

# QST

April 1956  
50 Cents  
55c in Canada

devoted entirely to

# amateur

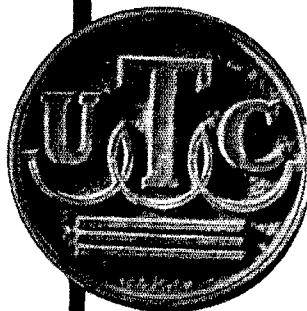
# radio



THE STANDARD OF COMPARISON FOR OVER 20 YEARS

# HIGH FIDELITY TRANSFORMERS

FROM STOCK... ITEMS BELOW AND 650 OTHERS IN OUR CATALOGUE B.



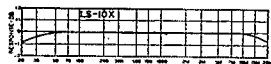
## TYPICAL UNITS

### LINEAR STANDARD series

Linear Standard units represent the acme from the standpoint of uniform frequency response, low wave form distortion, thorough shielding and dependability. LS units have a guaranteed response within 1db. from 20 to 20,000 cycles.

Hum balanced coil structures and multiple alloy shielding, where required, provide extremely low inductive pickup.

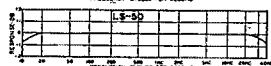
These are the finest high fidelity transformers in the world. 85 stock types from milliwatts to kilowatts.



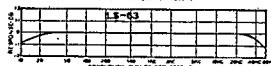
**LS-10X Shielded Input**  
Multiple line (50, 200, 250, 500/600, etc.) to 50,000 ohms... multiple shielded.



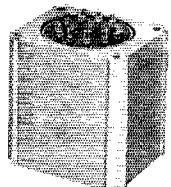
**LS-19 Plate to Two Grids**  
Primary 15,000 ohms.  
Secondary 95,000 ohms C.T.



**LS-50 Plate to Line**  
15,000 ohms to multiple line... +15 db. level.



**LS-63 P.P. Plates to Voice Coil**  
Primary 10,000 C.T. and 6,000 C.T. suited to Williamson, MLF, ui-linear circuits.  
Secondary 1.2, 2.5, 5, 7.5, 10, 15, 20, 30 ohms. 20 watts.



**CASE LS-1 LS-2 LS-3**  
Length... 3 1/8" 4-7/16" 5-13/16"  
Width... 2 3/8" 3 1/8" 5"  
Height... 3 1/4" 4-3/16" 4-11/16"  
Unit Wt. 3 lbs. 7.5 lbs. 15 lbs.

### HIPERMALLOY series

This series provides virtually all the characteristics of the Linear Standard group in a more compact and lighter structure. The frequency response is within 1 db. from 30 to 20,000 cycles. Hipermalloy nickel iron cores and hum balanced core structures provide minimum distortion and low hum pickup. Input transformers, maximum level +10db. Circular terminal layout and top and bottom mounting.



**HA-100X Shielded Input**  
Multiple line to 60,000 ohm grid... tri-alloy shielding for low hum pickup.



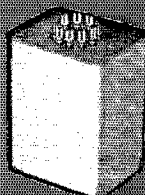
**HA-106 Plate to Two Grids**  
15,000 ohms to 135,000 ohms in two sections... +12 db. level.



**HA-113 Plate to Line**  
15,000 ohms to multiple line... +12 db. level... 0 DC in primary.



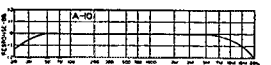
**HA-133 Plate (DC) to Line**  
15,000 ohms to multiple line... +15 db. level... 8 Ma. DC in primary.



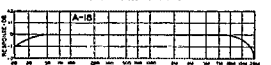
**CASE HA-100 HA-106 HA-113 HA-133**  
Length... 4 1/2" 4 1/2" 4 1/2" 4 1/2"  
Width... 3 1/2" 3 1/2" 3 1/2" 3 1/2"  
Height... 3 1/2" 3 1/2" 3 1/2" 3 1/2"  
Unit Weight... 2 lbs. 2 lbs. 2 lbs. 2 lbs.

### ULTRA COMPACT series

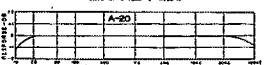
UTC Ultra Compact audio units are small and light in weight, ideally suited to remote amplifier and similar compact equipment. The frequency response is within 2 db. from 30 to 20,000 cycles. Hum balanced coil structure plus high conductivity die cast case provides good inductive shielding. Maximum operating level is +7db. Top and bottom mounting as well as circular terminal layout are used in this series as well as the ones described above.



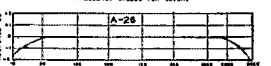
**A-10 Line to Grid**  
Multiple line to 50,000 ohm grid.



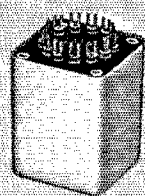
**A-18 Plate to Two Grids**  
15,000 ohms to 80,000 ohms, primary and secondary both split.



**A-20 Mixing Transformer**  
Multiple line to multiple line for mixing mikes, lines, etc.



**A-26 P.P. Plates to Line**  
30,000 ohms plate to plate, to multiple line.



**A CASE**  
Length... 1 1/2"  
Width... 1 1/2"  
Height... 2"  
Unit Weight... 1/2 lb.

### OUNCER series

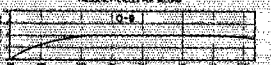
UTC Ouncer units are ideal for portable concealed service, and similar applications. These units are extremely compact, fully impregnated and sealed in a drawn housing. Most items provide frequency response within 1 db. from 30 to 20,000 cycles. Maximum operating level 0 db. These units are also available in our stock P series which provide plug-in base. The 1015 is a new line to grid transformer using the heavy gauge hipermalloy shields for high hum shielding.



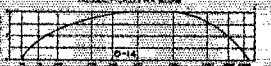
**O-1 Line to Grid**  
Primary 50, 200/250, 500/600 ohms to 50,000 ohm grid.



**O-6 Plate to Two Grids**  
15,000 ohms to 95,000 ohms C.T.



**O-8 Plate (DC) to Line**  
Primary 15,000 ohms, Secondary 50, 200/250, 500/600.



**O-14 50:1 Line to Grid**  
Primary 200 ohms, Secondary .5 megohm for mike or line to grid.



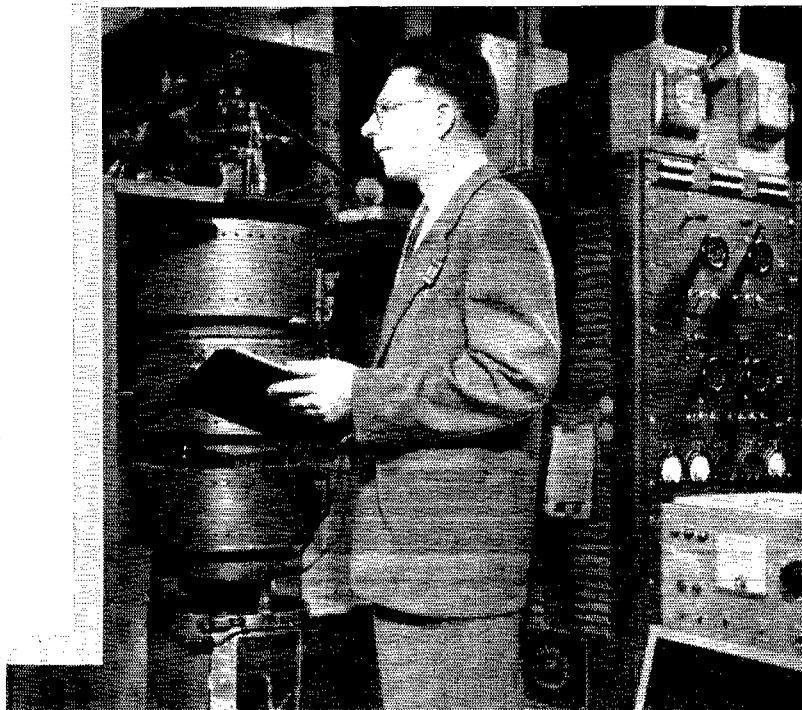
**OUNCER CASE**  
Diameter... 7/8"  
Height... 1-3/16"  
Unit Weight... 1 oz.

# UNITED TRANSFORMER CO

150 Varick Street, New York 13, N. Y. EXPORT DIVISION: 13 E. 40th St., New York 16, N. Y. CABLES: "ARLAC"

## W2GYV CHECKS PERFORMANCE OF G-E 12-KW KLYSTRON

Transmitting power tubes like this carry u-h-f television to viewers in all parts of the country. Rigid General Electric tests precede shipment and installation. The special equipment for klystron tests shown in the picture, was designed and built under the direction of W2GYV (L. F. Jeffrey). Features are the three large beam focusing coils, surrounding the upper half of the tube . . . the rectangular wave guide on top, into which output of the klystron is fed by a coaxial line ending in a  $\frac{1}{4}$ -wavelength antenna . . . the elaborate power-supply control and metering cabinet at right.



# Radio Amateur Lawrence F. Jeffrey Holds Important G-E Power-tube Responsibility

WITH 8 states still to contact on six meters—he has 40 already in his log-book—amateur Jeffrey (W2GYV) can be pardoned for wishing his rig had a final as high-power as G.E.'s big 12-kw television klystron!

A licensed ham since 1934, Jeffrey finds that his after-hours work with mike and key is a hobby tuned to the same frequency as his daytime job as supervisor, tube circuitry engineering for General Electric power tubes.

Moreover, 25 percent of the electronic specialists who work for and with Jeffrey, are active amateurs. Experience gained, lessons learned in the ham shack, contribute to efficiency in testing and designing circuits for G-E tubes whose frequencies go from d-c to microwaves—whose power ranges from milliwatts to megawatts.

Radio amateurs like W2GYV share importantly in the design, manufacture, and

testing of tubes—power, receiving, C-R—built in all 7 General Electric tube plants. Ham vision and know-how are quality ingredients of G-E tubes of every type supplied by your local distributor! *Tube Department, General Electric Company, Schenectady 5, New York.*

\* \* \*

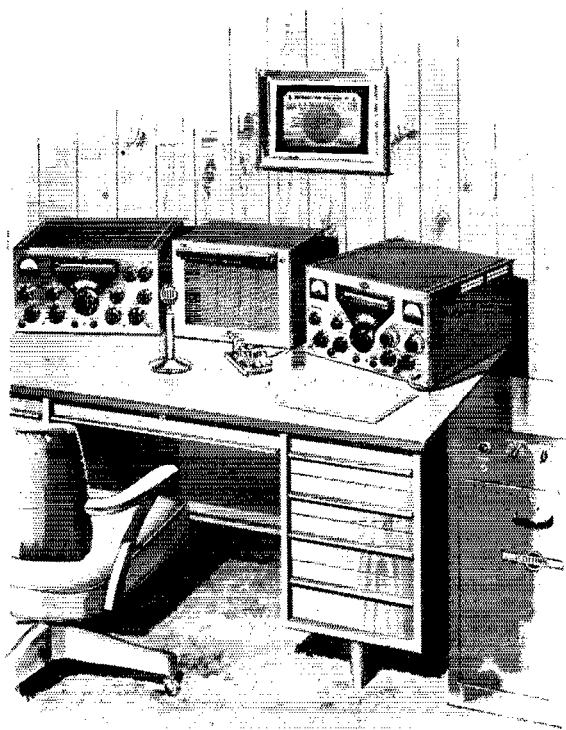
**Congratulations from General Electric to the 1955 Edison Award winner, Robert W. Gunderson, W2JIO, Bronx, N. Y.!** Mr. Gunderson was named for noteworthy achievement by the committee of judges because, a blind operator himself, he continued to aid others similarly handicapped by editing the only electronics magazine in Braille and completing 30 types of special test equipment for the blind. By presenting the Edison Award trophy and gift to W2JIO and by citing other amateurs for meritorious 1955 service, national recognition again was given the efforts of all radio amateurs in the public interest.

GENERAL  ELECTRIC

COLLINS NEW

# Time Payment Plan

MAKES THE FINEST SSB EQUIPMENT  
AVAILABLE NOW



Collins 75A-4 Receiver, 312A-1 Speaker/Control,  
KWS-1 Transmitter and Power Supply.

Collins Radio Company and its distributors have made it possible for you to operate the new Collins SSB rig while you're paying for it. It can be yours right now by taking advantage of the new Collins Time Payment Plan. A small down payment will team you and superior SSB performance on the Ham bands. Your present equipment may apply on the down payment, too. See your Collins distributor — he'll explain how that Collins rig can be yours for a few dollars a month, with up to 18 months to pay

#### Here's how easy it is to own Collins SSB equipment

Take the Collins 75A-4 Receiver for example. For as little as \$59.50 down, you take your 75A-4 home and start operating. You can choose the plan that fits your budget best — as low as \$33.00 a month for 18 months, or fewer payments if you wish.

Here's another good point to consider. Collins advanced engineering and quality construction give you a station with lasting value. When it comes time to modernize your rig in the years ahead, your Collins equipment will retain its position of top trade-in value on the Amateur market.

*Collins*

CREATIVE LEADER IN COMMUNICATION





APRIL 1956

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**OFFICES**

38 La Salle Road  
West Hartford 7, Connecticut  
TEL.: AD 3-6268      TWX: HF 88

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# QUALITY PRODUCTS

BY

**B&W**

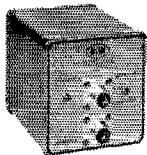


### DIP METER

This indispensable measuring instrument helps you get the most out of your equipment. It will save you time in initial transmitter tuning, neutralizing, antenna loading, and dozens of other jobs. Extremely versatile, the unit will serve you equally well as a sensitive grid dip meter, signal generator, absorption wave meter, or signal monitor from 1.75 to 260 mc. The calibrated, color coded dial is divided in five bands, matching each of the five coils supplied.

Net Price: Model 600 .....\$39.75

### AUTOMATIC T - R ANTENNA SWITCH

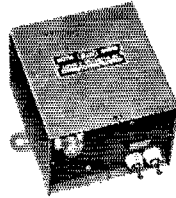


Fully automatic electronic antenna change-over from receiver to transmitter and *vice-versa* — suitable for all power applications up to the legal limit. Model 380B is ideal for voice operated SSB — AM phone and break-in CW — all with one antenna.

Net Price: Model 380B \$23.70

ALL OF THESE FINE B&W products are available at leading distributors' everywhere.

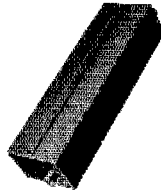
### 1 KW BALUNS



Fill the gap between unbalanced feed lines and balanced antenna loads, provide maximum transfer; low power line radiation on transmission; high signal-to-noise ratio on reception. Models for rotary beam, folded dipole antennas.

Net Price: Models 700 to 714 .....\$16.50

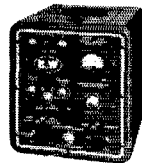
### LOW PASS FILTERS



Fight TVI by attenuating undesirable harmonics and spurious radiation by a minimum factor equal to 17,780 to 1 with this new B&W low pass filter. Wave Guide principle and novel multi-sectional construction mean more attenuation in less space at lower cost.

Net Price } Model 425 (52 ohms imp.) } \$14.85  
 Price } Model 426 (75 ohms imp.) }

### SINGLE SIDEBAND GENERATOR



The 51SB generator offers sparkling SSB performance with your present B&W, Collins, Johnson, or other commercial or composite home built transmitter, on 80 through 10 meters with the output frequency control presently in your transmitter.

Net Price: Model 51SB \$279.50

### PLUG-IN LINKS



Match present feed lines up to 600 ohms by pulling out one coil, plugging in another with correct number of turns. Wide range of sizes and turns available.

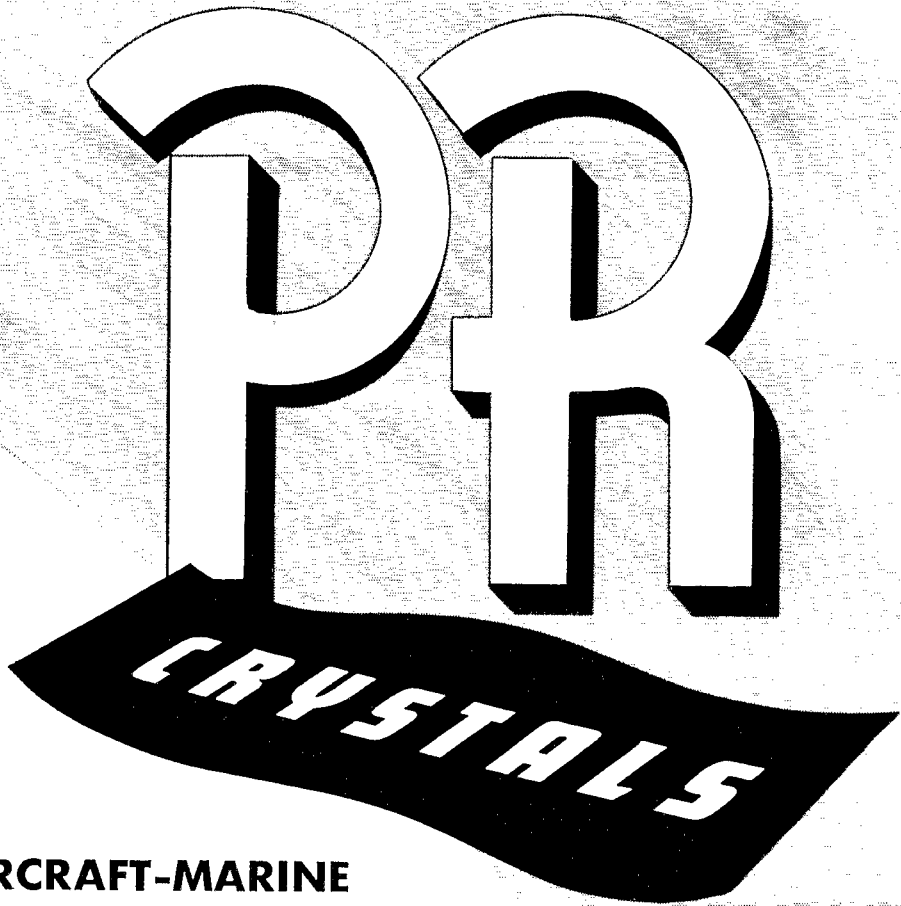
Net Prices for links, arms, and arm and hinge assemblies, range from \$.60 to \$1.86.

WATCH FOR the big value announcement on B&W's new L-1000A 1 KW Single Sideband Linear Amplifier!

All prices subject to change without notice.

## Barker & Williamson, Inc.

237 Fairfield Ave., Upper Darby, Pa.



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## 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*. **ARRL Field Organization station appointments** are available in the areas shown to qualified League members. These include ORS, OES, OPS, OO and OBS. SCMs also desire applications for SEC, EC, RM and PAM where vacancies exist. *All amateurs* in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).

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Ontario	VE3IA	G. Eric Farquhar	16 Emerald Crescent	Burlington, Ont.
Quebec	VE2GL	Gordon A. Lynn	R.R. No. 1	Ste. Genevieve de Pierrefonds, P. Q.
Alberta	VE6MJ	Sydney T. Jones	10706-57th Ave.	Edmonton, Alta.
British Columbia	VE7JT	Peter M. McIntyre	981 West 26th Ave.	Vancouver, B. C.
Yukon				
Manitoba	VE4HL	John Polmark	109-13th, N.W.	Portage la Prairie, Man.
Saskatchewan	VE5HR	Harold R. Horn	1044 King St.	Saskatoon

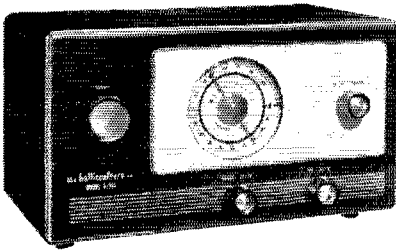
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# THE AMERICAN RADIO RELAY LEAGUE, INC.,

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.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.



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# "It Seems to Us..."

## NEWCOMER TRENDS

Recently, a would-be ham walked into Hq. for some additional help in getting on the air. This is not a rare occurrence, but what set this particular incident aside in our mind was the book he already had on getting into ham radio. We took some time to leaf through it; the experience is one we won't soon forget.

A recent publication, it is liberally sprinkled with information on learning the code, procedure in FCC examinations, on-the-air operating and ARRL organization. Its bulk, however, is occupied with a catalogue-type description of equipment the newcomer can buy — receivers, transmitters, antennas, test gear, mobile equipment. There is even a separate chapter devoted to "how to buy it," with advice on time payments, shipping costs, trade-ins, etc. In all fairness, it must be said that in these respects we felt the book performs a useful function of guidance to the newcomer.

What startled us, however, was to find in a general introductory text on amateur radio there was not one schematic diagram or symbol, not one word about the most elementary theory, only the barest suggestion that the written portion of the amateur examination deals with theory and technique, not one word of encouragement that the beginner might learn — and have fun — by constructing some of his own gear. The author abhors the thought of "building a receiver from scratch," and in the transmitter field infers that even building from kits is for the other guy; "the charge for factory assembly and wiring, including testing and adjustment, is well worth while." An alternative title could easily have been a quote from the text: "Putting a factory transmitter on the air is no more work than installing a floor lamp."

We simply cannot bring ourselves to subscribe to this as a picture of amateur radio; if it is, pardon us while we shed a tear. We aren't so reactionary as to ignore the growing trend toward "store-boughten" equipment, nor do we fail to recognize the vital importance of the radio manufacturing industry to our growth and progress. But we cannot completely ignore the existence of radio technique as a prime field for the interest of the radio amateur; we must, we believe, do more than put modern

amateur radio right alongside the TV set and washing machine (and floor lamp!) as just another home utility. We must indicate that the need of the prospective amateur today, as in the years past and the years to come, is how to learn something about radio, not stopping with advice on what and how to buy. To stop at that point is a far cry from the amateur radio we know and have nurtured, miles distant from the "service of self-training, inter-communication and technical investigations" defined in international treaty and the reason for the continued existence of amateur bands.

We have not reached the point where it no longer becomes of the slightest importance to know what's going on behind the dials. We have not reached the point where we avoid telling prospects that much of the fun and real satisfaction in amateur radio can come from a suggestion for an improvement in technique that sends us diving toward the junk box, gleam in eye, to dig out parts and try the gadget. Amateur radio must continue to take more than an academic interest in new developments in the art; our interest in technique is not confined to how many knobs per dollar a receiver offers. Prospective amateurs must continue to look forward to being more than third-class telephone permit holders, or citizen-band licensees.

Many of today's leaders in the communications field began their careers through an early interest in amateur radio — an attraction which, we'll wager, was primed largely by technical interest. We cannot subscribe to an amateur radio that, ten or twenty years hence, will depend on its contribution to the art from "amateurs" raised in the belief that what goes on inside the crackle-and-chrome boxes is wholly unimportant.

### ARE YOU LICENSED ?

- When joining the League or renewing your membership. It is important that you show whether you have an amateur license, either station or operator. Please state your call and/or the class of operator license held, that we may verify your classification.



**Harry R. Hick**

... *QST* Contributor Extraordinary

**T**HE IMPRESSIVE RECORD of having served *QST* continuously for 40 years is established this month by Harry R. Hick, artist and draftsman, who has contributed to every issue since April 1916.

Harry first saw *QST* on the newsstands in that year and went to Clarence D. Tuska, one of its pioneers, with the request that he be allowed to make covers for it. He made the cover of the following issue and his first hook-ups were done for the July 1919 issue.

The square letters *QST* and the flash symbol on the cover today are Harry's product. He has become renowned for his ability to draw hookups rapidly and estimates that his diagrams for *QST* now total well in excess of 8000. In one two-week period he prepared 300 of them for the Handbook.

His ham interest began with a spark set and a second grade license prior to World War I. His amateur career with station 1ESS was interrupted by this conflict, in which he served in the aviation section of the signal corps, attaining the rank of sergeant.

He is married and the father of three children. He served ten years on the Rocky Hill, Connecticut, Board of Education and was a member of its building committee for a year. He is former treasurer of Rocky Hill Methodist Church and has been finance officer for the Campilio-Holmes Post 123, American Legion, since its organization in 1923. He has been a member of Washington Lodge No. 81, A.F.&A.M., of Cromwell, Connecticut, for 25 years.

Harry also will have been an employee of Aetna Life Insurance Company for 40 years in 1956. Nearing retirement, he looks forward to having more time for the thing he likes best, drawing, and for painting in oils and water color. He particularly likes landscapes, for he finds that like hookups they take careful planning for proper design and layout.

April, 1931

... Twenty-five years ago this month the editors of *QST* were alive with thoughts of Spring and the out-of-doors. Gil's cartoon cover showed the Podunk Hollow gang out sprucing up the club shack, while over in the back of the magazine you were urged to obtain a large metal ARRL auto emblem, so that other hams would recognize you on the road.

... Jim Lamb took a look into the future, and gave some dope on how to move up from the "short" waves and take advantage of the wide open spaces on 160 meters. Most of the emphasis was on antennas and coil construction.

... George Grammer came to the aid of those who wanted clean signals, with his description of "A Harmonic Monitor".

... On the editorial page was a report of continued cooperation with B.C.L.'s; and admonishments to stay within the band, 'cause the Department of Commerce, Radio Division, had finally determined to take action against out-of-band offenders.

... Ev Battey reported on the phone-vs.-c.w. Transcon Relays, with phone winning some rounds and c.w. the others. These Relays were of such importance that April 1931 *QST* devoted 13 pages to the write-up. In addition, there were 7 pages of pictures and descriptions of the outstanding stations in the Transcon Relays.

... Ross Hull produced for League members a story of the crew at 38 LaSalle Rd., complete with pictures and biographies.

... J. S. Cebik wrote up a Push-Pull A.C. Receiver Using Screen-Grid Tubes, which was described as being just the thing for the ham with a push-pull complex.

... In the I.A.R.U. News were reports about New Zealand hams participating in earthquake traffic, as well as reports from several other active overseas amateur societies.

... And in the human side of the news it was reported that over at WIMK one night Ev Battey so vigorously manipulated the key that it collapsed.

... Those who peruse the ads will find *QST* of 25 years ago a fascinating place. The Manhattan Electric Bargain House lists some Army and Navy radio surplus; and some fine 40 meter crystals are available at \$40.00 (unmounted), but the price drops to \$15.00 in the 160-meter band.

... A real nifty double-button carbon mike is listed at \$19.50, and the Leeds Co. offers a 10-watt transmitter kit for \$70.00. RCA lists a UV-211, rated at 75 watts output, at a firm net price of \$30.00; and both E. T. Cunningham and CeCo give specs on some of their latest tubes.

#### COMING A.R.R.L. CONVENTIONS

- March 3 — Michigan State, Grand Rapids
- April 14-15 — Southeastern Division (West Indies Section), San Juan, Puerto Rico
- June 9-10 — Rocky Mountain Division, Denver, Colorado
- June 15-16-17 — West Gulf Division, Galveston, Texas
- July 6-7-8 — ARRL National Convention, San Francisco, Calif.

# A Club-Project 2-Meter Portable

*KBT Radio Club Produces Hand-Carried V.H.F. Rigs*

BY CARL H. ERICSON,\* W2PPL

• "Let's start a construction project!" If this idea comes up in your club it may be the start of a program that will do the organization a lot of good. Or it could mean headaches for the sponsors, before it's done with. How it turns out depends mainly on planning done beforehand. Here is a report on a project that was carried through in a business-like manner, giving members a useful piece of equipment and valuable experience in cooperative effort.

CLUB CONSTRUCTION PROJECTS may serve many ends. They may help to educate the newer members of the fraternity in methods of construction. Their purpose may be to obtain a number of duplicate units for CD work, or to develop an interest in club activities through cooperative effort. In the KBT Club of Buffalo it was decided that a club project would be worthwhile, so a committee was appointed to investigate and report. This article relates the experiences of that committee, and describes the result.

It was decided that suitable and popular units that might be constructed would be (in the order of increasing difficulty) monitors, modulation meters, grid dippers, field-strength meters, and hand-carried transmitter-receivers for 2, 6 or 10 meters. The committee also recommended that one of the first three units be chosen. As might be expected, the voting membership of interested amateurs chose the portable transmitter-receivers, to operate in the two-meter band, the most difficult of the projects.

From this point the committee worked to develop a suitable circuit and layout from available literature plus home-grown innovations, and to set up some form of financial and administrative organization. We followed through the project with a small committee doing all of this work in a more or less informal manner, but now, with the advantage of hindsight it is quite apparent that a much more effective organization might have included the following:

*Chairman* — to coordinate all groups and to act most essentially as a whip to get things done on time.

*A Technical Committee* — to develop the unit, construct and test a pilot model and to act as advisors to the working groups.

*An Expediter* — to break construction down into subunits, to call the participants and arrange

construction meetings, and to make sure that a each of these meetings there would be sufficient parts, tools, hardware, etc.

*A Treasurer* — to collect all payments and keep books on same and purchases.

*A Buyer* — to purchase all material.

Nine members registered for the project at the outset. We expected to pick up more members than we would drop as time went on and news of the project spread, so twelve units were started. This proved to be a sound decision as we easily filled our quota, and had but one drop out, whose rights were bought up immediately.

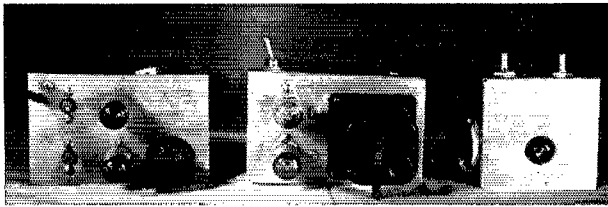
Financing was complicated. Some members were willing to pay cash at the beginning but most wanted to buy in on time, so a schedule of monthly payments was set up, the total investment being about 20 per cent more than estimated total cost. This was done so there would be some cash on hand to take care of small emergencies, and to avoid the necessity of charging anyone more than he expected to pay. At the conclusion of the project the surplus was divided equally.

There were quite a number of participants that felt we should not expect them to purchase parts for the unit if they could supply the parts from their scrap box for their own use. In order to avoid the difficulties that would arise if we were to build similar units with dissimilar parts we chose to refuse all substitution parts unless they could be offered in lots of twelve and therefore



The author, *right*, and K2DVD work a little DX with their KBT Radio Club 2-meter portables.

\*727 Moore Ave., Kenmore 23, N. Y.



Subassembly construction made mass production of the 2-meter rigs possible for KBT club members. The combined audio-modulator unit, center, is flanked by the transmitter r.f. section, and the receiver front end.

be used in all units. We further stipulated that a nominal price would be paid for all parts so obtained. Much to the credit of human nature we received quite a lot of assistance in this way, yet all of it was donated outright and, in some instances, donated by people not participating in the project.

Membership in the project was by registering name, telephone number and nights most favorable for working, and making the initial and subsequent monthly payments as they fell due. At the outset it was announced that the club, or the project in itself, would not buy up any membership in the project. Once a person signed up his only way out and only way to recover any of his investment would be to sell his rights to some other person at whatever price could be obtained. No trouble was encountered by this rule. It was additionally stipulated that possession of the unit by a member would not be allowed until the final payment had been made. Here again no trouble arose. We had no rule set up to enforce an equitable distribution of the work and subsequent developments showed that some advantage might be realized by having such a rule; however, its formulation and enforcement might be difficult.

There proved to be more bookkeeping than first met the eye on even so small a project as these dozen units. The total funds ran into several hundred dollars and disbursements reached 20 or 30 different vendors. To keep track of this in a manner that would avoid confusion and misunderstanding required that at least an elementary bookkeeping system be set up. There was work enough that the financial secretary, or treasurer, of the project found plenty to do. Certainly, the regular club treasurer should not be burdened with these extra duties.

Some sort of a technical committee was essential to the very existence of such a project. After a suitable circuit for the unit was developed there were other problems that arose and had to be considered by the committee and then voted upon by the participating group. In our 2-meter project a suitable circuit was developed around reasonably inexpensive components. From this point decisions were made on the following alternatives:

Some of the group wanted small hand-carried units with built-in mikes and phones such as were built by the Detroit CD group.<sup>1</sup> In order to simplify construction it was decided to build the units in a more spacious case, large enough to permit the use of a rechargeable wet battery

<sup>1</sup>"Structural Details of the Detroit CD Portables," *QST*, Feb., 1953, p. 16.

and vibrator supplies if such were desired. Since most of the fellows already had mikes and phones, to keep costs to a minimum these were made external to the units. In fact, even jacks were omitted as some men wanted 2-pin and some wanted 3-pin jacks. Some of the members wanted to add another 3A5 amplifier to the transmitter and some wanted to replace the super-regenerative receiver with a simple superhet. All of these desires were taken into consideration and insofar as possible, the units were designed to permit their inclusion at a later date.

The usual advantages of subassembly construction apply fully to a project of this sort, as future changes can be made with a minimum of disturbance to remaining circuits and the small confines "open up" when the subassemblies are pulled out. One other advantage which really outweighed the others in our project was that the subassemblies allowed the work to progress simultaneously on several parts of the units, and this would not have been practical if they had been all on one chassis.

Since labor was free, the expense of project-constructed units such as these is principally the cost of the parts, so if any savings are to be made they must be made in the purchase of the components. The postwar amateur is pretty well schooled into thinking in terms of both new and surplus parts, and some savings can be made if surplus parts can be used. There are, however, pitfalls to avoid. Since we used surplus transformers that may not be available for replacement in the future, the layout of parts was made with an allowance of sufficient space to allow replacement with any of several commercially-available transformers. Quite a number of the other components were procured from surplus sources also, and as much time and effort might be wasted if each component failure was referred back to its source, we adopted a blanket policy of making an over-purchase of 10 per cent on all parts, including tubes. This assured us of a sufficient supply of parts when we wanted them and did not actually run up costs 10 per cent because our parts failure wasn't that bad. The extra good parts were auctioned off at a regular club auction, the proceeds reverting to the treasury of the project. All in all, the savings were sufficient to justify the extra effort required to search out and purchase low-cost surplus parts.

### Getting Started

Finally the day arrived for our first construction get-together and almost at once our vision of an automotive type production line went up in thin air. We learned the hard way what a

production engineer probably could have told us in 15 seconds: that it is not economical to set up much of a production line for 12 units. Too much time was consumed in trying to explain to each station just what parts went where, only to have those parts added in fifteen minutes and the worker waiting for new instructions. Repeat this process with eight or ten men simultaneously and bedlam results. Our first night of full group effort produced a gay time for all, but very little real work done!

Here is where the subchassis idea really paid off. All chassis were bent and drilled by two of the most mechanically minded members. The antennas were made by another man. The receivers were built by three of the men working in their own homes, and the transmitters and audio chassis were built by other groups working separately. This proved to be far superior to the one production line, as the difficulty of getting everyone together at once was avoided, and yet efficient assembly methods could still be employed. It is quite possible that someone with more experience in such matters could have made a production line work well, but it wasn't for us.

Before any of the actual construction started all of the components were tested. The transformers were tested for continuity, shorts and grounds. Resistors were tested and those beyond 10 per cent rejected. So were the capacitors and, in addition, they were given a high voltage check. Out of the several hundred parts tested there were about a dozen rejects, each of which may well have represented a nasty trouble-shooting job avoided on the completed units.

Testing consumed about six man-hours, and it certainly saved much more than that in trouble-shooting time!

Visual inspections were made three times: once after all parts were mounted, once after about half of the wiring was in place, and finally, when the wiring was completed they were inspected. The first inspection checked for correct positioning of sockets, transformers, variable condensers, etc. A number of mistakes were caught and corrected before the final testing. These rather inelaborate precautions produced finished units that all worked the first time tested, with only a little coil squeezing needed to line up the transmitters and put the receivers in the band. After a few units had been tested and their average performance noted, the rest tested out very rapidly in that a performance standard was established and the tester knew quickly when he neared optimum performance. While the testing was originally viewed with some trepidation it turned out to be one of the simplest and certainly the most satisfying phase of the whole project.

### The Subassemblies

The unit is constructed on three subchassis and housed in an aluminum chassis 8 by 12 by 3 inches, with an aluminum cover plate, to form a case. The receiver chassis is 3 by 3 inches with a 2-inch turndown on two sides. The transmitter chassis is 4½ by 3 inches with a 2-inch turndown on one side. The audio chassis is identical to the transmitter chassis except for drilling.

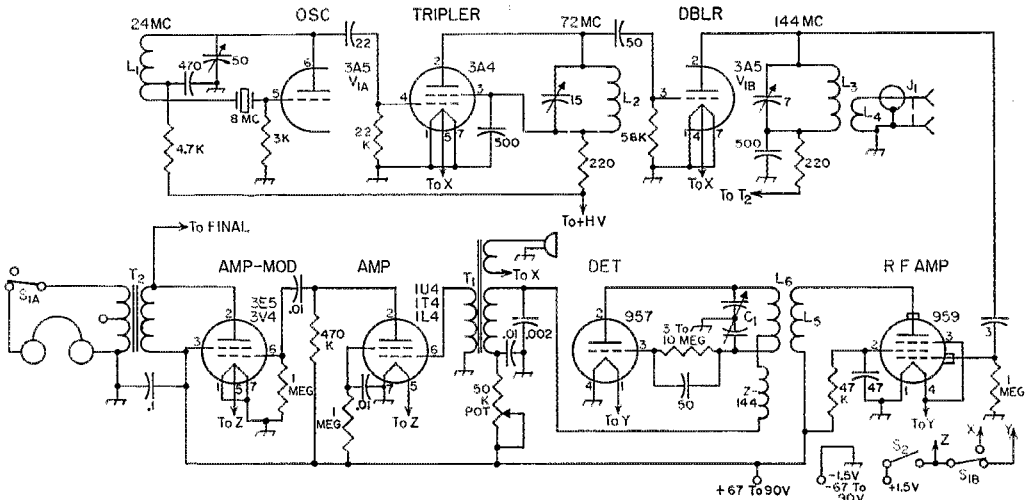


Fig. 1 — Schematic diagram and parts information for the KBT Radio Club 2-meter portable rigs.

C<sub>1</sub> — 1.5- to 3.1- $\mu$ f. butterfly variable (Johnson 3MB11).

L<sub>1</sub> — 17 turns No. 25 enam., close-wound on ½-inch diam. form. Tap ⅓ from crystal end.

L<sub>2</sub> — 4 turns No. 18 enam., ⅜-inch diam., ½ inch long.

L<sub>3</sub> — 3 turns similar to L<sub>2</sub>, about ¾ inch long.

L<sub>4</sub> — 2 turns No. 18 enam., ¼-inch diam., ⅛ inch long.

Couple close to cold end of L<sub>3</sub>, adjusting position for maximum field strength.

L<sub>5</sub> — 20 turns No. 20 enam., ¼-inch diam. Run through center of L<sub>6</sub>.

L<sub>6</sub> — 4 turns No. 14 tinned, ½-inch diam., ½ inch long, tapped at 1½ turns from plate end.

S<sub>1A</sub>, S<sub>1B</sub> — D.p.d.t. switch (shown in receive position).

S<sub>2</sub> — S.p.s.t. switch.

T<sub>1</sub> — Transceiver transformer (similar to Thordarson T20A03).

T<sub>2</sub> — Output transformer (similar to Thordarson T22S90).

The transmitter is a 3A5 with its first section as an overtone oscillator. An 8-Mc. crystal oscillates on 24 Mc. driving the 3A4 tripler to 72 Mc. The oscillators all worked with any crystal tried in the circuit, although some crystals required retuning of the 50- $\mu$ mf. trimmer to get them to start. It is good policy to check the output of the oscillator with a grid dripper or an absorption wavemeter to insure its being on 24 Mc. The 3A4 tripler is merely tuned up to give maximum output on 72 Mc., again its output being checked for frequency with a wavemeter. The signal then returns to the 3A5, the other half serving as a doubler to 144 Mc.

The receiver has a 959 r.f. amplifier stage and a 957 superregenerative detector. A common audio system is used as the amplifier for the receiver and modulator for the transmitter.

By virtue of a 3- $\mu$ mf. ceramic condenser from the hot end of the transmitter final tank the r.f. stage of the receiver is coupled to the antenna. Since either the 3A5 or the 959 filament is out at any given time the effect of the inactive stage upon the active one is that of added capacitance only, and this is tuned out in the adjustment of the final tank capacitor. The 1-megohm grid resistor of the 959 has no measurable effect upon the output of the transmitter. The primary function of the 959 is to isolate the superregenerative detector from the antenna and thereby minimize radiation from antenna loading on the detector. Although it is difficult to determine with any accuracy without suitable instruments the r.f. stage seems to have a small amount of gain.

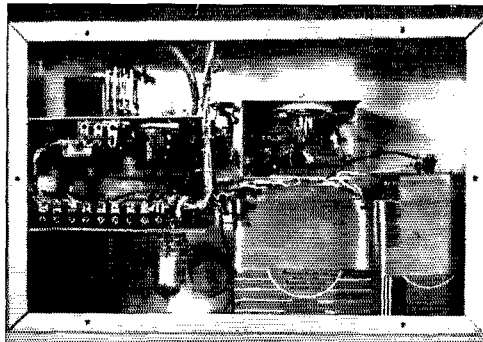
The detector required individual treatment in each unit to get the best performance. In general, it seemed advantageous to make whatever changes were necessary to secure smooth superregeneration at the lowest plate voltage on the 957. Some of the units worked with as low as 25 or 30 volts and these seemed to be the most sensitive, while others required 40 to 55 volts on the plate. Adjustments to the detector consisted mainly of moving the coil tap and trying various ratios of *L* to *C* by squeezing the coil. If an oscilloscope is available the grid-leak resistor should be adjusted to give a squegging frequency of about 50 kc.

There is a lot of hop in the audio section. In the interest of economy we might have eliminated the 1U4 stage, but it is nice to have lots of ear-phone volume under high room noise conditions, and plenty of modulation is a must in a transmitter in this power class. High modulation is achieved with most any type of carbon mike. A 1L4 or a 1T4 might be substituted for the 1U4. The 1T4 has a 67-volt maximum rating, however. A 3E5 will plug in in place of the 3V4 with almost identical performance.

Receiver battery drain is rather small so many hours of listening can be done on one set of batteries of the size illustrated. (1.5-volt Eveready No. 742 and 90-volt Eveready No. 490.) The transmitter drain is considerably more, and a few hours of talking will run the batteries down quite

a bit. By nature a unit like this will be used more for listening than talking and the occasional transmissions will be short and to the point. A rechargeable battery and vibrator supply would be advisable if a considerable amount of use is anticipated for the unit.

Although common practice on 2 meters is to use a 19-inch whip for an antenna we found by experiment that the maximum signal was radiated by a whip approximately 25 inches long. An inch plus or minus did not greatly affect the field but the 25-inch whip was considerably better



Interior of the 144-Mc. portables, showing transmitter, upper left, and modulator below it. At the right are the receiver unit and the batteries. There is room for substitution of rechargeable wet batteries, where heavy duty may make them more economical.

than the 19-inch one. The very small ground plane below the antenna, formed only by the case of the unit, is no doubt responsible for this.

After the antenna was attached, with the transmitter operating, the entire transmitter was retuned, this time for maximum radiated signal. With the voltages on the little rig at 67 or 90 nothing appeared to be abused by tuning up for maximum signal, and that is, of course, the desired end result. The field strength meter consisted merely of another whip antenna connected to an r.f. probe on a v.t.v.m. and placed several meters away from the unit under test.

The "final amplifier" runs about  $\frac{1}{2}$  watt input with 67 volts and 1 watt input with 90 volts on the plate. We have worked base station CD-2's whip to whip at one to two miles with good signals both ways and with fixed stations having more elaborate antennas the range is considerably greater. Unit-to-unit range is rather short, 1000 to 1500 feet, unless a completely open path lies between the two portables.

The transmitter is sure-fire and gives a very good account of itself. There is plenty of audio for both receiving in a noisy room and transmitting with a high percentage of modulation. The receiver, like all superregens, is inclined to be critical and it takes some care in tuning and setting the regeneration control if weak stations are to be copied.

The author wishes to thank Frank Lumney, W2UHI, for his cooperation in photographing the rigs. Circuit ideas were taken from an article by W3QCV in February, 1952, *QST*.



# Understanding Television Interference

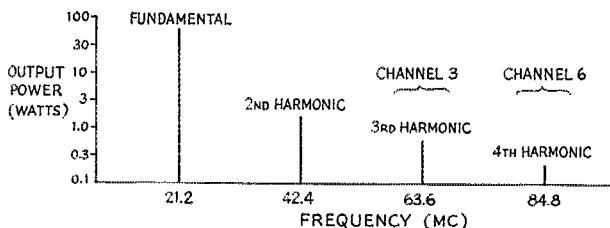
## TVI Facts for the Novice Operator

BY LEWIS G. McCROY, WIICP

WHILE TVI (television interference) may not necessarily be a problem for every Novice, the newcomer should have more than a nodding acquaintance with the subject. The purpose of this article is to discuss the various aspects of television interference and how they affect the Novice.

So far as amateur radio is concerned, TVI falls into two categories. One of these is interference due to faults in the amateur's equipment. In the other, the television receiver is to blame. Let's discuss the amateur's equipment first, because in the event of a TVI complaint one should be certain his station is not at fault. The prime cause of interference from a transmitter is harmonics. There are a few others which we'll discuss later, but by far the most important is the radiation of undesired signals that fall in the TV channels.

Fig. 1 — Sketch showing the relationships of a 21-Mc. signal and its harmonics. In actual practice, the harmonics might not have the amplitudes shown. The important point to remember is that in addition to the fundamental, there are harmonics present.



### Harmonic Interference

What is a harmonic? Let's say that you are operating your rig on 21.2 Mc. Depending on the design of the transmitter, it is quite possible that in addition to the fundamental signal, you'll be sending out signals that are multiples of your fundamental frequency. This is shown in Fig. 1. The strength of these harmonics will depend on many things, and it is a matter of considerable concern when one or more of them is strong enough to interfere with television reception.

Let's take the case where you are operating on 21,200 kc. and your local TV service is Channel 3, which is 60 to 66-Mc. Because it's the nature of the beast, the TV receiver needs this entire frequency range of 6000 kc. just to see one channel. Any signal other than the TV signal appearing in this frequency range can cause TVI. The reason we say "can" is because it is entirely possible that the TV signal will be strong enough to override the interfering signal completely. However, when the third harmonic of 21.2 Mc., which is 63.6 Mc., happens to meet up with a weak Channel 3 signal, the result is TVI. Your neighbor immediately yells, "That blankety-blank ham next door is running my TV!" And, in this

case, he's right. You have no business putting out a signal in Channel 3.

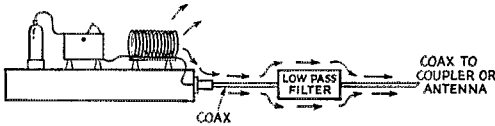
The first step in checking harmonic interference is to find out if the transmitter causes TVI *without* the antenna system connected. Remove the feedline from the transmitter output terminal and connect a dummy load, such as a light bulb, to the rig. Now load up the transmitter and check to see if the interference has disappeared. If it has, you can then be reasonably certain that the harmonic is not being radiated from the transmitter. Obviously, it was fed up the feedline to the antenna and then radiated. It is entirely possible that by using an antenna coupler (assuming you don't have one at present) the harmonic will be attenuated to a point where it no longer interferes. If the reader is unfamiliar with the construction and use of antenna couplers, it is recommended that he read the section on coup-

lers in *The Radio Amateur's Handbook*. In addition to the *Handbook*, a description of an antenna coupler for the Novice is given in the April 1955 issue of *QST*.

If the antenna coupler doesn't do the job, then more drastic action is needed. The best method for preventing harmonic radiation is the use of a low-pass filter. A low-pass filter is simply a device that acts as a gate. It permits your fundamental signal to be fed to the antenna but shuts off the harmonics. Low-pass filters are available commercially, or they can be constructed at home. The filter is an easy unit to build, and complete details are given in the BCI-TVI chapter of the *Handbook*.

For a low-pass filter to do its job properly, certain precautions should be observed. Most transmitters these days are designed for use with coaxial cable, the output terminal being a coax receptacle. The low-pass filter should be inserted in the coax line, close to the transmitter. If the harmonics are not being radiated directly from the transmitter but are fed up the feedline to the antenna, the installation of the filter may eliminate the interference. However, if it doesn't there are a few more steps needed to make sure the filter has a chance to do its job. In order for the

### UNSHIELDED TRANS



### SHIELDED TRANS

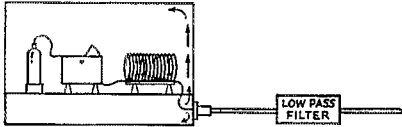


Fig. 2— In this drawing we see what can happen when the transmitter is not shielded. Without shielding, the harmonics flow over the chassis and on the outside of the coax and low-pass filter. With good shielding, the harmonics must flow inside the coax as there is no other means for them to escape.

filter to be *completely* effective, all of the transmitter output must be routed to it.

In the sketch at Fig. 2, we see how the harmonics can reach the antenna without passing through the filter. By shielding the transmitter, the r.f. is forced to pass through the filter to reach the antenna. Other leads that enter the transmitter box, such as the 110-volt and key leads, must be filtered to prevent the harmonics from escaping the box. In obstinate cases of TVI, complete shielding and lead filtering of the transmitter are required. This is particularly true in areas that are quite far from the TV station and when the TV signal is weak. Naturally, the stronger the TV signal, the less one is apt to be bothered by TVI. Here is a summation of the steps to try when combating interference: Try the antenna coupler first; it may be enough. Next, add a low-pass filter. If these two steps don't do the job, then shielding and lead filtering are necessary. You can be reasonably sure that with a shielded transmitter and a low-pass filter, your signal will be clean. If you have a TV set in your own home and it doesn't show interference when your transmitter is running, then it is pretty good evidence that your rig is clean.

#### TV Receiver Deficiencies

This leaves us with the other problem, that of faulty TV receivers. Let's make one point quite clear concerning TV receivers: interference due to poor receiver design is not your fault. You should cooperate as much as possible with the set owner but, once you know your signal is clean, the obligation of fixing the receiver is not yours.

A TV receiver is designed to receive the bands of frequencies on which TV signals are transmitted. When the receiver picks up signals from frequencies other than the TV bands, then something is wrong with the set. Usually this something is lack of selectivity. When the TV receiver is tuned to Channel 3, it certainly shouldn't receive your 21.2-Mc. signal. If it does, then it is lacking in selectivity. When the 21.2-Mc. signal

overloads the front end of the TV receiver (r.f. and mixer stages), these stages generate harmonics of the 21.2-Mc. signal. This type of overloading and generation of harmonics gives the same final result as TVI caused by transmitter harmonics. However, in this case, the TV receiver is at fault. The answer to the problem is the installation of a high-pass filter at the receiver. As mentioned before, if your own TV set or one belonging to a neighbor is clean of TVI, then you can be fairly certain the affected set is at fault. Of course, for your own set to be clean, it must have sufficient selectivity to keep from overloading. This may mean the installation of a high-pass filter on the set.

Just like a low-pass filter, a high-pass filter acts as a gate. When installed on the TV receiver it permits the TV signals to enter but shuts out lower frequency signals. However, the installation of a high-pass filter on the neighbor's set is not your responsibility.

#### Handling TVI Complaints

The first thing to do on being informed that you are causing TVI is to contact the complainant and explain what is happening to his set. Assuming that your station is clean, you are in a position where you know his set is at fault. If your radio club has a TVI committee, and many cities have such organizations, give the complainant the name and phone number of the committee. By all means let the committee handle the complaint. It is not only equipped and trained for such work; it is authorized by the FCC to take whatever action is necessary to settle the complaint.

Many TV manufacturers are aware of the need for additional selectivity when their receivers are used near a short-wave transmitting station. Upon recommendation by an authorized TVI committee, or the FCC, the manufacturer will furnish a high-pass filter at no charge to the set owner. If you are in an area not serviced by a TVI committee, then the procedure would be to write the FCC and explain the problem to them. They will take whatever action is necessary for the installation of filters.<sup>1</sup>

It should be pointed out that in order for a

<sup>1</sup>Information on the formation of TVI committees is available from ARRL Headquarters upon request.

high-pass filter to do its job properly, it should be mounted directly at the tuner of the TV set, not on the antenna terminals at the back of the set.

## 2-Meter Image Interference

There is one type of interference that the Novice 2-meter operator living in a Channel 2 area is likely to encounter. It is "image" interference in TV receivers having a 44-Mc. intermediate frequency. While this type of interference is a fault of the TV receiver, the Novice should know what it is if and when he encounters the trouble. If you don't know anything about receivers you'll probably wonder how in the world a signal in the 144-Mc. band could interfere with a TV receiver tuned to Channel 2 (54 to 60 Mc.). Without going into a long discussion on how a receiver works, we'll try and explain what happens. In Fig. 3, at A, the signal-input circuit of a TV receiver is shown in block diagram. To keep the explanation as simple as possible, only two signals are shown in the diagram, at 56 and 144 Mc. Actually, there will be a multitude of signals from the antenna reaching the first tuned circuit in the receiver. The tuned circuit should accept signals at its resonant frequency and reject signals at other frequencies. The degree to which the undesired signals are rejected will depend upon the sharpness, or "selectivity," of the tuned circuit. You will note in the diagram that the 144-Mc. signal is not as strong as the 56-Mc. one after they pass through Circuit 1. Both signals are amplified by the r.f. stage and then passed through Circuit 2. The 56-Mc. signal is now much stronger than the 144-Mc. one. Both signals,

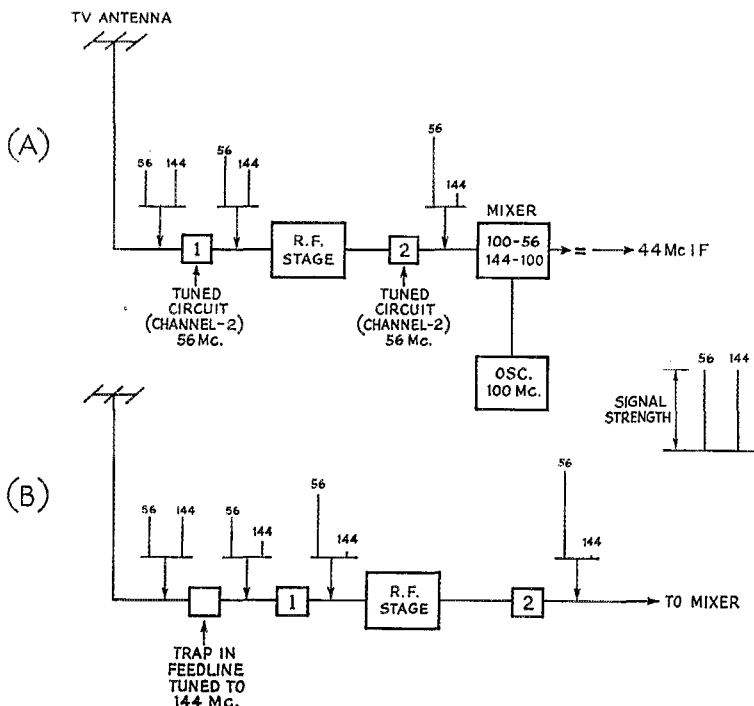
plus the oscillator signal, are then fed into the mixer stage. The action in a receiver mixer stage is to shift the frequency of the incoming signal to another frequency (the i.f., or "intermediate frequency") where it can more conveniently be amplified. This is done by introducing a "local oscillator" signal; the incoming signal will be shifted to frequencies corresponding to the sum and the difference of the two frequencies. In the case shown in Fig. 3A, the frequency relationships are such that the 100-Mc. oscillator signal shifts both the desired TV signal and the undesired amateur signal to the 44-Mc. i.f. If the receiver does not have sufficient selectivity to reject the 144-Mc. signal, it is quite possible for the signal to interfere with the 56-Mc. signal. However, the cure is simple.

At B, in Fig. 3, we see what happens when a trap (see *Handbook* chapter on BCI-TVI for constructional details) is installed in the feedline of the receiver, to improve the selectivity of the receiver. The trap is tuned to 144 Mc. to reject the interfering signal. After the two signals pass through the trap (the 56-Mc. signal is not attenuated by the trap), the difference in amplitude between the two signals is so great that the 144-Mc. signal no longer interferes.

As pointed out earlier, it is not your fault that the TV set picks up your signal. The cure for the problem is a 144-Mc. trap installed at the antenna terminals of the TV set. Explain the problem to the set owner and let him know that you'll be happy to tell the TV serviceman how to correct the interference. It is not recommended

(Continued on page 114)

Fig. 3—Block diagrams of the input stages of a TV receiver. (A) A receiver tuned to Channel 2 but with inadequate selectivity in the input stages will pass enough strong 144-Mc. signal to cause interference with reception. (B) Adding a 144-Mc. "trap" in the antenna feedline improves the selectivity of the TV receiver and prevents interference from 144-Mc. signals.



# Dual-Battery Power System for Mobile

## Reducing Battery Failure in Car Installations

JAMES L. ATKINSON,\* W9EQG

• This article discusses the use of two car batteries to reduce the danger of being stranded. A system for monitoring the condition of the batteries and charging system is included.

IF A BATTERY is discharged at an average rate greater than the average rate of charge, it is obvious that reliable motor starting cannot be expected with a single battery, and such is often the case in mobile amateur radio operation.

Originally it was thought that the problem could be solved by using two similar batteries in parallel. However, after several years of operation, certain disadvantages became apparent. Should one battery develop an internal short, the other would discharge through the faulty battery. From an economic point of view, one battery at half load will not necessarily last twice as long as the same battery at full load. And, finally, confidence in the ability to start under most conditions leads to overconfidence and consequent overloading of both batteries, and one finds two dead batteries on his hands.

To rectify this situation, a switching system was installed in the author's 1949 Chevrolet convertible so that either of two batteries could be used for starting and operating purposes. Additional metering was also provided to facilitate the checking of the condition of the batteries and the functioning of the charging system. The circuit of the control and metering system is shown in Fig. 3.

### Control Circuit

$K_3$  is the car's motor-starting solenoid.  $K_4$  is

\* 316 West Lutz St., West Lafayette, Ind.

the solenoid that controls the top-lifting motor of the convertible.  $K_1$  and  $K_2$  are additional heavy-current solenoids provided so that either of the batteries (or both simultaneously) may be used to power the starting and top-lifting motors. (See Fig. 2.)  $S_1$  selects the battery that is to be used for purposes other than starting or top lifting. With  $S_1$  closed in either direction,  $S_6$  can energize either  $K_1$  or  $K_2$  to select the desired battery for starting or top lifting.  $S_6$  is a spring-return switch, so that it must be held closed while the starting switch or the top-lifting switch is closed. This combination provides a measure of safety against tampering by children or others. In the event that both batteries are in a semidischarged condition and neither one alone will start the car, depressing  $S_5$ , instead of  $S_6$ , will actuate both  $K_1$  and  $K_2$  simultaneously, connecting the batteries in parallel. This is a very handy arrangement, since the two batteries in parallel will generally provide enough current to start the car.

It will be noted that  $S_1$  has a center-off position which is very handy in case a short occurs somewhere in the system. However, it should be mentioned that this switch should not be opened while the engine is running, since this unloads the generator.

### Metering

$A_1$  is the car's standard dashboard ammeter. Since this meter always reads the difference between charge and discharge currents, an additional ammeter,  $A_2$ , was provided so that the generator output current could be checked. It will also read the current which discharges back through the generator when the generator voltage drops below that of the battery. This latter is a normal condition which exists just before the generator cutout opens. However,

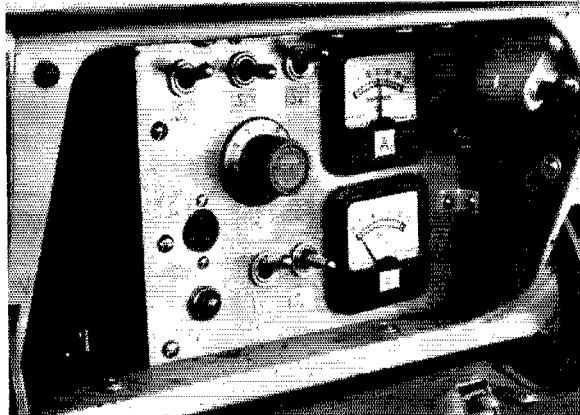


Fig. 1 — The battery-monitoring panel installed in glove compartment. Along the bottom, from left to right, are  $I_1$ ,  $S_3$ ,  $S_2$  and the voltmeter. Across the top are  $S_5$ ,  $S_1$ ,  $S_4$  and the ammeter  $A_2$ .  $J_2$  and  $K_1$  are in between.  $S_6$  is mounted on the dashboard in the hole formerly occupied by the choke control which was removed.

if the cutout is not operating properly it is easily seen on the meter. The *Chevrolet Shop Manual* gives the settings for particular cut-out relays. For example, the cut-out relay should be set to open within the limits of 5.9 to 6.7 volts with a preferred setting of 6.4 volts. These voltages are the closing voltages and will differ from the voltage at which the cutout opens. The important thing to note is that cutout should open when there is a discharge current of from zero to four amperes; the corresponding opening voltage is not important. Should the current be larger than this, the air gap and point opening should be readjusted. Since  $A_2$  measures this discharge current, a convenient check can be made to determine the operation of the cutout. If adjustment is necessary, it is recommended that a competent auto electrician be consulted.  $S_4$  shorts out the ammeter,  $A_2$ , when the latter is not in use.

A voltmeter,  $V_1$ , is also included. With  $S_2$  in one position the meter reads the voltage of the battery and, in the other position, the voltage of the generator. A comparison of the two readings will give the voltage drop in the wiring between the armature of the generator and  $A_2$ . The usefulness of this meter is seen when  $S_2$  is in the generator position and the r.p.m. slowly increased, for then it can be determined at what voltage the voltage regulator cuts in. From the *Shop Manual* the voltage regulator should be set to operate within the limits of 7.0 to 7.7 volts with 7.4 volts preferred. When the engine r.p.m. is slowly

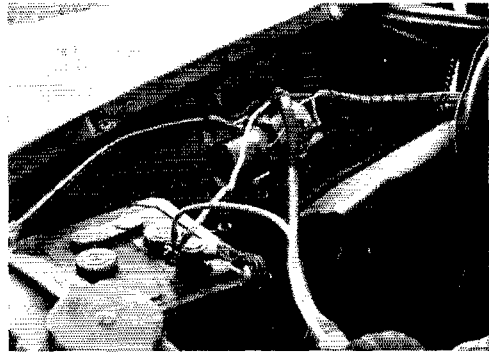


Fig. 2—The two additional starting solenoids are mounted against the wall of the engine compartment. The second battery is installed on the opposite side of the motor.

increased from idle or held constant, and  $R_1$  varied, the generator voltage will slowly increase to the battery terminal voltage. At this point the cutout closes. The meter now gives the cut-out closing voltage as mentioned above. As the generator voltage is further increased, the needle will be seen to vibrate about a voltage determined by the voltage regulator. The reading just before the vibration starts is the operating voltage and should be within the recommended setting. As the generator output is slowly decreased,  $A_2$  will show a reading which gradually approaches zero from the charge side, and then shows the discharge

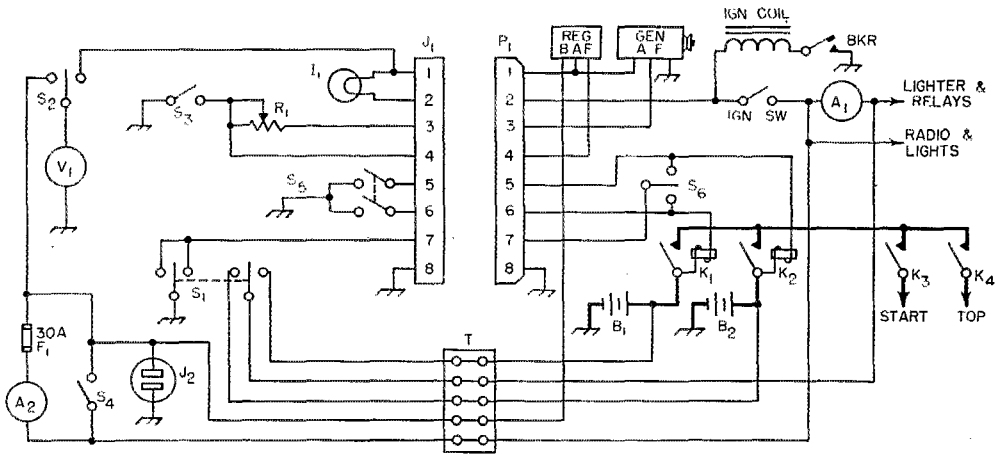


Fig. 3—Diagram showing the wiring of the dual-battery system.

- $A_1$ —Original instrument-panel ammeter.
- $A_2$ —30-0-30-amp. d.c. ammeter.
- $B_1, B_2$ —Car storage battery.
- $F_1$ —30-amp. panel-mounting fuse.
- $I_1$ —Panel lamp.
- $J_1$ —8-pin chassis-mounting female connector (Cinch-Jones S-108-AB).
- $J_2$ —2-pin chassis-mounting female connector (Cinch-Jones S-402-AB).
- $K_1, K_2$ —Automotive starting solenoid.
- $K_3, K_4$ —Contact circuits of starting and top-lifting switches. Windings (not shown) are energized

- through normal dashboard switches as described in text.
  - $P_1$ —8-pin male connector to fit  $J_1$ .
  - $R_1$ —3-ohm 25-watt rheostat.
  - $S_1$ —D.p.d.t. center off.
  - $S_2$ —S.p.d.t. center off.
  - $S_3, S_4$ —S.p.s.t.
  - $S_5$ —D.p.s.t. spring return.
  - $S_6$ —S.p.d.t. center off spring return.
  - $T$ —Double-row terminal block.
- Wiring shown in heavy lines should be of heavy-duty battery cable.

current. At a point between zero and "negative" four amperes, the needle should kick back to zero, showing that the cutout is operating properly. The preferred setting for the current regulator is 36 amperes, but since  $A_2$  reads only to 30 amperes the operation of the current regulator cannot be monitored.

In the event that it is desired to make the regulator inoperative,  $S_2$  can short the regulator to ground. This is useful when checking for regulator-contact noise. Its greatest use, however, is to increase the generator output above the limits normally set by the voltage regulator. The conditions for this usage must be carefully controlled or damage to the generator and system may result. The engine r.p.m. should be held constant and the generator output as read on  $A_2$  and  $V_1$  should not be allowed to increase above the maximum values as determined by the system components. Rather than adjust the engine r.p.m. to suit the proper current and voltage values, the rheostat,  $R_1$ , can be used as a "fine tuning" control, since it controls the generator field excitation.

$J_2$  provides a convenient metered socket for either six-volt output or trickle-charger input.  $L_1$ , when lighted, indicates that the generator cut-out relay is open and the ignition switch is on; i.e. a non-charging condition.

The various switches, meters and other components were assembled in a unit that could be mounted in the glove compartment, as shown in Fig. 1. The construction of the panel is straightforward, and the wiring is, of course, not critical from the standpoint of length and placement. But there is a difference between this wiring and the type normally encountered in radio construction. Most of the circuits in this panel must carry high current, so that wire size becomes an important factor. The schematic diagram of the electrical system found in the *Shop Manual* gives the wire gauges for the various sections of the system. The wiring of the panel is consistent with that of the original automobile wiring. Since manufacturers' recommendations may differ, the wire gauges were not included in Fig. 3.

To insure reliable starting, it is useful to know the condition of the batteries. It is difficult to determine their condition accurately, but a general approximation can be gained by a few tests with the aid of the panel instruments and a hydrometer. Hydrometer tests and, incidentally, regulator operation, were discussed in a previous *QST* article.<sup>1</sup> The rate of charge of a battery after heavy discharge gives a clue to its condition and the following example should illustrate this. Battery  $B_1$  is known to be in poor condition (specific gravity 1110) and battery  $B_2$  in good condition (specific gravity 1250). The ignition is opened and the cranking motor operated for 15 seconds with battery  $B_1$ . The engine is then started and data taken from  $V_1$  and  $A_2$  while varying the generator output. Battery  $B_2$  is

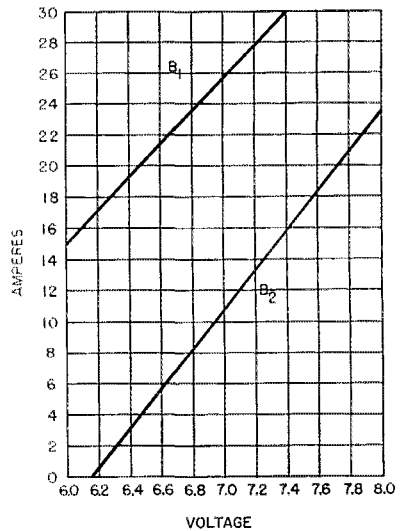


Fig. 4 — For any particular value of charging voltage, a discharged battery ( $B_1$ ) draws considerably more current from the generator than a charged battery ( $B_2$ ).

then tested in the same manner. The curves in Fig. 4 show that for any particular value of charging voltage, battery  $B_1$  draws considerably more current from the generator than battery  $B_2$ . This indicates that battery  $B_1$  is in a more discharged condition than  $B_2$ . If a discharge-charge test is made on a new battery or a battery of known condition, the graph can later be compared to the same battery under similar test conditions. This will give an indication of the condition of the battery.

Fig. 5 shows the results of another test which was simply the battery terminal voltage over a period of 4 minutes under driving-lights load. Under this relatively light load, the terminal voltage of a battery in good condition will remain at about 6 volts, as did battery  $B_2$ , while that of  $B_1$  dropped rapidly to 2 volts after only 3½ minutes of load. This extreme voltage drop indicates that battery  $B_1$  is in a very poor state.

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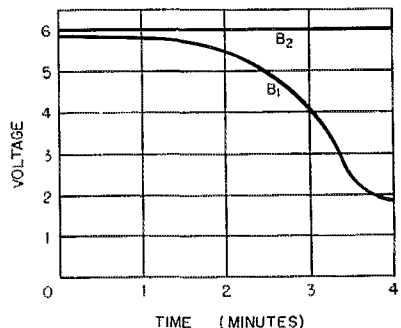


Fig. 5 — Under moderate load, the terminal voltage of a battery in poor condition ( $B_1$ ) will drop off, while a battery in good state of charge ( $B_2$ ) will maintain constant terminal voltage.

<sup>1</sup> Mix, "The Automobile Storage Battery and Its Charging System," *QST*, August, 1955.

# Reducing Power for S.W.R. Bridge Operation

• Here are a few answers to a problem that has been bothering some folks. Take your pick — they all work.

**P**RACTICALLY without exception, those who try s.w.r. bridges wind up enthusiastically proclaiming their virtues. There are some, however, who have shied away from bridge measurements because their transmitters do not have provision for reducing power to the low level required for most such bridges, particularly bridges of the simple and inexpensive type using fixed resistances.<sup>1</sup>

This need not be an insurmountable obstacle. In a great many transmitters it is a relatively simple matter to install a means for varying the power from the full output down to practically nothing. In others it may not be so easy, but if it can be done without extensive circuit changes it is certainly worth the effort — not just for the bridge application but for the sake of greater flexibility in other respects, such as tuning up without danger of damaging tubes or components from inadvertent overloads.

There are lots of ways of doing it — including such de luxe methods as having a Variac in the primary circuit of the final amplifier plate supply — but one that is probably as satisfactory as any is the “excitation control.”

## The Excitation Control

An excitation control usually is nothing more than a potentiometer for varying the screen voltage on some low-level tube. The stage has to be one that is used on all bands on which the transmitter operates. The potentiometer setting regulates the output of the stage and thereby the grid drive to the final amplifier. By this means the drive can be reduced to zero, and with it the output of the final stage.

There is one unavoidable requirement with this system: All tubes following the controlled stage must stay within their normal ratings, particularly plate dissipation, when grid drive is removed. Low-level stages do not represent much of a problem, since they can be cathode-biased as a general rule, but most final amplifiers have to have either fixed bias or some sort of protective device such as the “clamp” tube. The more pretentious commercially-manufactured transmitters have built-in protection of this sort for the final stage, but some of the beginner-type rigs do not.

A typical excitation control circuit is shown in Fig. 1A. The values for  $R_1$ , the control, and  $R_2$ , the screen dropping resistor, will depend on the

kind of tube and its normal operating conditions. The ordinary volume control, in most cases, will not have sufficient power-handling capacity to serve for  $R_1$ ; a unit rated at at least 2 watts should be used. A resistance of 20,000 ohms is a good figure for screen voltages of 100 to 150, and is available in ratings of 2 to 4 watts in inexpensive wire-wound controls. A 2-watt unit should suffice if the maximum screen current is not over 5 ma.  $R_2$  should be calculated to give the proper drop in voltage from the plate supply when carrying the full screen current plus the current through  $R_1$  at the maximum operating screen voltage. A 2-watt resistor generally will be required.

## The Output Control

If for some reason the installation of an excitation control does not seem feasible there may be another string to your bow if the final amplifier has a clamp tube. This is the “output control,” which is simply a means for varying the negative d.c. bias on the grid of the clamp tube. All it requires is the addition of a potentiometer across the grid leak that supplies the clamp tube bias. Fig. 1B is a typical circuit.  $R_2$  is the final-amplifier grid leak and  $R_3$  the screen dropping resistor; these need not be changed from existing values. Although Fig. 1B shows a triode-connected clamp tube, the tetrode circuit is equally amenable to control.  $R_1$ , the output control, may be an ordinary carbon volume-control

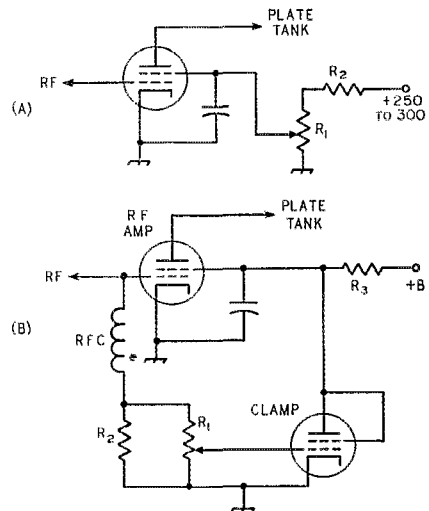


Fig. 1 — (A) Excitation control.  $R_1$  may be a 20,000-ohm 2-watt potentiometer in most low-level stages.  $R_2$  depends on the screen current and the total resistance of  $R_1$ , as discussed in the text. (B) Output control.  $R_2$  and  $R_3$  are the existing grid leak and screen dropping resistor, respectively. The value of  $R_1$ , of the order of 0.5 megohm, is not critical.

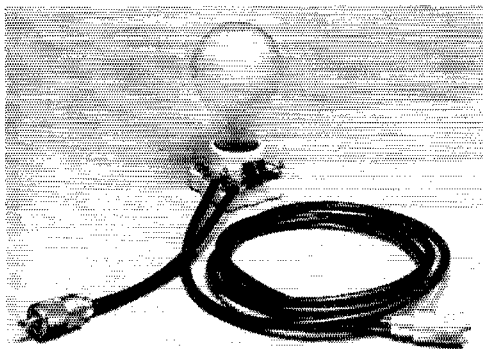
<sup>1</sup> For example, the ones described in the chapter on measurements in *The Radio Amateur's Handbook*.

type potentiometer having a resistance of a half megohm or so.

With the potentiometer arm at the cathode end the screen voltage reaches its lowest value, just as in the case of no excitation. However, with most clamp circuits this is not zero screen voltage, and when the final-amplifier grid is being driven there may still be some output. If it is too much for the bridge, it can be reduced by detuning one of the driver stages to reduce the excitation, or by detuning the final plate tank to effect a further reduction in output. This can't harm the tube, since the screen voltage should be far enough below normal to hold the input to a safe value.

### The Power Absorber

If for one reason or another it does not seem feasible to make any modifications whatsoever to the transmitter the case is still not hopeless. The answer lies in "soaking up" some of the output in a dummy load and diverting just enough to the bridge.



A practical "power absorber" using the circuit of Fig. 2.  $I_1$  is a 40-watt lamp and  $R_1$  is approximately 22 ohms, 3 watts (three 68-ohm 1-watt composition resistors in parallel). These values will suffice for r.f. power levels from less than 10 to over 50 watts, handling transmitters up to the two-6146 class. The mounting holes in the lamp socket are used for mounting the resistors. The short section of cable should be on the bridge (output) side.

The accompanying photograph bears witness to the simplicity of such a device. Fig. 2 is the circuit diagram, the gadget being inserted between the transmitter output terminal and the input terminal of the bridge. An incandescent lamp has very desirable characteristics for this application, since its change in resistance with temperature tends to keep the r.f. current through  $R_1$  constant regardless of the power output from the transmitter. Thus there is an almost constant voltage drop across  $R_1$  and hence essentially constant input to the bridge.

Most bridges operate at a level of 5 to 10 volts r.f. The resistance required at  $R_1$  can be figured from Ohm's Law, based on the nominal current through the lamp,  $I_1$ , at its rated power. For example, the current for a 40-watt 115-volt lamp — the size used in the unit pictured — is approximately  $40/115$  or 0.35 amp. For 10 volts, therefore,  $R_1$  would be  $10/0.35$  or about 28 ohms, and

the power lost in it would be  $10 \times 0.35$  or 3.5 watts. Since the exact voltage required is seldom known accurately, approximate values are good

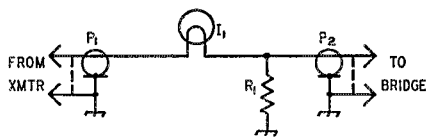


Fig. 2 — This circuit uses a 115-volt incandescent lamp,  $I_1$ , to absorb most of the transmitter's power output and maintain essentially constant voltage across  $R_1$ . Values are discussed in the text.  $P_1$  and  $P_2$  are cable-mounting coaxial connectors.

enough at the start.  $R_1$  in the unit shown consists of three 68-ohm 1-watt resistors in parallel, giving a resistance of about 22 ohms and a voltage in the neighborhood of 7.5. This has worked satisfactorily with several different bridges at transmitter power output levels from less than 10 to over 50 watts. It is thus usable with the beginner's kit transmitter as well as the popular "120-watt" table-top outfits. The latter can easily be operated at power inputs of 50 to 75 watts without any danger of damaging anything in the set. This is low enough to stay within the safe limit of a 40-watt lamp.

The lamp is not a perfect constant-current device, of course, so there is some variation in voltage across  $R_1$  at different power levels. In any event, it would be an extreme coincidence if the meter in your bridge happened to read exactly full scale in the reference position. This is not important for matching purposes, since the object of circuit adjustment is simply to obtain a null reading. However, if the pointer goes off scale there is a choice between two things to do about it: Reduce the resistance of  $R_1$  by adding resistors in parallel, or connect a variable resistor in series with the milliammeter so the meter reading can be set where you want it.

As stated above, these values will take care of nearly all currently available commercial transmitters and exciters. If the input to your final stage cannot be brought down under 100 watts, a larger lamp and smaller value for  $R_1$  will bring the bridge input into the proper range. The same method of calculating values is used.

— G. G.

## Strays

Here endeth another chapter in amateur radio. When the problem of TVI was at its worst, Phil Rand, W1DBM, made a compilation of articles dealing with the solution of the problem and through the courtesy of Remington Rand had them published in the form of a booklet titled "Television Interference". This booklet was distributed through three editions by mail, at ham-fests and conventions, and by W1DBM in person. In all, 75,000 copies were distributed, and now W1DBM advises that no more copies are available, and no further reprint is contemplated.



