QRRR

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November 1961
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Operating News

PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

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Here's a chance to get in your "two cents worth" to stimulate SSB operation on VHF frequencies . . . promote better CW on all bands . . . and win yourself a shackful of Hallicrafters equipment besides! Easy to enter, easy to win, through your own favorite distributor. He selects the local winner, who qualifies for grand prizes worth over $1,000.

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1. Simply visit your Hallicrafters distributor listed below, and see his special display of Hallicrafters amateur equipment.

2. Your distributor will furnish an entry blank. Just fill in your name, address and call; then answer this easy question in 25 words or fewer: "I would like to see more SSB and CW operation on VHF because . . ."

3. **Do not mail the entry blank**—turn it in to your distributor. He will award to a winner in his local area a Hallicrafters HA-4 transistorized electronic keyer. Entries will be judged on a basis of originality and sincerity.

4. Local winners' names and winning statements will be forwarded to Hallicrafters for entry in the national contest. A special panel of judges will select 10 semi-finalists, each of whom will be awarded their choice of an HA-2 Transverter, HA-6 Transverter, or an HT-37 Transmitter.

5. From the 10 semi-finalists, a **Grand Prize Winner** then will be selected by the panel, and he will be awarded in addition to his earlier prizes an SX-115 Receiver!

6. All entries become the property of The Hallicrafters Co. Winners' names and their statements may be published by Hallicrafters. Decisions of both local distributors' and Hallicrafters' judges shall be final.

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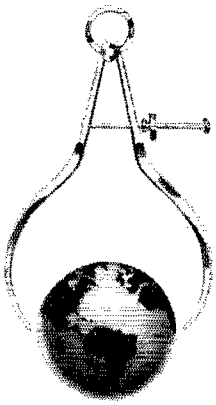
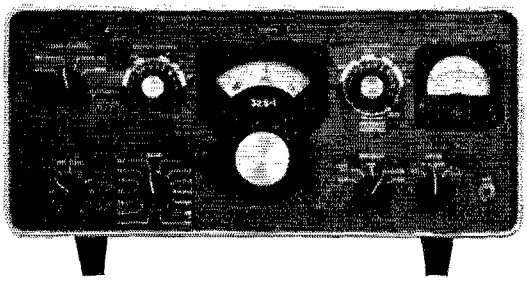
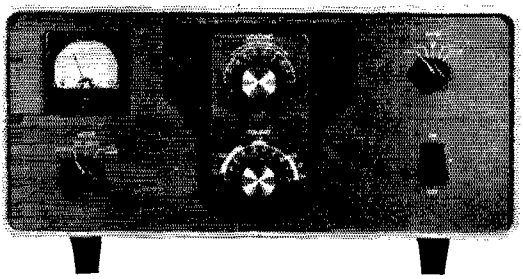


The World Is More Compact With Collins S/Line





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COLLINS

QST

NOVEMBER 1961

VOLUME XLV • NUMBER 11

PUBLISHED, MONTHLY, AS ITS OFFICIAL ORGAN, BY THE AMERICAN RADIO RELAY LEAGUE, INC., WEST HARTFORD, CONN., U. S. A.; OFFICIAL ORGAN OF THE INTERNATIONAL AMATEUR RADIO UNION

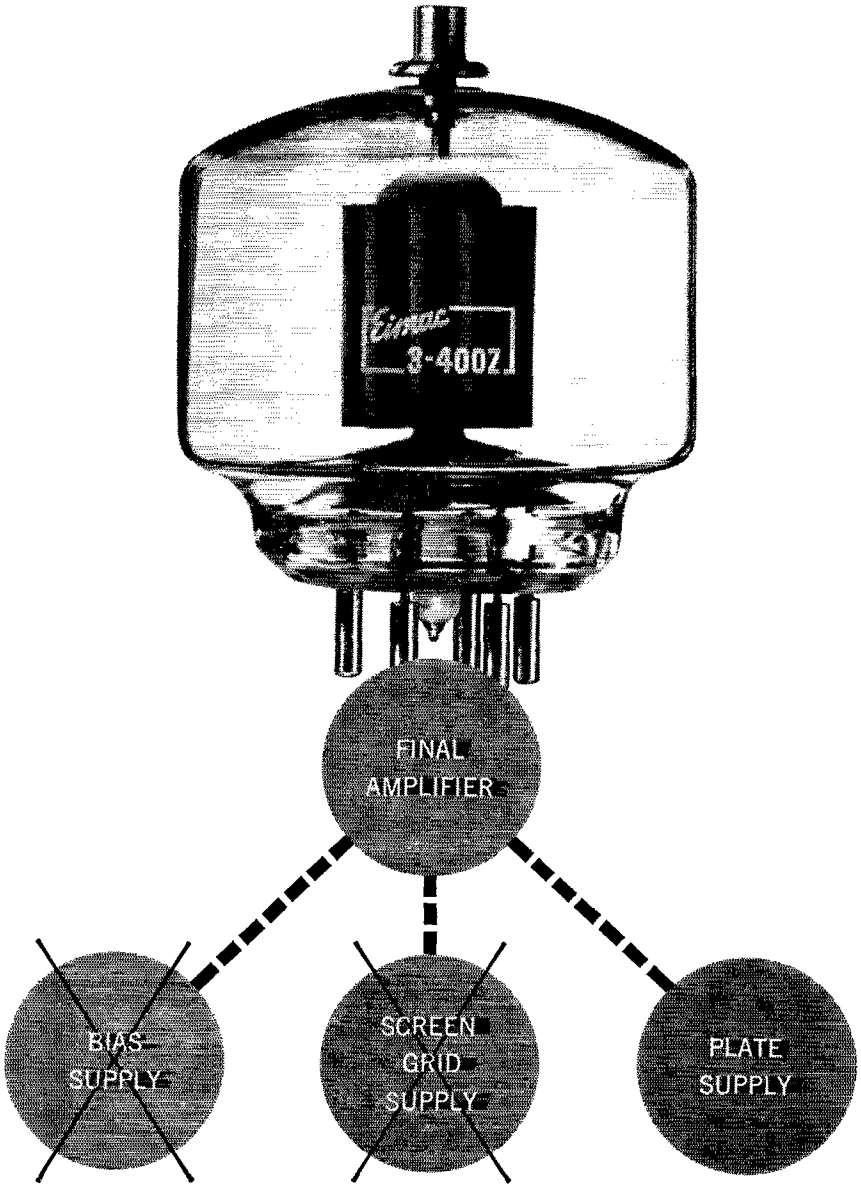
Subscription rate in United States and Possessions, $5.00 per year, postpaid; $5.25 in the Dominion of Canada, $6.00 in all other countries. Single copies, 50 cents. Foreign remittances should be by international postal or express money order or bank draft negotiable in the U. S. and for an equivalent amount in U. S. funds.

Second-class postage paid at Hartford, Conn. and at additional mailing offices.

INDEXED BY
Applied Science and Technology Index

Library of Congress Catalog Card No.: 21-9421

—CONTENTS—



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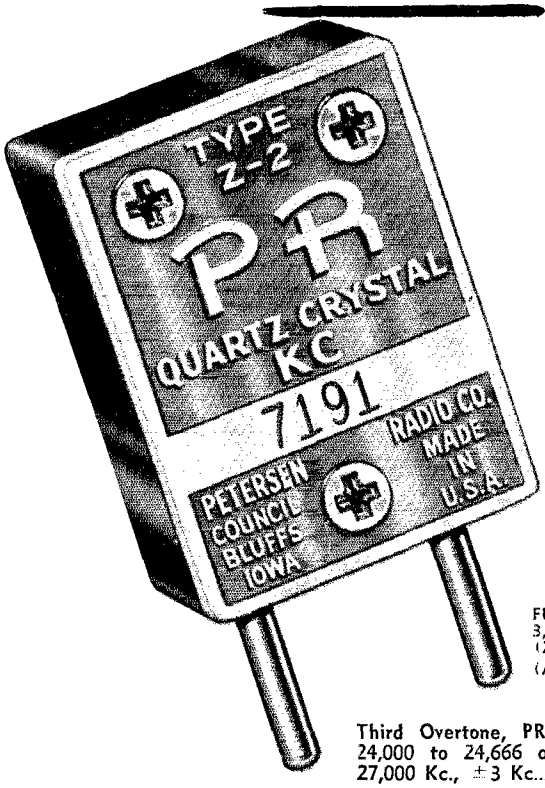

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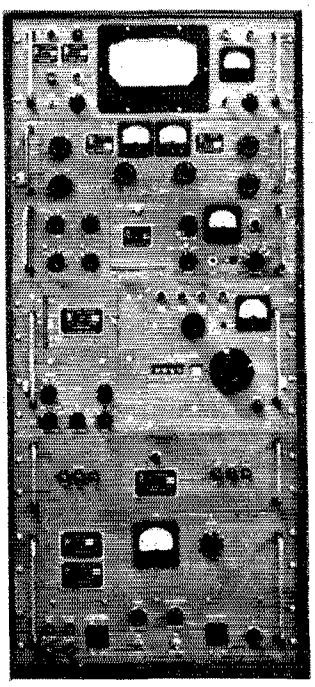

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is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the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

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

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

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

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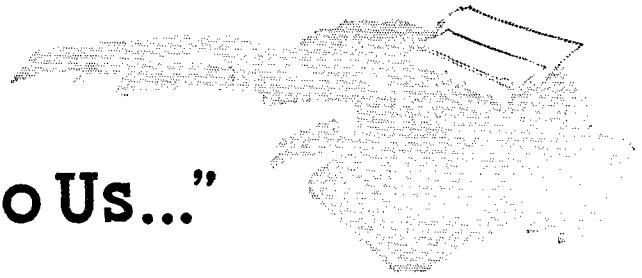


"It Seems to Us..."

OSCAR

TOUCH up your 2-meter receiving gear and beams for peak efficiency, gang, because it looks very much as if the 145.0-Mc. signal from OSCAR may shortly be coming our way from orbit. Nominal approval by the Government has now been obtained, through the cooperative efforts of representatives (many of them hams — naturally!) of a number of federal agencies concerned with the field of telecommunications in space. Barring unforeseen difficulty, the OSCAR package will get a "piggy-back" ride on one of the Discoverer series of U. S. Air Force satellite launchings, and we'll have (if all goes well) the dididididit-didit signal available for experimentation and training and — who can say? — possibly an uncovering of some phenomena heretofore unsuspected.

In the Space Act of 1958 the U. S. Congress set forth clearly and forcefully statements of policy which emphasized that America must maintain a role of world leadership in space science and technology, and that space activities should be devoted to peaceful purposes in an aura of open cooperation with other nations. We believe that Project OSCAR symbolizes this policy. It is a worldwide effort, led by U. S. hams; it promotes the peaceful use of outer space; it encourages international cooperation; it is a tangible example of our traditional openness and of our desire to share space technology freely with other countries. The radio data received from the OSCAR satellite, if only in a modest way, could be a valuable contribution to science.

This is a project in which every amateur potentially can participate and contribute, although of course the program relies heavily on skilled and experienced v.h.f. men. Conventional satellites are tracked by a comparatively few installations of high precision capabilities. While some outstanding ham stations will be able to produce OSCAR tracking reports of comparable accuracy, the bulk of amateur intercepts will be obtained with simple gear, and their value will be reflected after reduction of the mass data.

OSCAR is ham-designed and ham-built, and meets all necessary specifications for "official" satellites such as ability to operate under space environmental conditions. It is ham all the way — it is noncommercial and non-military (except for the USAF launch). It is our baby. Its success can raise the prestige of the amateur body; conversely, failure . . . but let's not contemplate that. Let's all pitch in, preferably in club groups and teams, but also individually, by participation in the program. Various *QST* articles this year have carried the essential dope on how you can help. Be ready — and keep an ear on W1AW's bulletin frequencies for announcement of the launching.

One final word, a special plea to 2-meter operators: form the habit of avoiding the 145.0-Mc. channel so you won't be unintentionally there at launch time; and when OSCAR flies, give the frequency a particularly wide berth. Thanks!

ROLL YOUR OWN

FROM time to time we receive letters giving us what-for because the *Handbook* fails to include certain information that would provide a basis for evaluating the alternative types of gear from which each ham must choose in setting up his station. A typical letter received recently went on to ask why nowhere could be found what is the *best* compromise antenna where space is limited, and how would a random wire, 20 feet above ground, compare for 40-meter DX with a 25-foot-high grounded vertical on a lawn-sprinkler-piping ground system in arid country. The same correspondent was also unhappy because nowhere was he told how to evaluate a receiver. Is triple conversion better than double? Are two r.f. stages better than one? On c.w. is 300-cycle bandwidth at 6 db. better than 600 cycles at the same point?

Many receiver features are matters of personal opinion and final objective, so how can they be explained in a tightly written handbook? And in the c.w.-bandwidth question there is no answer; it depends on the band, the conditions and, most of all, on the personal preference and operating skill and habits of the operator. Selectivity that is an "Open, sesame!" to some operators is much too confining to others (with built-in "cerebral filters").

But the part that shook us was the request for the "best" antenna within a tight set of conditions. We have always thought that part

(Continued on next page)

of the *fun* of amateur radio is trying new antennas, and keeping records in an effort to determine which antenna is the best. Each new configuration is going to be the world beater, we keep hoping, and each new arrangement of wire and insulators and tubing and supports indeed teaches us a little something. We even have delusions of devising an antenna that is a little bit better than anything in the books. Somehow it never occurs to us that an omnipotent Great White Father should punch buttons on his Univac and come up with the absolute and final answer for us. We still find it hard to understand the few amateurs who take the apparent view that the path of amateur radio leads only to a great big silver platter. QST

25 Years Ago *this month*

November 1936

. . . The lead article was a description of a deluxe amateur station — W1CCZ — which had separate phone and c.w. rigs on all bands from 3.5 to 28 Mc., plus all the trimmings.

. . . Technical articles included discussions of heterodyne c.w. reception, the radiation characteristics of horizontal antennas, amateur use of the "magic eye" tube, rhombic antennas, automatic phone break-in, a simple two-band one-tube transmitter, and a speech amplifier.

. . . The 7th annual Sweepstakes was announced, and for the first time it was a two week-end affair.

. . . Correspondence from the Members indicated that interference with a.m. broadcasting by 160-meter phone operators was a big problem.

. . . RCA announced a new version of the 6L6 for transmitter service — the 807. . . . ARRL announced a new map of the world, complete with WAC boundaries, country prefixes, and other helpful dope.

. . . Twenty-five years ago WWV was on the air three hours a day, three days a week! QST

Frank Stewart, W6KWT, 65 years old and totally blind, is chief operator for WA6LMT at the San Francisco Lighthouse for the Blind. Part of each day he spends making brooms at Blindcraft, and the rest he spends at ham radio. He works DX, plays chess over the air, and helps other blind people with their studies for an amateur license. He has been licensed himself for 26 years. The San Francisco Lighthouse for the Blind is located at 1097 Howard St., San Francisco, and is a private Public Service Agency, maintained by contributions.

Hamfest Calendar

Michigan — The annual Michigan v.h.f. conference will be held at Western Michigan University, Kalamazoo, beginning at 1330 on November 18, under the sponsorship of the university's physics department. W8CVQ is the host. There will be technical talks on various phases of v.h.f. operation, plus equipment displays by several manufacturers. Supper tickets will be available for $2.50. Contact Louis Gerbert, W8NOH, 3816 Ivy Drive, N.E., Grand Rapids 5, Mich., for further information.

New York — "Pioneer Night" is scheduled for Saturday, November 4, at the Manger Hotel, Rochester. This promises to be an unusual event for the old timer. It will start with a banquet at 1800, followed by a program of speakers, demonstrations, and a display of historical equipment. $4.25 includes everything, although advance registration is a must prior to November 1. Mail check to Lincoln Cundall, W2QY, 69 Boulevard Parkway, Rochester 12, N. Y.

Texas — The Brownfield Free Swapfest will take place on November 12 from 0700 until 1600, at the National Guard Armory. The only cost will be approximately $1.25 for the noon meal. Free coffee and donuts to the early arrivals. Bring the whole family and all the gear you want to swap. There will be meetings of various groups such as MARS, sidebanders, etc., but there will be no formal speeches. For motel reservations write to the Terry County ARC, P. O. Box 1149, Brownfield, Texas.

Wisconsin — The fourth annual banquet of the Fond du Lac ARC will be held in Bernward Hall on Highway 175 north of Fond du Lac on November 11. Reservations must be made in advance, at $3.50 per person, by writing to the Fond du Lac ARC, P. O. Box 243, Fond du Lac, Wis.

OUR COVER

Our cover this month carries typical photos from a number of the articles in this issue, to indicate the broad coverage of this and every issue of *QST*.

Strays

K4BOO has just written in for a copy of QST to replace one he loaned to the local police department and which has now "disappeared." To quote K4BOO, "Some police force!"

— • • • —

The XYL of K7JXG reminds us that you can have your ham call listed in the telephone directory simply by paying a small extra listing charge.

— • • • —

Another hammy wedding. K4PQV's daughter married K4HVO. K4ATF issued the marriage license and K4PRQ performed the ceremony.

— • • • —

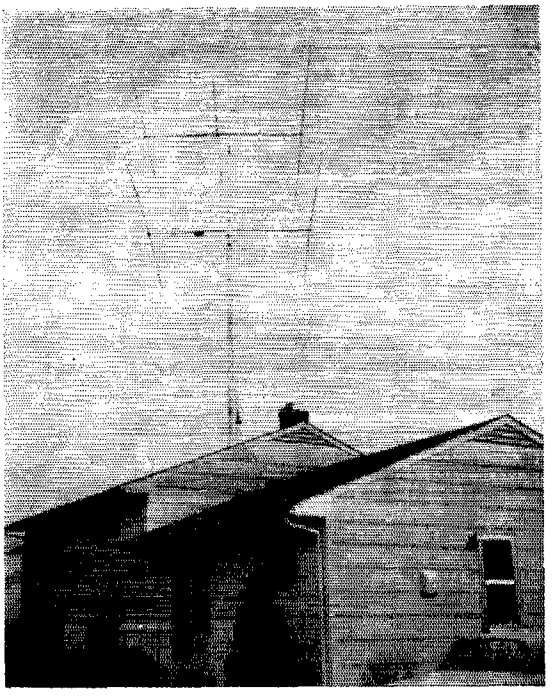
The Oakland (Calif.) Radio Club recently held an old timers' night. W6HD was the oldest ham there — 71 years. W6IT was the first licensed ham — 1914, K6KG was the first licensed commercial — 1913.

— • • • —

David Richardson, W7LLV (RFD Box 81A, Eastsound, Wash.) would like to hear from any hams interested in Esperanto.

Four Bands on a Split Level

BY JOEL HURWITZ,* W3YZI



"The XYL just fainted. . . ."

If you would like to mount 20- and 40-meter beams on your roof, this shows one way of doing it. If you run into opposition, you can still make use of some of the excellent mechanical ideas described here in a less ambitious installation.

Telescoping Mast for Dual Beam Antennas

Last winter, 20 meters went out very early in the evening, while 10 and 15 were virtually hopeless at that hour. Since most of my operating has to be done after the kids have hit the sack, my thoughts turned to 40 meters — more specifically to a Hy-Gain 2-element beam as a back-up for the tribander. I must confess that I ordered the 40-meter job without much thought about how I was going to put it up. As a result, it rode out one of the worst winters in history lying in its carton while the details were worked out.

The problems that I had to overcome were many, not the least of which was the decision handed down by the XYL against a tower in the back yard. This restriction had been circumvented in the case of the tribander by installing a 26-foot aluminum-pipe mast through a weatherproof hole in the roof of the house at the time it was built. This mast consisted of single lengths of 4-inch, 3½-inch and 3-inch standard pipe which telescope perfectly. The base was bolted securely to attic timbers, and the top was steadied with guys fastened to anchorages at the roof corners. A C-D Ham-M rotator, carrying the tribander on its shaft, was mounted at the top of the mast.

Adding 40 Meters

Since there wasn't enough roof area to swing the two beams if mounted on separate masts, the project boiled down to one of mounting both arrays on the same mast. My first thought was to stack the two on a 10- or 12-foot extension mounted on the rotator. This idea was rejected however, when I began to consider the stresses that would be imposed on the rotator shaft and mounting in a high wind. There was also the question of how to get the two-band assembly on top of the mast without the aid of a crane.

Both of these major problems were eventually solved by the telescoping arrangement shown in Fig. 1. The mast can be collapsed to bring the lower of the two antennas (the 40-meter one in this case) down to the level of the first mast section — about 3 feet above the ridge of the roof. The complete mast, with the exception of the base section, rotates in a base bearing which

* The Hurwitz Electrical Co., 1011 Hillen St., Baltimore 2, Md.

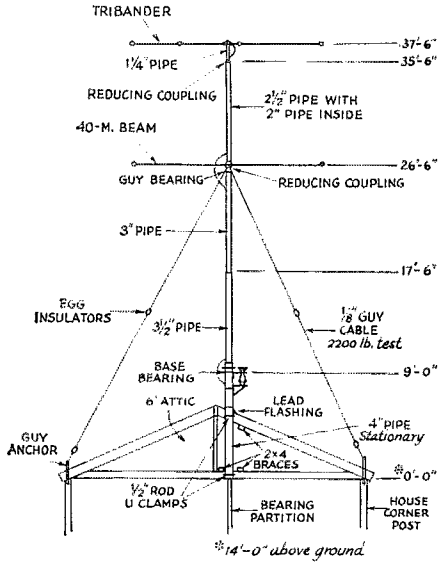


Fig. 1—This sketch shows the over-all makeup of the mast and its mounting. Sections are lengths of aluminum pipe in the sizes indicated.

relieves the rotator of all weight. The total length of the mast is 37½ feet, bringing the tribander 51½ feet above ground level.

The design details are shown in the sketches and photos. The various stresses and loads were checked by my good friend Irv Kind, K3DCP, who is a civil engineer when not hamming, and he made several recommendations as to materials and dimensions. He estimated that the structure, as shown, carrying the two beams, should be good for winds up to 90 m.p.h. At the prospect of hurricane winds above this velocity, the mast can be collapsed to a safe height. The president of a local machine shop was using the back end of my garage to refinish the top of his boat, so I knew where I could get the few machined parts that I needed. (He also possessed a well-stocked junk box.)

Mast Design

The base section is a 9-foot length of 4-inch aluminum pipe.[1] This section is mounted as shown in Fig. 2. It protrudes through a waterproof hole in the roof. Be sure that it is plumb.

The second section is a 9½-foot length of 3½-inch pipe. This telescopes nicely into the 4-inch pipe with a clearance of 0.013 inch. After inserting the smaller pipe 12 inches into the larger, a collar consisting of a 4-inch length of 4-inch galvanized steel pipe is bolted to the 3½-inch pipe as shown in Fig. 3, thus forming a simple sleeve bearing.

The third section of the mast is a 10-foot length of 3-inch aluminum pipe. This telescopes 12 inches into the 3½-inch pipe with a clearance of 0.024 inch.

The top section, which is unguyed, is stiffened by inserting a 10-foot length of 2-inch pipe inside a similar length of 2½-inch pipe. The clearance between the 3-inch and 2½-inch pipes is almost 0.1 inch, which is much too great to be tolerated. Therefore, the top end of the third section is threaded to take a 3-to-2½-inch reducing coupling, as shown in Fig. 4. The threads at the

[1] Standard aluminum pipe or conduit in 10-foot lengths, threaded at both ends and including one coupling, may be obtained from electrical-contractor supply houses, such as Graybar, Westinghouse or General Electric.

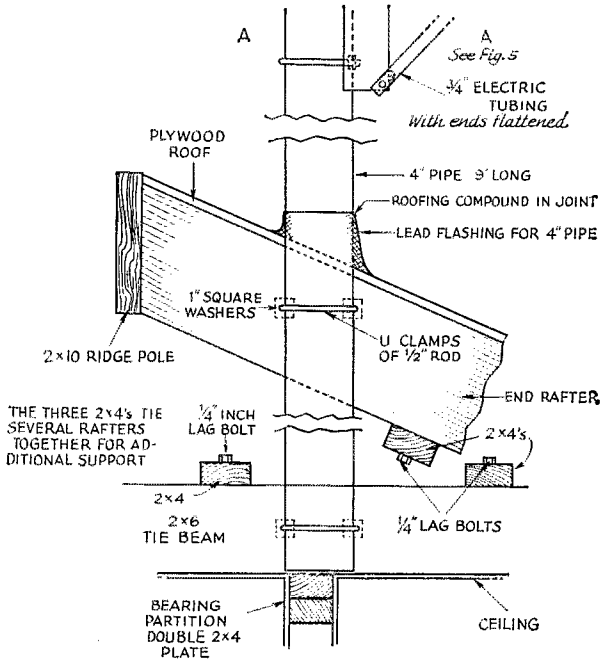


Fig. 2—Details of the base-section mounting. Points A—A match up with similarly-lettered points of Fig. 5.

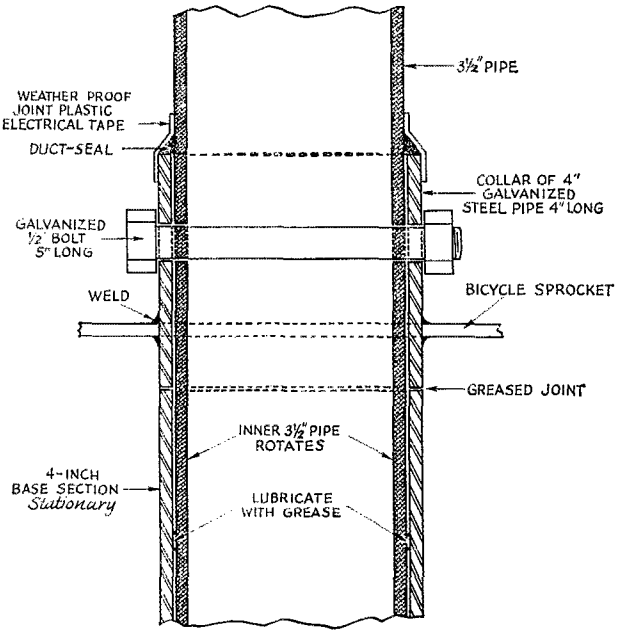


Fig. 3—Details of the sleeve bearing at top of base section. The driving sprocket is welded to the galvanized iron collar which mates with the 4-inch base section to form a bearing.

smaller end of the coupling are reamed out so that the 2½-inch pipe will go through with a sliding fit. The bottom end of the 2½-inch pipe is threaded to take a straight coupling turned down to make a sliding fit inside the 3-inch pipe.

A guy bearing is placed at the top end of the third section. This consists of a 6-inch-square plate of ¼-inch aluminum, bearing against the reducing coupling. The plate has a hole reamed out to 2.9 inches at the center to fit the 2½-inch pipe, and a ⅜-inch hole in each corner to take a guy-wire thimble. A metal skirt immediately above the bearing plate, as shown in Fig. 4, protects the bearing from rain and snow. The 40-meter boom is fastened to the mast just above the rain skirt, also as indicated in Fig. 4.

