in the West Gulf Division in the recent CD Party and suspects he is the only one who participated. Fear not, Andy, you were first but not last. Andy interrupted his report to take time out and pour a load of No. 4 buckahot into a sport model tom cat who had decided to move into the ranch site. Andy says this animal threw a scent a lot farther than Washington threw a dollar. QFY, Carswell Air Force Base, has 40-watt rig on 7090 kc. This is George's first rig and he reports lots of fun and good results. BKH reports activity still strong with AEC nets, and plans are to continue through the summer months. Now is a good time to check your emergency gear and get it in readiness for the Field Day competition. Congrats to RJM, newly-licensed in Bonham. LSN and GZU make BPL. Thanks to all traffic and EC members, you are doing a fine job. Traffic: W5LSN 3004, GZU 716, ARK 201, PKR 105, BKH 16, LGY 4.

**OKLAHOMA** — SCM, Frank E. Fisher, W5AHT/AST — SEC: AGM. RM: OWV. PAM: ATJ. Plans for traffic from the Easter pageant at Lawton kept OWV and the Lawton-Ft. Still gang very busy. Four circuits manned by the topmost traffic men of this region took care of traffic. The code class recently opened by the Oklahoma City Club has been moved to OCU, where it operates three days each week. Average speed after six weeks is about 7 w.p.m. A new club in Oklahoma City has been formed at Classen High School under the direction of MOH. The mobile bug has bitten many Oklahoma City hams. New officers of Tulsa ARC are PA, pres.; EYK, vice-pres.; QPI, treas.; and OOM, secy. Ten to twenty stations meet bi-monthly on Tulsa County 10-meter emergency net and there is a growing interest in mobile operation. ATB, BBS, BCO, ETR, GZS, HFY, JJR, COM, and QNP are now mobile. OOM runs a QSL bureau for Tulsa hams. OWG, at Ardmore, is co-operating with OWV in the transfer of traffic from OLZ to the 'phone net. Ardmore AEC is well supplied with 28-Mc. rigs because of the police switching to v.h.f. The Ardmore Club is getting ready for a bigger and better Field Day, cultivating its 300-acre antenna farm. 6GNB now is 5QZW at Ardmore. JP is running third No. 2 wires into his shack. KFJ has a new VFO with Clapp oscillator. PDD, OJ, and MPL are new ECs. The OLZ Slow-Speed net is picking up, with K5WAH, W5JFT, LCN, LRF, PCQ, QAE, QBX, QVV, and PPD reporting in. Traffic: W5OWV 317, FOG 173, FMF 133, AHT 83, OYP 73, FOM 69, MEZ 32, EHC 1.

**SOUTHERN TEXAS** — SCM, Ammon O. Young, W5BDI — PNP has a new beam and is active on 3.5, 7, 14, and 28 Mc. GGQ and LM are on 28 Mc. LFW is having rig trouble. QCB is back on 3.5 Mc. NIY is working schedules. MN makes the BPL again. DAA has 150 watts to a pair of 24Gs and a twelve-element beam on 144 Mc. ADZ is on 3.5-, 7-, and 14-Mc. c.w. OFM, NIH, NMA, IX, and OXI are on 28-Mc. 'phone. OP is on 28-Mc. mobile only at present. NMG is working DX on 14- and 28-Mc. 'phone with the aid of his new 10-over-20 beams on a 75-ft. pole. IYR has a pair of 304TTs on 14-Mc. c.w. NOT is working some new ones with his new beam and HRO-7. OQK is working 28-Mc. 'phone and 7-Mc. c.w. NNY is on 28-Mc. 'phone and 14-Mc. c.w. LXV is rebuilding with a pair of 4-125As in the final. The Kingsville Radio Club reflected the following officers: GLP, pres.; RHJ, vice-pres.; PLG, secy.; and GUW, treas. JKB is on 3.85-Mc. mobile and is getting back on 144 Mc. LGL is building a new house. GLP is using supermodulation on 28 Mc. with a new beam. Traffic: W5MN 706.

**NEW MEXICO** — SCM, Lawrence R. Walsh, W5SMA — SEC: BYX. PAM: BIW. PAM-v.h.f.: FAG. RM: ZU. Officers of the Mesilla Valley Radio Club are PKT, pres.; OPN, vice-pres.; and DRA, secy.-treas. QKJ is chairman of the Field Day committee and RCU heads up the constitution committee. The Los Alamos Radio Club officers are DWB, pres.; OMR, act. mgr.; MII, secy.-treas. The Sandia Radio Club named MSG as chairman of its Field Day committee. WRS is on 3.85 Mc. with an 807, 28-watt portable rig, and an 813 final to the home rig. NQA is on 3.85-Mc. with 100 watts to a 30-ft. vertical. OMR is on 3.85 Mc. again

(Continued on page 94)

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Type 947	6.3VCT @ 6 Amps.	2500V Ins.	\$2.79
Type 948	6.3VCT @ 10 Amps.	2500V Ins.	\$3.67
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Type 143	7.5VCT @ 8 Amps.	2500V Ins.	\$4.12
Type 146	10 VCT @ 10 Amps.	3000V Ins.	\$4.99
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VR-6113	120 14	\$31.00
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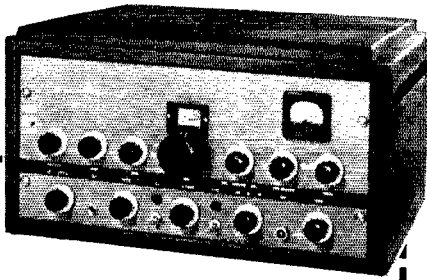
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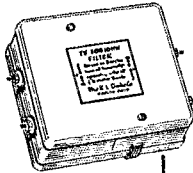
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with 200 watts to a 4-125A. PIZ has a mobile rig on all bands, 3.5 to 28 Mc. DRA has a new rotary under construction. RHZ is a new call at Los Alamos. The Hot Springs "D" Day was a complete success. QDD has a new 32V-2. NKG is using a new center-fed 3.5-Mc. antenna. JXO, AFU, and SMA are using new multi-band antenna which is fed with 300-ohm ribbon. NJR is operating portable from the hospital. MSG, Class I OO, shows he is as usual very much on the job. QNQ is conducting a code class of seven members. Traffic: W5IGO 227, QKJ 211, ZU 118, A5ZU 49, W5AFU 38, MYM 24, JXO 22, SMA 20, A5MYM 19, W5NKG 16, QNQ 13.

## CANADA MARITIME DIVISION

**MARITIME**—SCM, A. M. Crowell, VE1DQ—EC: FQ, EV sent some items of interest on the Moncton boys. GF made his first "UC." AAQ is a new three-letter call. TE is rebuilding to use 812s with 450 watts to the final. WS is on 3.5-Mc. c.w. JG sticks close to the 27-Mc. band. YM is rebuilding to 807 bandswitching final. GN works 7-Mc. c.w. and 14-Mc. 'phone. YU handles traffic on the Bluenose Net. JG is waiting for a dynamotor so he can go mobile. TZ has been "de-bugging" a new 'scope. EV has combined his "Dog House" and ham shack and claims it works well. MARC officers are GF, pres.; EV, vice-pres.; AAQ, secy.-treas.; TZ, EC and PAM. KS has been quite active in both the AFARS and Maritime 'phone nets on 3830 and 4290 kc. Ron schedules VE2GK Sundays at 2:30 p.m. SH is rebuilding to 300 watts 'phone. AAP is a new call in Sackville. VY is active on 3.8 and 7 Mc. c.w. Attention 7-Mc. gang: The Bluenose Net meets Mon.-Wed.-Fri. at 8 p.m. on 7160 kc., manager YU. DQ will be on 3.8-Mc 'phone occasionally during the summer. LZ has a new Col lins 32-V transmitter with all the trimmings, bandswitching, etc. Traffic: VEIKS 32, FQ 18, MK 14, HC 10.