# The Beer-Can Antenna, Minnesota Style

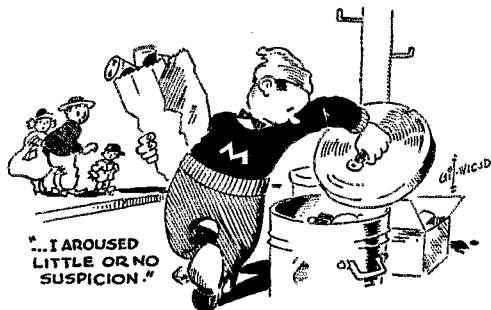
BY H. T. ORR,\* WØWET

ALMOST AS SOON as W2JTJ's article, "Budget 7-Mc. Vertical Antenna," was published,<sup>1</sup> the local boys decided that here was something: A real, honest-to-goodness vertical made of beer cans. Almost immediately remarks could be heard on the local nets like, "Say, Bob, you want to come over and help me get material ready for my new antenna?"

The first thought at this QTH was to invite the local boys over to begin construction of this antenna, the theory being that each person would be capable of successfully removing the contents of enough cans to make a 6- or 10-meter vertical. As emptying would progress, one member of the group could manipulate the soldering iron, putting the cans in place on top of each other. After a little cogitation, the conclusion was reached that, while maybe 10 or 15 meters' worth might be vertical, the remainder of the 82 cans, stacked on top of each other, would probably not be a beautiful sight to behold.

From this the conclusion was drawn that, not only did the 82 beer cans have to be obtained, they had to be found pre-empted. W2JTJ's article mentioned that little trouble was had in the summer months in obtaining the required number of beer cans. This was very good for W2JTJ, but the month was now November and winter, along with its snows, had long since made its debut in the Great State of Minnesota.

For quite some time, two days to be exact, the problem of obtaining the required number of cans seemed insurmountable. It was then suggested that one look in the trash barrels in the alley. Being dressed as a radio amateur, I aroused little or no suspicion as I lifted one garbage can lid after another. After one-half hour and a



few trash barrels, there were 82 beer cans in a paper bag in the basement waiting to be soldered. Even the soda bottle base insulator was present and accounted for.

Since no silica gel was available to act as a dehydrating agent in each can, the occasional

\* 821 26th Ave. N.E., Minneapolis 18, Minn.

<sup>1</sup> In the November, 1955, issue of *QST*. — Ed.

cigarette butt found in the cans was left there in hopes that it would absorb any moisture that might collect.

According to W2JTJ the beer cans merely had to be tacked together in three spots, then rotated and soldered. The only means of soldering here was a 135-watt soldering gun. The first two cans took about ten minutes to solder. The handle of the gun was hot enough to melt solder by itself. After the first ten cans, the joints began to look somewhat better. After about 40 cans, the joints were almost professional looking, with a minimum of solder neatly melted between the cans. Oh, they were strong, these cans. In 18-can lengths they could hold a substantial amount of weight.

After completing the soldering, the cans were given a shining coat of aluminum spray paint. They looked just like the picture in *QST*. Spirits were high, although the same did not hold true for the constructor.

## Up She Goes!

Saturday was a warm, sunny day in Minnesota. The thermometer almost went above freezing. This was the day. All the cans were taken outside,



laid in the snow, and carefully soldered together. Did I say carefully? Well, outside the 135-watt gun did not seem to give quite as many BTUs as it did in the basement. However, with a little extra dab of solder here and there, the joints appeared quite firm. A quick run to the local supermarket provided the necessary plastic-covered clothesline at only ten cents more than W2JTJ paid for his. All was going swell.

The diagram in W2JTJ's article indicated four 32-foot radials lying underground. After testing the hardness of the frozen Minnesota tundra, it was quickly decided that the radials could be buried in the ground next June when and if the snow melted; for the present just burying them in the snow would have to do.

Everything was prepared for the final step. According to the article, the assistance of four persons is necessary to raise the antenna. It

(Continued on page 116)

# A Radical Approach to VFO Design

## New Hope for an Old Problem

BY LARSON E. RAPP,\* WI0U

• For some years the self-assured author of this article has been a controversial figure, and the publication of his articles has often precipitated a storm of protest and encomium from our better-informed and most erudite readers who take their radio more seriously than the average amateur. However, recognizing the inherent worth of his current interest, we have no alternative but to offer another example of Mr. Rapp's conceit.

THE SCIENCE of amateur radio has been brought to a high degree of perfection in practically every phase except one. There is little room left for improvement in receivers and r.f. power amplifiers. The modern two-wire feed version of the off-center fed antenna, with its standing-wave ratio of less than 0.5 on all bands, has neatly solved the antenna problem for all but a few, and even those few are beginning to have their doubts. However, there is still one field in which amateurs have not kept up with the times, and that is the field of frequency control.

Let us examine the record. Amateurs have vacillated from self-controlled oscillators of the worst possible sort (*circa* 1922) to crystal control (*circa* 1933) to the well-loved-but-inadequate "ECO" (electron-coupled oscillator, *circa* 1939). Listening to the signals on most of the bands, one gains the impression that all three types of oscillator are still in use. Unquestionably this is a disgusting blot on the glorious escutcheon of amateur radio! Simply changing the name from ECO to the more general "VFO" has effected little if any improvement. It is time something was done about it.

Something *can* be done about it! The author will present in this paper his latest findings on frequency control and stabilization, and it would be well for every amateur to study the following pages carefully unless he has something better to do. Even the manufacturers might learn plenty.

It was obvious from the beginning that the oscillator circuit must meet several stringent conditions. It should be completely insensitive to temperature and voltage changes, and it should be impervious to shock and vibration. However, the primary objective of good stability was never lost sight of.

As it developed, and as other workers have noted, the temperature and shock requirements could be met by good mechanical design and thermal compensation. The author's major contribution is in the field of voltage insensitivity.

The clue was found in an old log book, where it was noted that most of the operators working the low edge of a band used the Hartley oscillator, while those at the high end used the Colpitts.

### Basic Circuits

For those readers whose knowledge of oscillator circuits doesn't go further than the Clapp and the modified Pierce, a slight review is indicated. The basic Hartley circuit is shown in Fig. 1-A. It can be seen that the cathode connects to a tap

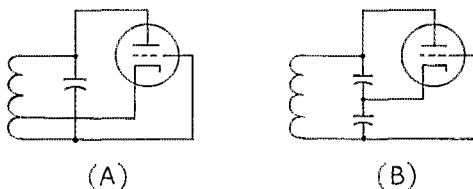


Fig. 1 — (A) Basic Hartley oscillator circuit. (B) Basic Colpitts oscillator circuit.

on the inductance. The Colpitts, shown in Fig. 1-B, is somewhat similar, in that the cathode connects to a tap on the capacitance. In practice this was readily obtained through the use of two capacitors in series. The clue, mentioned above, was in recalling that all Hartley oscillators chirped one way (higher in frequency) and the Colpitts chirped in the opposite direction (lower in frequency). Obviously, the amateurs had been aware of this and used only the band edge that would permit them to chirp back inside. It occurred to the author that the two circuits might be combined to result in an oscillator that wouldn't chirp in either direction. (It should be pointed out that the chirp of any oscillator is a result of voltage changes during "make" and "break.") Combining the two circuits to form a Harpitts (or Coltley) circuit is a simple matter, resulting in the basic circuit of Fig. 2. It seems rather odd that this was never done in the past, but blind spots like this occasionally show up in our think-

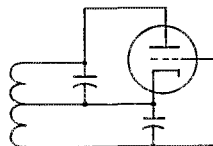


Fig. 2 — Combining the two circuits of Fig. 1 results in a VFO circuit with amazing possibilities. The circuit shown here is not a practical one, since no provision has been included for applying power.

\* Kippering-on-the-Charles, Mass.

Readers who may have had doubts about the effectiveness on the air of Mr. Rapp's inventions can forget them in view of this evidence. The coveted "Helvetia XXII" award has been received by only four other Ws, all in the 2nd call area.



ing. A practical circuit based on Fig. 2 would include an adjustable grid leak to set the operating bias to a proper value. Since the chirp is dependent upon the amplification factor ( $\mu$ ) of the tube, adjustable bias and the use of a variable- $\mu$  tube are obvious necessities.

#### A Super Solution

Most experimenters would have been satisfied with this solution, but the objective here was Perfection (with a capital "p"). Old hands at this radio game will recall that there is much to be said for push-pull operation of vacuum tubes. It is a matter of record that at one time in amateur radio practically everything was push-pull: transmitters,<sup>1</sup> receivers,<sup>2</sup> and even antennas.<sup>3</sup> For some reason that escapes the author, the widespread use of push-pull has fallen by the wayside, although suggestions of it may still be found in power supplies, some audio amplifiers,

<sup>1</sup> Lamb, "Push-Pull Transmitters," *QST*, December, 1928.

<sup>2</sup> McCord, "A Receiver with Push-Pull R.F. and Detector," *QST*, September, 1930.

<sup>3</sup> W9CRD, "Push-Pull Antennas," *QST*, December, 1929, page 45.

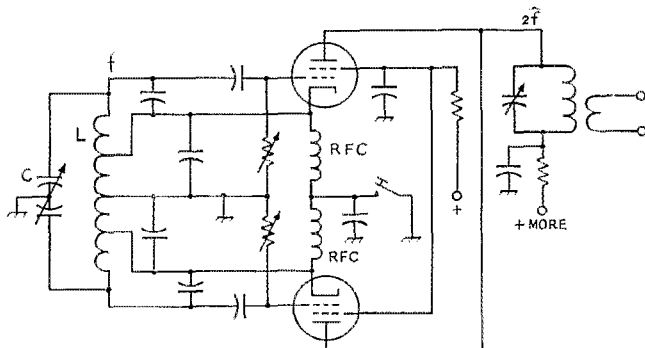
<sup>4</sup> *The Radio Amateur's Handbook*, 12th edition, 1935, published by The American Radio Relay League, West Hartford, Conn., page 106.

and primitive u.h.f. work. Having decided to utilize the advantages of push-pull in the Harpitts (or Cottley) circuit, it became obvious that push-pull frequency multiplication would add still further improvements. As is well known, push-pull frequency multiplication uses push-pull excitation and parallel output to obtain highly-efficient even-harmonic multiplication.<sup>4</sup> No well-designed VFO should operate on the same frequency as the radiated output, so frequency multiplication must be used somewhere, and what better spot than the oscillator?

The practical circuit is shown in Fig. 3, and it must be confessed that the results with it exceeded all expectations. After the cathodes had been permitted to come to temperature, plate and screen voltages were applied and the oscillator worked immediately. Tuning the plate circuit to the second harmonic peaked the output. When the frequency was changed by turning the control for  $C_1$ , it was observed that the frequency didn't change immediately. At first it was thought that this might be caused by a mechanical deficiency in the rubber tubing that was being used as a shaft coupling (as indeed some of it was), but it was finally established (after removing the rubber

(Continued on page 118)

Fig. 3 — The practical VFO circuit in its push-pull push-pull variation. The use of variable- $\mu$  tubes is mandatory, as explained in the text.



# Push-Pull 6146s in a Two-Stage Rig

Five Bands with No Switching

BY ARMAND RENAUD,\* VE2RZ

• This simple two-stage transmitter makes use of multiband tuners to cover the 80- to 10-meter range. The push-pull 6146 final amplifier will take up to 180 watts on c.w. A clamp-tube modulator, power supply, and provision for VFO input are included.

THE rig shown in the photographs has worked out so well that perhaps others will be interested in the details. The circuit is shown in Fig. 1. A 5763 crystal oscillator drives a pair of

\* P.O. Box 403, Quebec 4, P. Q., Canada.

6146s in push-pull. Multiband tuners in both stages make switching unnecessary in covering all bands, 80 through 10 meters inclusive. Crystals in the 14-Mc. range are required for 28-Mc. output.

The oscillator is keyed by c.w., and the amplifier is protected by a 6216 screen clumper and series VR tube. The 6216 also serves as a screen modulator for phone operation.

In the amplifier stage,  $C_2$  is a small trimmer capacitor whose purpose is to balance the grid drive by compensating for the output capacitance of the 5763, which appears across the opposite side of the push-pull circuit.  $L_1$ ,  $L_2$  and the 100-

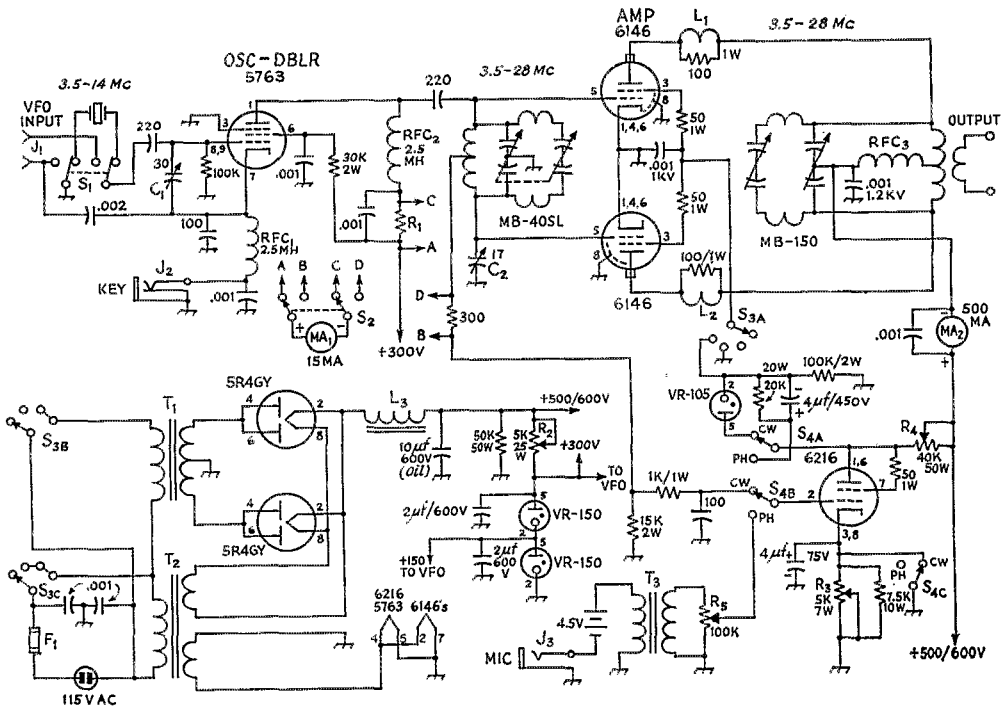
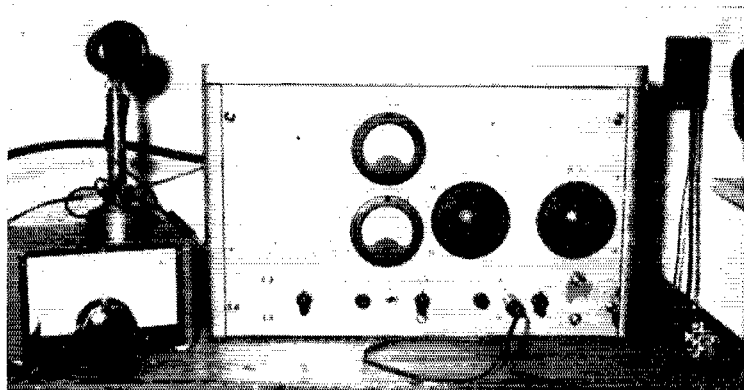


Fig. 1 — Circuit of VE2RZ's transmitter. All capacitances less than 0.001  $\mu$ f. are in  $\mu$ f. Unless otherwise designated, all 0.001- $\mu$ f. capacitors are disk ceramic, and polarized capacitors are electrolytic. Other fixed capacitors (except filter capacitors), may be mica or ceramic. All resistors are  $\frac{1}{2}$  watt unless otherwise specified. The multiband tuners are produced by the National Company.

- $C_1$ ,  $C_2$  — Ceramic compression-type trimmer.
- $R_1$  — Wire-wound shunt adjusted to give  $MA_1$  a full-scale deflection at 100 ma. See text.
- $R_2$ ,  $R_4$  — Adjustable slider tap.
- $R_3$  — Wire-wound pot. (Mallory E5MP or similar).
- $L_1$ ,  $L_2$  — No. 12 enam. wire close-wound full length of 1-inch 100-ohm 1-watt resistor.
- $L_3$  — 10 h., 400 ma. or more (Triad C-22A or similar).
- $F_1$  — 10 amp. fuse.
- $J_1$  — Prongs on octal socket also used as crystal socket.
- $J_2$  — Closed-circuit jack.
- $J_3$  — Open-circuit jack.

- $MA_1$ ,  $MA_2$  — 2 $\frac{3}{4}$ -inch milliammeter.
- $S_1$  — D.p.d.t. toggle switch.
- $S_2$  — D.p.d.t. spring-return switch.
- $S_3$  — Three-wafer 4-position bakelite rotary.
- $S_4$  — Three-pole d.t. rotary.
- $T_1$  — Plate transformer: 1200 to 1400 volts r.m.s., c.t., 400 ma. (Triad P-9A, Thordarson 21P85).
- $T_2$  — Combination filament transformer: 5 volts, 4 amp. or more; 6.3 volts, 5 amp. or more (Thordarson 21F23, Triad F-38A). Individual transformers may be substituted.
- $T_3$  — Single-button carbon microphone to grid.

Along the bottom of the panel, from left to right, are  $S_3$ ,  $R_3$ ,  $J_3$ ,  $S_2$ ,  $R_5$ ,  $J_2$  and  $S_4$ . The cabinet is a standard type for 12¼-inch rack panels. The unit to the left is the remote tuner for the VFO.



ohm resistors in the 6146 plate leads combine with the 50-ohm resistors at the screen terminals to suppress v.h.f. parasitics.

The milliammeter  $MA_1$  may be switched to read either oscillator plate current or amplifier grid current. A wire-wound shunt,  $R_1$ , is adjusted to increase the full-scale reading to 100 ma. when checking oscillator plate current. (See measurements chapter of the ARRL *Handbook*.) A second milliammeter,  $MA_2$ , is connected permanently in the plate circuit of the amplifier.

A power supply delivering approximately 500 volts at 400 ma. is included in the unit. The rectifiers are 5R4GYs with elements paralleled to handle the full load current. A regulated 300-volt tap for the oscillator is provided by a pair of VR150s.

$S_3$  is a control switch. In the first position, all power is off. In the second position,  $S_{3C}$  turns transmitter and rectifier filaments on. In the third position,  $S_{3B}$  turns the high voltage on, while  $S_{3A}$  grounds the screens of the 6146s so that these tubes draw negligible plate current while the 5763 is tuned up. In the last position,  $S_{3A}$  applies screen voltage to the 6146s.

$S_4$  is the phone-c.w. switch. In the c.w. position (shown in Fig. 1),  $S_{4B}$  connects the grid of the 6216 clamper tube to the amplifier grid leak,  $S_{4A}$  supplies screen voltage to the 6146s through a VR tube which acts as an electronic switch to cut off screen voltage when the key is open, and  $S_{4C}$  shorts the 6216 cathode resistor. In the phone position, the microphone transformer is connected to the grid of the 6216 by  $S_{4B}$ , reduced

screen voltage is applied to the 6146s through  $S_{4A}$ , and cathode bias is applied to the 6216 as  $S_{4C}$  removes the short across the cathode resistor.

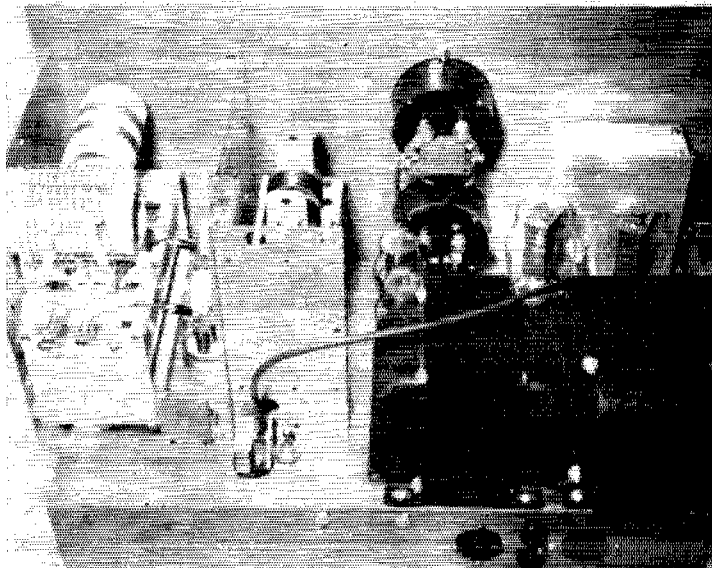
Provision is included ( $S_1$ ) for switching the input of the 5763 to the output of a remotely-tuned VFO similar to the one described in the last three editions of the ARRL *Handbook*, and in *QST* for January, 1953. The 5763 then functions as an amplifier or frequency multiplier. Plate and screen voltages for the VFO are taken from the 300- and 150-volt regulated taps of the transmitter power supply as indicated in Fig. 1.

### Construction

The unit is constructed on a 17 × 10 × 3-inch chassis fitted with a 12¼-inch rack panel. The right-hand half of the chassis (as viewed from the rear) is devoted to the power supply. The two multiband tuners, enclosed in shielding compartments of aluminum sheet, occupy the remainder. The two 6146s are in the compartment with the MB-150, while the 5763 is to the rear of the MB-40SL. The cover of the amplifier compartment is drilled for ventilation. An octal socket and the crystal-VFO switch are to the rear of the oscillator enclosure. The octal socket is wired up as a combination crystal socket and VFO input connector.

(Continued on page 120)

Portions of the shielding enclosures for the multiband tuners have been removed in this rear view of VE2RZ's push-pull 6146 transmitter. The octal socket used as a crystal socket and also as input connector for the VFO is to the rear of the crystal-oscillator compartment. The toggle switch is  $S_1$ . The 2 × 4 × 4-inch aluminum box near the right-hand end of the panel houses the tube and associated components of a remotely-tuned VFO. The filament transformer,  $T_2$ , is under the chassis.



# Pep Up Your Old Receiver

Improving Performance with a Better R.F. Tube

BY HOWARD O. LORENZEN,\* W3BLC

WE HAVE been reading a lot in *QST*<sup>1,2</sup> on how to improve the noise figure of amateur receivers and thus achieve the ultimate in sensitivity. Like a lot of amateurs I am not blessed with the latest in fine receivers, but some fairly simple changes in my set have effected some major improvements in its performance. I am sure others can do the same with no difficulty.

My BC-348 as it was manufactured used a 6K7 as the r.f. amplifier<sup>3</sup> and its performance

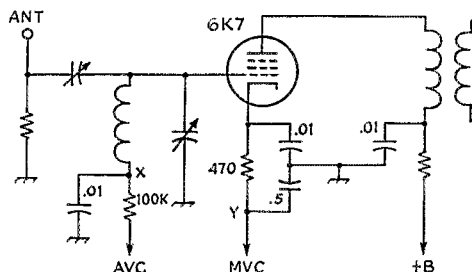


Fig. 1—Simplified circuit of pentode first r.f. stage in BC-348 (see Footnote 3). The only changes made were to ground points X and Y.

seemed to be quite satisfactory. I knew that a higher  $g_m$  tube in the first r.f. stage should improve the noise factor, but I hesitated to tear into the receiver to effect any major modifications. However, I felt it would be desirable to remove the a.v.c. from the first r.f. stage as well as to take the stage off the r.f. gain control. This was accomplished by breaking the a.v.c. lead at X in Fig. 1 and returning the bottom side of the r.f. coils to ground, and by breaking the lead to the manual r.f. gain control at Y and grounding the 470-ohm resistor. No noticeable changes in the receiver performance could be observed even though these steps were in the right direction to get optimum performance from the receiver.<sup>4</sup>

Next I replaced the 6K7 with an 1851 pentode, which has base connections identical with those of the 6K7. (The 1851 is a 6AC7 with the grid

coming out the top.) First I tuned in a weak foreign broadcast station that was just above the noise level with the 6K7. The reason for choosing the b.c. station was because I wanted a steady signal that would be there for 15 or 20 minutes at least, just in case of fading. When I put in the 1851 the same Spanish music was there but the signal sounded like a local. What a difference! I was sure the station's signal strength had come up, but when I replaced the 6K7 there it was back in the "mud" at the noise level of the receiver. Several times I changed the tubes back and forth, always with the same result. Later I talked several friends of mine with BC-348s into trying the test by loaning them my 1851. In a couple of cases I darn near didn't get my tube back, but the results were always a unanimous endorsement of the change.

To realize the full gain of the 1851 you should use a 220-ohm resistor in the cathode; however, if the shielding in the receiver is not too good it may be necessary to use a higher resistance to avoid oscillation.

Now a few words of caution before you start out to get yourself an 1851 to change your receiver: First, it is desirable to take the first r.f.



Fig. 2—An adapter unit for substituting a 6AC7 for the 6D6 in an early-model HRO. The 6AC7 plugs into an octal socket mounted in a 6-prong tube base.

\* 3713 Bangor St. S.E., Washington 20, D. C.

<sup>1</sup> "Technical Correspondence," *QST*, July, 1955.

<sup>2</sup> Longerich, Smith, "Low-Noise Receiver Design," *QST*, March, 1955.

<sup>3</sup> In the J, N and Q models the first r.f. tube is connected as a triode; in the others it is connected as a pentode. In some cases, therefore, it will be necessary to revise the wiring if the substitute tube is to be used as a pentode. — Editor.

<sup>4</sup> Removal of a.v.c. from the first tube is of doubtful utility unless the a.v.c. circuit is poorly designed in the first place. Taking the stage off the manual gain control will improve the signal-to-noise ratio in c.w. reception by the preferred method — i.e., a.f. gain full on, r.f. gain adjusted for the desired audio output level — particularly at low-gain settings of the manual r.f. control. — Editor.

tube off the a.v.c. line since the 1851 is a sharp-cut-off tube and you may impair the receiver performance if you leave it on the a.v.c. line. Second, you also want to take it off the manual r.f. gain control for the same reason. A word of further caution: If you have a brother ham living in your backyard with a kw. rig you may find he blocks your receiver due to the sharp-cut-off tube in the first r.f. stage. I have encountered this condition only once here in Washington.

### An Adapter Unit

My father, W0UEX, has an old National HRO with 6D6s in the r.f. stages. When I was home I

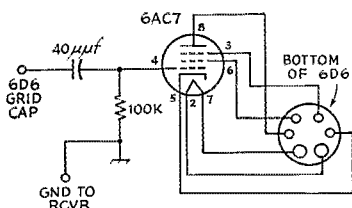


Fig. 3 — Circuit of the adapter unit shown in Fig. 2.

noticed the receiver didn't have the snap my BC-348 did so I made him an adapter for his set. Fig. 2 is a photograph of the plug-in unit and Fig. 3 shows its internal connections.

In this unit I wanted something foolproof that could just be plugged into the present HRO first r.f. socket without having to change connections in the receiver. As can be seen in the diagram,

• Some of the older receivers — particularly prewar models and military surplus — can benefit by replacing the first r.f. tube with one having lower noise and higher gain. The application to the BC-348 and the HRO as described here is practically painless.

a.v.c. was removed from the tube by putting in the grid-return resistor and the 40- $\mu$ mf. coupling capacitor. An external ground wire is provided to ground the unit at the regular shield by passing the wire over the socket portion and putting the shield over the top of it. This unit makes a big difference in the receiver performance.

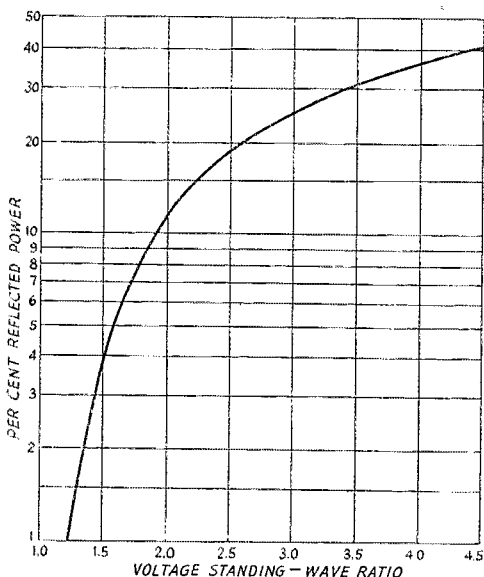
Now how about looking at that old faithful receiver that has served you so well? It is possible that you can make major improvements in its performance just by changing the first r.f. tube. Remember, you can't work them if you can't hear them. How often I hear one of the local hams say, "Sorry, OM, I can't hear you," and here at W3BLC I am getting solid copy. Improved sensitivity really pays off on those weak signals or DX contacts.

Although 1851s are a little scarce, you can still get 6AC7s in large quantities, so maybe you will have to choose between the alternatives of making an adapter, rewiring your socket or, if necessary, replacing it with an octal for the 6AC7. This is really one of the things you should try before you junk the old set — or before you convince yourself it can't be beat for performance.

### Reflected Power vs. Standing-Wave Ratio

There is a direct relationship between standing-wave ratio (defined as the ratio of voltage or current at a loop to the corresponding quantity at a node) and that portion of the power arriving at the load end of a transmission line which is reflected back toward the power source. In the accompanying chart, prepared by Robert J. Schlesinger, K6LZM, the reflected power, expressed as a percentage of the incident or outgoing power, is shown as a function of the s.w.r. The chart will be useful with bridges calibrated as power meters and capable of separating the forward and reflected power.

Since power varies as the square of the voltage, the percentage of power reflected is rather small for moderate standing-wave ratios. This accounts for the fact that the much-feared loss caused by standing waves is more of a bugaboo than an actuality — a point that can be confirmed by referring to the s.w.r.-loss chart in the *Handbook*.



# Directional Antenna for the Transmitter Hunter

*Making Use of a Sense Antenna for Single Directivity*

BY HAROLD J. BRASCHWITZ,\* W8YPT

**I**N the Cleveland, Ohio, area 10-meter transmitter hunts have been conducted on a county-wide basis (Cuyahoga County) by the AREC. The transmitter hunters usually start from a fairly clear region near the center of the county and the winner is determined by the distance traveled rather than by the time consumed. Incidentally, in some instances the last man to arrive at the hidden transmitter site has been declared the winner. This method of transmitter hunting places a premium on the accuracy of radio direction-finding equipment and eliminates the need for fast and/or reckless driving

• The addition of a simple sense antenna to the usual 10-meter shielded loop enables the transmitter hunter to determine quickly which of the two loop nulls is the correct one.

when needed and a built-in radio-frequency amplifier to increase sensitivity.

## The Loop

The loop shown in Fig. 1 has an outer shield made of  $\frac{3}{4}$ -inch brass or copper tubing, preferably a thin-wall type to reduce weight. The inner conductor is simply a No. 14 copper wire with polystyrene disks used as spacers to maintain the inner conductor in the center of the outer shield. The spacers were cut from  $\frac{5}{8}$ -inch rod stock. A polystyrene spacer is used at the top of the loop to insulate one half of the outer shield from the other half. The outer shield helps to balance the loop electrostatically so that it will respond to the magnetic field only. This balance prevents the

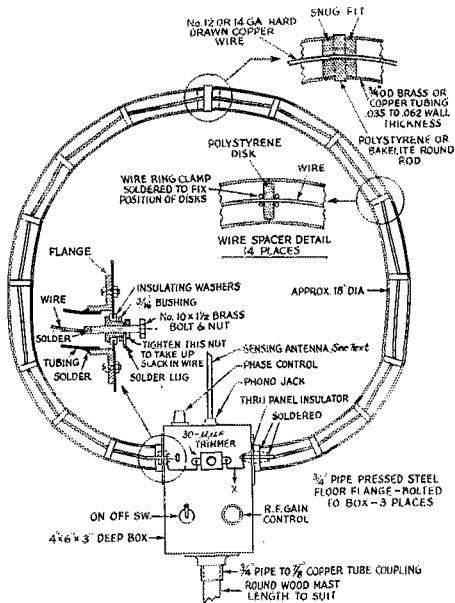


Fig. 1 — Sketch of W8YPT's d.f. loop and sense antenna.

while on a hunt. Poor driving technique is, of course, not in the best interests of ham radio or transmitter hunting.

With this plan of transmitter hunting, a need developed for both accurate unidirectional bearings and an extremely sensitive loop antenna, since the hidden transmitter could be as far as 20 miles away in any direction. The loop described in this article is a simple and effective answer to that need. It consists of a shielded loop antenna equipped with provision for addition of a sense antenna to produce unidirectional characteristics



W8YPT's 10-meter d.f. loop antenna. The sense antenna is braced against, but insulated from the loop with rubber tape.

\* 12187 Sprague Rd., Cleveland 30, Ohio.



loop structure from operating also as a vertical antenna which tends to broaden or displace the nulls.

A small utility box has been used at the bottom

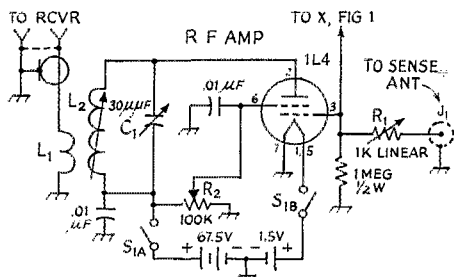


Fig. 2 — Sketch showing the circuit of the r.f. amplifier. The variable capacitor is a mica trimmer. The 0.01- $\mu$ f. capacitors are ceramic.  $R_1$  is the sense-antenna phasing control. It should have a linear taper.  $R_2$  is the r.f.-amplifier gain control.  $S_1$  is a d.p.s.t. toggle.  $L_2$  is a CTC LS-3-30 slug-tuned coil (approximately 1.3  $\mu$ h.).  $L_1$  is a 4-turn link wound at the battery end of  $L_2$ .

of the loop to support the antenna and to house the amplifier (see Fig. 2) and batteries.

The sense antenna allows one to determine which of the two bearings obtained with the loop alone (Fig. 3A) is the correct one. This eliminates the need for unnecessary travel to determine which bearing of the loop is the true bearing. It is a small vertical antenna whose signal is fed in with the loop signal to the r.f. amplifier to give a unidirectional characteristic as shown in Fig. 3B. This single null is generally not as sharp and accurate as the null obtained with the loop alone, so it is used merely to determine which of the two bearings obtained is the true bearing. In order to obtain the pattern shown in Fig. 3B, the correct length of sense antenna is necessary and this length can be determined experimentally. Generally, it has been found that the length needed is about three loop diameters. The 1000-ohm linear-taper phasing rheostat is also adjusted in conjunction with varying the sense-antenna length to produce the best cardioid pattern. A switch could be used to connect and disconnect the sense antenna, but it has not been too convenient to plug the vertical element into the phonograph-type receptacle on the top of the box which forms the base of the loop antenna when the sense characteristic is needed.

The gain control included has also been quite valuable in that with most loops the null becomes virtually indistinguishable when the transmitter hunter gets close to the hidden transmitter. The gain control included in this circuit overcomes this difficulty nicely for, by reducing the gain of the 1L4 amplifier stage, the null is quite apparent by aural or visual methods, even when the hidden transmitter is extremely close.

#### Adjustment of the Loop

Although the loop input and output circuits can be peaked up by listening to 10-meter signals, the adjustment is greatly simplified by the use

of a grid-dip oscillator. Merely set the g.d.o. to the operating frequency desired. Place the oscillator coil inside the loop and adjust  $C_1$  for resonance. Then place the g.d.o. coil near the 1L4 plate coil and adjust  $C_2$  and  $L_2$  coil-form slug for resonance.

Next, the proper sense-antenna length should be determined. While receiving a signal from a known location (preferably a station using a vertically-polarized transmitting antenna), the sense antenna should be pruned so that a single well-distinguished null in the plane of the loop is obtained. A suggested procedure would be to start with the sense-antenna length equal to about four times the loop diameter, and then prune the sense antenna in small increments until the correct pattern is obtained. A collapsible auto broadcast whip antenna can be used for increased adjustment convenience. At the same time, the side of the loop which actually points to the transmitter should be noted.

Now the loop is ready for transmitter hunting. With the loop alone, the figure-eight pattern will be obtained with two accurate nulls perpendicular to the plane of the loop and then, by connecting in the vertical sense antenna, a single, not quite so accurate and sharp a null will be obtained in a direction in the plane of the loop, the specific direction having been determined as outlined in the preceding paragraph.

#### Technique of Using the Loop Antenna

The most successful technique used in this area is as follows:

- 1) At the starting point, a null direction with the loop alone is obtained and noted.
- 2) The sense antenna is then used to obtain the correct general bearing.
- 3) The loop is mounted on the car so that bearings can be obtained without the need for getting out of the car. Then, keeping in mind the



Fig. 3 — Loop field pattern. A — Without sense antenna. B — With sense antenna. The horizontal lines show the plane of the loop.

general bearing, travel in that direction, correcting your course as determined by the subsequent loop bearings obtained. In essence, the technique employed is that of following the line directly to the hidden transmitter site.

A few further comments are in order with regard to the use of the loop from a mobile installation in a populated area. Serious errors at times result from the use of the loop on an automobile in built-up areas. Reradiation from various and sundry objects seems to be the largest factor in obtaining false bearings.

First, as far as the car itself is concerned, pulling the mobile whip antenna down while taking a bearing is helpful. Collapsing the auto broadcast antenna and other vertical elements which

(Continued on page 122)

# • Technical Topics—

## Twice or Four Times?

A FEATURE of push-pull amplifiers that puzzles numerous readers is the relationship between the plate-to-plate load resistance and the load on one of the tubes. The confusion is understandable, since the relationship is not always obvious, nor is it the same under all conditions.

It is helpful to make the approach in easy stages. In Fig. 1 two generators are connected in

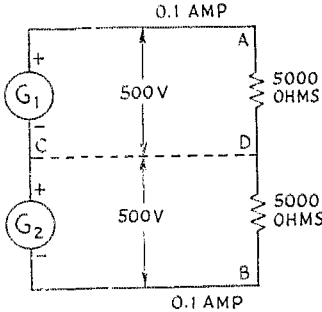


Fig. 1—Generators in series divide the load equally between them.

series and are furnishing power to a resistive load totalling 10,000 ohms. Let us suppose initially that they are d.c. generators, each developing 500 volts under a load current of 0.1 ampere (100 milliamperes). If the polarities are as shown, the total voltage between points A and B is 1000 and 0.1 ampere flows through the 10,000-ohm load. The total power is 100 watts (1000 volts  $\times$  0.1 amp.), of which each generator is supplying 500 volts  $\times$  0.1 amp. = 50 watts. Each generator therefore "sees" a load resistance of 500 volts divided by 0.1 amp., or 5000 ohms.

Points C and D are at the same potential and can be connected together without disturbing the operation of the circuit. With such a connection the circuit could, in fact, be divided into two separate parts at this point and neither generator would know the difference, since each would continue to see a 5000-ohm load.

So far this should not be hard to follow. The next step is also an easy one: Imagine that the two generators are now a.c. instead of d.c. generators, each developing an r.m.s. voltage of 500. The two are working in phase; that is, each reaches

<sup>1</sup> This idea can be extended a bit. So long as the two generators continue to deliver the same power, it does not matter what load resistance is connected to the secondary provided the turns ratio of the transformer is properly chosen. A 100-ohm load, for instance, would take a current of 1 ampere in consuming 100 watts. It would require 100 volts to force 1 ampere through 100 ohms, and so the total primary-to-secondary turns ratio would have to be 1000 volts divided by 100 volts, or 10 to 1. Each generator would continue to see a 5000-ohm load, the total for the two remaining at 10,000 ohms.

the peak of its positive cycle at the same instant, and the polarities are aiding just as in the case of the d.c. generators. Except that the current is alternating and we are dealing with r.m.s. rather than steady values, the operation of the circuit on a.c. is identical with its operation on d.c. Each generator sees a 5000-ohm load and the circuit could be divided just as before.

### Enter the Transformer

Now for step number three, illustrated by Fig. 2. Here we have the same two a.c. generators and the same 10,000-ohm load. However, the load is now connected to the generators through a transformer having a 1-to-1 turns ratio. The transformer is assumed to be perfect, so the secondary voltage is exactly the same as the primary voltage, and the power in the secondary circuit is exactly the same as the power in the primary circuit. This being so, the load "reflected" into the

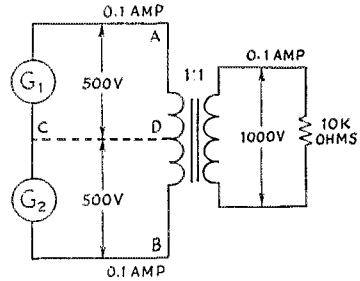


Fig. 2—Transformer coupling with a 1-to-1 transformer ratio is equivalent to the direct connections of Fig. 1.

primary circuit is exactly 10,000 ohms, and so the two generators think they see a 10,000-ohm resistance instead of the transformer primary.<sup>1</sup>

In other words, so far as the two generators are concerned Fig. 2 is no different from Fig. 1, and each generator still sees a 5000-ohm load. Each continues to deliver half the total power. A tap at the center of the transformer primary, as at D, could be connected to the junction, C, of the two generators without disturbing the circuit operation, since the voltage drop along the primary is proportional to the number of turns.

The point is that a transformer connected in this way has changed nothing, and the total load on the two generators is simply the sum of the loads on each individual generator. Or, if you prefer, the load on each generator is equal to one-half the total load resistance.

### Where There Is a Difference

Now suppose that points C and D are actually connected together and that one generator, G<sub>2</sub>, is removed from the circuit, giving the arrange-

ment of Fig. 3.  $G_1$  is still applying 500 volts to one-half of the transformer primary, and since the transformer is now stepping up the voltage in

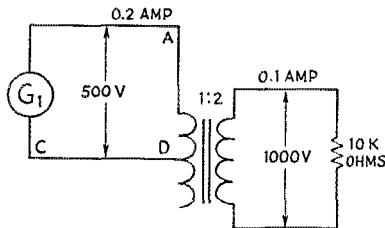


Fig. 3— With one of the generators of Fig. 2 removed, the remaining generator doubles its power output.

the ratio of 1 to 2 the voltage induced in the secondary is still 1000 volts. This continues to put 0.1 amp. and 100 watts into the 10,000-ohm load. The transformer cannot generate any power, so all of it has to come from  $G_1$ .  $G_1$  accordingly increases its current output to 0.2 amp. (500 volts  $\times$  0.2 amp. = 100 watts), and is now seeing a load resistance of 500 volts divided by 0.2 amp., which equals 2500 ohms.

How is it that the current from  $G_1$  automatically doubles when the generator is still connected in exactly the same way as it was in Fig. 2? The answer is to be found in the operation of a transformer. We won't go into the intimate details (an outline of them can be found in the *Handbook*) but will be content with stating that the product of amperes times turns must be exactly the same in both the primary and secondary of a perfect transformer. In Fig. 2 the two windings both have the same number of turns active (all of both windings) and so must carry the same current, 0.1 amp. In Fig. 3 only half the primary turns are active, the half formerly connected to  $G_2$  being unused, and so twice as much current must flow in that half of the primary to make the ampere-turn product the same in the primary as in the secondary.

Of course, these voltage and current figures assume that  $G_1$  is able to maintain its terminal voltage at 500 under the heavier load, so that 1000 volts will be induced in the secondary. But even if it does not, the load on  $G_1$  will still be 2500 ohms so long as the load on the transformer secondary is 10,000 ohms. No matter what  $G_1$ 's terminal voltage may be, the secondary voltage is twice as large because there are twice as many turns in use in the secondary as in the primary, so the primary current must be just twice the secondary current. Thus the impedance looking into the primary is one-fourth the load resistance connected to the secondary. Since the secondary load stays 10,000 ohms regardless of the voltage applied to it, the secondary-to-primary impedance ratio remains 10,000 to 2500 no matter what voltage  $G_1$  applies to the primary.

So much for the background. Vacuum-tube operation can be related directly to the generator examples just discussed.

### The Class A Amplifier

A Class A amplifier is very much like the a.c. generator used in the previous examples. Like the generator, it is working throughout the cycle, since by definition a Class A amplifier is one in which plate current flows throughout the cycle. To be sure, its "output" voltage depends on the alternating signal applied to the grid, but we will consider the grid signal to have a constant value, in which case the voltage generated in the plate circuit likewise is constant. The tube then becomes equivalent to the a.c. generator, the principal difference being that its internal resistance is large compared with that of a regular generator. Hence the actual voltage applied to the load will not be so independent of the value of the load resistance as in the case of the generator. This, however, is a detail that does not at all affect the principles involved.

Everything that has been said about the behavior of the a.c. generators applies with equal force to the push-pull Class A amplifier. Each tube sees half of the total or plate-to-plate load resistance, just as the generators did in Fig. 2. In Fig. 4, an illustrative tube circuit, the same

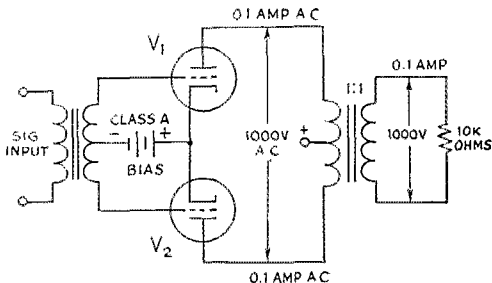


Fig. 4— The Class A push-pull amplifier is equivalent to the two series-connected generators of Fig. 2.

numerical values are assumed as in Fig. 2; thus the plate-to-plate load is 10,000 ohms and each tube sees half of it — 5000 ohms. The tubes are in every way equivalent to two a.c. generators connected in series.

If we pull  $V_2$  out of its socket, the circuit immediately becomes comparable with Fig. 3.  $V_1$  then sees a 2500-ohm load and will deliver more power than was required of it when  $V_2$  was present and operating. The power may not double, in the practical case, because of the relatively large internal (plate) resistance of the tube. But the tube will supply just as much as it is capable of developing in a 2500-ohm load.

With both tubes operating — which is the normal way of using a push-pull Class A amplifier — the plate-to-plate load is twice the load for one tube. This relationship can be used for designing a push-pull Class A amplifier from single-tube Class A data.

### The Class B Audio Amplifier

In considering the Class B audio amplifier — which, it is to be understood, is one biased to cut-off or so near cut-off that the "resting" plate

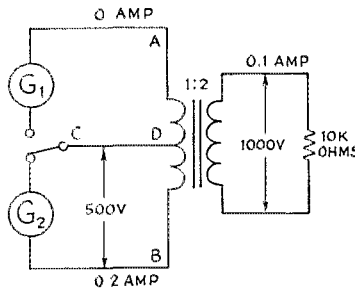
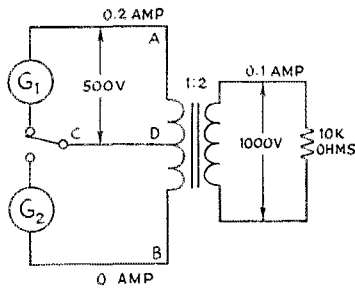


Fig. 5 — By means of the toggle switch, the circuit from either generator to the transformer can be completed and power delivered to the load, but one or the other generator is always working.

current is negligible — it is helpful to go back to the generators again for a moment. Referring to Fig. 3, suppose that instead of removing  $G_2$  entirely we rig up a toggle switch so either generator can be used, as indicated in Fig. 5. When the switch arm is up,  $G_2$  is idle while  $G_1$  delivers full power, 100 watts, to the load. When the arm is down,  $G_2$  does all the work and  $G_1$  is idle. If we imagine a switch that acts so rapidly that one connection is made at the instant the other is broken, we could operate the switch as we pleased and the power delivered by the transformer secondary would be continuous, since one generator or the other always would be working.

This, in effect, is just what happens in a Class B audio amplifier. When biased to cut-off as suggested in Fig. 6, the grid voltage is beyond cut-off

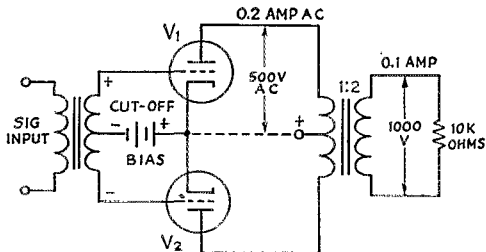


Fig. 6 — In the Class B audio amplifier the two tubes work alternately, as suggested by the fact that in this drawing the grid of  $V_1$  is positive and power output is taken from the plate circuit, while  $V_2$  delivers no output since its grid is beyond cut-off. On the next half cycle of signal voltage the reverse takes place and  $V_2$  delivers power while  $V_1$  rests.

during the negative half cycle of driving voltage. Because of the push-pull arrangement of the grid circuit, the negative driving half cycle for one tube is the positive driving half cycle for the other; thus the tubes work on alternate half cycles. Like the generators, one tube has to deliver the full power output while the other is idle, and since the switching is instantaneous the power output is continuous.

We have already seen that in a "work — no work" arrangement like this the generator or tube sees a load resistance that is one-fourth the total or plate-to-plate load resistance. Thus the plate-to-plate load resistance for a Class B audio amplifier is four times the load resistance for one tube.

It is of interest to note that taking one tube out of its socket does not affect the load that the other sees. All that happens is that the plate current drops to one-half the value it had with two tubes. The active tube continues to take the same plate current that it did before. The average power output is one-half, of course, since every other half cycle of output is missing.

### The Class AB Audio Amplifier

Most audio power amplifiers are operated Class AB rather than pure Class A or pure Class B. At some low level of output a Class AB amplifier will become pure Class A, since if the grid signal is small enough both tubes will be taking plate current throughout the cycle. The exact point at which this occurs depends on the biasing. When the tubes are operating Class A, what was said above about Class A push-pull operation applies.

As the grid signal is made larger and approaches the value that gives maximum undistorted power output the amplifier approaches Class B operation. It never quite reaches it, because the bias is something less than cut-off. However, if the bias is quite close to cut-off, as it may well be in a high-power modulator, the operation is essentially Class B and the discussion of Class B audio amplifiers above applies. That is, the load on each tube is one-fourth the plate-to-plate load resistance.

In other words, as the grid signal is increased from a very small value to the maximum usable, the load on each tube shifts from one-half the plate-to-plate load resistance to one-fourth the plate-to-plate load resistance, because of the reasons already discussed. The plate-to-plate load resistance remains the same throughout, since it is determined solely by the transformer ratio and the actual load on the transformer secondary.

### R.F. Amplifiers

A radio-frequency amplifier (a typical push-pull circuit is shown in Fig. 7) does not use simple transformer output but of necessity has a resonant plate circuit. The  $Q$  or "flywheel effect" of the tank circuit keeps power circulating continuously even though each tube may give the tank a "kick" of energy only during a small part of each cycle. So far as the output circuit is

concerned, this is just the same as though each tube were delivering power continuously instead of taking turns at working.

In short, with any class of operation — A, AB, B, or C — at r.f. a push-pull amplifier has the same plate-load relationships as a Class A audio

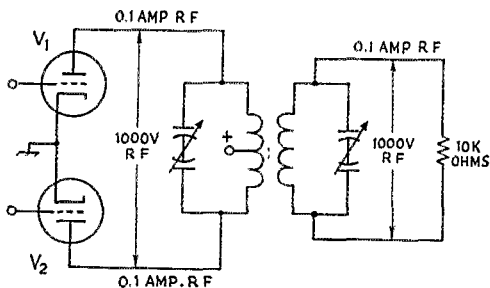


Fig. 7 — The push-pull r.f. amplifier, because of the power circulating in the tank circuit, is equivalent to the two series-connected generators of Fig. 2.

amplifier. The load resistance seen by each tube is one-half the plate-to-plate load resistance. The behavior of a Class B or C push-pull r.f. amplifier when one tube is removed is quite different from that of a Class B audio amplifier. In the

<sup>2</sup> The tube may not be quite able to make it because of various factors which can, broadly speaking, be grouped under voltage regulation.

latter, as we have seen, the plate current and output will drop to one-half on taking out one tube. In the r.f. amplifier, the remaining tube will make a gallant attempt to take over the whole job and supply just as much power as the two tubes did working together.<sup>2</sup> It is easy to convince yourself of the difference between audio and r.f., if push-pull amplifiers of both types are available for the experiment.

### Summary

Summing up, the plate-to-plate load resistance is twice the load resistance for one tube if both tubes deliver power continuously. It is four times the load resistance for one tube if the tubes work alternately.

Tubes in Class A amplifiers deliver power continuously. Tubes in any class of r.f. amplifier operation can be considered to deliver power continuously because of the flywheel effect of the tank circuit.

Tubes in true Class B audio amplifiers deliver power alternately.

Tubes in Class AB audio amplifiers deliver power continuously at low signal levels and may approach delivering power alternately at high signal levels. At intermediate levels both tubes may be delivering power simultaneously during part, but not all, of the cycle. — G. G.

## A "QST Combination" at VE1IA

The transmitter at the station of John Hamby, Charlottetown, P.E.I. is the cabinetted assembly at the right in the picture below. It incorporates three QST designs: Remote-tuned VFO from the January, 1953, issue, the 75-watt transmitter

from December, 1952, and the associated Class AB<sub>1</sub> modulator from May, 1953, QST. You'll agree, we think, that VE1IA has made a good-looking job out of the project. Incidentally, all three circuits were in the '54 and '55 Handbooks.



# • Recent Equipment —

## The Hammarlund PRO-310 Receiver

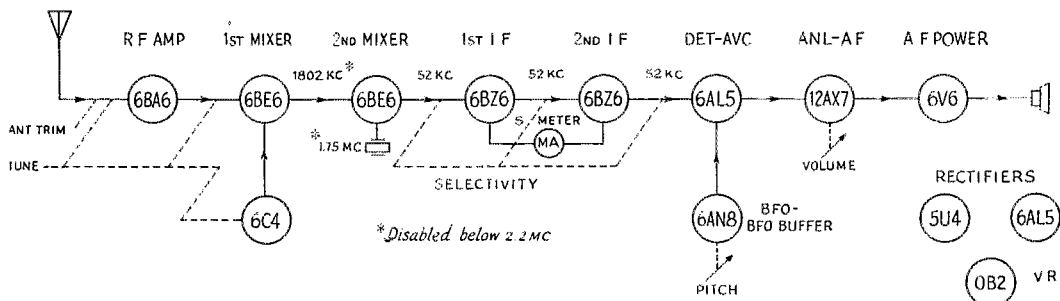


Fig. 1 — Block diagram of the Hammarlund PRO-310. The 6AL5 rectifier is for the bias supply; the manual gain control applies negative bias to the grids of the r.f. amplifier, the second mixer and the first i.f. amplifier, and the a.v.c. is applied to the same stages.

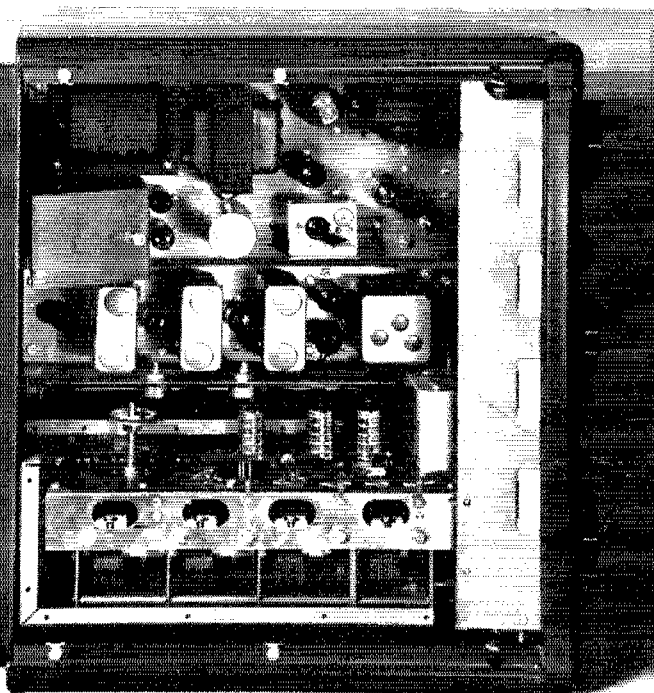
THE ADVERTISEMENTS for the PRO-310 receiver have aroused considerable interest in many ways, but perhaps the outstanding promise was the one about the "differential" tuning system that provides for extremely accurate logging at all frequencies. This is indeed different than the tuning system of any other receiver we have seen, and it may take quite a few words to get the idea across. We'll save that for later.

The PRO-310 covers the range from .55 to 35.52 Mc. in six bands: .55 to 1.11 Mc., 1.10 to 2.22 Mc., 2.20 to 4.44 Mc., 4.40 to 8.88 Mc., 8.80 to 17.76 Mc. and 17.60 to 35.52 Mc. Accurately-calibrated bands are available on all but the first of these bands, where it is hardly necessary anyway.

Double conversion is used on all but the two lowest-frequency bands, for good image rejection

(better than 70 db. on all but the first and sixth bands; better than 50 db. on the remaining two bands). With double conversion, the first i.f. is 1802 kc., and the second i.f. is 52 kc. As can be seen in the block diagram in Fig. 1, the 52-kc. i.f. has variable selectivity; a three-position switch gives a choice of bandwidths of 0.3, 1.5 and 4.0 kc. These figures represent the bandwidths at 3, 3 and 6 db. down, respectively. The respective bandwidths at 60 db. down are 3.8, 12.9 and 13.2 kc. Variable selectivity is obtained by varying the mutual coupling and the resistance in the six 52-kc. tuned circuits. Unlike other receivers using this method, the bandwidth "grows out" equally in both directions.

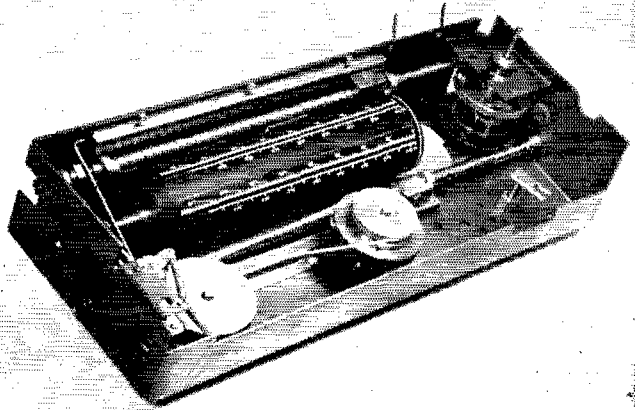
The S meter is a voltmeter connected between the cathode of the first i.f. amplifier and the arm of a 200-ohm potentiometer that furnishes



This view of the PRO-310 shows the r.f. section (bottom), i.f. amplifiers (center), and the power supply and audio. The rectangular shield at the upper left corner, just below the power transformer, is a hood over the rectifier tube that deflects the rising hot air out the back of the cabinet.

QST for

This photograph shows the dial assembly. The scale rotates with the band switch so that only the frequency range in use is visible. The mechanism at the right is the differential that permits turning the two tuning knobs independently.



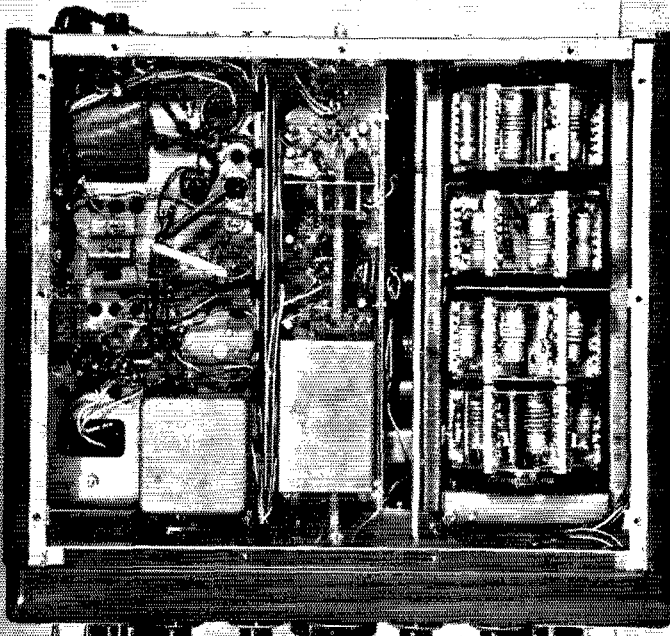
cathode bias for the second i.f. amplifier. This potentiometer is the zero-set control for the S meter; a portion of the bias on the second i.f. amplifier is sufficient to balance the cathode voltage of the first i.f. stage. The b.f.o. stage is unusual in that it uses the series-tuned Colpitts (Clapp) circuit and a "B.F.O. Buffer" stage. The instruction book states that the buffer stage eliminates b.f.o. lock-in on an incoming signal. The automatic noise limiter uses a diode-connected 12AX7 section in a series-limiter circuit. No 100-kc. crystal calibration oscillator is shown in the block diagram; one is available as an accessory, and a switch for its control is included on the panel.

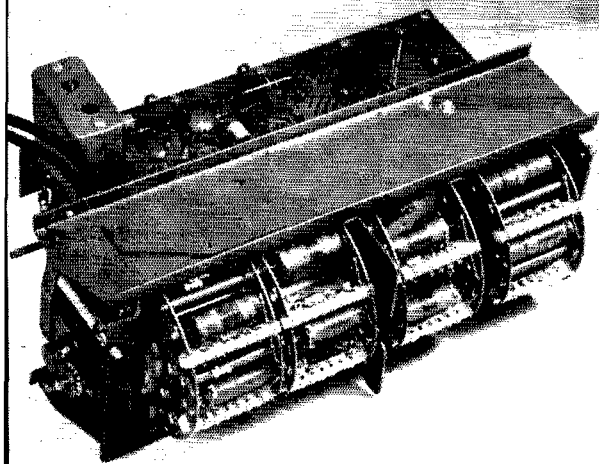
One of the photographs shows the turret assembly that houses the r.f. section of the receiver. Each coil assembly and associated circuitry can be quickly removed for servicing or exchange. The same photograph shows the printed circuitry associated with the r.f. section. The component leads are dropped into proper holes and the unit is then dip-soldered.

If you have seen photographs of the front

panel of the PRO-310, you may have observed the slide-rule tuning scale and the three large knobs. The left-hand knob is the band-switch that actuates the turret assembly. The center knob roughly corresponds to the "handset" capacitor of an ordinary two-dial receiver; it drives the tuning capacitor gang at a fairly rapid rate and moves the top pointer on the slide-rule dial. In the fourth range, for example, this scale is calibrated 4.40 to 8.88 Mc. The right-hand knob, which roughly corresponds to the hand-spread knob of a two-dial receiver, turns the tuning capacitor at a rate that is only 1/200 of the rate of the other knob, and it also moves a pointer on a bottom scale in the window. This scale would be calibrated 0 to .44 Mc. in the fourth range. The frequency setting of the receiver is the *combined* reading of these two scales. For example, if the top scale reads 7.0 Mc. and the bottom scale reads .20 Mc., you are tuned to 7.2 Mc. You can also tune to 7.2 Mc. with the top scale reading 7.1 Mc. and the bottom scale reading .1 Mc. As you can see, for ham-band operation you would probably set the top scale

The bottom view shows the accessibility of the front-end components and the extensive shielding used in the i.f. and b.f.o. stages.





◆  
 The r.f. assembly features readily removable coil assemblies and printed-circuit techniques.  
 ◆

to the low end of a band and read the fractional Mc. on the bottom scale. The bandspread scales are (none on the first band) .11, .22, .44, .88 and 1.76 Mc., respectively, so 75-meter phone reception would require a setting of 3.8 Mc. on the top

scale but the higher bands could be tuned as described, from the low-frequency end. The 200:1 reduction drive is obtained through worm drive of spring-loaded gears; we don't pretend to understand the differential or clutch mechanism involved in the independence of the two dial drives. Thirteen turns of either knob is required to cover their respective ranges.

The PRO-310 is compact, measuring 9 inches high, 17 $\frac{7}{8}$  wide and 15 $\frac{1}{2}$  inches deep, and it weighs 65 pounds. A loudspeaker in a smaller housing but with matching styling is available.

— B. G.

## The Knight V.F.O.

**T**HE KNIGHT VFO kit includes all of the parts and instructions necessary to build a v.f.o. covering the amateur bands from 80 through 10 meters. This includes a power supply and voltage-regulator tube. The v.f.o. is compact, and the over-all dimensions are 6 by 6 by 8 $\frac{3}{4}$  inches high.

Circuitwise the v.f.o. uses a 6BH6 series-tuned Colpitts (Clapp) oscillator on 160 meters followed by a 6BH6 buffer. A bandswitch on the panel has two positions, 80/11 and 40/20/15/10. The two positions change the tuning ranges of the 160-meter oscillator circuit, so that the harmonics will fall within the bands mentioned. An output switch on the panel has three positions: a.c.off, 80, and 40/20/15/11/10. In the latter positions fixed-tuned circuits in the plate of the buffer stage are switched to 80 or 40 meters. These fixed-tuned circuits are both capable of adjustment from 80 to 40 meters, a convenience where an owner might want to use 80- or 40-meter output exclusively.

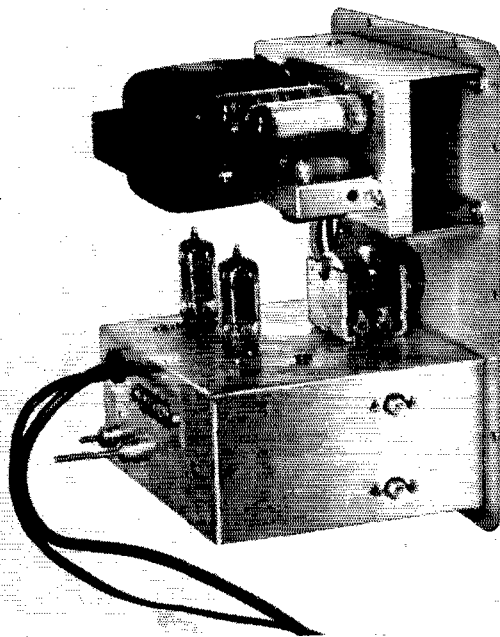
A 3-position d.p.d.t. center-off toggle switch on the front panel is marked CAL — STAND BY — XMT. One pole is used to close the oscillator cathode in the CAL position, and the other pole is available for control of transmitter circuits. The closed-circuit key jack is connected to the oscillator cathode in the XMT position.

A 0A2 voltage regulator stabilizes the plate and screen voltage on the oscillator, and a 6X4 rectifier is used in the power supply. Cathode bias is provided in the buffer stage to hold down the key-up plate current.

The 24-page instruction book appears to be as complete as anyone could ask for. It calls for a simple step-by-step procedure, and many of the pictorial instructions are duplicated so that the constructor can hang the sketches on the wall

while working. A number of the illustrations are larger than life-size. The instruction book states that the r.f. output of the unit is approximately 10 volts; it is introduced to the transmitter at the crystal socket through a short cable furnished with the kit.

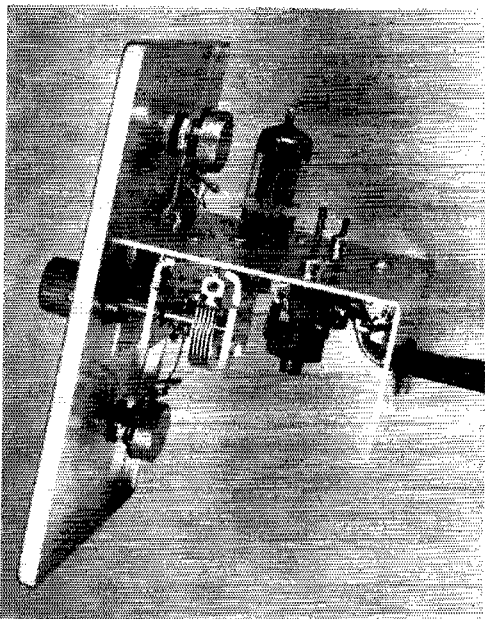
The Knight v.f.o. is sold by Allied Radio Corp., Chicago, Ill.





## The Heathkit Q Multiplier

ONE OF THE latest additions to the Heath Company line of products for amateurs is a Q-Multiplier kit. Like other Heath products, it is available in kit form only. The unit is designed to work with any receiver having an intermediate frequency from 450 to 460 kc. Power



The Q Multiplier removed from its cabinet.

for the unit is derived from the receiver — the requirements are 6.3 volts a.c. at 0.3 amp. and 150 to 250 volts d.c. at 2 ma. The power is used to run a 12AX7 dual triode.

The circuit of the unit is shown in Fig. 1. This is a shunt type Q Multiplier, to be connected in parallel with the plate circuit of the first i.f. stage of the receiver. There are four operating functions that are controlled by a three-pole four-position switch. These are: OFF, PEAK, NULL and BROAD. In the OFF position, the heaters of the 12AX7 are left on but no plate voltages are applied to the tube. In the PEAK position, only one triode section,  $V_{1B}$ , is active. A tuned circuit in the plate of  $V_{1B}$  uses an inductor that has a Q of approximately 200. Through the use of positive feedback (regeneration), the apparent Q of the circuit can be increased up to a maximum of

approximately 4000, depending upon the setting of a 10,000-ohm resistor in the cathode circuit of the tube. Shunted across the i.f. stage of the receiver, the Q Multiplier has the same effect on selectivity as would making the i.f. stage regenerative, and the receiver has increased gain over a narrow band of frequencies. Any signal falling in this portion of the passband will be amplified more than adjacent signals. By tuning the 100- $\mu\text{f}$ . variable, the peak can be moved across the passband. The gain, of course, is controlled by the setting of the 10,000-ohm potentiometer in the cathode circuit.

The BROAD position is obtained by switching the 27,000-ohm resistor in series with the lead to the receiver i.f. This reduces the effect of the Q Multiplier and broadens the peak.

In the NULL position, negative feedback is applied to the circuit by switching in the other triode section of the 12AX7. The effect of the resultant null is to short-circuit any signal in the i.f. passband that happens to be on the same frequency as the null, while adjacent signals pass through the receiver without attenuation. As in the other two positions, the null can be moved across the passband by tuning the 100- $\mu\text{f}$ . variable. The degree of attenuation is controlled by a separate 10,000-ohm variable resistor, so that NULL and PEAK levels can be preset.

The kit is marketed complete with all necessary parts, including a  $7\frac{1}{2} \times 4\frac{1}{16} \times 4\frac{1}{8}$ -inch metal case. A power cable is furnished, with an octal plug for use with receivers having an accessory power socket. A 2½-foot length of coaxial cable is included for connection to the receiver i.f. Detailed instructions are included with the unit, and the only tools needed are a soldering iron, screw driver, wire cutters, knife, and solder. The writer made it a point of checking the wiring time needed to complete the unit and, in his case, it was slightly over two hours.

— L. G. M.

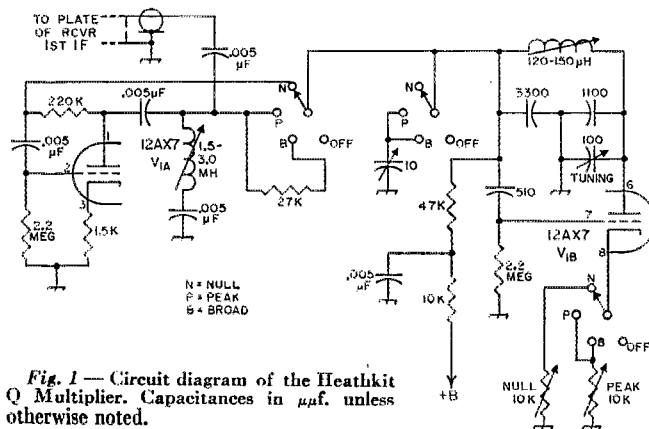


Fig. 1 — Circuit diagram of the Heathkit Q Multiplier. Capacitances in  $\mu\text{f}$ . unless otherwise noted.

# Simulated Emergency Test—1955

*Amateurs in 145 Communities Test Their Readiness to Serve in Emergencies*

GEORGE HART, WINJM

SOME of our Emergency Coordinators are starting to ask: "Why must we have a Simulated Emergency Test when we are already so overloaded with civil defense (RACES) drills?" That's a good question and deserves a good answer. Let's give it one.

The Annual Simulated Emergency Test is a function of our own Amateur Radio Emergency Corps, a once-per-year putting-through-the-paces workout for the organization we amateurs have been working since 1935 to perfect. The AREC is not an amateur organization designed to serve amateurs, but to render communications service wherever such service is required. Therefore, the annual SET does *not* require any amateur to forget his other affiliations and participate in a strictly-AREC drill. On the contrary, it urges him to utilize his AREC affiliation to demonstrate that he can render an effective amateur

radio communications service, be that through Civil Defense, the Red Cross, the Police Department, the Fire Department, or all of them together.

Thus, since many amateurs these days have strong c.d. affiliations and are kept busy on c.d. drills, it is a long way from unrealistic to convert a c.d. drill, routine or special, into the AREC Simulated Emergency Test, and to contribute that one drill to the AREC (as well as civil defense) for the amateur's nationwide record of service preparedness. Many groups did just this, some holding the SET on other than the specified week end dates; and they all got credit for having participated in the SET.

Nevertheless, we feel that the 1955 low in SET participation is to some extent attributable to this feeling of incompatibility between the AREC and RACES, and wish here to repeat very

SET operations in Vigo County (Ind.) were conducted under the supervision of EC W9IHO, on 80, 40, 6 and 2 meters. This control station is located atop Terre Haute's City Hall. In the picture, left to right are WN9EJC, W9AWW and W9VMI.



emphatically that the AREC and RACES are partners, not rivals, and they work together. If this isn't true in your area, something is wrong and you should do something about it.

A total of 145 AREC groups reported participation. This was more than the total for 1954; however, fifteen of these groups reported by radio only, and a few others did not submit data called for on the regular SET report form, so all statistics were down somewhat from the 1954 figures. Forty-seven of the 1955 reporting groups also reported last year, and of these 23 bettered their last year's score. Ninety-eight groups reporting this year did not report last year, and 95 who reported last year did not report again this year; so the turnover remains rather high.

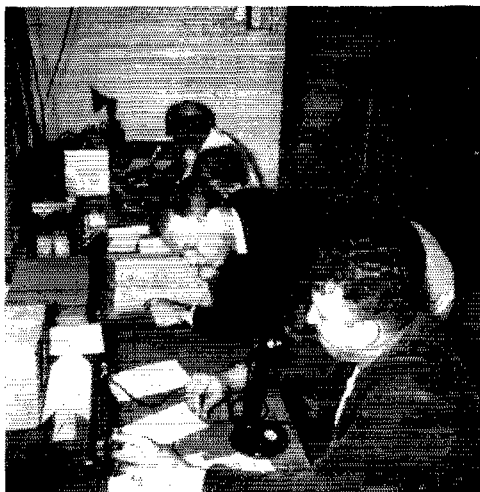
Once again, traffic on long haul circuits was light. Stations monitoring the National Calling and Emergency frequencies during the days and evenings of the October 8th-9th week end had little to do except intercept the Test Emergency Alert. This year, station W2CRD in Syracuse, N. Y., operated by the Amateur Radio Emergency Communications Ass'n in conjunction with the American Red Cross, joined the "big three" (W3PZA, W6CXO and W9DUA) in monitoring the National Calling and Emergency Frequencies for traffic addressed to American National Red Cross. National radio chief W4PHL reports that attendance and participation were somewhat better in 1955 than in 1954, with W3PZA and W2CRD each handling 33 messages, W9DUA three and W6CXO "a few."

### Test Emergency Alert

This year the TEA message was transmitted more often and by more stations than in 1954. In addition to W1AW, Red Cross sponsored amateur stations W2CRD, W3PZA, W9DUA and W6CXO transmitted TEA messages at different times of the day and on different bands. Each of the Red Cross amateur stations made two transmissions, one on phone and one on c.w. W1AW made four transmissions, two simultaneously on all c.w. NCE frequencies and two simultaneously on all phone NCE frequencies. Twenty-nine stations reported copying the TEA message.

The following stations made 100% copy of the TEA message on one of the NCE frequencies: W2LSX, W2WFL, W3CVE, W3MCG, W4BAZ, W6OZ/YMD, W7BDU, W0N1Y. These stations submitted copy which was found to have one or more defects: W1AVY, W1BDI, W1LKP, W2DP, K2DUR, W3OYX, W3VZI, W3ZME, W4HLH, W5DWJ, EA4BH, VK3XB. The remaining stations indicated that they had copied, but did not send in their copies for checking: W1CWX, W1LIB, W1QMB, W4BUA, W4CZR, W4WXZ, W4YZE, W6FYW. Our thanks and congratulations to all these for listening for the TEA message. Many others monitored long and hard without success. Vigilance (or luck) paid off in the above cases.

It's interesting to note that 20 of the stations known to have copied made their copy from



In Seneca County, Ohio, the C.D. Director took charge of operations during the SET. That's Richard Waite, C.D. Director, leaning over the table while W8CNI operates the 160 meter position in foreground and W8VKB operates 2 meters in the background. Five mobile units and 8 fixed stations were used in the Seneca County SET.

W1AW; two copied W3PZE, two W6CXO and one W9DUA; apparently no one copied W2CRD. Several did not indicate whom they copied. Fifteen made their copy on 3550 kc, five on 3875, 3 on 14,050 (including EA4BH and VK3XB), and one each on 7100 and 21,050. Others did not mention the frequency.

Reporting ECs sent in the usual fine batch of publicity clippings, one of the more important features of the SET. Some of these were adaptations of our suggested news release, others were original and often included pictures. The SET is an ideal vehicle for publicity which should be made the most of.