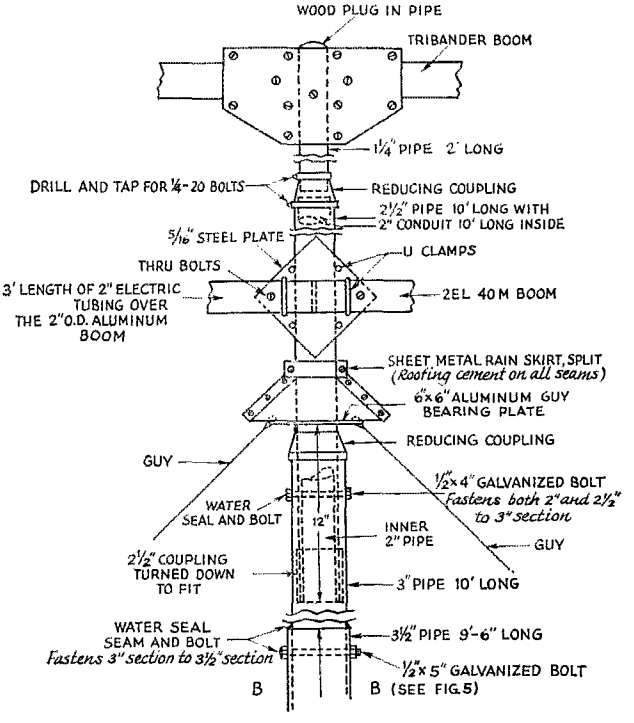
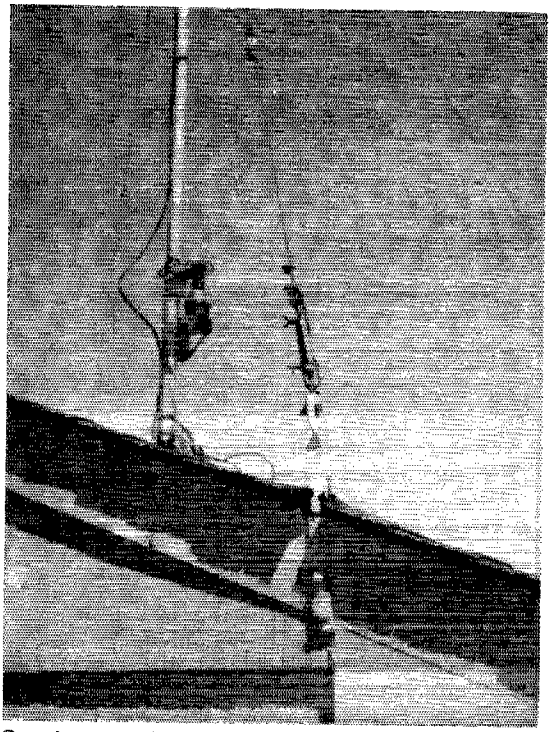
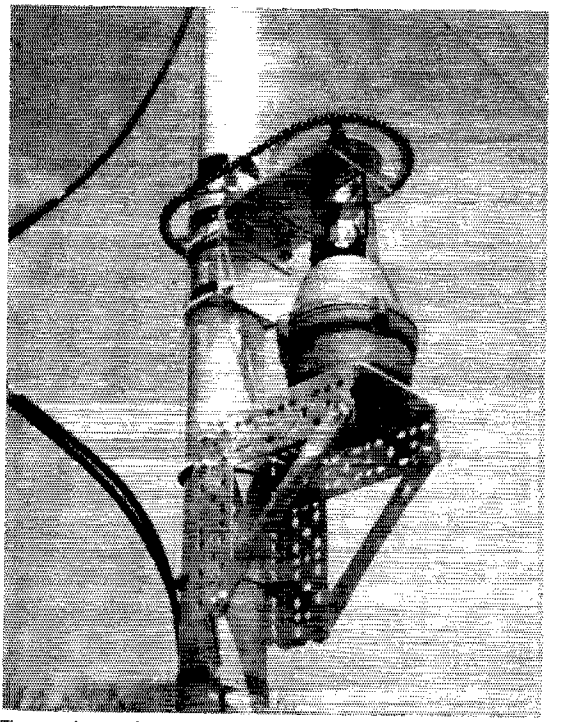


Fig. 4—Details of upper sections of the mast, showing the mounting of the two arrays. Points B – B match up with similarly-designated points in Fig. 5.



Guy wires are anchored to outside rafters and corner posts of the house. Notice that the turnbuckle is bridged with a safety wire.



The rotating mechanism and its mounting. U bolts are used to clamp the mounting to the mast. This view shows how the feed lines are looped around the bearing, and one of the waterproof tapings used at all section joints except the one at the guy bearing.

The top end of the last mast section is fitted with a 2½-to-1¼-inch reducing coupling into which is threaded a 2-foot length of 1½-inch pipe. The boom of the tribander is mounted on this short stub.

Aluminum pipe is virtually essential, since steel weighs about three times as much and would be practically impossible to handle in the manner described. It would also add significantly to the load on the bearing and rotator. The bolt holes at the mast joints should be given an identifying mark at the time they are drilled. It is very difficult to drill these holes so that they will match exactly except as drilled.

Rotator Mounting

The sketch of Fig. 5 and one of the photos show how the rotator is mounted on a shelf attached to the stationary base section. The shaft of the rotator is fitted with a bicycle sprocket, and a similar sprocket is reamed out and welded to the 4-inch collar at the base of the second mast section. The two sprockets are joined with bicycle chain. Thus the rotator carries no weight and is subject to only torque stresses.

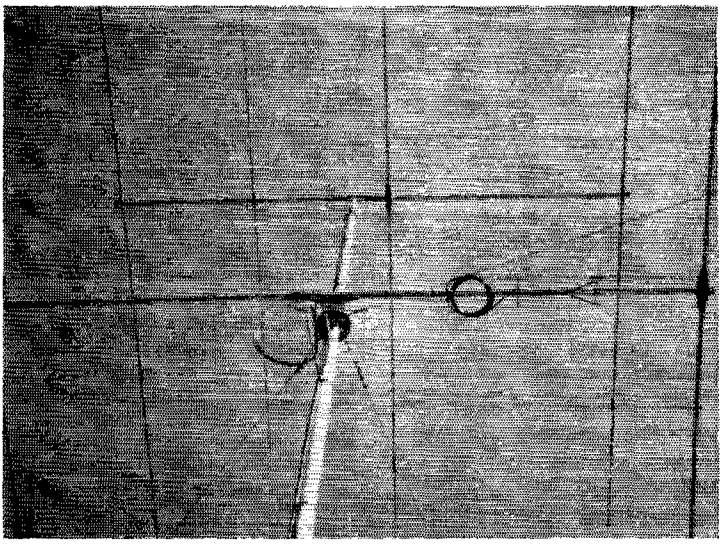
Raising the Mast

This project of putting the mast up is one that should be reserved for a calm day. (K3DNU, W3IMA and I tried to do the job in a 25 m.p.h. wind, and we'll never be quite the same again!)

It will be noted that each mast section is a little longer than the one preceding it. This allows the top end of each section to protrude above the preceding one when the mast is telescoped so that it may be grasped to raise it.

When raising (or lowering) the mast, a gin pole (a 14-foot ladder in my case) and a small block and falls will be needed. The setup is shown in Fig. 6. A short loop of rope, such as shown in the detail, can be used for grasping the mast section. The release cord is of twine. A similar double strand of twine over the hook of the falls will help to disengage the hook from the loop and bring the hook block back down if the latter does not have enough weight to fall of its own accord. A yank on the other release cord will free the seizing loop from the mast. As for manual assistance, you will need two men to heave-ho on the line, a third ready to secure the line after the mast section has been raised, and a boy to insert the intersection bolt after the holes have been lined up.

The raising process starts with all sections telescoped. When telescoping the sections, try to keep the intersectional bolt holes oriented according to the identifying marks, since it may be difficult to twist a section very far to line up the holes after it



Ten through 20 over 40. The chief point of interest here is the rain-shielded guy bearing plate.

has been raised. Before inserting the 3½-inch section, apply a liberal coating of lubricant, such as water-pump grease, to the bottom 12 inches. Before dropping the third section into the second, slip the collar carrying the sprocket over the 3½-inch pipe. Also, before dropping the top section into the preceding one, be sure to slip the guy bearing plate over the bottom end of the top section and apply lubricant to the bottom side of the plate.

Make an estimate of the length of each guy and attach the guys to the bearing plate. Raise the mast first without the beams attached, and fasten the guy wires to their anchorages with approximately normal (fairly loose) tension Without the load of the antennas, the mast can be raised by hand. Also, it is not necessary to extend the top section at this time.

Now lower the mast. Fasten the upper beam (the tribander in this case), with coax feed line attached, to the stub on the top section. Using the gin pole, raise the 2½-inch ection and bolt to the 3-inch pipe. As the section is raised, tape the feed line to the mast section at intervals. Attach the rain skirt immediately above the bearing plate and then mount the lower beam. Make sure that the two antennas have the same orientation. Bring both feed lines down over the rain skirt and bearing plate in the form of a wide loop that will allow 180-degree rotation without interference from guy wires.

Now raise the 3-inch section and bolt it to the 3½-inch section. Raise the 3½-inch section, twist the sprocket collar around so that the holes line up, and fasten with the bolt. Both feed lines should be taped to the mast at intervals as these last two sections are being raised, and the lines should be formed into loops around the bearing and sprocket as they were at the guy bearing.

At this point, slight readjustment of the guy wires may be required to line up the mast so that there is a minimum of binding at the sleeve bearing. Check the mast for plumbness with a 36-inch level or an engineer's transit. Too much tension on the guys will put unnecessary pressure on the bearing, causing it to bind. On the other hand, too little tension will allow the mast to bend, again increasing the friction at the bearing.

The rotator mounting brackets are fitted with slotted holes to permit accurate adjustment of the alignment of the two sprockets and the tension of the chain. The chain should be tight. Otherwise there is danger that it will jump off the

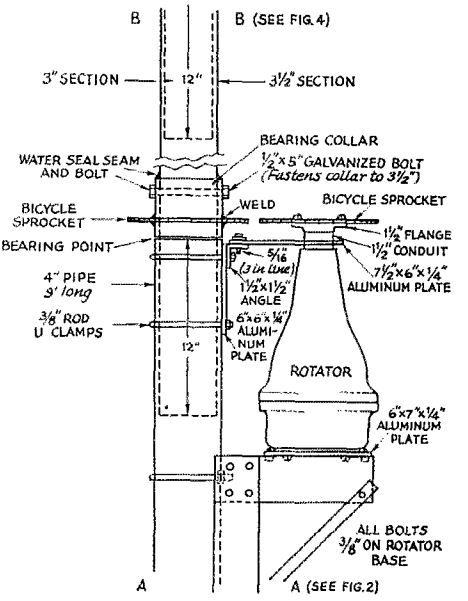


Fig. 5—This sketch shows the mounting of the rotator. Points A–A and B–B match up with similarly-designated points in Figs. 2 and 4.

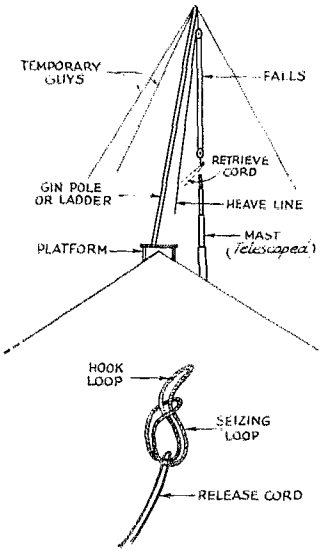


Fig. 6—Suggested method of raising the mast. Guyed gin pole and falls are used to raise the telescoping mast sections, one at a time, starting with the top section.

sprockets when the mast is turned, or in a high wind.

You are now all set to run the feed lines to the rig and give it a whirl. Of course, your wife, friends and neighbors are not speaking to you at this point, but you are on the air!

I would like to extend thanks to the Dorman Electrical Supply Co. for the pipe and miscellaneous electrical supplies, the Westendorf Mfg. Co. for the machine work and access to their junk box, Irv Kind (K3DCP) for the structural calculations, Len Muskin (K3DNU) and John Selis (W3IMA) for their strong backs and weak minds, Lloyd Briggs for his extra strong back, Lou Taich (W3IKX) for the use of his camera and last, but not least, my XYL Elaine, who didn't bat a pretty eyelash when she unexpectedly saw the thing on our roof — she just fainted! QST

• New Apparatus

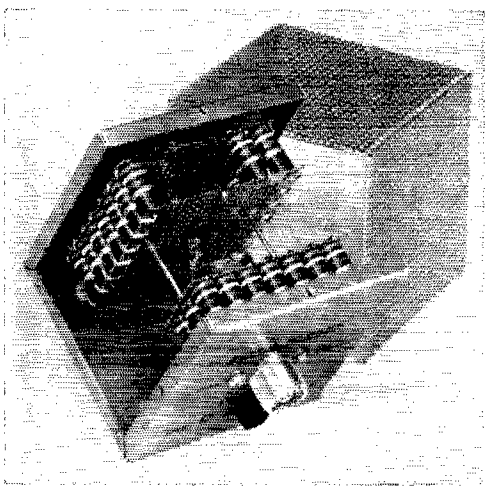
Seco Model 511-A Attenu-Load

THE device shown in the photograph can be used as a 50-ohm shielded dummy load or as a 10-to-1 power reducer. Manufactured by Seco Electronics, Inc., Minneapolis 19, Minn., the unit consists of several banks of composition resistors, a slide switch, and two SO-239 connectors all mounted in an aluminum box which measures about 3 inches on each side. With the slide switch thrown to the INTERNAL position, the unit becomes a 50-ohm dummy load with a power dissipation rating of 50 watts. The following table shows the impedance of the load at various amateur frequencies, as measured in the ARRL lab:

Table I

Frequency (Mc.)	*Input Resistance* (ohms)	*Equivalent Shunt Capacitance* (μuf.)*
4	51.0	14.3
7	51.0	14.0
14	50.5	13.0
21	50.	12.4
29	49.5	12.0
50	47.5	10.7
145	35.0	6.6

* Shunt capacitance required to be subtracted to resonate the circuit at the given frequency.



With the switch in the EXTERNAL position, the circuit is changed to a 10-db. T pad, which reduces the power by a ratio of 10 to 1. A second SO-239 connector at the rear of the box (not visible in the photograph) connects the reduced power to an external load which could be, for example, a low-drive amplifier or a test instrument. The Attenu-Load can be mounted in any position, but the metal case has four rubber feet on one side for mounting convenience.

— *E. L. C.*

Strays

Units of Naval Security Groups (specialized naval communications) will hold open houses at the Whitestone (Queens), N. Y., armory on Wednesday, November 8, and at the New Rochelle armory on Thursday, Nov. 9. Equipment displays, movies on operating and technical matters, recruiting talks, and refreshments. For further information call FLushing 9-4064 or NEw Rochelle 2-7478.

Sweepstakes Comes First

BY JOHN G. TROSTER,* W6ISQ

Now, Marge, I distinctly remember telling you that this next week end was out! Sweepstakes only comes once a year."

"But, John, Uncle Osky said he would give us the plane tickets free — just to go along to keep him company!"

"Well, I'm sorry, but Acapulco doesn't qualify for any points in the Sweepstakes. Maybe I could suggest to the League that they make "XE" into section 73 — I wonder —. No, anyway Marge it's probably hot and humid there and nothing to do but sit around the pool and watch gir — ahhhh, drin — ahhhh, nothing to do but watch — no, probably too many sharks. Sweepstakes comes first."

"Well, I already told Uncle Osky we could go. You told me the date of the Sweepstakes last July and I put it on the calendar. See, circled in red. You said you were planning ahead like it said in the article.[1]

"Marge, would I make a mistake on a date like that? It's like your birthday, Christmas, our wedding anniversary, July Fourth — things like that. If Uncle Osky really wants us to go, he'll have to move it up a week or so. Maybe I could rest up for SS — ha. Anyway, how do you think I could get away from the office?"

"That's unimportant! You would just have to leave, that's all. Besides the children will be very disappointed."

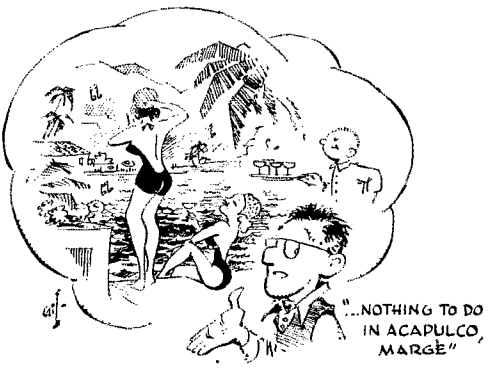
"Don't make it sound so horrible, Marge — like I'm a monster or something. Sweepstakes is the only contest I really work at — kind of a tradition. In the DX contest I only spend 60 or 70 hours — I've never used the whole time yet! Same with the CD contests and v.h.f. tests. Never spend over 18 hours — and in W, VE and VK ZL I only spend Saturday night and Sunday afternoon. So don't exaggerate or be unfair, Marge. Besides, you said you liked doing the yard work."

"But I just hate to tell Uncle Osky we can't go because of a radio contest, John. He'd never understand. Think you were on a quiz program or something — and you know what he thinks about those!"

"Well, tell him something. Business engagement or something — I have an appointment Saturday evening — can't break it. And the kids will get over it. Take 'em to see the "Two-Headed Teenage Monster Meets Snow White". Good family-type show — togetherness. Kids would love it! Ha."

"Don't be vulgar, John. I wouldn't even let you go to see that odious thing. What kind of depraved people would go to a thing like that anyway — ???"

"OK, Marge, don't get mad. But tell the old gent something — and be nice too — remember your inheritance, ha!"



"John, really!"

+ + +

"It's all worked out beautifully, John. Uncle Osky understood. He knew all about those contests. Said he used to win all the spelling bees. Since you are busy, he wants me and the kids to meet him at his rancho in Palm Springs — the one that backs up the second green. You know, the one with the olympic-sized pool. So we'll go down there and spend the week end."

+ + +

"Suppose they are all swimming around Uncle Osky's pool. Now to lock the doors and have a *real* week end — the first of such idyllic trysts devoted exclusively to the pursuit and happiness associated with Sweepstakes — da de da —"

"Five to go. Snap off the rig, move the coffee pot in here. Full pot ought to take me through about 1800 zebra. Ha! TV dinners — snacks — where's the cheese — OK, everything set."

"Tune up the old Scandahoovian Pulverizer on 20 — all 100 terrifying watts ready to tear the ether atom from atom! Swing beam east. Drop of oil on the bug. Drop of coffee for the OT. Ready for the count down — and here we go —"

"5–4–3–2–1 Go! Cqeqeqeqeqeq de W6ISQ k."

"W6ISQ de W9BRD k."

"Ha, ha. Boy, am I hot — first one! W9BRD de W6ISQ. Nr 1 W6ISQ 589x SCV 1500 date k."

"W6ISQ de W9BRD. R Nr 449 W9BRD 579x Ill 1700 date k."

"— Nr. 449?? My gosh, he's kidding or sumpin. Rod's a good operator but 449 already! He's trying to demoralize the opposition — that's it. W9BRD de W6ISQ r 73. QRZ de W6ISQ."

"W6ISQ de W6YHM k."

"Ahhhh — old buddy YHM de W6ISQ. Hi, Don. Nr. 2 W6ISQ 599x SCV 1501 date k."

"W6ISQ de W6YHM. R es sri missed you first half SS last week. Hr Nr 507 W6YHM 599 — 73."

+ + +

"Good evening, Bijou theater."

"Miss, when is the next showing of the "Two-Headed Teenage Monster Meets —."

QST

* 45 Laurel Street, Atherton, California.

[1] Troster, "Planning Ahead," *QST*, Nov. 1960, p. 56.

Single-Switch RTTY Control

Simple System for Transmit/Receive/Print

BY JAMES H. FLYNN, JR.,* W4ISM/A4ISM, Ex-W2BDJ

This article describes the use of a single switch, normally on the transmitter and functionally labeled TRANSMIT-STAND-BY, to permit the following RTTY operations:

1) While in the STAND-BY position, the selector magnets on the teleprinter are in series with a 60-ma. (or other value, depending upon the requirements of the magnets) supply and the TU (converter) output for routine receiving operations.

2) When in the TRANSMIT position, the printer keyboard pulses a relay that has one set of contacts in series with a 60-ma. loop containing the selector magnets, thus providing local copy of transmissions. The other set of contacts pulses the f.s.k. circuit.

3) Also, by the installation of an additional switch, the machine can be used as a station typewriter.

One sure-fire method of checking the frequency shift and quality of one's own RTTY transmissions is to copy your signal through the receiver and TU to provide local copy. This method, while satisfactory if you are transmitting and sending on the same frequency, cannot be accomplished if you are a kilocycle or more off frequency. This point was brought home during the recent Armed Forces Day RTTY contest when some RTTYers in the amateur bands attempted to establish contacts with military stations on various frequencies outside the amateur bands. If the station lash-up consisted of a scheme to make local copy by picking up the transmitted signal in the receiver, it was tough sledding — if you remained on the military frequency, you could not monitor your sending.

ZS1FD, in his "Case History of RTTY in Foreign Lands" (*RTTY*, May, 1961), laid it on the line by saying, I "just could not figure out why so many fellows insisted on making local copy by their own signal in the receiver." Of course, the reason for this is a desire to maintain monitoring, via the TU, the frequency shift of the transmitted signal and exactly what you may expect the receiving station to be printing. This inflexible control seems unnecessary. Normally the usual 850-cycle shift is set and seldom needs resetting.

* 1112 Drewlaine Drive, Vienna, Virginia.

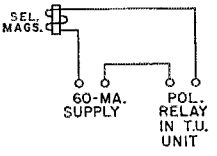


Fig. 1—Basic RTTY selector magnet circuit.

Before describing the rather simple circuit of Fig. 2, it must be assumed that the RTTY station has at least a t.r. switch that is capable of performing antenna switching, receiver muting, and other normal functions. This being the case, we have the ability to either add a relay to the t.r. switch circuit, or add a couple more poles to the relay that you may be using to duplicate the functions of K_2. However, this gets ahead of the story.

In RTTY, keep in mind that the teleprinter is basically a simple electrical apparatus consisting of a pair of selector magnets and a glorified switch called a keyboard. Add a 115-volt a.c. line for the motor, and that's it — ignore all the rest of the wires and you'll agree that the printer is a simple electrical device. Now, getting down to business, in the receiving position the keyboard is not in the circuit. Most of us get the selector magnets to pulse from a polar relay in the TU in series with a 60-ma. current supply, as shown in Fig. 1. If you desire to send and copy what you send without using the station's TU, it's a cinch that you need the selector magnets, current to pulse them, and pulses from the keyboard to take the place of the polar relay. In addition, don't forget the most important function of keying the f.s.k. circuit.

Now refer to Fig. 2, which is shown in the STAND-BY position. Studying this, we see that the circuit of Fig. 1 is still intact. Let's go to TRANSMIT and follow this: K_2 breaks one leg of the polar relay that was in the receive circuit and, at the same time, closes the keyboard circuit. This activates relay K_1 and, with the keyboard in its "rest" position, the f.s.k. is pulsed in the "mark" position and the selector-magnet circuit is closed, waiting for the keyboard to be hit. When a key is depressed, K_1 pulses the selector magnet for local copy and pulses the f.s.k. for transmitting — *regardless of the station receiver and the station's TU.*

By closing S_1 while in the RECEIVE position, the teleprinter can be used as a local (off the air) typewriter, a practice we all follow. The author also uses this switch when receiving in upper case by merely closing the switch and pressing the LTRS button on the keyboard and then opening the switch. This brings the machine down to lower case for correct printing. When using the machine as a typewriter, you may have to pull the plug from the polar relay temporarily if the polar relay contacts are touching the armature.

Any of a variety of relays could perform the

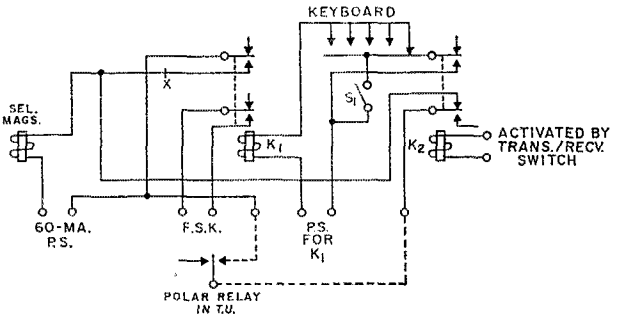


Fig. 2—Circuit of the control system.

K_1—Fast-respond d.p.d.t. d.c. relay, 120 volts, d.c., 2500 ohms (Clare C-27998).

K_2—D.p.d.t. a.c. relay (Advance MG2C115VA or similar).

S_1—Toggle or other s.p.s.t. switch.

functions of K_1 and K_2. Those I use are listed under Fig. 2. A whole lot will depend upon what is available to the builder, but anyone in the RTTY business who has fought the battle of the polar relay should have no trouble with simple relays. However, it must be noted that K_1 should be a fast-keying relay, capable of reacting to the 22-ms. pulses.

For RTTYers who have TUs that do not use a polar relay, do not despair. In this type of arrangement, the selector magnets are fed directly from the output of amplifier tube(s). The circuit in Fig. 2 can be adapted to this arrangement. If you want local copy without use of the station receiver and TU, you will need a 60-ma. supply (you can't get something for nothing here). Break the line at X, insert the 60-ma. supply at this point, short the 60-ma.terminals shown in Fig. 2, and you'll have local copy as described above. (In this case, disregard the polar relay and the location of the 60-ma. supply as originally noted in Fig. 2.)

One more point, and we'll let you go. The author uses this circuit primarily on MARS frequencies where the c.w. identification requirement doesn't exist. However, when using RTTY in the amateur bands, a single-pole single-throw, spring-loaded, normally closed switch should be inserted across the standard telegraph key. When identifying on c.w., merely open the spring-loaded switch, identify with the key, using the other hand and, when the hand holding the spring-loaded switch is released, the printer is ready to send. Some amateurs use the SEND REC BK switch on the printer for this function, but this unnecessarily complicates the wiring of the machine, and we previously agreed that it should be a very simple device. QST

NEW BOOKS

Eliminating Man-Made Interference, by Jack Darr. Cat. No. MMD-1. Published by Howard W. Sams Co., Inc., 1720 East 38th St., Indianapolis 6, Indiana. 160 pages, 5½ by 8½ inches, paper cover. Price, $2.95.

Divided into twelve chapters, this manual covers just about the entire field of man-made interference: what it is, how it is transmitted, how it originates, how to track it down, how to eliminate or minimize its effect on TV, audio amplifiers, auto, aircraft and marine radios. There are several case histories of out-of-the-ordinary noise and interference, as well as cases of typical interference from the files of the FCC. There are many illustrations showing how different types of interference appear on TV screens. Other illustrations show how to build noise filters and interference suppression devices. Especially of interest to radio amateurs should be the chapter on automobile interference.

Radio Transmitters, by Laurence F. Gray and Richard Graham. Published by McGraw-Hill Book Company, Inc., 330 West 42nd St., New York 36, N. Y. 462 pages, including index, 6¼ by 9¼ inches, cloth cover. Price, $12.50.

This manual includes analysis of all the major components that go to make up a transmitter. Design information on amplifiers, coupling circuits, frequency control units, power supplies, cooling equipment, and control circuits, methods of modulation and keying, and typical testing and measurement techniques are covered. The book also goes into basic principles of transmitter circuits, frequency control techniques, operation and methods of designing amplifiers, transmitting tubes, antenna coupling circuits, methods of amplitude modulation, s.s.b. circuits, frequency, phase and pulse modulation, power supply design, including filters and automatic regulators, and protective and control circuits. There is also information on directional couplers, power dividers, diplexers, synthesizers and microwave components. The treatment of the material, although practical in nature, is sufficiently theoretical and includes plenty of bibliographical material. The subject matter is arranged so that almost anyone with a basic understanding of electronics and physics will be able to follow the discussions and use the design information.

How To Locate and Eliminate Radio & TV Interference, by Fred D. Rowe. Second edition. Published by John F. Rider Publisher, Inc., 116 West 14th St., New York 11, N. Y. 160 pages, including index, 5½ by 8½ inches. Cat. No. 158. Paper cover. Price, $2.90.

The second edition of this manual has been brought up-to-date and includes the newest FCC rules and regulations concerning interference. The latest detection techniques are described, as new and improved electronic components for eliminating interference. Although concerned primarily with TV and b.c. radio interference, the techniques can be applied to amateur interference problems too. Especially interesting to radio amateurs will be the chapters on power line interference, fluorescent and filament lamp interference, and television interference suppression for transmitters. Included in the manual is a section of questions and answers on the subject of interference and another covering FCC rules and regulations.