## ONTARIO DIVISION

**ONTARIO**—SCM, Thomas Hunter, jr., VE3CP—Asst. SCM c.w., W. Guillott, 3BUR, Asst. SCM 'phone, E. Kimble, 3FQ, SEC: KM, RMs: ATR, AWE, BMG, BUR, DU, GI, IA, TM, and WK, PAMs: BSA, FQ, and DF. New appointments include IA as RM, ANO as ORS. GI has been reinstated. CGB submitted a fine report in the last Frequency Measurement Test, ATR has been forced to give up the job of manager of the 7-Mc. net, AJU is doing a good job as OO, BER has new quarters, DH is back on the Beaver Net, ABP is awaiting confirmation for DXCC. IL gave a very fine talk on emergency work before the Windsor gang, QE and BL are after ORS and OPS appointments. The new officers of the KARL are PA, pres.; BJE, vice-pres.; BNI, secy.-treas.; and BHJ, act. mgr. VD is on the 7-Mc. net. BCZ is preparing a directory of the Toronto district hams. HP is assistant controller for the London area AFARS. AQG is NCS for AFARS 144-Mc. net with BVN, AWR, BGT, BOW, AOR, AOT, KM, and LU active. IL, BNQ, DEG, and AER visited Windsor at the same time. BSG, AUJ, and CP are on 14 Mc. when not on 3.8 Mc. BKM has a pair of 812s. AGW operates 'phone from 3.8 to 50 Mc. and is doing some nice DX work. CBL is new in Kingston. ASM has a new rig. BQL was flown from Whitehorse for an emergency operation. VR has three-element on 28 Mc. BBY is on 14-Mc. c.w. DEF is after WAS, BDA and BFK are on 28 Mc. from Kingston. ANY is doing an FB job on 50 Mc. I would like to suggest an exchange of club bulletins between clubs. Some fine bulletins are being turned out by Hamilton, Kingston, Windsor, and Kirkland Lake. Traffic: VE3IA 188, BUR, 123, ATR 119, BL 90, WK 81, GI 77, DU 76, WY 72, IL 65, NI 61, APS 53, CP 46, BTQ 43, RLL 40, ANO 39, PH 37, YJ 36, BER 30, BUG 28, ADN 26, BMG 24, AZH 23, AZZ 19, BBM 17, ASL 16, BSK 15, DCW 13, AYW 12, BNQ 11, RG 10, BSA 9, AG 8, BBJ 7, DF 7, HK 6, AER 5.

## QUEBEC DIVISION

**QUEBEC**—SCM, Gordon A. Lynn, VE2GL—On Mar. 14th 65 amateurs gathered at the Ritz Carlton in Montreal to attend a testimonial dinner to our CGM, who has started his 21st year. XP is new president of MARC. QN keeps schedules with QEN, AFARS, and Saguenay Net. EC schedules AKJ daily for outlet to PQN, in addition to RM, ADF, AEM, VE, EV, ABJ, and AIM. ADB has received WAC certificate, ZG, with mobile, has worked the St. Maurice Valley on 144.14 Mc. ACD is back on 3.8 Mc. with n.f.m. 5KF visited EC. BG reports VK contacts fair, CA is working on new n.f.m. for 3.8 Mc. AKM is proud of working F8 and CO, also contacting but losing G and PA on 7 Mc. with 25 watts to 6L6. AKJ has homemade receiver operating as it should. CD and LO spend most of their time on traffic in PQN, EAN, and TRN. DV is busy on 28 Mc. with new ground plane antenna with excellent results. ACC has TBS-50, WV rebuilt rig with pair of 813s in final but accidentally applied 20 volts to filaments with disastrous results. TV has been heard on c.w. trying out new rig pend-

(Continued on page 98)



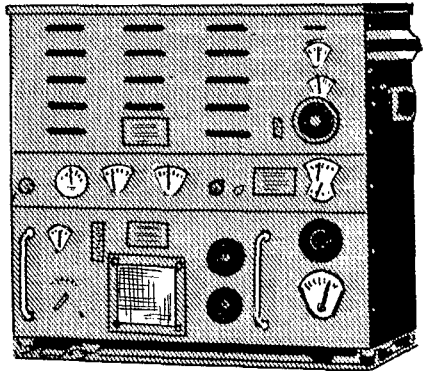
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These sets are sold individually packed in strong, steel-strapped wooden cases, and they are ready to set up and operate. **\$37.50** *ea.*  
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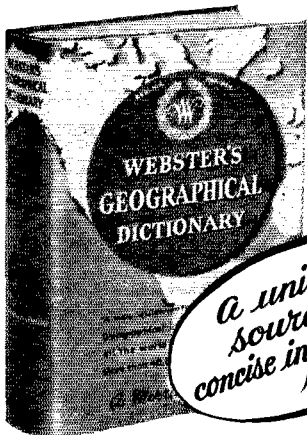
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## Strays

Truer words than these were never written:  
"There must be some kinship between amateur radio and democracy since they appear to thrive so well together."

— Bill Williamson, JA2WH,  
in "FEARL News"

— . . . —

W4NV requests that the gang be on the lookout for his Collins 32-V-2 transmitter, serial No. 638, which was stolen from his shack on either April 22nd or 23rd. Jim will appreciate any information leading to the recovery of same. His address is James C. Melton, 1117 Cambridge Crescent, Norfolk 8, Va.

— . . . —

W and VE amateurs visiting London are cordially invited to attend the meetings of the London Members Luncheon Club of the Radio Society of Great Britain. The group meets on the first Friday after the 15th of each month at the Kingsley Hotel, Bloomsbury Way, London W.C. 1. Arrangements can be made by telephoning Art Milne, G2MI, HURstway 1877, or RSGB Headquarters, HOLborn 7373.

— . . . —

## AN AFRICAN EPISODE

*The Scene:* Southern Africa

*The Time:* Sunday Morning, March 19th

*The Cast:* ZS9F, VQ2HJ, and ZE2KS

*The Plot:* A plane is needed from Livingstone, N. Rhodesia, to convey medical aid to a critically-injured man in the hinterlands of Bechuanaland. The only available means of communication is amateur radio station ZS9F who is trying without success to contact Livingstone on 14 Mc. ZE2KS in S. Rhodesia hears him and tells him that he can QSO VQ2HJ in Livingstone. By means of ZE2KS, contact is established between ZS9F and VQ2HJ and a plane is immediately dispatched. The injured man is flown back to Livingstone and there receives the medical attention he needs.

*Curtain:* Time of play, 2 hours, 5 minutes.

## BRIEF

Amateurs have served the public in many ways but they probably chalked up a "first" when they were instrumental in apprehending a "kidnapper." An emergency bulletin, put out by Ernie Terral, W6KUP, Ruth, Calif., and picked up by Wilfred Dumas, W7JLM, Sparks, Nevada, brought an end to the romantic plans of a 14-year-old school girl and the married driver of her school bus. On Tuesday, March 21st, when the pair disappeared, the local sheriff contacted Ernie and asked him to alert the police because he had the only available means of communication from that area. Ernie put out a general call on 3854 kc., the 'phone frequency of the Mission Trail Net which has good coverage on the West Coast. A complete description of the truck and runaway pair was transmitted several times. One of the many listeners to the net was W7JLM, who saw a truck which answered to the description given out pass his house the following day. He immediately notified the Reno police and they took the couple into custody. An amusing twist to the story is that W6KUP is truly an emergency station. The location of Terral's station is so remote that he uses a water-driven generator to obtain his electrical power.

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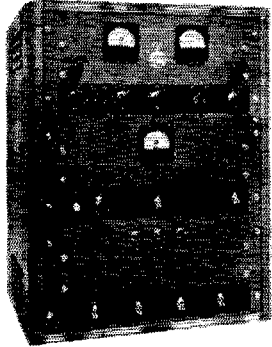


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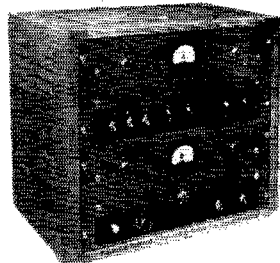
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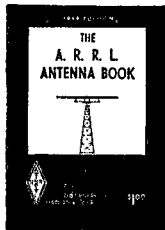
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WEST HARTFORD 7, CONN.