Annual breakdown of the SET by participating groups (figures in parentheses are last year's, for comparison):

- Total reports for activity: 145 (142)
- AREC members in areas reported: 3086 (3635)
- Total known participation: 1621 (2252)
- Mobiles & portables: 561 (999)
- Fixed stations on emergency power: 98 (164)
- Messages from participants to EC: 1189 (1365)
- EC radio reports to ARRL: 88 (77)
- Total points: 14,618 (18,369)

Area of Jurisdiction	EC	Points
Abiti & Temiskaming Cos., Que.	VE2FL <sup>2</sup>	35
Albany Co., N. Y.	W2AWF <sup>2</sup>	124
Albany, Linn Co., Ore.	W7SO	—
Allegheny Co., Pa.	W3LMM <sup>2</sup>	239
Augusta & Richmond Co., Ga.	W4AAY	162
Bedford, Mass.	W1ZSG <sup>2</sup>	67
Belleville Area, Ont. <sup>6</sup>	VE3AUF <sup>2</sup>	48
Belleville, N. J. <sup>1</sup>	W2JYW <sup>2</sup>	100
Berrien Co., Mich. <sup>1</sup>	W8QOT <sup>2</sup>	149
Blount Co., Tenn.	W4NLJ <sup>2</sup>	120
Boise, Idaho <sup>7</sup>	W7DOH	123
Boonton, N. J.	W2RQI	77
Boulder City, Nev.	W7PRM <sup>2</sup>	111

Boulder, Colo.	W6IA <sup>2</sup>	35	Hughes Co., Okla.	W5ADC <sup>2</sup>	43
Bradford, Pa.	W3L0D <sup>3</sup>	—	Jefferson Co., Ky. <sup>1,2</sup>	W4BAZ	134
Bridgeport, Conn.	W1EJH <sup>3</sup>	—	Herkimer Co., N. Y.	W2PYC	55
Bristol, Conn.	W1RLN <sup>2</sup>	84	Hobbs Area, N. M. <sup>1,13</sup>	W5NQG <sup>2</sup>	93
Bristol, Tenn.-Va.	W4IYI <sup>2</sup>	111	Isabella Co., Mich.	W8PDF	43
Broward Co., Fla.	W4EF <sup>2</sup>	118	Kingsport, Tenn.	W4VUA <sup>2</sup>	119
Burlington Co., N. J.	W2UA	81	Kingston, N. Y.	W2YOK <sup>2</sup>	—
Butte, Mont.	W7LER	73	Lake Co., Fla.	W4VDY	124
Cape Breton Island, N. S. <sup>7</sup>	WE1FH <sup>2</sup>	—	Lake Co., Ind.	W9KRJ <sup>2</sup>	165
Carroll Co., Md. <sup>8</sup>	W3FVK	23	Lamb Co., Texas	W5TGW	8
Chambly/LaPrairie/Vercheres Cos., Que. <sup>5</sup>	VE2KG	—	Laurel, Park City, Joliet, Red Lodge & Roberts (Mont.) <sup>1</sup>	W7LBK	167
Chautauqua Co., N. Y. <sup>9</sup>	W2SB	103	Linn Co., Iowa	W0HSV	227
Chula Vista, Calif.	W6HRI	120	London, Ont. <sup>6</sup>	VE3TO	80
Clark Co., & Springfield, O. <sup>8</sup>	W8DCJ	88	Lynchburg, Va.	K4DBC <sup>3,4</sup>	—
Cocoa/Merritt Island, Fla.	W4FIQ	96	Mamaroneck, N. Y.	K2ASQ	58
Columbia Co., Fla. <sup>1</sup>	W4YNM <sup>2</sup>	71	Manitoba Section	VE4HL <sup>2</sup>	219
Cook Co., Ill.	W9HPG <sup>2</sup>	585	Marshall Co., Iowa	W0SRQ	67
Coventry, R. I.	W1UEF <sup>3</sup>	—	Memphis & vic., Tenn. <sup>1</sup>	W4BAQ <sup>2</sup>	365
Cranston, R. I.	W1ZPG	146	Menominee & vic., Mich. <sup>1</sup>	W8QGQ	105
Cuyahoga Co., Ohio	W8AJH <sup>2</sup>	368	Merrick, Bellmore, Wantagh, Seaford, Massapequa, Massapequa Park, N. Y. <sup>19</sup>	W2DUS	—
Decatur, Ala.	W4LEN <sup>3</sup>	—	Milwaukee, Wis.	W9RUF <sup>3</sup>	—
Dutchess Co., N. Y.	W2HZZ <sup>2</sup>	123	Missoula, Mont.	W7COH	45
Eastern Volusia Co., Fla.	W4RWM	78	Monroe Co., Ill.	W9ICP <sup>2</sup>	19
El Cajon, Calif. <sup>6</sup>	W6KUU	173	Monroe, Pike, Lamar Cos., Ga.	W4FYC <sup>3</sup>	—
Eugene, Lane Co., Ore.	W7BDU <sup>2</sup>	49	Montgomery Co., Pa.	W3CNO <sup>2</sup>	129
Everett, Mass. <sup>10</sup>	W1PJ	49	Montgomery Co., Hillsboro, Ill. <sup>6</sup>	W9VWJ <sup>2</sup>	78
Falls Church, Fairfax Co., Va.	W4OP	50	Nashville, Davidson Co., Tenn.	W4OEZ <sup>2</sup>	116
Fanwood, N. J.	W2HXP <sup>2</sup>	58	Nassau Co., N. Y. <sup>1</sup>	W2FI <sup>2</sup>	1098
Faulkner Co., Ark.	W5TYD	48	National City, Calif. <sup>14</sup>	W6HFQ	180
Fort Collins, Colo.	W0MMT	—	West Central Nassau Co., N. Y. <sup>19</sup>	W2ZAI	—
Fredericton, N. B.	VE1AA <sup>3</sup>	—	New Bedford, Mass. <sup>1</sup>	W1AVY <sup>2</sup>	118
Garfield Co., area, Okla.	W5MFX	54	New Orleans, La.	W5ABD <sup>3,5</sup>	—
Genesee Co., N. Y.	K2DVC	82	Newington, Conn.	W1NJM	41
Goldthwaite (Mills Co.), Texas	W5ZTB	52	Newton, Mass. <sup>16</sup>	W1EK	167
Grand Rapids, Mich.	W8FCP <sup>2</sup>	—	North Brunswick Twp., N. J.	W2GUZ	30
Grant Co., Marion, Ind. <sup>11</sup>	W9AYD <sup>2</sup>	98	Northampton Co., Pa.	W3NNT <sup>2,4</sup>	146
Groveland, Mass. <sup>1</sup>	W1MRQ	49	Okeechobee Co., Fla.	W4PZT <sup>2</sup>	52
Hamden, Conn. 1, 20	W1NFG	203	Olmsted Co., Minn. (Rochester)	W0TJA	94
Hamilton Area, Ont.	VE3KM	138	Onondaga Co., N. Y.	W2CYD	198
Hamilton Co., Tenn.	W4JVM <sup>2</sup>	134	Orange Co., Ind. <sup>6</sup>	W9QYQ <sup>2</sup>	53
Harford Co., Md.	W3UCR <sup>3</sup>	—	Ossining & Briarcliffe Manor, N. Y. <sup>1</sup>	W2UF <sup>2</sup>	97
Harlowton, Mont.	W7NPV	119	Oswego Co., N. Y.	W2ZHU	73
			Ouachita Parish, La. <sup>16</sup>	W5MWE	62
			Park & Sweetgrass Cos., Mont.	W7FGB	15
			Pasadena, Calif.	W6NTN <sup>2</sup>	—
			Paso Robles, Calif.	W6FYW	52
			Pike Co. Miss.	W5EWE	24
			Pittsfield, Mass.	W1BK <sup>2</sup>	62
			Polk & Haralson Cos., Ga. <sup>1</sup>	W4IMQ <sup>2</sup>	67

<sup>1</sup> Bettered last year's score. <sup>2</sup> Reported by both mail and radio. <sup>3</sup> Reported by radio only. <sup>4</sup> Non-EC reporting. <sup>5</sup> Club call, no EC reporting. <sup>6</sup> Oct. 16. <sup>7</sup> Oct. 15-16. <sup>8</sup> Oct. 10. <sup>9</sup> Oct. 7-8. <sup>10</sup> Oct. 13. <sup>11</sup> Oct. 19. <sup>12</sup> Oct. 24. <sup>13</sup> Oct. 18. <sup>14</sup> Oct. 15. <sup>15</sup> Sept. 27. <sup>16</sup> Oct. 14. <sup>17</sup> Oct. 23. <sup>18</sup> Oct. 4. <sup>19</sup> Score included with W2FI report. <sup>20</sup> Oct. 27-31.

(Continued on page 122)

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The Rome, N. Y., SET was sponsored by the Rome Radio Club. Club members operated the C.D. Communications Control Center, K2-BIA, and the club's radio-equipped bus, W20FQ. Shown above are K2AOP and W2-SWN fussing with the club's auxiliary power unit.

»



# The World Above 50 Mc.

1215-1500

2300-2450

5300-5500

5650-5925

10,000-10,500

21,000-22,000

39,000-?

**H**ERE we go again! The 10-meter band is open every day, and the mobile services in the region between 30 and 50 Mc. are having more trouble with interference from distant stations all the time. The other day W2GGM sent us a clipping from a New Jersey newspaper, reporting a 45.9-Mc. QSO between the Newark Police and a Venezuelan oil-company station on the same frequency. It was by no means an isolated case. FCC has issued a Public Notice warning users of the spectrum below 50 Mc. that they must expect to have their communication disrupted in this way fairly often for the next few years.

Contacts are being made on 50 Mc. from Argentina to Mexico, and various points in between. LUSAE writes that the band started to open last October, with several contacts being made with XE1GE and OA4AE. After a lapse of five years with nothing heard over the path, PZ1A, Surinam, was worked by LUs 6DO 3EX 2DFL 2EW 9DH 9MA and 9AS on Jan. 22nd. Our 49.8-Mc. signal has been heard, and U. S. mobile services just below 50 Mc. are coming in at times.

From JA1AN, Tokyo, we learn that the first 50-Mc. contact between Japan and Australia was made on Jan. 22nd, at 1330 Tokyo time. JA1AHS worked VK4NG, Rockhampton, Queensland, and VK4NG heard JAG6R, JA6BK and JA2JAL.

In other words, if you haven't heard, the sunspot cycle is on the sharp upswing that means worldwide 50-Mc. DX in prospect. The CRPL predictions for April look as if there is at least a chance of South American work from our more southerly states. After April there will be some drop in F2-layer maximum usable frequency during the next few months, but October and November, 1956, and the spring and fall of 1957 should see 50-Mc. DX conditions building up to what they were in the late '40s. If you missed that round, you'll want to catch this one. If you were in there for the first 50-Mc. DX, you'll need no urging to be ready for another go at it.

There's nothing like riding the m.u.f. for thrills, and in doing it we have an opportunity to make contributions to man's knowledge of ionospheric propagation in the v.h.f. range. By no means all is known of what happens in the 50-Mc. region, and hams, by the nature of their operation, can provide important clues. We urge 50-Mc. enthusiasts the world over to watch the band carefully for the next few years — and to report details of any unusual DX heard or worked. The 50-Mc. band is in just the right spot in the spectrum to show up vagaries of v.h.f. propagation that are as yet far from completely under-

stood. By our almost universal distribution, and because of our habit of working a band just to see what happens, we can collect propagation evidence that would be well-nigh impossible to gather by any other means. Let's not miss the chance!

## Here and There on the V.H.F. Bands

Evidence of rising solar activity has not been lacking on 144 Mc., either. One of the most violent solar outbursts on record produced aurora DX of record proportions Feb. 25th. It all started well after midnight, so the population was sparse, but those who stayed with it were well repaid for their loss of sleep.

The first Massachusetts-Wisconsin QSO in 2-meter history was made around 0200 EST by W1FZJ, Medfield, Mass., and W9GAB, Beloit, Wis. This is about 880 miles, and well beyond the usual 2-meter aurora range, but the prize event was reception of W0SV, St. Cloud, Minn., by W1FZJ. Nothing approaching this 1200-mile hop has been reported previously.

Some signs of aurora effect were noted on both 50 and 144 Mc. as early as 2130 EST the 21th, but the real show didn't get underway until nearly everyone had called it a night. For W1FZJ, signals continued to buzz in until after dawn streaked the eastern sky.

There could be another chance. If you read this before March 25th, don't forget that 27-day cycle!

Regular schedules can work wonders in extending the reliable range on any v.h.f. band, and they are particularly helpful during parts of the year when v.h.f. activity tends to drop off somewhat. A circuit of close to 400 miles was kept active throughout the winter season on 144 Mc. by W2CXY, Chatham, N. J., and W8KAY, Akron, Ohio. W2CXY uses 4-125As feeding a 50-element array. (Four



Don't leave home during the gardening season, or this could happen to you! W4DWU came home from an extended trip to find that his wife had planted morning-glories around the tower that supports his 2-meter beam.

Yagis in a 1-wavelength square, with trigonal reflector system.) Equipment at W8KAY is unknown, except that it is in the high-power bracket, and the source of one of the most potent aurora signals currently heard from W8-land.

W2CXY calls from 2210 to 2215, and the contact is held for about 15 minutes thereafter. Following this W8KAY listens for other eastern stations who may have been tuned in. W2AMJ, Bergenfield, N. J., has raised W8KAY quite a few times in this way. Frank has 120 watts to a 5894 final, feeding four 7-element Yagis that are coax-phased in a rectangular configuration  $\frac{3}{8}$  wavelength high, with the two sets of Yagis  $1\frac{1}{4}$  wavelength apart horizontally. All work is on c.w.

W1FZJ, who has the biggest 2-meter antennas in W1 (no use describing them; they'll be different before this appears in print!) hears W8KAY quite regularly. Sam has also demonstrated his ability to work VE3DIR, Toronto, almost at will—including during the V.H.F. SS, when he was the only W1 to do so. W1FZJ works stations like W3TOM, Elkton, Md., 320 miles and W3TDF, 275 miles, regularly.

Such nightly work not only establishes the reliability of communication over what would otherwise be exceptional distances, but it provides an excellent check on any favorable conditions. With this going on regularly, many other operators listen in to see how things are going. If there is any auroral or tropospheric propagation coming up it is unlikely that it will escape notice under such circumstances.

A long-haul 144-Mc. contact that we hope will become a regular schedule is reported by W6LSB, Hood, Calif. Jack worked W6NLZ near Long Beach, more than 350 miles, for the first time Jan. 3rd, and repeated on Jan. 30th. From W6LSB's description of the signal (weak with irregular flutter) it sounds like the stuff we hear over similar distances under dead-band conditions. In other words, tropospheric scatter, that can be counted on at any time, if you have the receivers, antennas and power to push the thing across. W6NLZ has high power, but W6LSB was running 120 watts for the first contact. This has since been increased to 500 watts to a 4X250E, in a coaxial-line amplifier that is delivering a good 300 watts to a 16-element extended collinear array of W6GD design. Polarization is vertical at present.

The first 300 miles of the path from Hood (15 miles south of Sacramento) is over the floor of the San Joaquin Valley, but at the southern end it hops the 8500-foot Tehachapi Range. The first contact was arranged by W6s JIE and EFS in the Fresno area. This is probably the longest distance yet covered by W6s working from home locations. W6AJF, Sonoma, about the same distance, and W6TFZ, Belmont, have both heard W6NLZ, and it is expected that many others will if tests are continued regularly.

Promoting v.h.f. interest and activity is best accomplished through joint effort, both on the air, as outlined above, and within one's own community. The radio club serves the latter well, particularly if the club is devoted to v.h.f. only, or has a section that concentrates on the bands above 50 Mc. The Rochester V.H.F. Group has operated advantageously in this way for years, as a unit of the parent Rochester Amateur Radio Association. The Midwest V.H.F. Club, a potent factor in enlivening the v.h.f. scene in the Chicago area some years ago, has been reorganized. Its influence is apparent in the greatly-increased participation by W9s in the 1956 V.H.F. Sweepstakes. The Cleveland V.H.F. Club is building up membership and interest. Meetings are held the second Friday of each month, currently at the home of the secretary, W8DOG, 1202 Irving Ave. Visitors are always welcome.

Probably the largest v.h.f. club in the country is the Two Meter and Down Club of Southern California. Their 1956 slate of officers includes K6CBD, president, K6CBK, vice-president, K6HOQ, secretary (and first YL officer), K6CEO, treasurer. Past presidents W6MMU and W6IHK head the technical and public-relations committees, and W6RJS is chairman of the membership committee. The club is sponsoring a 220-Mc. build-it project to stimulate interest in that band. A repeater station for 220-Mc. work is in prospect. A primary aim is to maintain the club on the basis of an amateur technical society, for people who are genuinely interested in v.h.f., u.h.f. and microwave development and experimental work.

If your club is working on a v.h.f. program, send us the details for mention in this section of QST. We'll be glad to help the cause along.

W9KSL, Milwaukee, has found that his "Who's Who on 6" grew too large to be repeated in full in each issue of his 50-Mc. News. By issue No. 2, the list of 6-meter calls workable from the Milwaukee area had reached 107. Henceforth, the section will be called "Newcomers to 6."

Groups looking for business: Grand Rapids, Mich., has 17 stations on 6, with nightly operation on 51.048 Mc. Other frequencies are available for band openings. W3s ZZR and YNC, Oley, Pa. (between Allentown and Reading) are on 50.4 Mc. nightly, 1900 to 2100.

W7KKN, Tacoma, Wash., reports that there are now 17 stations on the f.m. net on 53.29 Mc., some with small battery portables in addition to commercial rigs of 20 to 40 watts output. These are wideband f.m. setups, with 15 to 20-ke. deviation. Most of the stations are mobile, but several base-station rigs are being installed. W7UVE, EC for Thurston County, has a coaxial vertical 60 feet up and monitors the net frequency 24 hours a day for emergency calls.

For South Carolina on both 6 and 2, look for W4CPZ, Gaffney, S. C. Ray has 800 watts and 4-element array on 50.3 Mc., and is looking for Delaware, Kentucky and West Virginia to complete his WAS. His 100 watts and 16-element array on 144.36 Mc. have brought him 12 states on 2 since last fall. He has a 500-watt final about ready to go. Ray uses either c.w. or phone on either band.

### Converter Combination for 2-Meter Mobile

The usual procedure for 2-meter mobile reception is to use either a single-conversion receiver and a broad i.f. (unsatisfactory because of inability to separate stations, and poor sensitivity) or to employ a crystal-controlled converter and broadcast receiver, sacrificing part of the band. It seems not to have occurred to most 2-meter men that the tuning range of some mobile converters for lower bands is considerably greater than their calibrated dials indicate.

W2PQG noticed that his Gonset Triband dial went three times around, yet the calibrated portion for the 14-Mc. band used only part of one rotation. Bench-checking with a BC-221AK frequency meter, he found that the actual tuning range on the 14-Mc. position was 13.375 Mc. to 17.465 Mc.—more than the four megacycles necessary to cover the 2-meter band, if the right crystal was used in the 2-meter converter.

The converter at W2PQG is a Tecraft Model CC5/144, using 14 to 18 Mc. for the i.f. range. Its crystal was 7.222 Mc. With a multiplication of 18 times this gives an injection frequency of 130 Mc. A little work with the pencil showed that a crystal at 7.255 Mc. would multiply to 140.59 Mc. in the same stages. This would mix with the incoming signal to provide an i.f. range of 13.41 to 17.41 Mc. to cover 144 to 148 Mc. As noted above, this is well within the tuning range of the converter.

Now some form of calibration was needed. The operator can remember that 14 Mc. on a receiver dial means 144 Mc., 15 Mc. means 145 Mc., and so on, but lining up figures like 13.41 and 144 Mc. is more mental exercise than most of us can handle readily. So W2PQG made a calibration that could be fitted over the logging scale on the converter. The sample shown in Fig. 1 is life-size; you can cut it out and

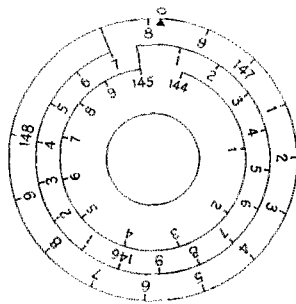


Fig. 1 — Dial scale for 2-meter calibration of Gonset Triband converter using Tecraft 2-meter converter and modified injection frequency. W2PQG found that more than the necessary 4-Mc. tuning range was available on the 14-Mc. position.

## 2-METER STANDINGS

Call States Areas Miles			Call States Areas Miles				
W1RFU	19	7	1150	W5MLL	9	3	700
W1HDQ	19	6	1020	W5SWV	8	3	600
W1RFZ	18	5	710	W5ERD	8	3	570
W1UIZ	17	5	680	W5FEK	8	2	580
W1CCH	17	5	670	W5GTX	7	4	—
W1IZY	16	5	750	W5VY	7	3	1200
W1KCS	16	5	600	W5ONS	7	2	950
W1CLL	16	5	565	W5FSC	7	2	500
W1IEO	16	5	475	W6WSQ	5	3	1380
W1AJE	15	5	600	W6JND	4	2	350
W1AZK	14	5	650	W6JND	3	2	1400
W1MNF	14	5	600	W6ZLL	3	2	320
W1BCN	14	5	650	W6BAZ	3	2	360
W1IDJ	13	5	520	W6NLL	3	2	240
W1MMN	12	5	520	W6MMU	3	2	360
W1MNN	12	5	520	W6LSB	2	2	360
W2ORI	23	8	1000	W7VMP	6	4	1280
W2NLY	23	7	1050	W7LEE	5	3	1020
W2AZL	21	7	1050	W7LJU	4	2	353
W2BLV	21	7	1020	W7YZU	3	2	240
W2UTH	19	7	880	W7JOO	3	2	140
W2AZP	19	7	650	W8WXX	28	8	1200
W2QCP	19	6	630	W8LDP	25	8	750
W2DWJ	19	6	660	W8SFG	24	8	850
W2AOC	18	6	660	W8RMH	24	8	800
W2AMJ	17	5	550	W8SRW	23	8	850
K2CBE	16	7	910	W8SVI	22	8	725
W2WFB	16	6	900	W8DX	22	7	675
W2PAU	16	6	740	W8BAX	21	8	685
W2PCQ	16	5	650	W8WXX	20	8	670
W2LHL	16	5	550	W8JVV	19	8	710
W2RXG	15	6	620	W8EP	18	7	800
K2IEJ	15	5	525	W8ZCV	17	7	970
W2CFT	15	5	525	W8RWV	17	7	830
W2BRV	15	5	590	W8WSE	16	7	800
W2PHJ	15	5	435	W8FGR	16	6	680
W2LBX	15	5	—	W9EQC	24	8	820
W2DFV	15	5	—	W9EHX	24	7	725
W3BGT	28	8	740	W9FVJ	23	8	850
W3RUE	25	8	950	W9KLR	23	7	1000
W3KCA	21	7	—	W9ZLL	23	7	690
W3KWL	19	7	740	W9WOK	22	8	860
W3NKM	19	8	660	W9UCB	22	8	750
W3IBH	19	7	650	W9UED	22	7	960
W3GCP	19	6	800	W9KPS	21	7	860
W3TDE	19	6	720	W9GAB	20	7	750
W3BNC	18	7	750	W9MUD	19	7	640
W3FPH	18	7	—	W9MAL	19	7	600
W3LNA	16	7	720	W9REM	19	6	—
W4HHK	28	9	1280	W9LF	19	6	—
W4AO	23	7	950	W9ALU	18	7	800
W4MKJ	20	8	725	W9JGA	18	6	720
W4PCT	20	8	—	W9MBI	16	7	660
W4JFV	18	7	830	W9JYJ	15	7	560
W4VLA	17	7	825	W9BVO	15	6	720
W4TLV	16	7	1000	W9LEB	15	6	750
W4UMF	16	6	600	W9DSE	15	6	760
W4HQJ	15	7	650	W9DDG	15	6	700
W4OLK	15	6	720	W9FAN	14	7	680
W4CLY	15	5	720	W9QKM	14	6	620
W4ZBU	14	5	800	W0EMS	27	8	1175
W4XCC	14	5	500	W0GUD	25	7	1050
W4JHC	14	5	720	W0IHD	24	5	870
W4WCB	14	5	740	W0UQP	18	6	—
W4TCR	14	5	720	W0NQP	17	6	1000
W4UBV	14	5	435	W0INI	15	5	830
W4WNH	13	7	650	W0OAC	14	5	725
W4IKZ	13	6	720	W0TJF	13	4	—
W4JFU	13	5	720	VE3DIR	26	8	895
W4SOP	13	5	680	VE3AIB	22	8	890
W4CPZ	12	5	650	VE3DER	15	7	800
W4UDQ	11	5	850	VE3RQN	15	7	790
W4MDA	10	4	680	VE3EPB	15	6	715
W5RCI	21	7	925	VE3AQG	11	7	800
W5JTI	19	7	1000	VE1QY	11	4	900
W5AJJ	13	5	1260	VE1FJ	2	1	365
W5HEH	12	7	830				
W5ABN	11	3	780				
W5QNL	10	5	1400				
W5CVV	10	5	1180				
W5MWW	9	4	570				

flat across the band, response may vary considerably across the tuning range, as the Gonset converter was not intended to work over such a wide range. This can be corrected to some degree by the antenna trimmer. In any case, this combination of converters provides a degree of sensitivity and stability far greater than is obtainable with tunable 144-Mc. jobs, and it brings 144-Mc. mobile reception up to a level comparable with that obtainable in home stations.

### OES Notes

**W3UQJ, York, Pa.** — York County now has 14 active 50-Mc. stations. Keystone V.H.F. Club, devoted entirely to 50 Mc. and higher bands, organized and going strong.

**W4VUO, Langdale, Ala.** — Lost 16-element 2-meter array in storm, but it is now replaced with 32-element. Converter has 417As in front end. W4EQM has 24-element array 70 feet high, and W4BGC has 32-element. With improved activity in Alabama, Georgia and Tennessee, these states should be heard from at distant points when propagation is right for 144-Mc. DX.

Agree with W4LNG (Feb. *QST*, p. 56) that low-edge crowding for DX makes little sense. If we must crowd, 145.0 to 145.2 Mc. would be much more useful.

**W5CZW, Brownfield, Texas** — W5NFO and W5CZW looking for 2-meter contacts. Have worked only W5SNX, Slaton, and W5KTX, Lubbock.

**W5FPB, Albuquerque, N. Mex.** — Local net operates on 146.8 Mc. each Tuesday at 1930 MST. Discussing possibility of v.h.f. repeater atop Sandia Crest, 10,682-foot elevation nearby.

**W5KWP, Santa Fe, N. Mex.** — Operating on 50 Mc. each Tuesday at 2000, working W5s PHM NSJ and FAG. Caught 50-Mc. openings Jan. 11th and 19th. Worked 18 W6s on latter date, opening lasting from 1840 to 2200 MST.

**W5TIA/5, Fayetteville, Ark.** — W5BHJ, W5WHU and W5TIA modifying surplus gear for 420 Mc. Local 6-meter net shifted from 50.1 to 50.55 Mc.

**W7QDJ, Clearfield, Utah** — Activity on 6 in Utah picking up, with W7s VHS, Ogden, WLV and SPO, Salt Lake City, and RQS, Orem, working DX when band is open. TVI on Channel 2 is troublesome, but will shoot the works with high power during hours TV is not on the air. Skeds? Planning mountain expedition on 6 and 2 for June V.H.F. Party, with W7NVY. Will also line up skeds for W7LHL's Idaho expedition in July or August. Welcome high-power big-antenna skeds on 144-Mc. c.w. at any time.

**W8NAP, Dayton, Ohio** — Screen neutralization seems answer with tricky 2E26 stages on 144 Mc. Find cathode keying is stable, if each cathode pin is by-passed directly to chassis with 0.001- $\mu$ f. disk ceramic.

**W9HPO, Anderson, Ind.** — Heard foreign broadcast signal on 49.1 Mc. Jan. 23th, in daylight hours. Considerable 6-meter activity now heard within 60-mile radius.

**W9KLR, Kesselsaer, Ind.** — Here's a noise generator hint that came from W9EIX. Uses a 2-volt 60-ma. pilot lamp instead of a crystal diode. Otherwise similar to diode job

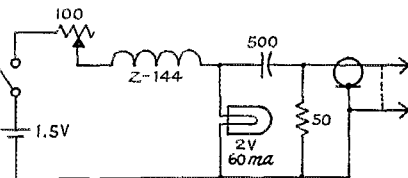


Fig. 2 — Noise generator using 2-volt 60-ma. pilot lamp, in place of the usual crystal diode.

paste it on your converter, if you don't mind having a hole in the *QST* page. The problem with the Gonset Super-Six is a little different. It has a similar tuning range, but more dial scales. You'll probably have to sacrifice one or more of them to make room for a 2-meter calibration. Otherwise the approach is usable with either converter.

The dial scale has three concentric circles, calibration at 144 Mc. starting at the innermost circle. The actual calibrating was done with the BC-221AK, starting at 13.41 Mc., but it can also be done with suitable crystals for several points across the 2-meter band, once the 2-meter converter is connected. To provide more space for viewing the 2-meter scale, it may be advisable to use a smaller knob on the converter. A smaller knob is a necessity with the Super-Six, if a calibrated scale is to be used for 2-meter tuning.

Although the output of the Terrafit converter is essentially

described in *QST* for July, 1953. R.f. choke didn't appear necessary, but is advisable to prevent loss of noise through battery circuit. Output is constant, in comparison to the rather variable results obtained with some crystal diodes. Built mine in old soup can from junk parts; cost close to nothing. Load resistance should be equal to impedance of line used to feed antenna. Shows about 4.5db. of noise with best 144-Mc. converter. More noise could be obtained with increased filament voltage, at expense of shorter lamp life. Other types of lamps deliver about the same noise output, so 60-ma. type is most economical. Coax fitting should match that on converters to be checked. Make all leads as short as possible.

(Continued on page 152)

# 9th V.H.F. Sweepstakes Results

## Upsurge in 50-Mc. Activity Pushes Participation to New Record

THE LOGS turned in for the 9th Annual V.H.F. Sweepstakes, Jan. 7th and 8th, nosed out last year's record total by a mere 1 per cent — 753 acceptable logs for 1956; 747 for 1955. Use of the 144-Mc. band was as widespread as ever. There was a slight increase in 220- and 420-Mc. reports over last year. But the big difference was on 50 Mc., and it can be summed up in one word: *Technicians!*

Now it can be told: use of the 50-Mc. band had been falling gradually for some years, reaching an all-time low in 1955, when only 12 per cent of the V.H.F. SS contestants reported work on 6. Activity was booming on 144 Mc., but the picture on 6 was anything but bright. If there is any doubt left of the effect of admitting Technician licensees to the 50-Mc. band it can be dispelled by an examination of the record of the 1956 SS: an increase in 50-Mc. use by a whopping 283 per cent over last year!

This was largely new 6-meter blood, for the boys who worked on 144 Mc. only did as well as last year, or better. Where the new burst of 6-meter activity shows is in the reports of stations operated on two or more bands. Top score in the country was turned in by W1RFU, Wilbraham, Mass. Bill worked 241 stations on 50, 144 and 220 Mc., collecting 13 ARRL sections and 6227 points. W2PRF won the Northern New Jersey Section award with 265 contacts on 6 and 2 meters. His section multiplier of 11 gave him 5830 points and second place in the mythical national ranking.

Two West Coast stations posted QSO totals higher than anything easterners could produce. K6EYN/6, a multioperator station in the Santa Barbara Section, rolled up 323 contacts on 50 and 144 Mc., working 5 sections for 3260 points. The only other QSO total over 300 was also a product of Southern California group effort: W6SDW/6, Los Angeles Section, with 317 contacts in 4 sections on 50 and 144 Mc. Southern California reports mention that more than 100 stations were active on 50 Mc. in the Los Angeles area, and the 6-meter band became a major factor in contest scoring for the first time in several years.

Concentrating on catching every available ARRL Section on 144 Mc. paid off for W2CXY. Walt collected 15 with his high-powered c.w. rig and 50-element stacked-Yagi array. With 158 contacts this gave W2CXY 4740 points, the top one-band score. W3IBH, Philadelphia, won this honor last year, and he worked 225 stations on 2 in the 1956 contest, but his section multiplier of 10 left him a close second, with 4500 points.

Several teams and individual operators braved winter weather and icy mountain roads to set up in choicest v.h.f. loations. W1VXW/1, atop Pack

Monadnock Mountain in Peterboro, N. H., did an outstanding job, working 237 stations on 50, 144 and 220 Mc. for 5214 points. W1OUN/1 and W2BVU/1 saw to it that Vermont multipliers were handed out in very helpful quantities. K2CMB/2 worked 209 stations on 6 and 2 with his trailer station in Northern New Jersey. W1PX/1 used a u.h.f. TV site in Paxton, Mass., to work 232 stations on 50, 114 and 220 Mc.

A new wrinkle in v.h.f. contest operating was tried by W0ZJB/0. Vince tied into the Channel 10 TV array of KAKE, Wichita, Kansas, after the station's program schedule was completed on Saturday night. He laid down a potent signal over a wide area, but found the omnidirectional pattern of the "big stick" something of a handicap for contest activity, what with the piling up at the low edge of the band, and around the popular surplus-rock frequencies.

The Central Kansas Radio Club made a week end of it on the highest hill in the vicinity of

### CLUB SCORES

Club	Aggregate	Certificate Winner
South Jersey Radio Assn. ....	49,431	W2TBD
Hartford County Amateur Radio Assn. ....	34,703	W1DXE & W1VLE
York Road Radio Club. ....	26,346	W3IBH
Hampden County Radio Assn. ....	21,105	W1RFU
Waltham Amateur Radio Assn. ....	20,988	W1VXW/1
Windblowers V.H.F. Society. ....	17,156	K2CMB/2
Midwest V.H.F. Club. ....	16,000	W9WOK
Morris Radio Club. ....	11,404	K2BI
Dayton Amateur Radio Assn. ....	10,344	W8LOF
V.H.F. Institute of New York. ....	9248	K2IEJ/2
North Penn Amateur Radio Club. ....	8105	W3TDF
El-Ray Amateur Radio Club. ....	6878	W1ZGO
Lake Success Radio Club. ....	5248	W2YHP
Ohio Valley Amateur Radio Assn. ....	3203	W8LPD
Seneca Radio Club. ....	3057	W8MVE
Palo Alto Amateur Radio Assn. ....	2490	W6EXX
Keystone V.H.F. Club. ....	2393	W3DEX
Middlesex Amateur Radio Club. ....	1990	W1VYS
Lakeland Amateur Radio Assn. ....	1988	W2FEV
Burlington County Radio Club. ....	1684	K2INQ
Ithaca Mike and Key Club. ....	1529	W2WFB
Amateur Radio Club of Falls Church. ....	1464	W4JCJ
Rochester V.H.F. Group. ....	1138	W2QY
Mid-Island Radio Club. ....	974	W2JBQ
Laurel Amateur Radio Assn. ....	788	WN1FSE
South West Iowa Amateur Radio Assn. ....	524	W6GUD
Syracuse V.H.F. Club. ....	398	W2UFI
Kankakee Area Radio Society. ....	364	W9KLD
Queen City Emergency Net. ....	258	W8SVU

The following clubs were mentioned on less than three valid entries: Albany ARA, Albuquerque VHF C, A UHF C of Jamaica, Buckeye SW RA, Chesapeake ARC, Coffee Dunkers, Columbia U AWC, Connecticut Wireless A, Framingham RC, Hamsters RC, Hardin County ARA, IBM RC, Lake Washington ARC, Lehigh County ARC, Levittown ARC, Lockport ARA, Milwaukee RAC, Mohawk ARC, Monterey Bay RC, Motor City RC, Nassau RC, Newport County RC, New York RC, Niagara RC, Northeast RC, Northern NJ RA, North Suburban RC, Orange County RC, RA of Western NY, St. Joseph High RC, Southington ARA, Suffolk County RC, Sunland-Tujunga ARS, Tri-County RA, Turlock ARC, U of C ARC, Wantagh RC, West Side RC, Wichita ARC, York ARC.

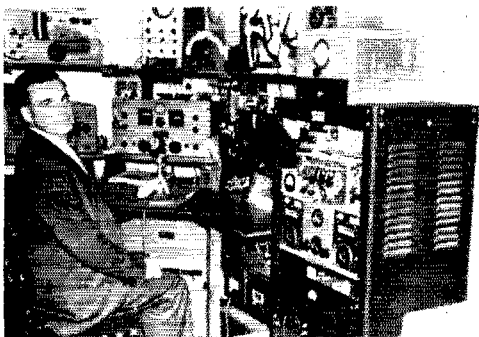


Salina, Kan. With all the comforts of home, the operators of the house-trailer station, KØKQU/Ø had a fine time of it.

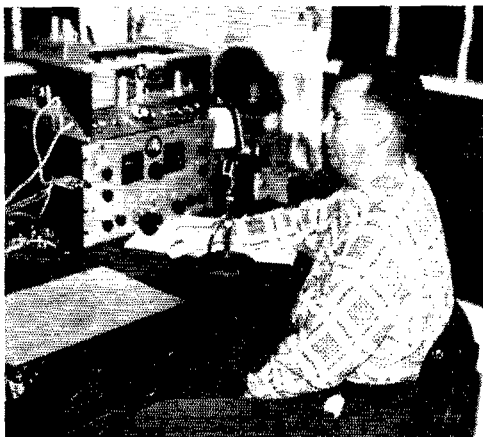
Club activity was a potent factor in the success of the V.H.F. Sweepstakes, as always. Those perennial first-place winners, the South Jersey Radio Association, did it again. But they are going to have to look to their laurels: club scores elsewhere in the country are rising rapidly. A private competition that has been going on for several years between the Hartford County Amateur Radio Association (north-central Connecticut) and the Hampden County Radio Association (Springfield, Mass. and vicinity) is building up v.h.f. activity in the Connecticut Valley. The Hartford group rose to second place in the national club ranking, with the highest score ever posted by a second-place club. This is the first time that a club outside the New York-Philadelphia axis has looked like a real threat to the leaders. Dark horses to watch are the Waltham Amateur Radio Association (Boston area), the Windblowers of Northern New Jersey, and the Midwest VHF Club (Chicago area), all of whom improved their scores markedly in the 1956 running.

Participation in a joint effort is a great thing for club interest. Membership and morale can be boosted by a project of this nature, wherein everyone's effort counts toward a club objective. There is an individual incentive: the top scorer in each club receives a special certificate. And everyone's work contributes to the club total, so there is a group incentive as well. Your club may never win the silver-band gavel that goes to the country's top club in the V.H.F. SS, but you'll have plenty of fun if you give it the big try next year.

Some random highlights and observations: Ten Novice and 12 Technician certificate awards were made. Some such awards were lost because of insufficient reporting by these license classes in some sections. If you are in either of these groups, see to it that others in the same category get on *and report* in future contests. Leading



Tom Stewart, W2TBD, Medford Lakes, N. J., won top place in the standings of the No. 1 v.h.f. club, the South Jersey Radio Association, and the Southern New Jersey Section certificate as well, with his 201 contacts on 144 Mc. for 3600 points.



Bill Rosner, W1RFU, Wilbraham, Mass., winner of the Western Massachusetts Section and Hampden County Radio Club certificate awards in the 1956 V.H.F. Sweepstakes. Running less than 100 watts on 50, 144 and 220 Mc., W1RFU posted the country's highest total, 6227 points.

Novice: WN1FVT/1, Washington, Mass., with 115 contacts in 9 sections, for 2061 points. Leading Technician (who won no award!): W1ZWL, Leicester, Mass., with 85 contacts in 8 sections on 50 Mc., for 1360 points.

Many areas reported increased activity, and not only for the contest week end. W4VZR says that he has been on the v.h.f. bands for several seasons, but that this was the first time he felt that contest participation was sufficient to warrant reporting his results. This reflects the fast-growing v.h.f. interest in the region around Atlanta. There must have been similar growth in other sections, for we have 49 ARRL Sections represented in the final tabulation below, a new record.

Lost causes: W8IPS operated from 2030 to closing time Sunday night, but worked only 3 stations. Reason? He was on 147 Mc. Now, will you fellows around the Detroit area *tune the band*? W6BB, the University of California Radio Club station, worked 65 stations on 144 Mc., but the beam didn't seem to be working quite as well as usual. Some time the following day it was discovered that the coax from the 2-meter rig had been connected to the 10-meter array!

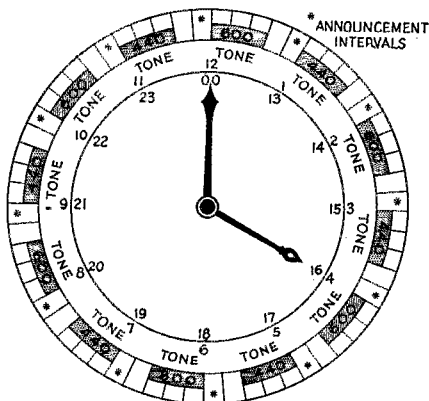
Fifteen operators who sent in logs are not listed in the tabulation, and they include one fairly sizable club total. Reason: they were mailed far after the deadline given in *QST*. We give the first stragglers the benefit of the doubt, but these were all very slow in coming in. Everyone wants prompt reporting of contests in *QST*. Please help us to deliver by getting your logs into Headquarters as soon as possible after each contest.

## SCORES

In the following tabulation, scores are listed by ARRL divisions and sections. The top scorer in each section receives a certificate award, unless



# Paste This in Your Handbook



Recent changes in the method of transmitting standard frequencies from WWV and WWVH make the s.f. information in the *Handbook* chapter on measurements incorrect in a few respects. The most noticeable change is that concerning the length of time that the a.f. tones are transmitted — tone is now sent for three minutes, instead of four, out of each five-minute period. The change is effective at both stations. During the fourth minute there is no modulation on the carrier except the one-second time ticks. The fifth minute carries the announcements as usual. The accompanying chart shows the revised method. The extra minute without modulation is the result of requests from users of the service who found a one-minute tone-free interval too short for the adjustment of frequency standards.

WWV also now has a silent period of four minutes during each hour beginning 45 minutes, plus or minus 15 seconds, after the hour. The purpose of this is to provide a completely clear channel for ionospheric measurements by laboratories throughout the world. The silent periods at WWVH are unchanged.

In transmitting time ticks, the 59th second is omitted to help in identification of the tick that initiates the following "zero" second. With fading, QRN, and the like, this has not always been sufficient identification, so the zero-second tick is now sent double, another tick following the marker tick after an interval of 0.1 second (between leading edges of the pulses). The tick or pulse transmitted from WWV continues to consist of exactly 5 cycles of 1000-cycle tone, but the pulse transmitted by WWVH has been changed to 6 cycles of 1200-cycle tone. This is for purposes of additional station identification.

The accuracy of transmissions has been increased to 1 part in 100 million instead of the 1 part in 50 million formerly maintained.

## Receiving-Tube Key

Some owners of the 1956 *Handbook* may not be familiar with the standard letter-symbol designations used to head the columns of receiving-tube data. The key to the designations used is as follows:

- $E_t$  — Filament or heater voltage.
- $I_t$  — Filament or heater current.
- $C_{in}$  — Input capacitance (grid to cathode, all other electrodes grounded), in  $\mu\mu\text{f}$ .
- $C_{out}$  — Output capacitance (plate to cathode, all other electrodes grounded), in  $\mu\mu\text{f}$ .
- $C_{gp}$  — Grid-plate capacitance,  $\mu\mu\text{f}$ .
- $E_{bb}$  — Plate-supply voltage.
- $E_{c1}$  — Control-grid d.c. bias.
- $E_{c2}$  — D.c. screen voltage.
- $I_{c2}$  — D.c. screen current, milliamperes.
- $I_b$  — D.c. plate current, milliamperes.
- $r_p$  — Plate resistance, ohms.
- $g_m$  — Grid-plate transconductance (mutual conductance),  $\mu\text{mhos}$ .
- $P_o$  — Power output, watts.

Paste this and the WWV information in your *Handbook*. If you don't like the idea of mutilating a *QST* page, send us a self-addressed, stamped envelope for a separate copy.

## HAMFEST CALENDAR

**Connecticut** — The Tri-City Amateur Radio Club Council is again sponsoring the Annual Hamfest — the Twelfth; on April 28 at the Crocker House, New London, Conn. Attendance by advance reservation only, \$3.75. R. Y. Chapman, W1QV, General Chairman.

**New Jersey** — Everyone is invited to attend the Eleventh Annual Old-Timers' Nite Round-Up and Banquet to be held on Saturday evening, April 21 in the Grand Ballroom of the Stacy-Trent Hotel, West State Street at Willow, in downtown Trenton. The party will be *Stag*.

A turkey dinner will be served *promptly* at 6:30 o'clock in the hotel ballroom, and the program will include personalities prominent in early radio and wireless history. Bring along your oldest amateur and commercial licenses. W2ZI's now famous collection of oldtime wireless gear will be on display.

Tickets, by reservation only, may be obtained by mailing a self-addressed envelope on or before April 16, with your remittance of \$5.00 per man. Late-comers will be assessed \$6.00 at the door. Plan to bring along as many guests as

you wish, everyone is welcome. Write Ed Raser, W2ZI, 315 Beechwood Avenue, Trenton 8, New Jersey.

**New York** — The Crystal Radio Club is celebrating its 25th anniversary with a dinner at the Silver Pheasant Restaurant in Pearl River, N. Y. (opposite the Lederle Labs) on April 21 at 7:30 p.m. Price \$3.75 per person. Good food, dancing, and many other interesting events. Tickets and further info may be obtained from Anthony Maiorano, 14 Peck St., West Haverstraw, New York.

**Oklahoma** — Mark your calendar to attend the Hamfest of the Aeronautical Center Amateur Radio Club to be held Sunday, April 22, at the American Legion Hall, N.W. 50th and MacArthur. Further details may be had by writing the ACARC, Box 1082, Oklahoma City, Oklahoma.

**Pennsylvania** — Saturday, April 14, at the Arcadia Cafe, 27 West Orange Street, Lancaster, the 11th annual banquet of the Lancaster Radio Transmitting Society. Festivities will begin at 6:30 p.m. Entertainment has been planned for the OMs, YLs and XYLs. Registrations are in advance and may be obtained through Arthur C. Jacoby, W3OY, 136 Springhouse Road, Lancaster, Pa.



W2NAI, Marge Fischer

### How Many YLs?

A good question. When we find out, you'll be the first to know. The guesses run between 1500 and 8000. Anyone for going through the call-book counting calls preceding feminine-sounding names? (Beware of Marion or Shirley or Beverly, etc. HE may not like it if you classify him feminine gender. And you're in for some puzzlers when you get to the back of the book. Maria Teresa de Angel may be tall, dark, and a tobacco-chewer.)

Tabulation of a recent questionnaire distributed to all ARRL members of the New England Division by Director Rand, W1DBM, tells us how YLs fit numerically into the picture in New England anyway. Director Rand found that of the W1 amateurs who returned questionnaires, 2.3% are YLs.

Assuming this percentage is fairly representative, the conclusion is that there are probably approximately some 3000 YLs (125,000 amateurs in the world).

### Veteran Traffic Handler

Marge Fischer of Sloansville, N. Y., says she's a very insignificant person, except for always getting mixed up in something or other. Many amateurs would be obliged to dispute W2NAI, for they consider her service and activities far from insignificant. A charter member of the NYS, 2RN, and EAN nets, Marge is a veteran traffic handler. As manager of the SRPN and IPN she has high praise for the YLs who are regular members of the nets (W1sUKR, ZUR, K2sAHG, AMZ, CUQ, DJN, IWO, IYP, W2sBNC, EEO, KEB, KQL, RUF, W3WUE and W4BLR). Marge hits upon a theme which impresses us as bearing weight when she says that YLs, most of whom are home during the day, are the logical ones to do a heavy share of the operating during an emergency. Hence, they should prepare themselves by lots of practice gained particularly by regular participation in traffic nets. Marge proved her point herself during floods in N. Y. state last fall. As EC and Radio Officer of Schoharie County, Marge and local amateurs rendered much valuable service when they operated with

# YL NEWS and VIEWS

BY ELEANOR WILSON,\* W1QON

scarcely a break during the entire flood emergency. Licensed in 1940, Marge was a charter member of the N. Y. C.-Long Island YLRL unit. She holds ORS, OBS, OPS, A-1 Op. Code Proficiency Certificate-35 w.p.m. and is PAM for Western N. Y. Her OM is not licensed, but Marge is happy that he is interested enough in her hobby to help build some of her equipment.

### YLs in Electronics

Even today, forty years after the first YL was licensed, there are relatively few YLs gainfully employed in radio or electronics. When we hear of one who is, we like to spread the word, for her story may encourage other YLs to seriously consider working in a field they should find as challenging and satisfying as do their male counterparts.

Ruby Rhude, W8MDK, of Dayton, Ohio, told us to write anything we wanted to about her, if it



W8MDK, Ruby

would help to encourage YLs, particularly those of high-school and college age, to study for a job in electronics. So, to quote Ruby verbatim:

"When I outgrew dolls, instead of the usual things that interest the twelve-year-old, I was bitten by the radio bug. First was a crystal set, and I have been building and tinkering ever since. It took a few years to get around to the serious business of the study of radio, but even in high school, the elective subjects were associated with science, math, and physics. A special college course in electronics, plus all I could learn from association with my brother and other ham friends, and I was on my way from North Carolina, a red head just 87 pounds, 5 feet tall, to try to break into a man's world of radio repairs. I landed a job in Dayton with the Air Force and was discouraged for awhile from actual equipment by a side track in the Signal Corps as group leader and then instructor in basic radio. Then came a series of training schools in general air-borne theory and equipment maintenance, pre-radar and radar at Bell Labs. I worked in electronics until the end of the war. In 1944 I took advantage of leap year, but even with a new husband and a house to keep, I found time to continue with

\*YL Editor, QST. Please send all news notes to W1QON's home address: 318 Fisher St., Walpole, Mass.

my study in electronics. Four years ago I secured a job working with Air Force transmitters at Gentile Air Force Station, Dayton AF Depot. I trouble-shoot and repair transmitters and associated electronic equipment. Hams were everywhere, and I just had to get a ticket. I have been teaching code on my lunch hour to several workers, and some already have passed their general class exams. I am the only woman ham among many men on the Depot. I am very happy in my work; there is always something new in electronics. The greatest compliment I can receive is the admission from one of my fellow workers that I am a good radio repairman."

P.S. Ruby is considered a good cook and house-keeper too. Her OM is not licensed, but she's working on him.

She is also Chairman of Women's Activities for the 1956 Dayton Hamvention. See Coming YL Get-Togethers.

We wonder how many YLs are employed in electronics or the technical end of radio. If you are, or know of a YL who is, we'd appreciate hearing about it for our records.

### California Floods

During the floods which ravaged parts of California during the Christmas season, YLs K6G1B, W6FEEA, HTS, PJJF, and QMO handled much emergency traffic.

W6HTS, Mildred, and W6PJF, Rosemary, have both been members of the Region 3 Civil Defense Net for several years and drill daily on 3992 kc at 0900. On Dec. 23rd at 1900 the net became activated under RACES following the Governor's declaration of a state of emergency. K6FAV, W6EBL, and W6PJF were appointed NCS by C-D officials. The net continued under RACES for 71 hours, until Rosemary closed it officially at 1800 Dec. 26th. Rosemary writes: "We handled official and emergency traffic *only*, into and out of the stricken areas of Yuba City and Marysville. Everyone worked very hard throughout the long Christmas weekend. The wonderful teamwork and co-operation was obvious during the entire time. Governor Knight mentioned many times on TV and radio throughout the ordeal the fine job the hams were doing. There were so many who did outstanding work, but when you come right down to it, the fellow who keeps his receiver tuned to the appointed frequency, his filaments on, and his carrier off until needed, deserves much credit too."

We think the remarks of a W6 XYL bear repeating. In an article she wrote praising hams for their flood aid (*Los Angeles Times*, Jan. 16, 1956), the XYL of W6EJU, Grace Hicks concluded: "As the wife of a very active amateur, I've often been irked when the "old man" spent needed money for useless items of radio gear. I've been the one to bear the neighbors' complaints of television interference, and have spent many a lonesome evening with a book while he was operating some net. Even so, I felt humbly privileged to bring him hot coffee during that first terrible night of the flood and help keep some semblance of order in the traffic that was all marked priority or urgent."

◆

With little doubt KN6-MTQ, Ann Deck of San Bruno, California, is the youngest member of the San Francisco YLRC. Eight years old and in the third grade, Ann and her dad, W9JVI, are on 80 c.w. Other hobbies include pets like Sonya in photo.

◆

As Assistant Chairman to W8MDK for Women's Activities and as moderator of the YL Operators Forum, Betty Hall, WN8-AXA, will be one busy girl at the forthcoming Dayton Hamvention. And with four small jr. ops. and attempts to work 40 c.w. as much as possible, Betty keeps hopping at home too. Her OM is W8QFA. (Photo by W8-VPG.)



### Coming YL Get-Togethers

#### New England

The Women Radio Operators of New England will sponsor the annual W1 YL Spring Luncheon at a hotel in Boston on Saturday, May 26th. Details next issue.

#### Midwest

The Sixth Midwest YL Convention, sponsored by the North Star YL Club of the Twin Cities, will be held at the Hotel Capri in St. Paul, Minnesota, May 25th, 26th, and 27th. Registration fee of \$2.00 should be sent to Rae Vigeant, K0BZJ, 593 White Bear Avenue, St. Paul, before May 10th. The program will include on Friday, luncheon and tour of a local industry, supper box social and technical talk; Saturday, business luncheon, movies, Smorgasbord, prizes, and dancing; Sunday, appearance on TV, "The Hobby Show." Convention chairman is W0KJZ, Lydia Johnson.

#### Dayton Hamvention, Women's Program

The program for YLs and XYLs who attend the Dayton Hamvention on April 14th at the Dayton Biltmore, Dayton, Ohio, has been planned by Women's Activities Chairman W8MDK, Ruby Rhude, and her assistant WN8AXA, Betty Hall (see photos). The program includes social hours, tour of exhibits, luncheon, many awards, musical entertainment, a guest speaker, banquet, and is highlighted by a YL Operators Forum. WN8AXA will be Forum moderator with AF/W2BTB, Jeanne Walker, W3QPQ, Janette Ebur, W8LGY, Ruth Rickett, and W8SPU, Helen Smith, as panel speakers. Write to W8MDK, Ruby Rhude, 203 Pleasant Ave., Dayton 3, Ohio, for further details.

#### ARRL National Convention, San Francisco, California

Chairman of Women's Activities for the Convention is W6PCN, Peggy Detsch, 123 Robinhood Drive, San Francisco 27, with W6FEA, Gertrude Cassidy, assisting her. Plans for an interesting variety of women's activities are being carefully made, and Peggy and her committee hope to afford the best YL and XYL program ever to accompany a National Convention. Next issue we'll try to give you as many of the details as possible. The big dates are July 6th, 7th, and 8th. San Francisco here you come!



# Happenings of the Month



## LICENSE RENEWALS

The year 1956 is marked by two important factors in the processing of amateur license renewals—for the first time, Technician-class tickets reach their expiration dates; and this year is also the peak (second time around) of renewals for the huge number of licenses issued in 1946, when postwar licensing was begun.

So this is a reminder to take a look at your own ticket; chances are good it expires this year. Two or three (but not more than four) months before expiration date, collect the proper form from your district FCC office—Form 405-A for straight renewals, or Form 610 if your license is due to be changed in any respect, such as a different address. Take special care to fill out the blanks accurately; FCC could process these papers much more rapidly were there not so many mistakes or failures to answer certain questions. Don't forget to have the form notarized. Mail it to FCC in Washington, and note in your log the date of mailing. Include your present ticket in a Form-610 application; do not send your ticket with a 405-A application.

And, don't become alarmed if you don't hear from FCC in what you consider a reasonable time. The load of work is going to be especially large this year. You may not have your renewed license back before expiration date, but neither is this cause for concern; FCC has taken care of this possibility by a regulation which permits you to continue operation even past the expiration date, provided you have made proper application for renewal. Just be sure to note in your log the date on which you apply for renewal.

One more reminder: the processing of the Form 405-A renewal application includes returning to you a card-size portion of the form, with FCC's authentication thereon. Don't throw your old ticket away; it is still your license, and the card is simply a renewal endorsement. It is not a license in itself, as some hams have found after making the mistake of discarding their old ticket!

## F-1 SHIFT LIBERALIZED

In accordance with an ARRL Board of Directors instruction, last summer a petition was filed with the Federal Communications Commission seeking to lift the current restriction on permissible frequency-shift in F-1 keying, 800-900 cycles, and instead amend our regulations to allow any shift up to 900 cycles. Arguments were presented to show that such action would result in more extensive experimentation by amateurs with radioteprinter communication, an im-

provement in technique, and a reduction of potential interference to other forms of emission on adjacent channels. Subsequently the Commission issued formal notice of such a proposal, and it has now acted to amend our rules as requested, effective March 16. The new language is as follows:

*Sec. 12.107(c)* When frequency shift keying (type F-1 emission) is utilized, the deviation in frequency from the mark signal to space signal, or from the space signal to the mark signal, shall be less than 900 cycles per second.

*Sec. 12.107(d)* When audio frequency shift keying (type A-2 or type F-2 emission) is utilized, the highest fundamental modulating audio frequency shall not exceed 3000 cycles per second, and the difference between the modulating audio frequency for the mark signal and that for the space signal shall be less than 900 cycles per second.

## CODE PRACTICE IN VOICE BANDS

In another action similarly stemming from a petition by the League, the Commission has added a new paragraph to our rules to authorize radiotelephone stations the use of tone modulation to form code characters, interspersed with voice instruction, during the conduct of code practice by such stations. A few of the numerous amateur stations conducting code practice on the air for beginners use voice transmission, and this new regulation confirms FCC policy, established years ago on League inquiry, permitting an audio oscillator in front of the mike, or similar scheme, to help newcomers learning the code. The new paragraph reads:

*Sec. 12.114(b)* Whenever code practice, in accordance with Section 12.106(d), is conducted in bands authorized for A3 emission, tone modulation of the radiotelephone transmitter may be utilized when interspersed with appropriate voice instructions.

A.R.R.L.

## SOUTHEASTERN DIVISION CONVENTION

West Indies Section

San Juan, Puerto Rico — April 14-15, 1956

The Puerto Rico Amateur Radio Club is sponsoring the ARRL Southeastern Division Convention which will be held in San Juan on April 14-15, 1956. Embracing Cuba, Puerto Rico, and the Virgin Islands, the club promises a *paradise reception* to all mainlanders. For those who might like to take their vacations early the secretary will provide travel information upon request. Hotel reservations and other information may be obtained by writing A. R. Crumley, KP4DV.

»

J. M. Lang, General Manager of the General Electric Company's tube department, presents the 1955 Edison Award to W2JIO (right) while Herbert Hoover, Jr. (center) shows his approval.

»



## Edison Award to W2JIO

In recognition of his outstanding contributions in helping blind persons achieve security through employment in the electronics field, Robert W. Gunderson, W2JIO, has been chosen recipient of the 1955 Edison Radio Amateur Award.

An electronics instructor at the New York Institute for the Education of the Blind for more than 20 years, and sightless himself since birth, Bob Gunderson has turned out several hundred blind radio technicians, quite a few being World War II veterans. W2JIO has also devised numerous specialized pieces of gear for use by blind persons, such as auditory measuring equipment (see p. 27, April, 1951 *QST*). And in time somehow spared from this activity as well as work on the staff of Hudson Radio in New York, he edits and publishes the *Braille Technical Press*, a non-profit monthly keeping blind technicians up-to-date on electronics developments.

The Award and a \$500.00 check, which Bob is contributing to his beloved *Press*, were presented at a dinner-ceremony in Washington on February 16, attended by more than 100 military and civil communications officials. Under-secretary of State Herbert Hoover, Jr., W6ZH/K6EH, was speaker of the evening.

The judges also selected eight other amateurs for special citations: Louis Arivello, W0CPI; George F. Beard, K6HCI; Paul M. Crown, Jr., W3YAZ; Edmund A. Guardiani, W1TTN; Roland E. Lemire, W1TZO; Murton Lyon, W1BGT; Lewis Papp, W3MAC; and Steven P. Temby, K6IRE. All were for disaster-emergency performances, except for W0CPI, who won his citation for message traffic work with Pacific possessions, and K6HCI, for his work with newcomers. Because of the great number of instances of disaster-emergency service by amateurs in 1955, the judges framed a special resolution, which we reproduce herewith, in commendation of the public-service contributions of amateurs during the year.

The Edison Radio Amateur Award is an annual presentation sponsored by the Tube Department of the General Electric Company.

### Disaster — Emergency Citation 1955

#### Edison Radio Amateur Award

WHEREAS the 1955 floods and hurricanes constituted the year's most widespread and destructive disaster; and

WHEREAS during these disasters the nation's licensed radio amateurs performed a most outstanding public service by providing emergency communications, and

WHEREAS many of these radio amateurs made sacrifices and demonstrated ingenuity far beyond the normal call of amateur radio communications; and

WHEREAS these amateurs contributed directly to the success of disaster relief in stricken areas; therefore be it

RESOLVED that said amateur radio operators, many of whom in the disaster vigil are unfortunately unrecorded, be commended for the voluntary public service rendered in establishing emergency communications circuits and the devotion of long hours to monitoring emergency operations, holding themselves ready to assist when needed; and

RESOLVED that the undersigned judges of the 1955 Edison Radio Amateur Award take this means of recognizing what they believe to be an unparalleled group effort in such circumstances.

Herbert Hoover, Jr., *The Under-Secretary, U. S. Department of State*

Edward M. Webster, *Commissioner Federal Communications Commission*

E. Roland Harriman, *President American National Red Cross*

Goodwin L. Dosland, *President American Radio Relay League*



# Correspondence From Members -

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

## EX-BOOSTER BOOTED

111 No. McKinley  
Mounds, Illinois

Editor, *QST*:

In reply to Mr. Worrorm, concerning the SS contest rules, February issue of *QST*, I think the best operator should win; the emphasis is placed on operating skill, not on the fellow who has high power or an elaborate antenna system. As for code practice, it's a good idea. I wonder if Mr. Worrorm ever tried it?

Break-in and push-to-talk are convenient but not necessary, but having to throw four switches is a little out of date.

If the multiplier was used the way Worrorm would like it would have no purpose because it would increase everyone's score by one-half.

I think that the ARRL has done a fine job in handling contest rules, also I bet the ARRL won't miss Mr. Worrorm as much as he will miss *QST*.

— H. K. Windland, W9ITM

407 Tilden Road  
Egypt, Mass.

Editor, *QST*:

When Mr. Worrorm, 8AOF, has thought over what he has said about the Sweepstakes, I hope he will come to his senses.

In effect, he has said that credit should be given to the ham with less ability, and to hams with less efficient stations. I have always considered the Sweepstakes a game of skill, designed for the resourceful and dynamic ham.

It seems, rather, that the country has been catering to the lads, those too lazy to learn code, and those who buy equipment to plug into the wall, with no knowledge of how to adjust it. In other words, we are getting soft. How can we let people like these earn the title of "Amateur Radio Operator." Mr. Worrorm wishes to pull the real hams down to give the half-hearted do-nothings a try. I'm sure Mr. Worrorm must have been kidding anyway, but that still doesn't alter the cold, hard fact that some hams prefer to be hams.

— Philip Rand, W1YTA

3241 Rolling Road  
Baltimore 7, Maryland

Editor, *QST*:

I think Mr. Worrorm is taking this business of the Sweepstakes too seriously. . . . If some of the fellows want to put up new antennas, use code oscillators to bone up on their keying, so what! Figuring out what bands pay off at certain times is good strategy. . . .

As for being taken care of by the ARRL, they have done a heck of a lot for ham radio. . . . I'm behind the ARRL 100%.

Open your *Handbook* to the Amateur's Code. Look at number 3, "The amateur is progressive . . . he keeps his station abreast of science. It is built well and efficiently. His operating practice is clean and regular." If this doesn't include putting up good antennas and fixing up his station I'll eat the whole *Handbook*! Also, check "Assembling a Station" for the answer to your throwing four switches. "In any amateur station worthy of the name it should be necessary to throw no more than one switch to go from transmit to receive condition."

Those multipliers would never work. Who is to say what one operator has too much QRM? What Mr. Worrorm wants is to give everyone a multiplier of 15. Don't go around yakking 'cause no one can get your call right unless you know you are sending it perfectly.

The bands are gaining more hams each day; and, if people like you Mr. Worrorm are going to spoil it for us, I think we would rather not have you at all.

No, I don't run a kw. Just 60 watts on 50 meters. I'd be willing to wager you are running more than that. So I don't see how you can complain about a simple, little contest that proved who the real lid is, Mr. Worrorm.

— Melvin N. Morris, W3YYYH

Athens, Tennessee

Editor, *QST*:

. . . Who in the heck does this "ex-boosted" 8AOF think he is? I think that he should be boosted straight to Hades. You fellows should send someone down for a personal interview with guys like A. L. Worrorm. Checking in the call book, I see that the call W8AOF belongs to someone else. That is in the Winter 1955 issue. I just happen to be one of these jerks who practices his code before a code-practice oscillator and a tape recorder. Why I find that I still can't even copy my own sending half the time after practicing. I would just like to hear that "bug swing" from ole Wor Worme.

— Jim Grant, W4UVU

Nahcotta, Washington

Editor, *QST*:

What goes with this A. L. Worrorm. 8AOF guy? Is he for real? Off resonance . . . maybe?

— Ray Stone, W7UFL

## T DEFINITIONS

2346 Clover Lane  
Northfield, Illinois

Editor, *QST*:

It seems to me that the definition or meanings currently attached to the "T" numbers in the R-S-T system are practically obsolete. Not for years have I heard amateur c.w. signals that could be described by T1 to T4 (well, hardly ever!), and I'm not at all sure what is currently meant by "a musically-modulated note" (T5) or by "modulated note, slight trace of whistle" (T6). Do they ever sound like that?

In actual practice, it is seldom that an amateur reports other than T9 for the station he works. This is quite understandable, because the other T numbers, with their current definitions, are practically useless to him in describing a less-than-perfect tone. No doubt these definitions were useful once, but they are outmoded now.

The principal defects nowadays are chirps and clicks and modulation from a.c. ripple. There is no way to report these manifestations in our present T system, and your recent suggestions of adding C (for chirp) to the RST report, or K (for click), is not going to help much because it does not meet the real problem in a sufficiently direct fashion.

My suggestion is that the T numbers be completely re-defined, in accordance with present needs. They could thus be made much more meaningful, and therefore useful. Here are some preliminary suggestions.

T9 — Perfect tone. No chirp or click.

T8 — Slight to moderate chirp.

T7 — Bad chirp.

T6 — Slight to moderate click.

T5 — Bad click.

T4 — AC Ripple present.

T3 — (what would you suggest here?)

T2 — (what would you suggest here?)

T1 — Terrible! The FCC will get you!

Please don't take my suggestions too literally. The idea is to use currently meaningful definitions, whatever they may be.

— Hubert Woods, W9IK





# How's DX?

CONDUCTED BY ROD NEWKIRK,\* W9BRD

## Hence:

DXpeditions which take place unheralded and are on the air before the DX grapevine has had a chance to alert the gang are known in the trade as "sleepers." FS7RT (W6ITH) of St. Martin Isle is one example. Guys atop the DXCC Honor Roll stay up there mainly because they're seldom caught snoozing when sleepers appear. They're awfully sharp, those DXperts, and they don't miss much. But our April mailbag turns up a DXcursional narrative which we quite confidently title

### One They Must Have Missed

DXward-ho! . . . We had decided to make it a family affair. And I won't bore you with all the details of our tedious preparation — the stocking of supplies and fuel, the testing of communications gear, the selecting of travel routes and innumerable other problems. It was tremendous! And, frankly, there were times when we came very close to calling the whole thing off.

But finally we were ready. After a frantic last-minute check of provisions, clothing (we brought several changes for everybody) and radio gear (I had full responsibility here) we were set for our DXpedition at last.

The momentous day dawned damp and dismal. We were bound for a point about 270 miles WNW of Lima. The *Rambler* — humorously so called because her former owner is an old salt named Nash — pointed into the breeze with her running lights piercing the morning murk. And although weather reports promised smooth sailing for most of the trip, our trim single-master began to take water at the very first mild squall.

### Glossary of Unfamiliar Terms

<i>col.</i> . . . . .	mountain pass
<i>cwm</i> (pronounced coom) . . . . .	valley
<i>couloir</i> . . . . .	steep gulley
<i>mal de mere</i> . . . . .	seasickness
<i>serac</i> . . . . .	ice pinnacle
<i>simoom</i> . . . . .	sandstorm
<i>terra firma</i> . . . . .	terra firma

Of our party, which consisted of the XYL, two young jr. ops and myself, only I had had prior sailing experience worth mention. Fortunately this greenness of crew was to be of no serious consequence. Our teamwork was commendable; each voyager behaved well, albeit reluctantly now and then, in response to my barked commands. But I knew the worst might be yet to come and thought of such disturbing phenomena as typhoons sweeping toward us across the Pacific, Alaska's dank chinook winds, the dread Syrian simooms, treacherous seracs teetering above cols and couloirs overlooking Himalayan cwms. . . .

Once under way we periodically broke out sustenance rations — chocolate bars and thermos-bottled milk or coffee for all aboard. This shored our morale whenever it appeared likely that we would never sight good old familiar terra firma again. (Later on we gladly would have dropped anchor and climbed over the side for a full-course dinner but we couldn't spot a place that was open, hi.)

With our friendly radio assuring us of clearing weather ahead we at length reached the halfway mark en route our destination. The crew had become restive by this time and grumbled mightily as good crews will. And at this moment the XYL would wonder out loud if she turned off the water in the sink back home! Then our youngest began to suffer from *Rambler's* unpredictable lurchings. The rest of us, however, remained remarkably free from the clutches of *mal de mere*.

I broke the monotony of staring at limitless greenish scenery by turning the helm over to the XYL and firing up our battery-powered 25-watter on 20 c.w. Despite h.f.o. receiver instability and the difficulty of keying in the swaying shack we raised a W2 who bade us Godspeed upon learning of our circumstances. I switched to phone for a few quickies — O! that W/K phone band QRM! — and returned to the wheel not a moment too soon, for the inexperienced XYL by this time had us several degrees off course.

Well, after what seemed like weeks, we found ourselves nearing our predesignated advance base. Lookouts were posted and on the alert for familiar landfall. The weather was closing in again, it was growing dark, and *Rambler's* crew was eager to regain land legs.

A cheery shout — journey's end!

With our faithful engine purring smoothly and our single mast standing back in the brisk wind we came around and hove to under an old oak. We had finally reached base camp: Peterson's place, RFD 1, Harvard, in McHenry County. *Rambler's* entire complement rallied 'round Grandpa and Grandma — it was swell to be back on the farm for Easter!

\* \* \*

When we all turned in that night I set my alarm for 5 A.M. You see, I was unanimously elected to continue alone on the last leg of our DXpedition. I would coax *Rambler* up to the summit of Gay's Hill, a dandy radio QTH just north of the west forty. There I knew the Europeans would come booming through on fifteen meters while I watched a beautiful Illinois sunrise.

(QSL via ARRL.)



\* 4822 West Berteau Avenue, Chicago 41, Illinois.

## What:

In late February a quick combination punch to the solar DXus brought the crowd up cheering. It was FS7RT first, uncorking hundreds of multiband French St. Martin QSOs. Then came the awaited 14-Mc. eruption of FB8BR/FB8 on virgin Comoros Isles, quickly followed by mountaneous 21-Mc. pile-ups around Andaman Islander VU5BC. Get 'em? Other distant rumblings on the DXpeditionary front follow.

Soon (maybe): KT1EXO, EA9DF and CN8s to Iñi; ON4QX to AC3-4-5; FB8BK to the Glorioso group; PYs to Trinidad Isle (PY0); W5HBM and VQs to Zanzibar; VSs to Maldives and/or Laccadives; VP5BE to the Caymans; DL/DJs to Luxembourg; VQ4NZK and VQs to Seychelles; OHs to Aaland (OH9); VS2DQ to ZC3; MP4QAL to other MP4 and VS9 areas; LAs (LBs) to Jan Mayen; F7s and HB9s to Monaco; I1s to M1 and HV; shipboard VP2VB/P to VR and CR10 locales; F's to Andorra; W5LAK to AP2; ZLs to the Kermadecs; VE2AFC and various W/Ks to Caribbean hotspots and/or TI9; Ohio W8s to ???; ZD6BX to the Comoros; and CEs to Easter Island. For meaningful dates, call signs, frequencies and other factual details run, don't walk, to your nearest crystal ball. . . .

**15** phone facts bring us back down to earth from heady and hazy clouds of speculation. FS7RT's s.s.b. was the biggest DX bombshell to hit 21 Mc. in many a moon, and Ws 2QJHH 4GUV 4TFB 4YOK 6ZZ 9ICL and 9WHM were among the first to report QSOs. FS7RT is but the second ham to fire up on French St. Martin postwar, and the first since FG8Z shut down there in early 1947. W6ITH brought along gear to do a man's job, including Collins kw., 75A and 2-kw. generator. Incidentally, Reg has worked over 40 s.s.b. countries back in Kilofornia. . . . Leave us face it, men: Fifteen meters now rules as undisputed king of DX phone bands and 20-meter beams are being scraped as second fiddles. MP4BBW (21,355), VP5DC (220), VR2BC (172) and ZS7C (170) were caught by W9WHM. . . . W9ICL got those four plus FO8AJ (290) 19 (GMT, LX1SI (190) 15 and VP3YG (160) 21. . . . EA8AX 14, ELIA 22, FF8AP 24, KG6FAE 1, PZ1RM 15, VP3HAG 24, VO4s EO 20, RF 21, ZE2KG 20 and ZS9G 21 hooked up with W4GUV, making it 101 for Louie. . . . W6NJU liked BV1US (224) 1, an FF8 and VP2SI (159) 18. . . . CR9AH, DU7SV, HR3HH, JAs 1ANG 3BB, KA8 2GS 2KS 2LZ 2NY 5CL, KC6CG, KR8s AB AF PI PO, KV4BD, PJ2AF, TG9AD, ZE2KR and a ZS9 jawed with W6ZZZ. Miles joins the chorus of Yanks who opine that DX stations who work phone should always indicate what range of frequencies they intend to tune. . . . W4TFB lists good luck with FM7WN, HC1ES, VPIJH, VO4s AC EU FK, YN4CB, ZE3s JF JL, a ZS9 and other goodies. . . . The 100 watts and dipole at W9AMM accounted for FM7WQ, mobiler FF8AP/m, FO8AK, GD3IBQ, HP3FL, KGs 1KW 6GX, KM6AX, KT1WX, VO3s 2C 3DQ, ZE2KR and ZS3F. . . . HR1LW, KV4BI, PJ2AB, TG9s AO WB, VP7s NG NK and NZ are among W5HNS conquests. . . . W4YOK took on Uruguayan portable CX3ZBI, HR1CB, VP8 1BK 7NF and ZD4BL. . . . Down the list here and there at W1YQC: ELs 1A 12A, ZE6JP, ZS7, W1ZDP; ZS7H, W3ZJR: a Windwards VP2, W5HEX, UA8, EL3A, KR6, ZE2JE, W81XU; India's lone s.s.b. entry, VU2RX (200) 14-16, W90BV; VO2GW, VO3, K2BZT; ZB1EB 14. . . . SWL J. A. Rocha hears FF8s AQ 17, BF 18, BS 1 and XE9BVX 1 boiling into Brazil. . . . FO8AD (140) 0, GD3GMH (214) 17, KJ6BM (300) 20, KX6ZB (430) 20, MP4KAC (260), 15, OQ5BQ (206) 19, SP5s AH (261) 18, CC (280) 15, SV4VO (250) 15, VP8 1BE (217) 0-1, 2DL (219) 18, 8BD (180) 1, VO5EK (170) 19-20, VR3A, VU2s in number, YN1KK (242) 20-21, YU1AD (210) 15, ZD9AD (203) 21, ZE4JR (230) 20, 4X4s BL (160) 16, DK (227) 16-17 and 5A2TZ (220) 18 are 21-Mc. microphonists suggested by WGDXC and NCDXC.

The antarctic snowscape at left was snapped from the back porch of VP8AZ's 1955 Grahamland hamshack. Relief ship *John Biscoe* is in view. At right, we see that all Mike of VP8AZ relaxes after his turn in the base kitchen — darned appetizing batch of bread! (Photos via W4TFB)

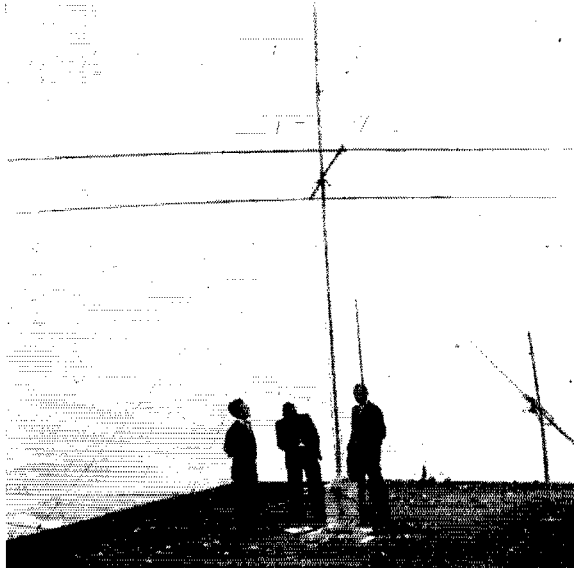
**15** c.w., now, while we're on the subject of 21 Mc., and W9QGI's ZE26 30-watter thinks it's a kilowatt; DM2ACN (45), EA8BO (10), FO8AG (50), IT1ZGY (80), I1BGB of Trieste (110), VO2AS (35), ZB21 (55), ZD1DR (75), 4X4FA (80) and one VR4FR (95) gave Lloyd 145/127. . . . An FQ8, JAs 1ACA (75) 2, SAQ (75) 1, KG6AF (30) 23 and W41KC/KW6 worked K6ENX. . . . W1CTW must sign his call meticulously, for W1CY and W9CTW also work 21-Mc. c.w. VU2BK and 4X4BX made it 89 on 15 c.w. for Cal but MP4QAL and one PXLIL got by him. W1CTW notices punk 20-meter habits beginning to show up on 15: "KN seems to mean 'Start calling me on my frequency at once.' . . . W2CWX cleaned up on GC3EML, GDs 3FXN 3IBQ, HE9LAA who is Liechtenstein's only native ham, KW6BV, that ZP6CR fellow and a 4X4, FD4BD, UB5s KAA and KAG escaped Jim's hook. . . . Mr. Everywhere (DU7SV), ZD6BX (33) 19 and ZK1BS chatted with W4AUL's new 500-watter. . . . W4TFB keyed with CR6AI (20) 13, W04BY, ZE5 5JA and 6JY. . . . JA4AF, KG1KK and SP8AR will receive W9URO QSLs. . . . Log excerpts from random records, at K2BZT: IT1TA (106) 16, SPs 1KAA (50-60) 16, 5AA (83) 15, K2EQD: VO2GW (78) 20, K2KDW, TF3MB 14, W3HFG: VP8 1KT 6RG, 9S44X, W3YUW, CR6, XE-1P (10) 15, W6ZZZ: an SP1 for No. 105 on 21 Mc. . . . WGDXC and NCDXC recommend 15-meter codework by FAs 30A (18) 17, 8RJ (18) 17, JA5 1EC (55) 0, 31T (97) 0, KB6BA (73) 19, ZE5JA (20) 21-22 and ZS3BB (93) 19.

**15** Novice is a new heading necessitated by the steadily increasing number of monthly reports received on the subject of WN/KN DX endknors. G31DG is hearing these Novices on 21-Mc. c.w.: WN/KNs 1EGS 1ELA 1EOA 1FFV 1FID 1FYA 1FSZ 1GDB 1GOS 1QHT 1GVG 1GZR 1HDK 2MFQ 2MVN 2OKA 2PEJ 2LGL 3AWU 3BWU 3CKR 3DQR 4CMB 4DHH 4HG YHNA 8ABM and 8HEF. . . . ZS6AJD made it 29 countries and all continents for KN6JQC's friend KN6OFF. . . . GE3AX, DU7SV, HK3PC, KH6s, KL7s, WH6BOK, WP4ACF and that VR4FR guy came back to KN5BGB. . . . VP8BH (130) 22 is most choice at KN4DRO. . . . WN3BWU has a fistful of Europeans, YU3KU (115) 13-14 and CN8DC (115). . . . CE3DZ, VP8 7ND 9BP and others enthralled KN0CER. . . . K2BYA/VO4 was WN8BX's first stride toward real DX, and KN5ARH broke the ice on WP4AOI. . . . WN8ONX starts off with KL7BKN and KZ5CF, promising more to follow.