Field Day—1961

BY JOHN F. LINDHOLM,* W1DGL

SPLASHING across the newspapers, blaring over the radio, and being viewed on TV, news of Field Day 1961 told of amateur radio activity in hill and dale. Eye-catching headlines like "Hams Really Cooking on Field Day," "Field Day Big Success," "Area Radiomen Participate," "Three Stations Beam to World," provided hams the golden opportunity to show our wares to the community and acquaint the public with our abilities in providing emergency communication. Field Day's 3000-plus transmitter-receiver setups in the field on emergency power and 13,000 people to provide that communication testify to our capabilities. This year our hobby really proved its worth in the community's eye as evidenced by the excellent publicity Field Day activities generated. It is important that amateur radio efforts be so recognized by the community.

Of course, Field Day publicity just doesn't "happen." You've got to make the effort yourself to get your FD operations publicized. What group doesn't thrill in seeing their operations written up in the local "Bugle?" In familiarizing John Q. Public with Field Day and ham radio, the Jones County Amateur Radio Club, W5FDQ/5 related: "Our club publicity before Field Day included over 150 radio spots, tape recorded by members of the club and run on three local radio stations. We had several stories in the local daily. We also appeared on a 15-minute TV show in connection with Amateur Radio Week. The entire show was devoted to a discussion of ham radio and a display and explanation of a typical ham station, including a mock demonstration of passing emergency traffic. Our mayor (Laurel, Miss.) proclaimed the week of June 18–25 as Amateur Radio Week and Sunday, June 25, as Amateur Radio Day, encouraging the public to observe this day by visiting the Field Day site. The local police force brought their emergency truck to the FD site to demonstrate to our visitors. It was the first time the chief had ever observed ham radio in operation. In spite of the heavy rain, we had over 200 visitors to our FD site."

To promote good public relations, ARRL distributed press releases to 1200 affiliated clubs and more than 650 newspapers. The Helix Amateur Radio Club, W6MGJ/6, put this to good use: "We used the sample publicity sheet which ARRL sent us, and we were able to get good news coverage both by press and TV. Many of us were able to see ourselves on TV after Field Day was over, during the weekly news résumé." And the Ogdensburg Amateur Radio Club, WA2FKK/2, reported good results: "We had about 200 visitors with most comments on the beer-can vertical. With the large number of

* Ass't Communications Manager, C.W., ARRL.

(1) (2) (3) (4)

Record 13,750 Hams Report Activity Afield

visitors and excellent publicity, this was an outstanding public relations event in this area. Seven different articles appeared in four newspapers, and six items on radio and one on TV."

Participation

We have a lot to crow about. Marking a healthy steady increase in reported activity, 13,750 people sojourned into the field to participate; this reveals a 1.6% increase over last year's previous record figure . . . and it's anyone's guess how many didn't send in their results to ARRL. Measuring it rig-wise, there were 3184 separate receiver-transmitter setups reported, while just three short years ago, there were 500 less than this. Field Day is by far the biggest, and judging from the activity, the "bestest" amateur radio activity in the world. No other operating activity even comes close to comparing with Field Day. Field Day is tops with everyone.

Conditions

Radio conditions proved good in almost all areas and generally speaking, seemed to be very much on a par with last year, only slightly poorer in some sections. Two days before Field Day, the W1AW Propagation Forecast Bulletin of June 22 announced that "the present unstable conditions are expected to continue through tomorrow, with quality good on June 24-25, and depressed again the following few days." Wow, good conditions *just* for FD! Eighty and 20-meters were hot for many QSOs all the way through, with 40-meters squeezing in the most signals in the smallest slot of spectrum . . . like QRM galore. It depended where you were on how well you did on 10 and 15; most found it dead, while others scored slews of contacts here. V.h.f. hadn't fully recovered from the greatest 6-meter opening ever during the V.H.F. Party two weeks earlier. With a slight opening Sunday afternoon, coupled with loads of local activity, scores were to be had here, too.

Weather

Since FD setups are pretty much at the mercy of the elements, the weatherman is looked to with anticipation and hope prior to Field Day. This year he wasn't much consolation, though, as weather conditions were generally spotty with scattered thundershowers reported throughout most of the country. It varied as much as there being 24 hours of rain in Dallas but pleasant sunshine in Houston. Texas is mighty big though! Many groups had to take extra precaution at their high eagle-nest locations in the face of danger from lightning. Citing the electrical storm hazards, the Lehigh Valley Amateur Radio Club, W3OI/3, penned: "We had good operating positions but lost one 300-foot long-wire to lightning, a close one for six of our members." The Thornton Schools Radio Club, K9PFN/9, concurred with: "Surprise thunderstorms, 35 m.p.h. winds, and a blown final whittled down our score." Fortunate were the few areas, mostly in the West, that dodged any shower activity. A saturated Saturday and a sunny Sunday seemed to be the order of the week end.

(1) Here's a beam farm for you. The 40-meter job was well worth the pains of erection, so says the crew at K4GSD/4. (2) Two operators at W5SA/5. (3) Left to right, W4HNW, W4NOW, and K4IVI's dad refuel on steaks prepared by the latter to keep the ops in top operating shape at K4IVI/4, North Augusta-Belvedere Radio Club. (4) Six and 2-meter station at South Peninsula Amateur Radio Klub, W6WC/6. (5) W4YMG (left) and K4BOM (right) at Mid-South Amateur Radio Assn., W4EM/4. (6) Finishing touches on the beam installation at the Prarie Amateur Radio Club, W9GFD/9. (7) W9SNJ holds down the 20-meter position for the Fort Wayne Radio Club, W9RJY/9. (8) Here's the faithful genny for VE4HE/4, Winnepeg Amateur Radio Club. (9) The convenient operating bus of K9UTI/9.

(5) (6) (7) (8) (9)





"Why don't you shave?" is a familiar expression of razor blade salesman, but KØTBE (left) is obviously too engrossed in scoring more contacts for the Pikes Peak Radio Assn., KØTBE/0, to worry about such details. Logging (right) is W4EKD.

Here and There

However, wherever there are determined hams together, nothing but nothing will halt Field Day. Of the club entries, the two-transmitter class was the most popular with 251 entries and the one- and three-transmitter setups even at 216 entries each. Number of entries descend from there with increased number of transmitters. W3RCN/3, the Rock Creek Amateur Radio Assn., accumulated the most gear with 12 rigs scoring simultaneously . . . and also high in people participating with 110 scurrying about. My, what a hectic week end! ARRL log checkers found three out of four hams can't spell peninsula (or is it perninsaler?), while a goodly number didn't bother to put down their club name — these people being saved by patience and the trusty *Call Book*. And what hams *don't* know about message handling would fill two *Operating an Amateur Radio Station* booklets. That's minus ten points on the score, you know! Also on the negative side, several entries came in considerably past the deadline. Without a reasonable excuse, they just missed out on the score listing. To report the results earlier, we must have the logs per the rules.

VEs

Statistically, the Canadian picture is an interesting one, with VE activity simply soaring skyward this year. Numerically speaking, Canadians account for only about 4% of the total W/VE ham population, yet the VE Class A entries account for 7.5% of the total . . . meaning that in proportion to the number of Canadian to U. S. amateurs, Canadians had nearly 100% more participation or did *twice* as well as U. S. hams. If the W/K entries equaled the Canadian participation, we'd have roughly twice as many logs to score! Think of that a minute, will you? Congratulations to the VEs for an outstanding performance. Speaking of VEs, quite a battle for top score in VE1-Land ensued with VE1FO/1, VE1JV/1, and VE1PF/1 scoring 3564, 3546, and 3537 respectively. VE3DOH/3, the Windsor Amateur Radio Club, led the eight transmitter category, while the Scarboro Amateur Radio Club, sporting a new abbreviated call, VE3WE/3, wrested top-VE laurels from the Nortown Amateur Radio Club, VE3NAR — both groups in the 10-transmitter class.

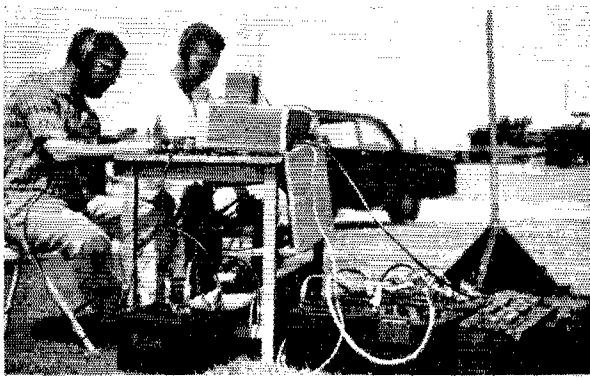
Top Scores

The contest aspect of Field Day pushes us forward scoreward. The Valley Amateur Radio Club, W7HZ/7, enjoying good weather and propagation conditions, fell shy of their record 1960 mark by but 50 contacts and a few hundred points, to outscore all others again this year with 30,357 points. The 11-transmitter class ended in a virtual dead heat between W7DK/7, Radio Club of Tacoma, and the Tri-County Radio Assn., W2LI/2, with ten QSOs separating these second and third highest scorers. Of course, you're competing against clubs of like number of transmitters in operation, and these groups were tops in that department:

Class	*Call*	*Club Name*	*Score*
1A	K5SGX/5	Lafayette ARC	6777
2A	W1TX/1	Connecticut Wireless Assn.	10,539
3A	W5KHB/5	Old Natchez ARC	12,357
4A	W2OYH/2	Morris RC	18,090
5A	W2YKQ/2	Lake Success RC	12,033
6A	K2AA/2	South Jersey R Assn.	17,774
7A	VE3DOH/3	Windsor ARC	8367
8A	W9FQ/9	Wheaton Community RA	8622
9A	W2GSA/2	Garden State AR Assn.	21,366
10A	W7HZ/7	Valley ARC	30,357
11A	W7DK/7	RC of Tacoma	23,130
12A	W3RCN/3	Rock Creek AR Assn.	16,749

On Field Day everybody "wins." If you're not top scorer in a particular transmitter class, then perhaps you're tops in your call area, state, or

Two operators here score for the Bedford County Amateur Radio Soc., W3AHS/3.



Constant swapping of alligator clips and acid burns on clothing . . . but it's all worth it for the extra multiplier available to Class B and C stations. This is the fine battery array of fifth highest scoring Class B station W5YJS/5 (left) and partner W5NCN (right).

county . . . or maybe you beat out that rival club for a steak dinner. Next year you can set your sights higher. Everybody won experience!

Class B

"The gear worked fine, and our score climbed up a bit-and-a-whistle over last year. Some day, just some day, we'll turn in that top Class B entry." Well, that some day arrived, as K6QHZ and K6EXO, signing K6QHK/6, brought home the bacon with that long awaited top Class B score in superlative fashion. 'Twern't easy though with perennial W2FBA/2, and W3YDF/3, W3DQG/3, W5YJS 5 and a host of other hopefuls bearing down all the way. Tenderfoot KN3OSV/3 aided by KN3OIO posted the highest FD Novice score ever recorded with 2025 points, 23rd high of all Class B entries. Summing up unit/individual operation, K6QFS/6 decreed: "Battery power is the only way . . . no generator hash etc. It took only six minutes to set up the entire station."

Class C, Mobiles

Records . . . records . . . records . . . in the mobile class, the Radio Amateur Mobile Soc. (Sacramento, Calif.) shot a gaping hole in all previous mobile records, with 51 mobiles combining their scores for 124,073 points. That's an average of 2433 points per member . . . gadzooks! W6QYY 6, with three operators manning two rigs, led the triumph with K6UKH 6 highest single-operator mobile score. The Westpark Radiops, who have had a strangle-hold on this category for years, tumbled to third, pushed aside also by the Phil-Mont Radio Club (Pa.), led by their club mobile van, W3RQZ/3. In the mobile division, 175 participated — a fine showing indeed.

In Conclusion

Unfortunately, Field Day becomes a memory all too quickly . . . 1961 FD no exception. Let these quotes bring back fond memories and relive those pleasant FD experiences, and also stir us to begin thinking of Field Day 1962. It's never too early to start making those plans!

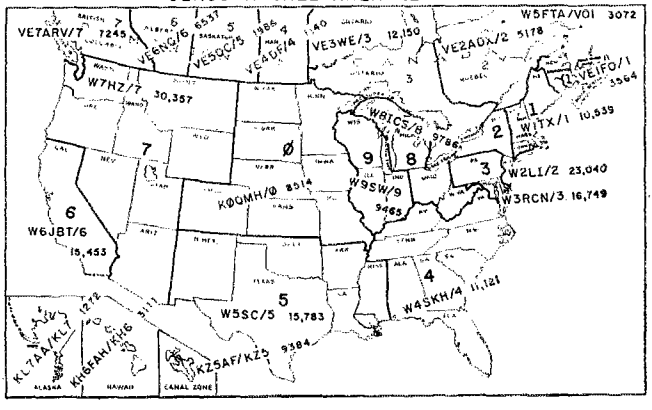
CLUB AGGREGATE MOBILE SCORES

Radio Amateur Mobile Society (Calif.)	124,073
Phil-Mont Mobile Radio Club (Pa.)	35,020
Westpark Radiops (Ohio)	28,112
San Gabriel Valley Radio Club (Calif.)	25,048
Mobile Amateur Radio Club of South Bend	12,115
Argonne Radio Club (Ill.)	1364
Roanoke Valley Amateur Radio Club	671
Parma Radio Club (Ohio)	583

Quotes

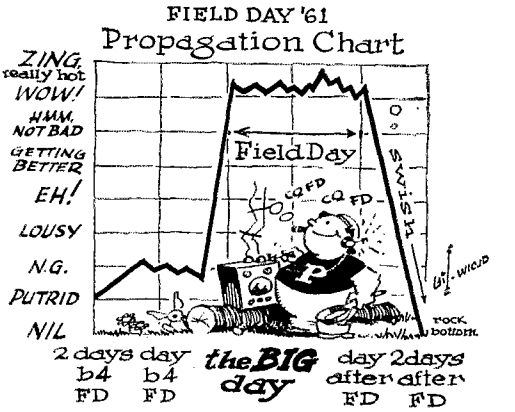
"Another two months of planning and backbreaking work is over. The antenna poles and antennas have finally come to rest on the ground, and the logs have been deciphered. The final ration of liniment and suntan lotion has been passed out — to those who haven't already passed out. I have heard nothing except the immortal phrase, 'Never again!' Atop an inaccessible mountain we braved snakes, 111-degree heat, poison ivy, and various vermin, to once again prove that amateurs are crazy. So it is with humbleness and *pained* relief, that we submit our Field Day logs. See you next year!" — *North Bay AR Assn., K6TWT/6.* . . . "We *operated* from the banks of the *mighty* Columbia with the idea of promoting better public relations, which we believe we did. A great many visitors wandered through out site asking questions and observing the orderly operation. Our local radio station reported our progress hourly via relay through W7JVF. The local TV station spread the word often and a local newspaper gave us all the space we desired." — *Richland ARC, W7VPA/7.* . . . "Did you notice the lack of YLs this time?" — *Gainesville Amateur Soc., K4DPZ/4.* . . . "The flies must have known we were coming, as they turned out in clouds, but a liberal supply of 'dope' kept them away from the operating posi-

CLASS A CALL AREA LEADERS



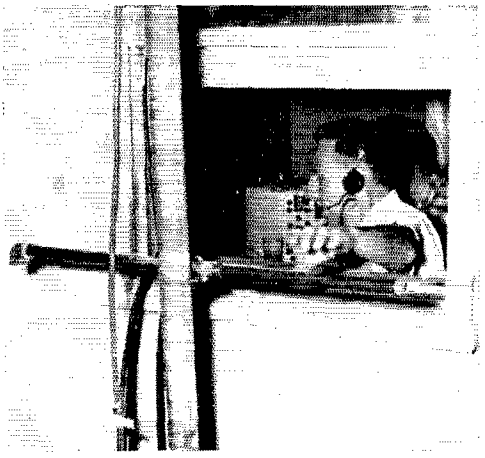
tions." — *Halifax ARC, VE1FO/1.* . . . "We attempted to use helium-filled balloons to support 80-meter vertical, but the wind made the antenna more horizontal than vertical." — *Hialeah ARC, W4MRC/4.* . . . "Activities were hampered the first day when someone left the gate wide open to the field where we were operating. All our work came crashing down when a horse charged into the field from a neighboring farm, ran into the tower's guy wire, broke it, and let tower and antennas fall." — *Oh-Ky-In VHF Radio Soc., W8DQK/8.* . . . "Noticed an extreme amount of courtesy on the bands, especially when calling CQ. The answering station in almost all cases QSY'd and left the frequency to the original station that had called CQ. Heard one station get a DX call, and he explained that he was in a contest. The DX station then said he would not hold him up, but the U. S. station told him he always had time for DX chit chat, contest or not." — *Somega ARC, K4MCL/4.* . . . "Two complete stations were set up in a Volkswagon bus." — *K9UTI/9.* . . . "As a conclusion of this first experience in FD, we suggest not to fool around on the FD site too long before the starting of the FD period, because a large part of 'our pep' was gone when the time c me to go on the air." — *VE2OX/2.* . . . "Field Day is a shot in the arm for our club. Members who do not attend meetings all year work like beavers on FD. This year's outing left us at a high pitch, and it looks like we'll avoid our usual summer slump." — *Kinston Alt Soc., W4OIX/4.* . . . "The boys really enjoyed the late movie after their hour shift, even though the tent was kind of crowded." — *Chuckstowaga Amateur Transmitting Soc., W2ICZ/2.* . . . "When the contacts come fast and furious, you use anything for a log. Some of the newer hams have decided that the old timers can still rack up the contacts, because of experience and patience. Seems that just lots of calls, fast QSY, flashy operating procedures, and wild phonetics don't automatically bring contacts on the run. A lot is learned on FD about shortcomings, facilities, physical limits, etc. It's good for the fraternity!" — *Casper ARC, W7YNJ/7.* . . . "New club . . . first FD. Everyone had a sleepless time." — *East Contra Costa ARC, K6POR/6.* . . . "FB conditions, courteous ops, and plenty of activity made this the best FD ever. Is Murphy's Law weakening?" — *Wells County ARC, K9OJI/9.* . . . "We held our breath on the generator, a new c.d. unit that had not been operated an hour. It started on the first pull though and purred along without a miss. We received much favorable pre- and post-Field Day publicity in several newspapers." — *Bedford County AR Soc., W3AHS/3.* . . . "Dipoles high in Eucalyptus trees were terrific. Tree climbers, as

This rare candid shot, taken within the confines of a FD servicing shop for units that require major on-the-spot repair, reveals an inaccurate chronometer timepiece being adjusted and calibrated by a skilled technician of the Flambeau Amateur Radio Club, W9BLW/9.



used by power company, were a necessity." — *K6MSK/6.* . . . "We had one fellow try to make coffee with white gas!" — *Black River Valley RC, K2GVR/2.* . . . "The club went up to the Cherokee National Forest. The location afforded excellent propagational facilities as well as a most beautiful and inspiring view." — *London County ARC, K4UPX/4.* . . . "A tent pole snapped and we were nearly buried alive." — *K1IVK/1.* . . . "We had a good laugh when all operators fell asleep at the rigs and the generator ran out of gas. Everyone slept for about an hour before someone realized what had happened." — *K9MPG/0.* . . . "We had a ball." — *W0ALG/0.* . . . "After a period of FD inactivity, our club came back this year. The result is nothing to brag about, but for sure we did get in there and did the best with what we had." — *Amateur VHF Institute of New York, W2UCR/2.* . . . "This was the first time many of our members ever worked s.s.b. We were very surprised at the results, especially when we worked Saudi Arabia when we were just testing out the rig." — *Tu-Boro RC, W2BMW/3.* . . . "Murphy had the upper hand this year for us." — *Chisholm Trail ARC, K5DUJ/5.* . . . "Operated 75-meter s.s.b. from a treehouse." — *The Kenmore Society, K2MTV/2.* . . . "There was a lot of public interest which was helped by posters and good local newspaper coverage before and after the event." — *The Tube and Shutter Club, W0CVJ/0.* . . . "When 10-meters opened up our local communications ground plane became our foremost antenna. The ground plane was located on top of Mort Matanzas, 60-feet above the inter-coastal waterway. Outboard motors caused ignition noise 5-9, a half-mile away! What other club in the country had complete control over a national monument for 24 hours? What other club occupied a 221 year-old fort isolated from land on an island in one of our inter-coastal waterways? Everything had to be carried by boat, including the two-kw. generator." — *Ancient City ARC, W4UHC/4.* . . . "We got out like a burglar on 80 but not so well on 40. Gangway for next year." — *W3NNL/3.* . . . "The Novice station at our Field Day site was the only one to start at the set time. The others were two hours late because of generator trouble." — *KN8VVL/8.* . . . "Our old reliable putt-putt burned 22 quarts of high grade motor oil and only three gallons of gasoline. No piston rings." — *K9KGA/9.* . . . "The ultimate disaster occurred this year; the generator caught fire when one of the operators refueled it without stopping the engine. This put a severe cramp in the operating activities. The club's old 350 watt unit was retrieved from its burying place and after being rebuilt on the spot, was pressed into service. Now we know enough to use the fuel pump on the generator instead of filling the tank." — *Chicago ARC, W9CAF/9.* . . . "The club had an opportunity to use its newly bought first aid kit, when K3EUG discovered that after a continuous 24-hour running period, the generator manifold is *hot*." — *Adams County AR Soc., W3KGN/3.* . . . "After burning up four transmitters and faced with the prospect of going home defeated, we hooked up our v.f.o. directly to the 80-meter antenna, making 40 more contacts with the v.f.o.'s 2E26." — *Lacey ARC, K7ITL/7.* . . . "Thought we had the ideal FD site on the beach on Kent Island, until we found the nearby owner of the property had a 21-Mc. i.f. TV set. Kinda dampened our best phone band." — *W3HEC/3.* . . . "No speakers

were taken to the Field Day site. For once we could carry on a conversation in the operating room. Flagpoles are dandy antenna supports when they are so plentiful." — *Ohio State University ARC, W8LT/8.* . . . "Our town recently built a new airport. We set up our Field Day stations in the old terminal building, no longer in use. One of the triband beams was on top of the old 65-foot control tower, with the other up about 40 feet on a boom truck. We think we had one of the best locations and station setups in the entire country." — *Rochester ARC, W0MXW/0.* . . . "Our biggest problem was keeping our cook on his feet. He tripped over our tent ropes and exposed tree roots; but he looked after us during the wee hours of the night." — *Leavenworth ARC, W7AEY/7.* . . . "Why not have some article by one of the high scoring clubs to show us how they get the big ones?" — *Walton R Assn., W2LZ/2* [If they'll write 'em, we'll print 'em. — *Ed.*] . . . "We found the audio limiter described in 'How To Get Rid of the Other Fellow's Key Clicks' (McCoy, *QST*, January 1960, p. 44) extremely effective in getting rid of key clicks from neighboring rigs." — *K9RAS/9.* . . . "First Field Day activity for our club since 1953. We'll be back next year." — *Kaw Valley, RC, W0HS/0.* . . . "We got a large charge operating Field Day." — *K1LRB/1.* . . . "Tri-band elements were straightened while 50-feet up by casting expert K8STP with a fishing rod." — *Indian Hills RC, W8ICS/8.* . . . "The various colors of the enclosed Field Day log sheets (tan, blue, and green) aptly describe the Club members' condition after FD. We are *tan* from the Florida sun which beat down unmercifully during the erection of antennas. We are *blue* because we aren't sure if we won the *Florida Skip* FD Trophy. We are *green* with envy over some of the scores of other clubs." — *Dade RC, W4NVU/4.* . . . "Our club travels more than 80 miles to our FD site. With the elevation a cool 7200 feet, snow is a problem on the road to the site. Fish abound in the high lakes just below our operating positions, providing us trout for breakfast, lunch, and dinner. A whale of a good time is had by all." — *North Hills RC, K6QWL/6.* . . . "Our club's ace-in-the-hole was a TA-33 beam on a hundred-foot tower. This seemed to have made the difference for us." — *Lafayette ARC, K5SGX/5.* . . . "Location was an abandoned radar site, highest point in the county. As this was U. S. government property, all operators were locked inside the gates for the duration of the FD week end." — *SWANI RC, No. Group, W9CCN/9.* . . . "Did any of you guys ever haul a gas-powered generator miles to the Field Day site, only to discover it created a 40-over-9 disturbance? We did!" — *Crescent Bay Emergency Radio Net, K6LDA/6.* . . . "Murphy ignored us this year. Everything went off as if we knew what we were doing." — *Mid Mo ARC, K0ETY/0.* . . . "The station was established in a small house trailer and towed to a remote section of Manatee (Fla.) County known as Snead Island, reached by bridge from the mainland. The QTH was at the extreme western point of the island, with the waters of Tampa Bay and the Manatee River on three sides." — *Manatee ARC, K4BDT/4.* . . . "The generator *tuckered out one minute after FD was over.*" — *York ARC, W3EDU/3.* . . . "The QRN was very heavy because of electrical storms in the area. Six inches of water accumulated in the tent, and one time the group was driven away from the site by lightning." — *Convair ARC, W6SJZ/6.* . . . "FD is 'like FB.'" — *Hellertown ARC, K3JJV/3.* . . . "We're happy to report the biggest turnout in our club's history with 85 people out, 80 of these registered in AREC. YLs operated 40 phone and came through in fine style." — *Genesee County RC, W8ACW/8.* . . . "We put up a mile of electric fence wire for 40 s.s.b., but it didn't load up too well." — *Sangamon Valley RC, W9DUA/9.* . . . "Let's try RTTY next year." — *Sidewinders RC, K6LSZ/6.* . . . "Our club held down the Southwestern



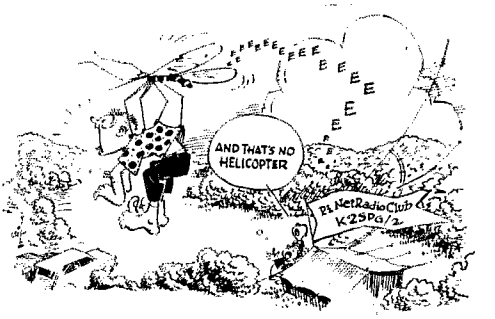
W3LVC employs the age-old Armstrong method of rotating the 6- and 2-meter beams for the Friendship Amateur Radio Club, W3GR/3.

tip of the United States. From our location at Border Field we were within a few hundred yards of the Pacific and also within sight of the new Tiajuana bull ring just across the border to Mexico." — *North Shores ARC, K6HAI/6.* . . . "This one was for *Scotty*, W2PWX, who joined Silent Keys last year. Two meters was his band and it just didn't seem the same this year. Quite a few fellows said they missed hearing his voice." — *Garden State ARA, W2GSA/2.* . . . "The local newspaper and radio station leaned over backward to give us outstanding coverage. The mayor of New Rochelle (N. Y.) again named the two-day period as 'Amateur Radio Days' in tribute to civil defense and to the hams who play such an important part in planning for natural and man-made catastrophe." — *Communications Club of New Rochelle, K2YCJ/2.* . . . "Highlight of the day was when WA6OCC tried to fasten a radial wire to a 'crooked stick.' It rattled and crawled down into its hole." — *The Corona Gang, W6LVM/6.* . . . "S.s.b. activity finally came into its own in the 1961 FD. Our hats off to those home stations whose participation help run up the s.s.b. contacts." — *Miami Valley AR Contest Soc., W8CEA/8.* . . . "The site was 450 feet above the surrounding terrain with line-of-sight 30 miles in any direction. The results from the inverted 'V' autennas were truly gratifying." — *Milwaukee Radio Amateurs' Club, W9HRM/9.* . . . "FD site was on top of Overlook Mountain which is a two-mile trip up a dirt road. No equipment failures helped make this the best FD the club has ever had." — *Ulster County Mike & Key Club, K2YOU/2.* . . . "All operating was done from a new emergency communications center that the club constructed in an old donated school bus. Club members have completely refurbished the interior, installing benches, power outlets, equipment to cover all amateur bands, and local police and emergency two-way radio channels. The exterior was finished in official civil defense

Tailgate table is a good hint for setting up Field Day operating positions. Furiously snagging another one are left to right: an SWL logger, W9UEO, and W5DXN for the Bellevue Amateur Radio Club, KØDWC/Ø, famous call of "Butch" Griswold. (Photo by KØZLY.)