## Impedance Bridge

(Continued from page 24)

design limitations. Adjustments of  $R$ ,  $L$ , and  $C$  are independent of adjustments for  $D$  and  $Q$ . Precision of measurements at the extreme range (for which the bridge arms have very large or very small ratios) may be expected to be somewhat less than that obtainable in the intermediate ranges for which the impedances of the bridge arms are more nearly equal. The parts used in the construction of the bridge are listed in Table I, together with their cost. It is evident that the total cost, including battery, buzzer, and headset detector, need not exceed ten dollars, exclusive of labor. Unless ham radio has changed a great deal since the author operated 9BR in the middle and late Twenties, the pleasure of constructing a bridge such as is described here will certainly be worth ten dollars. On the basis of such reasoning the cost of the bridge approaches the vanishing point!

## So You Don't Get Out

(Continued from page 25)

find 75 'phone useless in evening hours, but 80 c.w. is good then. In the daytime 80 c.w. is usually pretty dead, especially for weak stations down in the noise. This is the time to operate on 40. Chances with low power on 75 'phone are best in the early morning or late afternoon. In general, find the band where the population is fair but not overcrowded.

There is no doubt that 1-db. improvement in the antenna is worth 1-db. increase in power input. However, it is also true that with a fair antenna and a little more operating effort, it is possible to get the contacts. Naturally, my percentages and DX don't compare with those of the "big shots," but I still get a lot of enjoyment out of hamming and depending upon sharpshooting instead of blasting.

## M. A. R. S.

(Continued from page 28)

using two 4-125s in the final, to be driven by either an SCR-522 or a Millen exciter. The six-meter rig will follow the two-meter layout with a happy compromise worked out between the W4AO and the conventional r.f. section. Both transmitters will be capable of handling A1, A3 Class B, two-tone and f.s.k. teleprint, and facsimile at full kilowatt inputs.

## Networks To Expand

Once the v.h.f. teleprinter and voice nets are established along the Eastern Seaboard, efforts will be expended to push them westward to the Rockies. To date more than 250 surplus 522s have been distributed to MARS v.h.f. enthusiasts scattered all over the United States, with a preponderance east of the Mississippi. In event any members have been overlooked they should make their interest known promptly, through channels, to their MARS command director.

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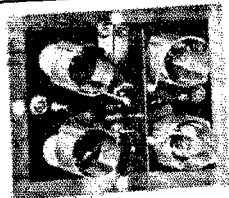
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73, Bil. W2AVA

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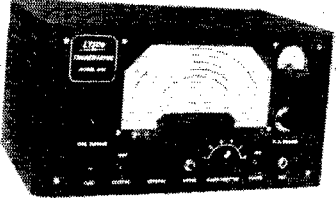
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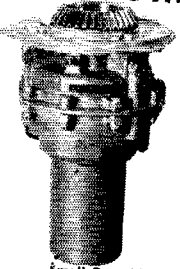


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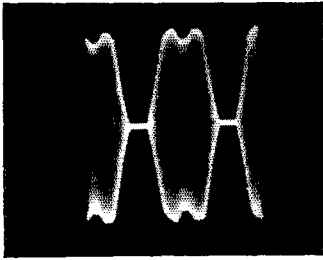
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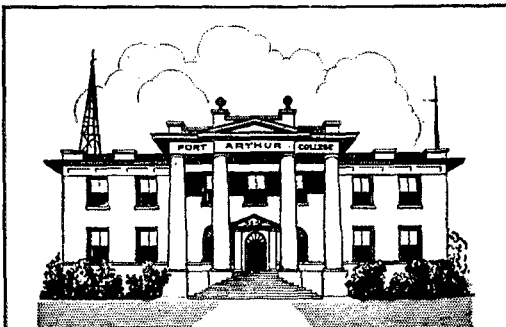
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## U. S. N. R.

(Continued from page 37)

out power or communication. The Fargo training center furnished Cass County Hospital with a small generator for lighting and heating. This generator later was used to provide power for water wells near Sabin, Minn., where livestock were endangered and to provide light and heat for a local transfer company. A large generator was taken to Finley, N. D., about 90 miles from Fargo, for emergency use. Power facilities also were provided for several homes in southwest Fargo. Communications were handled via an amateur radio network, ably controlled by Cmdr. G. L. Dosland, USNR, operating his station, WØTSN, at Moorhead, Minn. The Training Center at Duluth participated in this network, handling several messages.

— . . . —

During the period January 5th-8th, emergency conditions attributable to ice and sleet existed in the vicinity of Little Rock, Ark., including the towns of Camden, Helena, and Dumas. Power lines were down, roads blocked, railroad traffic brought almost to a standstill, and normal means of communication lost. An emergency communication net was established on January 5th by Naval Reserve Training Centers at Helena (K5NRU), Camden (K5NBL), Little Rock (K5NRL), and Electronic Platoon 8-2 at Dumas. Little Rock served as control station and also maintained a circuit to Eighth Naval District Headquarters in New Orleans. W. E. Hughes, RMC, USNR, W5PYU, was a busy man at Camden, manning the circuit single-handed and at times operating two circuits simultaneously. His operations included a hook-up with W4BAQ, Memphis, with whom messages were handled. At Little Rock, operators were F. C. Burt, RMC, USNR, W5EGX, and J. W. Duddy, RM1, USNR, while J. T. Reeder, RM2, USNR, and S. R. Dickerman, USNR, pushed the keys at Helena.

— . . . —

On February 1st, a destructive ice storm disrupted communications in many cities and towns in the North Texas area. Particularly hard hit were Denton, Whitesboro, and Bonham. Assisting in emergency communication efforts were Naval Reserve Training Centers at Dallas (K5NRD) and Fort Worth (K5NRB), the Naval Air Station at Dallas (K5NAD), and Electronics Company 8-51 (K5NBY) at Paris, Texas. Cooperating with ARRL SCM W5CDU and EC W5CJJ, the Naval Air Station at 2330 February 1st dispatched a mobile radio van to Bonham. The Dallas Training Center's communication truck already had departed for Whitesboro. Meantime, NRTC-Forth Worth and NAS-Dallas stood radio guard on Naval Reserve emergency frequencies.

The communication truck from NRTC-Dallas made contact with W5DM, Denton, Texas, while en route to Whitesboro. All communications were handled through W5DM until 0945 February 3rd, when contact was made with Eighth Naval District Headquarters, New Orleans, NAS and NRTC, Dallas, and NRTC, Forth Worth. This circuit continued until 2200 February 4th.

The mobile van from NAS-Dallas arrived at Bonham at 0430 February 2nd and established contact with NAS-Dallas, NRTC-Forth Worth; and later with the truck at Whitesboro. The van operated until 2200 February 4th when an emergency radiotelephone circuit was established to Sherman, Texas, by the Texas Telephone Company. Up to that time, the unit handled emergency Western Union traffic to the Dallas-Forth Worth area, Red Cross emergency traffic, press, and weather information. The van also supplied emergency power to the headquarters used by the repair crews of the telephone and power companies. Traffic count was 114 plus 2000 words of press.

Among Naval Reserve personnel participating in the above emergency communications work were the following radio amateurs: Lt./jg C. G. Levonius, W5OQZ; L. M. Dees, MMC, W5ORV; N. P. White, RM1, W5OTH; W. B. Webb, ALC, W5LTG; C. H. Lewis, ALC, W5BNS; F. W. Alexander, AL1, W5MTF; and R. Sloan, SN, W5OHD.

An additional communication channel out of Bonham was furnished by Joe Morgan, W5OYT, who set up an emergency station in the City Hall at the outset of the storm. A gas-driven generator was provided by Naval Reserve Electronics Company 8-51 of Paris, Texas. Arrangements were made via contact with W5KVV in Paris. Communication for the town of Honey Grove, also without power, was supplied by Charles Cain, W5GML.





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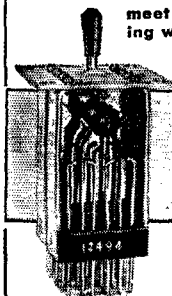
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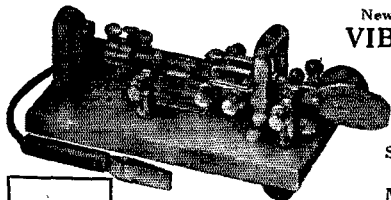
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833 Broadway New York 3, N. Y.