**20** c.w. is the next stop for your "How's" Bandwagon and W99EU confronts us with ET2PA (37) 14, FO8AN (80) 4 aboard *Yasme*, KA9MF (25) 2, KG6AAY (71) 14, rarish LU4XC (33) 4, VP8s AI (40) 2, BK (11) 1 and W3UIP/KG6 (76) 0. . . . K6ENX reached 144/118 by way of CR4AG (60) 3, CT3AP (30) 17, GD3FBS (25) 16, HA5BL (65) 17, KB6JA (50) 3, LU9ZB (70) 1, OQ5CP (75) 17, SV9WR (20) 16, VK1IJ (70) 16 of Macquarie, VP8BM (10) 2, VO3 2AS (80) 16, 4FK (70) 19, 4FM (40) 20, VR3B (50) 4, VS1GZ (80) 19, ZE5 1JG (75) 17, 6JN (80) 17 and a long-path 4S7MG (30) 2 QSO. . . . CR6CW (15) 21, FO8AM (68) 2, FS7RT, KB6, PZ1LL, CR6CW (15) 21, FO8AM (68) 2, FS7RT, KB6, PZ1LL (28) 19 and VQ4 heartened K2BZT. . . . CR8s 6AP (80), 71Z (80), and ET2, FB8BE (15), FC7XB (90), FK8AO (65), FO8AO (85), FO8AV (30), KT1UX (5), UA8KKB (40), VS9AS (90), ZD2DCP (20), 3V8s AN (5), FA (5) and 4S7WP (40) clicked with Iowan W9QGI. . . . K2EQD drove through to CN2BP (33) 20, EAs 6AF (10) 21, 8BF (43) 17, 8BP (30) 7, 2AP (45) 21, FY7YF (30) 19, PZ1LM (12) 0, TF6WAK (11) 22 and ZB1AJX (23) 19. Hal finds that ignoring big pile-ups pays off in more DX. . . . AC5PN (92) 13, AP2M (61) 13-16, LU3ZY (60) 4 of South Hotdog, MP4QAL (50) 14, YA1AM 13, YJ1DL (5) 20 and a South Georgian VP8 mingled with W4CWC. . . . W9URO's Globe Scout gobbled up FF8BI, KA2KE, KT1CH, PZ1s BS and CD. . . . DU7SV (83) 14-15, FB8BS (72) 19-20, KA2s NA (95) 22, UA (18) 0, ZDs 3A (52) 22, 4BQ (56) 22-23, 4BT (18) 23, KB6, VP8, VS9 and So. Sandwich carry K2GMO to 171 worked



Precipitous Mount Rigi, a 5000-footer in Switzerland's rare Schwyz canton, has become popular as a DXpeditionary objective for the HB9 DX and v.h.f. gangs. Always the scene of feverish QSOing during Swiss Helvetia-22 DX tests, the peak sees more and more ham visitors throughout each year. Here's a typical Mount Rigi skywire lash-up with HB9MO and colleagues inspecting their handiwork. Watch for HB1 signals from Rigi during this year's H-22 frolic scheduled for May 12 and 13th — full details next month.



..... VU2BL (38) 13, VSIGX, Y12AM (75) 15, ZD2-ROO, ZS7H (10) 4 and many rare ones attracted K2GFQ. Paul is among those who wonder about the ZD7A active in the recent FB8RU test. .... An Aden V89 and Amsterdam Isle's FB8ZZ (31) 18 pushed K2BU and his Cube Quad to 182. .... W80TH preferred GRs 6AI (45), 7CI (50) 22-23, EA8BK (85) 21, FF8AJ (50) 20, YPs 4LW (100) 0, 5BE (80) 2 of Turks & Caicos, VO6LQ (75) 19, VS6CG (50) 12, ZE3JP (90) 23, 4X4CK (45) 19 and hordes of LU antarctica personnel, plus CE7ZN (5) 4. Tom adds an amen to current widespread complaints of slow VK confirmations. .... DL4ZC contributes CR6DA 17, KG1-KK 18, an STIAB who claims affiliation with the French Foreign Legion, UA1KAI 12, VK1RA 17 of Mawson Base, and VQ2AB 18-19. Lloyd reports improved conditions and oodles of needle-pinning W/K signals on 14 Mc. .... W2CWK, critiquing for the unusual, turned up evidence of EA8J/Ifni and ZC1 signing /HV. Save your QSLs — W2DOD quotes W6BP as knowing nothing about these or PJ2MB, either. W2CWK should have better QSL results from CR4AL, ETs 2LB (30) 14, 3LF (3) 23, GM-3ETH of the Sheldans for WAE enthusiasts, HC1LE, HZ1HZ, ISREX, JA4AF, KA3AC, MP4JO, OH90Z in the Finnish polar region, OY7ML, TA3EF and VQ8AY. UA1KUA and UB5CR got away. .... CN2AY (20) 20, CR6s, FM7WP (30) 23, VQ2JB (70) 20 and YNICAA (90) 2 sampled W3YCE's 50 watts. .... W6SUQ added HA5KA (56) 18, KV4AA (23-80) 18-2, PJ2AJ (66) 1, YOs, Y12 and 487 to his fast-rising 65/37 tally. .... W7LAN, freshly returned from DL4MY-DL4GQ enterprises, grabbed KG1CG (55), PILLC (87), U55BP (2) and ZD6BX (54) 16-4. .... EA8AB 21, OQ5PE 22, ZSs 3Q 21 and 90 (40) 18-21 are among the trophies at W3SOH. .... W6NJU managed CN8MM (7) 18, KJ6BN (82) 4, KX6AF (49) 3, LU5ZS (79) 4, VQ6, YO3RD (46) 16 and 4X4BX (57) 15. .... G5JB (65) 21-23, HC1JW (65), IS1FIC (90), ST2AC (45), UA1DH, VP8BT, VU2AL and ZS7D (50) 17 plopped into W6AOA's bag, according to KN6JQJ. .... Scanning archives across the land, at W1PYK: PZ1, 3V8, K2KDF; CN8MX 27. W3YUH: CN2AE (40) 15, KG1JB (40) 16, PZ1, VP1AA (5) 17. W4AUL: EA6, PZ1, Turks VP5, W4TFB; VP8, YV3AE/MM, W4UWA; VP7N, W6HPB; LU9Z 3. K6DNH: Amsterdam FB8, HP1EH, 4S7NX, W6FGX; FP8AP, KG6AFT, W6VFM; UA0KBB 21, VQ6, YV5BJ 22. W8RET: W2CWK, VQ6GC; K6ENX (40) 15. .... So, Calif. DXC's Bulletin, No. Calif. DXC's DXer and West Gulf DXC's DX Bulletin put us wise to the 14-Mc. c.w. prowlings of AP2s C (24) 17, Q (61) 15-16, BV1US (49) 0-1, CE7ZM (55) 5, CN2s AZ (60) 19, BO (20) 19, CR7s AD (62) 4, CJ (25) 22, EA5 6AM (51) 14-15, 9BP (50) 22-23, EL2s D (25) 21, PE (17) 20, ETs 2AG (55) 21, 3AH (70) 15-16, F9SC/FG (80) 15, FB8BX (75) 15, FD4BD (20) 21, FF8BF (51) 23, FM7WF (92) 15, F08s AD (30) 16, AK (47) 16-17, F08AT (76) 16, H18HC (36) 0, H18VR (52) 1, HZ1AB (3) 16, 15AAW (38) 14, KGs 1AK (1) 20, 6AAV (71) 14, K1GASP/KB6 (32) 4, KTIEXO (12) 16-17, KW6s BN (40) 2-3, BV (94) 3, LUs 3ZF (79) 23, 6ZS (76) 2-3, 0AAW (93) 0, LZs galore, MD5UK (40) 14, MP4s BAU (42) 15, BBE (30) 15, TAA (57) 16, OD5s AV (36) 15, LJ (40) 15, OQ6s BT (70) 16, HI (78) 17, OYs 2H (60) 12, 2Z (25) 18, 3AF (69) 16, ST2s GN (35) 16-17, NG (14-75) 15, SU2AD (80) 16, SVs 1AB (71) 15, 0WL (53) 14, 9WY (9) 13, TG9MR (15) 2-3, UAs 1AM 3FG 4HM 6UI 6KOE 9KCA (83) 12, 9CE (66) 2-4, 0KKB (50) 14-15, UB5s KBB (35) 14, KKA (64) 15, UC2KAA (65) 14-15, UH8KA (89) 14, UR2KAA (64) 13, Norfolk Islander VK9RH (45) 4, VOs 2AB (32) 18-19, 3EX (69) 19, 3FN (69) 15, 4AQ (50) 13, 4EO (52) 15, 8AG (10) 13, 8CB (60) 13, VR2s BZ (52) 21, CS (84) 8-9, VSs 1BJ (90) 14, 1GP (19) 16, 2CR (72) 14, 2DW (12) 0, 2ET (82) 14, VU2s AX BL BT CO HF JG JK KM KV KW MA SX SZ peaking between 13 and 15, Australian mariner X1NP (50) 7, Y12RR (58) 15, YK1AB (20) 22, one ZA1AA (23) 14, ZB1s TD (101) 18, ZR (56) 14-15, ZC4IF (73) 13, ZDs 2WAF

(95) 17, 6EF (13) 15, 6RM (5) 17-18, a ZD7AB (42) 16, ZD9AD (5) 21, ZK1s BG (67) 2-3, BL (15) 3-4, BS (65) 3, ZP5s EC (70) 1, GM (20) 2, ZSs 2MI 3AP (108) 17-18, 7HR (75) 19, taboo 3W8AA, 4S7s BW KH MR WD WP between 14 and 15, 4X4s BR DH FQ GS all 15-16, 5As 1TD 2CL 2TG 2TZ from 16 to 23, 9S4s AL (72) 14 and AX (3) 15.

**20 phone**, valiantly battling upstart 15, dished out HC8GI (155) 3, So. Sandwichman LU2ZY 0, VQ5FS 20 and VR6AC (143) 6 to W4QCW of KC4 renown. .... KX6BU (265), LU8 3ZN (205), 9ZB (205) and VU2ED cornered W4HKJ. .... W9EU speared FM7WN (131) 2, HC2BH (170) 23, HH2Y (124) 3, HP2ON (175) 0, KG1s AR (202) 3, FR (260) 19, CB (253) 23, SV0WL (127) 14, VPs 1JH (112) 4 and 7NK (160) 0 while modulating. .... KJ6BN (26), KX6AF (260), ZD2JDB and others chomped with W9WHM. .... FP8AP of St. Pierre 2 logged W4s GUV and TFB, W4GUV also captured FM7WQ 4, a KX6 and ZE5JA. Briefly, now, at K2BU: HI6EC (165) 14, a VQ5, W3SOH: EL9A (310) 19-20, VP3LE 19, W3YCH: VPI, VP3, KG1. W6ZZ: FB8ZZ (125) 17 in French, KP6AK (217),

### W2SN Testimonial Dinner May 6, 1956

In recognition of more than two decades as QSL Manager of the second-call area, his many friends are honoring Henry Yahnel at a dinner in his honor. It's going to be a gala evening and one that will be long remembered. Now retired, after twenty-three years, his friends plan to show him how much they appreciate his contribution to our hobby. Attendance at this dinner will be your opportunity to demonstrate to Hank your deep gratitude.

Special seating arrangements may be made for groups up to ten in number, so that those of you who come from some distance will be able to sit together. Ticket sales — at \$6.00 per person — close April 21, and there are a limited number available. Get your reservations in early. Be sure to bring the ladies. Tickets may only be obtained by writing Rev. Charles Wood, W2VMX, 15 Church Street, Fair Haven, N. J. Bill Leonard, W2SKE, prominent CBS newscaster, will MC the affair which will be held at the Robert Treat Hotel — Grand Ballroom, Park Place, Newark, N. J. Doors open at 4:00 p.m. for rag-chewing.



**0A0AL**, with **K5AQD** up, gets in mobile DX licks at the scene of road construction high in the Peruvian Andes. **0A3L** is manager of the project which involves carving a 31-mile section of highway through rugged rock and jungle. The contracting firm, R. G. LeTourneau, Inc., receives payment in the form of a good-sized antenna farm — 1,000,000 acres of virgin Peruvian pastoral. **0A0AL**, likely the only land-mobile in Peru, is intermittently active on 20, 15 and 10 meters, using 5370 kc. for commercial traffic.

**Z8SL**, expects **PZ1BS** to work much phone soon. **W90BY** (**W9QVY** opping); **ST2WB** . . . . . Listener J. A. Rocha of Sao Paulo recorded the voices of **EL2B** 7, **JAs** 2BC 7, **6AK** 7, **KG1AA** 8, **ST2DB** (117) 18-20, **VQ5AS** 20, **VQ8AR** 20, **VK1LJ** (186) 8-15 of antarctica, **VR2CW** 6, **VS9GV** 19, **W7VMD/KG6** 8, **XZ2SS** (186) 9-18 and **ZS9G** 19 . . . . . 14-Mc. A3 possibilities listed by **WGDXC**, **NCDXC** and **SCDXC** superpies: **ACs** 38Q (120), 4NC (150) 17-0, 5PN (100), **AP2s** A (130) 13, L (110) 14, **CRs** 6AU (130) 2, 6CN (200) 23, 6CX (110) 0, 7AH (110) 20, 7CN (167), **CT3AI** (125) 0, **EA9AR** (123) 23, **EL2D** (130) 21, **ET2US** (188) 14, **FB8BC** (157) 3, **FF8s** AG (144), AP (148) 0, **FM7WF** (125) 15, **FO8s** AB (110) 5-7, AD (135) 4, AO (151) 4, **FY7YE** (168) 23, **GD2FRV** (135) 15, **HA5KBA** (176) 17, **HZ1s** AB (90-125) 13-15, TA (105) 15, **I5AAW** (165), **IS1EHM** (200) 16, **KX6NB** (290) 23 on s.s.b., **MP4s** KAB (175) 14-15, **KDS** (116) 5, **OD5s** AB (110) 14, DA (187) 15, **OQ5HI** (320) 18, **PJ2s** a-plenty, **SU1AS** (165), **TF2WAF** (150) 23, **UC2AA** (52), **VKs** 1RA (172) 17, 9SP (174) 13, **VPs** 1MA (130) 13-14, 8BF (120) 1, 8BQ (200) 1, 8BS (115) 1, **VQs** 4AK (134), 4AQ (150) 16, 4FK (180), 5AU (160) 20, 6LQ (168) 14, **VR2CS** (128) 7, **Vs** 2UW (180) 13, 4BA (100), **VU2s** EB (140) 14-15, EJ (165) 13, **YI2AM** (132) 15, **ZC5CA** (240), **ZDs** 4RZ (126) 23, 6RD (167) 17, **ZK1s** BL (187), 5, BM (175) 4, BS (160) 5, **ZP5JD** (139) 3, **ZM6AT** (162) 8, **ZSs** 2MI (163) 17, 7C (120) 16-17, 4S7s SR (170) 13, YL (106) 12 who has quite a QSL backlog, 4X4s BC (137) 3, DK (155) 15 and 5A3TR (198) 15.

**10** phone is worth keeping an ear on. With 100 watts and a 3-cl. w.s. rotary over 70 feet high, **W0PBT** soaked up **CN8FL**, **CRs** 5AC 7BB, EA9AZ, FA9RZ, hit-and-run **FS7RT**, **GC3EML**, **GD3IBQ**, **HR1BE**, **HH7W/m**, **KA2LZ**, **KG4AQ**, **OQ5EB**, **PJ2AP**, **TG9JW**, **Vp** 1EK 8AQ, **VQ2NS**, **YNICAA**, **YSIA**, **ZBs** 1GBF 2P, **ZD6RM**, **ZE2KI**, **ZK1BS**, **ZP5JE/m** and **4X4BL** . . . . . **W8URO** bumped into **KG4AV**, and **W0PME** reports **VQ2AS** (200) available . . . . . **CE3CZ** and **YN1KK** hooked **W6ZZ** and **W7LAN**, respectively . . . . . **G3IDG** logged A3 radiations by **OD5BR** and **ZD3BFC**, while **CR5AF** also is known to be haunting the band . . . . . **Eleven** phone received a play during the recently concluded **ARRL** DX test, but are there any DXers making 27 Mc. a steady diet at this time?

**10** c.w. might have the same question asked on its behalf although we know there are a few lads who watch this part of the DX spectrum closely. **G3IDG** still clings to his 28,066 rock; **IT1ZDA**, **LZ1KSA** and **UJ8KAA** are recent keyers heard . . . . . **VQ2AS** (70) 10 is reported at **W3SOH** and **W0PME** . . . . . **ZD6RM** got that **W3**, as well as **W8URO** who adds miscellaneous Europeans and ZS brethren.

**40** c.w., afflicted with shortening skip and rising atmospheric levels, clings to a decimated following. **W3DLI** is also assailed by ITV but Walt picked up **DM2ADL**, **HG4MK** (100) and **Z1LM** . . . . . Here and there, the pickings at **W2CIFA**: **UC2AA**, **K2EQD**, **CR7CI** (8) 1, **VQ6LQ** (2) 1, **W3BZR**; lonely **XE2FL**, **W3WFG**; **HP1UQ**, **LA6U**, **SL3AG**, **PZ1**, **W5YUF**; **YU**, **OK**, **K4CQ4**; a CQ answered by **VK3XB** (5) 11, **K6DY**; **JAIAGU's** a.s.b., sharp and clear, heard working **W6ROB** on 7015 kc. **W7PSO**: curious **ZM1BL** 6, **W8URO**:

**HK5BY**, **PZ1**, **XE2HA**, **W0VBS**: **KJ6RN**, **PZ1BS**, **VP4IL**, **ZLs** and **Euros**. If you don't believe poor old 40 has come upon evil DX days just take a look at the juicy 7-Mc. potpourri listed in April **QSTs** for 1953 and 1954 . . . . . **Novicewise**, **W8URO's** friends **WN8s** **VNN** and **VKO** have worked **KH6** and **VK2XZ**, respectively, while **KN5ARI** encountered **WP4AOI** . . . . . **Eighty** is even farther down sunspot alley. All we have in the line of noncontest DX to report is **K2KDW's** snatch of **GD3UB** and some **Gs**, plus **WN8COA's** good fortune with **PJ2CJ** on 3722 kc. at 5-6 GMT. Oh, well, traffic hounds will be happy.

**160** c.w., judging from the stupified state of 40 and 80, ought to be deader than that doornail we hear so much about. Not entirely so, however, **W1BB**, **W3RGQ**, **W8GDQ**, **W9PNE** and their nocturnal colleagues even went so far as to scare up signals from a few **Gs**, **DLs** **1DA** (1835), **1FF** (1832), **600**, **HR3HH** (1834), **KV4AA**, **KZ5PB**, **T2BX**, **YN1s** **AA** and **KK**. On February 12th, after a three-week static and loran siege, the long vigil paid off **W1BB** with a dandy 150-meter first—**HB1CM/HIE** (1769) on junket to Liechtenstein, a rare one on any band . . . . . The scales are swinging against much more of this 1.8-Mc. long-haul stuff as sunspot activity mounts. But who knows? Persistence thrives on heavy odds, as some sage said.

### Where:

A veritable blizzard of antarctic ham activity is blowing up from the far south and this reminder is in order: All QSLs for I/U stations with "Zs" immediately following the numerals can go via **RCA** (**LU9AH**); for CE stations with similar suffixing, via **RCC**; for **VPs**, via **RSGB**; for **VK1s**, via **WIA**; for **FB8X**, **FB8Y** and **FB8Z** stations, via **REF**; and for **KC4s** **USA**, **USB**, **USN**, etc., via **ARRL**. **KC4** test transmissions were logged in Australia and New Zealand as early as late January, incidentally . . . . . **W6SYG** advises he has taken care of outbound **VR6AC** QSLs for the period May through December, 1955. For 1956 QSOs **VR6AC** is doing the job himself and all cards from North America should be addressed to **Floyd McCoy**, Pitcairn Island, S.P.O., via Balboa, C. Z. . . . . From **ex-VP8AZ** via **W4TFB**: "I QSL'd the boys 100 per cent months ago but quite a few must have gone astray. Tell any who may need my cards to let me know and they'll get sure return." Mike readies a 40-watt 807 and 135-foot wire for DX action back home in the U. K. . . . . Via **WIAPU**, **W4LVV** reports scant QSL cooperation from **FG7s** **XA** and **XB**, **FG7XC?** Fingers crossed . . . . . **YA1AM**, who won't be very workable henceforth because of a punctured undercover status, pleads that no QSLs be sent to any Afghanistan station direct. QSL **YAs** only through **ARRL** or **RSGB** unless otherwise specified here . . . . . Aided by **G2MI**, **W9FKC** ran down an **AC4RF** QSL for a 1950 QSO . . . . . **SCDXC** understands that **ex-JZ0DN** (**PA0DN**) plans to issue QSLs via **W6YMD** . . . . . **ARI** (Italy) reports that its bureau handles **M1** and **ET2** cards in addition to pasteboards bound for all "I"-prefixed  
(Continued on page 132)



# Operating News



F. E. HANDY, WIBDI, Communications Mgr.  
GEORGE HART, WINJM, Natl. Emerg. Coordinator  
PHIL SIMMONS, WIZDP, Asst. Comm. Mgr., C.W.

ROBERT L. WHITE, WIWPO, DXCC Awards  
LILLIAN M. SALTER, WIZJE, Administrative Aide  
ELLEN WHITE, WIYYM, Asst. Comm. Mgr., Phone

WHAT A SEASON this has been! Most all the bands were found in good shape after the unfavorable propagation cycle. The 21- and 28-Mc. bands have been much better for DX, and there were more traffic nets registered than in any previous season. WAS applications are running 25 to 30 per cent above a year ago. V.H.F. work hit new high spots in the January V.H.F. Sweepstakes. CP awards continue in great demand. The RTTY Nets and s.s.b. operations are on an expanding scale. FSK frequency-shift limitations were liberalized for RTTY, effective March 16th.

Operation *Deepfreeze*, initial bases complete, starts the wintering-over antarctic night period and KC4USA-V should be keeping some of us busy. Active affiliated clubs now number close to 900, many of them promoting active AREC and RACES groups in their communities. USCDARA will hold its first annual meeting of amateur representatives at Battle Creek, Mich. April 5th and 6th. This enlargement to national proportions of the Northeast States Civil Defense Amateur Radio Alliance can do much to recommend and promulgate Standard Operating Procedures and suitable state-amateur organizational patterns for a perfected Radio Amateur Civil Emergency Service, we trust. Unusually high demand for advance ARRL Field Day rules comes from all those affiliated clubs. More car-installed mobiles than ever before will constitute a base for increased enlistment in tests looking to emergency readiness. Becoming part of local emergency organization, belonging to the Section Net, and having an appointment in ARRL's Field Organization should be definite objectives for every active amateur operator.

It's going to be a big summer for mobiling, even apart from that important aspect of each of us lined up to be a definite part of some AREC or RACES group. Be sure to do this to have a communications spot in any disaster threat. Flexible Local Plans for the communications, organized-in-advance instead of hit or miss work, and a once-a-month exercise can work wonders for any EC/RO and enable our service and ourselves personally to live up to our best traditions.

**The Challenge of C.W.** In one recent *CD Bulletin* we included an evaluation of c.w. based on a MARS release. The Navy likewise is convinced of the need for greater proficiency and greater numbers of c.w. operators. Steps are currently under study to encourage competition in the Navy for c.w. championships, hand as well as speed keys, for ships, command and fleet units.

This is in addition to present requirements for intensive ship board radioman training, utmost utilization of drill circuits and requirement for exclusive use of c.w. for certain periods of training exercises. Here's a quote from the *Naval Communications Bulletin* (October '55):

To meet an increase in traffic load radioteletype was developed and brought into use. It permitted the delivery of traffic at 60 to 100 groups per minute. Also, voice radio came into extensive use for certain very obvious reasons, two of which are: it requires very little operator training and no knowledge of any special code; and it permits messages to be transmitted directly from originating officer to action officer without the necessity for specialized transmitting and receiving operators. Today the majority of message traffic to, from and within the fleet is carried by radioteletypewriter and voice radio. C.w. is still the primary means for delivery of messages for ship-to-shore traffic, broadcast to submarines, ships not radioteletypewriter equipped, ships in areas not covered by radioteletypewriter broadcast and for general messages and hydrographic information, and for intra-fleet when beyond the range of present voice equipment.

All this means that today's radiomen spend only a small fraction of their watch-standing time on a c.w. net, and even less time handling a key. But . . . c.w. remains with good reason — a vital means of radio communication. It can be copied through atmospherics, interference, and jamming at times when RATT and voice are unreadable. It is the primary means of delivery of ship-to-shore traffic. It fills a vital need for medium- and long-distance early warning nets beyond the range of reliable voice communications. It is faster than voice for all but short tactical messages. In communications between allies of different nationalities it has a great advantage over voice radio because the operators do not need to understand or interpret the languages. . . .

**There Ought to be a Law Against.** (The following points are presented with credit to the Phil-Mont Mobile Radio Club from the bulletin *Blurb*.) There ought to be a law against:

Guys that tune up on a net frequency (or any frequency) without listening first.

Amateurs who call CQ for five minutes without signing. Those who zero on a DX station you are working and call him while you are still transmitting.

Guys who just love to send vvvvvvvvvv over and over.

Guys that use phonetics in their call when there is no good reason.

Guys that talk with their audio gain wide open — and do their thinking with their carrier on.

Those guys that do their homework on a monitored net frequency.

Men behind the mike that couldn't copy code if their life depended on it.

All operators, phone or c.w., who "roger" your traffic and then ask for fills.

**Call Book Indexing.** Speeding up our paper work in connection with amateur operating is always a good objective. "The book" grows larger and larger. This may precipitate a crisis when you have to find out under pressure if the station you are hearing is indeed in that rare state. Of course there is nothing basically new in the idea

of indexing. To find this QTH in time to call ahead of competitive efforts justifies some advance preparations to speed up the process.

Fix up your call book with some office-file tabs on the edge of the pages, and you have it made. The first requirement is to get the book to open up quickly to the proper licensing area or country. Then in the areas where it's important to you, or there are most licenses, you may wish to have additional tabs. Be careful to place these on the pages in such a position that a top one does not obscure those next in sequence. Marking call blocks AA, AB, AC, etc. will pinpoint the parts of the book within large licensing areas. You can carry the indexing as far as you like. In adding this operating convenience to your station try to get your stationer to provide tabs on which the letters and numbers are sufficiently prominent.

**Operating Hints for the Newcomer.** Care in tuning your receiver as well as in timing your call to another station is of first importance in making those first contacts after getting your license. To hear weak signals one has to tune slowly. Not more than 50 to 75 kc. can be covered effectively at one time in most cases. When operating crystal controlled remember that a good many of the replies to CQs are likely to be close to your own frequency.

Contacts of course do not have to be restricted to the one part of the band where you have a crystal. Good progress in operating technique was made by a good many in the course of the Novice Round-up. We're now going to suggest a new technique to try, to help get more stations than those with crystals close to your frequency.

When you send a CQ or general call, add to it some figures indicating in abbreviated form what part of the band you will tune — then cover that part most carefully for stations calling you. For example, if working in the 3750-ke. Novice allocation, you would send "50/25 K" after your CQ meaning that you will tune 3750 to 3725 kc., and even if your crystal is down at 3706 this should give you a chance at some new stations.

— F. E. H.

### W1AW OPERATING NOTE

A complete new schedule of operation will become effective at W1AW on April 29th, with the start of Daylight Saving Time in some areas. This schedule will appear in detail in May QST. Until April 29th, W1AW will operate on the schedule appearing on page 67, March QST.

### DXCC NOTES

For the benefit of those who have not previously examined ARRL's DXCC approach to the "banned list," the following information may prove both interesting and helpful.

Article 42, Section 1, of the International Regulations states "Radiocommunications between amateur stations of different countries shall be forbidden if the administration of one of the countries concerned has notified that it objects to such radiocommunications." Looking to future international conferences, ARRL must respect these provisions in setting up award rules to maintain its position as a law-abiding group. As a result of FCC Public Notice dated December 21, 1950, ARRL rejects confirmations submitted for DXCC credit which are dated on or after this date with the following countries: Lebanon (AR-OD); Iran (EP-EQ); Indonesia (PK) with the exception of PK7; Thailand (HS);

Indo-China (FIS), which included Cambodia, Viet Nam and Laos; Netherlands Antilles (PJ); Japan with the exception of Allied occupation stations; and Austria (OE) with the exception of Allied occupation stations. A later FCC notice advises that Korea (HL) was added to this list as of June 1, 1953.

Since the original notice was issued in 1950, several additional FCC announcements have been issued which have modified the original notice so that it is possible to give DXCC credit for the following countries as of the following dates: Netherlands Antilles (PJ) March 11, 1952; Lebanon (OD) and Japan (Japanese nationals, JA) October 15, 1952; Austria (Austrian nationals, OE) April 1, 1954; Laos (XW8) July 20, 1955; and Thailand (HS) September 1, 1955.

At the time of this writing the following countries are still considered as being on the "banned list" and accordingly no DXCC credit can be given: Cambodia, Indonesia, Iran, Korea and Viet Nam.

## DX CENTURY CLUB AWARDS

### HONOR ROLL

W1FH... 263	W6SYG... 253	W3KT... 251
W6VFE... 259	W9NDA... 253	W8NEK... 251
W6AM... 258	W3GHD... 252	W2XCO... 250
W6ENV... 255	W8HGW... 251	W2AGW... 250
W6MX... 255	W3JTC... 251	G6RH... 249
PY2CK... 254	G2PL... 251	W7AMX... 249
W3BES... 253	W68N... 251	W6DZZ... 249

### Radiotelephone

PY2CK... 247	W9NDA... 221	WINWO... 217
W1FH... 236	W1MCG... 220	GM3DHD... 217
VQ4RR... 235	W9RBL... 220	XE1AC... 215
ZS6BW... 231	W1JCX... 219	W6AM... 215
	W3JNN... 218	

From January 15, to February 15, 1956 DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

### NEW MEMBERS

W0LEV... 124	YK5QR... 110	W3BTQ... 101
W2NUT... 117	W4SR... 109	W9WIO... 101
K6ENX... 110	W0CPM... 109	W0YQ... 101
DL1AO... 110	W6FHR... 106	G8CJY... 101
F3AT... 110	W9EHU... 104	W48HJ... 100
	W0SYK... 102	

### Radiotelephone

W5YLL... 150	EA9RC... 108	W6FHR... 104
W9E2D... 121	W4LRG... 106	W0CPM... 104
W0LEV... 120		KL7ZG... 102

### ENDORSEMENTS

W8JIN... 245	W6YY... 173	W3LEZ... 140
W0DAE... 239	W4EPA... 171	G3AJT... 139
VK2DI... 232	W4QCW... 171	PY7AN... 139
W0AIW... 230	W6ID... 163	W5CEC... 133
W5CEK... 220	W5NGO... 163	W6CPM... 132
W5GEL... 211	W8RV... 162	G2AJB... 132
W3DKT... 210	G3FKM... 162	W1JEL... 130
W6GPE... 210	W2HSS... 161	K2GMO... 130
W6UHA... 210	K2GFQ... 160	W3KDF... 130
W7GBW... 202	G8EMD... 160	W7FB... 130
W2DKP... 201	W5KBU... 158	DL4ZC... 130
W2BJ... 200	11ALU... 156	W0QCI... 126
W5EFC... 200	W9UXO... 151	SM8RIZ... 122
W9ABA... 200	W1IKE... 150	W2MUM... 120
W1WK... 191	K2BZT... 150	W7WH... 120
W3ALE... 190	W3AZG... 150	K24TF... 120
W1KPY... 185	W2ZGW... 148	W2HQL... 112
W7ENV... 181	W8SWG... 147	W3MQC... 110
W5OLG... 175	W8DGW... 142	W3SOH... 110
	W1ODV... 141	

### Radiotelephone

G3DO... 181	G6BS... 146	F8SE... 127
F0HF... 170	W0VSK... 140	W5KUJ... 120
PY4PI... 161	W7EXG... 138	G3DFJ... 115
W6YY... 160	W5NGO... 136	W0CPM... 114
PY2JU... 153	W4FPS... 130	DL4BY... 112
W6CHV... 151	PY4LP... 130	CN5AF... 111
W5KBU... 150		PY1ANU... 111

### W/VE/VO Call Area and Continental Leaders

W4BPD... 241	VE3QD... 210	VERAW... 160
W5MIS... 248	VE4XO... 118	VO6EP... 190
W5A8G... 248	VE5QZ... 140	Z86W... 238
VE1HG... 150	VE6VK... 115	4X4RE... 218
VE2WW... 189	VE7HC... 209	ZL2GX... 247

### Radiotelephone

W2APU... 202	W8HCW... 214	VE3KF... 163
W2R3A... 202	W0ATW... 201	VE5YE... 140
W4HA... 191	VE1CR... 120	VE7ZM... 140
W5BGP... 214	VE2WW... 114	ZL1HY... 205
W7HIA... 185		OD5AB... 170



In the February issue of *QST*, under Traffic Topics, we made some comments relative to handling traffic on phone which brought accusations of our being pro-phone. This month, in this column, we want to make some comments relative to use of c.w. in emergency communication which will undoubtedly bring some accusations that we are pro-c.w.

But it's a ripe subject. Much correspondence of recent months, no little of it reporting emergency work in the floods, has made comment that more use should be made of c.w. for emergency work; that it can get through where phone (yes, even single sideband) cannot; that it is more accurate given some halfway decent operators; that the equipment is simpler, cheaper, more compact; that less power is needed to cover a given distance; that it is more conserving of frequency space; that c.w. stations can operate within two or three hundred cycles of each other and still be copied under most conditions; and that there is less QRM on the bands assigned to c.w. operation. If these are facts (and even most phone operators will admit that they are), then why in tarnation should we use phone at all?

There are two reasons. First of all, there is a lack of operators. Anyone can talk, but not all amateurs have developed the knack of handling the code skillfully. In fact, depending on your definition of the word "skillfully," very few of them have, relatively speaking. But we can do something about this, if we really want to. We can train c.w. operators. It's a little harder than teaching them to talk properly, but not as much as so many people think.

The other reason is that the general public does not understand c.w., and therefore distrusts it. They know nothing about the above advantages; to most of them, the whole proposition is reduced to a simple question: "Why wiggle a key when you can talk?" Or, "Why learn to talk Chinese when you already know English?" Non-amateur civil defense directors seldom give any thought to using anything but voice communication, unless it's RTTY, which they also understand. This we can do little about, although in some cases it's possible to educate high officials.

Whatever the reasons, we ought to make maximum use of our facilities. Mobiles on 75 meters are of less real usefulness during an emergency than the same stations on c.w. So put a key jack in your mobile rig, a b.f.o. in your mobile receiver or convert it if it doesn't have one, and go mobile c.w. You'll be surprised and pleased at the results.

On March 1, 1955, a jet fighter crashed near Waltham, Montana. W9OYV/m and W7PCZ/m proceeded to the area to ascertain the extent of the crash and to locate the pilot. K7FCC stood by at Great Falls AFB. W7SPK helped keep the frequency clear and served as relay between W7PCZ/m and the base. W7PCZ/m found the pilot had ejected himself too late to survive, so further operation was devoted to getting crash equipment and a coroner to the scene, routing W9OYV/m to intercept the emergency crew and direct them to the crash scene. W7BOZ also assisted in giving directions. — *W7KUH, SEC Montana.*

A fire was discovered in a store in Valley Head, Ala., on January 15, disrupting the nearby telephone exchange. The Fire Department called on W4DGH to get help. W4WR in Birmingham was immediately contacted. He called the Fort Payne Fire Dept. which dispatched help immediately. W4WR then informed the Valley Head Dept. via W4DGH that help was on the way. Good publicity was received in both the Chattanooga and Birmingham papers. — *W4TKL, SEC Alabama.*

On the afternoon of January 19th, W4PKI/m came upon a head-on collision at the intersection of Highway 51 South and Brooks Road in Memphis, Tenn. Finding both drivers suffering from head injuries, he called W4BAQ who relayed the information to the sheriff's office requesting an ambulance and squad car. Within nine minutes, assistance was

on the scene taking care of the situation. — *Mid South Amateur Radio Assn. Bulletin.*

On January 26th the Los Angeles Basin encountered flood conditions as a result of a 5-inch rainfall in the mountainous areas. At 1100 PST the RACES County Organization was activated and the command net of 14 established district control stations in the area was activated on 1955 kc. Shortly thereafter, special purpose networks were organized on the 10, 6 and 2 meter bands. In the early afternoon mobile units were dispatched to provide communication for ambulance and sheriff units in the Norwalk and San Dumas areas. At 1500, RACES was activated in its entirety, resulting in establishment of 24 separate networks by 1600 and alerting of 70 mobiles for movement to any place within the county they might be needed. By 1800, 191 operators had reported on the air for duty, with about the same number additionally standing by on telephone call. At 2100 all units not still engaged in emergency work were secured, and by 2300 normal communications had been restored. Letters of commendation were received from the sheriff and others praising the response of the RACES group. The above report by W6QJW, Alternate Radio Officer for Los Angeles County.

### NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

C. W.	'PHONE
3550 14,050	3875 14,225
7100 21,050	7250 21,400
28,100	29,640

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: c.w. — 3535, 7050, 14,060; phone — 3765, 14,160, 28,250 kc.

### NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc.      7140 kc.

We also have a report from K6CUK, Radio Officer for El Segundo, Calif., to the effect that the El Segundo RACES was alerted to provide assistance to Torrance, whose RACES group was not yet fully organized. A two and ten meter fixed station was established in Torrance and mobile units dispatched to local danger points to report on highway conditions. Operators were on duty over ten hours without relief. One operation consisted of helping police apprehend youths who removed roadblock signs and waved motorists into deep water, then offered to tow them out with a wrecker for exorbitant fees. K6CUK reports the following participants in this operation: W6s ACL CDK FNE HLF KLZ PXX QOH SOH WNZ; K6s AOK BJH CUK ESS EUV HUV KSD; KN6s IJP JTQ KBF.

During Hallowe'en in 1955, many AREC and RACES groups assisted local police in keeping down incidents of vandalism by teen-aged gangs. We have three reports on such activities:

The Hamden, Conn., AREC used the activity as its annual SET exercise. The boys used five or six mobiles each of four nights, October 27, 28, 29 and 31, patrolling the town from 1900 to 2200 with an auxiliary policeman in each car. During the total operation, EC W1NFG reports that they handled 32 requests for police assistance, reported a fire and a wreck and apprehended four teen-aged drivers. W1NFG estimates that the potentially destructive activities of fifty gangs of kids were disrupted by the patrols. The setup was a 2-meter rig at police headquarters relating to W1NFG, from whence the mobiles were dispatched. Each mobile received gasoline for the operation, and W1NFG has a nice thank-you letter from the police chief.

In Whatcom County, Wash., members of the Mt. Baker Radio Club assisted Washington State Patrol on Hallowe'en. Members of the club met at police headquarters and were dispatched from there. Members who didn't have mobiles helped with net control, relay, or acted as observers. Since they were not deputized, they had the function of spotting offenders and keeping tabs on them until police arrived. Twenty-five amateurs participated, including the following: W7a BLP FOK ILR JSC JWC KCB KVA LZZ MBY NSI OUK QGP SJL TIZ VOY VCB VRD VES VRL WLP WOR WOQ WOT WOM YAX. Thanks to W7VCB for this report.

In Cedar Rapids, Iowa, EC W0HSV and W0DGF arranged for a mobile net on 29.6 Mc. to operate Hallowe'en night. Later, when the chief of police requested assistance for Sunday night preceding Hallowe'en as well, W0DJK organized a mobile net on 3915 kc. W0GQ set up as NCS, with W0NSN as alternate NCS across town, and W0KRD and W0WKW as additional alternates. Contact was maintained with police headquarters on six meters, with W0LBK operating at control and K0ADM downtown. Nine mobile units reported in, with two or three more on standby basis. They were assigned patrol areas and a police officer. On Hallowe'en night the operation was repeated, this time with mobiles on ten meters. Eight mobiles reported this night. The procedure was to dispatch cars to every scene of would-be vandalism reported. If the officer in the car felt additional help was needed, it would be so indicated to W0GQ, who relayed the information to headquarters on the six-meter link. In most cases, however, this proved not to be necessary. A total of 25 amateurs took part, including the following not already mentioned: W0a AJA BFY BTY CPR CTQ FBH GIM GM KCL PCQ QLU UCU UWF WQQ YAM K0AZI.

December SEC reports totaled 17, representing 5750 AREC members, winding up our 1955 season. Reports for December were received from the SECs of the following sections (new ones in italics): Minn., Wash., Western N. Y., NYC-LI, E. Fla., Ala., San Joaquin Valley, Wis., Ontario, Los Angeles, Montana, Ore., So. Texas, Santa Barbara, Missouri, *Indiana and Maryland-Delaware-D. C.* This makes 33 sections heard from in 1955, two more than in 1954, and 189 total reports received, 11 more than in 1954. So we continue to show slight progress from year to year.

These sections submitted *twelve* SEC reports (100%) in 1955: Western N. Y., NYC-LI, Eastern Fla., Wisconsin. Note that all four of these were also 100% in 1954, and three of them 100% in 1953 — an achievement worth noting. Submitting *eleven* SEC reports: Minn., Wash., San Joaquin Valley. *Ten*: Ala. *Nine*: Oregon. *Eight*: Tenn., Los A. *Seven*: Colorado, So. Dak., Mont. *Six*: Georgia, Ontario. *Four*: Maritimes, W. Fla., Ky., Santa Barbara. *Three*: East Bay, Louisiana, Nebr., So. Texas, Santa Clara Valley. *Two*: Vermont, No. Texas, E. Pa., Mo. *One*: Maine, W. Va., Ind., Md.-Del.-D. C.

If your section is not listed above, it means your SEC submitted no reports for 1955.

### RACES News

Back in early 1951, there was formed, at the behest of the New York State Civil Defense Commission under the ramrodding of one Vincent T. Kenney, W2BGO, N. Y. State Radio Officer, an organization called the Northeastern States Civil Defense Amateur Radio Alliance (NSCDARA). ARRL was asked to send a representative to the initial meeting, and we have been participating in active observer (but non-voting) capacity ever since.

The "Alliance" was formed for the purpose of fostering and enhancing the position of the amateur in civil defense, specifically for bringing out the RACES rules and assisting in implementing RACES for the amateur service in close liaison with civil defense.

At first covering ten northeastern states, the Alliance was later expanded to cover fourteen states. More recently, the NSCDARA as such was dissolved and a new nationwide organization formed, called the United States Civil Defense Amateur Radio Alliance (USCDARA). Each state has been urged to send a representative to an annual meeting (preferably the state radio officer), in which will also be included representatives from FCC, FCDA, MARS and

ARRL. The 1956 annual meeting, the first for USCDARA, has been scheduled for April 5-6 in Battle Creek, Mich.

Additionally, states in the various FCDA Regions are forming Regional Civil Defense Amateur Radio Alliances meeting twice yearly with representation similar to that of the National Alliance.

In past years, NSCDARA has come forward with a practical frequency allocation plan for RACES, a standard operating procedure manual, and has submitted a number of recommendations regarding RACES to FCDA and FCC. It is expected that USCDARA will continue this type of activity. None of these organizations is ARRL sponsored, but any earnest desire on the part of amateurs to organize to serve civil defense as amateurs in RACES deserves and should receive your League's support. So far, we can say that the CDARA movement appears to be an earnest effort to foster better relations and coordination between amateur radio and civil defense.

Idaho had a state CD Alert on January 16th. Twenty-five counties were contacted on three bands: 160 and 75 phone and 80 c.w., all linked to state CD Headquarters on two meters. Established net frequencies were used. The test started at 1830 MST and lasted until 2100. SCM W1IWU reports that skip was bothersome on 75 and 80, but did not affect 160. The test was a success, but need was evidenced for emergency power facilities at control points.

A new amateur at FCDA Headquarters in Battle Creek is W9ABS, now working with W8LBM and W8DUA (July, '55 QST, p. 71) in the Warning and Communications Office, under which RACES activities are handled. We understand that Bob is a DX man and a former high speed c.w. operator for Illinois State Police. In any event, another active amateur in the FCDA office handling RACES matters can have only a good effect on the official atmosphere.

### JANUARY CD PARTIES

Listed below are the highest claimed scores for the January CD Parties, open to ARRL appointees and officials. Figures after each call indicate score, number of contacts, and number of ARRL sections worked. Final and complete results will appear in the April CD Bulletin.

C.W.	
W6BIP	191,232-339-82
W1EOB	170,100-533-63
W1BFT	169,785-532-63
K2QQO	160,580-511-62
W4YZC	160,255-470-83
W1AW	146,320-465-82
K6GUZ	146,740-260-61
W6YHM	139,122-262-69
W3VOS	137,555-446-61
W1TYQ	133,200-437-60
K6ORT	129,978-214-58
W1RAN/4	124,440-402-61
W4PNK	122,090-421-68
K6BWD	120,698-229-58
W6CHV	111,864-204-59
W3JNQ	111,100-399-65
W7GHH	110,544-215-56
W6UED	110,081-228-53
W6UTV	101,970-206-55
W4KFC	101,210-342-58
W9SDK	100,050-338-58
W2FEB	99,465-349-57
W2ZYW	98,930-352-54
K2GHS	93,575-333-55
K2DSV	91,800-354-51
W1BIE	89,375-318-55
W2DMJ	88,850-315-55
W8NOH	86,400-315-64
W1A	86,330-468-58
W4NE	85,800-288-10
W8YDR	84,560-302-56
W6EEB	79,750-285-55
K2AFQ	79,430-332-47
K2CPR	79,040-297-53
W4WJQ	78,840-292-54
W4LK	77,140-268-58
W8UYR	75,900-276-55
W9KLD	75,350-270-55
W6VA	74,970-160-51
W2AEE	74,760-267-56
W1ZDP	72,165-276-51
W7UQY	70,600-163-50
W4WHK	69,360-272-51
W1PZ	68,900-255-53
W8SQ	66,983-148-49
K2EDH	66,555-257-51
K6OIZ	65,790-140-51
K6CSW	63,865-241-53
W0VBQ	62,010-229-53
W3ZAL	61,880-238-52
W6IA	61,360-201-59
VE2YU	60,685-225-53
W9NH	58,565-215-53
W0RLX	58,235-215-33
W9DUX	57,630-220-51
W2DRV	56,500-219-50
W4WJW	56,445-207-63
W4BDU	55,275-201-55
W3SLJ	54,800-220-48
VE6NX	54,136-128-48
VE2DR	53,815-223-47
W8DAE	53,345-223-47
W1WLF	52,890-251-41
W1HUM	52,675-208-49
W0IUB	52,170-222-47
W8TZO	51,700-213-47

### PHONE

W1FZ	30,525-180-33
W2VCZ	28,000-157-35
K2GHS	25,280-152-32
W8NOH	22,940-119-37
W3NF	21,390-131-31
W3EAN	18,330-88-26
W1JYH	15,520-111-28
W8NSS	13,920-82-32
W8NYH	13,600-100-27
W4VY	12,400-73-41
K6BWD	10,632-47-24
W4LK	10,465-61-23
W4WQT	9,585-68-27
W1GIX	9,230-71-26
W1ZDF	9,000-83-20
W1MRP	8,970-78-23
K2DSW	7,905-87-17
W0ALW	7,155-50-27
W2BG	7,150-55-25
VE2CP	6,930-59-21
W0GNS	6,630-46-24
W2EBN	6,175-61-19
W4JUT	6,120-61-18
W2VDT	5,985-52-21
W0BLZ	5,880-46-26
W4D	5,850-61-18
W1EOB	5,780-61-17
W8PXB	5,760-52-26
W1BHX	5,400-47-20
W1BKQ	5,145-42-21
W3ADE	5,060-37-23
W1AW	5,015-52-17

<sup>1</sup> W1WPR, opr. <sup>2</sup> Multiple operator. <sup>3</sup> W1QIS, opr.



## MEET THE SCMs

Robert E. Fields, W4SBI, Kentucky SCM, became interested in amateur radio in 1948 and his first license was issued to him under date of October 20, 1950.

Formerly holding Official Bulletin Station and Emergency Coördinator appointments, SCM Fields now is an Official Relay Station. He is active in MARS and won first prize in the 2nd Army Area Contest. For his noteworthy emergency work in several tornadoes, forest fires, and snow storms, he has been awarded Public Service certificates.

While the shack is located on the second floor of the house, there also is an outside shack for supplies and equipment. W4SBI's transmitting tube line-up is a BC-457 into an 811 driving p.p. T-55s, 400 watts. A BC-669 transmitter and



receiver run about 80 watts and an HT-9 runs 120 watts. Other receivers are an HQ-129X and an NC-57. For antennas a 120-ft. doublet and a 142-ft. doublet fed with RG-59U coax are used. A 600-watt gas-driven generator and a 1000-watt gas-driven generator for either the HT-9 or the BC-669 are available for emergency work. W4SBI's favorite bands are 75 and 80 meters.

Mr. Fields is one of two Ruling Elders of the South Williamson Presbyterian Church and is a member of the Men's Club of that church. He served in the U. S. Marine Corps during World War II and is at present a member of the American Legion and the USNR. A coal miner, his employer is the Pond Creek Colliery of the Norfolk and Western Railroad.

## CURRENT FILM ADDITIONS

Our Training Aids section announces the addition of two 16 mm. films. *Vacuum Tubes*, F-31, explains entirely with animated drawings the operation of a vacuum tube and describes its functions as oscillator, detector, and amplifier. The film is sound, runs about 15 minutes and is in black and white. The Tacoma Field Day film entitled *Field Day at DK*, F-32, made by the members of the Tacoma Amateur Radio Club, W7DK, depicts in excellent sequence the set-up, operation and the closing of a typical Field Day event. It is a color silent film and runs approximately 20 minutes.

The above films are available to any ARRL-affiliated club. It is requested that a month's notification be given prior to a scheduled showing.

## TRAFFIC TOPICS

Time was when traffic handling without complete break-in was considered pretty "liddy" traffic handling. Nowadays, it seems to be the rule rather than the exception. We want to point out that break-in is a great time saver and increases the accuracy of traffic handled because the receiving operator interrupts the sending operator as soon as something is missed. He doesn't have to go back and go through the procedure of asking for fills.

Personally, we run our receiver wide open while transmitting, and start message transmissions with QSK (look it up, if you don't know what it means). Even then, we seldom are "broken" by the receiving operator, but usually there are "fills" to be given after the message.

How come so little break-in on nets these days? Is it because we're getting old, or lazy (or both?), or because it's too much trouble to set up your operating position to use it? Sure, if you key an oscillator, you have to sacrifice something in signal quality. If you operate your receiver wide open during transmission, you may hurt your ears, or in extreme cases burn out the receiver antenna coil. To construct a complicated muting system is too much trouble. So we drift along. . . .

We're just guessing, in the above, but it does seem to be a fact that an awful lot of good traffic stations are *not* using a complete break-in these days, and that procedures as a result are becoming long and cumbersome. Why not acknowledge a whole string of messages with a single "dit" on c.w., like we used to? Why bother to get a "QSL" after each message, when there is more than one? Why not "break" the sending station every time you miss something, and get it correct right then and there?

Here are some procedures that some of you never heard of, others may have forgotten. They will help shorten traffic procedures if you use them:

(1) If you are equipped for it (and if you're not, *get* equipped), operate QSK. Then, while you're sending traffic, listen for breaks in between characters and words. If you're not going to do this, start the message with NBK, so the receiving operator won't waste his time and temper trying to break you. Get into the habit of making QSK or NBK part of the preamble (before the NR) of each message you send.

(2) If you're operating complete BK-in procedure, don't waste time between messages with a lot of frilly QSLing. If you insist on getting an acknowledgment for each message, a single "dit" or "dah" will do it; otherwise, send them one right after another, until you're clear. Receiving operator should break you if he misses anything.

(3) When breaking a sending station, just give him the *first letter* of the word you missed, or the first letter of the word you want him to start from.

(4) Copy *words*, not letters, in plain language messages. If you miss part of a word, wait until that word is completed before you break; it might be obvious. However, if it isn't obvious, don't guess.

(5) If a station breaks you and sends the complete last word he received correctly, don't waste time repeating that word. Send AA (all after) and continue the message from there.

(6) If you're using BK-in, there's no sense in repeating even difficult words or groups. Send them carefully and keep going. If your receiving operator misses, he'll break you. On the other hand, if you send a word *wrong* (or louse it up in *any* way), *do* repeat it, first indicating an error. If you do start repeating and the receiving operator breaks you, it means "quit fooling around and get the traffic cleared."

(7) Learn to copy behind. You never will if you don't practice doing it. But once you have learned, your receiving speed goes up at an incredible rate. I'm always favorably impressed by an operator who breaks me for three words back; unfavorably if he breaks me for the word I'm sending. The former seldom breaks, the latter frequently.

(8) Don't try to show how hot an operator you are by sending fast. Just send *steadily*, with plenty of spacing between words. The faster you go, the more mistakes you'll make and the more times you'll get "broke" by the receiving operator. Thirty w.p.m. is plenty fast enough even in the best nets.

The above hints are for c.w. traffic only, of course. There is no such thing as "break-in" on regular a.m. phone unless you use voice-controlled carrier — not a bad caper, by the way — or "duplex" operation. Or, of course (of *course!*), single sideband.

Transcontinental Phone Net makes the following report for January: First Call Area, 540 message counts by 17 stations; Second Call Area, 632 messages by 9 stations; Ninth and Tenth Call Areas, 505 message counts.

W9TT reports that W6ELQ has taken over the management of UTL West from W6DDE.

*National Traffic System.* We'd like to reiterate that in NTS there is room for all grades of operators. It's not a net for high-speed c.w. operators only. However, it *is* a system, and operators must fit into it at a level commensurate with their ability, experience and time availability — and in some cases, out of pure bad luck, there may be no net avail-



Here's W0CPI, Edison Award Citation Winner, at his business-like operating position. Lou is midwest anchor man on the Transcontinental Phone Net and makes BPL every month. His transmitting equipment consists of a Collins 310B exciter driving separate finals on 20 and 75 meters to inputs of 750 watts and a kilowatt respectively.

able for you to work into. If you're a phone operator, there may be no NTS section phone net; if a Novice or a slow speed operator, there may be no slow speed net for you to work into. If you can operate only in the daytime, quite likely there is no daytime NTS net into which you can work. Where nets exist, however, all operators are eligible and welcome to participate. And if nets don't exist, they can always be organized for an NTS purpose; see your RM or PAM to get the ball a-rolling.

January reports:

Net	Ses- sions	Traffic	Rate	Aver- age	Repre- sentation (%)
EAN	23	862	—	37.5	94.9
CAN	22	748	1.03	34	100
PAN	29	1104	0.43	38	—
1RN	25 <sup>1</sup>	342	0.55	13.6	85.1
2RN	26	238	0.40	9.2	100
3RN	43	248	0.63	5.8	86
RN5	40	404	0.51	10.1	72.2
RN6	58 <sup>2</sup>	385	0.32	6.4	52.3
RN7	43	266	—	6.1	—
8RN	51	190	—	3.4	82.4
9RN	30	741	0.88	24.7	98.3
TEN	62	1349	—	21.8	77.8
TRN	39	106	0.29	2.6	82.9
Sections <sup>3</sup>	654	4401	—	—	—
TCC Eastern		409	—	—	—
TCC Central		1281	—	—	—
TCC Pacific		586	—	—	—

Summary	1145	13660	CAN	9.9	—
Record	1145	13660	1.08	12.1	100

<sup>1</sup> Reported out of 26 sessions held.

<sup>2</sup> Reported out of 62 sessions held.

<sup>3</sup> Section nets reporting: IFN (Ind.); GSN (Ga.); KYN (Ky.); Iowa Phone & TLCN (Iowa); NYS (N. Y.); S. Dak 75 Meter Emerg. Phone; CN (Conn.); NTX (N. Tex.); QKS, QKS SS & QKN (Kans.); WVN (W. Va.); MSN (Minn.); AENB, AENP & AENT (Ala.); Tenn. 160 C.W. & Tenn. C.W.; N. Dak. Phone & C.W.; Colo. Weather & HNN (Colo.); Minn. Fone.

Late reports:					
TEN (Dec.)	70	2577	—	36.8	78.8

Once again, records have fallen as NTS rolls onward to greater accomplishments. Both in sessions reported and total traffic handled, we have exceeded all other January records. Only in rate and average per session did we fall slightly below the 1954 figures.

W9DO indicates need for a Saturday CAN session and wants volunteers for NCS duty. All but E. Mass., N. H. and Vermont made 100% attendance on 1RN during January. W2ZRC indicates 2RN certificates sent to W2s AEE, HDW, MLW and VDT; all worked hard to get it. For the second consecutive month, all three sections were represented on every 2RN session. W4OGG is continuing as RN5 manager until a successor is appointed; net certificates have been awarded to W4HIIH, K5AOV, W5FNV and W5ZWR. Doc, W6ZRJ, says "things going fine" on RN6; they're conducting two sessions daily, including Sunday. W4KKW also reports 100% attendance on Sunday sessions, making 9RN a daily operation with one session each day. First report from W0KJZ as TEN Manager, and it's a good 'un. VE3GI wants to relinquish TRN managementship so that others can have a chance at it; he reports VE1 attendance on the increase, and VE3AJR representing the phone net single handed.

New stations on Eastern Area TCC include W2AEE, W1AYC and K2GHS; the latter is holding up the Saturday schedule. W9DO is handling much of the Station C traffic from CAN to EAN. TCC Central Director W0SCA reports all TCC traffic to, from and through his area being handled with efficiency and dispatch. W0KQD submits a complete and detailed report for TCC Pacific. Only three TCC schedules were unreported out of 97 officially filled. All schedules are filled, Monday thru Saturday, although some of them have no Eastern Area counterparts. Congratulations to Irene for a very impressive job as TCC Director, Pacific Area.

## BRASS POUNDERS LEAGUE

Winners of BPL Certificates for January traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CUL	132	896	701	89	1818
W0BDR	100	739	696	5	1540
W9DO	11	665	137	539	1352
W0SCA	19	651	643	2	1315
W0PZO	3	572	555	8	1138
W0KLEB	44	485	411	91	1031
W5UBW	15	476	368	460	987
W7PGY	25	476	408	68	977
W7BA	18	465	440	24	947
W2KPV	9	458	399	45	911
W0CPI	7	441	404	37	889
W6GQY	396	58	395	30	879
W9NZZ	254	312	0	312	378
W7FRU	7	365	250	88	710
W3YYC	93	296	229	44	662
W7VAZ	23	291	257	34	605
W8ELW	30	263	247	10	540
W0GAR	2	267	268	1	538
W4PJU	11	253	230	23	517
W3WV	20	275	163	57	515
W9TT	4	275	232	0	511

Late Reports:

W6GQA (Dec.)	353	236	826	135	2050
K3WBJ (Dec.)	175	327	430	72	1004
W8AGZ (Dec.)	12	456	412	44	924
W3CVB (Dec.)	408	161	139	22	730
W6LYG (Dec.)	11	262	96	166	535

MORE-THAN-ONE-OPERATOR STATIONS

Call	Orig.	Recd.	Rel.	Del.	Total
W6IAB	30	945	860	85	1920
K8WAY	328	230	519	27	1102
K0WBB	74	329	268	41	712
K2AIR	57	340	274	23	694
W4OEZ	0	268	268	0	536
K6FCY	18	352	225	27	522

Late Report:

W6IAB (Dec.)	57	1708	1320	388	3473
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BPL for 100 or more originations-plus deliveries:

K2DEM	168	W9SVZ	120	Late Report:	
W0NTX	161	W1DWA	116	W4ELS (Dec.)	323
VE1FQ	146	W7AHV	111	W8MZN (Dec.)	131
		K4EYV	100		

MORE-THAN-ONE-OPERATOR STATIONS

W2AEE	147	K4WBF	112
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BPL medallions (see Aug. 1954 QST, p. 64) have been awarded to the following amateurs since last month's listing: W1ARR, W3YYC, W1WOG, W9UQP.



Gathered in Sacramento for a disaster communications meeting at Red Cross headquarters are (sitting, l. to r.) W6JWF (Trustee for W6CXO), Red Cross Officials Mildred Schjeldahl and Yeshiko Mascida, San Francisco EC W6NL, ARC Terminal Supervisor Leonard Benson, and (standing, l. to r.) San Francisco Section SGM W6GGC and Asst. EC W6ZLQ.

### CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on April 13th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,010, 52,000 and 145,600 kc. The next qualifying run from W60WP only will be transmitted on April 6th at 2100 PST on 3590 and 7128 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 six speeds transmitted, 10 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 will be made from W1AW each evening at 2130 EST through April 28th; after that date they will be at 2130 EDST. Approximately 10 minutes' practice is given at each speed. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of QST text sometimes is reversed. To get sending practice, hook up your own key and buzzer and attempt to send in unison with W1AW.

Date Subject of Practice Text from February QST  
 Apr. 2nd: A Complete 8146 Economy Transmitter, p. 11  
 Apr. 5th: An Accessible Antenna Tower, p. 22  
 Apr. 9th: A Simple Code-Practice Oscillator, p. 23  
 Apr. 11th: "Echoes", . . . p. 26  
 Apr. 17th: The Ash-Tray Mobile, p. 28  
 Apr. 25th: Paradox: S.S.B. Splatter, . . . p. 43  
 Apr. 27th: The World Above 50 Mc., p. 53

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

Apr. 6th: CP Qualifying Run — W60WP  
 Apr. 13th: CP Qualifying Run — W1AW  
 Apr. 14th-15th: CD QSO Party (c.w.)  
 Apr. 21st-22nd: CD QSO Party (phone)  
 May 5th: CP Qualifying Run — W60WP  
 May 14th: CP Qualifying Run — W1AW  
 June 1st: CP Qualifying Run — W60WP  
 June 9th-10th: V.H.F. QSO Party  
 June 12th: CP Qualifying Run — W1AW  
 June 23rd-24th: ARRL Field Day  
 July 7th: CP Qualifying Run — W60WP  
 July 18th: CP Qualifying Run — W1AW  
 July 21st-22nd: CD QSO Party (c.w.)  
 July 28th-29th: CD QSO Party (phone)

### 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 Section. 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 addresses 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 the 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
Yukon * . . . . .	Apr. 16, 1956	W. R. Williamson	Mar. 17, 1949
West Indies . . . . .	Apr. 16, 1956	William Werner	Aug. 15, 1952
Eastern Mass. . . . .	Apr. 16, 1956	Frank L. Baker, jr.	June 15, 1956
Ontario * . . . . .	Apr. 16, 1956	G. Eric Farquhar	June 15, 1956
Idaho . . . . .	Apr. 16, 1956	Alan K. Ross	June 17, 1956
Northern New Jersey . . . . .	May 15, 1956	Mloyd H. Manamon	July 25, 1956
Kentucky . . . . .	June 15, 1956	Robert E. Fields	Aug. 16, 1956
Nevada . . . . .	June 15, 1956	Ray T. Warner	Aug. 16, 1956
Montana . . . . .	June 15, 1956	Leslie E. Crouter	Sept. 1, 1956

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

### ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

Western Florida	Edward J. Collins, W4MS/W4RE	Dec. 15, 1955
Quebec . . . . .	Gordon A. Lynn, VE2GL	Dec. 15, 1955
Virginia . . . . .	John Carl Morgan, W4KX	Feb. 11, 1956

In the South Carolina Section of the Roanoke Division, Mr. Bryson L. McGraw, W4HMG, and Mr. John R. Warner, W4FFH, were nominated. Mr. McGraw received 98 votes and Mr. Warner received 67 votes. Mr. McGraw's term of office began Dec. 30, 1955.

In the Eastern New York Section of the Hudson Division, Mr. George W. Tracy, W2EFU, and Mr. Frank J. Pacier, W2MHE, were nominated. Mr. Tracy received 173 votes and Mr. Pacier received 128 votes. Mr. Tracy's term of office began Jan. 27, 1956.

• 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, Clarence Snyder, W3PYF—SEC: NNT. PAM: TEJ. RM: AXA. Nets: 3850 kc. and 3910. First, I would like to congratulate the two E. Pa. appointees on the Edison Award special citations. MAC is OPS and YAZ is OBS and EC for Monroe County. New officers of the Northeast Radio Club are HTR, pres.; CLO, vice-pres.; DOB, sec. secy.; KIW, treas.; TYX, FQT, DYL, VOC, and HYJ, board of directors. The club meets the 1st and 3rd Tues. at Fox Chase Public School, Phila. The Lancaster Radio Transmitting Society is sponsoring a transmitter-building contest for Novices, and will hold its annual banquet on Apr. 14th. YDX now has a third operator; 4CTU has joined LJ and SMC at the Philco Techrep station. The Red Lion Hilltop Transmitting Assn. still is offering a box of cigars to any amateur working five Red Lion stations. ARY will head the Field Day committee for the Harrisburg Radio AC. KKK has been appointed Cumberland Co. Asst. C.D. Coordinator. A York Amateur Radio Council has been formed for York County with the York Amateur Radio Club, Keystone V.H.F. Club; PenMar Amateur RC and the EC Hilltop Transmitting Assn. Congrats to this group and QOL in their undertaking to benefit civil defense. The West Philadelphia Radio Assn. is working on 420-Mc. gear as a club project. TNO now is on s.s.b. CNO has a new DX-100 and a 75A-3. DBM reports on the formation of the Southern Chester County Amateur RC. Code and theory classes are being given. Active in forming the group were WBD, RPC, WN3DBL, and DBN. TSY now is residing in Red Lion. Fire destroyed the home of CBN, proxy of the Delaware-Lehigh ARC. DHJ is a new OO. OGD is now an OPS. NF is now operating from his Raubsville QTH and is ORS. The Phil-Mont Mobile Radio Club officers for 1956, are QZO, pres.; SAI, vice-pres.; QQH, secy.; and DSG, treas. PXY continues to edit the fine paper issued monthly by the Phil-Mont group. New officers of the Carbon ARC are UEU, pres.; OWP, vice-pres.; AIW, secy.-treas.; and AMC, act. mgr. EU has a new VFO and is looking forward to 20-meter DX. Again let me remind appointees that unless reports are forthcoming indicating activity in the appointed field, appointments will be cancelled. Traffic: W3CUL 1818, YDX 228, OGD 181, OK 157, BFF 121, TEJ 105, YAZ 102, DHJ 99, YVX 56, AXA 37, SMC 34, PYF 32, NOK 30, BNR 26, EML 22, NF 19, ZRQ 17, PXY 16, GIY 15, ZBW 15, OML 4, ADE 2, AMC 2, CNO 1, NQB 1.

**MARYLAND-DELAWARE-DISTRICT OF COLUMBIA**—SCM, John W. Gore, W3PRL—KTR has returned on a 30-day tour in Honolulu. While there he maintained a 3-day-a-week schedule with WV on 20-meter e.w. from KH6UL and KH6BCA. While riding with KH6BCA mobile one day they called CQ from the BCA 200-watt mobile unit and VK2LX Sidney, Australia, answered and a solid QSO for 45 minutes was maintained. While on the island KH6BCA, ex-W3NZF, from Washington, took him to KH6MOP, the Leeward Oahu Amateur Radio Club, which is located in the old Recreation Hall at Manakuli. QBI is the new trustee for PZA, the Washington Radio Club's station at the D. C. Chapter House, American Red Cross. New Novices in the D. C. Area are WN3EUH and WN3EUM. ECP reports that a recent D. C. Area TVI complaint turned out to be set up by airplane flutter caused by one certain flight plus a defective horizontal synch circuit in the TV set. HGY and MPT are mobile on 6 meters. The 6-meter gang in the Washington Area is slowly growing, and the Andrews Electronic Association has a regular net active each Tue. evening on 6 meters. @PRL, from South Dakota, addressed the Washington Radio Club Jan. 20th, and his talk made the club "drool" with his account of "Amateur Radio, Dakota Style" where TVI is practically an unknown quantity. ZSR is now on 6 meters with a TBY-7 and a three-element beam. RV is operating on 6 meters with p.p. 6140s (120 watts input).

ZME has a new 125-watt VFO rig. PKC has taken up Pedigreed-Dachshund-raising as a hobby and has won several ribbons in recent Dog Shows. WV reports MDD is running smoothly. The Antietam Radio Association is conducting classes on Mon., Wed., Thurs. from 1900 to 2000 hours. As a club project 20 SWR units are being assembled. On Mar. 1st the Washington County Boy Scout Council held an exhibition at the Fountindale School in Hagerstown and the ARA accepted an invitation to install a complete ham station for demonstration purposes. OYX reports that the RACES plan for Washington County has been approved, with OYX as CDBO and OXL and RAH as assistants. BUD finally worked Utah, which qualifies him for WAS. The AERO Amateur Radio Club of Baltimore meets at 1215 Wilson Point Road each Wed. at 8 p.m. The group has 2 transmitters on the air, 1 on 75 and 1 on 2 meters. Action is being taken to affiliate with ARRL. EEB and AHW have returned from Jamaica and an FB trip. ZAL has his 1 kw. working on 20 and 40 meters. To date he has 142 countries worked and 73 confirmed. PKC, SEC for MDD, has compiled a complete roster of all members of the AREC in the District, including ECs and Asst. FCs as well as Full and Supporting members, which has been forwarded to all ECs. CCB has completed a 75-meter mobile installation and has joined the AREC. YVC has been appointed manager of the Atlantic to Pacific Net, which operates at 1700 EST Mon. through Sat. on 7030 kc. and 2130 EST Mon. through Sat. on 7085 kc. LMC presented a demonstration and discussion on "Geiger Counters" at the CARG Jan. 23rd. The ARA elected as officers for the current year, YRK, pres.; EPV, vice-pres.; NHR, secy.-treas.; OXL, act. mgr.; VAM, net comm. mgr. Christmas meant something to the following: EHA, a new Heath VFO; YRK, a new SX-98; EPV, a new SX-98; VAM, a new SX-100; and OXL, a new mike for the mobile unit. 4CC, of the FCC, a member of the Washington Radio Club, gave a talk to that group on FCC Monitoring Service which proved very interesting. Traffic: (Jan.) W3YYC 662, WV 515, UE 253, K3WBJ 236, W3BUD 99, RV 89, PKC 71, UCR 45, COK 39, SPL 26, ZME 14, ECP 12, JZY 12, NNX 8, OYX 7, ZSR 6, HKS 4, ULI 4 (Dec.) K3WBJ 1004, W3CWE 730, COK 151, BUD 62, ECP 58, CQS 28, MSU 28, JZY 6, OYX 6, FY 4, HKS 4.

**SOUTHERN NEW JERSEY**—SCM, Herbert C. Brooks, K2BG—SEC: ZVW. PAM: ZI. VX has been appointed OO. K2JNJ reports the forming of the Garden State Phone Net, on 7240 kc. at 0900. K2HZR has received the WAS award. A new traffic operator this month is K2OOK, son of RG. UAE expects to be in VE3-Land for two months. Don is taking the 2-meter rig along and will work mobile and fixed. ZVW has QRP the rig at his Phillipsburg QTH and has moved the big rig to the 3NF location. Ed is NCS Wed. nights on EAN. KTR is assembling a new kit transmitter. BAY has a new receiver which he is using with a 2- and a 6-meter converter. YRW, Delaware Valley Traffic Net manager, reports a big increase in traffic handled by the net. Look for the net on 146 Mc. at 1930 EST. K2CPR has a new receiver. Jack was top scorer for S.N.J. in the recent WVE Contest. He also made 79,010 points in the January CD Party. Contact 3GHD for information regarding the WPRC certificate (Worked Frankford Radio Club). The 11th Annual Old-Timers Nite Roundup, sponsored by the DVRA, will be held Apr. 21st. Contact ZI for tickets. K2JGU is taking an active part in traffic-handling. K2EWR, one of our new traffic men, also is doing a fine job. The Tri-City Amateur Radio Club members have completed 12 mobile transmitters and are now building a like number of converters. EC RUX and his assistants are doing a fine job in Cumberland County coordinating their emergency equipment and operators. SUG is hoping to do the same in Hunterdon County. Your help is solicited in those counties where the AREC is not active, so that an EC can be appointed who will organize and coordinate your emergency personnel and equipment. Camden County (Area 11) and Burlington County (Area 10) continue to hold drills each Fri. night. Traffic: (Jan.) W2RG 121, K2BHQ 92, W2HDW 82, YRW 65, K2HZR 48, BWR 38, W2ZI 23, L2JGU 21, LFN 19, OOK 18, W2ZVV 14, K2CPR 8. (Dec.) W2YRW 266, K2EWR 37.

**WESTERN NEW YORK**—SCM, Edward G. Graf, W2JYV—Asst. SCM: Jeanne Walker, 2BTB. SEC: UTH/FRL. RMs: RUF and ZRC. PAMs: TEP and NAL. NYS C.W. meets on 3615 kc. at 6 p.m.; ESS on 3590 kc. at 6 p.m.; NYS Phone on 3925 kc. at 6 p.m.; TAR on 3720 kc. at 4 p.m.; NYS C.D. on 3509.5 and 3993 kc. at 9 a.m. Sun.; TCPN 2nd call area on 3970 kc. at 7 p.m.; SRPN on 3970 kc. at 10 a.m.; ISN on 3980 kc. at 3 p.m. JR has a B&W and a 75A-4. TPN is checking in TCPN with a

(Continued on page 70)

## Meet Your Neighbor on VHF

ONCE UPON A TIME amateur radio was a comparatively uncomplicated hobby. If you owned an amateur station you could be reasonably sure of communicating with any other amateur in your vicinity assuming you both were fairly active. Those days are gone forever. With the present multiplicity of bands and modes of transmission, it is now entirely possible to live within a few blocks of a fellow ham and not even know of his existence.

WE ALL HAVE our favorite bands and types of operation. Some of us work CW exclusively while others prefer phone. Still others spend all of their time handling traffic, and others pursue DX or take part in contests. Each of these activities is, of course, worthwhile and rewarding. But frequently we specialize to such an extent that we miss many enjoyable operating hours and many friendships which could be ours if we would only branch out a bit.

THIS IS PARTICULARLY true when we ignore the higher bands above 50 megacycles. While it is common knowledge that amazing distances can be covered on these bands with the help of high power, super sensitive receivers and big arrays, too often we overlook the fact there is no better place for *local* operating — to get acquainted with your neighbor — than on the VHF bands, 50 megacycles, 144 megacycles, or higher.

YOU DON'T NEED high power and an elaborate antenna to enjoy local rag-chewing on these frequencies. Even with one watt and an indoor antenna, 20 mile ranges are not uncommon. An efficient rig for local operation takes very little space and need not interfere in any way with the regular station equipment. The small investment in time and money pays big dividends in increased operating enjoyment; ask anyone who uses these bands regularly.

THE ELEMENTS which have been missing up to now are efficient and moderately priced receivers for VHF work that are completely self-contained, not converters. Such receivers will enable many of us to complete our station equipment with gear for local contacts on VHF thereby restoring a fraternal feeling to radio which in recent years has been neglected. Such a receiver also will increase our value to the community in time of national emergency.

HALLICRAFTERS, recognizing the need for this type unit, has just introduced the new S-102 receiver for 144 to 148 mc., and the S-106 for 50 to 54 mc. These two new models are now at your jobber's. See them today — either one will increase your enjoyment of amateur radio immeasurably.

— Cy Read, W9AA

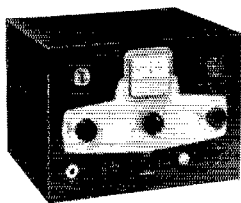
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During the past five years, novices all over the United States have been trying for this coveted award... and it took Frank Cuevas III, KN6JQJ, and a Viking "Adventurer" to finally make it. With 50 watts input, two simple dipole antennas, and two crystals, Skip (as Frank is known to everyone) worked: VQ4EO Africa; EI4J Europe; JA1AM Asia; CE3DZ South America; VE3ALJ North America, and VK4HR Australia. In addition, Skip has earned his WAS (Worked All States) and has worked 30 different countries with all contacts confirmed.

**"CUTS THROUGH  
TERRIFIC QRM...  
EASY TO BUILD  
AND OPERATE!"**



**VIKING "ADVENTURER" KIT**

Compact, completely self-contained 50 watt CW transmitter kit. Single knob bandswitching—effectively TVI suppressed. Covers 80 through 10 meters. Easy to assemble. Full output of self-contained power supply available from rear receptacle to power auxiliary equipment when transmitter is not operating. Complete with tubes, less crystals and key. Cat. No. 240-181-1..... Amateur Net \$54.95



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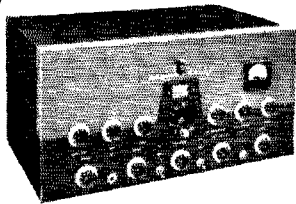
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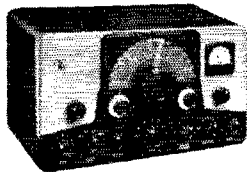
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## KNOWN THE WORLD OVER... VIKING AMATEUR EQUIPMENT



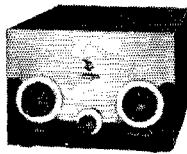
### VIKING II-CDC

For Civil Defense—180 watts CW input . . . 135 watts phone. Continuous coverage 1.7 to 30 mc—push-to-talk operation—modulation limiting. Completely assembled, wired and tested with tubes; less crystals, key and microphone.  
Cat. No. 240-102-16  
Amateur Net \$430.00



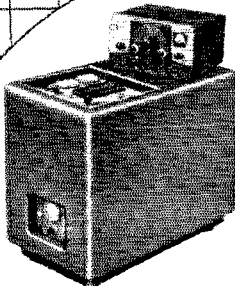
### VIKING "RANGER"

75 watts CW input . . . 65 watts phone. All amateur bands 10 thru 160 meters. TVI suppressed—built-in VFO or crystal control. Timed sequence (break-in) keying.  
Cat. No. 240-161-1 Viking "Ranger" Kit with tubes, less crystals, key and microphone. . . . Amateur Net \$214.50  
Cat No 240-161-2 Viking "Ranger" wired . . . . . Amateur Net \$293.00



### 250 WATT "MATCHBOX"

Performs all loading and switching functions required in medium power stations. Fully shielded—covers 3.5 to 30 mc. Built-in transmit/receive relay.  
Cat. No. 250-23 Viking 250 watt "Matchbox", assembled, wired and tested. . . . . Amateur Net \$49.85  
VIKING KILOWATT "MATCHBOX"  
Cat. No. 250-30 Amateur Net \$124.50



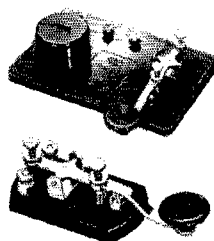
### VIKING KILOWATT AMPLIFIER

1000 watts AM, CW, or SSB. Boldly styled . . . contains every conceivable feature for safety, operating convenience, and peak performance.  
Cat. No. 240-1000 Wired, tested, complete with tubes.  
Amateur Net \$1595.00  
Cat. No. 251-101-1 Matching accessory desk top and three drawer pedestal. . . . . FOB Corry, Pa. \$123.50



### SWR BRIDGE

Provides accurate measurement of SWR for effective use of low pass filter and all antenna couplers.  
Cat. No. 250-24 . Amateur Net \$9.75



### TELEGRAPH KEYS

Johnson makes a complete line of semi-automatic, high speed, standard, heavy duty and practice keys as well as code practice sets, telegraph sounders, buzzers, and cords and wedges for semi-automatic keys. See your distributor for complete information.