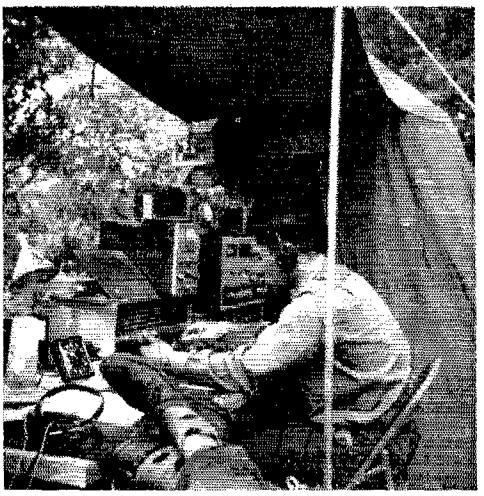
The sign in front of the v.h.f. setup of the San Antonio Radio Club, W5SC/5, facetiously proclaims this tent to be for "six and two meters, home of the video rangers." That handle can't hold much water though, as 143 QSOs here helped the club to score 15,583 points.

colors." — *Owensboro ARC, W4SUD/4.* . . . "Perched on a grassy cliff-edge 110 feet above Puget Sound, the view, weather, equipment, motor-generator, and conditions were superb." — *AR Communications Service, W7RGL/7.* . . . "The company again gave us permission to use their microwave relay site. Antennas were strung from the guys of the 160-foot microwave tower." — *Lawsville Gas & Electric Co. Amateurs, W4JRA/4.* . . . "Greater part of the operating was done by teenage hams, which resulted in a higher score than last year." — *St. Petersburg ARC, W4GAC/4* . . . "Our tents didn't have rugs, but did we have bugs!" — *St. Clair ARC, K9GXU/9.* . . . "This is the third year we've been using s.s.b. on the lower bands and it sure is far superior to a.m. on FD. However, we could sure use another half-dozen good c.w. operators. Our 15-kw. generator performed like a precision machine, gulping down more than 50 gallons of gas." — *Raritan Bay Radio Amateurs, K2OML/2.* . . . "Thanks to the inverted V-shaped dipole article by K7GCO (Glanzer, *QST*, August, 1960, p. 18), the 40-meter gang did a wonderful job. We're really sold on this antenna." — *Western Electric ARC, K9AVO/9.* . . . "We borrowed a hearse and had three transmitters set up in it. Could that be the reason the bands were so *dead?*" — *Orange County ARC, W6ZE/6.* . . . "Thanks to an insane tree climber in getting up a good antenna, we broke our 200-QSO barrier." — *W9TOR/9.* . . . "We set up operations next to a pig farm during slaughtering time. What a smell! Naturally we were downwind 95% of the time." — *K4LDR/4.* . . . "The XYL and I had a ball. We were camped within 20 feet of Big Pine Creek, up 8000 feet in the clear, cool air. I watched her catch rainbow trout while I hammed. What more could one want for a FD outing? The complete station (in a Campbell's soup box) stays in the pickup truck, and goes along on all trips from now on. The truck makes a fine shack." — *W6CIS/6.* . . . "Heard 6000 stations easily, but they couldn't hear me! " — *K4CXF/4.* . . . "No sweat this year. Ole Murphy took a holiday." — *K1ITU/1.* . . . "The receiver conked out on us, but K3BRS happened by out of nowhere to loan us a 75A-1." — *K4QET/4.* . . . "Egad, what a mess. Even a skunk was about creating quite a smell." — *W4GAWD/0.* . . . "On two meters, I used a coathanger antenna, three feet off the ground." — *KN1RIH/1.* . . . "We used a novel antenna, a longwire suspended from four six-foot diameter helium balloons held together by a parachute. It worked fine on long wave stations, but poorly on 6 and 2." — *Research City AR Assn., W1EUH/1.* . . . "The club set up in a clearing at the wood lot of Mt. Tom State Park Reservation. In looking for some poles to support a tarpaulin over the generator, W1UWX climbed up on the woodpile and found himself facing a large timber rattler. Needless to say, Cliff beat a hasty retreat. The rattler was quickly pinned down. The rattler was 47 inches long and had 13 rattles. Later, the ranger said it was the largest seen in years in this part of the country. The rattler is to be mounted and displayed in the park museum." — *Pioneer Valley RC, W1AEW/1.* . . . "All antennas were dipoles with their centers attached to a 65-foot pole, topped with a 2-meter ground plane." — *San Gorgonio Pass ARC, K6QYF/6.* . . . "The Novices could kick themselves for not having their General class licenses. We took slides of the whole operation and will show them to about 1800 high school students, to get more interested in ham radio and show the student body what ham radio is all about." — *Elkhart High School ARC, K9IXS/9.* . . . "While listening on 2-meters, I heard K2IYU/2 calling 'CQ FD' and I proceeded to call him, until I realized the call I was using was K2IYU/2 — crossband modulation," — *K2IYU/2.* . . . "Since everybody worked together and had fun together, regardless of their own personal love for a particular type of emission or band, we had a most successful and enjoyable *club* activity." — *Shenandoah Valley ARC, W4RKC/4.* . . . "Two barns and a milkhouse were our temporary headquarters for the exercise. The small barn had a horse, 100 chickens, and a hay rack and loader; we set up our c.w. station here. The milkhouse had the 80-meter rig, while the large barn with the cows, young bull, and wagon sheltered the 6-meter and 20/15-meter rigs." — *Evendale ARC, K8LUC/8.* . . . "To stay in three-transmitter class, we had multiple dipoles to the same feedline on 15- and 6-meters. We had a receiver on both bands at the same time, so we could switch bands fast." — *Bayside ARC, W2LAQ/2.* . . . "We got good coverage on TV, with two stations running pictures of the Field Day setup." — *Houston ARC, W5DPA/5.* . . . "Our 20-meter s.s.b. setup was in an all metal warehouse. We found it easier to work KH6s by reflecting a signal off the metal warehouse with our beam east." — *Old Natchez ARC, W5KHB/5.* . . . "Beam Stadium, a local baseball park at Albrook AFB, Canal Zone, was truly 'beam' stadium for us. The 10-meter station was located in the hot dog stand, the 15-meter station in the showers, the 20-meter station in the visitor's dugout, and the 40/80-meter boys in the bleachers." — *Caribbean Air Command MARS Club, KZ5AF/KZ5.* . . . "Mt. Pacifico, over 7000 feet high, is graced with beautiful pine trees 40 to 50 feet in height. Therefore, the bulk of our antennas were dipoles, fourteen in fact. Climbing the trees was fun. Try keeping your nerves when your atop a 50-foot pine when a 30 m.p.h. gust sweeps over that mountain. Every inch it sways seems like a foot. Next year I wear a parachute." — *Santa Monica City College RC, W6SVK/6.* . . . "Antennas were about 112 feet off the ground atop an old 97-foot fire tower," — *K9DPU/9.* . . . "We decided to participate in FD this year after an absence of about ten years in this type of operation. As there was a complete lack of trees at the site, the use of guyed extension ladders for masts facilitated the erection and



"We camped in a mosquito bog. Mosquitoes were so big that one tried to carry off K2SPG, but brought him back when he realized the real BIG ones down by the river might take Jim away. We trained two mosquitoes and had them put up our 80- and 40-meter antennas. All in all, it was a typical Murphy's Law type Field Day."
— *Pi Net Radio Club, K2SPG/2*

dismantling of our antennas." — *St. Thomas CD ARC, VE3TCD/3.* . . . "The effort put forth is not mirrored in the score achieved. However, right in the middle of near north Chicago, a FD station was established inside a Red Cross panel truck. It was a good demonstration that we can set up either local or long distance communications on short notice in an emergency." — *Chicago AR Disaster Corps, K9UAO/9.* . . . "Any 6-meter stations in Eastern Mass. had a chance for a Vermont contact this year. We put up a 6-meter rhombic and aimed it at Boston. At times six sounded like 75-meter phone." — *Windham RC, K1DJH/1.* . . . "Our secret weapon this year was four half-waves in phase on 80, and a 40-meter vertical supported by a 12-foot balloon filled with hydrogen. This antenna was carried away by a wind storm." — *Sabine Valley ARC, W5VFM/5.* . . . "Next year will be *sure* of operators and get gear collected and checked in advance, so we won't get caught all alone and without working equipment." — *W8CXS/8.* . . . "Oh brother, I still can't look a radio in the face. It was hot — 108 degrees; the cotton-pickin' generator goofed up, gremlins in the carb: and not enough operators showed up. But, after a shower, shave, and liberal application of sunburn lotion, it was fun." — *El Dorado County ARC, W6MIX/6.* . . . "Erection of our full-sized 40-meter beam took many hours of labor, but it was a masterpiece. Of course, this was too good, so it fell not once but twice. Highlight was K4YWW observed sleeping with his eyes open. Field Day with our group is something to forget rather than remember." — *Royal Fraternity of Screwballs, K4GSD/4.* . . . "Between a shorted coaxial antenna cable and power failure with the generator, the 'sly old FOX' got very little sleep." — *Delmont RC, W3FOX/3.* . . . "One hour was lost because of generator failure. This was caused by the vent in the fuel tank being plugged, and the engine eventually starved itself of fuel. Being a diesel engine, the whole fuel system had to be bled of air locks. MORAL: leave *nothing* to chance!" — *South Shore ARC, VE2ADX/2* [*Don't even leave nothing! — Ed.*] . . . ."Our only problem was keeping inquisitive cows from chewing up our tents and rubbing their heads on the guy wires. We followed the idea of low power with high-gain antennas, and it really paid off. We found s.s.b. a must. Also changing our call from VE3SRC helped quite a bit too." — *Scarboro ARC, VE3WE/3.* . . . "The crew received a little experience in actual emergency traffic. While monitoring the local net frequency Friday night before FD, an urgent call was heard for Merle, W7IKG, one of the members of the club. One of his daughters had developed acute appendicitis and it was imperative that Merle be contacted to sign necessary legal releases for the operation. Merle, however, was not at the Field Day site but was at his home which for the moment was without a commercial telephone. However, the boys were able to relay traffic, contact another member of the club who lived close to Merle, get him over to his house, and get all parties to the hospital in time for a successful operation." — *RC of Tacoma, W7DK/7.* . . . "Stations varied from tents to a surplus converted Greyhound bus. This bus was quite an attraction to the local visitors." — *San Antonio RC W5SC/5.* . . . "We tried a 'V' beam with success." — *Club des Jeunes Operateurs, VE2JC/2.* . . . "A lot of fun was had by a lot of hams." — *W8WUT/8.* . . . "Our location overlooked a scene of many former exciting days, as we were in the press box of the old Green Bay Packers Stadium." — *Green Bay Mike & Key Club, K9EAM/9.* . . . "This FD ended with disaster when approximately 150 homes in our location of Ft. Worth became flooded after five inches of rain during the night." — *K5PAW/5.* . . . "Almost lost the beam to an irate camper." — *K9JII/9.* . . . "The gang found one well-frightened rattlesnake and a 5-foot blacksnake, now a fatality. After all was over we checked the s.w.r. on 40 and 20 to find out why this *shouldn't have been* our best Field Day." — *Penn Central RC, K3AHS/3.* . . . "Other than the 80-meter rig not working right, rain, static from the weather, rain, DX-100 on 15 phone blowing a filter coadenser, rain, having to stop four hours early, and among other things rain (or have I said that), we had a lot of fun, even though the *score was shot.*" — *K5EQV/5.* . . . "One operator went around pullin r up weeds to make room for his chair and table. Found out later it was poison sumac." — *Burlington Short Wave RC K2MXN/2.* . . . "We had to drive 52 miles over mountain roads to our FD site. What about some others roughing it like us?" — *Walla Walla Valley RAC, W7DP/7.* . . . "At five o'clock in the morning we were still waiting for the band to thin out, but it never did." *Queen City Emergency Net, W8VVL/8.* . . . "Considerable time was spent training operators in operating techniques. Next year we plan on conducting a school several weeks before FD for the purpose of having these new fellows ready for action when they are needed." — *East River RC, K4YEG/4.* . . . "One interesting incident was the contact that ended with a shock from a stray piece of coax between the equipment. The stray coax turned out to be the antenna which was supposed to go through the s.w.r. bridge to the transmitter. Nevertheless, it was a good contact." — *K1MHW/2.* . . . "For the first time in the history of our club, we participated in Field Day, and to say the least, it was a most enjoyable and exciting occasion." — *Grey Bruce AR Assn., VE3GBN/3.*



The log keeper here fades away into oblivion, as KØWWW keys on for the West Suburban Radio Club of Minneapolis, KØWWW/Ø. Note the gas funnel, an excellent lampshade.

After cleaning up and removing some old dynamite found lying around, this old logger's line shack made an excellent shack for logging Field Day contacts for the Tualatin Valley Amateur Radio Club, W7UTV/7. Standing is K7GSM, club president, while FD Chairman W7ADU in the foreground tunes the receiver, an SWL logs, and W7DIS Assistant FD Chairman tunes in the background.

SCORES

CLASS A

Class A stations are clubs and groups in the field. Scores are tabulated according to the number of transmitters operated simultaneously at each station. The figures and letters following each call indicate the number of valid contacts, the power inputs used, the number of participants at each station and the final score. The "power classification" used in computing the score is indicated by the letters A, B or C after the number of QSOs shown. A indicates power up to and including 30 watts (multiplier of 3); B indicates power over 30, up to and including 150 watts (multiplier of 2); C indicates over 150 watts (multiplier of 1).

One Transmitter

K5SGX/5	Lafayette ARC	738-	A-	6-	6777
W9CCN/9	SWANI RC (No. group)	730-	AB-	9-	6219
W0RA/0	(nonclub group)	649-	A-	4-	6066
W2HQL/6	(nonclub group)	554-	A-	3-	5211
K2LXL/2	(nonclub group)	521-	A-	3-	4914
K2DXV/2	RA of Greater Syracuse	503-	A-	11-	4752
K9JAU/9	(nonclub group)	465-	A-	3-	4410
W2ZRC/2	RA of Erie County	452-	A-	3-	4293
K8ITH/8	McKinley High School RC	433-	A-	5-	4122
W8SMK/8	Cuyahoga Falls RC C.W. Group #1	433-	A-	5-	4122
W0LUX/0	Winona ARC	624-	B-	10-	3744
W0DEP/0	(nonclub group)	385-	A-	4-	3690
W8NCF/8	Tusco RC	381-	A-	8-	3654
W8NP/8	Massillon ARC	378-	A-	10-	3627
K6LDA/6	Crescent Bay Emergency Radio Net	377-	A-	15-	3618
W8RTR/8	Canton ARC	375-	A-	30-	3600
W5CK/5	Order of Boiled Owls of New Mexico	372-	A-	8-	3573
VE1JV/1	Pictou County ARC	369-	A-	8-	3546
W7OTV/7	Oregon Tualatin Valley ARC	561	AB-	8-	3504
K8EPV/8	Brass Pounders ARC	362-	A-	10-	3483
W5FKX/5	(nonclub group)	553-	B-	5-	3450
K0ETY/0	Mid-Mo. ARC	392-	AB-	12-	3354
W7DTT/7	K-W Club	476-	AB-	9-	3345
W6BLY/6	Whittier Radio 50 Club	334-	A-	12-	3276
K3MJW/3	Skyview R Soc.	519-	B-	15-	3114
K6CLZ/6	Aerojet General RAC	364-	AB-	8-	3111
KH6FAH/KH6	Air Force MARS	432-	AB-	8-	3111
W8VPC/8	(nonclub group)	319-	A-	6-	3096
W1GZ/1	Montachusett ARC	307-	A-	11-	2988
K2AZJ/2	(nonclub group)	302-	A-	5-	2943
K5MDV/5	Jefferson Parish ARC	481-	B-	5-	2886
K0HLB/0	(nonclub group)	486-	B-	4-	2796
W8QDJ/8	Buckeye Shortwave RC	465-	B-	7-	2790
K4BDT/4	Manatee ARC	418-	AB-	12-	2772
W7LHM/7	(nonclub group)	446-	B-	9-	2676
W7VJT/7	McMinnville ARC	360-	AB-	11-	2676
W8IN8/8	Muskingum AR Assn.	443-	B-	40-	2658
W3EDU/3	York ARC	293-	A-	11-	2637
K2ISP/2	(nonclub group)	396-	AB-	5-	2619
W3EAN/3	Main Line Dandies	411-	AB-	3-	2592
K5LJL/5	Lake View ARC	286-	A-	3-	2574
K9AVZ/0	Mac West RC	402-	B-	6-	2532
W6JTP/6	Tamalpais ARC	391-	B-	15-	2496
W2YGW/2	(nonclub group)	253-	A-	6-	2477
K9ZMR/9	Sun Prairie AR Klub	259-	A-	8-	2475
K5TNR/5	Crescent City Teenage Hams	406-	B-	7-	2436
K2BEV/2	South Amboy AR Assn.	270-	A-	8-	2430
W9NGL/9	Soc. of R Operators	396-	B-	20-	2376
W8SJZ/5	Conway ARC	256-	A-	15-	2304
W1CK/1	Burlington AR Assn.	229-	A-	12-	2286
K8IPI/8	Greater Cleveland VHF RC	237-	A-	10-	2268
K4MSM/4	(nonclub group)	377-	B-	4-	2262
VE1LZ/1	(nonclub group)	352-	B-	3-	2262
W0CKF/0	Minneapolis RC	375-	B-	-	2250
W5CYN/5	Hot Springs ARC	374-	B-	20-	2244
W1FWH/1	Newington AR League	224-	A-	14-	2241
W9NUW/9	Wisconsin Valley R Assn	372-	B-	3-	2232
W5CVU/5	(nonclub group)	219-	A-	3-	2196
W4MM/4	Albany ARC	337-	B-	25-	2172
K2IYO/2	Salem County RC	330-	B-	6-	2130
W4BKV/4	Tallahassee Contest Assn	354-	B-	3-	2124
K8MFK/8	(nonclub group)	210-	A-	8-	2115
K9MAN/9	Calumet ARC	304-	AB-	7-	2115
K3JJV/3	Hellertown ARC	318-	AB-	15-	2085
K4YOQ/4	Hillsborough AR Soc.	346-	B-	48-	2076
W4EM/4	Mid-South AR Assn.	300-	AB-	7-	2049
W1KKE/1	Providence R Assn.	201-	A-	15-	2035
W9LIF/9	Tri-State AR Soc.	312-	B-	9-	2022
K4PBK/4	(nonclub group)	335-	B-	5-	2010
K8SQM/8	Cuyahoga Falls RC C.W. Group #2	334-	B-	5-	2004
K4IYJ/4	Tallahassee ARC	307-	B-	10-	1992
W7SO/7	Albany ARC	304-	AB-	8-	1989
W0FFN/0	(nonclub group)	302-	B-	5-	1962
W8YPT/8	Chippewa ARC (B Group)	294-	B-	4-	1920
W5VFM/5	Sabine Valley ARC	293-	B-	12-	1908
W9JCL/9	Neenah-Menasha ARC	318-	B-	14-	1908
K0ITZ/0	Nodaway Valley R Assn.	287-	AB-	15-	1881
W2FT/2	Plainview ARC	272-	AB-	12-	1875
K8DXF/8	Mason County RC	288-	AB-	12-	1860
W5SA/5	(nonclub group)	203-	A-	4-	1827
K0EUD/0	Arrowhead AC	200-	A-	5-	1800
VE2CO/2	Lakeshore Field Day Group	333-	B-	5-	1798
W8CXS/8	(nonclub group)	271-	B-	4-	1776
K9EMG/9	Sheboygan County DXers	281-	B-	7-	1776
K0WEW/0	(nonclub group)	292-	B-	6-	1752
W4DIJ/4	(nonclub group)	265-	B-	4-	1740
K7AYF/7	Shy-Wy RC	265-	B-	11-	1740
W7TQC/7	Anaconda ARC	264-	B-	15-	1734
W0UNT/0	Lawrence ARC	289-	B-	11-	1734
K5FJC/5	MARS Station Dyess AFB	264-	AB-	9-	1680
W6MIX/6	El Dorado County ARC	161-	A-	9-	1674
WA6GWD/6	(nonclub group)	161-	AB-	4-	1668
K0PTK/0	Pine Ridge ARC (Group I)	160-	A-	13-	1665
W2TIO/2	Royal Order of Lightening Dodgers	274-	B-	10-	1644
W5AQR/5	Ville Platte RA	182-	A-	8-	1638
W9BKC/9	Arrows RC	269-	B-	10-	1614
VE3HCD/3	Sarnia ARC	250-	B-	3-	1614
K9WWW/0	West Suburban RC of Minneapolis	267-	B-	6-	1602
K9UNI/9	Valley VHF Club	177-	A-	7-	1593
VE7ASM/7	Fraser Valley ARC	152-	A-	4-	1593
K8SAP/8	Hillsdale ARC	176-	A-	-	1584
K2SPG/2	Pi Net RC	150-	A-	12-	1575
K0MGG/0	(nonclub group)	174-	A-	3-	1566
K4PEG/4	(nonclub group)	254-	B-	4-	1524
W4TWW/4	(nonclub group)	218-	AB-	3-	1521
W4UHC/4	Ancient City ARC	249-	AB-	9-	1512
K5CEB/5	(nonclub group)	167-	A-	3-	1503
VE7PQ/7	Comox Valley ARC	135-	A-	5-	1440
K9YCJ/9	Gibson ARC	168-	AB-	9-	1413
W3CDI/3	Baltimore Polytechnic Institute RC	235-	B-	10-	1410
K0KKQ/9	East Central Minn. ARC	235-	B-	10-	1410
W6MTP/6	(nonclub group)	155-	A-	4-	1395
WA6OWM/6	(nonclub group)	155-	A-	4-	1395
K9YBV/9	Michiana VHF RC	129-	A-	14-	1386
W5URW/5	Port Lavaca ARC	225-	B-	4-	1350
K8BTP/8	Quake R Assn.	199-	B-	18-	1344
W8EHZ/8	University High School RC	197-	B-	4-	1332
VE1DN/1	Dartmouth ARC	221-	B-	8-	1326
W9YCR/9	Quad-City ARC	207-	AB-	6-	1323
W9OYR/9	Mancorad RC	219-	B-	12-	1314
W2UMI/2	Oswego County AR Assn.	193-	B-	10-	1308
VE3RC/3	Ottawa ARC	193-	B-	12-	1308
W7FO/7	Butte ARC	191-	B-	14-	1296
W7QXS/7	Astoria ARC	187-	B-	5-	1272
K0JKS/0	Falls City ARC	187-	B-	4-	1272
W3NNL/3	(nonclub group)	141-	A-	3-	1269
W4UYQ/4	Polk County Civil Defense	164-	AB-	10-	1269
W8CIA/8	Louisville ARC	211-	B-	3-	1266
W9CHD/9	(nonclub group)	140-	A-	3-	1260
K3OUI/3	Short Skip RC	163-	AB-	12-	1257
W3VI/3	Huntingdon County ARC	204-	AB-	12-	1254
W8OCU/8	County R Assn of Manistee	176-	B-	15-	1206
K9TIG/9	(nonclub group)	200-	B-	3-	1200
K0EJS/0	Galua ARC	166-	B-	20-	1146
VE4DF/4	Cranberry Portage ARC	165-	B-	8-	1140
K0VTE/0	Albert Lea Spider Web AR Assn	164-	B-	6-	1134
W8JGB/8	Hickory Corners Engineering Soc	150-	AB-	3-	1131
K6BAJ/6	Yuba-Sutter RC	188-	B-	4-	1128
VE4AC/4	AR League of Manitoba	162-	B-	3-	1122
W0CDP/0	Arkansas Valley RC	183-	B-	7-	1098
VE3HK/3	Elliott Lake ARC	158-	B-	8-	1098
K6TRA/6	(nonclub group)	121-	A-	7-	1089
KN8VYL/8	(nonclub group)	96-	A-	8-	1089
K5VSW/5	6 Meter Club of Dallas	117-	A-	12-	1053
K9KGA/9	(nonclub group)	175-	B-	3-	1050
W9CAF/9	Chicago ARC	148-	AB-	12-	1050
VE2EE/2	Canadair ARC	172-	B-	8-	1032
K2SKO/2	Peanut Whistle Net Radiators	171-	B-	3-	1026
K3USN/3	Philadelphia Naval Base ARC	121-	AB-	15-	1017
K8UIUU/8	Buckeye Shortwave R Assn	113-	A-	7-	1017
W2OXU/2	Boys Club of East Aurora	142-	B-	4-	1014
WA2IKP/2	Plainview High School ARC	160-	AB-	5-	1011
W5YM/5	University of Arkansas ARC	167-	B-	-	1002
W9TWM/9	Kishwaukee RC	332-	C-	20-	996
VE7AHR/7	Prince Rupert Shortwave Club	90-	A-	5-	990
K0LZJ/0	(nonclub group)	110-	A-	3-	990
W4ELO/4	(nonclub group)	164-	B-	3-	984
W0CXK/0	Omaha ARC	162-	B-	12-	972
VE1GM/1	Yarmouth ARC	137-	B-	10-	972
VE6QE/6	Central Alberta R League	162-	B-	-	972
W2BV/2	Cumberland RC	159-	B-	6-	954
W0TIA/0	Homesteader ARC	133-	B-	15-	948
K8BSV/8	Buckeye Shortwave Assn.	154-	B-	10-	924
W2YNU/2	Ridgewood High School RC	123-	AB-	9-	921
W7NZJ/7	Great Falls RC	128-	B-	7-	918
K5ZDI/5	Six Meter Club of San Antonio	101-	A-	6-	909
W5ROC/5	Baldwyn AR Klub	123-	B-	8-	888
W7UBI/7	(nonclub group)	138-	AB-	3-	888