## JAPAN

A WAJAD certificate will be awarded by the Far Eastern Amateur Radio League to any licensed radio amateur who submits QSL cards or other written verification of having contacted one station in any seven of the nine JA districts (JA2-JA9) on either 'phone or c.w. in any amateur band. Only contacts made after January 1, 1949, may be counted.

Submit verifications to the Secretary, FEARL, APO 500, 7/10 Postmaster, San Francisco, Calif. Cards and the certificate will be returned by registered mail.

## PANAMA

The Panamanian government has issued new operating regulations governing amateur radio in that country. According to the terms of the decree, only Panamanian citizens will be issued licenses; however, exceptions will be made in the case of foreigners employed under contract by the Government, or if there is reciprocal licensing in their country of origin. There are three classes of amateur licenses, patterned after FCC regulations. Maximum power input is 1000 watts. The terms of the order affect a total of 82 licensed amateur operators in Panama, of which 41 are American citizens residing there.

Panama is divided into seven call zones by the decree: Province of Panama, HP1; Provinces of Colon and San Blas Islands, HP2; Province of Chiriqui, HP3; Province of Bocas del Toro, HP4; Provinces of Herrera, Cocle and Los Santos, HP5; Province of Veraguas, HP6; and Province of Darien, HP7.

The directors of the *Liga Panamena de Radio Aficionados* announce the establishment of a certificate to be awarded to amateurs who have made twenty contacts with HP stations. Details will appear in a later issue of *QST*.

## INDONESIA

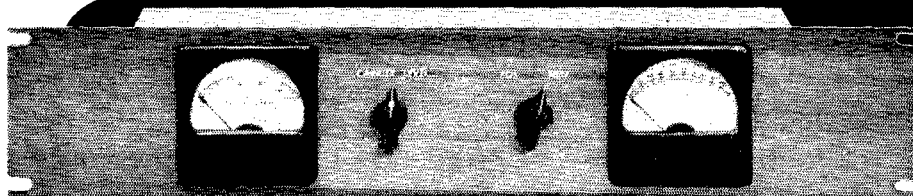
Amateur radio stations in Indonesia have been given legal permission to operate by the Interior Secretary of the new Republic, according to PK4DA. The recently-formed *Persatuan Amatour Radio Indonesia* was informed that stations must stay within the amateur bands and not interfere with other services.

Before the war the Dutch authorities permitted *Nederlandsch-Indische Vereeniging voor International Radio-Amateurisme* members to operate but never issued licenses. This same status prevails now but it is anticipated that a set of regulations governing amateur radio will provide for examinations and licenses.

## ETHIOPIA

Because of security reasons, amateur radio stations in Ethiopia have been temporarily closed down since December. Present plans indicate operation will resume before this summer following the establishment of new regulations.

# MODULATION MONITOR



For accurate and direct indication of modulation percentage at all A.M. frequencies between 1/2 and 150 Mc. Gates offers a new tubeless modulation monitor. Indicates both carrier level and modulation percentage at an accuracy of 2%. Employs 3" meters, indicates positive and negative peaks and requires only 3 1/2" by 19" rack panel space. Excellent for frequency response measurements as well. Requires about 1/2 watt excitation and will attach in a moment to any A.M. transmitter.

Write for bulletin MO3737.

2770 Polk Ave.  
Houston, Texas

Warner Bldg.  
Washington

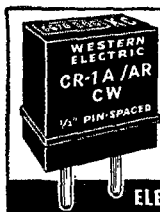
## GATES RADIO COMPANY

Manufacturing Engineers Since 1922

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### GOLD PLATED CRYSTALS

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All fundamental freqs. in Kilocycles

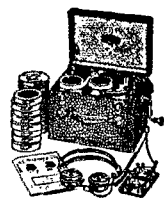
5910	6510	6690	7390
6350	6610	7270	7480
6370	6670	7350	7580
6470	6940	7380	9720

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Tuckahoe 7 N. Y.

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It is easy and pleasant to learn or increase speed the modern way — with an Instructograph Code Teacher. Excellent for the beginner or advanced student. A quick, practical and dependable method. Available tapes from beginner's alphabet to typical messages on all subjects. Speed range 5 to 40 W.P.M. Always ready, no QRM, beats having someone send to you.



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## TRAIN FOR ALL TYPES FCC (RADIO OPERATOR) LICENSES

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### MASS. RADIO SCHOOL

271 Huntington Avenue Boston 15, Massachusetts  
Lic. by Comm. Mass. Dept. Ed.

## MANY DX RECORDS WITH THE VHF 152A

The VHF 152A Converter has consistently set new DX records on both 2 and 6 meters — where it's a must! On 10 and 11 meters it eliminates troublesome images — also provides additional gain. If you contemplate using these bands, you can't be without a VHF 152A ahead of your receiver.

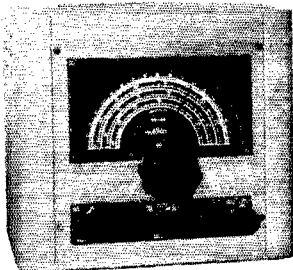
### Other Popular RME Equipment

HF-10-20 Converter (for 10, 15 and 20 meters)  
DB-22A Preselector (550 KC to 44 MC)  
RME-45 Communications Receiver (550 to 33,000 KC)

Write For Free Literature

TIME WILL TELL  
**RME**

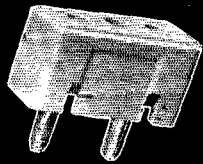
RADIO MFG. ENGINEERS, INC.  
Peoria 6, Illinois





# NATIONAL

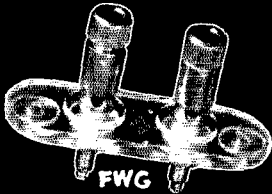
- **P**roven
- **D**ependable
- **Q**uality



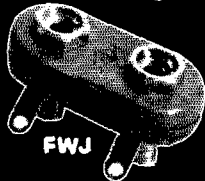
FWF



FWH



FWG



FWJ

## DELUXE TERMINALS

**FWG.** Polystyrene terminal strip for high frequency use. Binding posts take banana plugs at top, grip wires thru hole. at bottom. Net 60¢

**FWH.** Molded mica bakelite insulators with serrated bosses grip thinnest panel firmly. Binding posts, same as FWG. Net 66¢

**FWJ.** Same insulators as FWH but with jacks. When used with FWF plug no metal is exposed. Net 54¢

**FWF.** Banana plugs in molded mica bakelite. Fits FWG, FWH, FWJ. Leads may be connected thru top or side. Excellent for 300-ohm twin lead. Net 70¢

National deluxe insulators and fittings are available for a wide range of uses.

### National



NATIONAL COMPANY, Inc.  
MALDEN, MASSACHUSETTS

## How's DX?

(Continued from page 64)

from VR1 and also that F9ET has left for Madagascar with hopes of putting 500 watts worth of FB8 on the air. F9ET asserts that as of April Madagascar licensees will assume a more legal status. W6NZ has undertaken to handle the QSL department for F9ET/FB8 . . . . . A gander at the juice in the Southern Calif. DX Club *Bulletin* reveals that VS6JH plans a trip to VS5 for ham operational purposes before returning to England and that CR5UP will be back home at the CT1BW key shortly. An F8EX letter therein specifies an FH8AA as due to appear on Wallis as well as the activity of FQ8s HC and AB. None of the W6s quoted seems to take the DX Test VR8AA very seriously inasmuch as he was heard to stumble once or twice and blurt "DE W. . . ."

— . . . . —

You probably haven't heard of the WØ DX man who was acquitted from bumping off the doctor who cured his insomnia. Undoubtedly little truth to the yarn but it does leave a clue as to how some guys are able to operate, seemingly, upwards of 24 hours per day on 20 meters.

## Correspondence

(Continued from page 55)

have a junior section of news on activities published in *QST*. I have discussed this with many c.w. amateurs, and all are very enthusiastic. After all, we are the future old-timers.

— Frank Miller, VE2AFV

## FASHION NOTE

Lorne Park, Ontario, Canada

Editor, *QST*:

If any of the OMs are looking for a pair of cuff-links, I suggest using two screw-back type League emblems. As cuff-links these hold better and last much longer.