### LOW PASS RF FILTER

Handles more than 1000 watts RF—provides 75 db or more attenuation above 54 mc.  
Cat. No. 250-20. Amateur Net \$13.50



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(Continued from page 66)

new NC-300. YLG has 500 watts in a very small box. OY vacationed in Florida and visited DYD. BNC visited ZOL. PGU has a vertical on 40 meters. ESS is doing a swell job. Stations are needed in Hudson Valley and Triple-Cities for better coverage. K2HVZ is new trustee for CXM. K2KTK is on 3551 kc. with code practice Mon. and Wed. at 2100. My sincere thanks to the ARAT for voting me a life membership in the club. This young club is an ARRL affiliate, has a TVI committee, sponsors code and theory classes, and participates in c.d. The KBT meeting was devoted to Beams, Flat-tops, and Verticals. As a pinch-hit speaker TKO explained his vertical and its operation at RAWNY. QLK is on s.s.b. K2GHN moved to N.Y.C. K2HRB skeds 3KWH on 6 meters. CPN moved to Massachusetts and now is IRCQ. RQF is a regular in TCPN. It is K2GWN, not K2GWA, who has an NC-300, a B&W, TR switch, a WRL75, VFO, and a pair of 4-65As in the final. Our apologies for the error. HXG is on 2 meters with 60 watts, a VFO, and a six-element beam. The RARA v.h.f. group met at the QTH of OWF. KEL has a BC-458 and an 813 final at 200 watts on 15-meter c.w. K2DXY made BPL in September and has a pair of ARC-5s on 80 and 40 meters. K2s KIR and KNV are ORS appointees. EZS received an ARRL citation for emergency work. The city cut down a tree holding up one end of COU's antenna. ISI is busy at commercial radio. It's a daughter at 3Z0V3. PPY spoke on c.d. at the ARAT meeting. OE has a 32W5. EUQ has an NC-300. QLI has an 813 on 20, 15, and 10 meters. K2AHH is going to college. PAN is on 75 meters and is working on RTTY. UTH has a new exciter for 2 and 6 meters and 811 modulator. K2EGB, EC for Ontario Co., now is located in Canandaigua. COB is in NYS Phone regularly. CYD is on 2 meters with 120 watts, sixteen-element beam, and telecraft converter. The Red Cross Net in Onondaga Co. continues to grow. CRD now has a kw. final. Ten ERCA members received 10-year service pins. ITR is on 21, 28, and 144 Mc. The Elmira ARA held a dinner meeting at which our Atlantic Division Director, 3YA, was guest speaker. New officers of the Sidney ARC are ZLT, pres.; CYV, vice-pres. and treas.; MSJ, secy. The Eastman Kodak Co. devoted a full page of publicity in its publication for some of the hams employed at EK. Rochester is sponsoring the W.N.Y. Hamfest May 19th at Dowd Post American Legion Route 31, just west of the city line. New officers of the Otsego ARC are TSX, pres.; SHZ, vice-pres.; VGM, secy.; QHL, treas. The club sponsors code and theory classes each Wed., QHL, and MTA instructing at the local high school. KN2LCU is the XYL of MTA. K2DLB has a 813 final. KN2QBL is working out on 80 meters. The Northern Chautauqua ARC, K2PCQ, conducts code classes every Tue. evening. EW Kline, FCC Eng., conducted a forum on interference problems at the RAGS meeting at which Director YA was present and announced BTB as one of his assistants. RAGS has 5 classes going on code, theory, and law. Recent graduates are KN2s REK, QVK, QXJ and QXL. PEN is now up and around. The Syracuse v.h.f. group supplied communications on 2 and 6 meters for the Dog Sled Races, at Oneida Lake. At the v.h.f. meeting WZR spoke on Cascade Front Ends. K2LSF received an Area Net certificate. BXP and K2DSR were 100 per cent in QNI and NYS C.W. Net for January. New officers of the NYS Phone Net are NJL, mgr.; IEP, secy.; EHL, asst. mgr. Traffic: (Jan.) W2RUF 401, ZRC 206, K2LSF 196, IYP 179; DYB 124, DJN 92, W2OE 70, CXM 63, EMW 44, K2GWN 41, DSR 35, KTK 35, HVT 34, KNV 25, W2COB 21, QHH 20, K2DXV 18, W2RQF 13, K2CUQ 12, W2DSS 10, BLO 2. (Dec.) K2DXV 18.

**WESTERN PENNSYLVANIA** — SCM, R. M. Heck, W3NCD — SEC: GEG, RMs: UHN, NRE, NUG, and JEG. PAMs: LXE and AER. Traffic net WPA meets Mon. through Fri. at 7 p.m. on 3585 kc. The Warren County Emergency Radio System elected YUL, pres.; ZFB, secy.-treas.; and OMK, dir. VVJ and UZB are sporting new 75A4s and 813 finals. YZR has a new 15-meter beam. YZS and ZFB operate successfully on 15-meters. OMK presented the WCERS with a Command receiver-transmitter. BOZ is working on RC garage door controls. From *Hamateur News*, of the Horseshoe Radio Club of Altoona: SEN is a new father, W3EMU has a new 65-watt Globe Scout and a 348L receiver, EGV is building a pair of 1625s with an 829 modulator. ZUF has 32 states worked along with some DX in E, KV4, EA, and VEs 2, 3, 4, and 6. DKH now is on phone. B8R has 38 states worked. ZVA has a new 75A-4. ZUG needs 3 more for WAS. KQD has 119 countries worked. YOZ and KFD are working some new DX. The Radio Club of Erie appointed VNC as acting pres. and BFB as acting vice-pres. MED and committee are now making up the final plans for equipment and installation for the new emergency truck. Over 100 attended the RAE Annual Winter Banquet. We are sorry to report the passing of NFO. Steel City ARC news: 9CWL has a new 75A-4; UHM a new B&W transmitter, and KYC a 2-meter Gonset. TVB is DXCC. SDV has a new Dodge, OKU has 800 watts a.m. on 10-20 meters. ERA recently dropped the "N." NDH has a new jr. operator, a son. MPK is a model railroad enthusiast. ETM received a Viking mobile VFO for Christmas. NKM received a new hi-fi. WHY is designing an s.s.b. rig. ZUZ

has a new 40-foot crank-up tower for his 20-meter beam. The Breeze Shooters Net's December Groundwave Contest winners were MCE, SEC, AYB, DXQ, SJK, PII, KWH, VKD, SSQU, and 80IP. EUL helps move BSN lists. The BSN now is considering incorporation. ZWZ has a new DX-100. UJP's f.m. DX is Texas. EUL got a 'scope for Christmas. NRG is using a normal whip on mobile now. YIT worked Hawaii and Alaska. SUK, of the Washington County ARC, still maintains schedules with 8JG on 220 Mc. UEJ is on 220 Mc. with Telecraft at 20 watts. ZJA completed a 220-Mc. crystal converter. The Mercer County Radio Assn. conducts two-hour code classes on Tue. evenings at the Buhl Club Music Room, with GEG in charge. 8WJ, a regular attendant at the MCRA meetings, drove all the way from Salem, O., with a recently-broken right arm, for a recent meeting. Traffic: W3WIQ 334, GEG 218, YUL 109, ZEG 60, NRE 58, KUN 55, UJN 37, NQA 35, YA 31, SIJ 18, NCD 10, KNQ 6, PWN 6, NMJ 3, UTR 2.

## CENTRAL DIVISION

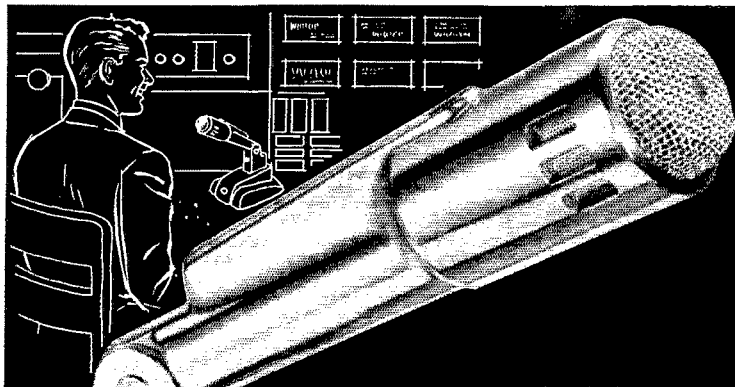
**ILLINOIS** — SCM, George T. Schreiber, W9YIX — Section Nets: ILN 3515 kc.; IEN 3940 kc. SEC: HOA. RMs: BUK and MRQ, PAM: UQT. Cook County EC: HPG. Club elections: Hamfesters — PBM, HPG, EGY, YNV, QKE, and IRH. Society Radio Operators — HEP, KLB, PUP, KIU, ORM (chaplain), KN9ALT (marshall), and BWM (chairman of the board). The Chicago Suburban Radio Club is proud of the fact that it has been ARRL affiliated since July 1930. The 2-meter RTTY Net is growing, reports KLB. Beside himself others active are SPT, BGC, JBT, GRW, QM, LLX, FJO, QBI (now in the service), ECA, THE, JBH, and BWM. Former NXC, now K6JCK, visited friends in Chicago recently. VER now is working in Springfield and misses ILN. A new General Class licensee is PCG. Old-timer DHN again is active on the air. He picked 40 meters, and is looking for a net connection there in the morning. TFA, headquarters station of the Hamfesters' Radio Club, is on 3503.5 kc. each Thurs. with code practice at 5, 7, and 10 w.p.m. The theory class meets each 2nd and 4th Friday at Viking Temple, 69th and Emerald in Chicago. W8SR/9 now is K9CFJ and, like LL, enjoys his new SX-100. Other new equipment: MAK and OKI, DX-100s; LRV, an NC-300; DEI, a Globe King. BRD's new address is 4822 West Berteau Ave., Chicago. K9AXS, the XYL of VEY, passed her Novice Class license and is being heard on 6 meters. The St. Clair Amateur Radio Club believes in pushing ham radio. Besides several demonstrations of "the art" for various civic and business groups, the club net participated in the March of Dimes Drive. Stations in were BA, EWU, 5AYS/9, PLP, K9AVC, QDM, OAN, ATU, and RQR. WFS has a completely equipped "radio den." FEB, who has been wooing 21 Mc., would like to know why his new beam works better off the back. CKU is another convert to 21 Mc. BBU reports that his new QTH at Wayne is excellent for DX. Des Plaines, Ill., claims seven old-timers: CA, IQ, NN, QN, RK, VL, and ZA. Boat catalogs have taken the place of ham gear at YMI's shack. YLU/XESPD is anxious to work anyone speaking Spanish just to brush up. ATH is casting eyes at 10 meters after hearing FB signals there. HME enjoyed the Mardi Gras, but enjoyed working mobile from New Orleans much more. DPY is tickled with his RTTY and FB copy. NN worked a DX station with only 100 watts (he says) and his friends laughed when he sat down. KBJ has worked seven countries mobile on 20 meters. 8XL "made" his company's newspaper with a page write-up on his rig and traffic work. IDA has a new location with two 45-foot antenna poles. The Greenville College Amateur Radio Club has started a code and theory class sparked by K9BJV and AAAW. The Kankakee Area Radio Club started its code and theory class with 120, and retained 50 regulars. Leaders in the project are LCH, KLD, VQC, HKA, OVI, and KN9AUA. EET now has a 5-over-5 on 2 meters and a three-element on 6. The LARK, at a recent meeting, enjoyed hearing KA talk and display his radio souvenirs of ham radio, said to be one of the largest in the world. NIU reports the Starved Rock Radio Club's 2-meter rig is just about ready to go. The Chicagoland Mobile Club really is planning its programs and getting out the members. Traffic: (Jan.) W9DO 1352, MAK 350, MRQ 219, K9CFJ 107, W9OR 84, YYG 83, CTZ 72, LRA 62, FAW 56, SBR 56, YIX 56, IDA 46, YFO 35, EHY 34, OKI 32, VEX 27, LL 24, BRD/9 22, CEE 22, STZ 22, VEY 17, 8XL 15, BUK 14, BA 13, LRV 10, K9AKS 9, W9VXSX, KA 4, WFS 4, OUS 2, UAR 1. (Dec.) W9WIO 6.

**INDIANA** — SCM, Seth Lew Baker, W9NTA — Asst. SCM: George H. Graue, 9BKJ. SEC: QYQ. RMs: DGA, JBO, WWT, and UQP. PAMs: CMT, EQO, and UXK. UQP reports QIN traffic as 93. WWT reports 85 messages for RFN. IFN, reported by EQO: Morning 155, evening 216, total 371. EHZ gives CAEN traffic as 179. A new club is the Standard ARC, Inc., at Whiting. Officers are HTE, pres.; FB, vice-pres.; ZOV, secy.; YAA, treas.; QCW and HVY, board. New officers of the Fayette Co. RC are OZJ, pres.; JWH, vice-pres.; Jack Binder, secy.-treas.; KNR, JGI, and C. Champe, directors; ELR, com.;

(Continued on page 78)



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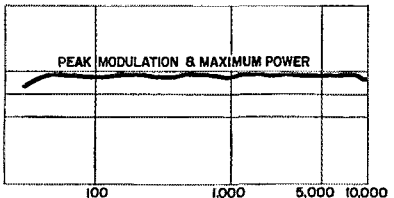
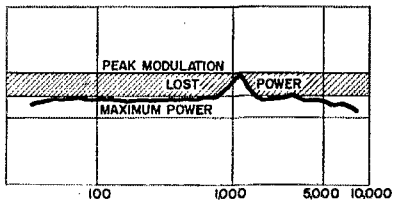
**The 664 will equal a useful power increase of four times over commonly-used peaked microphones, and could well be the best investment, dollar-wise, in your shack**

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This new principle enables the curve to be free from peaks or dips. Insures freedom of blasting and boominess from close talking. Eliminates effect from mechanical shock. High level —55 db. Acoustalloy diaphragm. Switch easily changed to relay control, if desired. Absolutely unaffected by moisture, humidity, or temperature.

Model 664. Without Stand.....Net Price: \$47.70  
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\*\*Forward gain is that compared to a pressure mike; actual front-to-back hemisphere pick-up ratio is 20 db.

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AIP, asst. com. The Indianapolis Club held an Old-Timers Night with over 200 present. ARK won an award for being on the air in 1910. Those receiving A-1 certificates were DOK, DUD, QYQ, and UQP. New ECs and their counties are CZD Sullivan, HUF Howard, LCL Parke, NSY Bartholomew, SWD Marion, TGZ Green, and WGU Elkhart. New Novices are KN9BZE and KN9BZZ, Martinsville, and KN9CCI and KN9CCH, Greencastle. KN9BZT, New Castle, YSQ and YSX comprise a father-and-son team at Springlake. Those dropping the "N" were WTR, AMT, JWH, and VPJ. PNE is the first to work a YN on 160 meters. He now has 22 countries on 160. The Evansville Area is active with emergency drills sparked by WJH, the EC. Those making BPL were NZZ, TT, and SVZ. MAM has a homebrew s.s.b. rig on the air. JJC has problems on s.s.b. He called a K6 and got a KH6. QP is back on the air after an absence of four years. FB also is back after a long absence. NTA and VNV have 5-kw. emergency power units. NYK is building 6-meter c.d. gear. New ICARC officers are PAS, pres.; MNO, vice-pres.; KRJ, secy.; and NIF, treas. MBL moved to Florida. PPD has a new Elmac. K9A0B, W9HTF, and ZOV have DX-100s. ODH is newly married. 147.3 Mc. is the active frequency at South Bend. 6 meters also is picking up. There still are many countries open for EC appointments. Get in touch with your SEC, QYQ. Traffic: (Jan.) W9NZT 378, TT 511, EHZ 347, JOZ 325, SVZ 137, JYO 129, ZYK 113, UQP 102, SVL 96, UKX 90, KTX 80, SWD 80, NTA 77, EQO 57, CC 38, TG 38, ALL 35, STC 35, BKT 33, CTF 33, WUH 30, AB 28, VNV 28, DGA 24, QYQ 24, RWY 24, CMT 21, TQC 21, BDF 17, PIA 17, DKR 15, ZSW 14, DOK 12, WBA 10, LCD 9, NSY 9, QR 9, NIO 7, WLY 7, FGX 6, LIT 5, WAU 5, WRO 5, HUF 4, YS 4, GDL 3, UTL 3, AZF 2, DDX 2, HPO 2, AQR 1, PPS 1, QXL 1. (Dec.) W9WRO 11, FGX 4, WRO 2.

**WISCONSIN** — SCM, Reno W Goetsch, W9RQM — SEC: OVO, PAMS: AJU and EBJ. RMs: BVG and YZA. Nets: WIN, 3685 kc., 7 p.m. daily; BEN, 3950 kc., 6 p.m. daily; WPN, 3950 kc., 1215 Mon.-Sat., 0930 Sun. Wisconsin mobile and c.d. frequency: 29,820 kc. Under the guidance of BVG and YZA, WIN activity showed a marked increase with 219 QNT in January. BTN is using a Viking Ranger to drive his Viking KW while an NC-300 takes care of the receiving and GWS, with an 8X-100 receiver, has the 490-watt final back on. KQB is affiliated with UTL, and made WAC in January with a Viking II and a vertical folded dipole on 21 Mc. (HFL picked up OQ5, EAS, CR6, VU2, VQ3, CX, VP6, ZS7, and PQ8, to make 92 countries on 21 Mc. New in Fond du Lac is KN9CBG. SQM has a new final with 4E27As. JEF reports improved results when the 28-Mc. dipole was changed to vertical polarization. GYA worked KH6 on 7 Mc. with 40 watts. Net certificates (BEN) were issued to AKY, BTN, CFO, DIA, DKH, GXD, JLU, KHR, KUW, NGT, OMT, and PAA. NRP has been busy bringing BEN attendance records up to date and doing an FB job as acting net mgr. GAB uses p.p. 826s on 144 Mc. and 2-bay 24-element long-long yagis on an 80-ft. tower. HIZ, new EC for Langlade Co., was appointed KO by the County c.d. director. YSZ is on s.s.b. with an 8-20A. CXY's traffic-handling was curtailed because of changing shifts at work. Active on 144 Mc. are IMQ, YNX, GFL, GYQ, HXL, LEE, and LJV. New officers of the PIARC (Madison) are UTV, pres.; LNM, vice-pres.; UGT, secy.; YWI, treas.; RTT, DOO, and LJR, directors. Net certificates (WPN) were issued to JCL, JLU, and RQQ. CBW built a regenerative transistor receiver with FB results. FYI replaces SLT as secretary of the NWRC. DVM/1 reports on a super layout with NC-183D, 20A-HT-31 with 500 watts on s.s.b. and antennas 110 ft. above the ground. K9BCC worked 23 countries on 21 Mc. with Ranger and NC-300. TCJ transmits bulletins on RTTY, 3617.5 kc., at 2030 Wed. and Fri., and 1500 Sun. KN9CJN is new in Wausau. PJT is on with a Globe Scout at 55 watts and an NC88. Make plans now for the WVRA Hamfest at Wausau, May 12th. Send \$3.00 for advance registration to WVRA Hamfest, P. O. Box 382, Wausau. Traffic: W9SAA 94, DVM/4 75, KQB 71, YZA 45, BTN 25, GWS 18, GFL 16, AJU 14, AKY 13, DIK 10, SQM 8, RQM 7, GYA 5, JEF 5, RTP 3, RQK 2.

## DAKOTA DIVISION

**NORTH DAKOTA** — SCM, Elmer J. Gabel, W0KZT — On Jan. 29th our SEC, CAQ, held a drill for ECs on 3845 kc. Conditions were very unfavorable; however, the State was fairly well covered with ten counties reporting. The State will be divided into four sections with the entire AREC enrollment in each section drilling as a unit once a month. The Jamestown Amateur Radio Club elected the following officers for 1956: AVT, pres.; YIZ, vice-pres.; and KN9CNC, secy.-treas. The club is installing its new transmitter at the club station, FX. New amateurs are KN9CMX, CNC, and CVC at Jamestown. WN9YMS, of Portland, recently dropped the "N" from his call. Let's all plan to attend the North Dakota Hamfest at Fargo June 10th. More details next month. Traffic: (Jan.) W0FVG 64, UBG 58, BFM 44, KTX 39, IHM 31, NPR 24, HVA 20, WRK 17, QOB 13, BMR 8, K0ATK 7, W0GQD 4, IRN 3, PHC 3, KLP 2. (Dec.) W0WRK 31.

**MINNESOTA** — SCM, Charles M. Bove, W0MXX — Asst. SCM: Vince Smyth, 0GGQ, SEC: GTX, PAMS: JIE, UCV, and LUX. RMs: KLG and DQL. The best news of the month is that Lydia, KJZ, has been appointed as Tenth Regional Net manager. We would like to see more of us checking into the Junior Net, which meets at 1800 CST on 3690 kc. VBS received a high-score certificate for 1955 VE/W Contest. Bob also ran up 22,400 points in the last CD Party and has worked some DX for himself. We have a new Novice, who is blind, on the air at Albert Lea, Minn. His call is KN9DEF. KMI is operating from the University of Minnesota. The U.D. Army Signal Corps is organizing a radio company at Fort Snelling, which will be teaching all phases of radio communications. A MARS station will be provided for operation on the MARS frequencies. Who can you talk to on 2 meters? According to RFA, the St. Paul Mobile Radio Corps official paper, a local St. Paul station running 75 watts on an 8295 with a beam pointed only west worked THY, CAE, TBD, KUL, EXC, and CQY, all of St. Paul; HDJ and GZN of Minneapolis; HXY and SV, of St. Cloud; 8AVA/9, at Marvins, So. Dak.; GNI, at Morris, Minn.; 9LEE, at Hillsboro, Wis.; DXY, at Canby, Minn.; and UGV, at Appleton, Minn., with no QRM. NKB is in the Navy for the next two years. The 6th YLER Convention will be held at the Hotel Capri in St. Paul May 25-26-27. The registration fee will be in the neighborhood of \$2.00. This will include a luncheon. Other entertainment will include a trip through Minnesota Mining Co. Mel Jass will entertain the girls at a hobby show on TV. DNO plans to get married in June. Traffic: W9WVO 289, LQR 280, KLG 202, KJZ 195, VEP 124, TUS 96, IRJ 84, QV3 53, PBI 41, WMA 40, MXX 37, UMX 35, QVQ 32, LST 30, OSJ 28, KPN 24, RVO 24, ALW 20, GTX 20, HMV 20, QDL 20, TCK 17, FGP 16, VEZ 16, LUX 15, BUO 12, UBD 11, UMJ 11, GDZ 8, OPA 8, VJS 8, UCV 7, ZMK 5, IIV 2, TQO 2, VEM 2.

## DELTA DIVISION

**ARKANSAS** — SCM, Owen G. Mahaffey, W5FMF — Appointments for the month: JAX as OBS; TJH and MRD as ECs. Major Meriwether, BJR, is home after giving a few weeks' instruction on guns at Fort Sill, Oklahoma. MED reports from Eureka Springs; he moved there from W9-Land. KN5DKT, in Booneville, is operating a new Globe Scout; he also is pastor of the First Baptist Church there. He is giving code and theory instruction to a group of hopeful Novices, and plans to organize a radio club. TIA, with BHJ and WHU, operated YM/5 from Pine Crest Fire Tower in Northwest Arkansas on 50.1 Mc. during the V.H.F. Sweepstakes on Jan. 8th. They carried up a 5-kw. generator, transmitters, receivers, and beams, but forgot the electric blanket. Boy it was cold! Traffic: (Jan.) W5CAF 144, MED 20, JZL 16, RMF 15, KN5DKT 2. (Dec.) W5CAF 126, ZJI 14, MED 13.

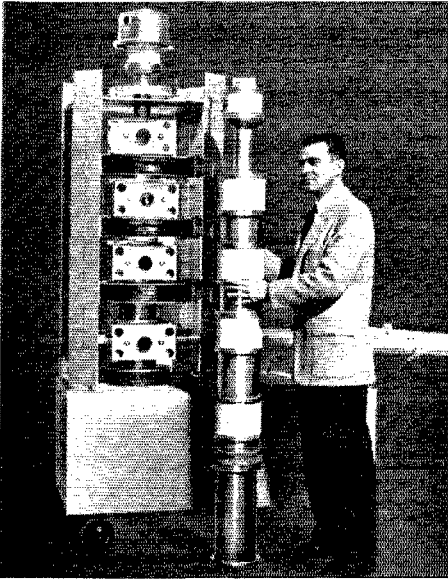
**LOUISIANA** — SCM, Thomas J. Morgavi, W5FMO — CEW is now net control for the Delta Net on 75 meters. MAV and CWC will be alternate NCS. CEW worked 487GE in Ceylon A1 on 20 meters. His totals now are 208 countries worked and 194 confirmed. HNS now has a General Class license. ZAK has his mobile going. CXB, an old-timer with a new call, is mobile with an Elmac and a kw. fixed. ZMI puts out a fine signal on 75-meter s.s.b. SWQ will be on s.s.b. soon. New officers of the Southwest ARC at Lake Charles are CXB, pres.; BQT, vice-pres.; ZMI, secy.; and ARG, treas. CZV, BQT, BTG, ARH, ARI, ARG, and AUQ are all new Novices around Lake Charles. K5AIE is a new OBS and sends Official Bulletins Mon. at 8 p.m. on 7073 A1, Wed. at 5 p.m. on 3870, Fri. at 7:30 p.m. on 3640 A1, and Sat. at 11 a.m. on 7240 kc. He would like some reports on his transmissions. KN5ABX took the General Class exam and is awaiting ticket. K5AGJ is active on the Hit and Bounce Net. KN5LJL has built a modulator for his Command rig. Maybe this will serve as an incentive to get his Conditional Class license. The American Red Cross has turned over a 32V-3 and 75A-3 to the Greater New Orleans Amateur Radio Club for use as its club station. A room has been leased to the club for its exclusive use. The New Orleans Emergency Net is being whipped into shape by K5BES with great plans for the future. Monitor 3905 kc., the Louisiana calling frequency. Send reports in promptly at the end of each month. Traffic: W5NDV 82, K5AGJ 22, W5Y8N 22, K5AIE 13.

**MISSISSIPPI** — SCM, Julian G. Blakely, W5WZY — A check with SCMs of adjoining sections as to how they get the wealth of news that appears in their columns each month reveals the following: 95 per cent of the news is sent in on a 2¢ postcard from the active, interested, holders of appointments. It is not a one-man job. It takes the cooperation of all League members of the section. It would help if each holder of an appointment would take 10 minutes a month to drop us a card with items of interest such as the state of your emergency set-up, the doings of your club, and the new hams in your area. Take a look at the columns of other sections in this issue. We are trying to do our part. Will you help us? Traffic: W5RIM 17, OTD 5.

**TENNESSEE** — SCM, Harry C. Simpson, W4SCF — SEC: RRV. PAM: PFP. RM: WQW. Thanks, fellows, for

(Continued on page 74)

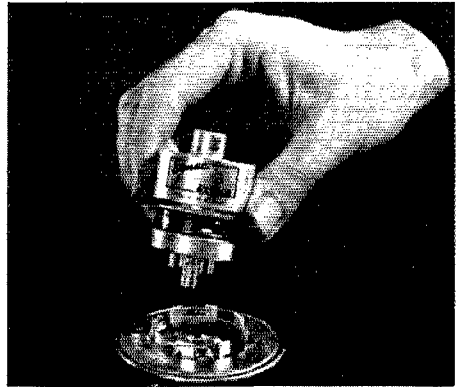
# What's New with the Electron—1956



*X602—75 kw/CW UHF Amplifier Klystron, and amplifier circuit assembly.*

High power pulse and CW klystrons, new negative-grid tubes and receiving tubes of the ceramic variety were featured by Eimac at the annual Institute of Radio Engineers' Show and Convention in New York City last month.

With the X602—75 kw/CW power output-amplifier klystron Eimac announced the most powerful electron-power tube ever produced for UHF operation. The giant six foot klystron is the most recent Eimac accomplishment for producing high power at higher frequencies. Pulse klystrons delivering 10 megawatts of peak power and high power klystrons serving as power sources for linear accelerators for applications including the processing of petroleum, plastics, chemicals and foods are among the current developments. Eimac klystrons have already contributed greatly to the revolu-



*4X250B Radial-Beam Power Tetrode and socket.*

tionary new art of forward-scatter communications in our continental defense system and are destined for extensive commercial application.

The development of ceramic receiving tubes is another important program at Eimac. Small and rugged, these tubes incorporate a radically new structural design and production technique, as well as being highly immune to damage by thermal and physical shock. In fact, the work at Eimac calls for tubes as permanent as resistors or capacitors — tubes that will be soldered into the circuitry.

Ceramic counterparts to the glass 6SN7 and 6AK5 are being delivered to the Air Force now in sample quantities.

Amid all the excitement about klystrons and ceramic receiving tubes at Eimac, the negative-grid tube is more than holding its own. Standard tube-types are being constantly improved and the amazing new 4X250B has created great enthusiasm in the amateur, commercial and military fields.

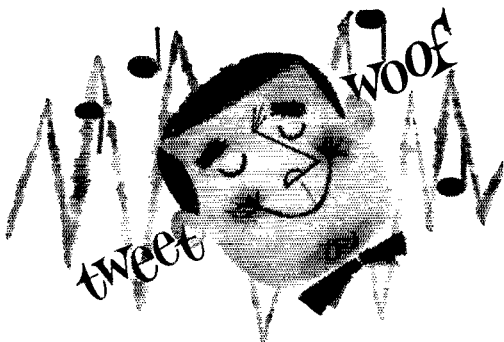
Speaking of shows and conventions, don't forget the National ARRL Convention in San Francisco July 6 - 8.

For a free copy of an illustrated brochure "What's New with the Electron—1956," write our Amateurs' Service Bureau.



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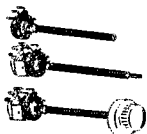


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Either way, Centralab's new Fastatch Senior Compentrol Kit is for you. For, quick as a wink, you can assemble the ultimate in a compensated control, to improve the tonal performance of your hi-fi amplifier or pre-amplifier.

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- To rear unit . . . (with shaft cut to length)
- Add the knobs . . . — and there's your compensated control

A special Printed Electronic Circuit\*, pre-wired to the rear unit, automatically bolsters frequencies otherwise often lost. Two additional high-boost plates are included in the kit, in case your taste demands even further emphasis of the highs.

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C2-200 Kit . . .

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all the wonderful information sent in this month. Fine bulletins were received from FEO and the Bays Mountain Club, from the Memphis ARC, the Tennessee C.W. Net, and RM WQW; plus fine new net routers for TPN, compiled by PAI PEP and printed by APD. BQG reports the Carroll County Emergency Net in operation on 29 Mc. at 8 p.m. Wed. with BQG as NCS. Other members and supporting stations are HKT, CZE, GFX, COY, BMI, FLW, HEZ, RMJ and FYD, and K4s AEG and BKC. BXG reports that the new Smoky Mountain ARC officers are NLD, pres.; ZEN, vice-pres.; and FEP, secy.-treas. He also reports on the East Tenn. 2-meter Net on Thurs. at 1900 EST. FEP and VSS are busy with classes at U.T. KN4DIR is en route to DL4-Land. FHT and BXG are using 32-element colinears on 2 meters looking for Middle Tennessee! A nice report was received from another ham family — OM HHB, XYL K4DIZ and 14-year old Sarah, K4DHA! SCF had a fine eyeball-type chat with PVD, BQG, and WQW, but couldn't track down PFP, RRV, or YPG. Memphis mobiles participated in "Operation Ride-out," a test evacuation. Many Memphis friends will miss RBL, but it's Nashville's gain. A grand report on TN was sent by RM WQW, who made an historic address at Dresden. UIO sends a nice report from East Tenn. PN. OEZ reports on the Poliothon; 536 messages were handled on 2 and 10 meters with 7 operators! A nice letter was received from K4GFL with dope on the Dyersburg flood. It's nice to see PL's traffic total. New appointments include K4GFL as OPS, VUA as EC, BQG as OBS. Traffic: W4OZ 536, PL 229, K4WBF 187, W4TYW 86, VNE 85, WQW 72, BQG 70, VJ 69, PFP 43, SCF 42, OGG 38, K4DIZ 36, W4CXY 34, UVL 27, UIO 21, TIE 18, WQT 18, IV 17, YPG 13, IGW 9, SZI 9, K4ABE 7, W4PTI 6, K4GFL 4, W4PVD 1.

**GREAT LAKES DIVISION**

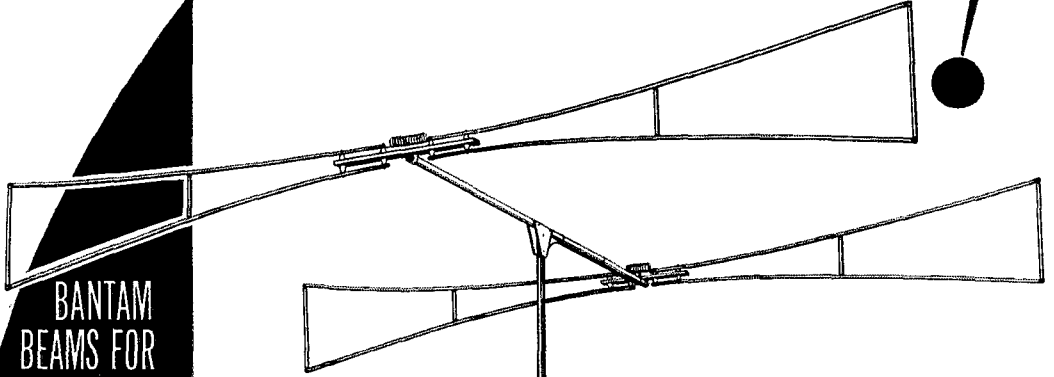
**KENTUCKY** — SCM, Robert E. Fields, W4SBI — SEC: CDA, PAM: YYI, RA: ZDB, Asst. RM: ZDA. The SEC is asking that all ECs, as well as AREC members, affiliate with Kentucky nets or their local nets now. K4AIT is using a single 807 portable rig instead of the DX-100, but that is no reflection on the DX-100. He says it is easier to get about with the smaller rig, but it doesn't have the punch that the DX-100 has. SBI is having his trouble, too, with his rig. It seems that the thing was built wrong to start, but we will keep plugging and maybe get it going one of these days. URF still is operating KIUSA at Ft. Devens, Mass. YOK has up a new 15-meter beam and now is building a 10-meter mobile rig. JUI is building a 50-Mc. rig after completing an s.s.b. rig. We learn by smoke signals and the grapevine that QCD has moved to a new QTH in the same town and has up a folded dipole. ZDB says his new Collins KWS-1 is working just fine with stations from Florida and California coming in. QNI is in the KYN C.W. Net. Traffic: W4KKW 179, HEA 131, ZDB 116, RPF 106, ZDA 105, QCD 94, CDA 55, HSI 52, NIZ 34, K4AIT 30, W4JSH 29, K4AGT 26, W4SZB 26, SBI 20, URF 20, BZY 19, W4MX 16, JON 15, KRC 13, YOK 10, IAY 1.

**MICHIGAN** — SCM, Thomas G. Mitchell, W8RAE — Asst. SCM (Phone), Bob Cooper, 3AQA; Asst. SCM (C.W.) Joe Beljan, 8SCW, SEC: GJJ. The last report missed noting PHA as making BPL. BPL certificates were issued this month to ELW for January traffic and to MZN for December traffic. ORS appointments were made to KOX and RVZ, who are becoming very active in QMN. UCN is a new Class IV OO. ELW is encouraged by the new stations and outlets for QMN and says that they are making his job easier. A glimpse at the totals for this month will indicate that he is pulling his share of the load. The Noon QMN has been pretty slack, but NUI is keeping it open for business. QCO is very QRL with the new Blossomland Club paper. JYJ is QNI the "Dragnet" on 20 meters when possible and says that he has a pipeline to Texas. There's a good outlet for Longhorn traffic. PHM is adding equipment that will enable him to operate in any emergency. FX still is busy feathering his new nest. W4O is well on the mend and is building 2-meter rigs for the Norxes in his area. HKT had to build a new 11-foot bookshelf to hold his collection of QST editions that goes back "eleven feet." There's a good source of information of a historic nature. EGI is QRP with the 45 watts to a single 6L6 but he managed to pile up 10,640 points in the January CD Party. TIC has been working on antennas for the DX Contest. Hope they worked out. Tom, HFA had to move his 50-foot stick to his new QTH so his OES activities have been a bit curtailed. Well, fellows, here we are approaching another Field Day, so let's prod the committees and ourselves into making this another record-breaker. It seems like we just finished the post-mortems on last year's Field Day, but look over the logs and notes on last year's event and see what can be done to make this one more enjoyable and profitable for your group. Traffic: (Jan.) W8ELW 540, NUL 151, ILP 123, WGU 98, ZLK 78, QGO 64, RVZ 57, IJY 39, JYJ 38, KOX 36, NOH 31, SIB 29, PHA 27, PHM 24, FX 19, RAE 18, NTC 16, SCS 15, W4O 13, FWQ 12, DAP 6, HSG 6, DSE 4, HKT 4, EGI 2, WVL 2, (Dec.) W8ZLK 140, MZN 135, IKX 23, OQH 21, EGI 4, YDR 4, SWN 2.

(Continued on page 76)

Don't let a small  
roof put a ceiling  
on your big DX...

# BEAM WITH BANTAM!



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BEAMS FOR

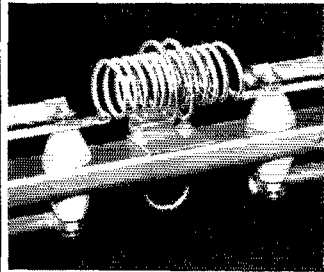
20

15

AND

10

METERS



Part of the W6AY 20 meter "take" resulting from 30 days of operation using a Gonset Bantam Beam and a power input of 150 watts.

The 16½ foot, tip-to-tip, 15 and 20 meter Bantams mounted in the center of a roof 20 feet square, can swing a full 360 degrees without overhanging at any point!

DX? Certainly! Enthusiastic reports from users everywhere give proof to the statement that Bantam performance closely approaches that of an excellent, full-length, two element beam.

Why is the Gonset Bantam a better shortened beam? Compare the effective combination of bow tie elements and the silver plated copper tubing coils used to achieve shortening. Low loss is plainly evident. No dielectric to soak up moisture, to lower the high Q. You can expect the same high performance, wet or dry.

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Excellent front-to-back ratio...Low VSWR...  
Worthwhile forward gain...single coax feed...  
fully balanced...symmetrical pattern...will handle  
a full kilowatt...

- 20 meter Bantam... (less coax line)...Net 59.50
- 15 meter Bantam... (less coax line)...Net 59.50
- 10 meter Bantam... (less coax line)...Net 44.50  
(10 meter elements are approximately nine feet overall and boom is five feet long.)

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# QST

## ADVERTISERS

“Advertising is accepted only from firms who, in the publisher’s opinion, are of established integrity and whose products secure the approval of the technical staff of the American Radio Relay League.”

Quoted from QST’s advertising rate card.

*Amateurs and Electronic Engineers: Practically everything you need can be supplied by the advertisers in QST. And you will know the product has the approval of the League’s technical staff*

OHIO — SCM, Wilson E. Weckel, WSAL --- Asst. SCMs: J. C. Erickson, 8DAE; J. E. Siringer, 8AJW; and E. F. Bonnet, 8OVG. SEC: UPB. RMs: DAE and FYO. PAMs: HPF and HUX. RRQ has gone s.s.b. Santa brought Q multipliers to FPH and URN. RXP has a new SX-100. PRC was home from the Navy. ULU has a new rig. The CACARC reports intracounty contest winners: Fixed station, AJW; mobile, FKB; and c.w. FDC, AJW and FKB were given cup trophies. The CACARC is sponsoring a 10-meter ground-wave contest from 9 p.m. Apr. 28th to 1 a.m. Apr. 29th. All entries should be sent to AJH. A new club was formed in Euclid, NAF reports IFZJ and 4HHK will be on the v.h.f. program at the Dayton Hamvention on Apr. 14th. SVI has been laid up with an infection. HOH runs 600 watts with a 64-element beam on v.h.f. EEQ is working some DX. Mansfield’s new Novices are AGW, BDO, FMB, GFO, GUG, HXT, ILXU, ILXV, WIO, WRK, and WSL. HWX is in the hospital. RZQ and his NYL celebrated their silver wedding anniversary. VYB and UKX passed their General Class exams. The

### FOURTH ANNUAL OHIO INTRASTATE QSO PARTY APRIL 7-8, 1956

The Ohio Council of Amateur Radio Clubs will sponsor a QSO Party, open to all Ohio amateurs, which will be held from 6:00 P.M. EST Saturday, April 7th, until 6:00 P.M. EST Sunday, April 8th. All Ohio amateurs may take part. In one county, ten contacts *only*, phone or c. w., may be counted.

Any and all amateur bands and any mode of emission may be used. There will be no power restrictions. Scoring: multiply the number of Ohio stations worked by the number of Ohio counties contacted. Each station may be worked but once regardless of band or mode of emission used. Logs should include call signs of stations worked, time, date, signal reports sent and received and the county in which the station is located. Operation near the following frequencies is recommended: 3550, 3740, 3860, 7100 and 7250 kc. On the other bands, take your pick. The call “CQ Ohio” should be used on both phone and c.w. A cup and four appropriate certificates will be awarded to the highest-scoring stations. Certificates will also be awarded to the Novices, the number of certificates being contingent upon the degree of activity.

All contest logs must be postmarked no later than May 1, 1956, and should be sent to the contest manager, Hamlin King, W8EQN, 353 S. Arlington Ave., Springfield, Ohio.

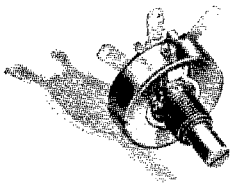
Toledo Club picked HSW as its ham of the month. The East Palestine Club’s 1956 officers are CQZ, pres.; and SXG, secy. The stork visited SZN and UUE. WSY makes General Class. RAJ has a jr. operator. Santa brought ACP a Heathkit. The Conneaut Club’s 1956 officers are JVR, pres.; LAC, vice-pres.; BKM, treas.; and FES, dir. SFG is back on 6 meters. NND is in the Navy. AJW is home after two weeks in Europe. The WestPark Radiops will give trophies to the highest c.w. and phone operators in the ARRL SS and DX Contest. JDN is going to O.S.U. EEQ has a new SX-96. UNJ and FNY have new AT-1 rigs. The Intercity Club’s 1956 officers are OZZ, pres.; BDO, vice-pres.; and KYB, secy.-treas. CGT received his Technician Class license. New Springfield Club officers are LAB, pres.; HQX, vice-pres.; DCJ, secy.; OKB, treas.; and JRG, editor. Let’s all get out for the Ohio Party. Traffic: (Jan.) WSVTP 289, DAE 191, ZAU 96, FYO 95, OPU 89, AL 54, DG 45, PZS 29, IIR 28, ITR 28, SDI 27, HDA 26, AJH 24, HZV 24, LPQ 24, RO 23, CVZ 22, GZ 22, AJW 21, VWX 20, WE 20, EEQ 18, SES/8 13, UOS 13, JDN/8 12, (Continued on page 78)

# MALLOBY HAM BULLETIN

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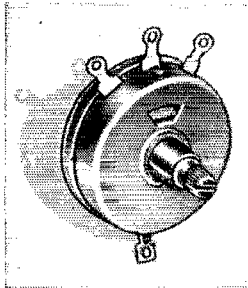
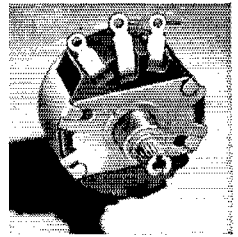


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one of the smallest rated at 2 watts dissipation; only  $1\frac{1}{16}$ " in diameter. Handy for many low voltage spots where size is a factor . . . such as bias control, "S" meters. Grounded rotor arm, screw-driver-slotted shaft,  $266^\circ$  electrical rotation. 6 to 15,000 ohms.

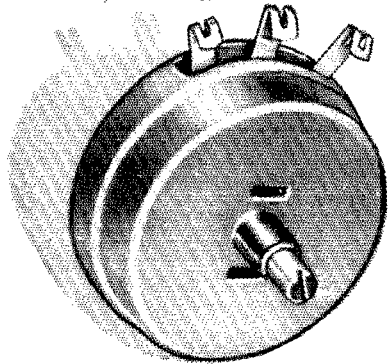
### "R" Type 2-Watt Control

especially designed for use in high voltage circuits. Insulation between shaft and resistance element rated at 1500 volts AC; dust-proof phenolic case. Shaft is thumb knurled, screw-driver-slotted stub,  $\frac{1}{4}$ " in diameter—takes 3" extension shaft where desired. 2 to 20,000 ohms.



### "M" Type 4-Watt Control

the old stand-by, used by more amateurs than any other. Universally accepted for voltage dividers, bias control, test instrument circuits. Resistance values from 0.5 to 100,000 ohms.



### "E" Type 7-Watt Control

fills the gap between relatively low power "C", "R" and "M" controls and 25-watt and up rheostats. Particularly well suited for screen grid and similar voltage divider or voltage adjustment circuits. In nine values from 5,000 to 150,000 ohms.

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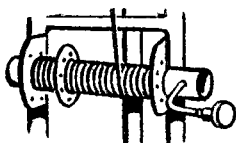
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WAV 12, ARO 11, NZC 11, RLR 11, STB 11, SYD 11, GKQ 10, HPP 10, LER 10, BF 9, FFK 8, STR 8, ET 7, OPX 6, USU 6, HNP 5, LMB 5, LZE 4, EQN 3, HQL 2, ILE 2, MYV 2, URN 2. (Dec.) W8AGZ 924, ZAU 37, GZ 23, HXB 16, PBX 4.

## HUDSON DIVISION

**NEW YORK CITY AND LONG ISLAND**—SCM, Harry J. Dannals, W2TUK—SEC: ADO, PAM: NJL, RM: WFL. Section nets: NLI, 3630 kc. nightly at 1930 EST and Sat. at 1915 EST. NYSFETN, 3925 kc. daily at 1800 EST. Five stations earned BPL cards this month, KEB, KFV, K2AIR, W2AEE, and K2DEM, the latter two on originations plus deliveries. The following stations earned Section Net certificates for their regular participation in NLI: W2s AEE, DUS, GP, OBU, TUK, VDT, VNJ, and WFL, and K2s ABW and AMP. ADO reports AREC activity at a high point in most of the section with particular emphasis on the Kings and Nassau groups. The Brooklyn AREC, under K2CCH and the Ass't, ECs, have been joined by the Brooklyn Chapter Re-Cross station, K2QDB. EI reports weekly participation of approximately 100 operators in the Nassau 2-meter AREC. AREC activity in Glen Cove is picking up under the direction of WJQ, with NUN and K2s BTK and GRE, and KN2PSG active. ZAI and the Nassau 10-meter mobiles have a diversified schedule with RACES drills, traffic and transmitter hunts. Plans are underway for this group to provide communications coverage for the L. I. Sports Car Association test run. LCF and K2AZT direct activity of the Nassau 6-meter mobiles and plans are underway for a unified drill with the 2- and 10-meter groups. KNA reports 110 operators and 96 stations enrolled in Suffolk RACES. Congratulations to JIO on winning the '55 Edison Award. K2ESZ/V04 asks that the gang look for him on 10, 15, or 20 meters. K2RFF, ex-5GWT, is on the air from Queens. KQC is leaving for W4-Land. AYJ has a DX-100 and a Super-Pro. LPJ is looking for operators for the Elmont c.d. station. K2MMX dropped the "N" and operates on 40 meters with an AT-1 and an NC-88. K2GBH has become interested in traffic on NLI. K2s DEM and DEV visited 1AW. DSC has a new 20-meter beam put up by GLM and K2LSP. GP added a 2-meter ground plane. K2KMF has three-element beams on 14 and 21 Mc. KN2BXC, a YL, is a new member of the Fieldston HSRC. K2IAG, president of the Newtown HSRC, is active with an AT-1 and an SX-16. LGG, on the air since 1938, worked Wyoming for his first W7! KN2QPT is the latest member of the Tu-Boro RC. K2GWW worked 12 countries with his new SRT-120. WOS is a new member of the Order of Boiled Owls Club. JCA finished the kw. final. K2IEG moved to Arizona. K2LYG is president of the CCNY Club. HJ, K2MNS received an RCC certificate. ELK returned to action after a successful operation. HQL earned a WBE certificate. OKU has 60 watts on 20-meter phone. K2IDB, station manager at YKQ, works the 10-meter mobiles, including ENW, KDC, SOB, VVZ, K2BQP, and 1PVF/2, en route to work, 29,560 kc. is monitored regularly in Suffolk for mobile stations touring the county. KN2PGP has 37 states. KN2QWC has a TBS-50D and an SX-71. K2s GCU, GFM, IMV, and JDY picked up 5 new states on 6 meters in one evening. BQM is sporting a new NC-300 and has 121 countries on phone. K2GMV, mobile from Colorado with an AF-67, is looking for skeds on 10 and 15 meters. New officers of the Suffolk County RC are BHD, pres.; DPT, vice-pres.; K2BTT, secy.; and OKK, treas. K2JQO is active with a Ranger. The newly-formed Long Island Phone Net, under the direction of OBW, meets on 3908 kc. nightly at 1730. KN2PAY, with 75 watts on 80 meters, worked W6-Land. New officers of the Levittown ARC are AEV, pres.; TEZ, vice-pres.; K2HZC, secy.; K2CFB, treas. K2s KSP, LUR, and QXH made General Class. Your SCM's XYL presented him with their second harmonic, a sirl this time. Traffic: (Jan.) W2KEB 1031, KFV 911, K2AIR 694, W2AEE 390, K2DEM 282, W2WFL 195, VDT 162, K2CQP 147, W2DSC 72, JOA 54, GP 52, K2AMP 45, W2BO 35, TUK 34, K2KXZ 33, GHS 26, CUI 25, GMV 20, IAG 17, DVT 14, W2LKG 14, K2ECY 13, GWW 9, W2LPJ 9, EC 8, OBU 8, IN 6, PF 6, MUM 4, K2ABW 3, W2JCA 3, CRH 2, MNS 2, DDK 1. (Dec.) W2NTB 18, JOA 14, LPJ 12, DUS 9, K2ECY 6, JDY 4 (Nov.) W2JOA 19.

**NORTHERN NEW JERSEY**—SCM, Lloyd H. Manamon, W2VQR—SEC: JIN, PAM: CCM, RMs: NKK and CGG. DRV is active in NJN and ran up a good score in the recent CD Contest. K2PIM, age 13, is a new General Class operator in River Edge. Art has a new Globe Scout on the air and an SX-24 receiver. K2CSC hopes to fire up RTTY gear very shortly. MXV is pleased with his new home-built 10-meter rotary. QPM is through constructing kits and is doing a stretch of operating. EBG finds his new home-grown T-R switch and commercial monitor combination PB for break-in operation. LRO is constructing a new VFO for his 10-A s.s.b. exciter. AMS constructs weekly skeds with 8QOH/MM on 21 Mc. QOH is mobile marine from a cargo ship running between New Sundays and African ports. OM is a regular in the 3505 kc. Sunday morning Western Union Net, composed of amateurs employed by Western Union.

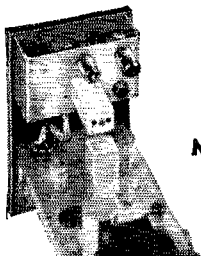
(Continued on page 30)



# NEW MULTIPHASE "Q" MULTIPLIER

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- No Loss in Speech Intelligibility

- No Insertion Loss — New Two Tube Circuit
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**MODEL A Q**



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## CONVERTS MODEL A SLICER

Plugs into Model A accessory socket, converting it into a Model B. New front panel and controls provided. Enjoy all the advantages of "Q" Multiplier selectivity on CW, AM & SSB with your present Model A Slicer.

Wired.....\$29.50  
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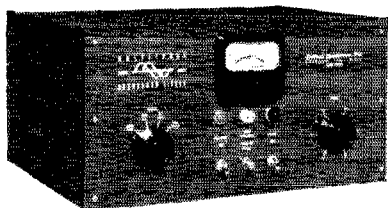
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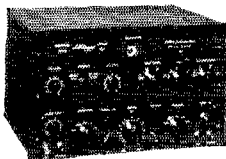
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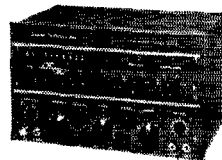
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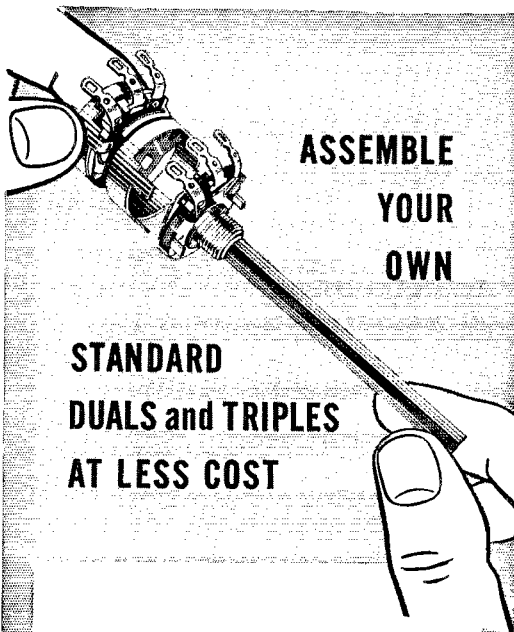
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Harry currently is Radio Officer for the Plainfield C.D. RACES organization. LTI has gone "commercial." Fred's multi-unit table-top rig has been rebuilt into a rack and panel job. OLV is transmitter engineer at WATV-TV. TWC is attending evening classes at Bell Tel. Labs. Our thanks to FCC for sending in the TCRA news. CJX still is laid up by illness. CFB has his new DX-100 on the air. The GSARA has sold its old club transmitter and has bought a new DX-100. The club conducts a c.w. net on 3635 kc. the 1st and 3rd Wed. of each month at 2030 hours. CQB is NCS and the speed is 10 w.p.m. There must be phone men in this net. Club programs for January included a talk by CQB on the NC-300 and a club auction, which ended up with PWX going home with a pair of parakeets. New GSARA members are BQS, BOK, KKI, VOH, K2CQJ, GIK, and HIMQ. K2BJA is the new owner of a 522. K2KLR is on 15 meters. K2CII has the rig back on the air. KN2PHI is now General Class. New officers of the Raritan Bay Radio Amateur Club are K2BEV, pres.; K2EQD, vice-pres.; K2DSW, secy.; K2DDM, treas.; TTM, act. mgr. K2DDM has a new 10-meter mobile rig. K2EQD is building radio-controlled model aircraft. TTM has completed a 10-B s.s.b. exciter and is working out P/B on 75 meters. K2BZX has a new receiver and reports hearing QRM that he never knew existed. The Jersey City Radio Club is a new club with headquarters at the Jersey City Red Cross Building. There is a complete all-band station at the club rooms. A club call has been applied for along with ARRL affiliation. K2EALW is the secy. C.D. RACES County RACES has a new Control Center. C.D. RACES equipment has been set up by JT, Conity RO, and regular drills are being held from the new location weekly. K2EB is doing a fine operating job for Morris County RACES control. K2GBP spent the mid-term school vacation building a new rig. K2ELR is a new Teaneck station. The Irvington Radio Club had RAX of Ampere Elec. Corp. give a lecture on transmitting tubes and their applications at the Feb. 6th meeting. K2LRF is a new Tech Class licensee. K2PGI is General Class. K2EAIN is doing an excellent job as code instructor for the Irvington Club. MZA, the Freehold Amateur Radio Club, has reorganized and meets every Thurs. evening at 1945 hours in the Freehold YMCA Bldg. Interested persons are invited to attend. Traffic: (Jan.) W2MLW 240, K2GFX 118, EB 71, W2BRC 70, K2EQP 45, BWQ 40, IKS 27, W2DRV 14, K2JOM 14, W2CFB 6, CJX 2, NIY 2. (Dec.) K2EB 33.

**MIDWEST DIVISION**

IOWA — SGM, Russell B. Marquis, W0BDR — New officers of the Fort Dodge Club are ZCN, pres.; ZKD, vice-pres.; NGS, secy.; JOL, AID, and QVZ, directors. Fairfield Club officers are UEG, pres.; CPC, vice-pres.; KN0BRF, secy.; QQA, act. mgr.; DKQ and LPW, assistants. New appointments: WPM as ORS and QQA as OBS. Endorsements: CZ as OPS and KVJ as ORS. New Novices reported: KN0DEL, DJV, DON, DPG, DPF, DPI, and DPJ. UIM has a DX-100 and is letting his kw. rig get rusty. About 60 stations report into the Linn County Emergency Nets. Drills are held 3 times a week. BSG and CZ received Public Service Awards. FKB is on vacation in California. UCE has a new HQ-140X. The Campus Radio Club in Ames holds code classes with 20 in attendance. The Quad Cities V.H.F. has been organized. It meets every Fri. night on 6 meters. UJC has a new Z match. SQE has a 3rd-class radiotelephone license. PZF received a 10,000 Club Trafficers certificate. LCX received his for 2500. LVJ is active again on TLICN. USQ is planning a v.h.f. directory of stations in a 250-mile radius of Davenport. PFS is the new president of the Waterloo Club. Traffic: (Jan.) W0BDR 1540, SCA 1315 PZO 1138, BJP 265, CZ 248, WYW 198, QVA 176, LGG 146, SQE 128, BLH 75, LJW 73, WPM 59, KVJ 28, VWF 21, PKT 20, TTT 20, CGY 16, EHH 16, UTD 14, K0WAD 14, W0YI 12, IKP 11, K0DBW 10, W0NGS 10, ZYC 10, ADB 9, PTL 8, BSG 7, EEG 6, JPJ 6, MJH 6, WVK 6, ILY 5, NYX 5, CQS 4, HNE 4, IHC 4, SRQ 4, KN0CIM 3, K0BPR 2, W0FMZ 2, PAN 1. (Dec.) W0PAN 31.

KANSAS — SGM, Earl N. Johnston, W0ICV — SEC: PAH, PAM; FNS, RM; FEO. The Kaw-Blue Radio Club of Manhattan is sponsoring a mobile picnic at Sunset Park, Manhattan, Apr. 29th. Two hidden transmitter hunts are scheduled on 10 and 75 meters. Next will be Christy's Picnic, May 20th, at Osage City, sponsored by the Kaw Valley Radio Club, of Topeka, with Christy at the helm. Two transmitter hunts, prizes, etc., are scheduled. ZJB has started the 2-meter emergency net rolling on 145.5 Mc. drilling each Fri. at 2000. The first drill was held Mar. 2nd. QGC is the new EC for Woodson, Allen, Bourbon, and Neosho Counties. IFR, who held that post for many years is moving. WJB, UAT, QGG, and FCE are new OPSs. FCE, QGG, and UAT are new ORSs. UAT has received a WAS certificate, using S-20R and Q5-er as his DX receiver. Phil has also built a new 211 modulator and is working on an s.s.b. exciter. FCB/0 is building a new s.s.b. exciter. There are 12 s.s.b. stations in Topeka now. The Se-Kan Radio Club's new officers are QUG, pres.; ERA, vice-pres.; ONF, secy.-treas.; Gene Cookston, act. mgr. DKK, of Hope, has 40 watts on 2 meters and is dicker for a Ranger. Several

(Continued on page 82)

# 3 BANDER

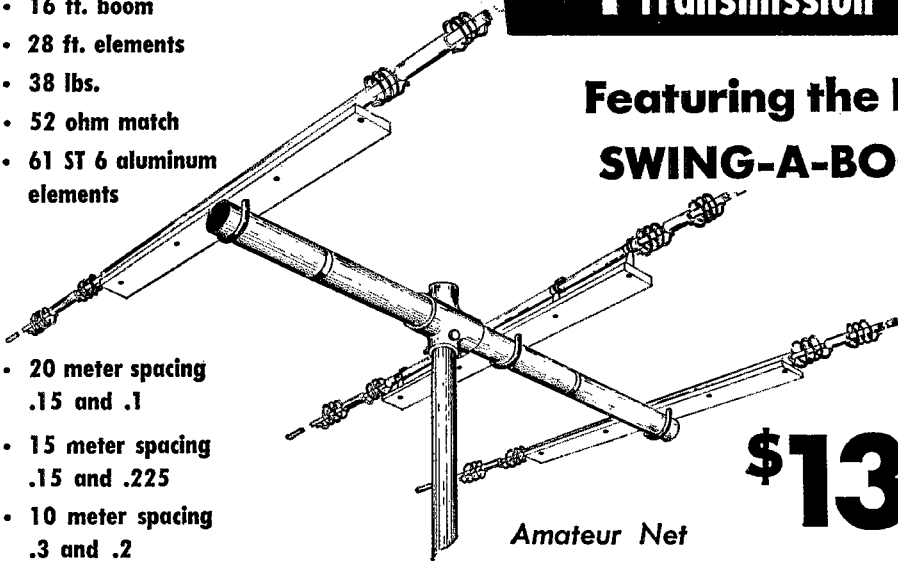
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- (b) 21300 — 1.4:1
- (c) 28750 — 1.3:1

### Measured front to back

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- (c) 28750 — 30 DB

### Measured Forward gain over Full Size Reference Dipole

- (a) 14200 — 7.8 DB
- (b) 21300 — 7.9 DB
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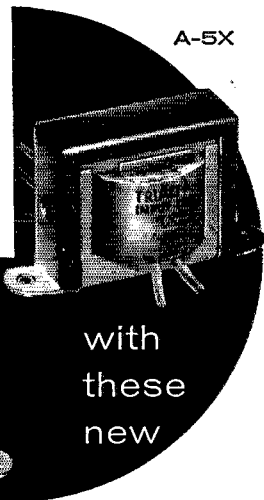
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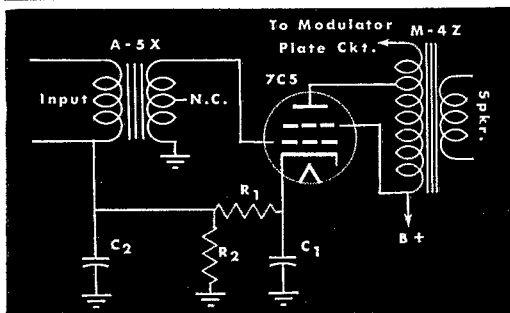
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Type No.	List Price	Application	Primary Impedance Ohms	Turn Ratio	Wt. Lbs.	
A-5X	\$4.15	Single button mike to p.p. grids—Hi-gain.	100	84	3/8	
Type No.	List Price	Primary	Secondary Impedance	Ma.	Audio Watts	Wt. Lbs.
M-4Z	\$3.40	5000 (Autoformer).	6750	100 (total)	10	3/4
M-5Z	5.60	5000 (Autoformer).	6750	250 (total)	20	1 1/2



Write for Catalog TR-55D



members of the CKRC, of Salina, had a V.H.F. Field Day participating in the January V.H.F. Sweepstakes. They were located in a trailer on the highest hill near Salina. Results were gratifying. Traffic: (Jan.) W0BLLI 451, N1Y 293, FEO 213, FNS 192, QGG 191, OHJ 161, ZYN 95, FCE 77, LBJ 77, SAF 73, ABJ 56, TOL 45, WWR 42, DBL 38, FDJ 33, YVM 28, KSY 27, K0AHW 24, W0RXM 24, VFC 21, UAT 20, TNA 14, ECD 11, LQX 10, LIX 9, MVG 8, ONF 8, TSR 8, BET 6, ICV 6, BIM 5, KN0AOQ 4, W0LOW 3, TTX 3, VNL 3, THX 1, VGE 1. (Dec.) W0UAT 34, SVE 30.

**MISSOURI**—SCM, James W. Hoover, W0GEP—SAK, who is 16 years old, received 1st-class telephone and 2nd-class telegraph commercial licenses. OUD rearranged her station and is confined to 80 meters because of a faulty receiver band switch. RCV has a new 55-ft. mast. RTO acquired an 80- and 75-meter transceiver for emergency use. Officers of the Southwest Mo. Amateur Radio Club are YWS, pres.; FXU, vice-pres.; TWL, secy.; ICW, treas.; SPU, act. mgr. K0BBDT has a new B&W 5100 transmitter and reports a small amount of Missouri activity in the Phone CD Party. WIC has a new transmitter and receiver. K0s ACK and BDT are setting up an emergency net for the Wabash R.R. and have a 5-kw. generator. VTF is having line voltage regulation trouble and his activity is reduced. WEQ received an OES appointment and is setting up a state-wide 6-meter net. Interested stations, please contact WEQ or the SCM. Many reports have been received regarding reliable 6-meter schedules up to 150 miles with moderate power. OIV, at Lancaster, received an EC appointment. Officers of the Ferguson High School Radio Club are PWN, pres.; TGD, treas.; PWO, trustee; JWW, sponsor. The club has a rig on 80 meters. Officers of the Suburban Radio Club are ZIO, pres.; YYS, vice-pres.; AKS, secy.; PMU, treas. The Northwest St. Louis Amateur Radio Club has built a prototype 6-meter transmitter to be copied by each member. Avoid late reports in QST by mailing on the first of each month. Traffic: W0CPI 889, GAR 538, GBJ 236, BVL 167, CKQ 121, RCV 100, SAK 93, OUD 78, RTO 61, RTW 39, WAP 38, VPQ 33, KIK 30, OMM 24, EBE 23, HUI 17, PME 17, TWL 12, IIR 10, EEE 8, K0BBDT 6, W0QMF 6, K0ACK 5, W0BUL 5, VTF 5, KA 2, MFB 2.

**NEBRASKA**—SCM, Floyd B. Campbell, W0CBH—Asst. SCM: Tom Boydston, 0VYX, SEC: J.D.J. KN0CDG is about to drop the "N". The Western Nebraska Phone Net meets at 1230 MST on 3850 kc. New officers of the NENR Club are DHO, pres.; GHM, secy. The '56 officers of the Norfolk Radio Club are RHZ, pres.; K0ABT, secy.-treas. DW placed 2nd, DQN 6th, AIN 11th, and RDN 14th in the contest of Radio Products (RAPSCO), of Denver. KN0AKW has a new Globe Scout 65-A. KN0DFO is a new call at Scottsbluff. AKR dropped the "N". K0AKV has a new 15-meter WRL beam. KN0BNP received a new HQ-140X. The Nebraska 160-meter Phone Net meets daily Sun. through Sat. at 1730 CST on 1995 kc. DDP is NCS. Violet, ZWG, is the net reporter. YOY, WZZ and WNU, are eager to set up skeds on 6 meters. EMS, VEY, and BTG showed up in the 7th and 8th Sweepstakes. KN0BQY has a Heathkit AT-1 and a Hallcrafters 8-41W receiver. K0AKR is a new mobile in Scottsbluff using a Heathkit AT-1 fixed. Traffic: (Jan.) W0ZJF 249, AIN 75, MAO 56, FTR 54, NIK 38, ORW 32, K0WBF 32, KN0CDG 31, K0RFD 31, W0ERM 23, TIP 22, ZWG 18, QOU 17, CLH 14, K0RDU 14, W0SZL 13, QKR 11, DQN 8, VGH 8, BEA 7, DDP 7, DDT 6, EGQ 6, OOX 6, KN0BQY 5, W0FBY 5, ZNI 5, FMW 4, HQE 4, IAY 4, KLB 4, NHT 4, CBH 3, OCU 3, VZJ 3, BOQ 2, GTW 2, HXH 2, RBL 2, SPK 2, VRE 2, KN0AKR 1, W0FRS 1, ZWF 1. (Dec.) W0RDN 273, W0AEM 98, ORW 51, ECQ 36, NIK 43, UJK 32, VGH 28, SZL 26, TIP 23, BOQ 19, GVA 19, DDP 15, FRS 14, HXH 14, OOX 13, RMO 13, ZOU 13, NHT 12, VRE 11, KLB 10, BTG 8, PQP 8, LFJ 8, ZWF 7, ZWG 7, IAY 6, BEA 5, NGZ 5, ZNI 5, FBY 4, YWK 4, HQN 3, OCU 3, FMW 2, NBS 2, PNY 2, VTX 2, UJR 1.

### NEW ENGLAND DIVISION

**CONNECTICUT**—SCM, Milton E. Chaffee, W1EFW—SEC: LKF, PAM; LWV, RM; KYQ, MCN and CN, 3644 (0645 and 1845); CPN, 3880 (1800, Sun. 1000); CTN, 3640 (Sun. 0900); CEN, 29,580 kc. With radio conditions good to excellent CN met 26 times, handling 202 pieces or 7.7 messages per session. KYQ, RGB, and RFJ were most consistent reporters. MCN, on 20 times, reported 56 with QNI honors to RFJ, RGB, and IBE. CPN pushed 152 with EGT, YBH, and EWH reporting most frequently. RDS has a new VIK on 75 meters from Norwich. CLD is using a new NC-08 and is checking into CN. Novice (NT) is active on 40 meters. FVW is active on v.h.f. and has applied for OES appointment. When WAZ broke his foot in December, QFQ and FNE erected a new antenna for him to permit continued activity during convalescence. A nice OES report was received from URC. ANU reports a new DX-100 and new Novices IDB and IJU as products of the Glastonbury HS Club. PRT is stirring up c.d./AREC activity at Bloomfield. The Tri-City Club reports activity at New London in its regular bulletin. TD says ex-ANC is now K4HEN. HYF, having completed overtime work, is more active on CN. BGP had fun in the CD Party and

(Continued on page 84)

# Improve Performance with **HAMMARLUND** MATCHED ACCESSORIES

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6" PM speaker with 6-ohm voice coil with power rating of 3 watts. Loaded-type baffle. Available in black or gray wrinkle-finish metal cabinet.

## HQ-140-X MATCHING SPEAKER

8" PM speaker with 6-ohm voice coil in HQ-140-X matching metal cabinet. Power rating of 4 watts. Also available for rack-mounting.

## SP-600 MATCHING SPEAKER

Same as above but housed to match SP-600 receiver. Includes matching transformer for 600-ohm receiver output.

## SP-600 CODAN SQUELCH UNIT

For use with SP-600 receiver. Provides threshold of operation adjustable to any pre-determined level within. RF signal inputs of 0.5  $\mu$ v to 100  $\mu$ v. Change in signal carrier level of 2 db or less completes switching action.

## TYPE XC-100 CRYSTAL CALIBRATOR

May be used with any receiver. Useable range to 55 MCS. Check points every 100 KCS. Complete with front-panel mounting switch. Provision for adjustment for zero beat against primary frequency standard. Special mounting kits available for HQ-140-X, HQ-129-X, and SP-600 receivers.

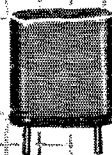
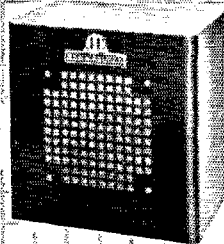
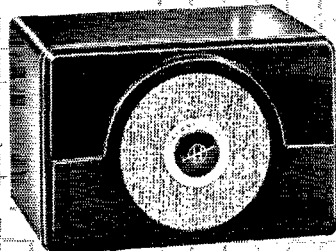
## SP-600 CRYSTALS

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\*Signal frequency not crystal frequency.

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Any vertical position can be obtained from adjustable swivel ball design. Wrenches, ground and solder lugs included. Model WCA-3.



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Bends 100° without damage. Heavy cadmium plating protects against rust and corrosion. Tightening wrenches supplied. Model WCA-3A.



**NEW, Roof Top Antenna** ▶  
Mounts from outside in 3/8" hole. Small but rugged. Includes 12-ft. RG-58A/U cable. Two models: WCA-250 for 2 meter band and WCA-251 for 420-450 mc.

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has a DX-100 on order. CTI, DHO, DXL, and EFW are all sporting new DX-100 rigs. RKA recently became president of the So. Norwalk Savings Bank. New officers of the Hamden Club: BVN, pres.; WHL, vice-pres.; FRQ, treas. and corr. secy.; QXT, rec. secy.; and AEU, act. mgr. AMY has compiled a record of 47 states and 14 countries on 40 meters as a 14-year-old operator with AT-1 and S40-B. YNP has licked problems which aroused the FCC by installing a new Viking II. The CQ Club at Torrington elected DND, pres.; KXB, vice-pres.; KVR, secy.; TZO, treas.; and JLL and HQM, directors. YNR, JLL, and HQM have new 2-meter beams. JLL and DND are mobile on all bands. APA is up to 159 countries and is handling traffic with DX points on 20 meters. BDI is active on RTTY. AVS is P.O. man at Wallingford and wonders if other hams in P.O. work will say so. MPO is running a radio class for c.d. at Wallingford. RAN racked up a score in the CD Party. John L. Reinartz, K6BJ, will speak at a special meeting of the HCARA in Hartford Apr. 23rd, place to be announced later. Traffic: (Jan.) W1YBH 235, AW 227, KYQ 136, RGB 80, LV 79, TYQ 65, EFW 45, BDI 32, APA 30, YNC 27, GIX 20, KV 18, BVV 17, REI 13, RRE 13, AVS 12, RAN/4 12, NLM 10, CUH 6, JTD 6, GVJ 5, ZPV 5, NFG 2. (Dec.) W1TYQ 110, JTD 9.

**MAINE**—SCM, Allan D. Duntley, W1VYA/BPI—TDK and SRW have Bandmaster transmitters. TDK is on the air. SRW soon will be. QUA and JUV are on 6 meters. These 2-meter boys are now trying their luck on 6 meters. WAS converted them. WN1FZQ, North Bridgton, has dropped the "N". TB, one of the old-timers, is now s.s.b., as is PNAI. IGZ is being heard coming out of Bethel. WRZ is on 2 meters and putting out a tremendous signal. YVW is not doing so bad, either. Both rigs are products of LHA, ED. "The Original Ridge Runner" is on with a new T-90, both phone and c.w. UZR has a T-90 mobile and can work WBW cross-band. Our good friend SSF could use a transmitter. Anyone have an idle one? NDE, Forest City, puts out on 2 meters running about 5 watts. It will be hamfest time again soon. Get your dates and places to me two or three months ahead if you want them printed. The many friends of AWN were very saddened at his passing. Al was one of the old-timers who certainly will be missed. You fellows tuning up on net frequencies and bothering them with "dead ones" better watch out. Loss of your ticket could result. Think it over, boys, and let's have ham radio as it should be. YDA now is VFO-controlled. AXX, the "Friendly Game Warden," now is mobile on the ham frequencies. Many radio clubs are holding auctions to raise funds. Why not plan to attend the one nearest you? Traffic: W1KLP 107, WTG 44, FNT 36, UDD 22, DTK 16, FZK 16, YVW 13, K2OPB/19, W1BCB 4, BDP 4, WN1HTD 2.

**EASTERN MASSACHUSETTS**—SCM, Frank L. Baker, jr., W1ALP—New appointments: SX, Alternate State Radio Officer, TWG, Net Control of Mass. State C.D. Mobile Net, on 145.5 Mc. at 9 p.m. daily, as ECs; KBS as OBS. We have a phone and a c.w. net in this section that are very active: TCPN on 3970 kc. at 5 p.m. daily, and the Eastern Mass. Net on 3660 kc. at 7 p.m. Mon. through Fri. If you want to get in on these nets just call in. We are sorry to have to report the death of FUR and RGR. Heard on 10 meters: RUG, YZM, and DWW. Heard on 2 meters: GGV, HTX, IET, CNAL, RPB, IOO, IME, GRH, and 9YPA/1. GRH is going to Greenland. Heard on 75 meters: W1VJ, JEP, ACC, ALX, and LTF. BOA is going in the Air Force. BNS has a B&W 5100 rig. Correction: OGE is treasurer of the North Shore Radio Assn. DYD, Scituate, has a Ranger and an NC-300. The Central TVI Committee of Greater Boston held a meeting at the Customhouse with GAG, CQ, TWG, AKC, ALP, several TV-set dealers, as well as WBZ-TV and WNAC-TV men present. Area 1 Radio Comm. held two meetings with QOL, BL, TQP, AR, DFS LN, KTG, DWY, ALP, ZYX, ZWQ, RM, and SX at one and CQ, BL, AK, ALP, IPA, ZXY, DFS, KTG, TQP and OTK present at the other. Ex-1RCQ is back in this section. The Braintree Radio Club held a meeting. SX gave a talk on "Antenna & Feed Lines" at the South Shore Club. Radio Amateur Open House held a meeting. AYG has his s.s.s.c. on the air again. BVP and DN now have general Class licenses. UIR is helping CTR to get back on 2 meters. UIR is on all bands. NF's XYL gave him a B&W 5100-B. AGE is on 10 meters. IBE is doing a lot of hi-fi work and recording with tape. BGW is active in the East Coast RTTY Net on 3620 kc. on Wed. at 7 p.m. AUQ is checking into EMN. DFY has a TBS-50C on 10 meters. AKN is active on many bands. NUP has 90 watts on 80 through 10 meters. SMO is rebuilding. UBB moved to Beverly. SUR moved to Foxboro. NBS is busy with 6 harmonics at home. NCO is on 10-meter mobile and has a 6-meter Communicator mobile with a beam. NX is on 2, 15, and 80 meters. QHC, on MARS, is on 75 meters. K1WAI has moved to the new Melrose Armory and QHC is Regt. MARS Officer. THR has a new 50-ft. Kuhne Tower. IEF, WN, CED, HLD, KXY, ACL, and CWP were up on Mt. Washington for the recent pickup of the Wide-Wide World program for WBZ-TV. Net certificates have been issued to HLP, ZOP, BSO, ZEN, FMH, HPE, QVK, TUI, OKK, WAIT and

(Continued on page 86)

# PRINTED CIRCUIT 6-METER CONVERTER

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**Sensitivity** 1 microvolt or better

**Output IF\*** (1) 600 KC to 1500 KC  
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**Plate Power** 150 volts to 250 volts DC @ 15 ma to 20 ma

**Heater Power** 6.3 volts @ 600 ma

**Tubes** 6AK5 RF Amplifier  
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**Size (overall)** 4" x 3 1/2" x 3 1/2"

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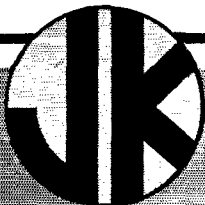
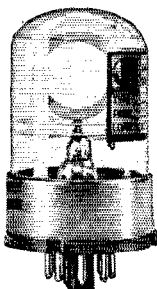
Crystals of extreme stability, over a complete range of 800 cycles to 5 mc.