WA2ISE/2	North Syracuse Central High School RC	143-	B- 3-		858
W3KGN/3	Adams County AR Soc.	117-	B- 8-		852
K9KSR/9	Dunn County RC	141-	B- 4-		846
K2SVU/2	(noneclub group)	89-	A- 5-		801
K8SOQ/0	Hastings ARC	106-	B-20-		786
KL7WAF/KL7	Wildwood Station ARC	127-	B- 6-		762
K9TZI/9	(noneclub group)	111-	B- 3-		756
W0EVT/0	Forx ARC	120-	B- 5-		720
K8UZQ/8	Yale AR Soc.	114-	B- -		684
W9AIQ/9	Door County ARC	113-	B- 8-		678
K7JEP/7	Homer County ARC	196-	B-14-		666
W9ACY/9	Northland ARC	108-	B-10-		648
W0RRZ/0	Western Slope RC	72-	A- 8-		648
VE7AJY/7	Terrace AR Assn.	82-	B- 6-		642
W2ZJ/2	Elmira AR Assn.	99-	B-13-		594
K0ZPC/0	Clinton ARC	194-	C-14-		582
K0EVC/0	Storm Lake ARC	70-	B- 3-		570
W1BH/1	(noneclub group)	90-	AB- 3-		555
W8GQN/8	Straits Area RC	89-	B- 6-		534
K7ITL/7	Lacey ARC	59-	A- 5-		531
K9QLD/9	Notre Dame High School RC	88-	B- 6-		528
W0FOG/0	Smoky Valley RC	87-	B- 6-		522
W8JIU/8	8, 9, 0 Assn. of Midland, Mich.	152-	AC- 8-		498
W7TMI/7	(noneclub group)	80-	B- 4-		480
K5RLM/5	Wheat Straw ARC	53-	B- 5-		473
WA2DSR/2	Forty Meter Zero Beats	77-	AB- 4-		465
K2INN/2	Chemung County AREC	51-	B- 9-		456
W5FZX/5	Stephen F. Austin ARC	69-	B- 6-		414
K0DDL/0	(noneclub group)	45-	A- 5-		405
W8AX/8	Thumb ARC	134-	C- 7-		402
WA2KIP/2	Trenton District R Assn.	42-	A- 6-		378
K0ALY/0	Pine Ridge ARC (Group 2)	61-	BC- 4-		354
VE2AXO/2	(noneclub group)	36-	A- 3-		324
K8KXJ/8	(noneclub group)	39-	AB- 3-		321
KH6DEX/KH6	(noneclub group)	149-	B- 4-		298
K1MJO/1	(noneclub group)	133-	B- 3-		266
K1KIN/1	(noneclub group)	42-	B- 3-		252
W2VSP/2	RA of Greater Syracuse (Group 2)	37-	AB- 6-		252
K8DAW/8	(noneclub group)	126-	B- 6-		252
W0QHB/0	Central Iowa VHF Club	25-	A- 5-		225
W8ACQ/8	Chippewa ARC (A Group)	78-	B-10-		208
W0CIW/0	Fullerton RC	34-	B- 4-		204
KN8ZSP/8	Kalamazoo ARC (Novice Section)	11-	B- 3-		186
W6KIL/6	Dunsmuir ARC	21-	B- 7-		126
W7MRW/7	Newberg ARC	58-	B- 7-		116
K3JKJ/3	Hamsters ARC	40-	AB- -		100
KN8ZOW/8	Melvindale High School RC	13-	AB-10-		81
K1JMQ/1	Lexington High School RC	7-	A- 5-		63

Two Transmitters Operated Simultaneously

W1TX/1	Connecticut Wireless Assn.	1146-	A-20-	10,539	
W3WJD/3	Frankford RC, Group A	1182	-AB- 5-		9933
W2BSC/2	Niagara Frontier DX Assn.	1001-	A-10-		9234
W7CO/7	Western Washington DX Club	937-	A-20-		8568
W3MFW/3	Elizabethtown AR Soc.	893-	A-14-		8262
W3ATR/3	Beacon RA	805-	A-12-		7470
W8CEA/8	Miami Valley AR Contest Soc.	784-	AB-13-		6264
W9HRM/9	Milwaukee RAC	668-	A-13-		6237
K3CLF/3	Circuit Breakers ARC	675-	AB-14-		6042
W1VB/1	Candlewood AR Assn.	624-	A-30-		5850
K4UYF/4	Hampton Roads RC	902-	B-20-		5562
W0RFU/0	Band Hoppers RC	684-	AB-11-		5313
W3ISE/3	Soc. for the Preservation of Key Clicks, Splatter & TVI	537-	A- 7-		5058
K5OJI/5	Texas Instruments ARC	815-	B- 5-		5040
W8COE/8	Kanawha RC	789-	AB-35-		4914
W0EEE/0	Missouri School of Mines RC	635-	AB- 6-		4902
W3GHM/3	Frankford RC, Group B	761-	B- 6-		4818
W4KVK/4	Audubon AR Soc.	773-	B-15-		4788
W5HTK/5	Enid ARC	738-	AB-16-		4671
W9IJ/9	Lake County ARC	742-	B-16-		4602
K8IMN/8	(noneclub group)	582-	AB-13-		4581
K5KMS/5	(noneclub group)	760-	B- 6-		4560
K2YOU/2	Ulster County Mike & Key Club	590-	AB-13-		4437
W4SUD/4	Owensboro ARC	711-	AB-25-		4437
K0TBE/0	Pikes Peak RA Assn.	709	B- 6-		4404
W0ZWY/0	Sioux Falls ARC	729-	B-22-		4374
W5ENL/5	Mississippi County AR Assn.	718-	B- -		4308
W3TDF/3	Thirtist Fielday Boys	440-	A- 5-		4194
W9UDU/9	Racine Megacycle Club	669-	B-20-		4164
WA2GVT/2	Camptown ARC	461-	A- 6-		4149
W3GR/3	Friendship ARC	432-	A-19-		4113
K4ALL/4	Pensacola ARC	658-	B-18-		4098
W1BFB/1	Southern Rhode Island DX & Prop. Assn.	508-	AB- 5-		3993
W5W1H/5	South Plains ARC	655-	B-25-		3930
W7RGL/7	AR Communication Service	496-	AB- 3-		3927
W8AW/8	Edison RA Assn.	522-	AB-17-		3894
W8OFW/8	Bendix RC	638-	B-10-		3828
VE3CCK/3	Kingston & District DX Assn.	604-	AB- 6-		3819
W0NWX/0	Newton AR Assn.	474-	AB-14-		3816
W4JRA/4	Louisville Gas & Electric Co. Amateurs	608-	B-13-		3798
K0USJ/0	Drifters	630-	B-12-		3780
W6TJ/6	Riverside County AR Assn.	394-	A-10-		3688
W4UA/4	High Point ARC	613-	B-12-		3671
W9CLH/9	(noneclub group)	613-	B-10-		3678
W0ERH/0	Johnson County ARC	509-	B-11-		3648
K4JRU/4	Warner Robins ARC	399-	A-10-		3591
W8LT/8	Ohio State Univ. ARC	539-	AB-15-		3546
W3PSH/3	Keystone ARC	368-	A- 7-		3537
W0MXW/0	Rochester ARC	749-	BC-26-		3537
W0ENR/0	(noneclub group)	438-	AB- 6-		3534
K9MAR/9	Point RA	481-	AB-16-		3457
K6BEP/6	Alexander Hamilton High School RC Alumni Assn.	382-	A- 5-		3438
K7CBP/7	Klamath Basin AR Assn.	550-	B-12-		3390
K4ART/4	(noneclub group)	386-	AB- 5-		3258
W1WFB/1	Milford ARC	541-	B-22-		3246
W8VTD/8	Warren AR Assn.	334-	A-10-		3231
K8NYM/8	Tire Town RC	511-	B-10-		3228
W3YA/3	Staff of W3YA	358-	A- 5-		3222
KL7AIZ/KL7	Adak ARC	534-	B-10-		3204
K4IAJ/4	Tidewater Mobile RC	505-	B-24-		3180
W5FQ/5	Meridian ARC	529-	B- -		3174
K5ISK/5	Oklahoma State Tech. AR Assn.	503-	B-12-		3168
VE3RM/3	(noneclub group)	501-	B- 4-		3156
VE7AAM/7	Penticton CD ARC	323-	A-15-		3132
W9YT/9	Badger AR Soc.	315-	A- 9-		3078
K8GTT/8	Ford AR League	512-	B-30-		3072
W2TCU/2	Auburn AR Assn.	311-	A-20-		3024
W0VQ/0	Wilcox Electric ARC	477-	AB- 6-		2985
W8MFY/8	Intercity RC	330-	A-18-		2970
VE1IM/1	Annapolis Valley ARC	471-	B-15-		2946
K4JLA/4	Spartanburg ARC	464-	B-17-		2934
VE3DFU/3	St. Clair Valley ARC	464-	B-17-		2934
K6RMO/6	DX-Plotters	429-	AB- 4-		2916
W4YJS/4	(noneclub group)	458-	B- 5-		2898
W7AEY/7	Leavenworth ARC	320-	A- 8-		2880
W8VPV/8	Cuyahoga Falls RC (Phone Group)	378-	AB-15-		2874
W9EJ/9	Chicago R Traffic Assn.	357-	AB-11-		2856
K3HUO/3	South Community YMCA RC	450-	B-14-		2850
W2LZ/2	Walton R Assn.	316-	A- 7-		2834
W5NS/5	Bartlesville ARC	357-	AB-40-		2775
W8LYU/8	Milford ARC	458-	B-12-		2748
K9RAS/9	(noneclub group)	279-	A- 8-		2736
W3RSC/3	All Band AR Klub	423-	AB-11-		2700
K9JKG/9	South Bend ARC	274-	A-35-		2700
K5VOZ/5	Lawton-Fort Sill ARC	874-	C-25-		2697
W0HS/0	Kaw Valley RC	449-	B- 5-		2694
K0QIK/0	Lake Region ARC	438-	B-12-		2628
K3DBE/3	Aliquippa Area RA Assn.	427-	B-10-		2562
K8HHF/8	Upper Arlington RC	325-	AB- 6-		2553
K4BV/4	Daytona Beach AR Assn.	400-	B-25-		2550
K1LRB/1	(noneclub group)	424-	B- 3-		2544
K8QIM/8	Oak Park ARC	419-	B-15-		2514
W4MN/4	Palmetto ARC	416-	B- -		2496
K7LYY/7	Flathead Valley ARC	250-	A- 8-		2484
W2JC/2	Bloomfield RC	272-	A- 8-		2448
K0NRM/0	Kaw Blue RC	377-	B-15-		2412
K3BKL/3	Pocono AR Klub	367-	AB- 8-		2406
K3LDD/3	Philadelphia Electric Co. Employees Assn. RC	370-	AB-25-		2382
W8AM/8	Coffee Dunkers of Detroit	372-	B- 9-		2382
K2UNY/2	Tioga AR Assn.	394-	B-15-		2364
W3AWA/3	Mobile Sixers RC	260-	A-10-		2340

"The 20-meter antenna raising party with bow and arrow and string resembled a Laurel and Hardy comedy. They missed the tree completely on the first try and very nearly strung W6SY up by the leg on the second try. Tom finally came to rescue and showed them it takes a rugged frontiersman, used to repelling Tennessee Valley Indians, to accurately draw a bead on the nearest tree with a bow and arrow." — *Soc. of Amateur Radio Operators, W6AEX/6*

KØAXU/Ø	Northwest St. Louis ARC	375-	B-13-	2340
K2OGW/2	Ramapo RC	253-	A- 7-	2313
K8MIT/8	Niles ARC	338-	AB- 8-	2301
WA6MAO/6	Bay Area YL ARC	284-	AB-11-	2277
W4QAY/4	Central Virginia ARC	378-	B- 7-	2268
K9PFN/9	Thornton Schools RC	351-	AB- 8-	2259
W9QQQ/9	Sparta ARC	374-	B- 6-	2244
KH6DUM/KH6	Wahiawa American Legion ARC	347-	B- 6-	2232
K9INY/9	Fayette County RC	290-	AB-11-	2220
W8OG/8	Springfield ARC	315-	AB-18-	2208
W8ZZ/8	Detroit AR Assn.	216-	A-11-	2169
W8RB/8	Buckeye Rag Chewers Net	241-	A-30-	2169
W8KEA/8	Midland ARC	358-	B-10-	2148
K8KIL/8	Stu Rockafella AR Soc.	357-	B- -	2142
KØWAL/Ø	Kansas State ARC	357-	B- 5-	2142
K8OBQ/8	(nonclub group)	491-	AC- 8-	2076
W8MAI/8	Blossomland AR Assn.	313-	B-12-	2028
VE2JC/2	Club des Jeunes Operateurs	251-	AB-13-	1986
VE5QC/5	"QC" Club	287-	AB- 6-	1986
W4NJT/4	Big Orange ARC	325-	B- 8-	1962
W8IAD/8	(nonclub group)	326-	B- 5-	1956
K4MCL/4	Sowega ARC	460-	BC- 8-	1896
K8BLS/8	Butler County VHF Assn.	290-	AB 12-	1890
K9UTI/9	(nonclub group)	289-	B-10-	1884
K2IBC/2	Avenel RC	253	AB-16-	1860
W2MFF/2	Bergen-Passaic RC	245-	AB- 6-	1854
K4JIY/4	Aiken ARC	309-	B-20-	1854
K4IVI/4	No. Augusta-Belvedere RC	280-	B-20-	1836
W8DOG/8	Forest City ARC	280-	B-12-	1830
W2MAU/2	Syracuse VHF Club	509-	BC- 7-	1806
WØVNI/Ø	Norfolk RC	275-	B-11-	1800
W5IDTR/5	(nonclub group)	337-	BC- 7-	1785
W1ECV/1	Southington ARC	259-	AB-12-	1779
W4PM/4	Hollywood ARC	170-	A-12-	1755
VE5NN/5	Regina AR Assn.	267-	B-12-	1752
K2QEQ/2	Explorer Post 304	266-	B- 5-	1746
K4CK/4	Winter Haven ARC	194-	A- -	1746
W6YA/6	Polytechnic RC	290-	B- 6-	1740
W5TOG/5	(nonclub group)	287-	B- 5-	1722
WA6DGZ/6	Far West RC	284-	B- 3-	1704
K2BCI/2	Wantaugh RC	164-	A-10-	1701
K8KMK/8	Jackson County VHF Club	187-	A-20-	1683
VE2OX/2	(nonclub group)	222-	AB- 4-	1653
K7IBX/7	Catalina RC	269-	AB-11	1638
VE3CKV/3	Algoma ARC	247-	B- 9-	1632
W6FBK/6	Humboldt ARC	246-	B- 4-	1626
W4OIX/4	Kinston AR Soc.	269-	B- 8-	1614
KØTOO/Ø	Coon Valley ARC	266-	B-11-	1596
W2UF/2	Western Westchester RC	253-	AB- 9-	1590
K8RPI/8	Key Clicker's ARC	261-	B-15-	1566
WØEEK/Ø	Minot AR Assn.	518-	C-10-	1554
W9VBU/9	Boone County AR Council	258-	B-11-	1548
KØIGO/Ø	(nonclub group)	255-	B- 8-	1530
W5FDQ/5	Jones County ARC	234-	B-12-	1524
W2ICZ/2	Cheektowaga Amateur Transmitting Soc	253-	B- -	1518
K3EWY/3	Bucks-Mont Teenage ARC	249-	AB-12-	1518
W7VNJ/7	Casper ARC	251-	B- -	1506
K2PNR/2	Mid-Island Six Meter Net	163-	A-10-	1467
K6POR/6	East Contra Costa ARC	161-	A-10-	1449
W1WQM/1	Port City ARC	231-	AB-10-	1434
VE2BEM/2	RC Saguenay	238-	B- 8-	1428
W8KEG/8	Tri-State AR Assn.	238-	B- -	1428
W4TGY/4	Suncoast VHF Club	215-	AB- 9-	1377
K9OJI/9	Wells County ARC	229-	B-10-	1374
W9TCH/9	Rock River RC	229-	B- 8-	1374
VE2CBC/2	CBC RAC	228-	B- 3-	1368
W4COY/4	(nonclub group)	226-	B- 8-	1356
KØGIA/Ø	Wichita Teens ARC	185-	AB-12-	1347
K9MAS/9	Wampara ARC	223-	B-15-	1338
W9GHZ/9	Des Moines Tech High School ARC	220-	B-10-	1320
K4SZF/4	(nonclub group)	189-	B- 3-	1284
K7JHA/7	Rodeo City RC	185-	B- 4-	1260
W7BUT/7	Gallatin ARC	206-	B- 9-	1236
W7LA/7	Twin City RC	205-	B-10-	230
KØBPR/Ø	Fairfield High School ARC	180-	B-18-	1230
W5CUQ/5	Pittsburg County ARC	179-	B- 8-	1224
K6DBS/6	Convair RAC	204-	B- 6-	1224
W2HIP/2	Mid-Hudson RC	176-	B- 7-	1206
W3AHS/3	Bedford County AR Soc	200-	B-20-	1200
W3UHN/3	Friendly AR Transmitters Soc	180-	B- 7-	1200
K4YJT/4	Mike & Key Club of Greenville, S. C.	200-	B- -	1200
VE3PE/3	Stratford ARC	147-	AB- 6-	1197
W5ING/5	Baytown ARC	198-	B-25-	1188
K6MSK/6	(nonclub group)	198-	B- 5-	1188
K2KKA/2	Six Meter Mobile Assn. of Western N. Y	135-	AB- 7-	1167
K9HEA/9	(nonclub group)	193-	B- 4-	1158
WØOMA/Ø	T. R. ARC	193-	B- 8-	1158
W7SWS/7	Magic Valley RA	174-	B- 6-	1134
KØCGM/Ø	Central Nebraska ARC	235	BC- 8-	1110
W7EIL/7	Mt. Baker ARC	184-	B-10-	1104
KØUOD/Ø	Iowa Great Lakes ARC	155-	B-12-	1086
K1OOM/1	51.30 Club	118-	A-11-	1062
W2SV/2	Sunrise RC	174-	B-12-	1044
KØOSS/Ø	Suburban RC	138-	AB- 7-	1023
K2MHP/2	Jersey Palisades ARC	134-	AB- 6-	999
W1ZLH/1	Middlebury Mike & Key Club	166-	B- 7-	996
VE3QCD/3	Kingston ARC	136-	B-15-	978
K3MMU/3	Juniata Valley ARC	135-	AB-12-	972
WA2TPV/2	6-Up ARC of Burlington	81-	A- 5-	954
K5INH/5	Temple ARC	106-	A-10-	954
K2GVR/2	Black River Valley RC	151-	AB-14-	927
K8IRC/8	Iron Mtn., Kingsford ARC	153-	B-10-	918
K8RQB/8	Lubrizol RC	150-	B- 7-	900
K4FXG/4	(nonclub group)	119-	B- 3-	864
VE1AO/1	Truro ARC	119-	B-20-	864
KØZCJ/Ø	The Communicators	152-	BC- 7	858
K4UPX/4	Loudon County ARC	111-	AB- 7-	849
K8LOD/8	Hiawatha AR Assn.	138-	B- 3-	828
W4SZK/4	(nonclub group)	242-	BC- 3-	822
WA2TIJ/2	Arma ARC	96-	AB-10-	813
K1QLY/1	Barrington High School RC	124-	AB- 7-	783
K5AGG/5	Red River Valley RC	84-	A- 6-	756
K6JS/6	Lick-Wilmerding High School RC	125-	B- 3-	750
K1MVQ/1	(nonclub group)	108-	AB- 4-	744
W9OLX/9	Montgomery ARC	92-	AB-13-	702
K8RQA/8	Radio Transmitting Communications Organization	115-	B- 7-	690
WØAZR/Ø	(nonclub group)	112-	B-10-	672
W9NSP/9	(nonclub group)	71-	A- 6-	657
W7ECA/7	Electric City RC	297-	B-16-	648
K3LIS/3	Pottstown YMCA ARC	99-	AB- 4-	639
W2DYM/2	Jamaica UHF Club	225-	AB- 6-	632
W1KFB/1	Greenwich High School RC	92-	AB- 5-	630
K4SBO/4	Murfreesboro ARC	104-	B- 8-	624
K3NZX/3	Abington High School RC	102-	B- -	612
W9BSM/9	(nonclub group)	85-	AB- 4-	597
K9ONB/9	Seymour ARC	293-	B- 6-	586
K2BFO/2	North Country RC	97-	B- 3-	582
W5USN/5	(nonclub group)	97-	B- 5-	582
W9AAH/9	(nonclub group)	97-	B- 3-	582
K1IVK/1	(nonclub group)	63-	A- 3-	567
K5VWK/5	Slaton ARC	81-	B- 7-	516
KØZQC/Ø	Atchison RC	96-	BC- 7-	504
KØMPG/Ø	(nonclub group)	82-	B- 4-	492
K9BFE/9	(nonclub group)	79-	B- 6-	474
W9QAJ/9	Owen County ARC	79-	B- 8-	474
K2TPZ/2	Greater N. Y. VHF Net	73-	B- 6-	438
K4ISK/4	Jax. Progressive RC	100-	AB- 9-	438
WØALG/Ø	(nonclub group)	218-	B- 4-	436
VE4JW/4	Beausejour RC	47-	B- 4-	432
KØJOQ/Ø	Crete ARC	44-	B- 4-	414
VE3PCD/3	Norquebont AR Assn. (Porcupine Branch)	63-	B- 7-	378
W4NGV/4	Austin Peay State College ARC	141-	B- 4-	366
K5USE/5	No. Little Rock ARC	49-	B- 6-	294
W2WCR/2	Amateur VHF institute of New York	91-	B- 5-	232
W2BMW/3	Tu-Boro RC	112-	B- 9-	224
W3GFK/3	W.E.N.S. RC	106-	AB- -	217
W3HQX/3	Dit-Happy Dash-Hounds	107-	B- 8-	214
W8PIF/8	M & M RC	50-	BC- 8-	192
KØYIP/Ø	(nonclub group)	110-	AB- 4-	192
K9QKG/9	Flambeau AR Tech. Soc	31-	B- 6-	186
W6LKF/6	Paso Robles RC	26-	AB- 7-	159
VE3CYD/3	Chippewa Secondary School ARC	102-	BC- 7-	153
K5DUJ/5	Chisholm Trail ARC	22-	B- 8-	132

YLs and XYLs have a proven attraction for scoring more phone contacts than the OMs. Here's WA6JMD (right) secretary of the Ventura County Amateur Radio Club, K6CST/6, at the v.h.f. position with K6ARK, club vice-president. (*Official U. S. Navy photograph.*)

QST for

Three Transmitters Operated Simultaneously

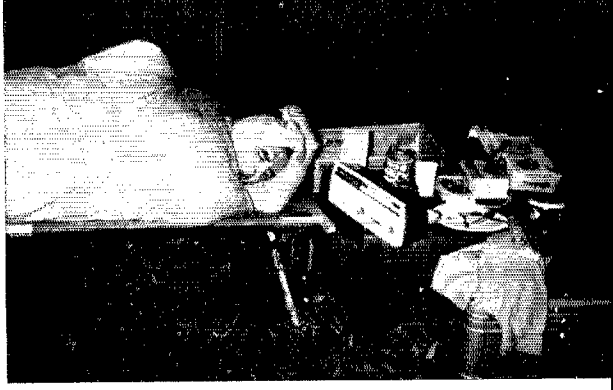
W5KHB/5	Old Natchez ARC.....	1348-	A-15-12,357	
W2IMM/2	Irvington RAC.....	1046-	A-56- 9594	
KZ5AF/KZ5	Caribbean Air Command MARS Club...	1539-	B-15- 9384	
W6SNK/6	Santa Monica City College RC.....	870-	A-14- 7830	
W8AF/8	West Park Radiops.....	1061-	AB-25- 7644	
VE7ARV/7	Vancouver ARC.....	774-	A- 9- 7245	
W1OC/1	Concord Brasspounders	777-	A- 4- 7218	
W4SA/4	Miami Springs RC.....	1052-	A- 4- 7218	
W4DU/4	Jacksonville AR Soc...	748-	A-19- 6957	
W9AB/9	Michiana ARC.....	831-	AB-40- 6822	
W3OK/3	Delaware-Lehigh ARC.	834-	AB-25- 6786	
W5PDO/5	Los Alamos ARC.....	867-	AB-18- 6762	
W4ABK/4	Kentuckyana RC.....	1101-	B-25- 6756	
W6LUC/6	Santa Barbara ARC...	1088-	B-10- 6678	
VE7EZ/7	Victoria Short Wave Club.....	708-	A-25- 6597	
W2UBW/2	Mid-Island RC.....	701-	A-16- 6534	
W6PID/6	Foothill Mobile Net....	720-	A- - 6480	
K5YJG/5	Suburban West ARC...	1052-	B-31- 6462	
VE2ARC/2	Montreal ARC.....	692-	A- 3- 6453	
W4AM/4	Frye ARC.....	998-	B-15- 6138	
W5FC/5	Dallas ARC.....	979-	B-24- 5874	
W2MO/2	Livingston ARC.....	738-	AB-23- 5769	
W5PAA/5	Aeronautical Center ARC.....	706-	AB-40- 5673	
K6AGF/6	Tri-County AR Assn., General Dynamics and Pomona Ham Club..	788-	AB-51- 5619	
WA2LAQ/2	Bayside ARC.....	589-	A- 8- 5526	
K8VHN/8	Kent RC.....	896-	B-25- 5526	
W6KA/6	Pasadena RC.....	589-	A-15- 5526	
VE3RAM/3	Ottawa Valley Mobile RC.....	584-	A-15- 5481	
W5GU/5	Oklahoma City ARC...	854-	AB-15- 5448	
W7NTO/7	Lewis County ARC....	544	A-14- 5121	
W4YKY/4	Lake AR Assn.....	794-	AB-25- 5064	
W2GLO/2	Levittown ARC.....	841-	B-25- 5046	
W6MSO/6	Inglewood ARC.....	535-	A-16- 4980	
K6TWT/6	North Bay AR Assn...	608-	AB-15- 4878	
K6FAV/6	McClellan AR Soc.....	689-	AB-61- 4872	
W9REG/9	Tippecanoe AR Assn...	574-	AB-20- 4818	
W5IDPA/5	Houston ARC.....	631-	AB 15- 4665	
KZ5PA/KZ5	Crossroads ARC.....	749-	B-12- 4644	
K8UZW/8	Parma RC.....	734-	AB-40- 4623	
K6GJ/6	Foothills AR Soc.....	667-	AB-13- 4551	
W5ABD/5	Westside ARC.....	729-	B-11- 4524	
K5WPH/5	Sun City ARC.....	746-	B-30- 4476	
K3MTK/3	Germantown RC.....	628-	AB-14- 4458	
W8MRM/8	Motor City RC.....	713-	B-54- 4440	
W4NGS/4	Columbus ARC and Ft. Benning ARC.....	708-	B-10- 4368	
W6KGP/6	(nonclub group).....	484-	A- 5- 4356	
K5RUA/5	Mississippi AR Soc.....	689-	AB-35- 4332	
W9IBZN/9	IMO VHF ARC.....	493-	AB-15- 4323	
K9ZEI/9	RCA ARC, Indianapolis	690-	B-30- 4290	
VE7BAR/7	Burnaby ARC.....	442-	A-36- 4203	
W9OD/9	River Park ARC.....	700-	B-15- 4200	
W7VPA/7	Richland ARC.....	697-	B-22- 4182	
W1DDD/1	Blackstone Valley ARC	670-	B-28- 4170	
K6CST/6	Ventura County ARC..	620-	AB-18- 4167	
W4TRC/4	Kingsport ARC.....	668-	AB-27- 4161	
W9MJL/9	Vermilion County AR Assn.....	668-	B-40- 4158	
W3BSF/3	Western Pennsylvania DX Soc.....	691-	B- 9- 4146	
W4KC/4	Ft. Meyers ARC.....	685-	B-20- 4110	
W5HMF/5	Oil Capital Mobile Club	579-	AB-30- 4059	
W8RYI/8	Kalamazoo ARC.....	449-	AB-15- 4059	
W7ZA/7	Grays Harbor ARC....	495-	AB-35- 4032	
K4DPZ/4	Gainesville AR Soc.....	634-	B-12- 3954	
K8SKF/5	Gulf Area YL AR Klub	621-	B-12- 3876	
W7IO/7	Arizona ARC.....	600-	B-18- 3750	
W7RDL/7	(nonclub group).....	387-	A-14- 3708	
K9QDE/9	Kokomo ARC.....	591-	B-35- 3702	
W4BTJ/4	Kennehoochee ARC...	615-	B-17- 3690	
VE1EO/1	Halifax ARC.....	568-	B-15- 3584	
VE1PF/1	St. Croix Valley ARC..	358-	A-10- 3537	
W4MRC/4	Hialeah ARC.....	500-	AB-12- 3519	
K3JJU/3	Windsor ARC.....	386-	A- - 3474	
W7YN/7	Nevada AR Assn.....	418-	AB-21- 3420	
W8DQK/8	Oh-Ky-In VHF Radio Soc.....	524-	AB-12- 3489	
K2YNT/2	Metuchen YMCA & Edison High School ARCs	411-	AB-13- 3396	
W7DP/7	Walla Walla Valley RAC.....	449-	AB-13- 3384	
K6OBS/6	Rebel RC.....	458-	AB- 3- 3356	
KØBXD/Ø	Flint Hills ARC.....	532	B-12- 3342	
WØIII/Ø	Story County ARC....	532-	B-18- 3342	
W1KKS/1	Manchester RC.....	468-	AB-12- 3321	
K5TEF/5	Curry County ARC....	553-	B- 8- 3318	
WØRC/Ø	Wichita ARC.....	510-	B-23- 3210	
K5TYP/5	Keesler ARC.....	530-	B-23- 3180	
W9AWE/9	Western Illinois RC....	504-	B- 8- 3174	
K2PQL/2	Bethpage ARC.....	491-	ABC-15- 3156	
W8VVL/8	Queen City Emergency Net.....	497-	B-32- 3138	
KØYGV/Ø	Henry Leavenworth ARC.....	439-	AB- 9- 3135	
W3URR/3	First State ARC.....	490-	B-20- 3102	
W3KQR/3	Clear Field County AR Assn.....	514-	B- - 3084	
WØEBE/Ø	Southwest Missouri ARC.....	513-	B-25- 3078	
W5FTA/VO1	Argentia ARC.....	468-	AB-11- 3072	
K5ZNR/5	Clinton Sherman AFB RC.....	417-	AB-11- 3012	
K8BQD/8	Cranbrook ARC.....	477-	B- 3- 3012	
KØLDN/Ø	Iowa-Illinois ARC.....	489-	B- - 2940	
VE1LC/1	Loyalist City ARC.....	462-	AB-20- 2931	
VE7FY/7	Royal City AR Assn....	442-	AB-12- 2832	
K1MUJ/1	Eastern Conn. AR Assn.	425-	AB-15- 2784	
W3AYS/3	Chesapeake ARC.....	345-	AB-20- 2751	
W8PZD/8	Berea Radio Ops.....	433-	B-12- 2748	

This is what a ski jump looks like to Otto von Champjümper before he makes his speedy descent — in der vinter of course mit snow. The Chain of Lakes Amateur Radio Club, W9ADZ/9, adorned this structure with beams. There's one on top as well as that monstrosity down below.