— Fred Burton

## Hints and Kinks

(Continued from page 57)

used to keep the relay from chattering under modulation. Be sure, if an electrolytic condenser is used, that the proper polarity is observed as shown.

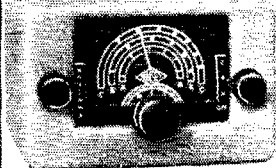
In selecting the relay, the ideal situation is to have a relay that requires approximately the same amount of current normally drawn by the final amplifier under full load. The desirability of a given relay for this purpose can be checked by connecting it in series with a milliammeter, a variable resistor, and a battery larger than the rated operating voltage of the relay coil. If the relay "falls out" at less than one-fourth of the current you plan to use in the final amplifier, it is too sensitive, and should be shunted by a low-enough resistance to reach the desired value. If the relay fails to operate at the current you plan to use, you'd better try another, or go on c.w., because it just won't do! — *Cmdr. E. E. Comstock, USCG, W7CNS*

**SWITCH**  
**TO SAFETY!**



# GOING MOBILE? TERMINAL HAS IT!

## GONSET 3-30 MOBILE CONVERTER



**ASK A HAM WHO HAS ONE!** A highly sensitive mobile converter with continuous bandspread coverage from 3 to 30 Mc. in three bands. Size only 5 1/4" x 3 1/2" x 5 1/4". Easily

attaches to your automobile set or any BC superhet. Complete with tubes and connecting cables.

**39<sup>95</sup>**

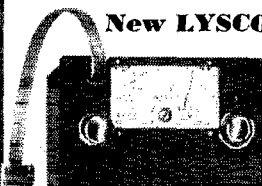
## LYSCO 10 METER Mobile Transmitter

**Model 129** - Extremely compact size (4 x 5 x 5 1/2 inches) for easy under-dash mounting in your car. Delivers 15 watts A-3 emission on 27-29.7 Mc. Uses 7 or 9 Mc. crystal. Power requirements are 6.3 volts AC/DC @ 2 amps and 350 volts DC @ 110 Ma. Uses three type 6AG7 tubes for oscillator, amplifier and modulator. Antenna termination for 50 ohm coaxial line and antenna change-over relay. Microphone may be T-17 or any single button carbon type. Less tubes and accessories

**23<sup>95</sup>**

**Model 175**—Same as above, for 75 meter band... 23.95

## New LYSCO Miniature VFO only 3x4x5 inches



**Model 381**—Good stability with series tuned "Colpitts" oscillator. Illuminated dial, calibrated for 80, 40, 20 and 10 meter bands. Output on 80 or 40 meters. Has three 6AK5

tubes for oscillator, buffer and doubler. Requires 6.3 volts AC/DC @ 1.35 amps and 200 volts DC @ 30 Ma. maximum. High impedance model, complete with tubes and 14" ribbon lead with plug for crystal socket.

**21<sup>95</sup>**

**Model 381-R**—As above, but low impedance model. 15 ft. coaxial cable with remote tuned circuit on 80 or 40 meters. Complete

**27<sup>95</sup>**

## MASTER MOBILE MOUNTS AND ANTENNAS

IN STOCK! See Master Mobile's QST ad for full descriptions and prices.

## MALLORY VIBRAPACKS--In Stock!

Dependable, smooth, low battery drain and equipped with built-in noise suppression. A model in stock for your requirements, priced low!

# TERMINAL

RADIO CORPORATION

Distributors of Radio & Electronic Equipment  
85 CORTLANDT ST., NEW YORK 7, N. Y. • Worth 4-3311 • Cable: TERMRADIO

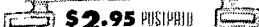
## CALL LETTER PLATES

Type A-18 -  
For Your Car



A large, sturdy cast aluminum plate with satin-finished letters and border against a black baked enamel background. Red, green, blue and gray -- 50¢ extra. Size - 2 1/2" x 8 1/2" with 1 1/2" letters.

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## LAPEL BUTTONS

An attractive metal button with highly polished raised letters against a black background. Other colors 50¢ extra.



ACTUAL SIZE **\$1.10** POSTPAID

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## CODE SENDING CODE RECEIVING SPEED



## HAVE SKILL, ACCURACY

SEND AND RECEIVE CODE this EASY - FASTER WAY! The CANDLER SYSTEM has developed expert Amateur and Commercial Operators, and Code Speed Champions. In a few weeks you can pass the code examination for license. You can send and receive with amazing skill and speed, without tension. Long hours of practice unnecessary to acquire proficiency. THE WAY YOU LEARN is ALL IMPORTANT! By simple progressive lessons Candler teaches you at home to send and receive as easily as you talk or read - FAST, ACCURATELY. SEND NOW FOR FREE BOOK - explains how fine amateurs and radio-telegraph experts learned code and developed skill and speed.

LEARN is ALL IMPORTANT! By simple progressive lessons Candler teaches you at home to send and receive as easily as you talk or read - FAST, ACCURATELY. SEND NOW FOR FREE BOOK - explains how fine amateurs and radio-telegraph experts learned code and developed skill and speed.

## CANDLER SYSTEM CO.

Dept. 4-G, P. O. Box 928, Denver 1, Colo., U. S. A.  
and at 121 Kingsway, London, W. C. 2, England

# SHOOTS TROUBLE FASTER!

MAKES MORE MONEY FOR YOU ON JOB OR AT SERVICE BENCH!

In radio service work, time means money. Locate trouble faster, handle a much greater volume of work with the SIGNALLETTE. As a trouble shooting tool, SIGNALLETTE has no equal. Merely plug in any 110V. AC-DC line, start at speaker end of circuit and trace back, stage by stage, listening in set's speaker. Generates RF, IF and AUDIO Frequencies 2500 cycles to 20 Megacycles. Also used for checks on Sensitivity, Gain, Peaking, Shielding, Tube testing. Wt. 13 oz. Fits pocket or tool kit. Satisfaction, or money back! See at your distributor or order direct.

# Signallette

MULTI-FREQUENCY GENERATOR

**\$995**

at distributor or post-paid, direct. No C.O.D.'s, please. Ohioan's add 3% State Sales Tax.

## CLIPPARD INSTRUMENT LABORATORY, INC.

Dept. E, 1125 1/2 Bank Street, Cincinnati 14, Ohio  
Qualified Jobbers write, wire for details



# HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contact discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League takes the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

*Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.*

**Please note the 7¢ rate on hamads is available to ARRL members only.**

**QUARTZ** — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 719 World Bldg., New York City.

**QSLs, 100, \$1.25 up.** Stamp for samples. Griffith, W3FSW, 1042 Pine Heights Ave., Baltimore 29, Md.

**QSL's, SWL's.** Finest stock. Fairest prices. Faster service. Dossett, W9BHV QSL Factory, 855 Burlington, Frankfort, Ind.

**QSL's!** Kromkote cards at a fair price. Dauphinee, W1KMP, Box 219, Cambridge 39, Mass.

**SUBSCRIPTIONS.** Radio publications a specialty. Earl Mead, Huntley, Montana, W7LKM.

**QSL's high quality, fair prices.** Samples? WGPP R. D. Dawson, 1308 F Street, The Dalles, Oregon.

**10-METER Beams, \$19.50.** Send Card for free information, Riverside Tool Co., Box 87, Riverdale, Illinois.

**CRYSTALS:** Bassett Type 100A precision low-drift units made to your exact specified frequency within the 80 or 40 or 20 amateur bands, at \$1.50 each, plus postage. Rex Bassett, Inc., Bassett Building, Ft. Lauderdale, Fla.

**QSLs, Stationery, "etc."** Taprint, Sumrall, Miss.

**ZIPPO lighter, ARRL insignia and call sign, inlaid enamel, \$5.00.** Ideal birthday gift. McCarron, W2BNO, 384 E. 193 St., New York 58, N. Y.

**WANTED:** Marconi magnetic detector, multiple tuner; DeForest responder and audion control panels; other wireless gear prior to 1925. Franklin Wingard, Rock Island, Illinois.