JK G-3

(Actual Size)

JK G-12A

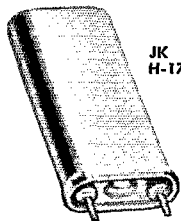


**PRODUCTS**

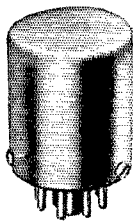
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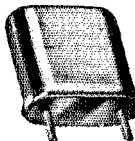
JK H-17T



JK 09

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FRR, who are in the Framingham Radio Club Emergency Net. The T-9 Club met at MVQ's QTH, Hull and Cohasset have a RACES plan in. FQA, new in Cohasset, is on 10 and 80 meters. AQE lost his beam on 2 meters because of winds. TWG has the v.h.f. power amplifier on 2 meters. OFF, JTU and LLY are on 2 meters. SSS is getting out with an off-center-fed antenna with 300-ohm line. KIV is building 813 final. WKM, New Bedford c.d. station on 29,610 kc. Sun. at 10:15 a.m., welcomes any c.d. group for mutual checks. DIY is busy with a tape recorder. DIR is working on the modulator for the rig. WN1HXX is active on 3712 kc. SPE is listening until he gets a phone rig going. UID has mobile rig in the car. UIE chases DX on 20-meter s.s.b. The following members of the Arlington 6-meter Net assisted in the "Mothers March of Dimes": QXX, WJR, HOA, LXR, FWQ, LLY, TMO, NBI, and WBX. CZW is a new ORS. News about 6 from THO: VYB is moving to W6-Land and will have a Gonset all the way mobile. QXX has a TBS-50 on. WN1IET is his son. JOW moved to Auburndale. ZXE, the brother of ZML, is on with a Gonset and a beam. TTG has an NC-300 and a Gonset. BWJ, SPL, and UNB have NC-300s. VHD has 250 to 500 watts on. VCZ is on 6 and 10 meters. CSH is mobile. GPK, UVB, and VSV had to stay over night in Paxton during the last hours of the SS Contest. More calls on 6 meters: AHE, BXV, DID, DVF, DYQ, EHT, FCJ, GWU, GWP, GWQ, IGH, OAZ, PYM, RRP, RUD, SPL, TOG, UIQ, and ZXO. Appointments endorsed: AIME Hull, IPZ Shirley, NCO Acton, KTG Cambridge, MRQ Groveland, ORA Wakefield, TRC Maynard, as ECs; EPE as PAM for 160 meters, also RM for 30 and 100-meter c.w.; AQE as RM for 40 meters; MME, QIC, and AVY as OBSs; AIME, MRQ, and ABJ as OPSs; NBS, MRQ, AQG, AQE, and TY as ORSs; AVY, RQZ, and UR as OBSs; AOG as OBS. THY is Radio Officer for Marblehead. MAN is going to N.Y. at night. WN1FHJ has a Heathkit AT-1 on 40- and 80-meter c.w. CLF is not too active because of a fall on the ice. QLT is building equipment. WOS has her General Class ticket. HKQ is a new ham. VKF has a new daughter. The QRA holds code and theory classes every Tue. night at the Wakefield YMCA. CUC sent in his OES certificate for endorsement. Traffic: (Jan.) WIEMG 435, EPE 156, KIUSA 126, WIBE 110, UKO 89, BOA 71, AVY 54, UE 32, TY 22, BGW 20, AUQ 18, SSZ 14, BY 10, ZNQ 10, AKN 7, DFY 7, AHP 6, HWE 5, LLY 4, ABJ 3, NUP 2, QLT 2, SMO 2. (Dec.) WINUP 37, DIR 2.

**WESTERN MASSACHUSETTS** — SCM, Osborne K. McKeraghan, WIHRV — SEC: RRR, RM: BVR, PAM; QWJ. The WMCW Net meets on 3560 kc. Mon. through Sat. at 1900 EST. ORS and OO Class IV appointments go to DWA, along with a net certificate. ORS endorsement goes to UVL. OBS appointment goes to ZEO. The Hoosac Valley Radio Club in North Adams is conducting code and theory classes. The interclub contest between the Springfield and Hartford groups in the V.H.F. Sweepstakes found HCARA again the winner over HCRA. There was excellent participation by both clubs. The HCRA sponsored two QST gift subscriptions through ARRL. One went to VU2EW in India and the other to CE3CB in Chile. HVZ, now living in Pittsfield, formerly was a W3 in D.C. K4AQU, formerly of Virginia, is now RWR, Amherst. TAY reports receiving RACES authorization for Amherst. The Sector 4C Hampshire County group is conducting a 10-meter net Tue. evenings with good attendance and coverage. PHU has a new beam rotator. IOB reports from his new QTH he made his highest score yet in the recent CD Party, using a 4-250 final. JAH is revamping the exciter after 18 years of use. AJX, operating from college in Troy, N. Y., frequently calls into WMN. DPY is building a linear final. AGM has a new Z Match coupler. UPH reports from Iceland that his exam for an Icelandic ticket is due soon and he expects to have a TF call before long. BPL certificates go to ZUU for December and to DWA for January originations. Traffic: WIHRV 172, DWA 151, EOB 127, ZUU 113, BVR 63, TAY 18, AJX 15, BYH 8, AGM 4, JAH 1.

**NEW HAMPSHIRE** — SCM, Harold J. Preble, WIHS — SEC: BXU, RMs. CRW and COC, PAM: CDX, WBM, HOU, and BYS are NCS for the Granite State P.N. WBM also is OBS for that net. Hillboro Co. E.N. is in full operation. WUU has a new Viking transmitter and VFO. RMH has RTTY on the air. ZFP is putting out an FB signal with his new 10-meter beam. RVQ is doing a fine job with his code classes on 11 and 2 meters Mon., Fri., and Sat. from 2030 to 2130 and Wed. from 2100 to 2300. Welcome to the following New Hampshire Novices: HGW, HFF, HHH, HQX, HQZ, HTI, HUK, and HUR. The Concord Brasspounders has started a club newspaper, with RVQ and LVG as editors. The club meets the 1st Thurs. of each month and all hams are welcome. Contact LVG for information on the meeting place. SSK has his new 10-meter rig on the air with a very strong signal at this location. Please check your certificates and send them to the SCM for endorsement. Several are overdue. Traffic: (Jan.) WIGMH 180, SAL 69, COC 38, ASZ 32, FZ 31, HOU 31, PFU 24, ARR 14, CDX 11, BYS 10. (Dec.) WISAL 73, YHI 3.

**RHODE ISLAND** — SCM, Walter B. Hanson, jr., (Continued on page 90)



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Rotary Beam

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Here's a 3 element 10 meter beam with design features that assure Top Performance—consistent DX Results!

The *all new* Mosley "Super Ten" has full length parasitic reflector and director elements teamed with a driven element shortened to permit use of loading coil and link which provides a perfect match to 52 ohm coax line and an exceptionally efficient and convenient coupling.

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*The VPA 1520*

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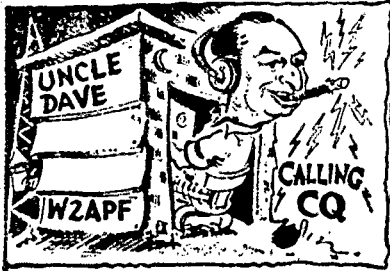
- Forward Gain, 7½db. (each band)
- F/B, 20db., or better.
- SWR, 1.2/1, or better, at resonant freq.
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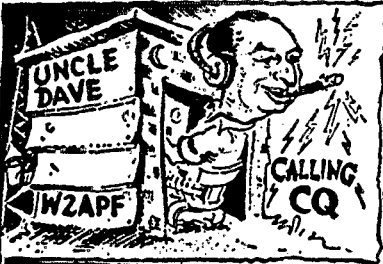
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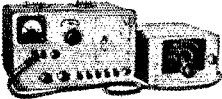
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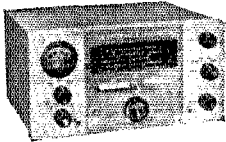
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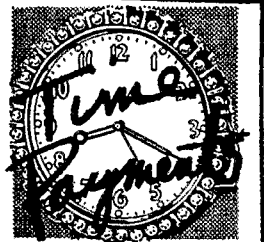
Hallicrafters SX-25 .....	\$ 75.00
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National NC-183 .....	150.00
Eldico TR75TV .....	35.00
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Harvey Wells (TBS50C-APS50) .....	100.00
National NC-240D with speaker .....	195.00
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Hallicrafters S-76 .....	145.00
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Meissner EX Signal Shifter as is .....	25.00
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# TRIPLET

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(Continued from page 86)

WIKKR — SEC: TQW, RM: BTV, PAM: VXC. This space has been vacant for some months, and the chief reason has been lack of reports from the members of the section. The SCM has four or five regulars who report faithfully, but we can't go on month after month just reporting the activities of only a few. The address is on page 6 of QST and we'll report all news turned in. Reports must be in to the SCM before the fourth or fifth of the month to get in the issue two months hence. The RIIN has been picking up customers steadily on 29,260 Mc. every week-day evening at 7:30 p.m., thanks to the regularity of our PAM, VXC, as well as ZDS, ZPG, CEM, SBP, OGT, YAO, WMW, URA, and others. The Bristol County Radio Club already is planning Field Day activities and has a new General Class licensee, JM. BNX is back on with a new home-brew rig after a six-month's silence. The PRA plans to break ground for a new building soon. The BVARC held a bean supper that was pronounced tops by all who attended. Traffic: WIUTA 114, CMH 66, VXC 14.

VERMONT — SCM, Robert J. Scott, WIRNA — SEC: SIO, PAM: RPR, RM: OAK, Nets: VTN, 3520 kc., 1830 Mon. through Sat.; VTPN, 3860 kc., 0930 Sun. only; GMN, 3860 kc., Mon. through Sat. 1200; c.d. nets, 3993 and 3501.5 kc., Sun. 1000. AVP is confined to the house recovering from a recent illness. Best from us all, Bill, and hope to hear you back on soon. OAK is quiet on the air because of a storm-broken antenna. Is the snow too deep for MIMN, Ann? BJP is recovering nicely from his recent illness. Although not allowed to go back to work he has been able to catch up on a little shack-repair work and operating. The Middlebury Mike & Key Club is looking for news letters other clubs are putting out with the intent of improving its own. Any clubs that would like to send theirs to the M&K Club, please address Harriet Proctor, WN1EIB, secy., c/o M&K Club, Middlebury, Vermont. Traffic: W1IT 77, ZNM 53, BJP 37, RNA 23, TAN 21, VMC 19, WOA 18, KGJ 12, VEZ 9, ZJL 2.

## NORTHWESTERN DIVISION

IDAHO — SCM, Alan K. Ross, W7WU — Gifford: VWS, an active Official Observer, has worked 47 states and needs only Rhode Island. Kuna: EMT has settled closer to town but still has room for an antenna — a 40-ft. long centered with one end on a pole on an island in a creek! Caldwell: EYR reports a club meeting — the first time in about three months. SWD is now 75-meter mobile. Smelterville: WHZ reports that a civil defense meeting with county officials was held Jan. 23rd. Kellogg: RQG is through with the shop modernization and is active again. RSQ has the new a.s.b. rig — not RQG, as reported previously. Lewiston: GMC is a new EC and assisted the Lions Club with the March of Dimes program. Others taking part were FM, HDT, IDZ, UJA, and YBV. Burley: A new EC is REF, using a Harvey Wells TBS-50C. St. Anthony: ZLO reports two stations took part in the Idaho C.D. Alert. Boise: New club officers are DOH, pres.; AHS, vice-pres.; and SJI, secy.-treas. Traffic: W7GMC 126, RQG 10, VWS 10, EMT 4, WHZ 1.

MONTANA — SCM, Leslie E. Crouter, W7CT — The Laurel and Billings AREC group did some fine work in preparing for a possible emergency of the Yellowstone River flooding. Those participating were MQI, FTV, YZQ, RDO, ZEK, FBB, SMY, RDM, QGJ, and LBK. ZEK made RCC. SMY has a new off-center antenna for 80 meters. SXG, LUT, SVE, and FUB have new Collins 75-A receivers. DQX moved to Wyoming. KGJ skeds CT/7 nightly on 3520 kc. TKB moved to a new QTH. DAN reports hams in 45 of Montana's 56 counties. Ex-PCZ is now K0CSW in Boulder, Colo. FUB put fins to four daily Weather Bureau readings recently and is making TV tests in the Broadus vicinity. A number of Miles City men are making good use of W1AW's code practice sessions. BTQ passed the code speed test by copying W1AW. SFK reports the Brady gang is making good use of high frequencies. We know YUP, JMX, OGT, REL, DXQ, JTT, WZX, AXG, LER, LNS, LNU, BUK, FIS, KUH, JRG, JRR are active. How about some reports, men? Officers of the new Yellowstone Radio Club are YHS, pres.; YZQ, vice-pres.; PXR, secy.; KGF, UDV, and FVB, directors. Recent endorsements: FUB, KGJ, CT, and TKB as ORSs; FUB and RSJ as ECs; QYA as OBS. Traffic: W7SFK 48, TKB 44, TVX 26, MQI 24, LBK 12, FIS 4, KGJ 4, CT 3. (Dec.) W7TTC 4.

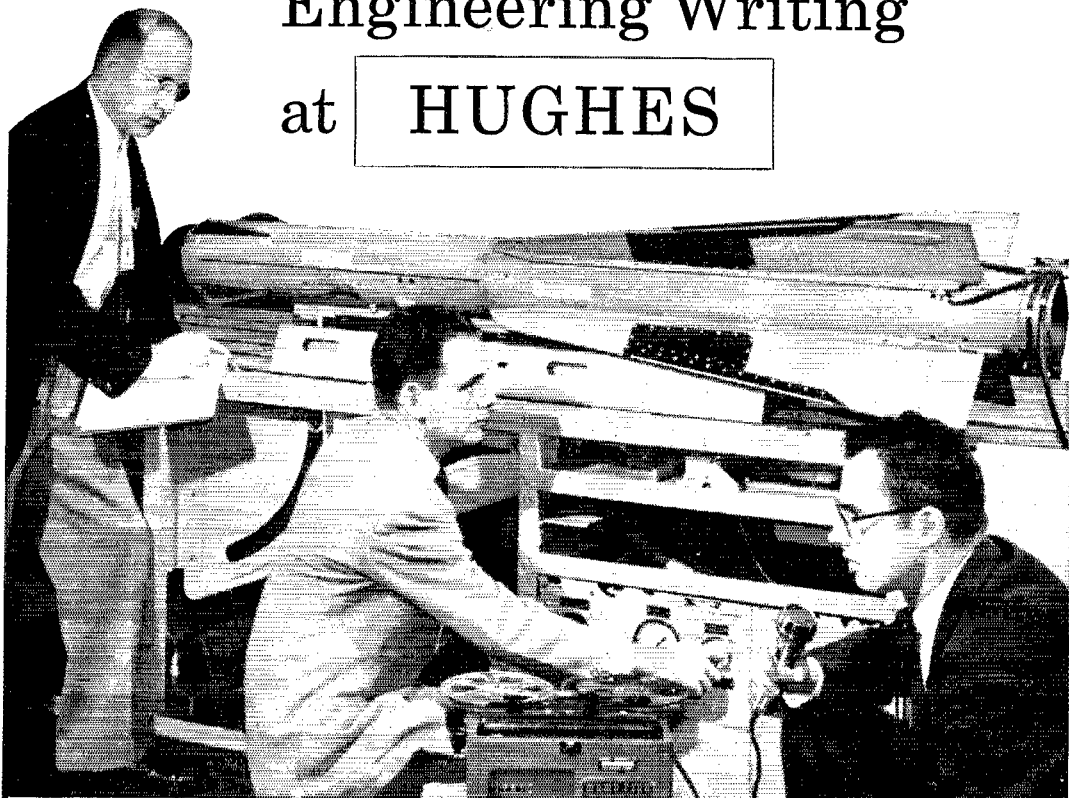
OREGON — SCM, Edward F. Conyngham, W7ESJ — ASK called a bank robber's bluff when the robber threatened to break a bottle of nitro on the floor. RVM lined up KH6BIM/7 to pick up a.s.w. b/c from Antwerp, Belgium, for exchange student Denise Rott. Her parents were on. WFO designed an emblem for the OARS. WTK, AQK, and PQJ applied for MARS. WKA, TAZ, and PQJ are working on better frequency-measuring equipment. The OARS consolidated code and theory classes. TIR is QRL school. GUR is on with a new Ranger. QF is building a 1X-100. NJS is QRL on OEN, Oregon. YLS, and Nylon Nets. GTK is rebuilding. VIL is building 2-meter gear. PHJ is QRL business. YUY and SYF are reporting in on

(Continued on page 92)

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Photo, above: Engineering writer working with Hughes engineers on a design phase of the Hughes Falcon air-to-air guided missile.



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NC-183D	Deluxe Communications Receiver	299.50
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OSN, BDU dropped EC, OSN, and MARS work because of the press of business. QKX built a new VFO for MARS frequencies. UJL completed a DX-100. SMF and OUC are interested in 6 meters. NGW is working 6 meters and publishing a nice PARC paper. ISP is interested in 2 and 6 meters. EUG has a new rig. BXU missed skeds on MARS because of the floods. RQJ lost power. RIM is in charge of K7WBB. TII completed the s.s.b. rig. VN and VBF are at new QTH. BUS has a new b/c station. ZBM is working on higher CP. WXB is interested in 2 meters. ADX renewed EC appointment. New appointments: QYS, as SEC; TAZ, as OO; VIL, as ORS; WKA and RGS as OESs. SYF has registered his station with the law enforcement offices. Red Cross, and c.d. for emergency communications. The Cascade Net changed its name to the OARS Net. Those reporting are PTJ, ZCX, YZM, LRT, PFW, TUX, QEI, QWE, UML, ZDQ, NQE, SFF, YQL, PRU, and GUR. YVE is getting a new 10-meter beam. For the March of Dimes, 10 Marines and a sailor marched from Salem to Portland, taking one step for each dime donated. UTU, UGQ, FRT, TWF, QKU, HDN, OGI, PFW, AEF, SZS, PPQ, JCG, QWE, and OUS furnished mobile and fixed station communication between b.c. and TV stations and the Parade. Traffic: W7QKU 262, PRA 72, HDN 51, OMO 40, BVH 21, BLN 22, WPW 17, AWI 15, TIR 11, VIL 10, GUR 6.

WASHINGTON — SCM, Victor S. Gish, W7FTX — Five made BPL this month — PGY, BA, FRU, and VAZ, and AHV for originations. OE operated portable from North Bend, Ore., during February and from Crescent City, Calif. thereafter. BXH says "My first full month of hamming. Love it." AIB, now retired from the Coast Guard, is awaiting good weather to work on his antennas. EYF enjoys working on nets any time he can get away from work. USO now is on the c.w. and phone nets. EHH says QRM is killing the nets and will kill hams also. NYJ says he misses "YB" on WSN these days. FWD reports cooking is improving and FWR is eating it now. AMC is wasting time building a house — it takes too much time away from hamming. EVW is on 10- and 6-meter mobile. HDT now has 110-volt power supply for his Elmac AF-67 and can operate anywhere. TIQ reports a good time was had in the CD QSO Party. ETO says TVI finally got to Wenatchee and he is QRL with suppression kits and filters. FZB was on in the CD Party but reports conditions poor. AVM gave a talk on amateur radio for the auxiliary of the VFW in Aberdeen and used a Gonset for demonstration. He says there's quite a bit of 2-meter activity in the Grays Harbor Area. TGO says school is interfering with his RN7 activities. WDL is busy on transmitter hunts. CWN now has a Gonset Super-6 converter for mobile use. Spokane news from KTL; HCJ and NXN are causing TVI with their 1½-watt 10-meter rigs; PCV is on with an HT-9, KTL with a 32V-1, YRX with an Elmac A-4. WDL with 150 watts f.m. on 10 meters; BRG got a Viking II from GBU; HCJ is going s.s.b.; the Spokane Radio Amateur Club sponsored a needy family for Christmas with sixty-five dollars donated and is thinking of sponsoring the license plate bill; KTL is trying to make the Windom work. Traffic: (Jan.) W7PGY 977, BA 947, FRU 710, VAZ 605, OE 195, AHV 130, K7WAT 122, W7WOK 48, EYF 40, BXH 36, RXH 33, ATB 30, USO 26, APS 22, EHH 18, NYJ 18, FWD 17, LVB 15, AMC 14, EVW 11, HDT 10, GAT 6, TIQ 6, ETO 5, FLX 5, JFY 5, FZB 3, AVM 2. (Dec.) W7UIN 147, WAH 43, K6BDF/7 30, W7ETO 10. (Nov.) W7WAH 73.

## PACIFIC DIVISION

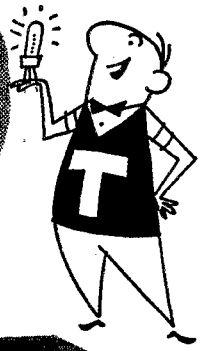
NEVADA — SCM, Ray T. Warner, W7JU — MWR, of Utah, received certificate No. 38 for "Worked 25 Nevada." TYF is the proud pappy of a recent arrival, a son. The Las Vegas mobile group continues to have weekly 10-meter transmitter hunts. OZ6ED recently joined the Southern Nevada Amateur Radio Club and hopes to get his U. S. ticket. A club picnic is being planned for the near future. WN7CCA is Boulder City's newest Novice. VIG, YJB, and VVC made plans for 6-meter activity and should be on the air now. OXX has blossomed out with a new two-letter call — NW. SNARC mobile members assisted on pick-ups in the March of Dimes TV Marathon. JU finally made WAC. JUO completed his new TVIED kw. final. A neat job of good workmanship, Frank.

SANTA CLARA VALLEY — SCM, R. Paul Tibbs, W6WGO — Asst. SCM; Roy E. Pinkham, 6BPT, SEC; NYO. The SCCARA has received the questions from the FCC and is now ready to give Novice and Technician Class license examinations. Anyone wishing to take the examination should contact WGO, club secretary. The NPEC is resuming its meetings on the 3rd Fri. of each month. K6GID has finished the 500-watt final amplifier and is starting on the power supply. YHM is converting the SCR-522 for 2 meters. Don expects to work on a 2-meter traffic net to start soon in the section. K6BAM needs Maine and Vermont for WAS. New officers of the PAARA in Palto Alto are K6DCO, pres.; EXX, vice-pres.; JKI, secy.; K6CQG, treas. PAARA-Graph editor is PKM. K6HGV is rehabing the Globe Scout 65A by taking out the Pi-Net tank and installing tripler and final

(Continued on page 94)

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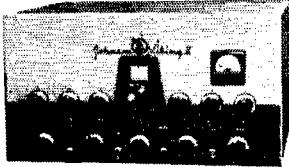
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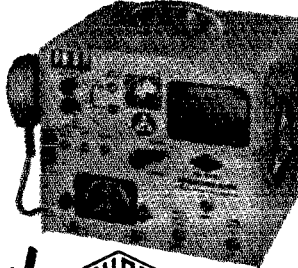


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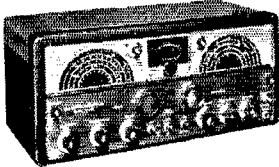
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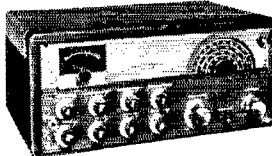
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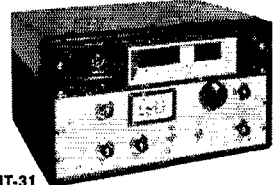
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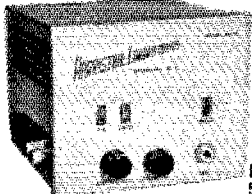
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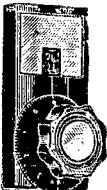
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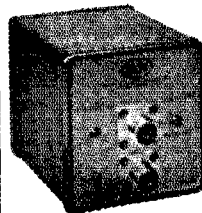
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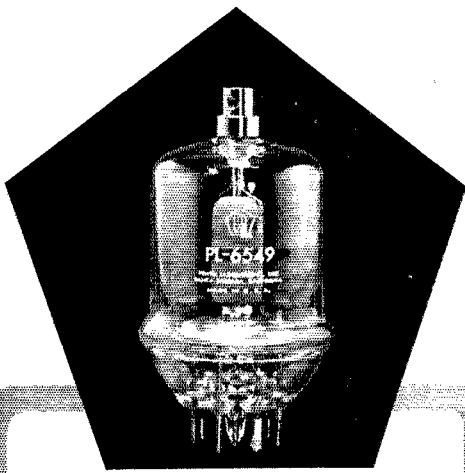
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for the 6-meter f.m. rig and expects to have about 35 watts output on phone and 50 watts out on c.w. He also is building a new rig for 6 through 40 meters with 250 to 375 watts output. K6JFJ says he gets better results on v.h.f. with his beam tilted at fifty degrees rather than horizontal for line-of-sight work. In the V.H.F. Sweepstakes stations in this section were working Sonoma, AJF; Travis 4FB, K6CWB; Ripon, QOZ; Santa Cruz, K6JJK. Stations working 6-meter DX are K6JFJ with Arizona, New Mexico and Texas; MMY with Arizona and New Mexico; K6BBN with New Mexico. These contacts were made between Jan. 12th and Jan. 19th from 1900 to 2015. Traffic: W6YHM 158, K6GHD 101, W6JCG 79, ZRJ 62, AIT 52, BPT 44, HC 39, VZE 32.

**EAST BAY** — SCM, Roger L. Wixson, W6FDJ — Asst. SCMs: Harry T. Cameron, 6RVC; and Oliver A. Nelson, jr., 6MXQ, PAM; LL, RMs: EFD, JOH, and IPW. AXW reports that Jan. 13th was the Hayward Radio Club's ladies' night and installation of officers. ULY, DKE, AXW, and K6HDM were sworn in. ACN was the guest of honor. The club meets the 2nd and 4th Fri. at the Hayward Airport. Code Classes are held Mon. and Thurs. PUH is doing a fine job on the TVI committee. LGW reports that the Mt. Diablo Radio Club members are now working on 2-meter equipment for c.d. Several sets are in operation and a total of ten sets will be finished soon. SXK reports hearing JFB, at Lemoor, at 2200 Jan. 2nd. Cliff claims this is first time he has heard the San Joaquin Valley section from his home QTH. LPW reports the Mt. Diablo C.D. Net is getting a good workout each Mon. at 2000 PST on 145.3 Mc. On Friday, the 13th, the East Bay Radio Club had a hair-raising talk by K6ERR on superstitions and where they came from. The SARO had its January meeting at the P.T. & T., San Francisco, in the form of a dinner on the house and a lecture with a tour of the tape-accounting system used by the P.T. & T. The Oakland Club was honored by John Reinartz, K6BJ, who gave an interesting talk on single sideband finals. John also introduced a new gadget for the ham work shop. It is wonderful to see a man like John Reinartz, who has put so much of his life into amateur radio, still in there pitching. The RTTY group is growing. The latest count is 132. A meeting is planned to form a traffic net which is to include the Pacific Coast and an East-West Net to Chicago and New York. Regular OBS are now in operation and it is hoped that before too long we will have a direct outlet from ARRL Headquarters in West Hartford. K6WAY reports a traffic count of 1102 using two operators. EPC has raised the power to 150 watts and is working some DX on 20 meters. Ed is using an 803 final. He is our newest OO. From the SCM of the East Bay Section to all clubs, appointees, and other active amateurs in this section: These station activities reports have to be mailed in on or before the seventh of each month. In order to give complete coverage of my section I would like to have copies of club "minutes" and other reports in the shack by the first day of each month. I hope to visit all the clubs eventually but time does not permit me to get around to all clubs each month. This column is yours and I intend to include all news I receive. Traffic: K6WAY 1102, W6YIJ 340, K6GK 105, EPC 40, W6YDI 5.

**SAN FRANCISCO** — SCM, Walter A. Buckley, W6GCC — The Marin Amateur Radio Club is becoming very active in Red Cross and Defense (c.d.) activities and is planning big doings during '56 Field Days. VE7AMM, of the Royal Canadian Air Force, attended the Tamalpais Radio Club meeting with GGC. A plan for the club to give FCC Technician and Novice Class tests met with the approval of the group and a committee was formed at once. The annual banquet was held at Ranch Nacasio on Feb. 3rd. BIP and SY were net control for the 10-meter hidden transmitter hunt for the 29ers Club. 2APF visited PHT's TV & Radio Shop when passing through San Francisco recently. The San Francisco Naval Shipyard Club held its annual banquet at the Far East Cafe in San Francisco's Chinatown on Feb. 4th and invited the members of the other Red Cross club, the HAMS, to join them at the dinner. Took a trip to Eureka to attend the semi-monthly meeting of the Humboldt Amateur Radio Club and found parts of the highway open to one-way traffic because of reconstruction of flooded highways. The trip took approximately 1 1/2 hours instead of the usual driving time of 6 or 7 hours. Some of the towns one used to see en route to Eureka were entirely wiped out by flood. CWR has moved from Eureka to Santa Rosa on a new work assignment for the telephone company. K6KGI won recognition as "Student of the Week" on a program over radio station KIEM for the work he did via amateur radio during the flood. VE7AMM, of Canada, attended a club meeting while stationed in the area for a few days. Club officers are K6DGA, pres.; TEX, vice-pres.; LE, treas.; PYL, secy.; JSY, asst. mgr. SLX, EC, wishes to take this opportunity to thank all amateurs who cooperated so well with the boys in the northern part of the state during the Christmas Flood emergency. The National Red Cross held a special meeting on Jan. 22nd. at the National Headquarters in Sacramento. JWF, trustee of RC station CXO; NL, EC of this section; ZLO Asst. EC; GHI Asst. SCM;

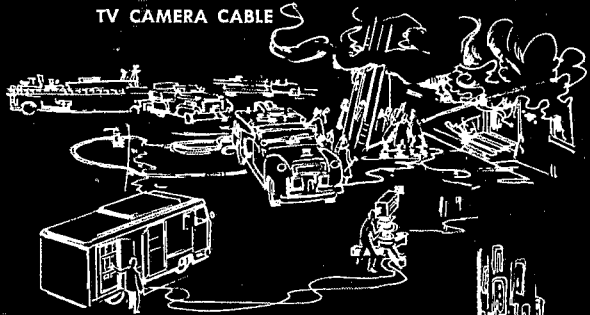
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BROADCAST AUDIO CABLES

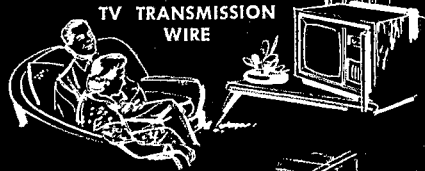


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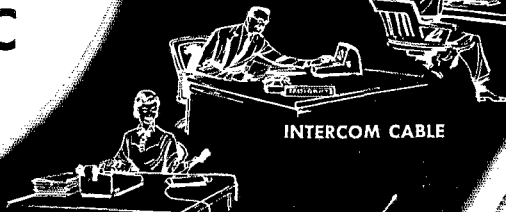
TV TRANSMISSION WIRE



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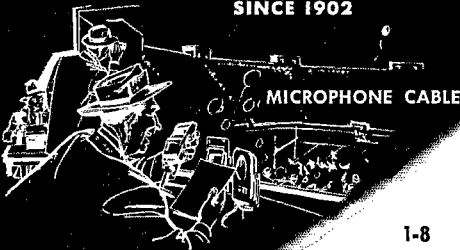


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and GGC attended the meeting along with representatives of both San Francisco and Sacramento Red Cross Terminals. Handling of traffic during emergency was the topic of discussion. OMC spoke on Hi-Power Mysterians and their operation at the San Francisco Radio Club meeting. A second feature was presentation of "50 Years of Amateur Radio," which includes some West Coast stations. BIP worked 340 stations in 62 sections in the Jan. CD Party along with keeping contact with the C.D. Net for late flood traffic. Elmar Electronics has donated a KWS-1 for the National ARRL Convention to be held in San Francisco July 6-7-8th. Injunction was served against K6EI using his rig between hours 10 A.M.-10 P.M. A local lawyer claimed he interfered with his hi-fi; when the case came to court the judge ruled it out saying that the FCC has complete rule of the airwaves not the court. The trouble later was cured with work on the lawyer's hi-fi. Traffic: (Jan.) W6GGY 879, K6IFM 20, W6GGC 12, GHI 10, GQA 8, BIP 6. (Dec.) W6GGY 2050.

**SACRAMENTO VALLEY** — SCM, Harold L. Lucero, W6JDN — SBH was on both c.w. and phone during the January CD Party. CMA reports the new emergency net is doing fine. ILZ worked mobile c.d. on the Levee for 6 weeks. JEQ was quite busy as SEC during the emergency. K6ECP requests AREC membership. K6ORT, working PAN, UTL, and RN6, piled up a total of 946 and this kept him on the hop. The new 8VEN will give you much needed aid. Al, K6ACN moved from Oroville to Redding, and gave much-needed aid to the c.d. during the recent California flood. K6AKF is the new Radio Officer for c.d. LSB reports that the Sacramento group is doing fine on 144 Mc. and the higher frequencies, and checks in on the Sacramento Area Emergency Net. CDT works in to the Bay Area regularly on 420 Mc. Stations active on 2 meters in the Sacramento Area are GDT, PIV, MEB, VBW, KVT, FRP, ILZ, KME, MCR, MIW, MLN, OJB, OTN, PEI, UM, LSB, K6HTZ, CKH, GFI, ERQ, and KN6KDW. These stations would like to ask all 2-meter stations to be on the lookout for them as their need for DX is always in the cards. MIW and PIV are studying frequency measuring at 144 Mc. MWR reports that he was on a c.d. alert, but nothing happened. The rivers didn't hit the level that would cause additional damage. K6GFI is burning a terrific hole in the 2-meter band with 200 watts. Traffic: W6ILZ 51.

**SAN JOAQUIN VALLEY** — SCM, Ralph Saroyan, W6JPU — OO: ZYR. UBK is having transmitter trouble and is heard on 10 meters. LOC is on 75-meter mobile and is Seaside Gas Distributor. JUK is in the Veterans Hospital, Ward 3M, Livermore. K6GTTI is thinking of s.s.b. so is QOS. XY has a new Mosley 20-meter beam. ONK and UBK are new editors of the Fresno Radio Club's dope sheet. Skip, K6GOX worked New Mexico on 6 meters. EXH is recuperating from a heart attack. The Turlock Amateur Radio Club had a backwards 2-meter hunt which was broadcast over KTUR. The RACES program is under way in Turlock, with ERE as R.O. DIY is on 2 meters. K6DBL has a 522 on 2 meters. K6DYM has a new 2-meter beam. K6HNE is chief engineer of KBOX. NTV has a Gonset Linear for 2 meters. K6BGO has a Gonset Linear for s.s.b. L7O is working DX on 10 meters. He is the original "Bakelite Kid." KN6PKA is the XYL of K6PQP. FIS has had a lot of publicity lately. BJT has converted a BC-354 with good luck on s.s.b. Code classes still are going well at C.D. Headquarters, Chandler Field. K6JQN is the call of the c.d. station, operating on 2, 6, and 75 meters. PSQ is handling all Novice exams in the Fresno Area. See you at the Fresno Radio Club, which meets the 2nd Fri. of each month at the Power building. Traffic: (Jan.) W6ADB 170, K6EVM 52, W6EBL 4, SJJ 2, K6CLK 1. (Dec.) W6EXH 53, K6BGO 18.

## ROANOKE DIVISION

**NORTH CAROLINA** — Acting SCM, Allen L. Guin, Jr., W4ZQB — K4DEY has taken over the Tar Heel Net from W4HUL, who did a wonderful job of handling the net. The Charlotte Amateur Radio Club started off the New Year with some very good programs, the first being a talk by FHI on the Cubical Quad. The second program included a talk by KKT and BVQ with the boys constructing a complete 15-meter beam right on the spot. We hear that the Greensboro Club has a new sixteen-element 2-meter beam. Officers elected at the last meeting were ULX, pres.; NHV, vice-pres.; VEF, secy.; and AGD, treas. ARP is keeping his new DX-100 hot handling traffic. BDU has sent more traffic reports to the SCM's office than he has received from the Internal Revenue Dept. FDP turned in a traffic count of 26 and has an ART-13 that he is planning to put on 20 meters. BUV tells us he has a new bug now. CVX/4 and JZQ/4 are both in new QTHs. SGD writes that she has been inactive except for meeting the Tar Heel Net. If you don't think the N.C. C.W. Net is keeping busy, how's this for traffic: IEL 135, BDU 94. The boys still need Asheville and Charlotte to complete their net. They meet on 3555 kc. The Charlotte AREC is planning its Annual Mobile DX Contest on Mt. Mitchell. They would like to invite any hardy mobile

(Continued on page 98)



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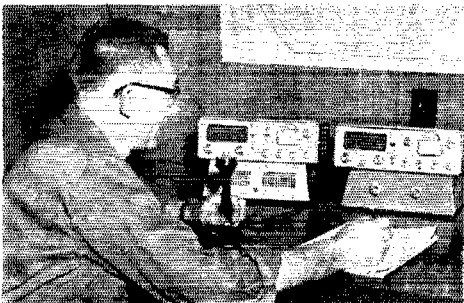
**RAP-250-S**  
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Handy push to talk carbon mike in modern cylindrical case. Amateur net, \$16.95.



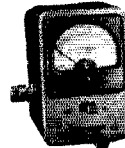
**MLV-50**  
Motor driven variable inductor used to tune mobile whip to operating frequency by remote control. Amateur net, \$24.95.



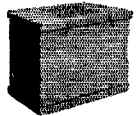
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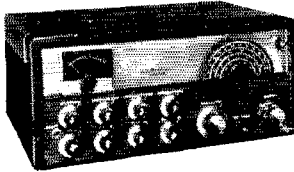
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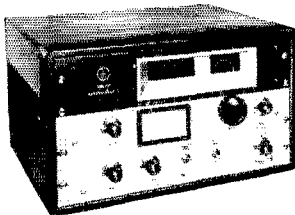
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**MODEL HT-30**  
Transmitter/Exciter

VFO or xtal operation,  
VFO stability is .009%.  
Built-in voice control for  
effortless operation. AM, CW, or SSB at the flick of a  
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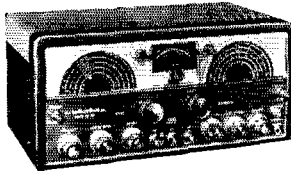


**MODEL HT-31**  
Linear Amplifier

Continuous coverage  
from 3.5 Mc. to 30  
Mc. Pi-net output from  
50 to 600 ohms with  
no antenna tuner. Fully  
metered. Two 811-A's in parallel produce 500 watts  
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**MODEL SX-100**  
Receiver

Frequency range  
538 kc-1580 kc,  
1720 kc-34 Mc. No  
images with dual con-  
version. Selectable  
upper or lower sideband for "round tables". TEE-NOTCH  
filter provides excellent rejection of unwanted signals.  
100 kc. calibrator. **\$295.00**



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I want to trade my.....  
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**PLEASE RUSH ME YOUR LATEST USED  
AND SURPLUS LIST NUMBER 410.**

## C & G RADIO SUPPLY CO.

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operators over the State to participate. There will be prizes to the winner. REW is completing his new mobile, a pair of 4-125s for the contest. How about a little competition, ZG and WSS? A personal thanks for the many reports this month. Traffic: W4LEL 135, K4BTN 132, W4BDU 94, K8XN 28, FDP 26, K4ARP 10, W4BUW 3, CVX/4 2, SGD 2, ACY 1.

**SOUTH CAROLINA** — SCM, B. L. McGraw, W4HMG — ANK is proud of his new 5-kw. generator. UNO reports that mobiles, SSG, GQV, DFW, NDH, JCP, UMW, NTD, CNO, GLJ, UFP, UNO, UMI, VEP and ZPB, assisted by KN4HJK, did a fine job for the March of Dimes in Rock Hill. DYP is proud of the new NC-300. The South Carolina C.W. Net operates nightly and it sounds like the operators are a bunch of old pros, although there is slow code for new members. ZRH, our new SEC, plans emergency tests for each town. Ready? Camden reports a Novice net with KNs EFR, GGP, GLL, and GMV, with DX their guiding light. The Piedmont Radio Club is now the Spartanburg Amateur Radio Club. Officers are K4BEW, pres.; CUB, vice-pres.; KN4DTQ, secy.-treas.; NTO, act. mgr. COA is mobile with that FB signal from Georgetown. AKC reports that the Rock Hill Club is going to press with a monthly bulletin with over 400 circulation. Congrats to K4AVU on his EC appointment for Columbia. We refuse to let ANK retire. He now is Asst. SCM. Congrats, HDR, on the USO award for your many hundreds of messages handled for them. Orchids to DXW and the mobile net. K4AXV mobile has a complete Elmac, record player and 2-way telephone. Traffic: W4HMG 30, DYP 13, YAA 12, ANK 10.

**VIRGINIA** — SCM, John Carl Morgan, W4KX — Traffic continues to burgeon, with all nets showing very healthy activity. Especial credit goes to many of the newer hams, who've been going all-out for originations. TFZ asks for a reminder of ODN and urges more QNIs. IA is daddy of the new "Traffic Hounds' Morning Watch," 3510 kc. from 0715-0745 EST. To QNI just send "ARF" on 3540 kc. SHJ urges more Virginia QNIs for 4RN. A well-earned leave for operator 3QQE dropped PFC out of the BPL for the first time in months. CWB reports much phone patching. LW has a new ship; and planned QNI VN from Gitmo. VAN (ex-8VAN, 3B1W, 3DKD) is on from Roanoke after a three-year layoff. CZB bemoans the fact that only 5 AREC members were recruited from Lynchburg's 28 hams. The Lynchburg Club now is K4HEX. (Continued on page 100)

### WEST VIRGINIA QSO PARTY APRIL 21-29, 1956

The Mountaineer Amateur Radio Association will sponsor a W. Va. QSO Party from 11:59 P.M. EST Saturday, April 21st, to 12:01 A.M. EST Sunday, April 29th. The contest is open to all W. Va. amateurs and to all others who have held calls in W. Va. in the past. Only these contacts may be counted. There are no power or band limitations and the same station may be worked on different bands for credit. C.w.-to-phone QSOs are allowed but cross-band contacts are not permitted. When working W. Va. stations, score 2 points for each QSO when the following is sent and received: date, call, time, city and county. In contacting stations outside W. Va., obtain the above information plus the call sign the operator held while in W. Va. All logs must contain complete information sent and received; incorrect logs will not be counted. The following frequencies are suggested for finding W. Va. stations: 3570 to 3580 and 3890 to 3900 kc. To be eligible for prizes, logs must be postmarked not later than May 10th. They should be sent to William R. Huff, W8LXC, Secretary MARA, 344 Kenmore Street, Morgantown, W. Va. Prizes will be announced at a later date over the W. Va. phone and c.w. nets.

# HOW MUCH SHOULD YOU PAY FOR A GOOD ROTARY BEAM?

The only true measure of value is (a) performance and (b) amount of aluminum per dollar cost. Study these specifications—compare them—and you too will agree, along with thousands of hams, that GOTHAM beams are best!

**TYPE OF BEAM.** All Gotham beams are of the full half-wave plumber's delight type; i.e., all metal and grounded at the center. No wood, tuning stubs, baluns, coils, or any other devices are used.

**GAIN.** Gotham beams give the maximum gain obtainable. Our 2-element beams give a power gain of four (equivalent to 6 db.); our 3-element beams give a power gain of seven (8.1 db.); and our 4-element beams give a power gain of nine (9.6 db.)

**FRONT-TO-BACK RATIO.** We guarantee a minimum F/B Ratio of 19 db. for any of our 2-element beams; 29 db. for any of our 3-element beams; 35 db. for 4-element beams.

**MATCHING.** Matching of the transmission line to the beam is extremely simple and quick. Everything is furnished and the matching is automatic. No electronic equipment or measuring devices are required.

**ASSEMBLY AND INSTALLATION.** No special tools are required for assembly and installation. Entire job can be done by one man in less than an hour. Full instructions are included with each beam.

**MAST.** Any Gotham beam can be mounted on a simple pipe mast. Diameter of the pipe should be between  $\frac{3}{4}$ " and  $1\frac{1}{2}$ ".

**STANDING WAVE RATIO.** A very low SWR of approximately 1.5 to 1 will result from following the instruction sheet, depending on the height above ground and the surrounding area. If an SWR indicator is available, Gotham beams can be quickly and easily adjusted to 1.1.

**STANDARD AND DELUXE BEAMS.** Standard beams in the 6, 10 and 15 meter bands use  $\frac{3}{8}$ " and  $\frac{3}{4}$ " tubing elements; the deluxe models for these bands use  $\frac{7}{8}$ " and 1". In 20 meter beams, the standard has a single boom, while the deluxe uses twin booms.

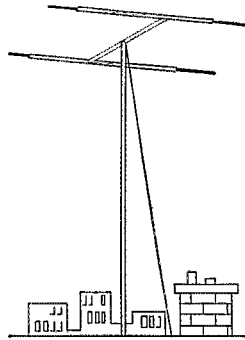
**WHAT WILL A GOTHAM BEAM DO?** A Gotham beam will amplify the transmitted and received signal tremendously and will greatly reduce noise and QRM.

## NEW VERTICAL ANTENNAS

**ENGINEERED VERTICAL ANTENNAS** for 40 meters, 80 meters, 160 meters. Gotham Hobby Corporation proudly announces three vertical antennas for operation on 40 meters, 80 meters, and 160 meters. Each antenna is absolutely complete with 2-12 foot lengths of tubing and a loading coil, can be assembled in less than two minutes, and requires no special tools or electronic instruments for adjustment and operation. Radiation is omnidirectional, with maximum radiation at the very low angles necessary for DX operation. These three vertical antennas have been developed over a period of three years in response to requests by hams for efficient, fool-proof, small-space, low-cost antennas for 40, 80, and 160 meters. Literature available.

- V40 vertical for 40 meters.....\$14.95
- V80 vertical for 80 meters.....\$16.95
- V160 vertical for 160 meters.....\$18.95

**HOW TO ORDER:** Send coupon with check or money order directly to GOTHAM or visit your local distributor. Immediate shipment by Railway Express, charges collect. Foreign orders accepted. Some leading distributors who handle GOTHAM beams: Ottenbach & Keimus, Curie, M. N. Duffy, Alltronic, Purchase Radio, Lew Bonn Co., Henry Radio, Evans, Gib's Ham Gear, Hobe's Radio, Western Electronics, Harris Radio, Capitol Radio, Kinkade, Johannsen, W. H. Edwards Co., World Radio Labs, Graham Electronics, Geo. D. Barbey Co., Hudson Radio, Selectronic, Radio Electric Service, Ken-Elis Radio.



**This Full Size Gotham Cost Only \$21.95 And Brought In 87 Foreign Countries, All Continents And 30 Zones On 35 Watts!**

**MAIL THIS COUPON TODAY!  
10-DAY MONEY BACK GUARANTEE**

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Enclosed find check or money-order for:

### 2 METER BEAMS

- Deluxe 6-Element \$9.95
- 12-El \$16.95

### 6 METER BEAMS

- Std. 3-El Gamma match 12.95
- T match 14.95
- Deluxe 3-El Gamma match 21.95
- T match 24.95
- Std. 4-El Gamma match 16.95
- T match 19.95
- Deluxe 4-El Gamma match 25.95
- T match 28.95

### 10 METER BEAMS

- Std. 2-El Gamma match 11.95
- T match 14.95
- Deluxe 2-El Gamma match 18.95
- T match 21.95
- Std. 3-El Gamma match 16.95
- T match 18.95
- Deluxe 3-El Gamma match 22.95
- T match 25.95
- Std. 4-El Gamma match 21.95
- T match 24.95
- Deluxe 4-El Gamma match 27.95
- T match 30.95

### 15 METER BEAMS

- Std. 2-El Gamma match 19.95
- T match 22.95
- Deluxe 2-El Gamma match 29.95
- T match 32.95
- Std. 3-El Gamma match 26.95
- T match 29.95
- Deluxe 3-El Gamma match 36.95
- T match 39.95

### 20 METER BEAMS

- Std. 2-El Gamma match 21.95
- T match 24.95
- Deluxe 2-El Gamma match 31.95
- T match 34.95
- Std. 3-El Gamma match 34.95
- T match 37.95
- Deluxe 3-El Gamma match 46.95
- T match 49.95

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

### NEW! RUGGEDIZED HI-GAIN 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.

- Beam #R6 (6 Meters, 4-El).....\$38.95
- Beam #R10 (10 Meters, 4-El)..... 40.95
- Beam #R15 (15 Meters, 3-El)..... 49.95

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# MOBILE VHF ANTENNAS

by **TGI**

RANGE: 144-160 MC.



TG-1

TG-2

TG-1 52 ohms, for conventional mounting on standard bumper or body antenna fittings.

TG-2 52 ohms, for direct mounting on trunk of vehicle. Lead passes through center of fitting.

## TGI Will . . .

- Extend Your Coverage
- Help Eliminate "Dead" Spots
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## Why TGI Out-Performs Other Mobile Antennas!

1. Half Wave Resonant Antenna
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Complete Satisfaction of TGI Antenna or Your Money Back Within a 10 Day Test Period.



Add \$.50 for Mailing in the U. S. A.

# Evans RADIO

P.O. BOX 312

CONCORD, N. H.

JAMB reports that K2JZV and W9TJJ are new operators of K4NCP, at Dam Neck. K4GPK is the club call of the Engineers Club at U. Va., with 3RYX, 8VHR, and K2BXX operators. K4BBR is back in Falls Church. TYC is back in Roanoke. UHG is at Hamden Sydney, and FLX is in new Bedford. QTH. New equipment: 20-meter beam at OFR; mobile and beams at K4AET, who skeds his son, 3DAD; mobile for K4ACZ; a Viking at CVO; and a cathode modulator at K4FAQ. Also numerous MARS members have acquired 50- and 72-foot masts which when erected should mean several fat signals. ZM lost his antenna in an ice storm. YZC is the proud possessor of a new DXCC certificate. BRF is DXing on 80-meter c.w. JJJ finally made WAVE. KFC raked up his 231st country and 5th papoose. UCH is trying "forward scatter" with a bucketful on 6 meters. QF and ZPE are hot on 2 meters. Traffic: W4PFC 392, KRR 273, SLJ 204, LA 154, TTF 94, YZC 56, FKP 51, K4AET 50, ACZ 29, W4EMZ 27, CVO 23, K4DBC 23, W4CZB 22, K4BBR 20, W4JUL 18, IF 17, K4DKA 14, DWP 14, W4KFC 13, KX 13, ZM 11, CXQ 10, K4EAQ 10, W4FLX 10, AAD 8, TYC 8, AQA 7, CGE 7, K4NCP 5, W4OWV 5, OFR 2, VAN 2.

**WEST VIRGINIA** — SCM, Albert H. Hix, W8PQQ — SEC: GEP, PAMs: FGL and GCZ, RMs: WFC, GBF, HZA, and JWX. IWB and GCN have transferred out of the State. Both will be missed greatly. ZJS, CLX, and PQQ are building 50-Mc. gear. HI has a 20A s.s.b. exciter and will be on single sideband soon. BKI still maintains a 2-meter out-of-State schedule and welcomes additional local activity on this band. EHA and ITP have been very active lately. WNBZY is near completion toward WAS. He has a Globe Scout 65-A rig and is building a 40-meter vertical. PZT now uses an 8303A in the final. BWD, HEY, HYS, and GIN, all of Weston, are now on 6 meters. GEP now is able to devote more time to SEC activities and is making great strides in boosting emergency preparedness for this State. QWW, of Ripley, is operating with a Collins KWS-1 and a 75-A-4. The Clarksburg Radio Club is moving to the American Legion Home. 4VCH is now located in Elkins. SNP received his WAS recently and is doing a bang-up job on all bands. VCA is now on 10 meters. FUL now operates 20-meter c.w. and UQP is on 20-meter phone. You are all reminded that the Dayton, Ohio, Hamvention will be held this year on April 14th. Contact 8ACE for reservation details. Traffic: W8IXG 130, GBF 99, PZR 78, HZA 75, PBO 66, SEV 55, FUM 47, BWK 43, KXD 41, DFC 35, TGL 35, TWX 32, UYR 22, PQQ 3.

(See West Virginia contest announcement on page 98).

## ROCKY MOUNTAIN DIVISION

**COLORADO** — SCM, James B. Simpson, W0HEM — SEC: NIT, RMs: KQD and MYX, PAM: IUF. The Denver Radio Club has started the ball rolling to incorporate. HXX and UPE have a class of 25 students and are looking for any code training aids. Winners of the Rapsco Amateur Contest for 1955 are SYA, UPT, SPO, 5RFF, QXM, 7GBY, WUY, AIN, DQN, 5DMO, DW, RDN, CND, and QAZ. EHE, at Swedish National Hospital, is on the air and will be glad to see you. SGG is ready, willing, and able with a new Ranger, and KHQ comes up with a Viking 11 and a Viking VFO. Thanks to Carl for the Round Table. CSSN has changed time from 1715 to 1800 Mon, through Fri. K0WBB and TVI alternate as NC. FKY has 35 of 37 states confirmed on 50 Mc. The boys at K0WBB are trying to promote some activity on 2 meters, with not much luck as yet. Anyone having out-dated appointments should mail certificate to Jim Simpson, 825 South Weber, Colorado Springs, and they will be returned at once. Maybe I can get some Colorado Springs news. Who knows? K0WBB was the lone BPL. Traffic: K0WBB 712, W0KQD 411, R0FAM 108, W0NVU 107, TVI 88, KHQ 60, SWK 54, WNS 33, MMT 31, AGU 22, HEU 22, HOP 20, NIT 17, EHE 15, CTI 12, QOT 12, SGG 12, IALL NWJ 10, W5WDEK/06, W0OGO 3, WVG 2.

**UTAH** — SCM, Floyd L. Hinshaw, W7UTM — The Ogden Club held its annual banquet at Old MacDonald's Farm recently and had a fine turnout of 101 persons. Included as visitors were 4IC, Rocky Mountain Division Director; UTM Utah SCM; VTA, ACR, VSZ, and LKM, from the Salt Lake City Club. Ray Clawson, Weber County C.D. Director, also was present. VHS reports he has California and Alabama contacts on 8 meters using 7 1/2 wattal LQE is 75-meter NCS for the Weber County Emergency Net drills. GPN is active on 2 and 10 meters and is 2-meter NCS for the Weber C.D. Emergency Net. SAZ says that BLY, VTC, VTD, LQE, VTJ, OCX, and WQC are active 75-meter check-ins on the C.D. Net drills. 0ZEE/7, at Hill AFB, is active on 75 meters, both mobile and fixed. LQE, NHQ, and OCX are not active on MARS because of the new frequency assignment and no crystals. QDJ now has 500 watts on 2 and 6 meters. Vic reports some TVI so has been doing most of his operating when the TV stations are off the air. Reports received, but not mentioned, will be listed next month because of lack of space this month. Traffic: W7UTM 3.

**WYOMING** — SCM, Wallace J. Ritter, W7PKX —

(Continued on page 102)

# ONLY THIS PROFESSIONAL VHF COMMUNICATIONS RECEIVER GIVES YOU

- Exclusive Automatic Noise Limiter
- Exclusive Squelch Control
- Continuously tunable over entire frequency range of 50-200 mc without switching
- Less than 50 micro-micro watts radiated power as measured across the 50-ohm antenna input terminals

*plus* these quality features

- AM-FM-c.w. selection
- Patented 72" bandspread dial with accuracy of 0.25%
- Beat-frequency oscillator
- Variable selectivity across entire bandwidth
- Antenna trimmer
- Continuously operable — no shut-down time required
- Sensitivity: 1 micro-volt input or less will produce a 10-db signal plus noise-to-noise ratio over entire frequency range
- Stability: effective over line voltage of 105-125 volts . . . better than 0.08% over a -10°C to +60°C temperature and ambient humidity of 0 to 95%



MODEL R5200

Supplied for rack mounting Attractive gray cabinet \$35 additional

**\$875** F.O.B. New Hyde Park, L.I., N.Y.  
Immediate delivery  
One year warranty

19" wide, 8 $\frac{3}{4}$ " high,  
14" deep, excluding cabinet

You'll find this VHF Communications Receiver used in the laboratory to calibrate other receivers; in flight-testing; control tower; propagation studies; evaluating transmitters; meteor research; and of course, as a general, all-around communications receiver. Built to the most exacting standards.



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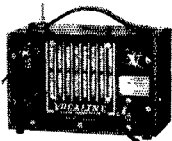
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20-20 JERICHO TURNPIKE  
NEW HYDE PARK, L. I., N. Y.

Representatives located in major cities throughout the country. Write today for the name of the one nearest you!

# ARROW... Equipment Headquarters for Hams!

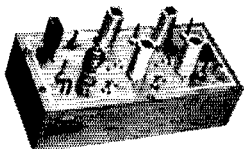
**VOCALINE  
Radio  
Transceiver  
JRC-400**



Amazingly low-priced two-way radio operates on 465 megacycles (Citizens Radio Band), provides satisfactory communication up to 10 miles—depending on location and terrain. Any U. S. citizen 18 years old or more may obtain a station license. No operator's license required.

**Operates on AC or DC current.  
No Installation—just plug into any 115 V.  
AC outlet or attach to 6 volt DC power source.  
Portable, lightweight, compact, durable.  
No tuning required—fixed freq. operation.  
Loud Speaking—true voice reproduction.  
RF Power Output: 2 Watts.  
Tubes: 6AV6, 6AF4, 6AS5.  
Weight: 4 lbs.  
Dimensions: 9" x 6" x 5".**

**Net Price (Complete with Mike).....\$59.75  
Model JRC 400-12 (AC & 12 V.)....\$64.75**



## Tecraft Converters for 1½, 2 or 6 Meters

Widely accepted by Hams, CAP and CD everywhere where top quality performance and highest quality is a must. The IF output frequency range for this model is either 14-18, 26-31 or 30-35 MC for the new NC-300. On Models CC5-50, CC5-144, CC5-220 please specify IF frequency required. Write for free literature.....\$42.50

Model CC5-50 & 144 in kit form....\$29.75

## Sensational Value

### Mobile Carbon Mike

Press-to-Talk with 5-foot coil cord.

Shpg. wt. 2 lbs.

Reg. Value \$16.50

**\$5.95**



All prices f.o.b. N.Y.C.

# ARROW ELECTRONICS INC

65 Cortlandt Street, N. Y. 7, N. Y.  
DlgbY 9-4714

525 Jericho Tpke. Mineola, L. I., N. Y.  
INdependence 1-8030

BHH is doing an FB job on the c.w. "YO" Net. BXS reports a nice visit to LAW. TQP has WAS on 40 meters. WN7ZGU is being transferred to Gillette. UFR advises he wants phone and c.w. on all frequencies. HYW is remodeling his home, losing out on DXCC to PSO. AMU is building mobile for a GMC truck. ACG still is trying to convince all he is boss of the IDO/ACG set-up. PMA is working on a top-secret project. IWF is getting mobile installed. NVI took P.E. Net Control while PKX was down with the flu. The Cheyenne Club is going to hold a "Safety Contest" for all club members. WN7AAF is looking hard for all Novice stations in Wyoming. Let's start a Novice Net, Roy. The Cheyenne Club was initiated into TV via KFBC with the help of Gil. KUB is in Vermont on business. MWS is visiting in Old Missouri. K6BQV is a new YL WAF stationed at Warren AFB. AXG now is top man on the Weather Net with over 200 reports to the Cheyenne Weather Bureau. New appointments: BHH as ORS, NMW as EC, YSF as EC, VTB as EC, KFY as OO, Traffic: W7HDS 80, PKX 74, ZOS 47, AXG 37, NMW 36, PAV 32, MNW 30, BHH 24, TZK 21, NVI 4, PMA 3.

## SOUTHEASTERN DIVISION

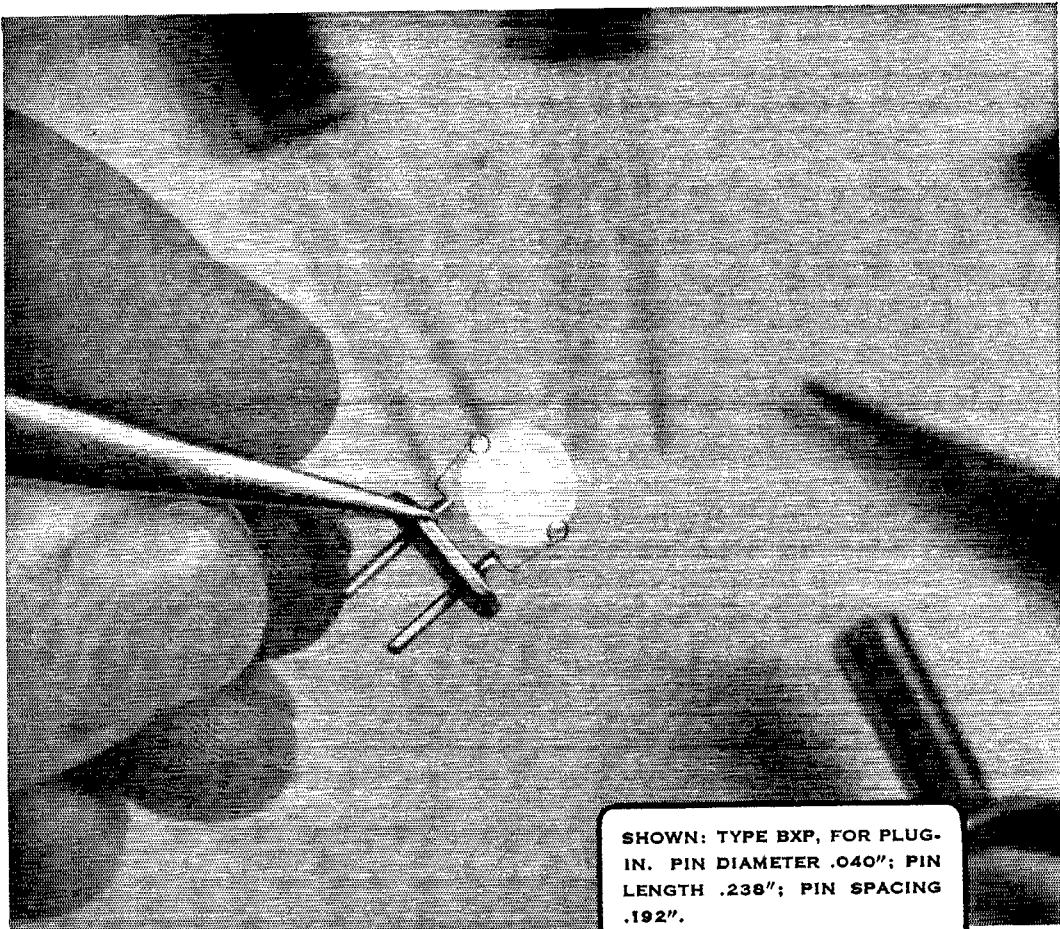
**ALABAMA**—SCM, Joe A. Shannon, W4MI—The new club at Tuscaloosa High School has K4AJG, pres.; KN4HMC, vice-pres.; and Betty Ozment, secy.-treas. KN4HMC, HNJ, and HMQ are new in Tuscaloosa. K4DFV is now Conditional Class in Florence. YNG is back on 80 and 40 meters from Auburn. The Auburn Club now has \$150 for the new club station, UJJ, which is back on with low power. The Anniston Club project of 6-meter emergency rigs on a production-line basis is going forward. EWB now has RACES 2-meter mobile going. CNU reports his new c.w. break-in and monitor are working fine. New Anniston Club officers are HZT, pres.; SVM, vice-pres.; and OAO, secy.-treas. Tuscaloosa Club officers are KN4DSR, pres.; K4GRA, vice-pres.; and HFK, secy.-treas. CHO is working all bands with a new 5100. NLB has moved to Gulfport, Miss. New officers of the Muscle Shoals Club are ZUP, pres.; VY, vice-pres.; and K4DFU, secy.-treas. MEM is trustee. The Mobile Club has a code and theory class going in the RC building and is pushing 2 meters. The following are building rigs for 2 meters: PRS, URW, AMH, WHW, GDD, IAX, and UZE. Three hamfest dates have been announced: Birmingham, May 6; Mobile, May 27 (tentative); and North Alabama, in Huntsville, June 17. Start making plans to attend them all! Traffic: W4RLG 112, K1X 88, WOG 62, EVD 55, YRO 55, DTT 42, K4AOZ 41, W4EJZ 26, ZSH 19, RY 16, K4ACO 14, W4YNG 10, TXO 9, EWB 8, K4AAQ 7, W4CNU 7, OAO 6, WHW 6, DXB 4, DGH 3.

**EASTERN FLORIDA**—SCM, Arthur H. Benzoe, W4FE—SEC: LYT, Miami; The Sheriff's Dept., under K4AG, has new 75A-3, B&W 5100, and coax vertical on the 21st floor of the Courthouse for tie-in on the inter-county net. BTM has a new DX-100 and is new president of the DRC. CEJ is QRL traffic along with EYV. The DEN meets each Mon. and is growing under EC YJE. YJE has a new 75A-4, '56 officers of the South Miami Radio Club are SJZ, pres.; RNV, vice-pres.; PAJ, secy.; KGI, club engr. Sorry to hear of the passing away of BYE, former Acting SCM of E. Fla. ZJZ has a new DX-100 and is working on the TVI Committee for Gainesville. K4AIW has a new rotator on the 10-meter beam. WHK now has 180 watts on 10 meters working c.w. DX. LMT reports a 2-meter net in operation between Sarasota, St. Petersburg, Nokomis, and Venice. K4BOS has dropped the "N." Lake County: HSY and VDY are on 6 meters. As club secretary VDY reports the LARA now has 40 members, one of whom drives 88 miles round-trip to attend. Monroe County: EC NQW and AQJ have formed an AREC emergency net with KOH, BCZ, HED, CQW, GXZ, 2ZLD/4, 8AQK/4, ELS, and several others. K4EVY has dropped the "N" and has a new Lettine transmitter. St. Petersburg: The SPARC now has a Technical Committee composed of TMB, chairman, WPF, LTE, and WME. This is to help members with their problems. (If they do not know the answer they will get it for you.) Other clubs might well follow this idea. The Novice Rebel Net (7170 kc. 0800 EST Sat.) now has 25 members. Traffic: (Jan.) W4PJU 517, FPC 435, K4EVY 145, W4IYT 137, GOG 94, WEO 88, LMT 77, AHZ 40, PZT 38, WHK 38, ZIR 38, RWM 35, K4AEW 34, W4BWR 33, FSS 22, ZJZ 15, FE 12, EHW 8, WEM 6. (Dec.) W4ELS 345, WS 193, FSS 38, EHW 7, KN4CEH 2.

**WESTERN FLORIDA**—SCM, Edward J. Collins, W4MS/W4RE—SEC: PLE. ECs: HIZ and MFY. QK puts out an FB signal on 75 meters for the Hurricane Net. K4DDD is making himself heard on 10 meters. UUF promises a 32-element job on 144 Mc. JLW has up a new 60-ft. tower with 3 on 20 and 6 on 10 and 15 meters. MEN comes to life again. FHQ reports the c.w. pounding. K4GEV is now in the area. YUU keeps several fellows interested in OO jobs over Tallahassee way. RDC is back on 10 meters. HJA has a new beam up and is enjoying 20 meters. PAA can only say "CQ Dog Xray." HI, UCY acts as MC on the 10-meter net nightly. DAO/DEF has a new Viking Ranger and works all bands. JPD keeps to 40-meter phone.

(Continued on page 104)





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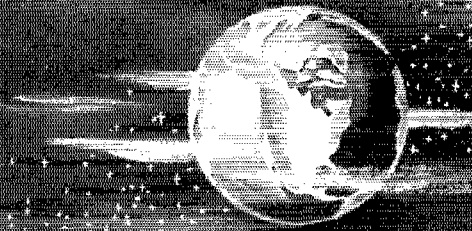
CCY keeps snagging the choice DX. BGG is building another beam. HBK fights key clicks and three-element beam. GMS has a new 15-meter beam and 10B exciter. MS built a new grounded grid final for the s.s.b. rig. WKQ ran up a swell score in the SS Contest. K4AH enjoys low power on 7-Mc. Phone. ZFL helped with J1W's antennas. ZPN is enjoying phone after years of c.w. VR has been showing the gang an FB fist on 7 Mc. RZV still is on the Gagwood Net. I would appreciate hearing from stations interested in ORS, OBS, and OPS appointments. MUX can be heard operating on nearly all bands. DHP is talking towers. KN4EEG should be ready for his General Class exam. The Pensa Amateur Radio Club will be moving to new headquarters at the Airport. PTK and TTM have been missed in the round tables. K4AKP is heard pounding out traffic. HI. AXP made a trip to W5-Land. DXQ is being crowded by new overpass and traffic.

GEORGIA — SCM, George W. Parker, W4NS — SEC: YTO. PAMS: LXK and ACH. RMs: MTS and PIM. Nets: Georgia Cracker Emergency Net meets Sun, at 0800, Tue. and Thurs. at 1830 EST on 3995 kc. The Georgia State Net (GSN) meets Mon. through Fri. at 1900 EST on 3580 kc. K4BMD, of Tifton, is setting a record on GSN; he missed only two sessions during the month. Net manager PIM reports that stations still are needed in Macon, Savannah, and Thomasville. Our sincere sympathy to RSY on the loss of his dad. New officers of the Columbus Club are: WXXW, pres.; PZL, vice-pres.; AHA, secy.; KN4ETY, treas.; and K4BAI, act. mgr. DJW, in Savannah, has a new 20-meter mini-beam and is now running 350 watts to a new 813 bandswitching rig. BYJ has a new Z-match. LNG now is active on 6 meters with a new 820-B final. He has a new 144-Mc. converter with 41YAs in the r.f. stages and is working on a new transmitter for that band with a 5894 final. ZSC has completed his WAS and is now hunting DX on 15 meters. MZO has a new B&W with the sideband exciter. The date of the Atlanta Hamfest has been changed to June 3rd to eliminate QRMing another hamfest already scheduled for the 17th. Forty-seven budding hams showed up at the Atlanta Radio Club instruction periods taught by ZD and MTS. It's a boy at 2JJW/4; the OM is Third Army MARS Director. UFE has moved to W5-Land. A new club is being formed in Brunswick. The Atlanta Teen Agers are organizing code classes. Traffic: W4PIM 201, DDD 141, K4BAI 47, W4ZDP 42, ZUF 42, DJW 32, MTS 24, NS 14, BYJ 12, ZD 12, BXV 11, FZO 4, KN4GNO 2.

WEST INDIES — SCM, William Werner, KP4DJ. — ACW is a new member of the AREC. The youngest amateur in Puerto Rico is WP4AEN, the 8-year-old daughter of KP4CC and sister of CX. AEN is on 80 and 40 meters and uses an electronic key! New Novice Class licensees of the Colegio San Jose RC are WP4AED, AEE, AEF, and AEG. DJ is new trustee of club station KP4NY of Colegio San Jose in Rio Piedras. LK has a Sonar SRT-20. MV is building 10-meter beams for MS, ABD, and others. ABA intends joining TCRN as KP4 outlet for Stateside and overseas traffic. ES has a new p.p. 813 s.s.b. transmitter on 75 and 20 meters running 900 watts. MV swapped a DX-100 for a Viking II. DJ installed a prop-pitch rotator in the new tower for the 20-meter Telrex beam. WT operated portable at Villa Nevaras near Rio Piedras using a 12-watt transceiver on 75 meters, while visiting her daughter. HG's DX-100 final tank heats up on 14 Mc. QR, testing on 160 meters in Fajardo, heard QRK at San Juan. AAA has new antennas on 80 and 40 meters. ABO is operating portable from Palmer, P.R. HZ built a DX-100 and is building a 20-meter beam. Twelve-year-old ACW appears in a weekly TV drama. UH received a BW-5100 transmitter. KD moved to a new QTH. ZW is chasing DX. DP has 10-15-, and 20-meter Telrex beams stacked 60 feet high, and a new 75A-4 receiver. CN is on 20 meters with a 500-watt s.s.b. rig and a new 75A-4 receiver. AZ is enjoying DX on 15 meters and is erecting a 60-foot windmill tower for a stack of beams on 10, 15, and 20 meters. MS is recovering from an operation. Neighbors WD and YT, 200 feet apart, cooperate on 20-meter DX and work the same stations. RM replaces RD, and ABN replaces WR, as directors of the PRARC. K2JXI is installing microwave links for I.T.&T. in P.R. DV works 10- and 15-meter mobile going to and from work. ZV/ZW provide phone patches on 14,405 kc. every Sun. ZW has QSL cards from 48 states for his WAS certificate and has worked 105 countries. ZO, at Canovanas, rotates his 20-meter beam with an anti-aircraft gun gear-box and a 20-foot pipe extending into the shack with a crank. ABX talks to his daughter at U.P.R. in Rio Piedras on 3925 kc. through the cooperation of US, DJ, and other Rio Piedras hams. BU is always on 14-Mc. c.w. YX, NCS of the Antilles Net, is off with transmitter trouble. In the meantime FJ and WW, as alternates, call the roll at 7 a.m. and 5:30 p.m. on 3815 kc. Other net schedules are: P.R. Emergency Net, 3925 kc., Wed. 8 p.m. and 3559 kc. Mon. 8 p.m. HM is on 3925 kc. with a TBS-50. VP3YG reports to the 3925 kc. Net using 40 watts. WV is finance officer at Ramey AFB. KV4BA is in the juke-box business at St. Thomas. CC received an Empire DX certificate. Traffic: (Jan.) KP4WT 43, ZW 16, DV 4. (Dec.) KP4WT 111, ZW 57. (Nov.) KP4WT 146.

(Continued on page 106)

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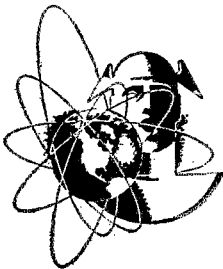
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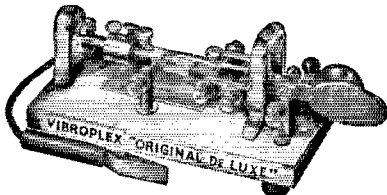
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**CANAL ZONE** — SCM, Roger M. Howe, KZ5RM — The Crossroads Radio Club had its annual election and elected KT, pres.; BY, secy.; JF, treas.; PH, act. mgr.; and VO, asst. act. mgr. Our SEC, WA, announces the appointment of KT as EC for the Atlantic Side. WA has returned from a vacation in Hawaii and U. S. NB has left these shores for W-Land. W6VDA/MM and W6JIE/MM were in town recently. W6VDA/MM promised to bring some motion pictures of a tuna fisher in action with him on his next trip. VR checks into the YLRL Net on 15 meters regularly. There is some talk of reviving our local ham newspaper. We would be glad to see that and wish the backers of the movement lots of luck. NAI and HG are known to have been active in the recent search for the five missionaries who were found killed by savage Indians in Ecuador. Traffic: (Jan.) KZ5VR 85, GB 74, DG 46, JJ 6, RM 6. (Dec.) KZ5MN 8.

**SOUTHWESTERN DIVISION**

**LOS ANGELES** — SCM, William J. Schuch, W6CMN — Asst. SCM: 6JQB, PAMs: MEP and PTB, RM's: BHG and K6DQA. Rio Hondo Radio Club officers are UKC, pres.; TTN, vice-pres.; K6GJU, secy.; K6AHL, treas.; Beachwood Amateur Radio Club officers are UKB, pres.; K6ELL, vice-pres.; K6JHR, secy.; K6BYB, treas.; K6CEO, c.d. mgr.; K6ELX, net control. Officers of the Two Meter and Down Club are K6CBD, pres.; K6CBK, vice-pres.; K6MOQ, secy.; K6CEO, treas. TFS, ONB, and ZLU are on 420-Mc. TV. K6DDO is South of the Border again as XE1PAD. New Novices are KN6PYU, PZY, QAA, QAG, QDJ, and QDL. K6LDG is president of the RTTY Club. K6BAG will run 10 meters on Field Day. Downey Amateur Radio Club officers are WGC, pres.; ZOH, vice-pres.; MTL, secy.; KN6OQF, treas.; K6CHQ, sgt. at arms. LPV is QRL DX. RW was multi-op in the DX Test with MBA, VSS, BUD, QJI, NJU, and HJK as the crew. GJP's vertical came down. The Alhambra District Radio Club is running code and theory classes. Contact W6MLZ or K6IZE for information. Northern and Southern California traffickers had a joint meeting in Santa Maria Feb. 5th. K6OIZ has a new 14-Mc. beam. K6BFC boosted the beam up to 50 feet. K6CHR has a new DX-100. MEP is new manager of the Valley Section of the 2X1 Net. K6GUZ raked up a good score in the January CD Party. KTZ reports a parakeet that CQs. CAK has antenna trouble on 3.5 Mc. LYG turns in a nice report. K6MON and W6YMD are new OOs. The Los Angeles section made a fine showing during the Hood. BUK has a new NC-300. Twelve Los Angeles section traffickers made a jaunt to the Santa Maria meeting. The Hamilton High Radio Club is planning for Field Day. The Los Angeles section QSO Party is set for May 12-13. Rules should be in May QST. CK is going on the road for the summer. Watch for his mobile signal. K6EA is coming back to the Coast. The SCN Net needs c.w. operators. See BHG for information. The 2X4 Net needs c.w. operators for liaison between RN6 and 2X4. See MFP for information. Traffic: (Jan.) K6FCY 522, W6GYH 278, K6KCI 213, MON 202, W6LYG 156, TDO 127, WPF 127, RNY 111, K6BWD 104, W6JQB 101, CAK 98, USY 78, BHG 63, KTZ 56, K6GUZ 17, W6ORS 11, MEP 9, K6BEQ 8, IQF 6, W6GJP 4, K6BFC 3, HOV 3, OIZ 3, W6CBO 2, K6COP 2, HBA 2, IYF 2. (Dec.) W6LYG 535, GJP 49.

**ARIZONA** — SCM, Albert H. Steinbrecher, W7LVR — Asst. SCMs: Kenneth P. Cole, 7QZH; and Dr. John A. Stewart, 78X. SEC: VRB. PAM: KOY. RM: PKW. Arizona Phone Net: Tue, and Thurs., 7 p.m. MST, 3865 kc. Arizona C.W. Net: Tues, and Thurs., 8 p.m. MST, 3690 kc.; daily Mon, through Fri., 1 p.m. MST, 7115 kc. This will be a combined report for the months of December and January. Gila Bend held a picnic during December with a very good turnout. The AARC of Phoenix held its annual Christmas Party with food and presents for all. The OPRC had as its guest speaker, PEY, who spoke on DX. Nat has done an outstanding job on DXCC-plus with only 60 watts. The Cochise County Emergency Net held a simulated emergency with the following 23 check-in stations: AMM (net control station), AOJ, BAM, BXO, CAD, HRS, JZG, MVV, NDR, PBD, PKM, QNC, SQA, TGJ, UKK, VKD, WFX, WUN, WZB, YJR, YJS, ZJT and ZVP. The Field Emergency net control station (AMM and ZJT) was located on Bisbee Hill with a 50-watt transmitter, a doublet antenna, and 1500 watts of power supplied by a gas-driven generator. Start making preparations to attend the Montezuma Well Picnic Hamfest, which will be held this year on June 16th. Reger to OAS, George Olsen, in Phoenix, for further details, reservations, and tickets. Traffic: (Jan.) W7AMM 140, LVR 15. (Dec.) W7AMM 158, PUV 28, LVR 22.

**SAN DIEGO** — SCM, Don Stansifer, W6LRU — EDG, with a transistor transmitter and .004 watts input, is believed to have made the first W/foreign QSO using this type of transmitter. The Upper-Ten Club presented MUJ with a DX-100 transmitter. New officers for this club are K6BCF, pres.; IBS, vice-pres.; APG, director. FBF is a new member. Officers of the North Island Amateur Radio Club are HFX, pres.; K6JXK, vice-pres.; HTF, secy.; treas.; RET, trustee. VR3A, of DX fame, was a recent

(Continued on page 108)

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visitor in the San Diego Area, and attended a ladies' night dinner of the Helix Club, and a special meeting of the San Diego DX Club at the home of OME, ex-TA3AA, a DXer in his own rights. BZE has a new kw, all-band pi-net final and a 700-foot-long wire plus a six-element 14-Mc. beam. Local clubs already are talking about and working on plans for this year's Field Day. K6DYG now is in the Navy. K6KGS passed the Technician Class test. A contact with CT1DJ on 3510 kc. gave LRU a WAC on his fifth band. I am glad to announce that ELQ again is in the traffic business from El Cajon, and again is an ORS. New officers of the Silvergate Club are K6HLL, pres.; K6CZU, vice-pres.; K6IWS, secy-treas. 1956 officers of the Palomar Radio Club are KVB, pres.; K6FSQ, vice-pres.; JPM, secy.; NQZ, treas. The following are Assistant Emergency Coordinators in the northern part of the County: Fallbrook, JPM; Escondido, UJO; Vista, NWI; Del Mar, HTN; Oceanside, OFT; San Marcos, FVA; and Ramona, K6BVP and BVR. KVB is the Northern San Diego County EC and has 28 full AREC members, 26 supporting, 8 official mobile units, and 3 emergency units. Traffic: (Jan.) W6IAB 1920, BKZ 68, K6DBG, 54, W4UOA/6 21, W6CRT 12. (Dec.) W6IAB 3473.