K4YEG/4	East River RC.....	429-	B-17- 2724	
K8POE/8	Logan ARC.....	427-	B-15- 2682	
W1AQ/1	Associated RA of Southern New England....	420-	B-15- 2670	
W2CGK/2	AR Soc. of Queens	417-	AB- 6- 2604	
VE3NSR/3	North Shore ARC.....	434-	B-10- 2604	
VE1CR/1	Sydney ARC.....	372-	AB- 8- 2586	
WA6BMH/6	Poinsettia RC.....	421-	AB- - 2553	
W4NPT/4	Naval Air Station RC, Norfolk, Va.....	425-	B-11- 2550	
K1MHW/2	(nonclub group).....	250-	A- 4- 2493	
W6IJK/6	Sacramento Aerojet RAC.....	349-	AB-17- 2466	
W4ETI/4	Tamiami ARC.....	399-	AB- - 2463	
VE3GBN/3	Grey Bruce AR Assn....	383-	B-10- 2460	
K6IXV/6	La Jolla Field Day ARC	408-	B- 8- 2448	
W5MUZ/5	Ouachita Valley ARC..	403-	B- - 2418	
W2CGJ/2	Ridgewood ARC.....	376-	B-15- 2406	
K2MTV/2	"Kenmore Society ..."	373-	B- 8- 2388	
K3ORS/3	Bainbridge Brass Pounders.....	389-	B-20- 2334	
K7FBL/7	Mountain Home AFB MARS Club.....	389-	B-12- 2334	
W4ZA/4	Richmond ARC.....	380-	B-15- 2280	
WØCVJ/Ø	Tube & Shutter Club...	353-	B- 7- 2268	
W4RUI/4	Greeneville RAC.....	431-	BC-25- 2256	
K6JKC/6	(nonclub group).....	350-	AB- 5- 2256	
W3SOB/3	York Road RC.....	276-	AB-10- 2238	
W9ASM/9	Central Home Brew Club.....	342-	B-10- 2202	
K5ANN/5	Acadia ARC.....	346-	B-12- 2196	
WØBFE/Ø	Jayhawk AR Soc.....	323-	AB-20- 2186	
K7IFR/7	ARC of Olympia.....	241-	AB- - 2076	
K8SAM/5	Edmond AR Soc.....	308-	AB-12- 2067	
W3VV/3	McKean County RC...	342-	B-15- 2052	
W8WUT/8	(nonclub group).....	295-	AB-20- 2049	
W2ODT/2	Adirondack RC.....	326-	AB- 9- 2022	
WØCUO/Ø	Grand Island AR Soc...	312-	BC-23- 1899	
K9EAM/9	Green Bay Mike & Key Club.....	311-	B-18- 1866	
W9VAR/9	(nonclub group).....	222-	AB- 3- 1860	
K5PAW/5	(nonclub group).....	309-	B- 9- 1854	
K8WBL/8	Xavier Univ. ROTC RC	308-	B- 7- 1848	
K9JII/9	(nonclub group).....	306-	B- 3- 1836	
KØZEV/9	Miami County RC....	247-	AB-20- 1809	
W4AB/4	Froward ARC.....	280-	AB-25- 1794	
W9EBN/9	Sky Wire RC.....	288-	B-12- 1788	
KH6DIG/KH6	Teens AR of Hawaii...	273-	B-15- 1788	
VE3YJ/3	London ARC.....	296-	B-12- 1782	
W3WDZ/3	Somerset County ARC	295-	B- 6- 1770	
K2YGY/2	Carteret CD Radio Group.....	353-ABC-	5- 1752	
K3MCP/3	Berwick AR Klub.....	267-	B- 5- 1752	
K8EMY/8	South East ARC.....	314-	BC-16- 1725	
W3SJI/3	Hazleton ARC.....	282-	AB-13- 1695	
W3FDG/3	Tyyridge ARC.....	276-	B- 6- 1656	
W6LIE/6	Kern County RC.....	269-	AB-22- 1644	
K8VXH/8	Genoa RC.....	252-	AB- - 1623	
KØZFK/Ø	Jefferon Barracks ARC.	231-	AB- 6- 1605	
WA6MXF/6	Escondido Boys' Club AR Soc.....	262-	AB-10- 1602	
W3FZC/3	M.I.C. ARC.....	174-	A-10- 1566	
W5HPI/5	Terry County ARC.....	259-	B- 6- 1554	
K6CXI/6	Alexander Hamilton Sr. High School ARC....	226-	AB- 9- 1553	
W4IOF/4	Atlanta Teenage RC...	230-	B-20- 1530	
K9SFH/9	La Porte ARC.....	229-	AB-12- 1530	
K3AHS/3	Penn Central RC.....	237-	AB-14- 1521	
W6BML/6	Mount Shasta ARC....	251-	B- 8- 1506	

W3RQZ is the snazzy mobile communications center of the Phil-Mont Mobile Radio Club, hailing out of the Philadelphia area. The Phil-Mont boys were second high in mobile aggregate scores with 35,020.

W3BPM/3	(nonclub group)	167-	A- 3-	1503
WA6DJS/6	El Cajon Valley High School ARC	172-	AB- 8-	1503
W8OIT/8	Branch Co. RC	248-	B- -	1488
K5EQV/5	(nonclub group)	170-	AB- 5-	1467
W9ELJ/9	Key & Mike ARC	221-	AB-[illegible]	1467
K5AVT/5	Irving ARC	219-	B- 6-	1464
W1TRZ/1	Tri County ARC	216-ABC-	5-	1446
K9VHF/9	Fishers High School ARC	167-	AB-11-	1440
K1OUL/1	ARC of Merrimack Valley	220-	AB- -	1437
W2ZOT/2	Sewanhaka High School ARC	186-	AB- 5-	1407
K7NWS/7	Boeing Employees' AR Soc.	234-	[illegible]-16-	1404
W9WFJ/9	Midway RC	165-	AB- 6-	1401
W7EAX/7	Umpqua RC	214-	AB- 9-	1392
W1JT/1	East Providence AR Assn.	203-	B-25-	1368
K3KXM/3	(nonclub group)	161-	AB- 3-	1377
K9CKP/9	(nonclub group)	300-	BC- 8-	1353
W5ES/5	El Paso ARC	224-	B-22-	1344
K8BHQ/8	Mayhams RC	209-	B-20-	1332
W9KHW/9	6N2 VHF AR Soc.	182-	AB-17-	1317
K2MXN/2	Burlington Shortwave RC	192-	B- 5-	1302
W9YVG/9	Eastern Il. Hamateurs	310-	BC- 9	1293
K1RKF/1	Nipmuc Emergency Radio Corps	170-	AB-12	1290
W2WUX/2	Utica ARC	207-	B-25-	1242
W9GFD/9	Prair e ARC	384-	BC-16	1224
K9UXZ/9	National Trail ARC	178-	AB-11-	1149
K9DPU/9	(nonclub group)	266-	BC- 5-	1137
K1JMR/1	Norwood ARC	125-	A-10-	1125
W9TWU/9	Melpher on ARC	178-	AB-10-	1077
VE3AUS/3	(nonclub group)	92-	A- 4-	1053
K1NXI/1	Farmington RC	161-	BC- 3-	1020
K8CHW/8	Mountain State Transmitters	168-	B- 6-	1008
K8GUE/8	Calhoun Area RC	167-	B-25-	1002
K9TBN/9	Emergency Service R Assn.	139-	AB- 8-	1002
W8QFO/8	Thunder Bay ARC	164-	B- -	984
W9BXR/9	Davenport RAC	153-	AB- 6-	942
K6OGR/6	Manteca Beer Drinking & Marching Soc.	156-	B- 6-	936
W7UPB/7	Casper VHF Soc.	123-	B- 5-	888
W2AVZ/2	Hamilton Township R Assn.	86-	AB- 9-	864
VE7WO/7	Pt. Grey ARC	116-	B- 4-	846
K2SJO/2	Port Chester CD	373-	AB-15-	840
VE3VCD/3	Sudbury & District	133-	B- -	798
K2KHB/2	Brighton High School ARC	99-	AB- 6-	789
K0TSW/0	New Ulm RC	106-	B- 6-	786
K5BHF/5	Electronic Technician & Amateur Club	129-	B-12-	774
K9RPM/9	Oshkosh ARC	122-	B- 8-	732
VE7BQ/7	Totem ARC	89-	AB- 8-	729
W9CRM/9	Decatur AR Soc.	82-	B- 7-	642
WA2FKA/2	Ogdensburg ARC	210-AEC-	8-	621
VE3TCD/3	St. Thomas CD ARC	91-	AB- 7-	606
W8HOP/8	Scioto Valley ARC	321-ABC-12-		561
WA2IKN/2	(nonclub group)	178-	AB- -	510
K9HGX/9	Ceno's ARC	83-	B- -	498
K2IAP/2	AR Soc. of Harrison	74-	B-10-	444
K9UAO/9	Chicago AR Disaster Corps	53-	AB- 7-	444
K3JLW/3	Carlson ARC	210-	A-15-	426
K7QBU/7	Marshfield AR Soc.	34-	AB- 3-	346
K9TMZ/9	AC Spark Plug ARC	53-	AB- 9-	342
K9ZED/9	(nonclub group)	56-	B-12-	336
W9CFV/9	Raytown ARC	29-	AB- 3-	294
W9DEQ/9	Chicago YLRL	63-	AB- 7-	153
K1DJH/1	Windham RC	75-ABC-	8	139
K1HPQ/1	Walpole High ARC	13-	AB- 4-	114
Four Transmitters Operated Simultaneously				
W2OYH/2	Morris RC	1985-	A-30-	18,090
W6JBT/6	Citrus Belt ARC	1717-	A-25-	15,453
W3TYU/3	William Penn RC	1495-	A-15-	13,485
W6MGJ/6	Helix ARC	1331-	A-20-	12,204
W6WX/6	San Francisco Peninsula MARS Group	1213-	A-35-	11,142
W6UUS/6	C. D. Astronauties	1040-	A-24-	9695
W2OR/2	Compton Valley RC	1145-	AB-30-	9411
W8TO/8	Columbus AR Assn.	1102-	AB-31-	8790
W6HS/6	Crescenta Valley RC	920-	A-22-	8505
K4HEX/4	Lynchburg ARC	1014-	AB-25-	8322
W9OFR/9	Joliet AR Soc.	889-	A-50-	8226
K4GSD/4	Royal Fraternity of Screwballs	887-	A-15-	8217
W4ULV/4	Blue Grass ARC	927-	AB-25-	7977
K2OMI/2	Raritan Bay RA	930-	AB-25-	7935
K2CW/2	Hudson Wireless Assn.	934-	AB-12-	7929
W7AW/7	West Seattle ARC	843-	A-25-	7821
W6WC/6	South Peninsula AR Klub	837-	AB-35-	6654
K9AVO/9	Western Electric ARC	1073-	B-17-	6642
W4THM/4	Bristol ARC	910-	AB-21-	6354
W2AC/2	Larkfield ARC	644-	A-22-	6021
W6AE/6	Orange Co.nty ARC	692-	AB-12-	5877
W9HW/9	Michigan City ARC	794-	AB-16-	5844
W3FOX/3	Delmont RC	933-	B-18-	5742
K3NIA/3	Oxford Circle RC	861-	AB-25-	5727
W1GLA/1	Framingham RC	810-	AB-22-	5706
W4NC/4	Winston-Salem ARC	993-	B-25-	5568
K8TKA/8	20/9 RC	885-	B-22-	5460
W6AEX/6	Soc. of AR Operators	831-	AB-10-	5454
W4BFM/4	Decatur ARC	857-	B-16-	5292
W3BN/3	Reading RC	714-	AB-40-	5280
VE2ADX/2	South Shore ARC	831-	B-19-	5178
W3ZEK/3	Harrisburg ARC	584-	AB-20-	5034
W9DUP/9	DuPage RC	714-	AB-14-	4839
W0EM/9	Boulder ARC	730-	AB-40-	4701
K4TKC/4	Jefferson County AREC	783-	B-22-	4698
VE3BSQ/3	Belleville & District ARC	757-	B-25-	4692
W9AXD/9	Rockford AR Assn.	740-	B-15-	4590
W1MHL/1	Waltham AR Assn.	480-	A- 7-	4545
W1USS/1	Pittsfield ARC	751-	B- -	4506
W3CWC/3	Antietam R Assn.	654-	AB-18-	4485
W6CKT/6	Marina ARC	751-	AB-26-	4362
W8KP/8	Dayton AF Depot MARS	673-	AB-32-	4272
W6TLO/6	Monterey Park ARC	534-	AB- 5-	4248
W5NW/5	Permain Basin ARC	667-	B-15-	4152
W1SYE/1	Newport County RC	620-	AB-25-	4062
W4MQN/4	Atlanta RC	636-	AB-15-	4008
W3GV/3	R Assn. of Erie	637-	B- 4-	3972
K8RPJ/8	Tri County AR Assn.	641-	BA-51-	3948
WA2DNI/2	Monmouth ARC	412-	A-25-	3933
W0OUI/0	Denver RC	405-	A-40	3870
W8EY/8	Van Wert ARC	641-	B-20-	3846
K9IND/9	West Suburban YMCA AR Council	616-	B-15-	3846
W6VDM/6	(nonclub group)	405-	A- 7-	3645
W1HGV/1	Nashua Mike & Key Club	547-	AB-21-	3639
WA6MPA/6	(nonclub group)	436-	AB-10-	3534
K3AJT/3	Susquehanna Valley ARC	542-	AB-15-	3465
W1EUH/1	Research City AR Assn.	503	AB-12-	3384
W6MLK/6	Hi Frequency Amateur Mobile Soc.	507-	AB-16-	3339
K6QYB/6	Litton Systems Employees ARC	516-	AB- 9-	3285
K8TIW/8	Oshtemo ARC	340-	A-20-	3285
K3AGE/3	Foothills RC	353-	A- -	3177
W4HFH/4	Alexandria RC	502-	AB-14-	3120
K4IKP/4	Roanoke Valley ARC	389-	AB-20-	3090
W9RJY/9	Fort Wayne RC	504-	B- -	3024
K8KFP/8	Tven Hams of Toledo	456-	AB-16	3006
W9BXR/9	Mont. Co. ARES	471-	B-20-	2976
K4VLY/4	Morganton ARC	538-ABC-	7-	2943
W8DSO/8	Tireman Big "B" ARC	485-	B-27-	2910
W7TD/7	Apple City RC	455-	B-15-	2880
K9OK1/0	Kansas City ARC	455-	B-15-	2880
K1PBO/1	Barnstable RC	455-ABC-15-		2862
K4ZRY/4	Glynn ARC	472-	B-16-	2832
K9VOG/9	Council Bluffs Radio Operators Club	416-	AB-20-	2775
K3KNO/3	Mahanoy Valley Brass Pounders Club	433-	B-17-	2748
W3LDD/3	Havre de Grace RC	442-	B- 6-	2652
W4BBB/4	RAC of Knoxville	410-	B-30-	2610
W4HOB/4	Bessemer ARC	303-	AB-31-	2598
W9AA/9	Hamfesters RC	432-ABC-20-		2508
W9VT/9	Tri Town RAC	460-ABC-20-		2481
W9AML/9	Central Illinois RC	384-	AB-37-	2436
W0QEV/0	Washington Univ. ARC	356-	AB- 8-	2418
W3CAB/3	Washington RC	238-	AB- -	2412
W0BLK/0	Black Hills ARC	397-	B-21-	2382
W1AEW/1	Pioneer Valley RC	374-	AB- -	2289
WA2MNQ/2	Brookside Off-beat Oscillators	254-	A- -	2286
VE2GP/2	(nonclub group)	271-	AB-12-	2247
W6IAC/6	Escondido High School ARC	312-	AB- 5-	2239
K6QYF/6	San Gorgonio Pass ARC	340-	AB- 7-	2232
K7HBA/7	Bay Area Radio Klub	339-	B-10-	2190
W1BRF/1	Quinebaug Valley RC	310-	AB-12-	2163
W3CWA/3	Monumental RC of Baltimore	213-	A- 6-	2142
K4FFB/4	Pope AFB MARS Personnel	408-	BC- 7	2136
W8NDR/8	Gratiot County AR Assn.	347-	B-17-	2082
K6BAU/6	Hendrix RC	290-	AB-12-	2061
K5YEA/5	Denton County ARC	304-	AB-20-	2058
W9CBR/9	Wabash Valley AR Assn.	324-	AB-30	2055
K7CCH/7	Coos County RC	306-	AB-11-	1989
WA2LHM/2	The Band-Dit-Dahs	304-	B- 5-	1975
K6HPC/6	Indian Wells Valley ARC	318-ABC-	-	1971
K2REY/2	Jersey City RC	261-	AB-14	1941



Here is hi-speed FD operator K2JON shown at his peak for the Ulster County Mike & Key Club, K2YOU/2.

K8CJS/8	Old Goats	293-	AB-	-	1929
WØYAB/Ø	Lee's Summit — C.A.C. ARC	317-	B-	-	1902
WØDVL/Ø	N. E. Iowa AR Assn.	410-	BC-25-		1872
K9IXS/9	Elkhart High School ARC	285-	B-22-		1860
K9MVV/9	Duneland AR Assn.	272-	AB-34-		1848
W1QAR/1	Bangor AREC	302-	B- 7-		1812
K9ENM/9	Communicators RC	298-	B-25-		1788
W1LN/1	Danvers CD Group	272-	AB- 8-		1773
W9BVM/9	Argonne RC	253-	AB-11-		1719
VE2APX/2	Club de Radio de St. Jean	238-	AB-10-		1719
VE5AA/5	Saskatoon ARC	259-	AB-25-		1716
W9BFO/9	Southeastern Illinois Ham Soc.	464-	ABC-35-		1707
W9ATG/9	Hancock AR Klub	234-	AB-15-		1695
WA6PDE/6	South Bay AR Soc.	167-	A-15-		1683
K9LCA/9	Jefferson County ARC	238-	AB-13-		1611
W1EDH/1	Middlesex AR Soc.	178-	A-16-		1602
W1VPU/1	Shelton Emergency R Assn.	210-	AB-20-		1569
K2IYU/2	(nonclub group)	183-	AB-12-		1512
W3UEN/3	Washington County ARC	271-	ABC-12-		1500
K6DTA/6	West Valley RC	249-	B- 6-		1494
W9EQQ/9	Ninth Area RC	212-	AB-16-		1446
W9PJ/9	La Crosse RAC	203-	AB-25-		1422
K8WNI/8	Oregon City ARC	225-	AB-16-		1416
W8FWG/8	Copper Country RA Assn.	234-	B-	-	1404
W5AVT/5	Northwest Louisiana RC	222-	AB- 8-		1380
K2BWK/2	Squaw Island ARC	182-	AB-14-		1359
W2IW1/2	Albany AR Assn.	196-	AB-16-		1323
W4RKC/4	Shenandoah Valley ARC	278-	BC-16-		1320
KL7AA/KL7	Anchorage ARC	204-	AB-23-		1272
W4KEK/4	Peninsula ARC	300-	BC-13-		1260
W8FT/8	Findlay RC	185-	B-10-		1260
W3EIA/3	Lebanon Valley Soc. RA	195-	AB-10-		1254
K7OJI/7	Treasure Valley R Assn. (nonclub group)	160-	AB- 7-		1197
W6LHY/6	Kans.-Nebr. RC	148-	AB- 5-		1029
WØJEO/Ø	Lockheed ARC	186-	BC-16-		999
W6LS/6	Spud Pickers AR Klub	170-	ABC-11-		987
K1PDV/1	Winslow AR Soc.	148-	B- 4-		888
K9MRL/9	Winnipeg ARC	420-	B- 7-		840
VE4HE/4	(nonclub group)	111-	AB-10-		837
KØSIC/Ø	Evendale ARC	190-	BC-22-		831
K8LUC/8	East Penn RC	132-	AB- 8-		790
W3QQB/3	Naval Avionics Facility RC	262-	AB- 3-		585
K9NBK/9	(nonclub group)	168-	BC- 8-		492
W1TCF/1		42-	B- 5-		402

Five Transmitters Operated Simultaneously

W2YKQ/2	Lake Success RC	1293-	A-20-	12,033	
W4SKH/4	Oak Ridge Radio Operators Club	1384-	AB-30	11,121	
W8ICS/8	Indian Hills RC	1504-	AB-38-	9786	
W4PLB/4	Orlando ARC	1002-	AB-25	9204	
K8AIR/8	Amateur MARS Communicator Club	1161-	AB-52-	9171	
KØQMH/Ø	Montrose & Delta Counties ARCs	946-	A-27-	8514	
W3BTN/3	North Penn ARC	1089-	AB-32-	8385	
W1ECO/1	Sun-Sig ARC	891-	A-30-	8244	
W4NVU/4	Dade RC	912-	A-20-	8208	
K4BEM/4	Atlanta Soc. of Teenage R Ops	896-	AB-16-	7764	
K3HKK/3	Nittany ARC	899-	AB-35-	7713	
W1WHF/1	Hamden AR Assn.	1218-	AB-23-	7641	
K2AE/2	Schenectady AR Assn.	1185-	B-35	7260	
W6AIL/6	Contra Costa RACES Group	742-	A- 6-	6903	
W2ZQ/2	Delaware Valley R Assn.	737-	A-	-	6633
VE6NQ/6	Calgary AR Assn.	976-	AB-27-	6537	
W6DNA/6	Newport AR Soc.	683-	A-34-	6372	
W2UW/2	Mohawk RC	957-	AB-12-	6168	
VE3JJ/3	West Side RC	635-	A-20-	5985	
VE3DC/3	Hamilton ARC	656-	A-27-	5904	
W8RX/8	South Eastern Michigan AR Assn.	755-	AB-25-	5658	
W2IMB/2	The Garnet	906-	B-18-	5586	
K2QYV/2	Niagara RC	659-	AB-30-	5067	
W6OF/6	Oakland RC	538-	A 20-	5067	
W9JP/9	Indianapolis RC	760-	AB-15-	5046	
K4IKR/4	Huntsville ARC	816-	B-15-	5046	
K6QWL/6	North Hills RC	571-	AB-12-	4821	
W2GLQ/2	Nutley AR Soc.	636-	AB-18-	4809	
W3MAT/3	Bucks County ARC	785-	B-30-	4710	
W1YQF/1	Tewksbury AR Assn.	704-	AB-	4671	
K9TSM/9	Goshen ARC	724-	AB-16-	4548	
W5TH/5	Kerrville RC	738-	B-18-	4428	
K1BCI/1	CQ RC	679-	AB-22-	4386	
W4MIK/4	Ole Virginia Hams	721-	AB-18-	4359	
W6CX/6	Mount Diablo ARC	450-	A-24-	4293	
K3GFW/3	Cumberland Valley ARC	462-	A-17-	4158	
K2MQW/2	Five Towns RC	579-	AB-25-	4140	
K5LRU/5	Muskogee ARC	619-	AB-28-	4080	
W6OPX/6	Palo Alto AR Assn.	627-	AB-24	3984	
W8ID/8	Seneca RC	621-	ABC-18-	3855	
K1OUR/1	Exeter AR Soc.	548-	AB-25-	3822	
W6AK/6	Sacramento ARC	486-	AB-17-	3762	
VE3MRC/3	Metro ARC	474-	AB-20-	3759	
W4SRX/4	Eglin AR Soc.	534-	AB-15-	3690	
W8HHF/8	Toledo Mobile R Assn.	376-	AB- 8-	3468	
W4NYK/4	Blue Ridge R Soc.	519-	B-15-	3264	
VE3AIS/3	Oakville ARC	337-	A 20-	3258	
W8RNF/8	Lake-Geauga ARC	528-	AB 10-	3198	
K8SUL/8	Edison Employees AR Soc.	430-	AB- 8-	3168	
W5RIN/5	Beaumont ARC	443-	AB-17-	2913	
K8YOI/8	Biennerhassett ARC	483-	B-17-	2898	
K3BKG/3	Chester County ARC	513-	ABC-14-	2802	
VE3CBC/3	CBC ARC	358-	AB-10-	2870	
W5MS/5	Corpus Christi ARC	453-	AB-12-	2739	
W3CSL/3	Monessen ARC	417-	AB-15-	2703	
W2SEX/2	AR Assn. of the Tonawandas	404-	AB-38-	2679	
W3QZF/3	Horseshoe RC	571-	ABC-	-	2667
W3OI/3	Lehigh Valley ARC	569-	ABC-15-	2520	
W8HH/8	Marietta ARC	403-	AB-25-	2481	
W5ND/5	Orange ARC	387-	AB-18-	2361	
W8QQQ/8	Shiawasse AR Assn.	335-	AB-	-	2232
K4FGF/4	Base Organized MARS ARC	400-	BC-13-	2196	
K1GAY/1	Bedford RC	408-	ABC-10-	2142	
W8FO/8	Toledo RC	427-	ABC-15-	2115	
W1NEM/1	Hartford County AR Assn.	228-	A- 6-	2052	
KØYAX/Ø	Three Rivers Ham Club	310-	B-12-	2010	
K8DAC/8	Saginaw Valley ARC	256-	B-10-	1536	
WA2GAN/2	Chaminade Explorers	113-	B-21-	678	

Six Transmitters Operated Simultaneously

K2AA/2	South Jersey Radio Assn.	1985-	AB-75-	17,774	
W2WW/2	Watchung Valley RC	1201-	A-31-	11,034	
W9SW/9	Chicago Suburban R Assn.	1109-	AB-28-	9465	
K9AVE/9	Illinois Valley R Assn.	953-	A-21-	8802	
W8ACW/8	Genesee County RC	1236-	AB-85-	7854	
K6QEZ/6	Ampex ARC	1224-	AB-35-	7731	
WA2LQO/2	Grumman ARC	1029-	AB-36-	7062	
K1BKE/1	Contoocook Valley RC	721-	A-11-	6723	
W9IUA/9	Sangamon Valley RC	875-	AB 20-	5688	
W6WWJ/6	South County AR Soc.	765-	AB-25-	5559	
K6LSZ/6	Sidewinders RC	809-	AB-22-	5277	
WØERG/Ø	Sioux City AR Assn.	824-	AB-35-	5184	
VE3VM/3	Niagara Peninsula ARC	612-	AB-23-	5172	
W8HTX/8	Heath ARC	782-	AB-16-	4965	
WA6ODP/6	Livermore AR Klub	571-	AB-22-	4632	

Fourteen hands gather around as a tower with beams attached is raised upright for the Canton Amateur Radio Club, W8RTR/8.