**QSLs.** Have you seen them yet? Samples today. Your best bet. Larry's QSLs, Opportunity, Wash.

**FOR Sale:** by estate of W0TGZ: 100-watt cw transmitter in floor rack, BC-348-Q converted, Hallicrafters SX-24, Hallicrafters S-72, BC-696, etc. All equipment in excellent condition. Send stamp for complete list. Hazel T. Lamney, Extr, 3019-54th St., Des Moines 10, Iowa.

**TELEPHONE BAR** relay 7-7777 any hour of the day, night, Sundays, holidays, for rush shipment of all standard parts and equipment! Lowest amateur-dealer prices. Harrison Radio, 225 Greenwich Street, New York City. "Ham Headquarters Since 1925."

**GONSET** Ten-meter converter, original carton, \$29.00. Brush Soundmirror tape recorder, Model BK401, perfect condition with 4 tapes. Cost \$230.00. Make an offer. QSTs 1932 to date, 25¢ each. W3EEH, 1530 Brookhaven Road, Wynnewood, Penna.

**SELL:** 144 Mc. transmitter, 100 watt. Exact copy of one on p. 354 of 1947 Handbook. Complete with the 6 tubes, meters, two crystals, etc. First offer over \$45.00. Irving T. Patridge, W0T1, Milbank, So. Dakota.

**CARDS? QSLs? SWLs?** "America's Finest QSLs!" No cheap trash! QSL samples, 10¢. Sakkers, W8ED2, Holland, Michigan. One day QSL service!

**FOR Sale:** HQ-129X, Meissner EX signal shifter with NBFM, 1 Kw power supply; 600 watt final with pair of 4-125A's and pair of 6V6 clampers. A-1 relayed, metered, in 3 1/4' foot high TVF proof relay rack. A-1 condition. \$400.00 amateur radio, Box U-46, Storrs, Conn.

**QSLs, SWLs.** Very attractive. Best in printing and prices. Kromkote or any other stocks. Samples. W4LXJ, Rood, Radford, Va.

**WANTED:** Hallicrafters S-39 receiver. Will trade S-36 receiver, or pay cash. W7ADI, Burton, Washington.

**STILL** looking for copy of famous Pink Sheet "Ban Off" Supplement 1919, in good condx. Wish to buy, not swap. Write E. Collins, 83 Deerfield, Manchester, Conn.

**SELL** BC-610-D complete, all bands, including speech amplifier. W. S. Soich, W9HXW, 6221 S. Bishop, Chicago, Ill.

**SELL** or swap: Pair used 250THs, sockets, fil. transformer. Also UTC 5V, IJA, transformer; 803; 50T. Want: microphone, 813s, large modulation transformer, etc. Make an offer. WIAB, Box 157, Essex, Conn.

**TRADE:** Almost new 80 bass Italian accordion for ART-13 or other ham gear. Woodmansee, W6HRX, 608 17th, Santa Monica, California.

**SELL:** VT-73 mike, Collins 32 V-1, National 173, spare final 4D32. Perfect condition, \$600.00. WAPGO, MOQ, 405-C, Gunter AFB, Montgomery, Ala.

**WANTED:** S-72 or good receiver covering .540-30 mg. Have following to trade or sell: new 19C-344J; new BC-342N; new BC-221 with bk. xtal, tubes; BC-779B (needa overhaul) with Hammarlund supply; ART-13. Write to Circle A Ranch, 18425 4th S.W., Seattle, Washington.

**QSLs, SWLs.** Stock up now! C. Fritz, 1213 Briargate, Joliet, Illinois.

**WANTED:** BC-610 complete. W. Robinson, 1405 N. Garden, Boise, Idaho.

**NEW** crystals for all commercial services at economical prices, also commercial re-grinding. Over fourteen years of satisfaction and fast service! Eldison Electronic Co., phone 3901, Temple, Texas.

**LOCALS only!** Sell RAK-7 Navy 15 to 600 Kc receiver, and spare parts: \$30.00. W2JB, Lazarus, 173 West 78th St., New York, N. Y.

**MUST** sell my HT-19 transmitter. Original, like new. Need cash but will consider some trade. Also N.C. 57 receiver. Bob McMurry, W5MTP, P.O. Box 4299, Corpus Christi, Texas.

**FOR sale:** Brand new Collins exciter, Model 310-B1, \$150.00. Write or details. W. A. Kuehl, 3656 Lincoln Ave., Chicago 13, Ill.

**QSLs** of distinction! Three colors and up. Rainbow map QSLs. Special DX QSLs. Samples? Uncle Fred, Box 80, Lyan, Penna.

**SURPLUS:** RT-7/APN-1 Altimeter with tubes, excellent, \$7.95; PL-4 filter, \$1.80; PL-3 filters \$1.37; trouble-shooting manuals BC-348, BC-779, BC-610, SCR-522, \$1.00 each; heavy duty 115 VAC 60-cycle selsyns, \$7.20 pair; RG-8/U, 6¢ ft., 500 ft., \$27.50; Selsyn indicator kit for 110V includes 1-82, \$6.15; 10 Henry 400 Ma chokes \$3.77; IN34 xtals, 69¢; RCA sound-powered units, \$2.22 pair; AN/AP5-13 with tubes, excellent, \$14.95; 4 µfd 1000 VDC, \$7.80; 451 control, 62¢; 13 Henry 250 Ma chokes, \$3.22; Radar Vagi antennas, \$7.00. Free Bargain Bulletin. Electronic Research Labs, 1021-Q Callowhill Street, Philadelphia, Penna.

**MATH** problems solved easily. Complete slide-rule course, covers all phases of hamming. Math instructions, slide-rule technique. Personalized individual instructions. Thirty seconds solves 5 minute, longer calculations. Instructor Electrical Engineer. Class A ham. First two lessons, \$1.00; total 15 lessons, \$5.00. KH6PJ, 4280 Sierra Drive, Honolulu, Hawaii.

**10 and 20-meter beams, \$19.25 up.** Aluminum tubing, etc. Willard Radcliff, North Countyline St., Fostoria, Ohio. P.O. Box 547.

**GIGANTIC** surplus equipment mail sale: Amazing values! Everything must go! Meters, burglar-fire alarms, telephones, transmitters, cathode ray tubes, thermists, motors, electric drills, A-C generators, air compressors, relays, 110 volt elements, etc. Everything less than manufacturers' cost. We pay parcel post charges. Rush a card to us for sales catalog. Burden Sales Co., 862 "O" St., Lincoln, Nebraska.

**HRO5TA1** complete, perfect, \$200.00; BC-348R converted 110V, perfect, \$65.00; Millen R9'er, 20 and 10 coils, like new \$18.00; 6V6, 6L6, 807 McElroy FU40 assembled 40-watt ECO/XTA1, rig, 5 1/4" rack mounting, 80 through 10, looks professional, \$30.00 less the power supply. H. Frank, W5EGA, 711 N.W. 30th Oklahoma City, Okla. Apt. 1.

**ARE** you or a friend going to try for an amateur radio operator's license? Check yourself with a complete-coverage multiple-choice test similar to those used by the F.C.C. Class B & C test, \$1.75. Class A test, \$2.00. Amateur Radio Supply, 1013 Seventh Ave., Worthington, Minnesota.

**COLLINS** equipment represents the best value for the radio amateur. All units stocked. We trade and offer terms. Evans Radio, P.O. Box 312, Concord, N. H.

**SALE** or swap SX-23 for Amertran 6200 V 700 Ma. W8TSD, Box 94, Oak Harbor, Ohio.

**BC224F** receiver, complete with AC supply broadcast converter, speaker, \$80.00. BC-221 frequency meter complete with xtal tubes original calibration book, \$45.00. WE and Raytheon 6AK5's, 50¢ each. W4POH, Apt. 1, 106 Mendoza Ave., Coral Gables, Florida.

WESTON Laboratories, Weston 93, Mass., will buy for cash your lab quality test equipment.

WANTED: Experienced amateur to help re-establish and align phone/cw station, one who has meters and test equipment. Surplus equipment or cash for services. Location: Shaker Heights. Contact Stanley Stein, W8YMV, 2460 Fairmount Blvd., Cleveland Heights, Ohio.

SELL: Rack-mounting HRO-7 in 3 ft. cabinet. Perfect condition. \$300.00. P. O. Box 430, W9ASO, Eau Claire, Wisconsin.