**SANTA BARBARA** — SCML, William B. Farwell, W6QIW — Asst. SCM; Betty Wilson, 6REF, SEC; K6KPU. New hams: KN6PCY, KN6PXR and KN6LFQ. The Ventura Club has an AREC Net every Mon. night on 10 meters and a "problem" drell every other month. The San Luis Obispo Radio Club elected the following new officers: JSJ, pres.; VWT, vice-pres.; K6HSK, secy.; and ENR, treas. Mrs. ENR provided and served the club a feed to commemorate the birthdays of NKT, JSJ, and ENR. This is an annual event. The Santa Barbara Club station, LUC, now has three rigs going for club use; one on 75, one on 10, and one on 2 meters. BND is on 10 meters with a cubical quad. KZO is sporting a new DX-100. K6KPU has a new 80-ft. tower with nothing on top but air. SRI was confined to the hospital for several days for an operation. ISQ is redecorating shack. K6END moved to Ventura. Traffic: K6NBI 123, W6QIW 43, K6KPU 27, W6FYW 4, ISQ 1.

### WEST GULF DIVISION

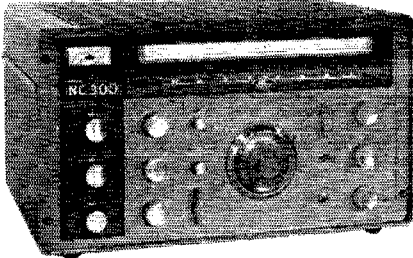
**NORTHERN TEXAS** — SCM, Cecil C. Cammack, W5RRM — SEC; PYL, PAMs: TFP and IWQ. RM: PCN. New officers of the Central Texas ARC are RDL, pres.; and DSG, secy. The club sold tickets for a TV receiver to raise money and is conducting code classes. KN5COD has received an RCC certificate and uses an AT-1 transmitter and AR-2 receiver. The first 2-meter contacts of CZW were SNX, KTX, and NPO. VFH has moved to Phoenix as insurance company Arizona Agency manager. AHC has acquired a 5-kw. generator. FNV has 300 watts on s.s.b. (Orchids to BKH for his cooperative OO activities. Fellowa, there are too many second harmonics from 75 meters showing up. KFT has a new 400-watt Globe King. Lubbock, Waco, Plainview, Odessa, and Abilene clubs reported March of Dimes Tefashion participation during January. YNL reports 40 members of the Plainview ARC are enjoying a handsome club house they built after a successful fund-raising campaign in 1955. NEW was reelected president. ITC has received his Gen. Cl. license and reports ITC, KDJ, K5ATD, BBO, GNO, and KNSDR in the Adamson High Radio Club of Dallas. The XYL of RRM received a 30-ft. tower for her birthday. Why must they nake deliveries at such times! With the sun spots looking up, how about some dope on your rare DX? The Waco Club must pay off the Temple Club with a dinner for being on the low end of the score in the 1955 Field Day. NTO 1955 totals: 364 sessions, 10,029 check-ins, 3679 messages, January NTX; 23 sessions, 167 check-ins, 111 messages. Traffic: W5UBW 987, AHC 264, KPB 192, FNV 130, FIB 97, SMK 46, BKH 44, YPI 27, RP 23, RRM 21, PAK 18, JFX 16, ASA 12, OCY 7, CF 4, KFT 4.

**OKLAHOMA** — SCM, Dr. Will G. Crandall, W5RST — Asst. SCM; Ewing Canada, 5G1Q, SEC; KY, RM: GVS, PAMs: PML, SVR, and ROZ. New officers of the Tulsa ARC are CMO, pres.; EOB, vice-pres.; CTI, secy.; EYK, treas.; KY, pub. chm. The annual issue of the *Tulsa Ham Callbook* will be out shortly. TLL is b.c. announcer in Cushing. EHC is experimenting with transistor circuits. CFG has a regular sked with K6BD, Johnson Is., so pipe any traffic for there to him. The Aeronautical Center ARC has set the date for its annual affair for hams on Apr. 22nd at the Legion Hall at N.W. 50th and McArthur in Oklahoma City. The Oklahoma Phone Emergency Net is preparing to pass the net control around to more members for training in net operation; also this will give some of the severest critics of net operation a chance to strut their stuff. A good idea, don't you think? Some of the delayed reports are because ADC caught the flu with some messages on the hook and could not get them before recovery. No harm was done except to the total for December. Tom Brett, State Civil Defense Director, has announced the appointment of SEC KY as State Coordinator for amateurs working in c.d. 8YLU, at Aeronautical Center, has requested K5YLU from R. I. Traffic: (Jan.) K5AOV 248, W5FEC 46, ADC 40, PNG 36, QAC 32, JXM 19, MQI 18, KY 16.

(Continued on page 110)

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GIQ 14, MFX 13, EHC 12, PML 11, LXH 7, SWJ 7, UCT 7, KN5CBA 5, W5VAX 5, PAA 2. (Dec.) W5GV5 186, SVR 56, CFG 34, MFX 33.

**SOUTHERN TEXAS**—SCM, Morley Bartholomew, W5QDX—SEC: QEM. NZE is on 10 meters with a pair of 4-250As and a six-element beam. CCL is busy converting his mobile gear for the 12-volt system in his new Buick. New officers in the San Antonio RC Emergency Net are EDZ, as NCS; KFD, 1st. alt.; EJT, 2nd. alt.; KOK, SGA, JSJ, JEN, QEZ, RUN, MXY, JCT, HRR, and HRS were guests at the Mesilla Valley ARC in Las Cruces, New Mex. EGH, EXZ, and RUN are operating s.s.b. The Bryan ARC assisted the March of Dimes Drive. FXQ has started construction on a pair of 813s. K5ABW latched on to country No. 100 for DXCC, but still lacks Nevada for WAS. FXN is back on 6 meters. TFY has his monoscope working. Austin RC members assisted the March of Dimes by setting up a transmitter downtown and mobile units picked up donations from those who called local radio stations KNOW, KTBC, and KVET. Joe Pooshee, QZJ, KHU, PRO, TFY, ANQ, QTF, AQQ, YJB, RBZ, OEE, IVQ, HNV, CWD, IOI, JBY, RID, K5CBL, and K5COO participated. New officers of the club are Joe Pooshee, pres.; HNV, vice-pres.; HBM, secy.; POL, treas.; and K5ABW, act. mgr. UIO and WMB set up their 2-meter rigs on the 500-foot tower of KTRF-TV at Lufkin. As usual, conditions were bad, but they did manage to hook JTI in Jackson, Miss. IRP has 32 elements on 2 meters. OZQ has a 75-meter loop with sense antenna. The El Paso ARC dedicated its March meeting to old-timers. Traffic: W5TFY 90, FXQ 66, ZWR 27, K5BYV 13, W5HEX 2.

**NEW MEXICO**—SCM, Einar H. Morterud, W5FPB—The NMEPN meets on 3838 kc. Tue. and Thurs. at 1800 MST, Sun. at 0730; the NM Breakfast Club meets on 3838 kc. daily except Sun. at 0700-0800 MST. K5DAL replaces W5DWT as president of the SBRC. FGZ is mobile and states that code classes have been started at W5FG. K5CDL and CDM have moved to El Paso. OME built a c.d. portable. GQA, our PAM for the past three months, has moved to Hagerstown, Md., to a new job. QDW has moved back to Albuquerque from Louisiana. JWC and POI, both mobile, have been working a little DX. CIN has a Viking II and a Viking mobile. The Los Alamos Club operated two stations at the YMCA open house, and has started a code and theory class. KWP has been working the openings on 6 meters. Approximately 75 amateurs participated in "Operation Ready" Jan. 25th. Many amateurs have received Public Service Award certificates for work during the Farmington and Roswell Floods, and the Sandia Mountain TWA plane crash. Anyone who participated but did not receive a certificate, please inform your EC. Traffic: W5ETF 42, K5FHU 32, W5FPB 21, UAR 14, DMG 9, FGZ 9, ARD 7, CIN 6, BIH 5, BZB 5, SUY 1.

### CANADIAN DIVISION

**MARITIME**—SCM, Douglas C. Johnson, VE1OM—Asst. SCMs: Fritz A. Webb, 1DB; Aaron D. Solomon, 1OC. SEC: RR. New ORS appointees are WP and VU. Bouquets to the VE1 gang who did such a successful communications job during the recent sleet storms and the following flood situations. ABZ made a two-week trip to VE2 and VE3 and had the mobile rig along. AEB is revamping his mobile rig. BN, OO appointee, reports no violations heard. ADII is a new Halifax ham. II, ex-1ME, is heard from Wallace. UT lost his modulation transformer during a strenuous emergency workout. WP has a new HF 10/20 converter. QD, formerly of Sydney, is now in Halifax. FG is active on 14 Mc. LZ is knocking them off on 28 Mc. with a three-element beam. UE is in the hospital in Charlottetown. AB is active again after a long layoff. ZE and PZ are sporting new DX-100s. The CBEN is setting up emergency equipment with power of 100-150 watts, as well as lower-powered mobile gear, for future emergencies. VO3X is working lots of DX on 7 Mc. VO6AH and VO6Q are on holidays in N. S. and the U. S. A., respectively. VE2ATQ was a visitor to Halifax. Traffic: VE1FQ 388, VO6U 78.

### VO6 QSO PARTY

The Goose Bay Amateur Radio Club will hold its Annual QSO Party from 0001 AST, Saturday, April 14th to 2400 AST, Friday, April 20th. All bands may be used. Any station outside Labrador submitting proof of working 5 or more VO6 stations during this contest will be awarded a certificate.

VE1AV 76, AO 59, FX 57, YB 38, AEB 27, WP 24, FH 23, YO 21, VU 18, ME 17, OM 16, DB 12, WK 10, MX 9, GA 8, ONTARIO—SCM, G. Eric Farquhar, VE3IA—This  
 (Continued on page 112)



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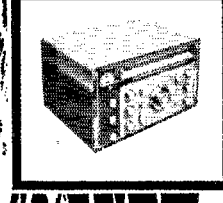
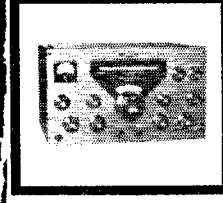
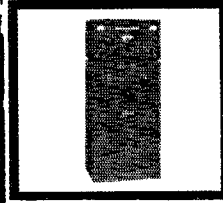
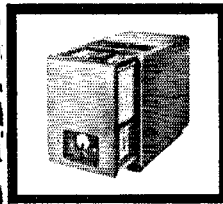
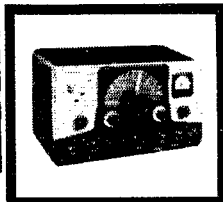
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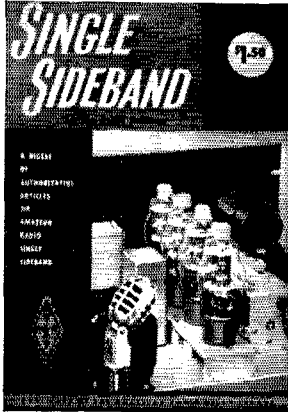
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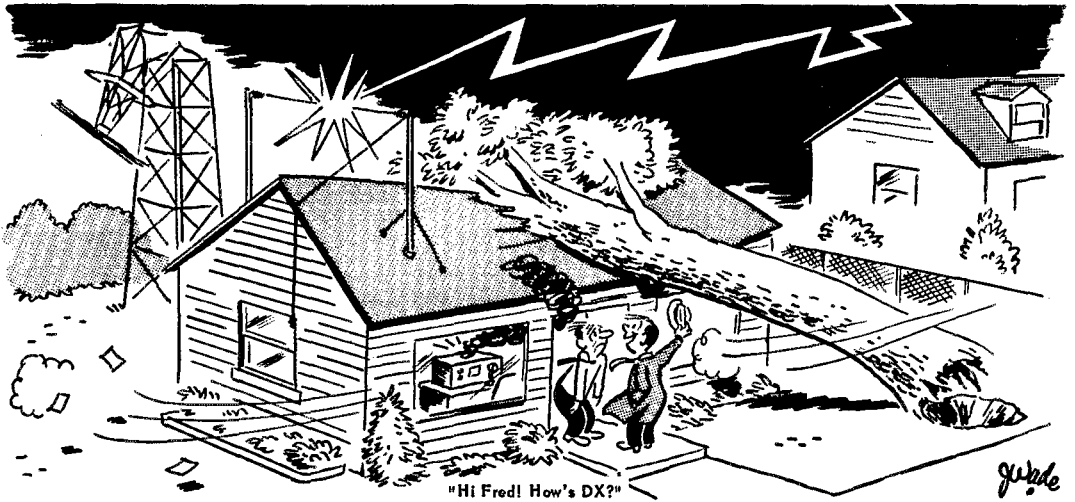
WEST HARTFORD 7 • CONN.

section has many excellent club bulletins, the latest being *Sunspot*, the newsletter of the Brantford ARC. Reviewing its first issue we predict and hope that it will be a standout. ASD solicits 15-meter contacts, RW is active on 2 meters. AUU gets places on 14 and 21 Mc. VL, AJQ, TO, and BVM, of London, are active on 6 meters. IB visited Texas. Code classes for eight hams-to-be are conducted by BQP and ASW. DMU vacationed in Florida. Congrats to the West Side Club, Toronto, on winning the Marconi Trophy for its 1955 Field Day participation. Details of the banquet and its presentation are lacking. RR has a regular 10-meter sked with South America. CJM breaks into the traffic-handling game and ably represents Hamilton as an outlet for OSN, COK, ALL, and TX have fun with hi-fi. Kingston exhibited an amateur radio display recently, we presume at a hobby show. No information was received other than that garnered on the Grapevine Net. How about it, fellows? BUR takes time out from traffic-handling to go DXing on 10 and 15 meters with good returns. The latest phone ticket holder in Brantford is Eleanor, DDA. BWK has returned to 75 meters, after an absence of four years. AEJ and KM like their new receivers, Marge, DZA and Dot, DXZ, are heard on 75 and 10 meters, respectively. DUH and BEG are new assistant emergency coordinators for the Timmins Area. DQL now is Class A. Traffic: VE3BUR 80, NO 68, NG 65, DQX 58, AJR 57, PH 46, VZ 44, KM 38, DPO 32, EAM 28, AUU 23, BZB 21, DH 14, DSX 7, APL 5, CJM 4, SG 2.

**QUEBEC** — SCM, Gordon A. Lynn, VE2GL — BK has changed QTH to Baie d'Urfee and now has his own radio room. CP reports 59 contacts in the CD phone and 33 in the CD c.w. week ends, with 12 in the BERU Contest. UN, the McGill University Radio Club station, skeds the College Net on 3859 kc. Thurs. and Fri. and has as new licensees AOQ, AHF, ABT, and AUE, to bring the total to 20. AIY has a new 813 rig. SC is building a 304TH final for the UN rig, which now has a 4-250 rig, 80 through 10 meters. AHH has 6146 on 40 meters using an RA-1155 receiver. APL, in St. Jerome, has a pair of 6146s c.w. and phone 80 to 10 meters with an SX-88 receiver. ARY is ex-VO2AW and has an 829B on 75 and 10 meters from Morin Heights. AOL and AGI sked daily on 3740-kc. phone. AAE and AIZ are back on the air with all-band transmitters. FL reports activity slightly better than in December and net activity almost normal. NY, GD, and AHY have been appointed AEC for their respective counties. The MARC held elections with the following results: AKY, pres.; BB, vice-pres.; SU, treas.; NI, secy. Other VE2s active in the BERU include NI, YU, RL, BN, W6AFJ/VE2, and GL. Traffic: VE2DR 132, LM 20, GL 18, CP 17, EC 16, ATO 11, FL 8.

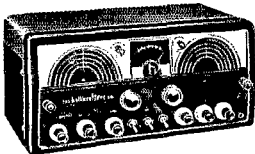
**ALBERTA** — SCM, Sydney T. Jones, VE6MJ — PAM: OD, RM, XG, WL and the Calgary gang are working better distance on 146.7 Mc., having kept contact to Crossfield and back. WC has completed bandswitching the 300-watt rig. TY has been elected secretary of the Calgary Amateur Radio Assn. CF, from Grand Prairie, was a recent visitor to Edmonton and QSOed the home town from MJ's shack. CI has the new rig about completed. The Alberta Phone Net has undergone a few changes with control duties being split between MJ in the north and PV in the south and OD as master control. How about a few more stations checking in? Plan now to attend the Alberta Hamfest being held this year in Edmonton on July 28th and 29th. The usual good time is assured. GW has a new National 300 receiver. The newly-formed radio club at Lacombe is off to a fine start. PP has just returned from Vancouver and Victoria after taking in some Naval training. KC was elected treasurer of the NARC to replace SN, who resigned because of the pressure of business. Traffic: VE6HM 260, OD 18, VE7HD 14, VE6YE 11, XB 4, SS 2, TT 1.

**BRITISH COLUMBIA** — SCM, Peter M. McIntyre, VE7JT — By now those reports from the Island town alleging that amateurs were implicated in some missing gear should have been cleared up as others, as well as myself, are writing civil defense officials to protest the statements allegedly made. If any VE4s or VE5s read this column we might ask them for cooperation for less QRM on a net frequency from 1800 to 1900 hours Mon. through Sat. We respect their net frequencies during their operating net times so ask the same courtesy from them. The BCAREC net frequency is 3755 kc., so please give us a break for the one hour each night. The regular net members are reminded that before net there are some mobiles that would like to QSO on 3755 kc.; but to a few they never give a listen nor even give the courtesy of the 2-second pause that has been requested many times by the SEC. They are in the same class as the switch-happy operators who indiscriminately break and relay after a definite relay station has been given the job. There is a time and place for relays from other stations, but please do it without disrupting the operation of the net. The use of phonetics on relays would save a lot of time for those stations checking in on late or missed call. Do it right and do it slow and it makes it easier copy for the NCSs and the net control. Traffic: VE7AUF 38, ABI 30, DH 27, XY 24, AIO 16.

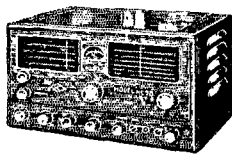


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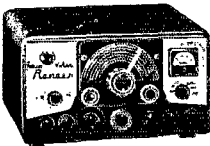
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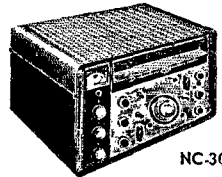
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HALLICRAFTERS S-40B Receiver	69.50
HALLICRAFTERS SX-71 Receiver, less speaker	124.50
HALLICRAFTERS SX-71 Latest Model, less spkr.	149.50
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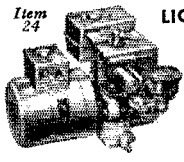
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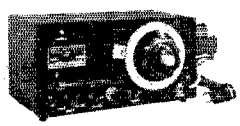
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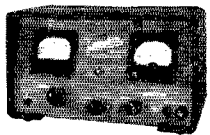
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**Novice TVI Facts**

(Continued from page 17)

that the amateur do any work on a neighbor's TV set. Installation of filters and traps should be left to a TV serviceman. The best procedure is to maintain a hands-off policy, because if something happens to the set after you have worked on it, you'll be blamed.

If you want to add a high-pass filter to your own TV receiver, details of its construction and installation are given in the TVI chapter of *The Radio Amateur's Handbook*. You can buy high-pass filters in any good radio store; they are inexpensive.

In summing up, the following points should be mentioned. It is much easier to clean up 80- and 40-meter harmonics than it is those from 15 meters. In most cases, the use of an antenna coupler will furnish adequate harmonic attenuation for 80 and 40 meters. Remember that when a TV set owner gets interference from you, he doesn't know that his set can be at fault. And, as a matter of fact, he'll probably take a dim view of your telling him his set is to blame. You can readily see that a great deal of diplomacy and tact on your part is required to keep relations on a friendly basis. It's nice to know you're right — but don't be smug about it.

**Dual-Battery System**

(Continued from page 20)

If the battery condition is good, the charging rate should soon drop to a nominal value, showing that the charge on the battery has been brought up to the normal. Fig. 6 shows the charging rates

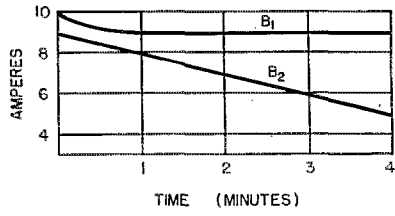


Fig. 6 — After a short discharge, the charging rate of a nearly-charged battery (B<sub>2</sub>) will taper off rapidly, while the rate of a nearly-discharged battery (B<sub>1</sub>) will remain high.

of batteries B<sub>1</sub> and B<sub>2</sub> at a constant terminal voltage of 6.8 volts. Curve B<sub>1</sub> shows that, after one minute, the charging rate leveled off to B<sub>1</sub>'s normally high rate, while curve B<sub>2</sub> indicates a smooth return to a normally-low charging rate. These types of curves, along with other data taken from the panel instruments, can be used later on to check the condition of the batteries and other components in the automobile electrical system.

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- 5 Bands
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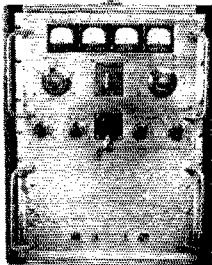
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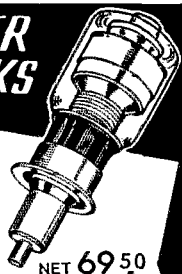
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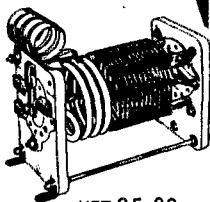


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ELVIN W6TT  
MARIO W6DUB

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## Beer-Can Antenna

(Continued from page 23)

was found that persons with interests in raising beer-can antennas were as scarce as 160-meter wide-spaced rotary beams. When the family was approached for assistance in raising the antenna, the enthusiasm was about as low as the belt buckle on an angleworm's belly. The antenna would just not go up on this day.

### The Zero Hour

The next day the temperature decreased slightly, to somewhere around zero degrees. Snow and cold, of course, do not bother Minnesotans, so the assistance of three other hams was soon obtained with only a minimum of begging, pleading, and coaxing. It finally was agreed that all could be present at 7 P.M. Since the sun sets at about 4:30 this time of year, the assistance of two photoflood bulbs and reflectors was employed to light up the back yard.

At the first attempt the antenna raised almost three feet off the ground before breaking. This break was attributed to a faulty solder joint and was soon corrected. On the second try the antenna went up almost six feet before breaking into three pieces. After more solder and one more attempt, the antenna decided it would rather be a half dozen 6-meter verticals than one 40-meter vertical.

It was at this time that we noticed a direct correlation between professional-looking solder jobs and separated beer cans. It seemed that the cruddier the joint looked, the greater were its chances of holding together. If the picture of W2JTJ's finished product had not appeared in QST, we would never have believed it could be done.

Soon we discovered a new method of approach. This time we put the antenna together vertically, soldering on new sections at the bottom. After blood, sweat, tears, frostbite, and the life of one photoflood bulb, the antenna stood up. Can 32 feet be so high?

We quickly made bets as to how many hours it would stay up. The optimist in the crowd said it would last all night. These cans, soldered at zero degree temperature, really had cold solder joints.

Why it still stands is beyond me. Any minute now it is expected to come tumbling down like the walls of Jericho. The coax cable was not included in the original estimate. The two-bit hank of solder used by W2JTJ turned out to be closer to a quarter-pound roll.

Measuring the impedance at the base with a bridge gave a value of 100 ohms. Oh, well, a 2:1 s.w.r. is not too bad.

The antenna works fine, and it even seems to load up my old 40-meter doublet located a few feet away from it. I just wish it had been up in time for the Sweepstakes contest!

## Young Miss Maass bet her life



**E**VEN at 6:00 A.M., it is warm in Havana. But young Miss Clara Louise Maass felt chilly. Her head ached. Worse, she knew nothing would help.

*The illness starts like any other febrile attack. But soon the face is flushed. There is high fever. After two or three days, the pulse becomes feeble, the skin cold and of a lemon-yellow tint. Chances of recovery hardly approximate 50%.*

In seven pain-wracked days, yellow fever killed Clara Louise. And it was her own doing.

At Las Animas Hospital, Cuba, in 1901, volunteers were needed for the famous U. S. Army yellow fever experiments.

And she, who had fearlessly nursed the worst fever cases, thought undergoing the disease herself would make her a better nurse. She asked to be bitten by an infected mosquito. "I tried to dissuade her," said the medical director. "But she insisted."

So, in what would soon be America's victorious battle against yellow fever, Clara Louise Maass bravely died as she had lived—for others.

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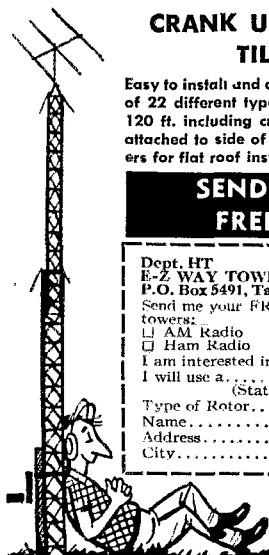
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## Mr. Rapp

(Continued from page 25)

tubing) that there was some "electronic backlash" to this circuit. Reference to the literature disclosed no discussion or report of the effect, and at first it was attributed to the inherent stability of the oscillator. This turned out to be the case but not the explanation; however, it is obvious that an oscillator that doesn't change frequency immediately even when detuned is indeed a very stable oscillator. A further analysis of the circuit disclosed that each tube was acting as a "Q Multiplier" during the half of the r.f. cycle when it wasn't oscillating, and consequently the effective Q of the circuit was higher than had ever been achieved before, even with special components. The author takes no credit for having anticipated this effect, merely for the explanation, but it should be apparent that the circuitry described saves two extra tubes. Since the effect of Q has been likened to inertia, or a "flywheel" action, the advantages of Q multiplication in an oscillator circuit are obvious. Everyone knows that once a flywheel is spinning at a given speed it cannot be made instantaneously to spin at another speed. In practice the slight time lag in changing frequency with tuning (only a few seconds) is no real operating hardship for anyone except perhaps a top contest operator. It affords a good measure of the effectiveness of the circuit, since if you can't observe the effect with the oscillator you build it should be apparent that you haven't constructed a true "push-pull push-push Q-multiplying Harpitts (or Coltley)." But don't settle for anything less!

One final advantage of this circuit should be pointed out, and then you can get busy with your soldering iron. It was observed that any kind of shaping filter or vacuum-type keyer connected in the keying circuit had absolutely no effect! This insensitivity to environment was accepted as another indication of the remarkable stability of the circuit. Eventually the key, with its associated shaping circuits, was placed in a later stage in the transmitter, and the fondest hopes of amateur radio were realized. No chirp or clicks!

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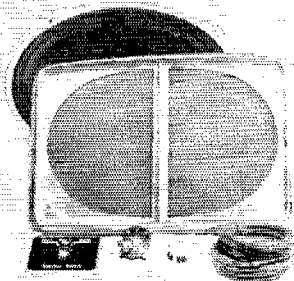
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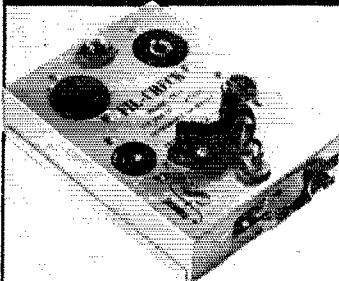
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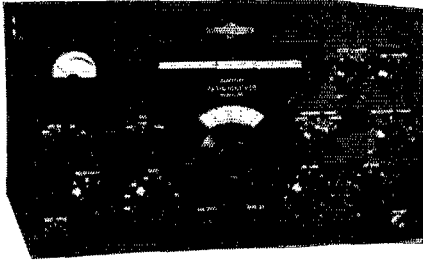
Brand new pocket-sized double duty checker has built-in 7-pin, 9-pin, octal, loctal, and CRT (TV) tube sockets, 15" leads, neon glow lamp, cheater cord socket; hammerstone gray metal case. Fully assembled, NOT a kit! Insert tube in socket, neon lamp indicates if filaments are OK. Test leads applied to circuit will show continuity or dead circuit by neon lamp! For 115V. AC-DC, complete less cheater cord. Ship. wt. 1 lb. Order No. Q-9109. CHEATER CORD (Order No. W-11)

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# RADIO SHACK CORP.

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## The 75A-4



### Designed Expressly for Amateur Operation on the 7 HF bands

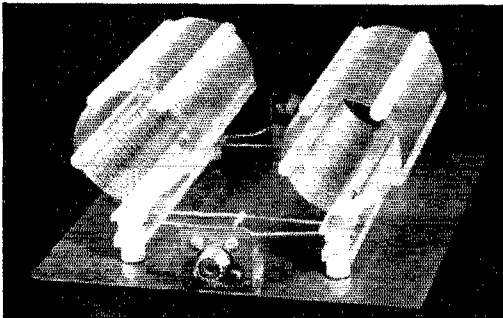
The Collins 75A-4 receiver retains time-proved features of earlier 75A series, plus AVC on SSB and CW, separate detectors for AM and SSB. Pass band tuning, rejection tuning, superior selectivity. Many other outstanding features,

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### air dux BALUN

The Air Dux Balun consists of a pair of bifilar wound coils which are used for impedance matching from transmitter to antenna without adjustment from 10 through 80 meters. A metal mounting plate is available. For further information, brochures, and free inductance calculator, write

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## Push-Pull 6146's

(Continued from page 27)

Along the bottom of the panel, from left to right, are the power-control switch ( $S_3$ ), the clamper-tube biasing resistor ( $R_3$ ), the microphone jack ( $J_3$ ), the meter switch ( $S_2$ ), the audio gain control ( $R_5$ ), the key jack ( $J_2$ ), and the phone-c.w. switch ( $S_4$ ). A.c. connectors and a fuse are at the rear.

The filament transformer,  $T_2$ , is mounted underneath the chassis. This combination 5- and 6.3-volt transformer may, of course, be replaced by two separate units.

If TVI is a consideration, all power wiring should be done with shielded wire, and the by-passes applied as described in the TVI chapter of the *ARRL Handbook*.

A low-pass filter using capacitors with type CM-45 cases, and patterned after one described in the *Handbook*, is attached to the rear of the cabinet in which the transmitter is housed.

### Adjustment

With  $S_3$  turned to the third position (6146 screens grounded), and the key closed, the slider on  $R_2$  should be adjusted so that the VR tubes stay ignited. (CAUTION: *Be sure to turn off high voltage when adjusting the slider!*)

Output on 80 or 40 meters may be obtained with 3.5-Mc. crystals, and output on 40, 20 or 15 may be obtained with 7-Mc. crystals. Output on 10 meters requires 14-Mc. crystals. Output on 15 meters may also be obtained using 10.5-Mc. crystals. The chart furnished with the multiband tuners will show the approximate settings for each band, and resonance will be indicated by a dip in plate current. Each resonance should be checked initially with a wavemeter or g.d.o. to make sure that it is at the desired frequency. The dip in oscillator plate current should be accompanied by a rise in amplifier grid current.  $C_1$  should be adjusted for optimum oscillator output as indicated by amplifier grid current. A grid-current reading of 4 to 6 ma. should indicate adequate excitation. After maximum grid current has been obtained on one of the higher-frequency bands, the 6146 whose grid is connected to  $C_2$  should be removed from its socket, and the grid current to the remaining tube should be noted. Then, the first tube should be replaced, the second tube removed, and  $C_2$  adjusted until the grid current is as close as possible to the value noted with the other tube.

With a load coupled to the amplifier, plate voltage may be applied, and the MB-150 tuned for resonance as indicated by the amplifier plate-current dip. Resonances should be checked with a wavemeter as before. The slider on  $R_4$  should be adjusted to give a screen voltage of 150 to 160 with the amplifier loaded to rated input. (CAUTION: *Be sure to turn off high voltage before each adjustment of the slider!*) Plate current on c.w. should be limited to 300 ma. by adjustment of loading.

(Continued on page 128)

# Gateway



## *to Amateur Radio!*

- ★ HOW TO BECOME A RADIO AMATEUR
- ★ THE RADIO AMATEUR'S LICENSE MANUAL
- ★ LEARNING THE RADIO TELEGRAPH CODE
- ★ OPERATING AN AMATEUR RADIO STATION

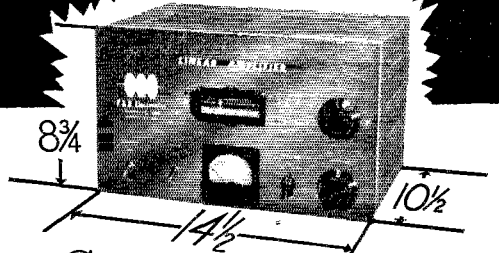
Anyone starting out in amateur radio will find these publications a necessary part of his reading and studying for the coveted amateur radio operator's ticket. Written in clear, concise language, they help point the way for the beginner. Tried and proven by thousands upon thousands of amateurs, these ARRL publications are truly the "Gateway to Amateur Radio."

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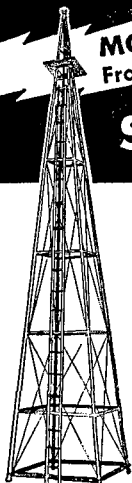
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With  $S_4$  in the phone position,  $R_3$  should be adjusted until the plate current is reduced to half the value normally used for c.w. operation. Then the audio gain control should be advanced until the plate current shows a small upward flicker on voice peaks.

With the VFO mentioned previously driving the 5763, adequate excitation to the final has been obtained on all bands up to and including 14 Mc., quadrupling in the 5763 for the latter.

## Directional Antenna

(Continued from page 31)

may be mounted on the car is important. We have had cases where a transmitter hunter has driven around town and all his bearings pointed at the broadcast antenna on the car. This is not conducive to great success as a transmitter hunter.

Secondly, the site from which a bearing is taken should be chosen carefully. Ideally, an area clear of all obstructions for perhaps 100 yards in all directions should be chosen. Sites of this type are usually quite rare, especially in an urban area. Since the ideal site is usually not available, the actual site chosen should be picked so that it conforms as nearly as possible to the ideal case. This means staying as far as is practicable from buildings, telephone poles, trees, woods, antennas and any other obstructions of this type.

An S meter is also a handy adjunct to the mobile direction finding installation. A simple and effective S meter is a 20,000-ohms-per-volt multimeter used to measure the a.v.c. voltage developed by the mobile receiver. Another convenience is some method of being able to apply either the output of the loop or the signal from the mobile whip antenna to the mobile receiver. A coaxial relay is especially convenient for this purpose.

An acknowledgment is made to W8BUQ, John Braschwitz, and W8GHO, Bob Koren, for helpful advice and assistance in designing, constructing and using the loop antenna described in this article.

## S.E.T.

(Continued from page 42)

Porter Co., Ind.	W9HDB <sup>2</sup>	195
Princeton, W. Va.	W8DFC <sup>3</sup>	---
Pulaski Co. & Fort Leonard Wood, Mo.	W0VPQ	58
Putnam Co., N. Y.	W2HIQ <sup>2</sup>	85
Putnam Co., Tenn.	W4PVD <sup>3</sup>	---
Queens Co., N. Y. (10 Meters) <sup>1</sup>	W2IAG	234
Racine, Wis. <sup>6</sup>	W0SZL	104
Ramsey Co., Minn. <sup>1</sup>	W0HKF	245
Redding, Conn.	W10DW <sup>2</sup>	62
Redwood City, Menlo Park, San Carlos, Calif. <sup>8</sup>	W6EXX	197
Richmond Boro (Staten Island), N. Y.	W2VKF <sup>2</sup>	211
Rock Island & Mercer Cos., Ill. <sup>8</sup>	W9RYU <sup>2</sup>	97
Rockingham Co., N. H.	W1CDX	45
Rockland Co., N. Y.	W2ZTZ	150
San Luis Valley, Colo. <sup>1</sup>	W0KQD	92

(Continued on page 124)



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Collins 75A-3 Receiver	\$375.00
Collins 32V-1 VFO Xmtr.	\$299.00
Collins 32V-2 VFO Xmtr.	\$369.00
Collins 32V-3 VFO (TVI'rd) Xmtr.	\$495.00
Collin 30K Trans.	\$695.00
Eidico TR75 TV 60W, CW Xmtr.	\$ 35.00
Gonset Super-Ceiver w/P.S.	\$ 69.00
Hallicrafter SX28A Receiver	\$159.00
Hallicrafter S36 (27-144 mc.) Receiver	\$ 89.00
Hallicrafter S38D Receiver	\$ 39.50
Hallicrafter SX71 Receiver	\$149.00
Hallicrafter S76 Receiver	\$119.00
Hallicrafter SX88 Receiver	\$399.00
Hallicrafters HT18 VFO	\$ 69.00
Hammarlund SP400X Receiver w/P.S.	\$199.00
Johnson Viking I Xmtr.	\$149.00
Johnson Viking VFO	\$23.50
Lysco 600 VFO CW Xmtr.	\$ 59.00
Elmac P.S.A. 500 (110 Vac P.S.)	\$ 24.50
Morrow FTR Receiver w/P.S.	\$ 79.50
National HR050T Receiver w/coils	\$249.00
National HR050T-1 Receiver w/coils	\$289.00
National HR060T Receiver w/coils	\$349.00
National NC173 Receiver	\$149.00
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RME HF 10-15-20 Convert.	\$ 49.50
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90002	TF1A10AJ001	MGA-3
90003	TF1A16AJ001	MGA-4
90004	TF1A13AJ001	MGA-5
90005	TF1A13AJ002	MGA-6
90006	TF1A13AJ003	MGA-7
90007	TF1A13AJ004	MGA-8
90008	TF1A13AJ005	MGA-9

### PULSE TRANSFORMERS

Freed Part	MPT-1	MPT-2	MPT-3	MPT-4	MPT-5	MPT-6	MPT-7	MPT-8	MPT-9	MPT-10	MPT-11	MPT-12
Blocking Dsc	<<	<<	<<	<<	<<	<<	<<	<<	<<	<<	<<	<<
Interst. Coupl.	<<	<<	<<	<<	<<	<<	<<	<<	<<	<<	<<	<<
Low. pow output	<<	<<	<<	<<	<<	<<	<<	<<	<<	<<	<<	<<
Pulse Volt/wdg	25	3	3	5	3	3	7	3	3	2	3	2
Number a/wdg	2	2	2	2	2	2	2	2	2	2	2	2
Pulse Duration /micro sec.	2-1	2-1	2-1	5-2	5-1.5	7-3.5	1-5	2-1	2-1	2-1	2-1	2-1
Char. Imp., ohms	250	500	500	200	500	700	700	700	700	700	700	700
Test volt KV RMS/wdg	.7	1.	1.	1.5	2.	500	700	700	700	700	700	700

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Seneca Co., Ohio <sup>1</sup>	W8WAB <sup>1</sup>	139
So. Pinellas Co., Fla.	W4HUY	56
Stark Co., Ohio <sup>1, 17</sup>	W8AL	178
St. Johns Co., Fla. <sup>1</sup>	W4UHC	22
St. Mary's Co., Md.	W3BUD <sup>2</sup>	45
Taylor Co., Abilene, Texas <sup>10</sup>	W5ANL <sup>2</sup>	98
Timmins, Ont.	VE3DSX	45
Tipton Co., Ind.	W9AQR	19
Tuolumne Co., Calif.	W6CQI	98
Vanderburgh Co., Ind.	W9WUH <sup>2</sup>	131
Vigo Co., Ind.	W9IHO <sup>2</sup>	119
Wabash River Basin <sup>1</sup>	W9TT <sup>2</sup>	228
Wakefield, Mass.	W1ORA	55
Waltham, Mass. <sup>8</sup>	W1JSM <sup>2</sup>	115
Warren Co., N. J.	W2ZVW	28
Warren-Henderson Cos., Ill.	W9V SX <sup>2</sup>	85
Washington Co., Okla.	W5MGV	128
Washington Co., Wis.	W9SAA <sup>2</sup>	62
Wausau, Wis. <sup>1</sup>	W9VHA <sup>2</sup>	148
Webster, Mass.	W1LIB	25
Whittier, Calif.	W6LVQ	125
Winthrop, Mass. <sup>1, 8</sup>	W1BB <sup>2</sup>	237
Wood-Ridge, N. J.	W2DMJ <sup>2</sup>	85
Wyandot Co., Ohio <sup>1</sup>	W8SPU <sup>2</sup>	48
Wyoming Valley, Luzerne Co., Pa. <sup>18</sup>	W3EU	61

National Point Total 14,618

We know that there were more SET's than those listed above. Newspaper clippings have attested this, and messages from participants saying the EC would report details (which he didn't). But heresy evidence is not admissible in court and we don't admit it to our statistical tabulations either. There were also a few ECs who reported that they had nothing to report. Don't laugh! At least they reported, which is more than a very high percentage of ECs did.

Let's wind up this account of the 1955 SET with some comments and details extracted from the reports:

We in the Tennessee Section are proud of our SET Oct. 8 & 9. The following cities activated their AREC and/or CD nets: Memphis, Knoxville, Chattanooga, Nashville, Kingsport, Bristol, Johnson City, Alcoa-Maryville and Oak Ridge. On Saturday afternoon Oct. 8th, I called a Simulated Emergency Drill, Section wide. W4WGW alerted the c.w. net with 19 stations reporting in. W4RRV was NCS of the phone net with 34 stations participating. Phone and CW nets were connected by W4CXY. Section traffic was brought to the phone net and all out-of-section traffic was handled by the c.w. boys. I want to say that the SEC who is overlooking either c.w. or phone is sure missing a very important part of his emergency organization. — W4RRV, SEC Tennessee Section.

The Alabama section also held a sectionwide drill, a surprise test by SEC W4TKL. Alabama Emergency Net P was alerted at 1347 CST Oct. 8th, completely without prior notice. Members of this net alerted local nets in Gadsden, Lanett, Montgomery, Winfield, Anniston, Birmingham and Huntsville, as well as the section c.w. and teen age nets. In the 27 minutes of the drill, ten nets throughout the section were in action. Nice going, Alabama!

A very fine drill was conducted by the Cape Breton Island, N. S., group under the leadership of EC VE1FH. Simulated high wind and rain completely disrupted all communications lines, and later a complete power failure was introduced. Then a simulated fire broke out in Cheticamp and got completely out of control in the high wind. Rockslides and washouts were also simulated on highways. VE1FH put his boys through a most vigorous test. Sixteen members cooperated from noon Saturday, Oct. 15th until noon Sunday, October 16th. Nine others stood by to offer any assistance needed, with VE1AV providing the Haxfax contact. VE1FH reports that everything went off well and that the event received much favorable publicity, and sent in clippings to prove it. Congratulations to VE1FH and his AREC group on Cape Breton Island.

(Continued on page 126)



## CERAMIC ASH TRAY and BALL POINT DESK PEN

with raised name and call letters (limit of 6 letters to name). Marble-like finish, with gold edge. Gold call letters and modern gold edged name letters. ASH TRAY 6½" x 6½" — DESK PEN 7" x 4½". Perfect as Easter gifts, etc. Allow 14 days for delivery. Price \$5.50 each or combination \$10.75 P.Pd. in U.S.A. Californians add sales tax. Send check or money order today. Print name plainly.

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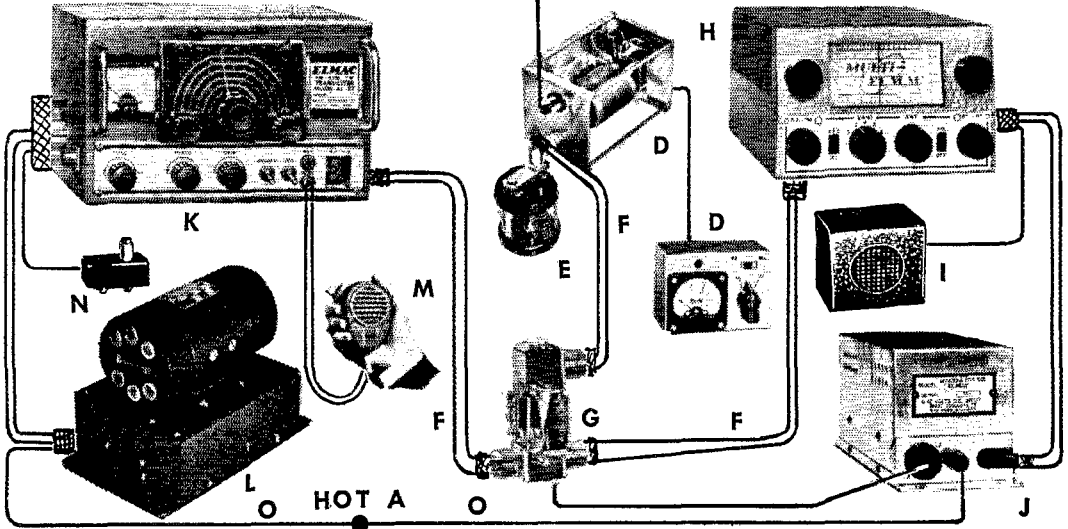
- A. Antenna. Durable Fiberglass 54" top section—\$5.75, and sturdy 36" metal base section—\$4.95. (If you prefer base loading—90" Fiberglass whip—\$6.95) FREE! Your choice of the above with purchase of B.
- B. Sherrick low-loss plug-in loading coil system. The most efficient way—a separate coil for each band, peaked for top performance. The most convenient—each coil snaps in or out of the heavy silver-plated clips. Attractive, streamlined, crystal-clear plastic housing only 3" x 8½", enhances the appearance of any car. Complete with high-efficiency coils for 80,40,20 shorting bar for 10, and full instructions. \$22.50
- C. The best body mount Master makes! Heavy duty stainless steel spring. Shielded coax connector. New type adjusts to any angle. \$15.95 (Coax connector 76¢)
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- E. Master Micro-Z-Match. The solution to the biggest power-wasting problem—it perfectly matches the radiation system to the impedance of the coaxial cable. \$7.95 (T coax fitting—\$1.88)
- F. Coaxial cable. Fresh, low loss RG-8/U. 25 foot coil—\$2.98
- G. Coaxial antenna changeover relay, with push-to-talk auxiliary contacts to quiet receiver, transfer power to xmitter, and chop "yoop." \$12.35
- H. The new, better-than-ever Multi-Elmac PMR-7 Communications receiver. 10 tube, dual conversion, adjustable squelch to cut out stand-by and tuning noise; temperature and voltage compensated, controlled injection BFO for SSB, ANL, etc.—all in a 4½" x 7" x 9½" cabinet! So much better sensitivity, signal-to-noise ratio, and selectivity than many fixed station receivers that lots of the gang are using the PMR-7 in the shack. All ham bands, 10 thru 160, PLUS full standard broadcast band. (Buy your car without radio, and save!) \$159.00 (115 Volt AC power supply with S meter—\$47.00)

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73  
Ed, W2AVA

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- J. Multi-Elmac power supply for receiver (and for transmitter oscillator)—to "zero in" on a received signal). Voltage regulated output, connections for S meter, completely filtered. Power cable plugs right into socket on PMR-7. Works on 6 or 12 volts DC without rewiring. Only 4¼" x 9½" x 9½"—PSR-612—\$34.00. (S meter, in cabinet—\$16.50)
- K. Three transmitters for the price of one! Tops as a mobile, FB as a field CW or phone job with a healthy 60 watt sock, or at home in the shack driving a high power final! That's the Multi-Elmac world famous AF-67. VFO or crystal-controlled, all bandswitch, 10 thru 160. Plenty of dependable performance packed into 7" x 11¼" x 8½"! One plug for all power and control connections, with jumpers for automatic conversion to 6, 12, or AC operation. \$177.00 (115 Volt AC Power Supply—\$49.50)
- L. Dynamotor Supply. Only Harrison brings you this exceptional value in a complete 12 volt supply. Built-in starting relay, RF hash filters, choke and oil capacitor audio filters, fuses, etc. Only 6" high, with latching mounting plate 5½" x 8½". Made for U.S. Navy, conservatively rated to deliver 425 volts at 163 ma, you can draw a lot more in amateur intermittent service. Brand new, with connector plug. RO-14—\$29.95
- M. This top-quality Shure police hand microphone has crisp audio "punch" and is impervious to heat and humidity. High impedance. Relay controlling push-to-talk button. With dash mounting bracket \$18.81 (Shielded 3 way plug—\$1.17)
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- O. Heavy dynamotor cable. 10 feet for \$2.28



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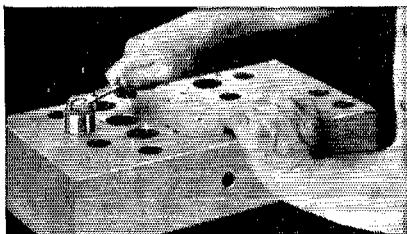
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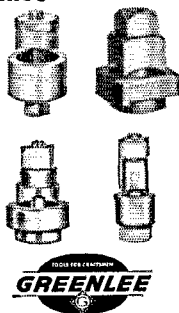
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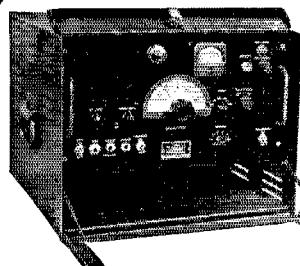
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"This AREC alert was a complete surprise to our members and . . . went off very well." — W2AWF, Albany Co., N. Y. "Everyone thinks we did good to do what we did in the time for planning. . . . We're happy if you are!" — W4FIQ, Cocoa/Merritt Island, Fla. "The eighth annual SET test was a success. . . . Results showed that city could be covered in any emergency." — W1ZPG, Cranston, R. I. "Lack of cooperation on part of local amateurs is delaying organization. . . . Hope to make better showing next time." — W7BDU, Eugene, Ore. "Two meters is 'red hot' for this type of communications disaster." — W9AYD, Grant Co., Ill. "We had the acting c.d. director in one of the mobile units and thoroughly convinced him that we had a working organization in our local emergency net — Red Cross Director also realizes now the true value of the radio amateur in emergency." — W5NQG, Hobbs, N. M. "It was necessary here to change the SET date. . . . The second Monday in October is, in Canada, Thanksgiving Day." — VESTO, London, Ont. "We do not have any active ECs yet, therefore report was all made in one. After the test I had three fellows volunteer for ECs, so some good has come of it." — VE4HL, SCM Manitoba. "Real lousy monitoring of the calling frequencies — never heard either WIAW or W9DUA at any time during test." — W9ICF, Monroe Co., Ill. "All AREC members hold FCC licenses under RACES plan." — W2UF, Ossining, N. Y. "This SET was conducted to show the way amateurs could serve c.d. in this community . . . very big step forward for both c.d. and amateur radio in this community." — W5MWE, Ouachita Parish, La. "The AREC of Porter Co. worked with Red Cross, C.D., Fire and Police Departments of 10 towns. Many faults were discovered and they will be eliminated." — W9HDB, Porter Co., Ind. "All Calling & Emergency Frequencies on all phone bands were completely covered by QSO-QRM." — W6VPP, Pulaski Co., Mo. "Twice as many stations and more than twice as many amateurs this year as in SET last year here." — W8KQD, San Luis Valley, Colo. "No cooperation this year whatsoever." — W1LKP, So. York Co., Me. "The test was the first attempt out of many tests conducted by the League. However, we have been too busy with actual emergencies of late to get into an SET!" — W3EU, Luzerne Co., Pa.

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## Silent Keys

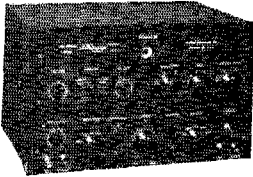
IT IS WITH DEEP REGRET that we record the  
I passing of these amateurs:

W1AWN, Albert I. Whitten, Lincoln, Maine  
W1SIL, Luther O. Durepo, Linestone, Maine  
W2AVD, Theron E. Tappan, Waverly, New York  
W2EA, Otto J. Eppers, New York City, New York  
K2JTH, Robert J. Entrikey, Mt. Holly, New Jersey  
W2LUY, Carl A. Roewer, Hicksville, New York  
W2VJ, James O. Maher, Tuckahoe, New York  
W2VOC, Eino E. Rautio, Ithaca, New York  
W3CBZ, Rev. Paul H. Sheffer, Ferndale, Penna.  
W3EUA, Clarence H. Zeiger, Nazareth, Penna.  
W3FC, Karl T. Gray, Easton, Pennsylvania  
W3NFO, Carlton E. Dietterich, jr., Imperial, Penna.  
W4BFY, William E. McArthur, Miami, Florida  
W4PFA, Staley T. Cates, Atlanta, Georgia  
W4PMC, Henry N. Brock, Cedartown, Georgia  
W4ZL, Fred Muller, St. Petersburg, Florida  
W5BAT, Frank Barnhouse, Dallas, Texas  
W5BDQ, Henry L. Boschert, Duncan, Mississippi  
W5KA, Paul M. Hargis, Austin, Texas  
K6GVE, Fred E. Stull, Gridley, California  
W6NHI, Adair Park, Sunnyvale, California  
W8BAE, Ivo J. Deppenbrock, Cincinnati, Ohio  
W8DXO, John T. Higgins, Hubbard, Ohio  
W8EDY, Orin E. Stevens, Medway, Ohio  
W8MZN, George A. Blauvelt, Flint, Michigan  
W8NAX, Carlos C. Hickock, Flint, Michigan  
W9EXC, Doyno E. Stroman, Kendallville, Indiana  
WN9PJJ (W9PJJ) Durlay D. Imbler, Peoria,  
Illinois  
W9PSN, Harrison J. Mellman, Gary, Indiana  
W9VT, Waldo E. Lisle, Chicago, Illinois  
W0HHZ, Terald J. Johnson, Denver, Colorado  
W0SOI, Dr. Donald W. Tripodi, St. Louis, Missouri



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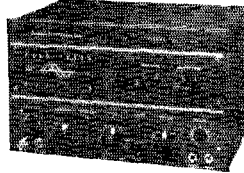


**MODEL  
20A**

20 watts peak envelope power output SSB, AM, PM, and CW. Completely bandswitched 160 through 10 meters — magic eye carrier null and peak modulation indicator. Choice of gray table model, grey or black wrinkle finish rack model.

Wired and Tested — \$24.95 down . . . \$13.59 per month for 18 months.

Complete Kit — \$19.95 down . . . \$10.87 per month for 18 months.



**MODEL  
10B**

10 watts peak envelope power output SSB, AM, PM, and CW. Multi-band operation using plug-in coils. Choice of grey table model, grey or black wrinkle finish rack model. Furnished with coils for one band.

Wired and Tested — \$17.95 down . . . \$14.27 per month for 12 months.

Complete Kit — \$12.95 down . . . \$10.29 per month for 12 months.



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BROADBAND  
LINEAR  
AMPLIFIER**

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Complete Kit . . . \$22.50



**MODEL B SLICER** — Improves the performance of any receiver. Selectable sideband reception SSB, AM, PM, and CW. For use with any receiver having 450-500 KC IF. Complete with built-in power supply and "Q" multiplier.

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**"Q" MULTIPLIER — MODEL DQ** — For AM, CW, SSB with any receiver having 450 to 500 KC IF. Tuneable electronic IF filter for excellent receiver selectivity. Rejects heterodynes to 50 db without affecting speech quality or amplitude of SSB, AM or CW signals. Powered by the receiver — complete with all cables.

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Complete Kit . . . \$22.50

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AP-1 Adapter . . . \$ 8.50  
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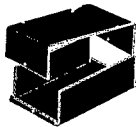
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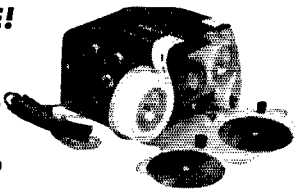
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# V.H.F. Sweepstakes

(Continued from page 48)

W8BOV..	64-32-1-B	K2CMB/2	
W8WYL..	64-33-1-B	3762-209-9-AB	
W8WIE..	58-29-1-B	K2BI..	2720-170-8-AB
W8HEP..	56-14-2-B	W2BWX	2380-119-10-AB
W8XYT..	46-25-1-B	W2CDB..	2184-137-8-AB
W8VIQ..	46-23-1-B	W2AZL..	1920-65-15-B
W8FQL..	44-22-1-A	K2BC..	1920-160-6-B
W8KWS..	44-22-1-B	W2IDZ..	1800-100-9-AB
W8BMO..	42-21-1-B	K2KSH..	1680-140-6-B
W8HTD..	42-21-1-A	W2ISK/2	1620-135-6-AB
W8ORH..	42-21-1-B	W28YR..	1344-84-8-A
W8ZOA..	38-19-1-B	W2IBM..	1260-105-6-B
W8RCA..	36-18-1-B	K2ICE..	1260-90-7-B
W8RBT..	30-15-1-B	W2DZA..	1224-102-6-ABC
W8WAB..	24-12-1-B	K2HLA/2	
W8MXR..	20-10-1-A	1116-92-6-B	
W8UDX..	14-7-1-B	W2ZDR..	1090-109-5-B
W8TEX..	10-5-1-B	K2AWY..	1032-86-6-AB
W8VKB..	8-4-1-B	W2PFM..	1030-102-5-B
W8LJG (W8s JWR TKV)		W2IMI..	1000-100-5-B
1465-147-6-ABC		W2NUL..	996-82-6-B
WNRVHU/W8VHU (W8s		W2YU..	976-61-8-AB
AXX VHU)		K2GQP/2	912-57-8-A
104-52-1-ABD		W2MM..	910-65-7-B
W8KTZ (8 oprs.)		W2IMG..	776-97-4-B
24-12-1-A		W2NLN..	744-62-6-B

## HUDSON DIVISION

Eastern New York

K2GCH..	2664-111-12-BD	W2WCM	372-31-6-A
W2HBC	2352-147-8-ABC	W2YTH	316-52-3-AB
K2HPN/2..		W2BSW..	300-30-3-B
1580-79-10-B		W2ZKE..	300-50-3-AB
K2HTT..	1164-97-6-B	W2RZ..	260-28-5-AB
W2LWI..	876-4-10-B	W2DMJ/2	222-37-3-B
KN2ONR/	525-53-5-B	KN2MWH	
K2HQL/2	516-43-6-B	W2GDN	176-22-4-B
KN2OAX/K2OAX		W2OHL..	174-29-3-A
345-66-5-AB		W2ESC..	168-28-3-B
K2BZM..	295-30-5-A	W2WBY..	132-22-3-B
W2LGY..	176-44-2-B	W2NFB..	92-23-2-A
KN2OJR..	100-25-2-B	W2YTH	88-22-3-AB
K2DRV (K2s DRV MDA)		W2YTI..	68-17-2-AB
2262-87-13-B		W2RQL..	48-12-2-B
K2DNR (K2s DNR LYG,		K2DO..	48-12-2-A
KN2QU1)		K2DPS..	36-9-2-B
480-34-5-B		K2CM..	22-11-1-B
KN2LYI (KN2s LIP LYD)		W2DAB..	16-6-3-B
216-27-4-B		KN2MMK	6-3-1-B
K2BCU (K2BUC, W2FDT)		W2GNE..	4-2-1-B
81-14-3-B		K2GLQ (K2s GLO JLO)	

N. Y. C.-L. I.

K2IEJ/2	3480-145-12-B	1302-109-6-AB	
W2KIR..	2700-139-10-B	K2KGH (K2s KGH KOD)	630-65-5-AB
W2LID..	2178-121-6-B		
W2YHP..	1332-111-6-B		
W2NZH..	1232-88-7-B		
W2SKE..	1224-102-6-B		
W2GLU..	1212-101-6-B		
W2DNO..	1164-97-6-B		
KN2MYS/			

## MIDWEST DIVISION

Iowa

W0GUD..	444-37-6-B
W0SMJ..	336-30-4-AB
W0USQ..	48-12-2-AB
W0OXY..	44-11-2-B
W0RMG..	36-9-2-B

Kansas

W0BDK..	152-19-4-B
W091FR..	99-18-2-B
W0SIF..	52-13-2-B
W0MOX/0	51-9-3-B
KN9CVK	48-8-3-B
W0ZJB/0 (W0s CIK FIJ	
QLZ ZJB)	480-40-6-B

W0KQU/0 (WICOT,	
W3WFZ, W0s JAS MVG)	
350-36-5-AB	

Missouri

W0IHD..	186-31-3-B
KN0CRM/1	124-31-2-B
W0WDE..	104-26-2-B
KN0DEP	68-17-2-B
W0TGC..	28-7-2-A
KN0ABA/K0ABA (K0s ABA	
DGG)	172-43-2-AB

Nebraska

W0EMS/0	184-23-4-B
W0VTP..	168-28-3-B
W0BTG/0	108-18-3-B
W0FRN..	78-13-3-AD
W0FRR..	63-11-3-AD
W0JJD..	16-4-2-B

## NEW ENGLAND DIVISION

Connecticut

W1HDC/0	5941-229-13-AB
W1REZ..	3648-152-12-B
W1TRF..	3465-158-11-B
W1XDE..	102-132-12-B
W1VLE..	3192-133-12-B
W1PHR..	2680-135-10-AB
W1ANI..	2322-129-9-B
W1WHO..	2280-95-12-B

Northern New Jersey

W2PRF..	5830-265-11-AB
W2CXY..	4740-158-15-B

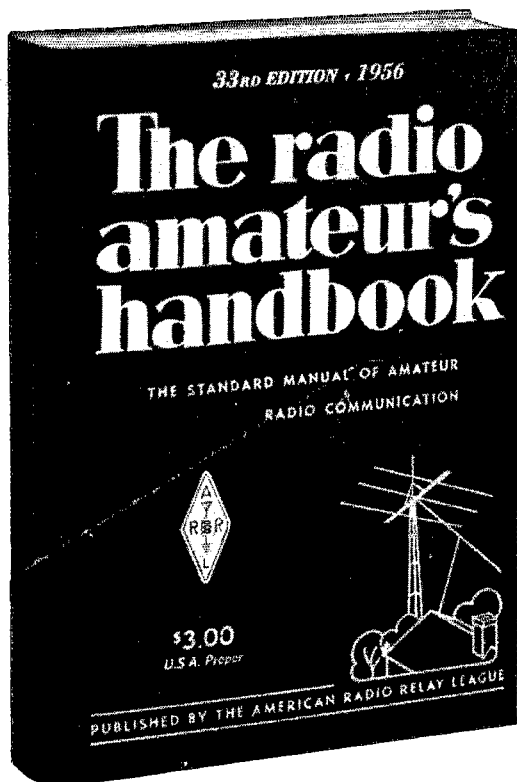
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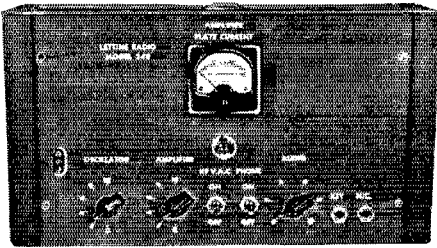
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See Page

129 ...



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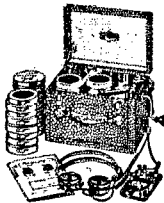
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| WIVLE . . . 1648-103-8-AB                                       | WNIAB . . . 496-62-4-B                     |
| WIYDM . . . 1332-111-6-AB                                       | WNIYCC . . . 464-58-4-B                    |
| WIEOR . . . 1246-89-7-B   | W2FDI/1 . . . 432-54-4-B                   |
| WITCJ . . . 1120-70-8-B   | WINLE . . . 344-43-4-B                     |
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| WIHXD . . . 1000-100-5-AB                                       | WIALV . . . 244-31-4-B                     |
| W1QMR/1 . . .   | W1BSA . . . 407-3-3-B                      |
| W1YOB . . . 830-83-5-AB   | W1AAW . . . 200-50-2-B                     |
| W1DFA . . . 742-54-7-B  | W1LW/1 . . . 200-20-5-B                    |
| W1DNU . . . 670-67-5-B  | WIUWX/1 . . .                              |
| W1ZDP . . . 610-61-5-B  | W1WDW . . . 162-27-3-B                     |
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| W1BDI . . . 600-60-5-B  | W1UDB . . . 120-30-2-AB                    |
| W1STU . . . 600-60-5-B  | W1DOL . . . 108-18-3-B                     |
| W1N1P . . . 592-75-4-B  | W1JUR . . . 108-18-3-B                     |
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| W1HDF . . . 408-51-4-AB   | W1KUE . . . 64-8-4-B                       |
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| W1UFV/1 . . . 354-50-3-B  | W1VBG . . . 16-8-1-B                       |
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| W1WRV . . . 144-36-2-B  | 5214-237-11-ABC                            |
| W1WRQ/1 . . . 140-35-2-B  | W1AZK . . . 1408-88-8-AB                   |
| W1NHQM . . . 138-23-3-B   | W1FZ . . . 176-22-4-AB                     |
| W1HAQ . . . 116-29-2-B  | W1HMT/1 . . . 15-4-3-A                     |
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| <i>Massachusetts</i>  | W1TVA . . . 144-14-5-A                     |
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| W1FOS . . . 1288-92-7-AC  | W7BBH . . . 130-33-2-AB                    |
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| W1JSM . . . 1176-84-7-B   | W7VZZ . . . 76-19-2-B                      |
| W1QMN/1 . . . 1020-85-6-AB                                      | <i>Washington</i>                          |
| W1AQE . . . 990-99-5-AB   | W7LHL . . . 372-62-3-AB                    |
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| K6HIC/1 . . . 668-84-4-B  | W7AUF . . . 58-29-1-A                      |
| W1DBH . . . 648-81-4-B  | W7FEG . . . 56-28-1-A                      |
| W1NHOX/W1HOY/1 . . .  | W7B9 . . . 50-25-1-AB                      |
| 380-58-5-AB   | W7CWN . . . 32-11-1-B                      |
| W1VYS . . . 576-72-4-B  | W7EOR . . . 12-6-1-B                       |
| W1NXX . . . 226-66-6-AB   | <b>PACIFIC DIVISION</b>                    |
| W1ZEN . . . 440-55-4-AB   | <i>Santa Clara Valley</i>                  |
| W1DJ . . . 390-39-5-A   | W6BXN . . . 1300-130-5-ABC                 |
| W1NXY . . . 338-56-3-B  | K6DPR . . . 1612-5-AB                      |
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| W1CGU . . . 210-35-3-A  | W6PBC . . . 375-38-5-AD                    |
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| W1ZXB/1 . . . 192-32-3-B  | KN6LOL . . . 216-36-3-B                    |
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| W1GPT . . . 154-39-2-A  | JFV . . . 880-88-5-B                       |
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| W1BYB . . . 116-29-2-A  | W6SAX . . . 160-14-4-B                     |
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| W1JCL . . . 52-26-1-B   | K6JKJ . . . 60-10-3-B                      |
| W1EQM/1 . . . 48-12-2-B   | <i>Sacramento Valley</i>                   |
| W1NDW/1 . . . 36-18-1-B   | W6PIV . . . 300-30-5-B                     |
| W1EPZ . . . 22-11-1-B   | <i>San Joaquin Valley</i>                  |
| W1YIZ . . . 14-7-1-B  | W6GQZ . . . 280-35-4-AB                    |
| W1HEB (W1S PQG SAD,<br>W1S DWJ LFP EQM)<br>PQG . . . 618-63-3-B | KN6PKO/6 . . .                             |
| W1CLX (W1S CLX DWZ)<br>186-31-3-A                               | W6VKD . . . 176-22-4-B                     |
| <i>Western Massachusetts</i>                                    | W6NDP . . . 136-14-4-B                     |
| W1RFU . . . 6227-241-13-ABC                                     | K6GOX . . . 26-13-1-A                      |
| W1NFV/1 . . . 2081-115-9-B                                      | K6LYO . . . 26-13-1-A                      |
| W1BXB . . . 1456-104-7-AB                                       | W6LBA . . . 20-5-2-B                       |
| W1N1GME . . . 1408-88-8-B                                       | W6TZJ . . . 16-8-1-A                       |
| W1ZWL . . . 1360-85-8-A   | <b>ROANOKE DIVISION</b>                    |
| W1RWV . . . 1120-80-7-AB  | <i>North Carolina</i>                      |
| W1N1Y . . . 1080-90-6-AB  | W4NHV . . . 54-27-1-B                      |
| W1FVZ . . . 702-59-6-B  | W4ACY . . . 46-23-1-B                      |
| W1RRX . . . 702-59-6-B  |  |
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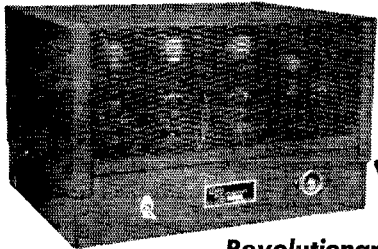
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W4CJC. 116-29-2-B  
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K4BRK. 28-7-2-A  
W4APQ/4 (W48 APQ EMN)  
148-56-4-AB

W7YZU. 32-4-4-B  
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W6ZOP/6 726-121-3-AB  
K6JYO. 548-70-4-B  
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W6ORH. 39-7-3-A  
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W5EHL. 72-12-3-B  
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W5DFU. 60-8-4-B  
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KN5AHU. 32-8-2-B  
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<sup>1</sup> Novice award winner. <sup>2</sup> Technician award winner.  
<sup>3</sup> W9KLR, opr. <sup>4</sup> Tied for section award. <sup>5</sup> K2DUV, opr.  
<sup>6</sup> Hq. Staff, not eligible for award. <sup>7</sup> W1QIS, opr. <sup>8</sup> W1YTL,  
opr. <sup>9</sup> W7ZTW, opr. <sup>10</sup> W6UPS, opr.

## World Above 50 Mc.

(Continued from page 46)

Worked 11 states on 144 Mc. in January, 8 of them without benefit of unusual conditions. Aurora on Jan. 24th and 27th added New York, New Jersey and Pennsylvania, W2CXY, Chatham, N. J., being best DX by that medium. Never had much luck in aurora work with 5-over-5, but since installing 32-element collinear results are markedly better.

W9MHP, Indianapolis, Ind.—Worked about 20 East Coast stations on 50 Mc. in openings on Jan. 3rd, 11th, 16th, 19th and 23rd. Keeping Thursday night skeds with W8INQ, Dayton, at 2200, and W8EVH, Columbus, at 2215.

W0CIO, Dakota City, Neb.—Tri-State Radio Club has plan under way for construction of 12 6-meter mobile stations.

W0TGC, St. Louis, Mo.—Equipment for 220 Mc. under construction; would like to hear from anyone in area who is interested in the band.

W0USQ, Davenport, Iowa—New v.h.f. club organized. Six-meter net operates each Friday at 1930 CST, on 50.7 Mc., 12 stations reporting for first session Jan. 22nd.

W0BTG, Lincoln, Neb.—Setting up skeds on 50 Mc. with W0YZZ and W0WNU at St. Joseph, Mo. W0YOY, Wilber, Neb., wants week-end skeds on 6.

## How's DX?

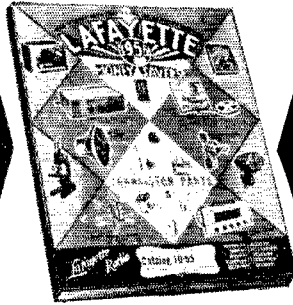
(Continued from page 58)

countries. ARI's present bureau address: Via San Tomaso 3, Milano, Italy. . . . . According to W3SCH, ZS90 answers all airmail QSLs via airmail. Fair enough. . . . . W4FHY collected 130 countries at KA2AK, 67 at KJ6AY, and ran up a grand total of 9334 QSOs. If your KA2AK or KJ6AY QSL went astray, check with Bill. . . . . Orchids to W1s APA APU RDV UED UPH ZDP, W2s CJX CWK

# FREE!

## LAFAYETTE

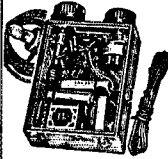
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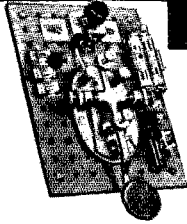
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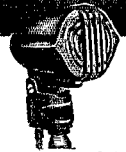
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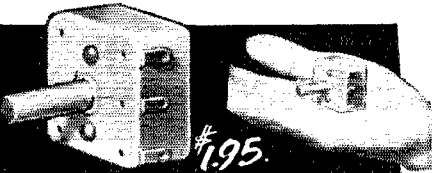
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### Whence:

Asia — "OD5AF has completed his contract with the Iraq Petroleum Co. and now is signing G3HEH. So OD5AF is now closed down, also MP4QAJ, although we understand that one of the oil boys in Qatar will be trying to get the MP4 call reassued. . . Unfortunately, a recent cable from Lebanon rocked us on our heels: it appears that the complete OD5AF-MP4QAJ rig, crated for sea delivery home, was submerged in disastrous floods in north Lebanon. So it's a B2 and old IRO (sergeoned from G3HPB) until we get a new rig built." This from G3KCE whose duct with G3HEH as OD5AF-MP4QAJ resulted in a flock of new DXCC credits on the gang in '54 and '55. G3KCE still gets down to VQ1HE occasionally for a try at Kenya conditions

--- K2MZAL, ex-HCLLW, drew a Formosa assignment but W6ZZ reports C3/BV1 licensing practically at

(Continued on page 138)



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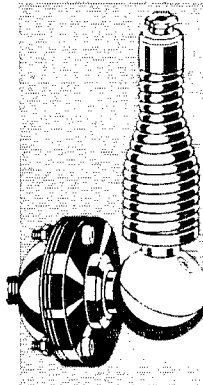
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370 KC-338 KC

**35 Crystals \$3.49**

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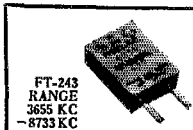
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2030 KC  
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370	393	415	485	508	531	400	462
372	394	416	487	509	533	440	463
374	395	418	488	511	534	441	464
375	396	419	489	512	536	442	465
376	397	420	491	513	537	444	466
377	398	422	492	514	538	445	469
379	401	424	493	515	540	446	470
380	402	425	494	516		447	472
381	403	426	495	518		448	473
383	404	427	496	519		450	474
384	405	431	497	520		451	475
385	406	433	498	522		452	476
386	407	435	501	523		453	477
387	408	436	502	525		455	479
388	409	438	503	526		457	480
390	411	441	504	527		458	
391	412	443	506	529		459	
392	414	444	507	530		461	

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49¢ each—10 for \$4.00

4035	5437	6206	6800	7650	7950
4080	5485	6225	6825	7660	7975
4165	5500	6240	6850	7673	8240
4190	5660	6250	6875	7675	8250
4280	5675	6273	6900	7700	8273
4330	5677	6275	6925	7706	8280
4340	5700	6300	6950	7710	8300
4397	5706	6306	6975	7725	8306
4445	5740	6325	7450	7740	8310
4450	5750	6340	7473	7750	8316
4490	5773	6350	7475	7766	8320
4495	5775	6373	7500	7773	8325
4535	5780	6375	7506	7775	8330
4575	5806	6400	7520	7800	8683
4640	5810	6406	7525	7806	8690
4652	5852	6425	7540	7825	
4930	5873	6673	7550	7840	
4950	5875	6675	7573	7841	
5000	5880	6700	7575	7850	
5205	5892	6706	7583	7873	
5295	5906	6725	7600	7875	
5327	5925	6740	7606	7900	
5360	5940	6750	7625	7906	
5365	5955	6773	7640	7925	
5397	5973	6775	7641	7940	

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CR-1A FT-171B—BC-610  
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Pin. 1/2" SP 1/2" SPC.

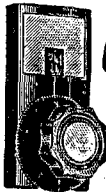
5910	7380	2030	2220	2360	3202	3945
6370	7480	2045	2258	2390	3215	3955
6450	7580	2065	2260	2415	3237	3995
6497	7810	2082	2282	2435	3250	
6522	7930	2105	2290	2442	3322	
6547		2125	2300	2532	3510	
6610		2145	2305	2545	3520	
7350		2158	2320	2557	3550	

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3735	6173	6606	7350	8350	8625
3800	6175	6625	7375	8375	8650
3990	6180	6640	7425	8380	
6000	6200	6650	7440	8383	8700
6006	6440	7000	8000	8400	8733
6025	6450	7025	8025	8425	
6040	6473	7075	8050	8450	
6042	6475	7100	8100	8475	
6050	6500	7125	8125	8500	
6073	6506	7140	8150	8525	
6075	6525	7150	8173	8550	
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6125	6573	7306	8225	8575	



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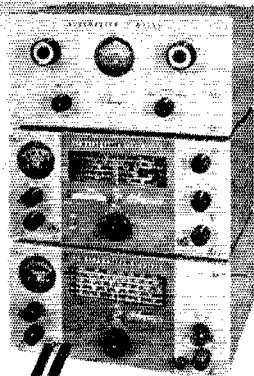
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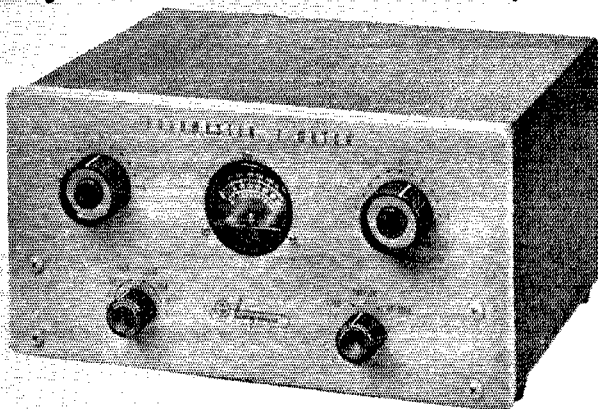
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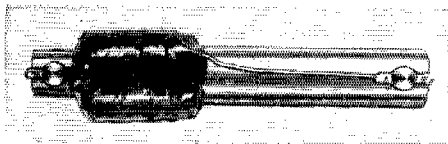
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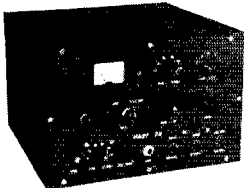
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The HART-75 transmits a powerful, fine quality signal — one that you can be proud of. Input: Up to 80 w. CW, 35 w. phone. Band-switching 160 thru 10. Crystal controlled osc. Provision for external VFO. Effective key click filter. Fused power supply. Dual 607 pi-net final. No ant. tuner required. SAFE: Only 60 volts at key terminals. Complete CW kit including tubes, cabinet, detailed wiring instructions, \$69.95. Plug-in modulator kit, \$19.95 extra.