K2TIO/2	Englewood AREC	486-	A-26-	4599
W9ARA/9	Bloomington ARC	588-	AB-25-	4467
W4UFE8/4	Panama City ARC	742-	B-10-	4452
K6SIR/6	Ramona RC	564-	AB-18-	4296
W3AVK/3	West Branch AR Assn.	514-	AB-22-	4059
W3CTC/3	Delaware Valley ARC	567-	AB-25-	3771
W9IKN/9	Elgin AR Soc.	584-	AB-18	3705
K9CJU/9	RA Megacycle Soc.	498-	AB-15-	3516
W6UOS/6	Monterey Bay RC	526-	AB-15-	3267
W6LMN/6	San Mateo RC	418-	AB- -	3063
W6HXN/6	Turlock ARC	491-	ABC-15-	2541
K6EAG/6	Hayward RC	415-	B- -	2490
W8APY/8	Champaign County ARC	411-	B- 8-	2466
K6HAI/6	North Shores ARC	388-	AB- 8-	2448
W4WYX/4	(nonclub group)	327-	B- 9-	1962
K7KRR/7	Mount Erie RC	293-	AB- 6-	1782
W9HLW/9	Flambeau ARC	387-	ABC-12-	1671
K2IOC/2	Central Queens RC	490-	AB-12-	1421
W2KVG/2	Tryion RC	230-	AB-14-	1199

Seven Transmitters Operated Simultaneously

VE3DOH/3	Windsor ARC	1037-	AB-49-	8367
W6PW/6	San Francisco RC	1278-	AB-25-	8214
W6ULL/6	Fullerton RC	864-	AB- 9-	7095
VE3ZM/3	Guelph ARC	719-	A- -	6471
W6SD/6	San Fernando Valley RC	976-	AB-30-	6234
K3IVO/3	Free State ARC	879-	AB-22-	6177
W9SWQ/9	Four Lakes ARC	884-	AB-45-	5964
WA2NGI/2	Gloucester County RC	918-	AB-27-	5940
VE3KCD/3	Kitchener-Waterloo ARC	827-	AB-27-	5040
W4GAC/4	St. Petersburg ARC	735-	B-30-	4410
W6PM1/6	United RAC	658-	AB-12-	4233
K9GXU/9	St. Clair ARC	580-	AB-27-	3576
WA2OII/2	Apple Pie Hill AR Assn.	456-	AB-22-	3360

Eight Transmitters Operated Simultaneously

W9FQ/9	Wheaton Community RA	1408-	B-43-	8622
W8HLD/8	Catalpa AR Soc.	1117-	B-30-	6702
W6PMK/6	North Peninsula Electronics Club	913-	AB-25-	6582
KØDWC/Ø	Bellevue ARC	921-	B-12-	5676
W9CEQ/9	Fox River R League	873-	AB-16-	5373
W4PAR/4	Davidson ARC	532-	AB-20-	3846
W2MDM/2	(nonclub group)	417-	B-25-	2502

Nine Transmitters Operated Simultaneously

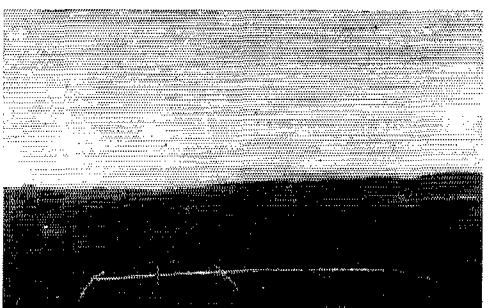
W2GSA/2	Garden State AR Assn.	2404-	AB-33-21,366	
K2YCJ/2	Communications Club of New Rochelle	1237-	AB-30-	9723
K2USA/2	Fort Monmouth ARC	1593-	ABC-45-	8949
W6LYM/6	The Corona Gang	839-	A-12-	7794
W2US/2	Suffolk County RC	838-	AB-26-	5973
W9YH/9	Twin City ARC	991-	ABC-29-	5577
W9UVI/9	Peoria Area ARC	867-	B- -	5202
W9ADZ/9	Chain of Lakes ARC	719-	AB-35-	4632
W4MOE/4	Buncombe County ARC	517-	AB-17-	3273

Ten Transmitters Operated Simultaneously

W7HZ/7	Valley ARC	3348-	A-68-30,357	
W6PMO/6	Associated RA of Long Beach	2021-	AB-40-13,023	
VE3WE/3	Scarboro ARC	1325-	A-30-12,150	
VE3NAR/3	Nortown ARC	1680-	AB-40-11,457	
W9RK/9	Northwest ARC	1157-	AB- -10,338	
W7NCW/7	Lower Columbia AR Assn.	906-	AB-35-	7908

Eleven Transmitters Operated Simultaneously

W7DK/7	RC of Tacoma	2545-	A-60-23,130	



This big beam overshadows the picturesque view of the K-W Club Field Day site, W7DTT/7.

W2LI/2	Tri County R Assn.	2535-	A-45-23,040	
W5SC/5	San Antonio RC	2117-	AB-50-15,783	
W2GIZ/2	Union County AR Assn.	505-	AB-21-	3357

Twelve Transmitters Operated Simultaneously

W3RCN/3	Rock Creek AR Assn.	2165-	AB-110-16,749	

CLASS B

Grouped in this listing are the scores of portable stations manned by one or two operators. Where two persons participated, the call of the other operator (if known) is given below that of the amateur whose call was used. Figures following the calls indicate number of contacts, power and final score.

One Transmitter

K6QIK/6[1]	445-	A-	6359
W2FBA/2	443-	A-	6318
W2JBQ			
W3YDF/3	519-	A-	5153
W3FSF			
W3DQG/3	558-	AB-	5019
K3JWV			
W5YJS/5	353-	A-	4766
W5NCN			
W6BAM/6	413-	A-	3942
WA6CFA			
W8VWY/8	222-	A-	3335
K8NGQ			
K7LQG/7	232-	A-	3132
W3HEC/3	347-	A-	3123
W3TLN			
W9TOR/9	318-	AB-	3087
W9OHG			
K7NFB/7[2]	510-	B-	3060
W6ANB/6	312-	AB-	2778
K6VSB			
W5SGA/5	460-	B-	2772
W5YFN			
VE7TT/7	274-	A-	2691
K2MFF/2	425-	B-	2568
K2VZJ			
K2OQA/2	396-	B-	2526
W2GKE			
W1WAJ/1	272-	AB-	2352
K5BKK			
K4LDR/4	234-	A-	2331
W4WHK			
WA2DPT/2	258-	AB-	2235
K2BMI			
KH6DQA/KH6	337-	B-	2172
KØBJH			
KØBFL/Ø	235-	A-	2115
KØBZP			
K4WOI/4	207-	A-	2088
KN3OSV/3	125-	A-	2025
KN3OIO			
K5UTV/5	315-	B-	1890
K5UTK			
W6NKR/6	209-	A-	1881
K6ZPE			
K8PZM/8	283-	B-	1848
K8JIC			
K8HVV/8[2]	193-	A-	1737
W9ZHD/9	286-	B-	1716
W9VWM			
K3KHK/3	125-	A-	1688
K4VSA/4	268-	B-	1608
K4WIP			
K2PGC/2	230-	AB-	1566
K2PSR			
W6MSM/6	109-	A-	1472
K5WUE/5	244-	B-	1464
K5HBO			
K9UKO/9	155-	A-	1395
K9OYD			
W7WXI/7	129-	A-	1386
K7AZH			
W1FKJ/1	204-	B-	1374
W1NXX			
KØGEY/6	73-	A-	1323
W1ALL/1	119-	A-	1296
W1VNX			
K4EOS/4	214-	B-	1284
K4RYT			
KØAQO/Ø	208-	B-	1248
W9UXT			
WA6MWA/6	207-	B-	1242
WA6KTS			
W5PTK/5	201-	B-	1206
K5ZZJ			
W9EDO/9	222-	A-	1998
K9E Y			
W6CIS/6	61-	A-	1161
KØORC/Ø	168-	B-	1158
KØORB			
K5YAA/5	186-	B-	1116
K5WZB			
W4SNU/7	117-	A-	1053
W5ESW/5	170-	B-	1020
K5URH			
K6QFS/6	67-	A-	905
K6GGP			
K5TUH/5	100-	A-	900
K5TXK			
K4CXF/1	149-	B-	894
W1GPY/1	40-	A-	878
K1GDX			
K4BEI/4	62-	A-	837
W1MBR/1	108-	B-	798
W1LNI			
K8QPY/8	88-	A-	792
W8RHV			
W9MAK/9	129-	B-	774
W9ADO			
W2THU/2	86-	A-	774
WA2JYK			
K1LPC/1	126-	B-	756
K1GVQ			
W8TSV/8	80-	A-	720
W8SSL			
K8PTK/8	80-	A-	720
K8OGO			
W9OHU/9	26-	A-	689
W9OEY			
K3LSE/3	75-	A-	675
WA6MDL/6	104-	AB-	645
W7AYH/7	79-	B-	636
K7IOA			
WA6HRS/6	105-	B-	630
KØPFV/Ø	34-	A-	531
W8TKY/8	229-	AB-	515
W8MNV			
K7DUF/6	56-	A-	504
WØOHM/Ø	65-	B-	480
WØDNM			
W5GH/5	32	A-	432
W2UJS/2	23-	A-	432
K5HXO/5	46-	B-	426
K5LDQ			
WA6JMQ/6	111-	B	420
WA2GWS/2	46-	A-	414
W6IAH/6	29	A-	392
W6EA			
K1ITU/1	128-	C-	384
K2EKS/2	175-	B-	350
K8SPQ/8	173-	B-	346
K1NFD/1	90-	AB-	343
K1BZB/1	57-	B-	342
K1BII			
KN3ONW	35-	A-	315
K9OBF/7	104-	A-	312
KØCFY/Ø	52-	B-	312
KØOLV			
KØTDL/Ø[3]	95-	C-	285
K1LNC/1	180-	B-	260
K1QCZ			
KØVAE/Ø	19-	A-	257
KØVAF			
WA2THG/2	39-	B-	234
WA2PRD			
K5CDC/5	107-	B	214
KØQHF/KP4	51-	B-	212
WV2PDE/2	22-	A-	198
WV2QDZ			
K4QET/4	22-	A-	198
K4IUB			
KØGCK/Ø	32-	B-	192
KØGCG			
W2MPM/2	88-	AB-	178
WA2EWB			
K9UMO/7	26-	A-	156
K1RGO/1	13-	A-	117
WA6AWD/Ø	13-	A-	117
W4YOX/4	36-	B-	72
W7HLA/7	11-	B-	66
K7IVJ			
K6HJU/9	7-	A-	63
WA6OLQ/6	9-	B-	54
KN1RIH/1	16-	A-	48
WIBB/1	23-	B-	46
W4CDA/4	15-	B-	30
KN4NYO			
KN9FNB/9	2-	A-	18
K5YPV/5	6-	B-	12
KØBNW/9	2-	B-	6

Two Transmitters

WA6JDL/6[4]	422-	B-	2622
K4YNO/4	207-	A-	1863
K4ZRH			
KØLFF/Ø	284-	B-	1854
KØCDG			
K1BVU/1	172-	AB-	1287
K1CIG			
W7GUS/7	135-	AB-	915
W7BJW			
KP4AQY/KP4	375-	B-	800
KP4ATV			
WA2CWA/2	219-	AB-	490
WA2EQP			
K1JBS/1	125-	C-	375
K1NQM			
KNØCMF/Ø	19-	B-	114
KNØHNE			
K3NFM/3	12-	A-	108
K3ATI			

Quite a few clubs tried balloons for supporting antennas with varying success. Here the Old Goats of Temperance, Mich., K8CJS/8, attempt to launch a six-meter halo. Happy landing!

CLASS C

Grouped in this tabulation are the scores of entrants in the mobile class. Figures following the call indicate number of contacts, power and final score.

W6QYY/6[5]	322-A-4766	WA6HGH/6	65-B-1728
K6UKH/6	162-A-3902	K6VYV/6	64-B-1719
K6RRD/6	161-A-3888	K3GNM/3	100-A-1688
WA6GIT/6	127-A-3429	W8SDV/8	71-A-1648
W6QHP/6	118-A-3308	K6PXH/6	95-A-1620
W6GTG/6	114-A-3267	W3VXN/3	94-A-1607
WA6LGZ/6	216-A-3254	W9NIO/9	85-A-1485
WA6DGH/6	105-A-3159	K6OXX/6	85-A-1485
W6OPY/6	100-A-3092	W8MWE/8	59-A-1472
K6UVE/6	99-A-3078	W3GOW/3	79-A-1431
W6KTB/6	92-A-2957	K3HIJ/3	89-A-1418
K6RPO/6	91-A-2943	W3YHV/3	79-A-1404
W6QPX/6	89-A-2916	W8OHA/8	41-A-1350
W6POP/6	183-A-2889	W6VHU/6	94-A-1269
W6CXD/6	86-A-2876	W8AJH/8	34-A-1256
W6VHT/6	79-A-2781	W8ZJQ/8	34-A-1256
WA6ORZ/6	79-A-2781	K8UNP/8	34-A-1256
WA6OXZ/6	79-A-2781	W8NOX/8	32-A-1202
K6BJU/6	79-A-2781	K6IQA/6	89-A-1202
K6UML/6	77-A-2754	W6OOR/6	64-A-1202
WA6IVI/6	74-A-2713	W3LNQ/3	61-A-1161
WA6IQK/6	72-A-2686	K9LJC/9	58-A-1134
K6LJC/6	71-A-2673	W9AYU/9	59-A-1134
W8GHO/8[3]	139-A-2673	K8PZQ/9	57-A-1107
WA6OXX/6	67-A-2619	K9MNF/9	46-A-1094
K6ZFI/6	66-A-2606	VE3DDB/W6	81-A-1094
WA6AXZ/6	62-A-2552	W3NIP/3	56-A-1094
K6LUQ/6	62-A-2552	WA6IDV/6	52-A-1040
K6SBL/6	62-A-2552	W3PWG/3	51-A-1026
K5TPT/6	62-A-2552	W9MYI/9	51-A-1026
K6YJL/6	57-A-2484	K6CAJ/6	76-A-1026
K6JNV/6	57-A-2484	W9QAX/9	54-AB- 963
K6SEA/6	56-A-2471	K3FBO/3[3]	105-B- 945
WA6JJD/6	55-A-2457	W3AJO/3	43-A- 918
K3MEB/6	53-A-2430	W6SRE/6	67-A- 905
K6SWZ/6	52-A-2417	W6DUY/6	39-A- 864
WA6MSZ/6	52-A-2417	W3VVS/3	37-A- 837
WA6NDL/6	51-A-2403	W5QF/5	93-B- 837
WA6BVI/6	51-A-2403	W3YJM/3	37-A- 837
K6GUU/6	50-A-2390	W2DLT/2	61-A- 824
WA6GIS/6	49-A-2376	K3GBA/3	35-A- 810
WA6JUO/6	49-A-2376	K9PKW/9	60-A- 810
WA6ITA/6	49-A-2376	W3FWI/3	34-A- 797
W3DSG/3	150-A-2363	W3PST/3	33-A- 783
K6AUU/6	48-A-2363	W3EQV/3	33-A- 783
K6RIJ/6	47-A-2349	K3DJE/3	61-B- 774
W6KME/6	46-A-2335	W3AK/3	69-B- 765
W3RQZ/3[6]	110-A-2268	W2LID/2	83-B- 747
W8PVC/8	111-A-2268	W6MEG/6	55-A- 743
K8AAG/8	105-A-2187	W3SAA/3	29-A- 729
W3SRU/9	132-A-2120	W9OGZ/9	29-A- 729
W8FTD/8	92-A-2039	K9UYU/9	29-A- 729
WA6KDO/6	89-B-1954	W3LEM/3	29-A- 729
W3AWH/3	118-A-1931	WA6CYP/6	26-A- 689
K3GNJ/3	117-A-1917	W3FOG/3	25-A- 675
W8GMK/8	83-A-1917	K6DJO/6	49-A- 662
K6GXO/6	141-A-1904	K6VJT/6	49-A- 662
W8QAV/8	83-A-1890	K5MQT/5	21-A- 621
W8IDM/8	71-A-1755	W3CDY/3	20-A- 608
K8VBI/8	71-A-1755	W3BBB/3	20-A- 608
K8MVA/8	70-A-1742	KN1RWS/1	44-A- 594
W9TIL/9	99-A-1728	K9ZOE/9	18-A- 581

W3QQH/3	17-A- 567	K4YCL/4	12-A- 162
W9GQY/9[7]	41-A- 554	W3ADV/3	18-B- 162
VE1NZ/1	61-B- 549	K4DYW/4	17-B- 153
KØOFM/Ø[8]	33-B- 522	K3JOY/1	17-F- 153
W6GDO/6	36-A- 486	K5VUX/5	11-A- 149
K5UOD/5[3]	52-B- 468	K4JQO/4	15- - 135
W3DJV/3	9-A- 459	K4RDT/4	9-A- 122
W3IWO/3	34-A- 459	K8LCC/8	9-A- 122
K8LOS/8	8-A- 446	K9BAY/9	13-B- 117
K8SKL/8	33-A- 446	K8YYK/8	8-A- 108
W3UMK/3	23-B- 432	WØBPO/3	11-B- 99
WA6AJI/6	32-A- 432	KØMUL/Ø	7-A- 95
VE2IK/2	4-A- 432	W6BUK/6	7-A- 95
K3AKR/3	22-B- 423	K8QZV/8	7-A- 95
K9IVX/9	5-A- 405	K3EZJ/3	10-B- 90
K8ERZ/8	33-AB-356	WA2THG/2	6-A- 81
K6TYJ/6	1-A- 351	K4WYR/4	8-B- 72
W6EPG/6	1-A- 351	K8UFW/8	5-A- 68
W3JYA/3	23-A- 311	K8IIU/8	5-A- 68
K6ICS/6	32-B- 288	K8RHN/8	4-A- 54
W3JPP/3	5-B- 270	K8TAU/8	3-A- 41
VE1KK/1	26-B- 234	WA2CCF/2	1-A- 27
W3HFD/3	21-B- 189	K4ACZ/4	3-B- 27
W4MBO/6	21-B- 189	K8VKE/8	2-A- 27
K1QPY/1[3]	13-A- 176		

CLASS D

Grouped in this tabulation are the scores of home stations operated from emergency power.

W9JMN[9] 245, W9VMW[6] 175, K2TNO[3] 169, W4CB/4[10] 125, W9BBF[11] 121, K9SRR 73, W6JLY 48, W1MRQ 44, W9BSO[6] 38, W1BNB 22, WØKLG[12] 21, WØFDM 6, W9ONI 5.

CLASS E

Grouped in this tabulation are the scores of home stations oper .ted from commercial power sources.

W8FAW 400, W2SZ[13] 336, WA6NNJ 290, WA6DBC 234, WA6IRN 228, K1OBA/1 226, W4YE 215, K8OCO 213, KØTGT 208, WA6IVN 206, KL7DVB 190, K8FCZ[14] 189, K9RHY 188, K8VIX 184, WA2JBA 176, W8CSK 170, VE3DJV[3] 170, K6EIL 162, K6LKG 159, WA2DHF 158, W5LJT 158, K5ZOX 157, K3JIQ 156, W4JTA 155, W3EIS 152, K1LOM[15] 150, WA2DLV 141, K5QFM 138, KØSCM 134, W3VRD 134, K5FLD 129, W2DRV 125, WA2PJL[3] 123, VE7AQD 116, K8QLL 114, K8HLR 113, WA6MJG/6 108, W2DUN 106, K9QFL 101, W1AW[16] 100, K2OSA[17] 97, K1MVV 96, W8CXZ 95, K2RJF[18] 90, W3RPZ 88, K3IPM 88, VE3AWE 87, K5VLG 86, KØZFI 85, K3NKV 83, K3ANU 82, W5CSN 76, K1KRP 75, K8SIJ 71, WA2JZM 71, WA2HRP 70, K3DDX 69, W9BEM 66, WA2PGY 62, W8MXO 60, K4CGY 58, K8LEF 56, WØKON/6 55, KZ5KR 54, W6OJW 53, K1CEY 52, K7AII 52, K8PFX 51, K8TYF 49, KØBQI 48, WA2NNW 47, WA2OUH 46, K5GHP 46, WA2NRK 46, K9UCG 45, WA2LGX 44, W3MSR 42, W6AM 42, K8MLO 42, WA2HTQ 41, K3NJF 41, W1RFJ 41, K3GKB 40, K9VQC[19] 40, VE2BGR 40, W3TN 39, WN4AAA 37, WA6NHO 35, K5FNV 35, VE3GT 35, K6CPA 34, K9GDF 33, K6RCK 30, K3MWT 30, K1PIL 30, W4HOS/4 30, WA6HQC 29, K4BZ 26, KN5HFR[20] 25, WA6GLD 25, WV2PVW 25, W2IU 25, W7IYJ 24, W2CKQ 24, W2MEO 23, W6HRK 22, VE3APF 22, KN9ARW 22, W9QGA 21, W1SWX 20, WA6NON 20, K5UYF 19, W6DYQ 19, K8LOU 17, K7JRE 15, KN8BAB 15, K6ODJ 15, WA2OID 14, W2DJ 12, W4AXP 11, W4HYW 11, W9UEM 9, W9BLQ 9, WA2ANU 9, KØVSV 9, KN5FUS 7, W3LNX 7, K1PGQ 5, K7OYU 5, W7LQU 4, KL7DIK 4, WN4AGT/4 4, WV6ORS 3, W3JWZ 3, W2WUX 2, W5MPF 1, WA6LSS 1.

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[1] K6QHZ, K6EXO oprs. [2] K7JWA, K7MTJ oprs. [3] 2 oprs. [4] K6SDR, WA6DMM oprs. [5] 2 rigs, WA6QYY, K6PXH, K6OXX oprs. [6] 2 rigs. [7] W9GQY, W9TBZ oprs. [8] KØOFM, KØENC oprs. [9] W9JMN, K9GVE, W9LVO oprs. [10] 2 rigs, 5 oprs. [11] K9YGM, K9UQI oprs. [12] WØKLG, KØCIB oprs. [13] 3 rigs, 10 oprs. [14] K8FCZ, K8DHT oprs. [15] K1LOM, KN1QNE oprs. [16] W1WPR opr. [17] K2OSA, WA2JEL oprs. [18] 2 rigs, 4 oprs. [19] 2 rigs, 3 oprs. [20] KN5HFR, KN5KLE oprs.

ARRL thanks the following amateurs for submitting their logs for checking purposes: *W2s* GHO KYS NCG PDG, *K2s* YNL ZYR, W3LNQ, *W4s* EOT LUV TS, W6UWL, K7ADI, W7ESM, W8FX, W9YDP, *VE3s* CYR EIG, *VE7s* BBB ASC, ZL1AH.

Strays

Here's the November schedule for the Air Force MARS Eastern Technical Net, meeting Sundays at 1900 GMT on 3295, 7540, and 15,715 kc.

Nov. 5 — Introduction to Sonar.
Nov. 12 — Underwater Communications.
Nov. 19 — Modern Submarines.
Nov. 26 — Oceanography.

A Method for Determining V.H.F. Station Capabilities

Using Readily Obtainable Data to Plot Reliable Range

BY D. W. BRAY,* K2LMG

If you have ever wondered about the maximum distance that could be worked by your v.h.f. station under normal propagation conditions, you probably decided that to determine the answer would be a sizable task. There is a great deal of literature on the subject, but much of it is too theoretical for the practical person. Then, even if an answer is obtained, you still may question whether it is just a theoretical number or the right answer.

After reading a recently published paper on ground wave and tropospheric scatter propagation,[1] I became interested to see if the answers that the theory predicted held true for an amateur radio station, where the antenna site and many other factors were not optimum. After running schedules over a period of months with K2GQI and W4LTU, I found that the measured signal strength checked with predicted signal levels within the limit of accuracy of my measuring equipment. Since the theory seemed to hold for amateur radio stations, other v.h.f. enthusiasts may be interested in having a relatively simple method of calculating the working range of their stations. Some might be surprised at how far they should be able to work. Such information is also useful to determine what station changes should be made to work a station that is presently just out of reach of reliable communications.

* Advanced Electronics Center, General Electric Company, Ithaca, N. Y.

[1] Norton, "System Loss in Radio Wave Propagation," *Journal of Research of the National Bureau of Standards*, July–August, 1959.

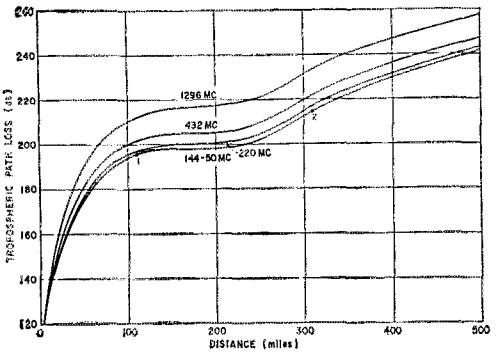


Fig. 1 — Path loss *vs.* distance for amateur frequencies above 50 Mc. Values indicated are those that the path loss will be equal to, or less than, for 99 per cent of the hours of the year. This curve should be used for extreme reliability requirements.

In order to make the calculation as straightforward as possible, data and graphs given by Norton have been reduced to nomogram form for the amateur frequencies from 50 to 1300 Mc. Before we get into the method of calculation, however, a few interesting things can be determined by plotting the path loss as a function of distance. The path loss is the loss in signal over the distance between two stations. It is expressed as a decibel loss and is the ratio of the power transmitted by one station, using an antenna with a gain of 1, to the power received by another station, also using an antenna with a gain of 1. Mathematically this is expressed as:

$$\text{Path Loss in db.} = 10 \log \frac{\text{Power Transmitted}}{\text{Power Received}}$$

In order to communicate, the path loss must be overcome by receiver sensitivity, antenna gain, and transmitted power. The path loss is not constant, but is the expected value which it will be equal to or less than, for a given number of hours of the year. If the path loss is given for 99 per cent of the hours of the year, then for a particular distance between stations the path loss will be equal to or less than that value 99 per cent of the hours of the year. Such a graph of path loss *vs.* distance is shown in Fig. 1. Fig. 2 is a similar graph plotted for a path loss equal to or less than the given amount 50 per cent of the hours of the year.

The first thing to be noted from the graphs is that the signal loss between two stations on the earth is anything but a straight line as the distance is increased. At first, the path loss increases rapidly as the distance becomes greater, then it tends to level out and again rise, but not as steeply as the original change of path loss. This is particularly true of the graph for 99 per cent of the hours of the year. This means that for a given increase in power or antenna gain, the benefit which can be achieved depends on the distance to the station that is receiving you.