SELL or swap: Signal generator Precision E-200-C, new, never used and in perfect condition: \$40.00 or swap for drill press of equal value. Robert Crysnack, W3RTQ, 1220 Woodland Ave., Pittsburgh 12, Penna.

SOUND power head and chest set, \$5.00. Pair of new S.P. handsets, \$8.00. Weston 785 analyzer \$79.50. Weston 564 V-ohmmeter, \$16.00. Sensitive altimeter, \$6.95. H. G. McEntee, 490 Fairfield Ave., Ridgewood, N. J.

COMPLETE ham station: BC-610E and BC-614E, manual; BC-459 and 696 VFO, power supply; SX-28 receiver, manual; Spare 250TH and two 100THS; 4-element beam and rotator, 10 meters; 10 ft. Trylon tower. All in excellent cond. First \$500.00 takes station. You pay crating and shipping. W. W. Dinlop, W4PNZ, Rm. 4D984, Pentagon, Hq, USAF, Washington 25, D. C.

SELL: Stancor 69, using 807, CW and fone, coils 160 to 10; 60 watts, mike, key, two extr. 807's. \$50.00 F.o.b. W1EZG, Paul Barrabee, 53 Morseland Ave., Newton Centre, Mass.

FOR sale: Military model Meissner signal shifter, 20 through 160 meters, self-contained power supply, in excellent condition, \$30.00. Dr. C. R. Crosby, (W1QP, ex-WIDDD), East Harwich, (RFD Chatham), Mass.

TVI proofed 1 kw all-band transmitter for sale: A.M., N.B.F.M., C.W. V.F.O., Hallicrafters HT-18 V.F.O. and N.B.F.M.; Exciter to PP807's to PP250TH's. Mod. J04TL's in Class AB1. Speech Amp. with clipper, all enclosed, completely shielded in 6 1/2 ft. relay rack cabinet. Completely TVI proof in fringe area, with chokes, by-passes, low-pass filter, A.C. line filter, etc. B & W Butterfly assembly and turret. A beauty! Best reasonable offer. Also PP1's final amp. \$25.00; NC-240D receiver. Make offer. Also many parts. Write for complete list. H. A. Wark, W2VZW, 75 Main St., Newton, N. J.

WILL swap Meissner 150-B transmitter, which is not converted, for BC-779, KP-81, or some other similar receiver. John R. Adams, jr., W4HX1, Camilla, Ga.

FOR sale: Used Dynamotors, Ecor type, 600 volt 150 Ma. output, 5.7 volt 25 amp. input. Price: \$25.00 each. W51GQ, Homer, Louisiana.

SELL: New National H.S.F. receiver, with power supply and a complete set of coils 27-250 Mc. Highest cash offer. Willis N. Weaver, W3AVO, R.D. No. 7, York, Penna.

WANTED: Radio ham who understands poetry. To proofread and correct some amateur dribble. Will pay well. Have about 50 poems(?). Charlie Short, Rdo opr. SS New London, KHBO, Sieling & Jarvis, 74 Trinity Place, New York, N. Y.

COLLINS 310B-3. Sell for best offer. Perfect condition. Factory carton. Used less than thirty hours. No time to operate. Paul Elliott, Route 2, Bishop, Texas.

BARGAINS: New and used transmitters, receivers, parts. Globe King, \$299.00; HT-9, \$225.00; Temco 75GA or Supreme AF100, \$250.00; Sonar SRT-75, \$149.00; ART-13, \$149.00; new 150-watt phone, \$199.00; HT-6, \$85.00; 60-watt phone, \$89.00; Globe Trotter, \$57.50; New Meissner signal calibrators, \$29.95; MB611, \$29.50; HRO complete, \$129.00; SX-43, \$129.00; NC173, HQ-129X, \$139.00; RME-45, SX-25, \$95.00; RME-69, \$75.00; S-38, \$29.95; S-41, \$22.50; VHF \$49.00; BC610's and many other. Large stock of trade-ins. Free trial. Terms are financed by Leo, W6GFQ. Write for catalog and best deal to World Radio labs, 740-44 West Broadway, Council Bluffs, Iowa.

SURPLUS: BC-221 frequency meters, clean and in perfect condition; \$39.50 each. Send your orders to the Monarch Electric Company, 411 Wood Street, Pittsburgh 22 Penna.

QSLs, SWLS. Samples free! W1HJ1, Cushing, Box 32A, Manchester, N. H.

FOR sale: HT-18 VFO, HT-9 Hallicrafters, 150 watt transmitter. Complete set of coils. Best price. Late model. Harold Knoll, W8DTP, Holland, Mich.

QSLs, SWLS. Meade, W6KXL, 1507 Central Ave., Kansas City, Kansas.

SELL: SX-28 with matched speaker. Perfect. Best offer over \$95.00. Fred Kloepper, W6PON, Lawrence, Kansas.

SELL: Mackay 167BY 200-watt CW with built-in NBFM and 600-watt power supply, \$200.00. Postwar HT-9 with 3 sets of coils, \$225.00; Millen exciter with 4 sets of coils with 300 watt power supply, \$35.00; HQ-129X with speaker, \$100.00; Amertran 6200 CT at 700 Mc 110 VAC primary, \$33.00; Good used 813 tubes, \$3.00 each; UTC CG 301, new, \$7.00; Wanted: any QST's December 1915 through December 1916. L. Rizoli, WIAAT, 100 Bay View Ave., Salem, Mass.

SELL: Complete SCR-274 type 80, 40 meter station, spare tubes, \$35.00. W0ZTU, Udeshet, Summit, So. Dakota.

2-Volt Willard BB54 plus Vibrator, \$2.29. 1N34, 67¢. GE/211G1 Selyns, used, guaranteed. Pair, \$1.48. "TAB," 109 Liberty, N. Y. C.

A BARGAIN! Hallicrafters S-38, latest model, \$39.50 list, \$29.50 net. Dick Bruce, 1171 Union St., Manchester, N. H.

BARGAINS: New and reconditioned Collins, National, Hallicrafters, Hammarlund, RME, Millen, Meissner, Gon-Set, others. Reconditioned S-38, \$29.00; S-40A, \$59.00; SX-43, \$119.00; HT-18 \$69.00; HQ-129X, \$129.00; SP400X, \$219.00; NC-173, \$139.00; NC-183, \$199.00; DB-20, \$29.00; DB22A, \$49.00; HF-10-20, \$59.00; VHF-152A, \$69.00; RME-45, NC-57, NC-240D, NC-200, HRO-7, HT-9, BC-610, 32V, 75A, etc. Shipped on trial. Terms. List free. Henry Radio Stores, Butler, Missouri.

WANTED: SP-44 Panadaptor, also BC-344. State condition and price. Keel, W0NEN, 732 18th, Des Moines, Iowa.

SWAP or sell: Windpower 45-ft. guyed tower. Hot-dipped galvanized steel. New! Very rugged. Best offer. Reason: changed OTH. W1QKF Vigoda, 1450 Beacon St., Brookline, Mass. BE 2-2411.

FOR Sale: BC-221AK, complete with power supply, like new. Perfect. \$80.00. Howard A. Wilson, W4KQZ, 9 Westmoreland Road Tauxemont, Alexandria, Va.

SELL: Meissner 150B transmitter with signal shifter. In excellent condition. \$175.00. J. E. Spiegel, W4MEL, P.O. Box 1011, Lake City, Florida.

WE offer a new surplus power supply unit delivering 600 v. at 350 Ma. and 6.3 VAC at 12.5A from 115v. 60 w fully assembled with best components (15 µfd output condensers measures 18" long x 9" wide x 1 1/4", net weight 62 lbs., gross weight 120 lbs. Constant duty ratings with less than 1% ripple assure satisfaction; fine for excitors, low powered transmitters, etc. The Overbrook Company, Overbrook 81, Mass.

WANTED: HQ-129X or like. Cash. H. Stewart, 4187 Richmond Ave., Staten Island 12, N. Y. C., N. Y.

IDENTIFY yourself. Your call and name on rear window of your car with 2-inch gold with black trim. Water slide-off decalcomania letters and numbers. 20¢ each. Money orders only. B. J. Lumbard, W0BQJ, 1319 N. Virginia, Mason City, Iowa.