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(Continued from page 134)

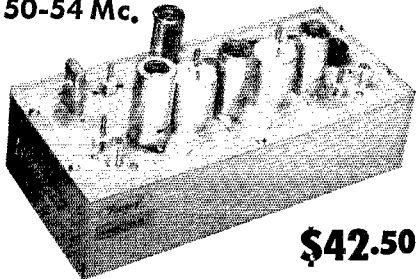
a standstill, Leo can be reached at U. S. Army Section, MAAG, APO 63, San Francisco, Calif., and it's possible he'll get in some DX swings at BV1US and/or C3AR. W6ZZZ has the BV1US humming hours as 2215-2330 GMT, week ends, on 21,223 kc. and other frequencies . . . 4X1CJ, returning to the air after a three-year layoff, frolics on 80 meters with 35 watts and a half-wave. W3AXT and VE1ZZ were Bob's 3.5-Mc. North American firsts. Watch for 4X1CJ daily except Saturdays between 0400 and 0445 GMT, 3520 kc. A 180-watter is in the works . . . W9MOW ferried a Beechcraft Twin-Bonanza to India and took along a compact s.s.b. station assembled with the assistance of W9GDS. Firing up at VU2RX, Bob worked W9RUK for several hours for what is believed to be an s.s.b. India-U. S. A. first. "Yas, VU2RX, is really stirring up the interest here in s.s.b. now that he is the only active VU2 Donald Duck. I returned to the States via Afghanistan, and when I go back to YA I hope to have amateur privileges. If so, DXCC hounds had better start getting s.s.b. rigs up on 20 and 15 if they want that QSL!" . . . D. C. Small, W3KDI, whose moniker would be quite appropriate for a QRP man, was another Yank DX'er roving Asia in recent months. Don was licensed as 487DS, had several DX contacts from Ceylon, and visited the HZ1AB gang while en route 487 with a solar eclipse expedition. "Contact was made with 487BW from HZ1AB, and on arrival at Colombo I also met 487s AS and GE, who kindly let me use their rigs while signing my own 487 call. Incidentally, 487GE has never QSO'd a W0 and looks for them around 14,100 kc. early in the a.m." W3IAMZ accompanied W3KDI on this jaunt and reports an additional stop at 8A2TZ of Tripoli . . . Tidbits via WJ SC and NC DXCS: G3FNP fired up AP2RH for an 18-month run with 25 watts to a Zepp on 20 c.w. . . JDXXC DX leaders per Japanese call area are JAs 1AA with a 138/124 score, 2LC 68/50, 3AA 102/72, 4AC 60/32, 5AB 121/94, 6AD 150/32, 8AA 115/91, 9BE 70/61 and 0AA 96/54. . . Life for ZC'ls is getting understandably rough. ZC4CK (G3CKK) isn't sure he'll linger to complete his 3-year Cyprus assignment.

Africa — F9MH contributes cheery word that the Comoros should be regularly available in the future. He quotes FB8BR: "I have to go to Moroni (on Great Comoro) once a month by air force courier. There I stay only from 2 p.m. to 6 a.m. the next day. Once my duties are fulfilled you see there is little time left for hamming. . . There is no power supply when the radio center closes at night. If operating by night I will have to start the 20-kw. diesel." FB8BR, an official for the French C.A.A. has a 60-watter and receiver available at the Moroni radio center . . . Gough Island's ZD9AD, not as active as had been anticipated, had its party beset with more than the usual difficulties that plague expeditions. W6HPB has it that the group's commander was injured during debarkation and was rushed to a Cape Town hospital for treatment. . . W6YY African items: Z57s C, D and H keep Swaziland workable on 20 c.w., while Z88L is your only good bet for Basutoland on phone. . . VQ5AB-bound cards bounce back from the Uganda bureau marked "pirate". . . I5AAW is frequently available on 14,165-kc. c.w. if you can penetrate the European curtain. . . NCDXC and WGDXC addenda: W5LAK headed for Egypt with a Viking II, NC-183D and a pocketful of crystals. John hunts electronically for petroleum. . . CE3DZ hears ZD9AD will remain active another month or so. . . VQ5EK's 6J5-6AU6-KT66-807-813 150-watter is located 18 miles north of the equator near Lake Victoria. Bill modulates with 807s and puts out a good 21-Mc. sock with his 2-el. c.s. spinner. . . CR5JB, of triple-sideband fame, employs a 40-watt Telefunken rig and decies the scarcity of radio components in Portuguese Guinea.

Europe — Don't forget that the c.w. session of REF's 1956 DPF-DUF DX test runs from 1200 GMT, April 14th, to 2400, April 15th. Details appeared last month under this heading. . . Here's your chance to qualify for the PACC certificate by QSO'ing and confirming 100-or-more different PA stations. VERON announces that the c.w. session of the 1956 PACC Contest will be held from 1200 GMT April 28th to 2400 GMT April 29th. The phone period comes up the same hours May 5th and 6th. Amateurs around the world will call CQ PA and try to work as many Netherlands stations as possible. PA's will call CQ PACC. One QSO per station per band is allowed. Entrants will exchange six (or five on phone) figures consisting of RST (or RS) reports plus QSO serial numbers. After the number, each PA station will identify his province by one of the following designators: FR, GR, DC, OV, GD, UT, ZII, NH, ZL, NB, LB. Each completed contact counts three points. For final score, multiply total QSO points by sum of provinces worked on each band. A certificate will be awarded to the highest scorer, c.w. and phone, in each country. Logs, which can be used toward the PACC award in lieu of QSLs, must be mailed before June 15th to P. v. d. Berg, PA0VB, Contest Manager, VERON, Keizerstraat 54, Gouda, Netherlands.

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*and for CAP and Airport frequencies including 122.8 Mc. and 148.14 Mc.*

**MODEL CC5-50**  
**50-54 Mc.**



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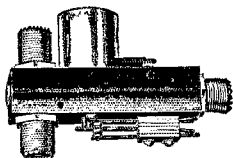


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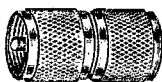
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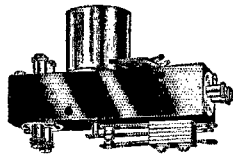


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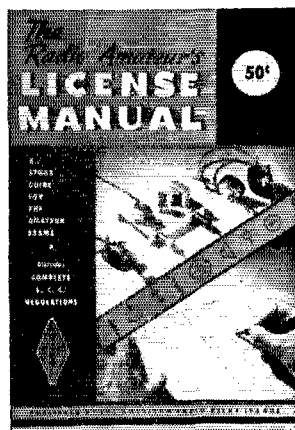
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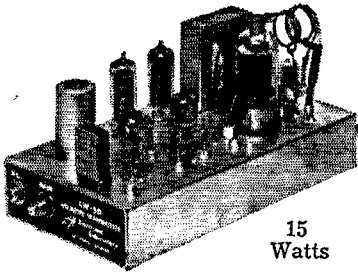
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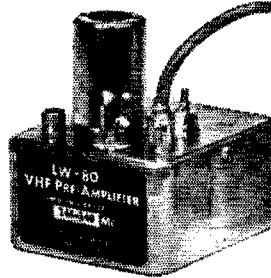


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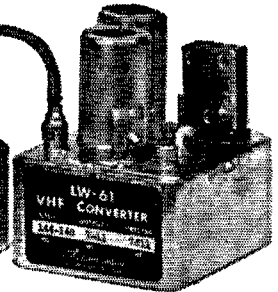
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LW-61  
CONVERTER



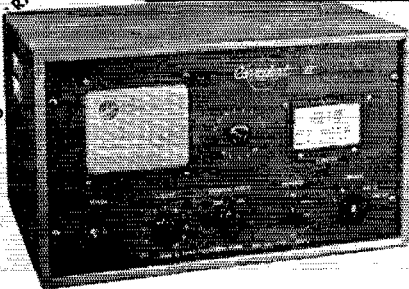
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Crystal controlled  
Choice of IF  
**\$18.50**

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JACKSON, MICHIGAN

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† Effective Jan. 2, 1957 \* De luxe model is FCDA certified and approved for federal matching funds.

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Conalert   
Dealership

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Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

**HEATHKIT  
DX-100  
PHONE AND CW**

**transmitter**

**KIT**

**FEATURES**

Design proven through actual signal reports.



Only top-quality components used throughout.



5-point TVI suppression, and pi network output to match 50 to 600 ohms.



Detailed construction manual for simplified assembly.



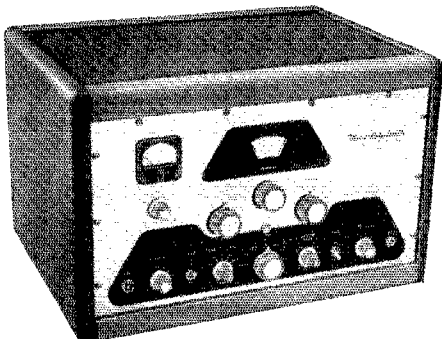
100 watts output on 160, 80, 40, 20, 15, 11, and 10 meters.



Attractive and functional physical design.

The Heathkit Model DX-100 Transmitter is rapidly becoming the "standard" ham rig in its power class. The high quality and outstanding performance it offers can be matched only in equipment costing many dollars more. It features a built-in VFO, modulator, and power supplies, and is bandswitching for phone or CW operation on 160, 80, 40, 20, 15, 11, and 10 meters. The kit includes a detailed construction manual, the cabinet, all tubes, pre-wound coils, and all other parts necessary for construction.

Push-pull 1625 tubes are used to modulate parallel 6164 tubes for RF output in excess of 100 watts on phone, and 120 watts on CW. May be excited from the built-in VFO or from crystals. Features pi network output circuit, illuminated VFO dial and meter face, and 5-point TVI suppression. High grade, well-rated parts supplied. Schematic diagram and technical specifications on request.



**MODEL  
DX-100**

**\$189<sup>50</sup>**

Shpg. Wt. 107 Lbs.

Shipped Motor Freight unless otherwise specified. \$50.00 deposit required on all C.O.D. orders.

**HEATHKIT**

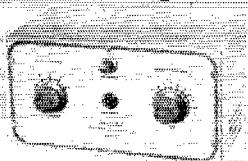
**antenna coupler**

**KIT**

**MODEL  
AC-1**

**\$14<sup>50</sup>**

Shpg. Wt. 4 Lbs.



In addition to matching a low power transmitter to an end-fed long wire antenna, this antenna coupler incorporates a 3-section low-pass filter, to attenuate output above 36 mc and reduce TVI. Handles up to 75 watts, 10 through 80 meters. 52 ohm coaxial input—tapped inductor and variable capacitor—neon RF indicator. Ideal for use with the Heathkit AT-1 Transmitter.

**HEATHKIT**

**grid dip meter** **KIT**

The Model GD-1B is a time-proven instrument. It will enable you to accomplish literally hundreds of jobs on all types of equipment. Frequency range is from 2 mc to 250 mc. A 500 ua meter is employed for indication, and a sensitivity control and headphone jack are provided. Includes pre-wound coils and rack. Indispensable for the ham, serviceman, and engineer. Extra coils available to extend frequency down to 350 kc.



**MODEL  
GD-1B** **\$19<sup>50</sup>**

Shpg. Wt. 4 Lbs.

**HEATHKIT**

**antenna impedance  
meter** **KIT**



**MODEL AM-1**

**\$14<sup>50</sup>**

Shpg. Wt. 2 Lbs.

Used with an RF signal source, the AM-1 will enable you to match your antenna-receiver-transmitter system for optimum operation. Will double as a phone monitor or relative field strength meter. Uses 100 ua meter, and covers 0 to 600 ohms. Frequency to 150 mc.

**HEATH  
COMPANY**

*A Subsidiary  
of Daystrom, Inc.*

**BENTON HARBOR 9, MICHIGAN**



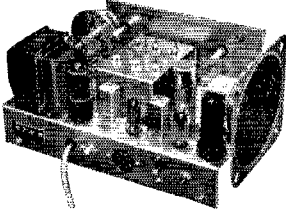
## HEATHKIT

# communications-type all band receiver KIT

Slide-rule dial  
—electrical  
bandspread—ham  
bands marked.

Slug-tuned coils and  
efficient IF trans-  
formers for good  
sensitivity and  
selectivity.

Transformer-  
operated power  
supply for safety  
and high efficiency.



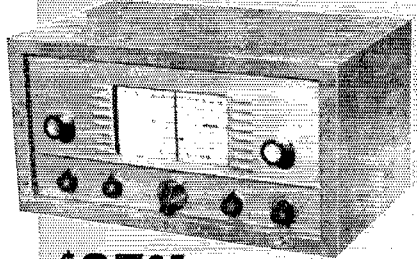
The Model AR-3 receiver features new high-Q slug-tuned coils, new layout, and new-type IF transformers. The result is high sensitivity and selectivity and better image rejection on all bands.

Transformer-type power supply, electrical bandspread, RF and AF gain controls, antenna trimmer, AGC, BFO, headphone jacks, socket for Q multiplier, 5½" PM speaker and illuminated dial.

### SPECIFICATIONS:

Frequency Range—550 kc to 30 mc on four bands.

Tube Complement—1—12BE6 oscillator and mixer • 1—12BA6 IF amplifier • 1—12BA6 second detector, AVC, first audio amplifier and reflex BFO • 1—12A6 beam power output • 1—5Y3 full wave rectifier



**\$27<sup>95</sup>** (Less Cabinet)  
MODEL AR-3  
Shpg. Wt. 12 Lbs.

CABINET: Fabric-covered cabinet available. Includes aluminum panel, speaker grille, and protective rubber feet. Measures 12¼" W. x 6¼" H. x 7¾" D. No. 91-15. Shpg. Wt. 5 Lbs. \$4.50.

## HEATHKIT

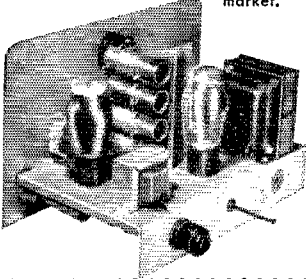
# CW amateur transmitter KIT

Single-knob  
bandswitching  
for 80, 40, 20, 15,  
11, and 10 meters.

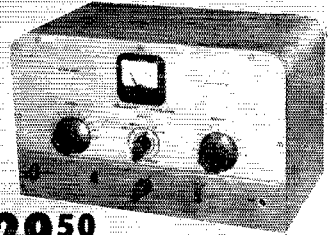
Plate power  
input  
25-30 watts.

Panel meter monitors  
final grid or plate  
current.

Best dollar-per-  
watt buy on the  
market.



The AT-1 is complete with its own power supply, and covers 80, 40, 20, 15, 11, and 10 meters with single-knob bandswitching. Designed for crystal or external VFO excitation. Incorporates key-click filter, line filter, copper plated chassis, pre-wound coils, 52-ohm coaxial output, panel meter, and high quality components throughout. Easy to build, even for the beginner. Employs 6AG7 oscillator and 6L6 final. Up to 30 watts power input.



**\$29<sup>50</sup>** MODEL AT-1  
Shpg. Wt. 15 Lbs.

### SPECIFICATIONS:

RF Amplifier Power Input ..... 25-30 watts  
Output Connection ..... 52 ohms  
Band Coverage ..... 80, 40, 20,  
15, 11, 10 Meters  
Tube Complement: 6AG7 ..... Oscillator—Multiplier  
6L6 ..... Amplifier—Doubling  
3U4G ..... Rectifier

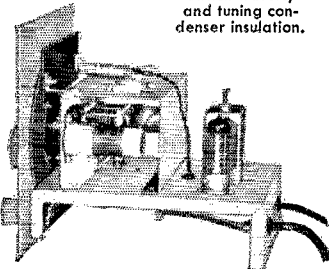
OA2 voltage  
regulator tube  
for stability.

6AU6 electron-  
coupled Clapp  
oscillator.

Covers 160-80-40-  
20-15-11-10 meters.

Copper plated  
chassis—aluminum  
case—profuse  
shielding—cer-  
amic coil forms,  
switch wafers,  
and tuning con-  
denser insulation.

Smooth-acting,  
illuminated and pre-  
calibrated dial.



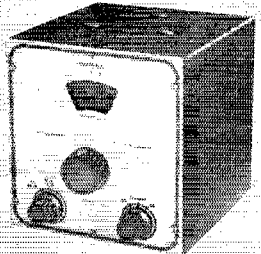
## HEATHKIT vfo KIT

The Model VF-1 features illuminated and pre-calibrated dial scale. Cable and plug provided to fit the crystal socket of any modern transmitter. Covers 160-80-40-20-15-11 and 10 meters with 3 basic oscillator frequencies. Better than 10 volt average RF output on fundamentals. Derives operating power from transmitter power supply. Has VR tube for stability. Go VFO for more operating enjoyment.

MODEL  
VF-1

**\$19<sup>50</sup>**

Shpg. Wt.  
7 Lbs.



### SPECIFICATIONS:

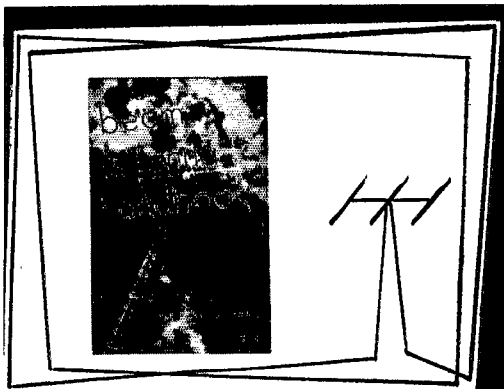
Output Frequencies—1750-2000 kc, 7000-7425 kc, 6740-6808 kc. Calibrated Bands—160-80-40-20-15-11-10 meters. Tube Complement—6AU6 Oscillator OA2 Voltage Regulator. Power Requirements—250-350 VDC @ 15-20 ma. and 6.3 VAC @ .45 A.

ORDER DIRECT FROM THIS AD... OR WRITE FOR FREE CATALOG. Describes more than 65 interesting "build-it-yourself" projects. Amateur equipment, hi fi amplifiers, and the complete Heathkit line of test instruments. Get yours today!

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BENTON HARBOR 9, MICHIGAN



## BEAM ANTENNA HANDBOOK

by William I. Orr, W6SAI

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## A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K and VE call area. All you have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

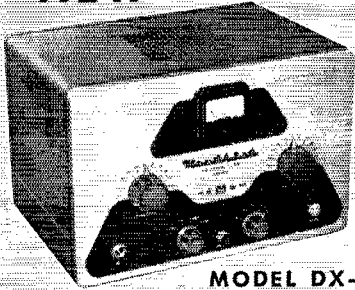
- W1, K1 — D. W. Waterman, W1IPQ, 99 Flat Rock Rd., Easton, Conn.
- W2, K2 — E. F. Huberman, W2JIL, P. O. Box 62, Station P, Brooklyn 12, New York.
- W3, K3 — Jesse Bieberman, W3KT, P. O. Box 400, Bala-Cynwyd, Penna.
- W4, K4 — Thomas M. Moss, W4IYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
- W5, K5 — Robert M. Roden, W5UXY, 5929 Bertha Lane, Ft. Worth 11, 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 — Walter E. Musgrave, W8NGW, 1294 E. 188th St., Cleveland 10, 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 — Harry J. Mabson, VE2APH, 122 Regent Ave., Beaconsfield West, Que.
- VE3 — Leslie A. Whetham, VE3QE, 32 Sylvia Crescent, Hamilton, 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, 2316 Trent St., Victoria, B. C.
- VE8 — W. L. Geary, VE8AW, Box 534, Whitehorse, Y. T.
- VO — Ernest Ash, VO1A, P. O. Box 8, St. John's, Newfoundland.
- KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.
- KH6 — Andy H. Fuchikami, KH6BA, 2543 Namaau Dr., Honolulu, T. H.
- KL7 — Box 73, Douglas, Alaska.
- KZ5 — Gilbert O. Foster, KZ5GF, Box 407, Balboa, C. Z.



If you're interested in a career as an instructor in radio, communications and television and are under age 60, contact Mr. Monroe M. Freedman, at the Samuel Gompers Vocational and Technical High School, 455 Southern Boulevard at 145th Street, New York 55. These instructors are urgently needed and the salary range is \$3900-7600 annually.

Upon moving into a two-family dwelling several months ago, Mert Aisles (pronounced Ales) W1UOQ, was surprised to learn that his immediate neighbors had the name of Beer. Beer upstairs, Ales downstairs — no soda in the basement?

# HEATHKIT NEW DX-35



MODEL DX-35

**\$56.95**

Shpg. Wt. 24 Lbs.

# phone and cw transmitter KIT

- Built-in modulator for phone operation.
- Bandswitching on 80, 40, 20, 15, 11 and 10 meters. Pi network output coupling.
- Switch selection of three crystals—provision for external VFO excitation.
- Attractive and functional physical design.

This brand new transmitter model provides phone and CW operation on 80, 40, 20, 15, 11, and 10 meters. Plate power input to 65 watts on CW and controlled carrier modulation peaks to 50 watts on phone. Completely bandswitching.

Employs two-stage 12AX7 speech amplifier, 12AU7 modulator, 12BY7 oscillator, 12BY7 buffer, and 6146 final. The buffer stage assures plenty of drive to the final on all bands. Pi network output coupling employed for easy antenna loading. Switch selection of crystals. Crystals changed without removing transmitter cabinet. Husky power transformer and choke are potted, and the circuit is well shielded. Meter indicates final grid or plate current.

Truly a remarkable transmitter package for the price. Ideal both for the novice and for the more experienced operator.

Send for free 1956 Heathkit Catalog describing more than 65 interesting "build-it-yourself" projects.

**HEATH**

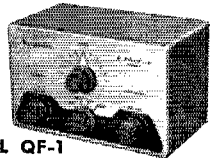
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BENTON HARBOR 9, MICHIGAN

# HEATHKIT "Q" multiplier KIT

Provides extra selectivity for separating signals, or will reject one signal to eliminate heterodyne. Effective Q of 4,000 for sharp "peak" or "null." Tunes any signal within receiver IF. Operates with 450 to 460 kc IF. Will not function with AC-DC type receivers. Requires 6.3 VAC at 300 ma, and 150-250 VDC at 2 ma.



MODEL QF-1

**\$9.95**

Shpg. Wt. 3 Lbs.

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**T**HE hump (around 8 words) is the thing that tells you you have wasted your time by starting out wrong.

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**CLEANING Shack!** Have equipment for AM, SSB, Power supplies, rotator, Hi-Fi, air conditioner, books, magazines, test equipment for TV-Radio repair, few TVs and radio-phonos. Consider trades. Stamp for list. W4WPI, 1420 South Randolph, Arlington 4, Va.

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**RUBBER Stamp:** Call, name and address, \$1.00, includes inking pad, Richard's, 2029T Bradley, Chicago 18, Ill.

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**QSL'S:** Comic, rural, Doctors!! Samples 10¢. C. Fritz, 1213 Briar-gate, Joliet, Ill.

**QSL'S,** sharp, 200 one color, three bucks. Multi-color samples dime refunded. Edward Green & Sons, 4422 Marquette Drive, Ft. Wayne, Ind.

**ENGRAVING:** Call letters white on black, 2" x 3", \$1.50; Key-chains 1" x 3", 50¢; also signs, trophies, plaques, nameplates, panels, etc. Inquiries invited. "Cliff" Head, W2FKH, 343 Fayette St., Bridgeton, N. J.

**QSL'S** samples 10¢. Bob Morris, W2IHM, 230 Rose St., Metuchen, N. J.

**QSL'S-SWLS,** rubber stamps, letterheads, bargain prices. Craigprint, Newark, Arkansas.

**QSL'S-SWLS.** Samples free. Backus, 5318 Walker Ave., Richmond, Va.

**QSL'S, SWLS.** 2 colors, \$2.00 per 100. Free samples. Caprinco, Box 4142, Columbia, S. C.

**QSL'S.** Samples, dime. Printer, Corwith, Iowa.

**QSL'S-SWLS.** 2-colors, 100 for \$2.00. Bob Garra, W3UQL, Lehighton, Penna.

**QSL'S.** Cartoons, colors, photos, etc. Samples 15¢ (refunded). Chris, W9PPA, 365 Terra Cotta, Crystal Lake, Ill.

**QSL'S.** Samples free. Jones, W3EHA, 840 Terrace, North, Hagers-town, Md.

**WANTED:** QSTs 1915 to 1924. Any years you have. Please quote issues, condition, and price. Joseph Mullan, W3RLR, 217 Northway, Baltimore, 18, Md.

**WESTON** microammeter, Mod. 506, 2" round 0-100 movement with dual scale 0-20 milliamperes and 0-300 volts D.C., Triplet Mod. 321, 0-200 microamperes, \$3.75 each, postpaid. H. W. Bower, W0DLM, 1713 N. E. 10th Ave., Ft. Lauderdale, Fla.

**OUTSTANDING** ham list revised monthly. Our prices are realistic and attractive. Standout values in used Barker & Williamson, Collins, Central Electronics, Elmac, Gonset, Hallicrafters, Hammarlund, Harvey-Wells, Johnson, Morrow, and National units. We deal easy and offer time payments tailored for you. All leading brands of new equipment always in stock. Write immediately for this month's Bulletin and for our exclusively amateur catalog just out. Stan Burghardt, W0BJV, Burghardt Radio Supply, Inc., Box 746, Watertown, S. Dak.

300 imprinted labels with name and address. Limited to 3 lines. Two color, silver and blue on mirror finish, gummed stock, for \$1.00. 300 extra labels free if you order within 10 days. Labels in handy pad form. Size is 1 1/4" x 3/4". L. D. Smith, Rainbow Press, 816 Maple Ave., NW, New Philadelphia, Ohio.

**WANTED:** Two-way FM equipment. Ronald Phillips, Communications, 1312 McGee, Kansas City, Mo.

**NATIONAL ARKL** Convention Flash! Civic Auditorium, Hotel Whitcomb, San Francisco, July 6, 7 and 8. Plan now for a really terrific show! Exhibits first-time technical talks, entertainment, music, dancing, banquet, golf. DX, SSB, VHF, traffic, mobile, Novice. Complete ladies' program. Write Bud Bane, W6WB, Chairman.

**MULTIBAND** Antennas. As designed by W3DZZ. See QST March 1955 and Radio & TV News for December 1949. Write for details now! Frederick Tool & Engineering Corp., 414 Pine Ave., Frederick, Md.

**AC** Generators and plants. Any size wholesale. Three guaranteed quality makes. Factory to you or stock. Dun & Bradstreet listing. E. T. Brou, W1GFD, Weylan, Mass.

**WALLETS:** Hand carved calf, exquisite designs. Your call letters. Emblems, etc. Double pockets each side. Insert for cards. \$7.00 each. Geo. W6LYG, Box 49083, Veterans Hospital, Los Angeles 25, Calif.

**VIKING I,** TVI-suppressed transmitter and Viking VFO in excellent condx for sale: \$200. John M. Pincomb, W2SIM, 2 Great Oaks Road, Roslyn Heights, N. Y. New York City hams please call OK 3-0574.

**COLLINS** 75A3 and 32V3, recvr. includes skpr. xmitter includes filters in new condx. \$900 takes both or will sell separately. What an I offered? W2UVC.

**CONELRAD** Alarm. To comply with new FCC regulations every amateur will have to monitor for alerts after January 1957. Complete design and instructions on simple Conelrad alarm, \$1.00 postpaid. Requires no power. Works on any superhet. New parts cost less than \$3.00. Can build out of junk-box free in 30 minutes. Guaranteed. Circuit used satisfactorily at broadcast stations over 2 years. Requires no tubes, transformer, relay or rectifier. B & M Electronics, Box 246, Lewisburg, Tenn.

MEISSNER 150-B; excellent condx; little used; final professionally modified. Covers 10 to 10 meters. Meissner VFO, 275w. phone & c.w., \$150 or with gnd SX-25 \$200. Also sell Mark II mobile, new, with 12v dynamo, best offer. David K. Trumper, WJMC, Summit Lane, Bala-Cynwyd, Pa.

MAGAZINES: Will sell for \$1000 complete set QST - Vol. 1, No. 1, to Vol. XXXX, No. 1. In excellent condition. WGSN, 525 So. Westgate, Los Angeles 49, Calif.

SELL: Factory-wired Globe Scout 65 with Heathkit VFO. \$75 takes them. Bob Montella, W9CNS, 1420 Park Ave., Chicago Heights, Ill.

SCADS of ham transmitting equipment at give-away prices. New TZ20 tubes, \$1.00; TZ40 tubes, \$1.50; TZ-55 tubes, \$2.00. Power chokes, Ill. power transformers, etc. Priced accordingly. W9AU, Flynn Court, Road, Barrington, Ill.

DYNAMOTOR Set, 12 VDC inp, 625V at 225 miles out; \$125.00; Power supply, 750V 250 mill out; with 300 volt reg., \$17.50; 4 872As with sockets and fil. xfrms (10,000 v. ins.) for bridge rectifier, \$15.00; B&W BTEL 35 w. turr. \$5.00. Write for details, W5AYZ, 3719 Zephyr, Houston, Texas.

GONSET "100% R", new, \$9.95; ARC-4, \$20; Supreme 601 signal generator 65kc-20.5 Mc., new, \$25; two Leece-Neville 60-80 amp. alternators with reg. and rect., \$35 each. Wurt-5-3, John A. Schwerbel, WZHDR, 111 W. Hoffman Ave., Lindenhurst, L. I., N. Y.

SELL: Meters, dials, small parts. Few instruments. No junk! List on request. F. Pallan, 613 Chandler St., Flint 3, Mich.

FOR Sale: NC-88 receiver, gnd condx: \$90. W5WTF, RR #3, Box 198 H-7, Denison, Texas.

SX-96, guaranteed perfect; \$75. Going V.H.F.F. W. J. Futch, W3JIT, RD #3, Wyoming, Penna.

WANTED: Bunnell double speed key, or other factory-built non-automatic side action key (stiffswiper), not bug. State your price; offers mail. G. Harston, W3JFK, 130 Valley Rd., Armore, Pa.

FOR Sale: 75A3 and spkr, \$400; 6 months old and in perfect condx. Prefer personal inspection. Exact calibration. W9JAU, Streater, Ill. C. A. Burt, Jr., 1723 1/2 N. Bloom.

CLEANING Shack 19' relay rack, receiver cabinet; 80 mtr. xmitter and recvr; medium power xmitter power supply, mobile Vibrapak, TV sets parts, tubes, defunct radio and TV chassis. In Connecticut phone Branford, Hubbard 8-2139 or write to: John W. Hoyt, WNI9QW, Mill Road, North Branford, Conn.

HEATHKIT AR-3 with cabinet and QF-1 Q-multiplier, \$35.00; Mallory UHF converter with antenna and wire, \$30. P.o.b. Racine, Wisconsin. K9NCAI, Don Meredith, 2416 Hansen St.

WANTED: Full set of inked code tapes for a IG-34A surplus cipher. State price and condition. Fall River Amateur Radio Club, (WIACT) Joe, WITXG, 120 Third St., Fall River, Mass.

FOR Sale of trade: Heathkit Antennascope, National NC-88, SS10A, QT1 and VFO, U9S microphone, Simpson 380 wavemeter, 3-4 X 150A, 2/TZ40, RME speech clipper, mobile power supply 425 v. with 375 Ma., Johnson 10-20 mobile antenna coil, Johnson whip-load, individual record players for 78, 3 1/4 and 45 rpm; Eico 221 VTMV tape-disc recorder with amplifier, SSB transmitter 2-807s in final, for 80 and 20 mobile or fixed; Bud crystal calibrator. Write: R. Lamb, W3VDE, 1219 Yardley Road, Morrisville, Penna.

SELL: Viking Ranger, latest model, used only few hours: \$210.00; F.o.b. Urbana, Ill. RCA 829Bs, slightly used. Guaranteed, \$6.00 each. Dick Rice, W9LOC, 1503 So. Anderson, Urbana, Ill.

RUBBER Stamp with your call letters, name and address: \$1.50; stamp pad 35 cents. El Kay Stamps, Box 5-WT, Toledo 12, Ohio.

FOR Sale: Transmitter, 50-watt all-band; complete with 40 and 80m. coils, aut. tuner, power supply, 10 1/2" rack panel with two extra meters, all in 3 1/2" deluxe relay rack. Will take \$50.00 or will trade for new Johnson Matchbox. Ken Lamson, W1ZIF, 53 Poquonnick Ave., Windsor, Conn.

OUTSTANDING Bargains: New and rebuilt ham gear. Hallcrafters SX-43, \$125.00; SX-96, \$199.50; S-85, \$99.50; National NC-183-D, \$259.00; NC-125, \$125.00; NC-88, \$99.50; NC-300, \$299.50; Central A Slicer, \$49.50; RME-45, \$99.50. Shipped on trial. Easy terms. Write to Ed, W9SAR, c/o Lafayette Radio Supply, Inc., 406-408 North St., Lafayette, Ind.

VIKING Ranger transmitter for sale. Factory-wired with push-to-talk complete with tubes. One year old and in perfect shape. Can ship anywhere in original factory carton. \$210.00; F.o.b. destination or \$209.00 F.o.b. Cleveland, Ohio. A. C. Schwager, W8DGK, 4361 Silsby Rd., Cleveland 18, Ohio.

FOR Sale: 75A-2 Collins in excellent condx with spkr, \$295.00. Will ship. 500 watt 80 thru 10 TVI-suppressed Final 4-250A with PI output, 500 watt modulator 810s, Hunter Cyclomaster with 100 Kc. osc. built-in. Power supplies, speech, modulators, final in 4 1/2" Par-Metal cabinet on castors: \$350.00. Come and get it. Both for \$590.00. C. M. Fouquet, W9YLO, 413 Main St., Scott City, Kansas.

REWARD for information leading to recovery of ART-13 transmitter, serial number AR 8511-A. Stolen from NW Baltimore sometime after late summer 1955. Jack Rodgers, W3TRF, 1003 Kent Ave., Baltimore 28, Md.

WANTED: OST's April 1948, February 1953. State price and condition. KOAQP, 1159 Clarendon, West Sacramento, Calif.

SELLING out all parts. Call SUnset I-7917 week-end. W2YTG, Edward F. Lear, 876 Annette Drive, Forest City, Wantagh, L. I., N. Y.

FOR Sale: Leece-Neville 6-volt system 100 amp, alternator, rectifier, voltage regulator with mounting brackets, schematic excellent condx: \$49.50. Samuel Lieberman, K21FL, 130-29 228 St., Laurelton, Queens 13, N. Y. Tel: LAurelton 7-1642.

S-40B used Hallcrafters receiver. Sell for only \$78. Clean, in gud condx with operating booklet. Stephen Fisher, 631 Lorna Lane, Los Angeles, Calif.

SELL: RME DB-23 Presselector, brand new: \$30.00. NYC area only. Tel. TE 7-4304. W2HJN).

SALÉ: Gonset Super Six w/noise limiter, \$35.00; mobile xmitter A54-H w. Electro-Voice 600D dynamic microphone, \$115.00; AC power supply, \$30; PE101C 6/12 volts Dynamotor, \$5.00. Will consider any offer. W2FFFH, Segalla, 316 Jerusalem Rd., Scotch Plains, N. J.

SALÉ: Together or separately: Globe Scout 65, \$70; Lysox 382 VFO, works with Scout, \$20.00; S38-D receiver, \$35. All eight months old and in perfect condition. Details: Ray Blackburn, 704 S. Palace, Tyler, Texas.

SELL Super-Pro (BC-779) with power supply, \$125; RME HF-10/20 converter, \$50; Sideband slicer Model B, \$70; complete combination, \$225. All perfect, with manuals. W2AOW, Park Ridge, N. J.

TAPE Recorded code courses. None other comparable. Full course, \$20.00; Tapes alone worth \$9.00. Send stamp for particulars. Tapes Code, Box 31, Mechanics, Penna.

PARTS exchanged, 813s, \$5.00; 810s, \$5.00, like new. Power supplies. Send your list and wants. Box 203, New York 25, N. Y.

FOR Sale: Two-meter mobile rig complete. Consists of Gonset 2-meter converter, Sonar, Mod. M B-26, xmitter, and 6-volt dynamotor. Price complete: \$85.00. Will sell units separately. Write for prices. Earle A. Sampson, Jr., WITQF, 51 Park St., Mansfield, Mass.

MUST Sell Doctor's orders! B&W 5100-B, National 183-D, Electro-Voice mike #64. Equipment in excellent condx. Highest offer takes. W9UGX, Everett Holstadt, 3957 Minnehaha Ave., Minneapolis 6, Minn.

SELL: McMurdo Silver xmitter, Mod. 701. Coils 80 thru 6, except 15-1. In gud condx: \$28.00. W3YYH, Morris, 3241 Rolling Road, Baltimore 36, Md.

FOR Sale: Complete 6V mobile rig, ready to install: A54 Elmac Tri-Band Gonset with clipper, relays, filters, mike, antenna, etc. \$150.00. E. T. McLaughlin, W4DLF, 530 Mandalay Ave., Clearwater Beach, Fla.

FOR Sale: factory-built Globe Scout 40A for \$55.00; NC57 with S-meter, \$50; Heathkit VTMV, Gonset Super-Six w/noise clipper, \$40. Leaving for service. Ken Larabee, W9BDD, RR #1, Chana, Ill.

FOR Sale: 10-80 m. completely bandswitching 130W AM/CW transmitter, 1VI-suppressed; in A-1 operating condition; 0146s in final; 807s in modulator; has 4-3' meter, 4 pwr supplies. B supply has built-in Variac; input variable 0-260 v. Fully shielded in deluxe BNC desk rack. Will include Heathkit VFO, E-V 930 Cardoid mike and stand; 3 tube speech clipper on separate chassis. Bud low pass filter #601, Balun coils, coax relay, J-38 key and spare 6146s and 807s. First \$175 F.o.b. takes all. P. Steinberg, 37 Morgan St., Bergenfield, N. J.

MAIL order amateurs! Get fast action on all the ham gear you need. Parts and equipment. Send for our Ham catalog. NRM Wholesale Radio, Inc., 286 Teaneck Road, Ridgefield Park, N. J. Tel. Hubbard 7-0113.

SELL: SCR-522 transmitter and receiver with power supply, in perfect operating condx, in rack, \$80.00. Workshop 6-element 2-meter beam: \$12.00. F.o.b. Scarsdale, N. Y. 10 Lockwood Rd., G. W. Krug.

FOR Sale: 50-watt all-band rig 80 thru 2 consisting of TBSSOD, APSS pwr supply, Harvey-Wells VFO, 52 ohm filter, mike, key, antenna relay. First \$150. All others returned. Also 4D32, \$12.50. William Tagan, W9DVN, 4111 Mercier St., Kansas City, Mo.

SELL, Trade: radio magazines. QST solid 1935 thru 1946. Bob Farmer, Plainville, Texas.

HALLCRAFTERS S-38D: \$40. Robert Gotschall, Box 684, Akeley, Minn.

TREMENDOUS Bargains: New and reconditioned Collins, Hallcrafters, National, Johnson, Elmac, all others. Completely reconditioned with new guarantee. Hallcrafters S-38, \$400; Workshop 6-element S-71 \$149.00; SX62 \$149.00; SX96 \$199.00; HQ129X \$159.00; HQ140X \$199.00; National NC125 \$129.00; NC171 \$139.00; NC183 \$189.00; HROSOT \$199.00; NC183-D; HROSOT1; HRO60; Collins 75A1 \$239.00; 75A2 \$289.00; 75A3 \$369.00; 32V1; 32V2; 32V3. Viking Ranger; Viking II, large stock of mobile receivers, transmitter and antenna tubes; 605; EC-35; \$10.00. Ship on trial. Write for free list. Henry Radio, Butler, Missouri.

FOR Sale: Like-new Craftsman C-10 AM/FM tuner, \$84; 522 xmitter, meter & xtal, \$38; 3' Weston O-50 microamp meter, new, \$6. K9CXS, 5200 E. Cornell Ave., Denver 22, Colo.

FERRIS Instrument Co. Model 32D radio noise and field-strength meter, new condition. In original shipping carton. Will consider swap for equivalent priced ham gear or best cash offer. Vic Cramer, W2NXX, 912 No. Atlantic Ave., Beach Haven, N. J.

NATIONAL HRO-SR41 rack mount receiver with general coverage and bandspread coils: \$165. Just aligned! General Radio 724A absorption wavemeter 10kc to 50 Mc., new, \$70.00; Panadaptor type PC-A 21-200 with ext. range tubes; 605; EC-35 in supply, \$65. LM13 with mod., \$45; BC906 150-225 Mc. wavemeter, \$15. Send for complete list of meters, microphones, chokes, tubes and parts. Will take RME VHF 152 as part trade or want and will buy same. W3BBV, P. O. Box 722, York, Pa.

SELL: Collins 32V-1, late model, very clean, unmodified except for highpasses in AC line and coax output. With spare 4D-32, \$300.00. At this price will not crate or ship, but will help deliver within reasonable distance of W2ESO, Eugene Black, 130 East 24th St., NYC 10. Tel. GR 3-0292.

6-METER Beams, 5-element, \$14.95; 2-meter, 6-element, \$6.95. All seamless aluminum tubing. Shipments prepaid. Wholesale Supply Co., Lunenburg, Mass.

DYNAMOTOR: 6v input, 425v 385 Ma., in new condx. First 20 bus gets it shipped. W5ENH, Hymel, 2608 S. Taylor, Little Rock, Ark.

QSTS: Extra copies 1930 to 1950, 20¢. W2CKQ.

CLEANING House! Philco portable 2" scope, \$25; Meissner signal shifter from 150B transmitter 1.4 to 12.6 Mc. Continuous in six bands, \$25; RME HF-10 converter, \$25; BC1284A 2-meter light-house tubes, r.f. amplifier, \$25; factory-built "portable" transmitter 802, 802, 813 c.w. only with power supplies and carrying case, \$125; high power transmitting tubes, vacuum transformers, etc. Also balance gear from estate of the late W2CZV. Stamp for complete list. W2BNX (no one calls, please!).

HRO-60, xtal calibrator, FM adapter, Select-O-Fect, matching speaker, A, B, C, D coils. Used about 50 hours: \$425. Globe King 400B, D-104 mike and stand, push-to-talk, Johnson 120 VFO, speech clipper, coax relay, TVI-suppressed. Used about 50 hours: \$425. Both for \$775 plus a storm damaged Hy-Lite 10-20 beam. Free delivery within 200 miles. W9JGH, Allan Poe, 816 S. Denver, Eldorado, Kansas.

DELUXE Chart "Amateur Bands at a Glance". All the amateur bands illustrated. Band limits. Privileges, emissions, etc. Send 50¢ to Amband Co., P. O. Box 632, Boston 2, Mass.

WANT Gonset 2-meter Communicator and cash. Have Johnson Ranger professionally wired. 250-20 filter, 250-24 bridge; 250-25 signal beery and 250-23 Matchbox. Best offer. M. J. Fein, 29 Wynmor Rd., Scarsdale, N. Y.

MEDICAL Hams! Swap Burdick EK-2 for Globe King 500-A. C. R. Faulkner, M.D., K4AXE, 106 No. Main, Somerset, Ky.

DXCC Directory! Alphabetical listing by calls and countries. Over 2900 individual scores. Beautifully printed. \$1.00 postpaid anywhere. Norman Thompson, W8YHO, 1368 Roslyn Ave., Akron, Ohio.

SWAP: Central Electronics Model 20A SSB transmitter or Heath DX-100 in kit form or complete. Lyco Model 600 for \$50. Swap Sonar 10 meter receiver for Sonar 6 meter receiver. Arthur Crissey, W2KBD, Phone Lake Mohawk 2141 (Sparta, N. J.).

WANTED: SX-99 or NC-98 or similar type rxvr and 50-200 watt xmitter. Will pick up within radius 50 m. Cash and carry. John Moran, 90 Barrister Rd., Levittown, L. I., N. Y.

HALLCRAFTERS SX-42 receiver. Six bands, 540 Kc. to 110 Mc. In excellent condition. \$125 or best offer. Harold Sittler, Croton Falls, N. Y.

SELL: I.R.E. Proceedings, April 1951 through April 1956. "Electronics", June 1952 through May 1954; both runs in excellent condition. Max Carlton, W2WFI, RFD #2, Prattburg, N. Y.

SELL: Complete Walter Ashe Novice radio station: \$25.00. Price includes shipping costs. John Morgan, 2250 Coyner Ave., Indianapolis, Ind.

FOR Sale: W2WGR selling out. Write for list. Ceruti, 80 Manor Rd., Eastport, N. Y.

WANTED: RD60 or RD112/AU ink tape CW recorder. Claude Sweger, W8BTV, Yuma, Colo.

FOR Sale: Viking I, 829 B. final, Johnson VFO, Balun coils, in excellent condx, \$180.00. C. W. Lane, W8EPC, 505 Dakota, Lawrence, Kans.

FOR Sale: Jan. 1923. Dec. 1942 QST, complete, excellent condx: \$40. Cash and carry. W3BKL, 24 Conestoga Dr., Pittsburgh 34, Pa.

WANTED: For delivery in France and/or Italy. Collins rxvr, 75A1/2/3, new, used, xmitter, Collins 3ZV2, 30 K, KW-1 or B; BC-610-E, Gordon rotor or equal. Send details and prices to W2BIB, P. O. Box 244, Grand Central Annex, New York 17, N. Y. U. S. Dollar payment will be arranged.

WANTED: 80 foot telescopic mast and rotor. W2MJI.

QSTs for sale: incomplete volumes 1930 to 1938. \$1.00 each. Write for the numbers you need. Glenn Rosenberger, 720 Marine, Boulder, Colo.

SELL: Half KW TVI-suppressed CW/phone xmitter, comprising custom-built chassis-panel assemblies mounted in 6 ft. enclosed rack with external VFO. Will consider selling individual assemblies separately. Ferd. C. W. Thiede, W2EC, 169 Buckingham Rd., West Hempstead, L. I., N. Y.

TRANSISTORIZED high voltage supply for Geiger counters. Uses seven TV parts. Flashlight batteries supply continuous, 900 volts. Transistor counter diagram, parts list \$1.00. George Wildeboer, W9KHJ, Savannah, Mo.

WYOMING DX QSOs: WHYW, W7PSO, W7UFB monitoring 14050, 21050 daily 1400 and 1915 GMT.

FOR Sale: Phasing type single sideband exciter with no-drift VFO, \$75.00; 813s, \$6.50 each; 810 and 832s, \$4.00 each. Send for list of meters and gear. W3PKI, 737 Pine, Steelton, Pa.

FOR Sale: RCA AR88D receiver rack-mount. Just reigned and really hot. A steal at \$195.00. David Goldstein, W6MJK, 8586 West Pico Blvd., Los Angeles 35, Calif.

BEST offer takes: LN drv 2 Kw 115/230 (TO) 1 kx5/230/460 V xmitter. Voltg. transformer, 40 watt modulator; 125 watt modulator; issues of QST, CQ and Radio since 1931; 4-65A tubes; HRO-7 rcvr complete; Viking Ranger like new. Need: mobile equipment. W5FW1, Hecht, 2213 College St., Junction, Texas.

FOR Sale: Collins 70E8A PTO-exciter, 160-80-40 meter output; W65A RCA battery w/ohmwrap; 19 meter 15-watt VFO-xmitter; Heathkit Q multiplier; all in A-1 condx. Best offer? Chester Benson, W9IFB, 311 So. 5th, Richmond, Indiana.

SELL or swap: Millen 90810 VHF rig complete; Hallcrafters R-42 speaker; UT-5 audio transformer; 40 watt modulator; 125 watt modulator; issues of QST, CQ and Radio since 1931; 4-65A tubes; HRO-7 rcvr complete; Viking Ranger like new. Need: mobile equipment. W5FW1, Hecht, 2213 College St., Junction, Texas.

SALE: TS-1/ARR-1 test osc., \$3.00; new 2 1/4" meters; Triplet 0-1 Ma., D.C. and Simpson 0-3 Ma., D.C., \$7 each; 8" x 14" x 8" marine-gear cabinet, hinged lid, 4; 5" x 9" x 6" black steel cabinet, \$1.50; aluminum chassis: 7" x 11" x 2", 90c, 7" x 7" x 2", 80c; 5" x 9 1/2" x 2", 80c; 5" x 7" x 2", 70c; steel chassis: 10" x 14" x 3" \$1.25; 5 1/4" x 10" x 3", 95c; 1 7/8" x 1 7/8" x 3", \$1.70. Every cabinet and chassis new and unused. Ford 614s, tested and guaranteed, \$4.50 each. Cecil G. Baumgartner, Box 343, Milton, Pa.

BC-312D Rcvr. Selling for widow of ham. Moderate condx. Best offer takes. J. Bacon, 422 Richards Rd., Columbus 14, Ohio.

BARGAINS: with new guarantee: S-38D, \$39.50; S-40A or S-77, \$49.00; S-47C, \$59.00; HFS w/pow. supp., \$99.00; Lyco 600, \$69.00; S-27, \$79.00; SX-28A, \$159.00; S-76, \$129.00; SX-71, \$149.00; SX-96, \$189.00; SX-88, \$175.00; HQ-140X, \$189.00; SX-42, \$139.00; HRO-50T1, \$299.00; SOJ, \$9.95; Collins 75A3, \$375.00; Collins 75A2, \$299.00; Sonar VFX 680, \$19.95; Eldico TR75TV, \$35.00; Meck T-60, \$39.50; HT-17, \$29.95; EX Shifter, \$35.00; Globe Scout 40A, \$69.50; Globe Trotter, \$49.50; HT-18, \$59.00; Harvey-Viking Sr., \$69.00; Harvey-Wells VFO, \$25.00; Elmac PMR rcvr, \$89.00; PSA 200, \$27.00; Viking \$7.49; Viking VFO, \$32.50; W8G II, \$229.00; Globe King 271, \$249.00; Globe King 400A, \$299.00; 3ZV1, \$299.00; 3ZV2, \$369.00; 3ZV3, \$499.00; and many others. Free trial. Terms financed by Leo, W9PQJ. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

SX346A receiver 27.3-143 Mcs., \$50; Micamold XTR-1 xmitter, 20-40-80, 45 watts, \$17; QST Jan. 1952 through December 1955, \$12; Radio News Jan. 1945 through Dec. 1953, gud condx; \$20. Bob Abernethy, W2PQV, 120 Frederick Ave., Babylon, L. I., N. Y.

ABOTT TR-4, \$20; tunable receiver 100-150 mcs., \$25; ART-13 with A.C. supply 400 or best offer; Motorola mobile rig, complete, \$65; 150 Mc. xmitter, \$35; Mobile police receivers, \$15; Bendix TA12 transmitter \$25. Swap or sell. Need Gonset Communicator, ARC-3 receiver, Lightplane VHF radio. Higley, 82 Lower Main, Matawan, N. J.

SELL: Complete station. Little used HRO-7; 150-watt transmitter, SCR-522, unused 10-20 rotary, prop pitch rotor, laboratory signal generator, power supplies, measuring equipment, instructorgraph, Kelco-Kit, new parts, tubes, miscellaneous. Sell complete or parts. Send for list. Matt Katz, 1399 Carroll St., Brooklyn, N. Y. Tel. SL 6-1073.

SX-71, like new condx, with R-46 matching speaker, \$150; Thordarson matched set TR1965 3000/2500 (at 300 Ma. 63C15 swinging choke; 04F33 fil. trans., \$50 for lot; Viking 240-122 VFO factory-wired with tubes, \$45. All F.o.b. Elmhurst, Ill. John Huey, 390 Hill St.

SELLING Out: Collins 75A1 with 3 Kc. mechanical filter, in gud condx, \$235; Globe Scout 65A, bandswitching, factory-wired, almost new, \$85; Heathkit VFO with power supply, \$20; Heathkit Grid-dipper, \$15; Bud low-pass filter 50-75 ohms, \$11; dynamos, 12 volt output 680v, 220 Ma. output, like new, \$15; pair of new 813s, 0146, many good meters, transformers, mike, headsets, etc. Bill Lowry, 38 Clovercrest Road, Wethersfield, Conn. Phone Jackson 9-6021.

TELREX Model 503 twenty-meter beam, excellent condx: \$60. Fred Norton, 1450 Winchester, Muskegon, Mich.

GONSET Super-Six, used 3 months, \$35; Pioneer Genemotor 6 vdc inp, 300 vdc outd., \$5; Burstein-Applebe bought Genemotor 6 vdc inp, 475 vdc outd., \$15; SCR-522, used xmitter and rcvr, original, no tampering, 2 power plugs, 181 page operating manual, \$40, including tubes; new BC645, 15 tube 420 mc. xmitter, and \$25, including tubes. All F.o.b. San Antonio, W5EDX, Jordan, 645 East Wadlaw, San Antonio 12, Texas.

SELL: 304THs, new, \$19.00. W9LKW, 615 Waukegan, Deerfield, Ill.

FOR Sale: Hallcrafters HT20 xmitter, \$300; Collins 75A-1 rcvr, \$200; Precision BV10A VTMV with RF10A probe, \$50. R. E. Cocklin, 2202 St. Elmo N.E., Canton, Ohio.

SELL: Viking I with VFO, TVI-suppressed. In perfect condx. Best offer. John Gillen, 912 South 57th St., Phila. 45, Pa.

NC101K, Globe Scout 40A, Heathkit VF1, 3BP1, Astatic mike, 2A1S. Best offer takes any or all. W5ZCT, Fuller, Station A, Searcy, Ark.

FIBER-Glass Scotty Beam, dual 10/15, 10.5 db forward gain, \$60.00. Send stamp for information. Gelow Electronics, 2323 Appletree Drive, Hagerstown, Md.

CANADIANS! Selling TR75TV transmitter, Eldico 807s modulator, Hallcrafters S85, V65KH, 429 Ave. R, So., Saskatoon, Saskatchewan, Can.

FOR Sale: For those who build their own. Hundreds of high quality components available, very reasonable. Send for list. H. C. Franke, P. O. Box 11, Morristown, N. J.

10 Meter mobile 15 W. xmitter, \$10.00; 10 meter Converter, \$8.50, \$0/40 mtr, 25W. Novice xmitter, \$10.00; grid dip, 3-60 Mc., \$8.50; 15 mtr. preselector, \$5.00; 40 mtr, 25W. Novice xmitter, \$5.00. W. W. Deane, 862 Elm Ave., Chula Vista, Calif.

WANTED: Any kind of ham equipment for high school radio station. We will pay all shipping charges. Write K4BND or W4WKB.

NOVICESI: Heathkit AT-1 xmitter and AC-1 coupler; \$30. In excellent condx. WN1FZV, Pralinsky, 173 So. Main St., Athol, Mass.

WANT to buy reasonably priced rcvr RME70, HQ 120X, HQ2-129X class. Also DX100, Viking I, II, Ranger or WRL-65A. W0ZHF, Kirkman, 2444 "D", Lincoln, Neb.

NOVICES: Proven, foolproof, bandswitching, de-TV'd, xtal controlled 80 and 40, 75-watt c.w. xmitter with Eldico low pass filter: \$55. W8VXU, 38520 Moravian, Mt. Clemens, Mich.

SELL: BC-312 receiver, \$65, W9YIJ, 108 West Park, Beloit, Wis.

FOR Sale: 75A4, in perfect condx, \$50; KW51, 250B tubes, like new, \$1650. Both F.o.b. Odell, Ill. Leo Hodgeman, W9BSG, Odell, Ill.

TABLETOP Bandswitching 300 w. phone 400w. c.w. TVI-suppressed; 813 rcvr, Jan. 54 QST, Viking Ranger etc. Complete with antenna tuner. Must be seen to be appreciated. Also converted heavy duty prop pitch motor with selsyn indicator. Westmount W1ZQ, 45 Orchard View Rd., Portsmouth, R. I.

WANTED: ART-3 receivers, ART-13 transmitter, radio altimeters. Advise price. Bill Spivey, 3117 Rolling Rd., Chevy Chase, Md.

CANADIANS: NC-125 with speaker and manual. Eighteen months old and in perfect condition: \$170. H. Walker, Box 172, Shellbrook, Sask., Can.

1 KW AM Fone xmitters. Bendix Type TG-6A or RCA Type S1-A, complete in cabinets. Sell or trade for good aluminum boat, etc. 100 amp. 6 v. Leece-Neville generator with regulator and new rectifier, \$40; Ecor Gen-E-Motor 6V-425 V \$15; SX-17 rcvr, \$40; 500 w. xmitter, \$40; 120 w. xmitter, \$30; B. J. Kucera, W8CKR, 10615 South Highland Ave., Garfield Heights 25, Ohio.

HIGH Power rotary Inductors. 30 microhenry ribbon, rugged commercial type. No air under load. Handle well over 1 kw. Ideal for high power pi network or antenna tuning. Dimensions 10 x 5 x 5 1/2. Satisfaction guaranteed. Paulsen Electronics, 138 E 6th St., Clifton, N. J.

BUY Heathkit, Johnson Viking, Tecraft and other equipment wired and tested direct. Heath DX-120 transmitter wired and tested, \$241.50 complete. New Heati Analog computer wired and tested, \$100. Free list reconditioned equipment. J. Lynch Electronic Co., P. O. Box 54, Glen Oaks Br., Floral Park, New York, N. Y.

RG15U HD 76 ohm cable. Used 2 years. Not currup. Two 135-ft rolls, \$20.00 each. One 170-ft. roll, \$25. R. R. Lacy, W5DXZ, 4101 Hughes, Amarillo, Texas.

ELMAC Mobile receiver, model PMR6A with 6 volt power supply, 10 mos. old and in poor condx, \$100; also S14 Hallcrafters Fan adapter, need only minor repairs, \$40. F. o.b. Washington, D. C.

Wanted: Pair of new 250TH tubes, price must be reasonable, and tubes must be guaranteed. S. Ades, W3WQN, 1924 Tulip St., N.W., Washington 12, D. C.

MARINE Crystals, new, large, rugged quartz plates. Best for marine service. Transmitting \$2.95, receiving \$2.50. Specify holder pin diameter and spacing. Airmailed. Crystals since 1933. C-W Crystals, Box 2065, El Monte, Calif.

RECEIVERS: \$3.75, several ARC-5 and Command 6.1 to 9.0 40-meter plus postage on 7 lbs. For VFO or conversion ARC-5, 4.0 to 5.3 and 5.3 to 7.0 Mc. transmitters, \$3.75, 10 lbs. All in unmodified gud condx w/ tubes. BC-654A 80 m. xmitter/rcvr, \$12 less tubes. Many other parts. Write for full list. W6KEG, Woods, F0RE8, 8-3139, 2142 Parkway, El Monte, Calif.

WANTED: ART-13 transmitters, ARC-3 equipment, test sets, BC-788 transceivers. Other military and aeronautical surplus. Advise price condition. We pay freight and C.o.d. James S. Spivey, Inc., 3908 Hamden Lane, Bethesda, Md.

FOR Sale: Vibroplex "Lightning-bug", \$10; National SW-54 receiver, \$30; crystal mike, \$5; all in excellent condx, priced F.o.b. Rockford, Ill. V. R. Hein, 418 Gregory.

FOR Sale: Viking Ranger w/filter and relay. In exc. condx: \$210 prepaid. Cole Hendrix, W9FT2, 1404 Alumn Pl., Lawrence, Kans.

SELLING Out! Custom-built HRO complete, AT-1 and VFO, bug key, teletype, dial tone, Equipment guaranteed as new. Write: W. K. Lindeman, W9LNH, 211 Union St., Michigan Cty., Ind.

**SELL or Trade:** RCA-MI-7835 mobile 10 m. FM xmitter with dynamotor, cables, control head. Easily modified to include AM. \$25.00; BC457A, BC459A, modified, \$6.00 each; Silvertone Model 6290 auto radio 6 tube with underdash control head, \$10.00; R&W TVL 100 M coil, \$2.00; 100 M Coto 500 w. with link \$2.00; BC4562c modulator, \$2.75. All in gud wrkg condx with diagrams. H. Clark, W9FKV, 605 N. Waiala, La Grange Park, Ill.

**HEATH** (GDTB, \$15.00; Eldico Antennoscope, \$15.00; Kenyon F671, 100VDC @ 500 Ma., CCS, \$22.00; RCA scope 151 modified to \$20.00; Viking II cabinet, new, 100% shielded, FB for 100 watt rig; \$12.00; Millen Grid Diopr. coils, 200-1050 and 925-2000 Kc ea., \$3.50; Ohmite 50 ohm, 100 watt dummy load, \$3.50; all F.o.b. Roslyn Heights, L.I., N.Y. Send for list. Cornell Jaray, 36 Flower Lane, Roslyn Heights, N.Y.

**SAVE \$175.00!** Conset 2-meter equipment. Communicator II, audio pream. and VFO linear amp. \$295.00 takes all Selling because of medical expenses. W1YVA, 121 Elm St., Holyoke, Mass. Tel. JEB. 2-1411.

**BARGAINS:** AT-1 (with 6 meter coils) \$25; your choice for \$20; S-38C, link 10 meter mobile with dynamotor, 120 watt modulator. Harry Partin, 6046 Woodlawn, Chicago, Ill.

**CALL** Letter signs for car, operator desk, shack, etc.; 3 x 8 in. yellow translucent signs with 1 1/4 in. black letters. \$1.00 each. The Plastic Shop, 5100 "Y" St., Lincoln, Neb.

**SELL:** Cabineted Heathkit AR-2, \$29; QF-1 Q multiplier, \$9. Both for \$35.00. WNFISJ, Kirkpatrick, 41 East, South Bradley, Mass.  
**ELMAC** Mobile receiver PMR-6A and PSR-12 power supply. Both 12 mcs and very clean looking. \$105.00 complete. W8VOK, Johnson, 20184 Springland Dr., Farmington, Mich.

**VACATIONS!** Ham with my equipment. American plan. Modern cabins. Nice for children. Lighthouse Lodge, Big McKenzie Lake, Spooner, Wis. A. Martorano, W9HZC.

**SELL:** McMurdo Silver 701 xmitter all bands, new condx, instrux book. 2 xtals, tubes, all coils; \$30.00. Waterman industrial 11A 3V scope, like new. \$70. National 1-10, Power supply, all coils, \$30.00. W.D. Wright, 1156 Woodrains, 39-82 65th Pl., Woodside, L. I., N. Y., Tel. Illinois 7-1549

**COMPLETE** SSB transmitter, needs only mike, antenna; 10R exciter, 150 watt 90V linear amplifier, VFO for 80, 40, 20, QF-1, T.R. switch, Microwatch, in 2 desk panel racks, separate interchanged power supply. Hear it on high end of 75. Price: \$350. W1RWD, Box 1832, New Haven 8, Conn.

**PERFORATED** aluminum sheet, .051, 5/64" OD holes, 3/4" centers, 11.20 sq. ft., cut to size. Send for listing on beaus, aluminum tubing, etc. Radcliff's, 1720 No. Countyline, Fostoria, Ohio.

**FOR Sale:** New and used Conset mobile equipment, Communicators, Linear Amplifiers, etc. Also "S" meters for Communicators that require no soldering, cutting, or disassembling to attach. Graham Company, R. T. Graham, W1KJT, 24 Cherry Ave., Stoneham, Mass. Phone ST 6-1966.

**WANTED:** 75A3 or 4, 32V3 or KWS1; Sell pr. 834As, PE103, Linhof Technika 23, W4SAW, Lampman, 1848 NPGS, Monterey, Calif.

**HRO-60.** All accessories: \$400. Primrose, 5-7263. W2ODI, Flora Park, L. I., N. Y.

**COLLINS** 75A1 with triple conversion unit: \$200. W6VC, Eugene DeTurck, 841 47th Ave., San Francisco 21, Calif.

**SSB** Filter capacitor, 50 ufd, 3 kv., \$25; power supply, 2500 volt, 300 Ma., complete, \$48; Simpson 3" rectangular milliammeters, \$5 each. Write for list. 250THs, HK254s, GE 805s, \$2.50 each. Vigoda, W1QKF, 25 Lafayette Rd., Newton Lower Falls 62, Mass. Tel. Bigelow 4-6340.

**SELL:** Conset Super Six. PE 101C dynamotor, 12v. 400 v. 200 Ma., 10 meter whip and mount. \$60. Dr. David Eaton, W1OKR, Roosevelt Hospital, New York 19, N. Y.

**IF** You have antenna problems, Colonial Aircraft Corporation's New matched impedance antenna will solve them economically and completely. Send us your plans. We'll send a quotation. Plans returned if no order placed. Full engineering report with each antenna. Design services also available. Colonial Aircraft Corporation, Electronics Dept. Box 250, Sanford, Maine.

**"CALL** Letter Kit". Order your call in neat 2-inch die-cut letters with base. Just the thing for the shack. You assemble. Price \$1.00 postpaid. Truart Products Co., Dept. B, Box 676, Spring Lake, Mich.

**NEW** 522 xmitter, \$18.00; S-20-R, \$35; SX-32/sprk, \$110; BC-348Q v/dwr supply, \$55.00; 2-meter mobile xmitter, Conset 2-mtr converter, G-E 6V/300V/275 Ma. dynamotor T-17 mike, \$50.00; Heath AT-1, \$18.00; new National MB-150 tank, \$14.00; RCA MI-6203 varicoups studio mike/cable, \$14.00; Conset "3-30" converter, \$28. W. P. Doide, K2KFP, Maple Shade, N. J.

**WANTED:** RME-45 and RME-70 for cash. Will sell for cash S-40-B with Q multiplier, \$89. C. Gurst, 2674 West 25th, Cleveland 13, O.

**VIKING** II with VFO. Best cash offer \$225 or over. Used very little. Murray McKee, W9WRC, 1911 Fifteenth St., Columbus, Ind.

**FOR Sale:** 1 Collins VFO 310-C2 exciter, exc. condx, \$85; 1 xmitter with PP 812As, final with pr 807A modulators. Separate pwr supplies for exciter, modulator and final. Rig mtd. in 5 ft. Bud rack, metering in all stages. Covers 80-40-20-10. 300 watts phone, \$145.00. D. H. Adams, W5AKH, 2117 No. Main St., McAlester, Okla. Exc. cond.

**NC-173, H. W.** TBS-50-C modified in 19" cabinet, VFO-A-1: \$225.00, 3219 7th St., Lewiston, Idaho, R. F. Jones.

**FOR Sale:** Johnson Matchbox, \$35.00; Conset J-30 converter, \$23. W9RFL, 345 W. 9th St., Fremont, Neb.

**SELL or trade:** Heathkit SG-1 signal generator \$15; RCA 45-watt bridging amplifier MI-4288-1, \$15; two Altec outdoor horn speakers (voice), \$10 each; Carter generator 6 v. in 430 v. at 260 Ma. outp. \$15; EE-99-73 telephone repeater, 12 V. power supply \$4; Motorola FMT-500 transmitter, \$30; pair 4-125As; Shure 102C mobile mike, \$5.00; chokes, condensers, etc. Want: GDO, BC-221, W4KMC, 91 Karland Dr., N.W., Atlanta, Ga.

**TRANSFORMERS.** Modulation and power, rewound to your specifications. Harry Havill, 9007 Avalon Blvd., Los Angeles 3, Calif.

**SELL:** 1-150 watt phone, 200 watt c.w. xmitter, 80-40-20 meters; VFO, 1626 ohm 160 ufd filter; 1522 ohm 200 ufd filter; coupler; Selt TVI-suppressed. \$100 F.o.b. Stockton, Calif. Hamilton, W6OXB, 68 E. Fargo St., Stockton, Calif.

**FOR Sale:** 2 Navy model TBV-4 4 VHF Walkie-Talkies. Frequency range 28 to 30 Mcs. Complete with wet batteries, Vibrator power supply, instruction manual and metal foot locker. G. A. Esler, W9MSJ, Kaukauna, Wis.

**SELL:** Collins 30K. Excellent TVI suppression. Grid block keying in 310 exciter. Bias potentiometer on rear 30K. Operates well on SSB with B & W or similar exciter as well as conventionally. \$650 cash F.o.b. Dr. M. A. Magid, W5KAU, 1525 Colcord, Waco, Texas.

**MORLEERS!** Elmac PSR-12 power supply, 12 volts inpp. 250 volts at 90 Ma. outp. only one month old! \$17.00; Sonar receiver, MR-3 with 6 volt vibrator supply, speaker and instrux book, in excellent condx. \$40. Sonar VFO, Mod. 120, like new, \$8.00. W2MPA, Box 222, Highlands, N. J.

**BIG** Bottles!!! 2 new Elmac 4-1000As. Will sell or trade for gud condx commercially manufactured receiving or transmitting gear. What have you? All inquiries answered. WZAEH, Box 32, Eng. Bldg., Columbia Univ., New York City.

**75A-4** and speaker, \$455; factory-wired 20-A with QT-1, \$195; SSB VFO 15-160 meters, \$25; GE 3V scope, \$40; 5V modified Panadaptor, \$40; 2-meter ARC-5, \$20; 160-meter ARC-5, \$15; BC223 AX VFO and xtal xmitter, \$25; 6-meter Conset converter, \$15; Vomax VMO, 320; Jackson signal generator, \$30; 3 kVA, 3000 w/dC transformer, 110-220, \$30; 120-3000 volt condenser, \$35; 2 WJ Variac, E-2000 amp. choke, \$20; final pushpull 304TLs, 40A, Jonathan Eddy, W3JTM, Tighman, Maryland.

**FOR Sale:** Viking Ranger, in excellent condx: \$180. Robert Glaser, W9VGA, Mulvane, Kans.

**COLLINS** 75A2 \$359.00, 32V1 \$395.00, 32V2 \$450.00, 32V3 \$550.00; Deltronic CD-144 \$95.95; Elenco BSM-3 \$50.00, SS-75 \$175.00; Conset 10-1 119.95, 3001 \$44.95, 3003 \$29.95, 3002 \$29.95, 3030 \$34.95, 3041 \$79.95, 3005 \$24.95, 3020 \$19.95, 3026 \$159.95, 3063 \$129.95; Harvey-Wells TBS-50A \$49.95, TBS 50C \$59.95, TBS-50D \$79.95, VFO \$29.95; Lettine 240 \$59.95; Sonar MR-3, SR-9 \$24.95, MB-26, VPX-680, AMP-50, CFC \$19.95, SRT-120 \$99.95, SRT-120P \$129.95; Eldico A-300, AT-1, GDO \$14.95, TR-75TV \$49.95; Sylvania 400-6, 6D \$19.95, 6C \$19.95, 6E \$20.00 \$34.95, E-2000 \$49.95; Elmac AF-67 \$129.95, PMR-6A \$89.95, PSR-6, PSR-12, PSR-116 \$19.95; Other used items available. Write for latest list. Evans Radio, Concord, N. H.

**HALLICRAFTERS** SX-28A receiver, Jensen LS-3 speaker, manual, \$115; Hallicrafters S-85, manual, \$95; RCA AYR20A receiver, 2300-6700 Kc., \$10; Johnson Matchbox, \$40; RME DB-22A, \$50; commercially built 100 kc receiver frequency calibrator, \$11.50; Sylvania X-7016 modulation monitor, \$12.50; Keyon T-489 universal modulation transformer 15 watts \$3; various types high power transmitting tubes; swap; L. C. Smith mill for 160 meter c.w. transmitter, Comman type or other; for Dixie and Jazz recordings or tapes. Items guaranteed, Excellent. F.o.b. Indianapolis. Request information. Howard O. Severeid, W9PDL, 2431 E. Riverside Dr., Indianapolis 23, Ind. Tel. WAlnut 4-2184.

**SELL:** QSTs May 1956 through December 1953. Also CQs 1946 to date. Make offer. G. Ilenberg, W2LSE, 222 Wickham Ave., Middletown, N. Y.

**WANTED:** ARC-1, ARN-7, ART-13, DY-17, CU-25, BC-610, BC-614, BC-939, BC-348, BC-312, BC-342, BC-221, 32V, 75A, APR-4 or parts, APR-5, Teletype, Boehme, Manuals, test equipment, all types receivers, transmitters, Cash or trade for NEW NC-400, SX-100, HQ-140-X, Pro-310, Viking, Ranger, Elmac, Conset, Telrex, Kuehne I Towers, Fisher HI-BI, Pentron, B&W #5100B, Teletext receiving converter for RTTY, etc. Write or phone. Tom. W1-ARN. Altronics, Box 19, Boston 11, Mass. Richmond 2-0048, (Stores: 44 Canal, Boston, 60 Spring, Newport, R. I.)

**SELL:** SX-71, \$135; HRO 5TA1, four coils, speaker, power supply, like new, \$145; 32V3, \$450; 75A-1, \$235; want: ART-13, A RC-1, ARN-7, teletype, Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Tel. Richmond 2-0916.

**FOR Sale:** Used Precision test equipment, all in excellent condx with test leads and operating instructions. 1-ES-500A scope with SP-5 test probe set; 1-E-200 signal-marker generator; 1-E-400 sweep generator; 1-CR-30 cathode ray tube checker; 1-VTM with high voltage and high frequency probes. No reasonable offer refused. Charles H. File, WN8EKV, Mt. Victory, Ohio.

**COLLINS** 32V-3 xmitter, Collins 75A2A recvr with 3 kc. and 800 cycle mechanical filters, also 100 kc. calibrator and FM adaptors. With instruction books. Original cartons. Like new condition: \$800. W. R. Peterson, W9PUP, 5343 Conrad Ave., Skokie, Ill.

**TRADE:** Panadaptor Mod. 2PCA-200 and Conset mobile Triband converter with limiter for factory-wired Central 10-B exciter, W8NFD.

**SELL:** Heathkit AR-2 receiver, wired and aligned, with built-in Q-multiplier. Instructions and revised schematic included. Phone only. No cabinet. \$25.00 F.o.b. Lakehurst, Frank Tooker, Box T. Lakehurst, N. J.

**VIKING** II factory-wired, set bahu coils, relay chassis, etc.; Conset Comm. 1-2 meters; transformers 2240/1120 740kVA, 1770 315kVA; WYF61, 71, also 21/2 1/2 volts filter chokes swing smoothing 200, 250, 500 Ma. EE reel cond. ufd. 4000 v., 2 ufd. 2000 volt. mica to 5000 volt; variable condenser, transmitting, receiving all caps. Re-lays, meters, R.F. chokes, modulation transformers, tubes all types. Will deliver rigs within 50 miles. No trades. What do you need? Selling all excess gear. Make an offer. Al Geifon, 217 W. Main St., Stamford, Conn. W1ZEQ.

**COLLINS** 32V-3, sparkling condition, on-the-nose alignment, with Collins low-pass filter. You'll enjoy years of satisfaction from this outstanding rig. Only \$500 with filter, \$150 below true value. Act immediately. Don't wait! Stu Cowan, W1RST, 45 Park Ave., Old Greenwich, Conn.

**WANTED:** Measurements Corp. Mod. 80, Millen GDO, commercial freq. meter 3 to 200 Mcs. Antennascope or bridge, mobile converter or receiver, mobile supply for 190. Sell or trade S-39 two new BC645 two new 4-125A Elmacs, Jack Watt, W8HYQ, Ontonagon, Mich.

**COLLINS** 32V3, 8 months old, \$595; 75A3 with xtal calibrator; N1M adapter, 800 and 6000 cycle filters, speaker, \$395; 75A2 NBFM adapter, calibrator, speaker, \$325. N. Konos, W1LMP, 842 Summit Ave., Salem, Mass.

**NEED** Wiring diagram TS126/AP range calibrator, especially 2API tube circuit Unit. State cash wanted. Loman, W8HRE, 20813, Erben Dr., St. Clair Shores, Mich.

**WANTED:** TU-53 tuning unit for BC-610. State price and condition. W7CPV, 837 Park Hill Drive, Billings, Montana.

Designed for



Application



**The No. 90901  
One Inch  
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Miniaturized, packaged panel mounting cathode ray oscilloscope designed for use in instrumentation in place of the conventional "pointer type" moving coil meters uses the 1" 1CP1 tube. Panel bezel matches in size and type the standard 2" square meters. Magnitude, phase displacement, wave shape, etc. are constantly visible on scope screen.

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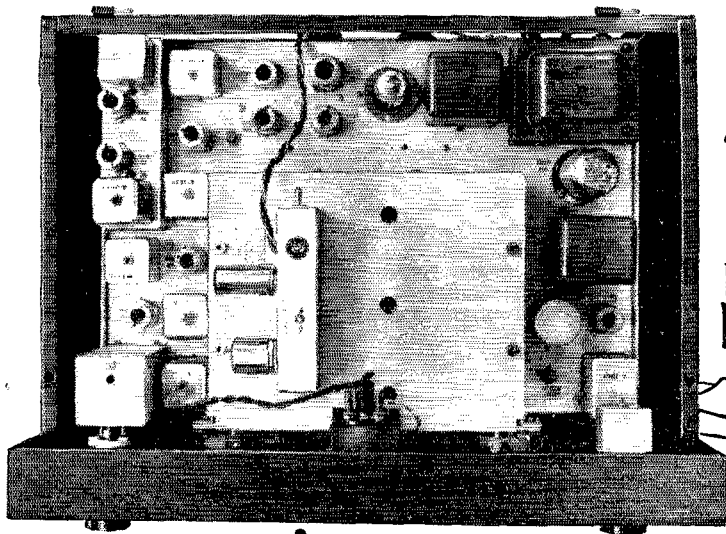
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**FEATURING:** Six bands covering .54 to 31 Mc. - AM, CW, MCW, and F5 with appropriate F5 converter.

Accurately calibrated main tuning dial plus auxiliary dial with full Electrical bandsread.

A ferrite transformer provides accurate antenna matching for 75 ohm unbal. and/or 300 ohm balanced inputs.

Sensitivity: 1 (one) microvolt or better for 10-1 signal to noise power ratio, 1.5 to 31 Mc. Less than 5 microvolts for .54 to 1.5 Mc.

Image Ratio: Better than 60 db.

Selectivity: Variable in 6 steps from 200 cy to 5 KC, 5 crystal and one non-crystal positions.

Input: 105-125VAC 50/60 cy., approx. 90 Watts - 6V.-6A, and 250VDC.- 0.1A.

Output: 4, 8, 16, 600 ohms, 2 Watts high quality audio-better than -60 db hum level.

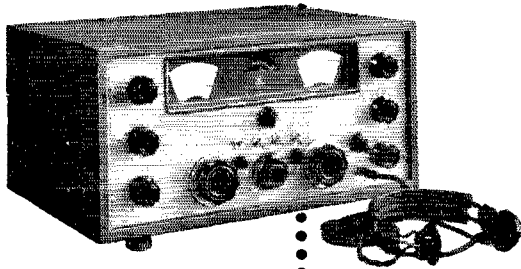
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SSB Coaxial IF output & Audio input.

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**Tube complement:**

6AB4 Grounded grid input RF amp.

6CB6 2nd RF

6AU6 1st converter

6AG5 Oscillator

6BE6 2nd Converter and Oscil.

6BA6 IF Buffer Amp.

3-6BA6 IF Amplifiers

6AL5 Det./Noise Itr.

6AG5 BFO

12AX7 Avc and Audio Amp.

6V6 Output

0A2 Regulator

5U4G Rectifier

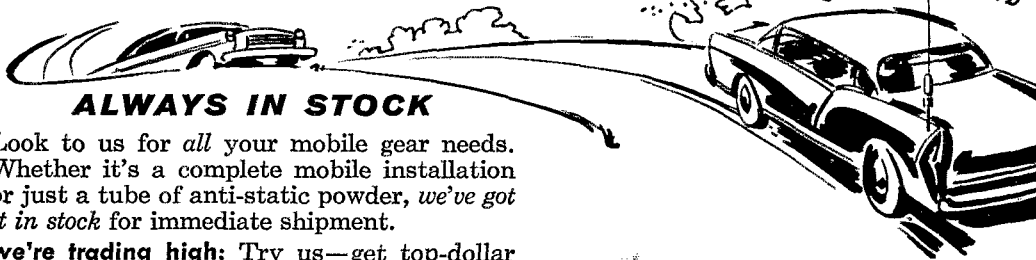


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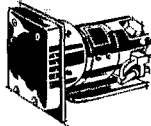


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  - 84 SX 918..... 210.21
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  - 98 S 056..... 99.50
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  - 99 SZ 044..... 89.50

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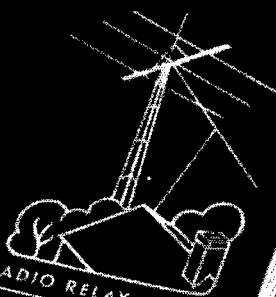
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