HAM'S HAVEN where amateurs fish and holiday. On Big Eagle Lake in Northwest Ontario. Family cabins. Write J. B. Connor, VE3AFH, Box 238, Dryden, Ontario, Canada.

MODERN QSLs. Sample booklet, 12¢. Stamps OK. Westerners see samples at leading ham stores. van Groos, W6GFY, 1436 No. Serrano, Hollywood 27, Calif.

TELEVISION rummage sale! Save as much as 80% off list on giant screen TV sets, wired chassis, kits, cabinets, tubes, antennae, ham items, electronic parts, service equipment, etc. High quality merchandise. Open only every Thursday evening from 7 to 11 PM; all day Saturdays. Television Warehouse Outlet, 1379 Palmer Ave., Larchmont, N. Y. (opposite RR station). PS: Can't come? Send for Rummage Sale Catalog "S".

QSLs made to order. Ham stationery. Prices right. Samples. Snyder, W9DRH Print, Peru, Indiana.

SELL: Meissner signal shifter, latest no-drift model EX. Factory wired. In excellent condition. Best cash offer over \$55.00. Phil Smith, W8HUD, 1756 Yosemite, Birmingham, Mich.

SNAIDER auditorium projection television for sale or trade, cheap. Originally sold for \$1495.00 Brand new. Will consider radio parts, ham gear or cash. Herman J. Simard, jr., W1MYO, P.O. Box 806, Lynn, Mass.

SX-43 receiver and R44 speaker, in excellent condition. National TV7M television receiver, near new. Must sell. Best offer takes one or all. Ship c.o.d. Ken D. Johnson, Hazelton, Iowa.

## AIM IT WITH THE MAP

## BUILD IT FROM THE ANTENNA BOOK

SEE PAGE 79

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RECEIVING  
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## Automatic Sender

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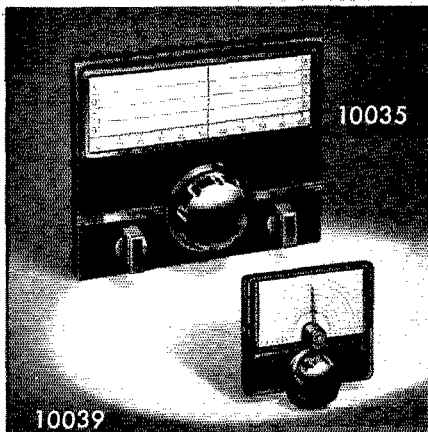




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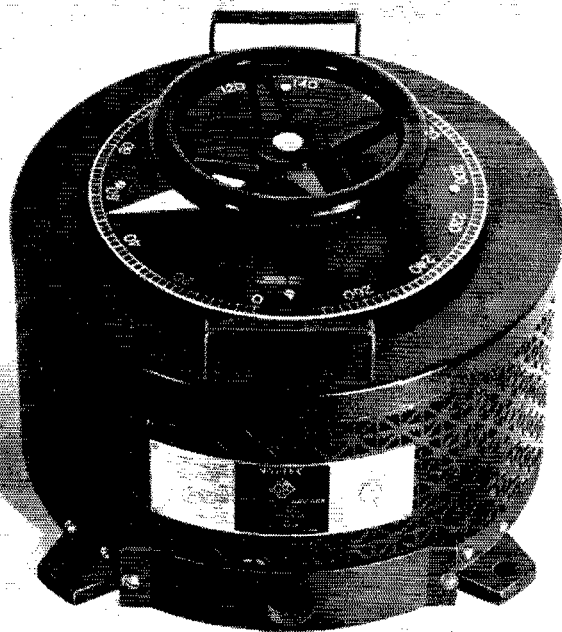


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The Type 50 VARIAC (above) is rated at 5 kva on a 115-volt line with output voltages adjustable either from zero to 115 or zero to 135 volts. Its rated current is 40 amperes and its maximum 45. This Type 50-A model is priced at \$140. The 50-B, the 230-volt input model, is rated at 7 kva with a rated current of 20 amperes and a maximum of 31 amperes. It is priced at \$140.00, also.

VARIACS in single or ganged units are available to handle any load from 170 va to 24.7 kva. They are described in detail in the **VARIAC BULLETIN**. May we send you a copy?



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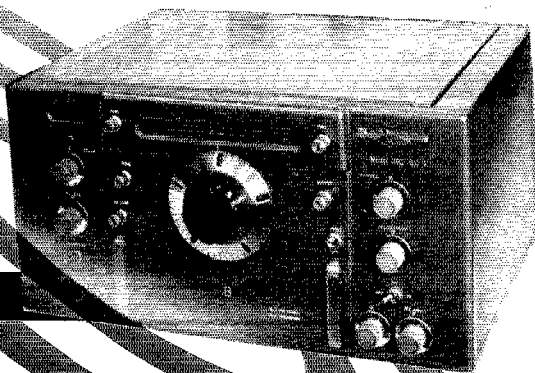
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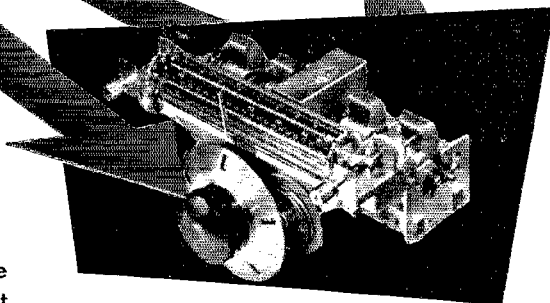


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50 kc - 35 mc.\*  
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Maximum frequency coverage  
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The HRO-50 tunes easily with direct  
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Type 50TS 10" PM Speaker . . . . .	Net \$14.00
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HRO-50E 900—2050 kc. . . . .	Net \$16.35
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#### PRICE:

HRO-50T (illustrated), \$335,  
less speaker; supplied with coils  
AA, B, C, D. HRO-50R (rack  
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B, C, D. Prices slightly higher  
west of the Rockies.



# Introducing...

# HAM TIPS



A PUBLICATION OF THE TUBE DEPARTMENT · RCA · HARRISON, N. J.

## A Panoramic Adaptor with a Circular Base Line

By W. E. Babcock\*

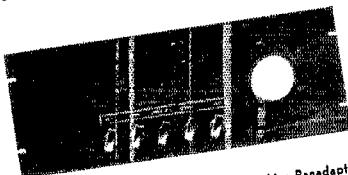


Figure 1. Panel view of the Circular Base Line Panadaptor showing position of the front controls and CR tube face.

**S**IMULTANEOUS visual reception of a large number of radio signals over a broad band of frequencies is provided by the panoramic adaptor. It may be used with almost any type of receiver, and provides an indication of the frequency, type, and strength of all signals within a given bandwidth (centered at the frequency to which the receiver is tuned). When used to spot unoccupied channels in the band it can be an invaluable aid in avoiding interference problems. When used with a calibrated scale it becomes an accuracy frequency meter. The amateur who owns a panoramic adaptor will no doubt find many additional uses for it.

\*Originally, a panoramic adaptor is a super-tuned r f stage with a broadly tuned i f stage. In the

position of the pip on the screen is determined by the position of the pip on the circumference of the circle as shown in Figure 2. The center frequency (to which the receiver is tuned) is shown at zero, while other signals are shown in proper frequency relationship to this zero.

### General Circuit Description

A circuit diagram of the panoramic adaptor is given in Figure 3. The signal input to the adaptor is taken from the plate of the converter tube in the receiver. The 6AU6 r f stage is tuned to the intermediate frequency of the receiver and has a rising frequency characteristic either side of the center frequency to compensate for the drooping frequency characteristic resulting from the sensitivity of the r f sp-stage in the receiver. The circuit of the 6BE6 mixer stage is tuned to the usual receiver i f, + 160 kc) at the rate of 6 times per second. The sawtooth voltage driving the reactance modulator tube, and the circular sweep voltage for the cathode-ray tube are both derived from the 60-cycle line voltage.

Plate and screen voltages for all tubes except the cathode-ray tube are obtained from a conventional full-wave rectifier. The anode voltage of the cathode-ray tube is obtained from a full-wave rectifier in which the output voltage is

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