As an example, assume there is a low-power 2-meter station which can reliably work a similar station 60 miles away. Referring to Fig. 1 (99 per cent of the hours of the year), it can be seen that the path loss for 60 miles is about 180 db. If the station transmitted power is raised from 6 watts to 60 watts, the station can now be heard reliably 90 miles away, since the 10-db. increase in power will overcome 10 db. of path loss, increasing allowable path loss from 180 to 190 db. However, for an increase in power of 10 times, the

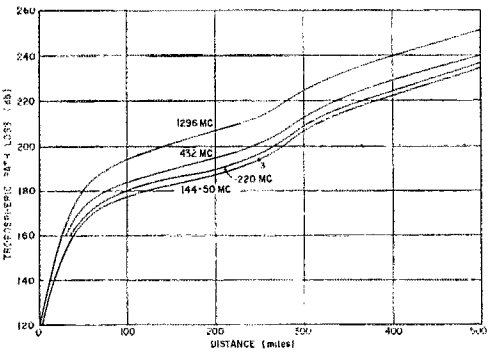


Fig. 2—Path loss *vs.* distance for 50 per cent of the hours of the year.

distance worked is only increased by 1.5 times. Making another increase in power of 10 db., thus raising the transmitted power from 60 to 600 watts, the allowable path loss is 200 db. and the working distance 240 miles. This time an increase in power of 10 times changed the station range 2.7 times, a substantial increase in distance from 90 to 240 miles.

This type of information can be very helpful if future station changes are planned. By the use of the method described here to determine where your station lies on the curve, the changes required to increase your working distance to a desired value can be easily found. Conversely, it is possible to determine if a planned change will accomplish the desired results.

It is a well-known fact that c.w. produces much better results than voice modulation in working v.h.f. DX. It becomes quite obvious why this is so by looking at Fig. 1. Take a typical 6-meter station: using a 100-watt transmitter and a 5-element beam, on phone, this station can probably work a similar station 110 miles away (see point 1, Fig. 1). The use of c.w. buys an additional 17-db. gain over the use of a.m. phone. Therefore, if this station switches to c.w. with no other changes he can now work another similar station at a distance of 310 miles (see point 2, Fig. 1). The switch to c.w. has pushed the station over the hump and produced a sizable increase in working distance.

If a comparison is made between Figs. 1 and 2, it is interesting to note that if you can tolerate being able to work a station only 50 per cent of the time instead of 99 per cent of the time, the maximum working distance is increased considerably. Using the previous example of the 6-meter 100-watt station, 99 per cent of the hours of the year he could work only 110 miles, but if the operator is satisfied with 50 per cent of the hours of the year he could work 250 miles (see point 3, Fig. 2).

Station Gain

So much for looking at the effects. In order to estimate your station's capabilities, two basic calculations must be performed. The first is the determination of a number that will be called station gain; the second is the path loss. The station gain is made up of eight quantities: receiver sensitivity, transmitted power, receiving antenna gain, receiving antenna height gain, transmitting antenna gain, transmitting line loss, transmitting antenna height gain, and required signal-to-noise ratio. The value of station gain is obtained by determining the value of each of these quantities and converting them to a db. value, then adding the db. values to obtain a total.

The computation of the station gain at first appears to be somewhat complicated, not due to the mathematics, but because of the various numbers which have to be obtained in order that their db. values may be added together. Two of the values are obtained by nomograms of Figs. 3 and 4. These are the receiver sensitivity and the antenna height gain. These and the other quantities are discussed one at a time with clues as to where the appropriate numbers may be found.

Receiver Sensitivity

The largest number in the station gain is the sensitivity of the receiver. The nomogram of Fig. 3 is used to calculate this. In order to determine the value, a straightedge is placed between the appropriate receiver bandwidth value on the left-hand scale and the noise figure of your converter, plus line-loss value, on the right-hand scale. The receiver sensitivity is then given on the center scale. The receiver bandwidth for phone will vary for the particular receiver, from approximately 2 to 10 kc. Your receiver instruction book probably will list the phone receiver bandwidth. This value should be used. If the receiver is used on c.w., due to the properties of the ear, the value of approximately 500 cycles proves best for the receiver bandwidth scale, regardless of the actual receiver bandwidth in the range from 3 kc. to 100 cycles. Therefore, computations of phone signals use between 2 and 10 kc. for the receiver bandwidth and 500 cycles for the receiver bandwidth for the reception of c.w.

The noise figure may be a little more difficult to determine. If you have a commercial converter, the instruction book may list its noise figure. If your converter is homemade, the noise figure could vary anywhere from 2 to 10 db., depending on the tube type used in the front end and the frequency band. If you do not know the value of the noise figure of your receiver, one way to determine this is to look at the commercial converter specifications which have a tube line-up similar to yours. The back pages of *QST* are likely to have some of these converter ads. In addition to the noise figure, the line loss from the receiver to the antenna must be computed. This is easily done by the use of the *ARRL Handbook* or *Antenna Book*, which list the transmission-line losses in db. per hundred feet, as a function of the frequency, for all common types of coaxial cable and open-wire line. By adding together the noise figure in db. and the line loss in db., then drawing a line between this

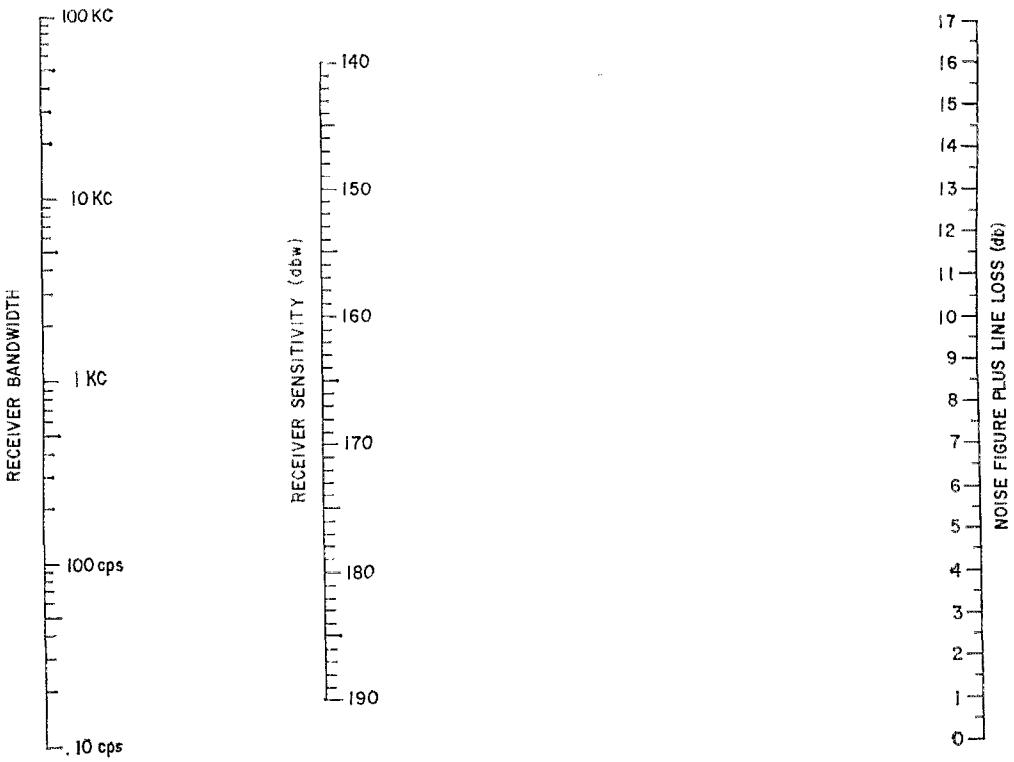


Fig. 3—Nomogram for finding effective receiver sensitivity.

value and the chosen receiver bandwidth, the receiver sensitivity is obtained on the center scale. This number as noted on the chart is in dbw., meaning that it is a given number of db. below the reference level of 1 watt. To be strictly correct, a negative sign should be in front of these db. numbers, but it has been omitted since we are computing a value we will call station gain.

Antenna Gain

The next largest number in the station gain is the gain of your transmitting antenna and the gain of the other station's receiving antenna, or vice versa. Of all the numbers used in the specifications of amateur radio equipment, the antenna gain is probably the one most loosely defined and the least likely to be believed. Therefore, for the antenna gain, although you can use the antenna gain as advertised by your antenna manufacturer (if you have a commercial antenna), probably a better and more conservative figure could be obtained by using a simple formula. The gain of a Yagi-type antenna is approximately equal to 10 times the boom length in wavelengths. This formula is independent of the number of elements.

Expressing this antenna gain in terms of length in feet and the frequency used:

$$G_P = \frac{LfN}{98}$$

where

G_P = Gain of the antenna expressed as a power ratio.
L = Length of the antenna in feet
f = Frequency of station in megacycles
N = Number of stacked antennas of the same length stacked widely apart.

This number must then be converted into db. by the standard db. formula or by using the db. table in the *Handbook*. This is the gain of the antenna if it were in free space. However, since most antennas are operated over the ground and pointed at the horizon, an additional gain due to the earth's reflection should be added to this calculated antenna gain. This value should be around 4 db. for most u.h.f. antenna sites. Therefore, obtain the antenna gain by the formula or commercial specifications and add 4 db. to this number. If you have a collinear antenna you had better use the commercial specification, or a reasonable estimate, and then add the 4 db. for ground reflection.

Antenna-Height Gain

Because the nomogram for the calculation of path loss is based on an antenna height of 30 feet, receiving and transmitting, an additional nomogram is required in order to obtain the antenna-height gain if your antenna is of a height other than 30 feet. The antenna-height gain is a function of the distance to the station

you are working and therefore the nomogram of Fig. 4 has a distance scale in the center. As noted on this scale, from 10 to 30 feet, all station distances are considered to be at the point indicated by the arrow; i.e., 10 miles. However, for antenna heights from 30 to 100 feet, the specific station distance should be used as a point through which to draw the line from your antenna height (left-hand scale) to obtain the height gain on the right-hand scale. It should be noted that the left-hand mark on the center distance scale is for distances from 0 to 10 miles and the right-hand mark of the distance scale holds for all distances from 100 to 500 miles.

To determine antenna-height gain, lay a straight-edge from the value of antenna height intersecting the station distance in the center of Fig. 4 and read the height gain on the right-hand scale.

Transmitter Power

The transmitter power is an easy one to calculate. Since you know the power input you are running, convert this into the db. ratio referred to 1 watt, since the receiver sensitivity is referred to 1 watt. That is, your input power divided by 1 is used for your db. ratio calculation; or look it up in the db. table of the *ARRL Handbook*. Because the transmitter is not 100 per cent efficient, subtract 2 db. for efficiency in the 50- or 144-Mc. bands and as much as 4 db. for the higher bands.

As an example, a 100-watt transmitter expressed in db. is equal to 20 db., minus 2 db. for efficiency, or 18 db.

Transmitter Line Loss

As with the receiving station line loss, this can be obtained by looking up the specific cable loss in the *ARRL Handbook*.

Required Signal-to-Noise Ratio

Because all forms of modulation are not as efficient as c.w., a required signal-to-noise ratio must be subtracted from the station gain. For c.w., no additional signal-to-noise ratio is required, since this is used as a standard. For single sideband, subtract 3 db. from the station gain. For a.m., subtract 7 db. (The additional 10 db., purely a bandwidth factor, is included in the nomogram, Fig. 3).

In addition to loss of signal due to the type of modulation, a fading loss must also be subtracted from the station gain. It has been shown that for station distances of over approximately 100 miles, a fade amplitude of 13.5 db. exists. This is a within-the-hour fade. The path loss curves are expressed as representing a given percentage of hours of the year, because within-the-hour additional signal changes can be expected. The curves are for the average signal for any hour. Thus, since a 13.5-db. signal change will occur at some variable rate within a period of a few minutes, the signal will drop about 7 db. below the average and then rise 7 db. above the average. This fading is familiar to all v.h.f. operators. Although the rate of fade will be variable, the amplitude is constant. Therefore, in order to copy another station solidly it is necessary to subtract this 7 db. from the station gain. This holds for all distances greater than 100 miles. For distances shorter than 100 miles it drops off almost in a straight line. For a 50-mile station-to-station distance, subtract 3.5 db., etc.

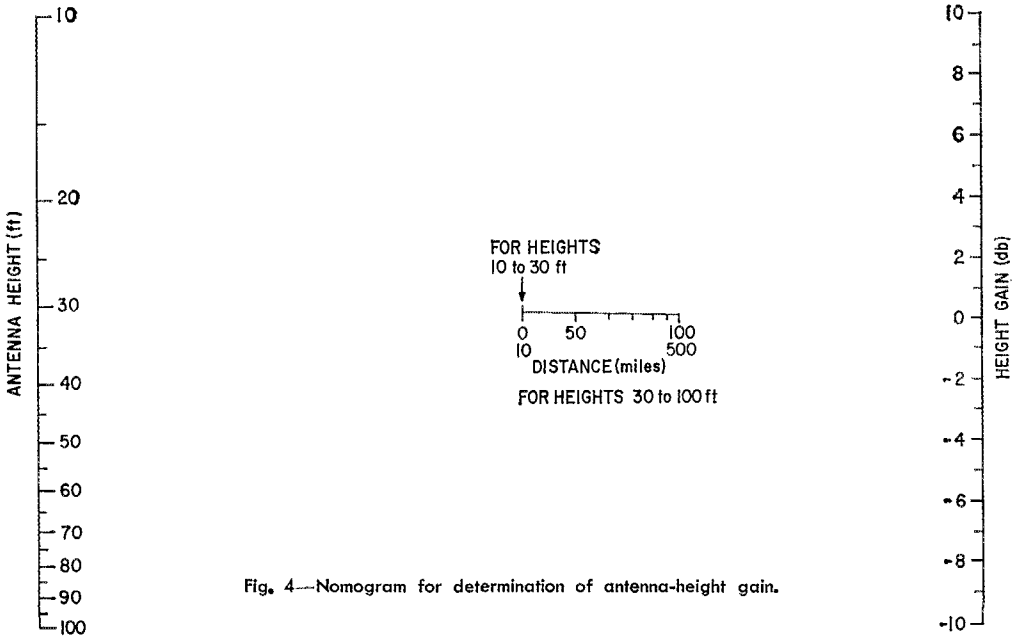


Fig. 4—Nomogram for determination of antenna-height gain.

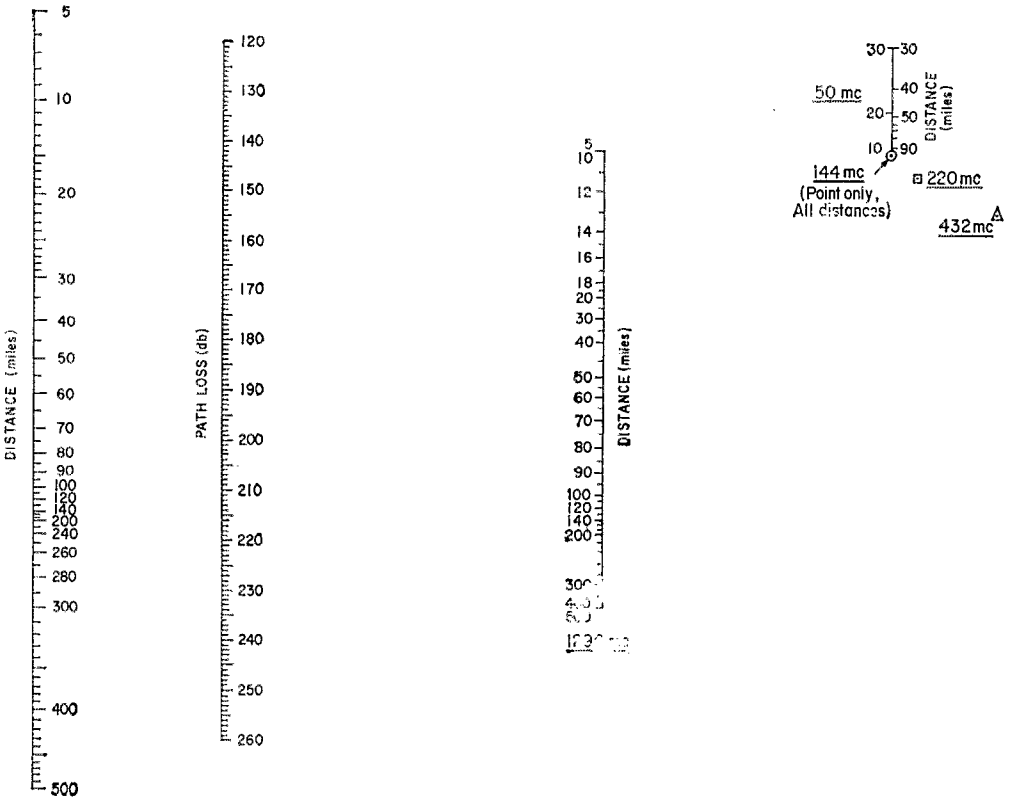


Fig. 5—Nomogram for finding distance capabilities of v.h.f. stations.

Therefore, subtract from the station gain 0 db. for c.w. or 3 db. for s.s.b., or 7 db. for a.m., and an additional 7 db. for fading.

Having obtained the values required to obtain station gain as discussed above, the station gain is obtained from the following procedure: (1) From Fig. 3 obtain receiving-station receiver sensitivity. (2) Add transmitting-station power in db. (3) Add receiving-station antenna gain in db. (4) Add receiving-station antenna-height gain in db. (if it is negative, subtract it). (5) Add transmitting-station antenna gain in db. (6) Add transmitting-station antenna-height gain in db. (watch that negative value). (7) Subtract transmitting-station line loss in db. (8) Subtract required signal-to-noise ratio, 0 for c.w., or 3 db. for s.s.b., or 7 db. for a.m., and 7 db. for fading.

Path Loss

The determination of path loss is considerably easier than the station gain. It is obtained by the use of the nomogram of Fig. 5. This is the same information as shown in Fig. 1, except that in nomogram form it is considerably more accurate. The use of this nomogram gives the path loss between two stations over a smooth earth for 99 per cent of the hours of the year. To determine the value of path loss, lay a straightedge from the value of distance between stations on the left-hand scale to the same distance on the appropriate right-hand distance scale and read off the value of path loss on the center scale. The right-hand distance scales are for the various amateur bands between 50 and 1300 Mc. However, note that some of the bands have incomplete right-hand distance scales. 1296 Mc. has a complete distance scale. For 432 Mc., use the dot surrounded by the triangle as the distance scale. For 220 Mc., use the dot surrounded by the square. For 144 Mc., use the dot surrounded by the circle. For 50 Mc., use the dot surrounded by the circle for distances from 5 to 10 miles and from 90 to 500 miles. Use the scale as marked between 10 and 90 miles.

As an example, the path loss at a distance of 50 miles is 185 db. for 1296 Mc., 178 db. for 432 Mc., 176 db. for 220 Mc., 175 db. for 144 Mc., and 174 for 50 Mc.

This path-loss information can be used two ways. Choosing a distance between stations and then determining the path loss, this value subtracted from the station gain gives the signal strength at the receiver, over and above that required, expressed in db. This can be converted to S units by dividing the db. value by 6. If the value is negative, the station is too far away to be worked.

If, in figuring the station gain as above, you use your own station receiver and transmitter parameters and use your antenna gain for both the receiving antenna gain and transmitter antenna gain, this will give the station gain for two

similar stations. If this value of station gain is entered on the center scale of Fig. 5 as the path loss, and the straightedge adjusted to lie on same value on both left-hand and right-hand distance scales, and if a right-hand distance scale exists, this is the distance which can be worked by your station if a similar station to yours were at that distance. This calculation can be used to get an idea of how far you could expect to work other stations, unless some favorable propagation is present. It is also helpful for determining what result station changes produce.

One last consideration should be made when choosing the distance between stations. The nomogram of Fig. 5 is based on a smooth earth. If the terrain at the horizon at your location is higher or lower than your antenna, a correction can be made to the distance between stations in order that a more nearly correct path loss will be obtained. After determining the air-line distance between stations of interest, determine the horizon elevation angle in degrees in the direction of the station to be worked and multiply it by 69 miles. If the angle is positive, add this new value to the distance; if the angle is negative, subtract this distance from the actual distance This correction should be made for both stations.

Examples

Determination of the signal strength above that required, from Station A to Station B:

Station A Receiving	*Station B Transmitting*
Frequency: 144 Mc., c.w.	Distance: 200 miles
Receiver noise figure: 3 db.	Transmitter power: 250 watts
Transmission line: 40 ft. RG-8	Transmitter line: 100 ft. RG-8
Receiver bandwidth: 500 cycles	Antenna: 2 Yagis 28 ft. long
Antenna: 14-ft. boom	Antenna height: 65 ft.
Antenna height: 20 ft.	Horizon angle: −0.5 degrees
Horizon angle: +1.2 degrees	

Preliminary Calculations

a) Looking up transmission-line loss in the *ARRL Handbook*, you find 1.0 db. for the receiver and 2.5 db. for the transmitter.

b) Compute antenna gain

$$G = \frac{(14)(144)}{98} = 20.6, \text{ or}$$

13 db. for the receiver.

$$G = \frac{(2)(28)(144)}{98} = 82, \text{ or}$$

19 db. for the transmitter.

Then find station gain:

1) Receiver sensitivity (Fig. 3), 500 cycles and 4 db.:	172.5 db.
2) Transmitter power, 24 − 2 db.:	22 db.
3) Receiver antenna gain, 13 db. + 4 db.: (4 db. for earth reflection)	17 db.
4) Receiver antenna-height gain (Fig. 4):	−3.2 db.
5) Transmitter antenna gain, 19 db. + 4 db.:	23 db.
6) Transmitter antenna-height gain (Fig. 4):	+3.2 db.
7) Transmitter line loss:	−2.5 db.
8) Required signal-to-noise ratio, c.w.:	0 db.
fading:	−7 db.
Total Station Gain =	225 db.

Path Loss Computation:

Find distance correction:

a) Multiply 1.2 degrees × 69 = 82.8 miles
Mult ply −0.5 degrees × 69 = −34.5
Total correction = +48.3 miles

b) Find effective distance:
200 + 48 = 248 miles
Find path loss:

1) Lay straightedge from 248 miles on left-hand distance scale to the dot surrounded by a circle (144 Mc.) on the right-hand scale.

Find path loss = 203.5 db. Find signal strength above that required:

1) Station gain = 225 db.
Path loss = 203.5 db.

Signal above required = 21.5 db.

or in S units, $\frac{21.5}{6}$ = 3.6 S units.

Determination of maximum range of two stations of similar equipment.

Frequency: 1296 Mc., a.m. phone
Receiver noise figure: 9 db.
Transmission line: 60 ft. RG-11.
Receiver bandwidth: 3 kc.
Antenna: 4-ft. boom, Yagi
Antenna height: 40 ft.
Transmitter power: 50 watts
Horizon angle: 0 degrees
Distance = ?

Preliminary calculation:

a) Looking up transmission line in *ARRL Handbook*, you find 60 ft. RG-11 = 4.8 db.

b) Compute antenna gain: $\frac{(4)(1296)}{98}$
= 52.9 = 17.2 db.

Find station gain:

1) Receiver sensitivity (Fig. 3), 3 kc. and 13.8 db.:	155 db.
2) Transmitter power, 17 db. − 4 db.: (−4 db. because of low efficiency at 1296)	
3) Receiver antenna gain, 17 db. + 4 db.:	21 db.
4) Receiver antenna height gain (Fig. 4): (distance unknown but guess 80 miles)	1.5 db.
5) Transmitter antenna gain, 17 db. + 4 db.:	21 db.
6) Transmitter antenna height gain:	1.5 db.
7) Transmitter line loss:	−4.8 db.
8) Required signal-to-noise ratio: a.m.	−7 db.
fading	−7 db.
Total station gain =	194.2 db.

(Continued on page 162)

Announcing the 28th ARRL Sweepstakes

November 11–13 and 18–20

CONTEST PERIODS

Starts	*Ends*
Saturday Nov. 11 **2300 GMT**	Monday Nov. 13 **0801 GMT**
Saturday Nov. 18 **2300 GMT**	Monday Nov. 20 **0801 GMT**

IT'S NEARLY post time for the 28th running of the ARRL Sweepstakes, so make sure your station is at the starting gate raring to go for another enjoyable contest. The race simply consists of making contacts during the contest hours, and swapping contest exchanges. You can enter the phone or c.w. contest, or both.

For the two week ends, forty hours is the maximum operating time allowed. The contest starts (dates and times listed above) on Saturday afternoon and ends early Monday morning — for two week ends. The phone and c.w. contests are considered separate, so send in separate logs.

The rules are the same as last year. A certificate is awarded to the highest scoring single-op in each ARRL section (plus Yukon-N.W.T.). A certificate also goes to the top Novice, Technician, and multiple-operator entry for those sections with sufficient entries; see the rules for award details. A favorite competition is between clubs. You may also credit your score to your club for separate club aggregate listing (total of all club members scores) . . . with an engraved cocobolo gavel to the club with the highest total, and a certificate to each club's top phone and c.w. scorer. Here's a good club project . . . get out your gang to help the club score. Make sure logs are clearly marked: "Participating for club award in the ..... (club)."

The annual trophy donated by W3GJY will this year be known as the *Ev "Pappy" Mayer, KP4KD Memorial Award* to be awarded to the highest scoring single-op in the 1961 SS.

"CQ SS" or answering such a call will get you in business in this contest, and send the exchange information as shown at the top of the next page. Make sure you use GMT in your time exchange. See page 105, this *QST*, to convert to GMT.

For this contest, Yukon-N.W.T. (VE8) counts as a separate section, and VOs as Maritime.

Check carefully the complete rules which follow. You'll find yourself trying to jog your memory on whether you've worked a station or not, so we suggest use of ARRL *Operating Aid No. 6*, a check list of stations worked. This helpful contest form as well as log forms are free on request; write today to ARRL Communications Dept., 38 LaSalle Road, West Hartford 7, Conn. Logs must be postmarked by December 20, 1961, to be eligible for score listing and awards.

Rules

1) *Eligibility:* The contest is open to all radio amateurs in (or officially attached to) sections listed on page 6 of this issue of *QST*.

2) *Time:* All contacts must be made during the contest periods indicated elsewhere in this announcement and between amateurs in (or officially attached to) the 72 sections. Yukon-N.W.T. (VE8) counts as a separate section. Time may be divided between week ends as desired, but a total of 40 hours must not be exceeded for each entry. Time spent in listening counts as operating time.

3) *QSO:* Contacts must include certain information sent in the form of a standard message preamble, as shown in the example. C.w. stations work only c.w. stations and phone stations only other phones. Valid points can be scored by contacting stations not working in the contest, upon acceptance of your preamble and/or receipt of a preamble.

4) *Scoring:* Each preamble sent and acknowledged counts one point. Each preamble received counts one point. Only two points can be earned by contacting any one station, regardless of the frequency band. The total number of ARRL sections (see p. 6) worked during the contest is the "section multiplier." It is not necessary for preambles to be sent both ways before a contact may count, but one must be received, or sent and acknowledged, before credit is claimed for either point(s) or multiplier. Apply a "power multiplier" of 1.25 to c.w. entries and 1.5 to phone entries if the input power to the transmitter output stage is 150 watts or less at all times during contest operation.

The final score equals the total "points" × the "sections multiplier" × the "power multiplier."

5) *Reporting:* Follow the sample shown in reporting contest results. Printed contest forms will be sent free on request. Indicate starting and ending times for each period on the air. All Sweepstakes reports become the property of ARRL and none can be returned.

There are no objections to one's obtaining assistance from logging, "spotting" or relief operators, but their use places the entrant in the multiple-operator class, and it must be so reported.

A single-operator station is one manned by an individual amateur who receives no assistance from other persons during the contest periods. He may not have assistance in any manner in keeping the station log and records, or in spotting stations during a contest period. The operation of two or more transmitters simultaneously is not allowed. Contest reports must be postmarked no later than December 20, 1961, to insure eligibility for *QST* listing and awards.

6) *Awards:* Certificates will be awarded to the highest c.w. scorer and to the highest phone scorer in each ARRL section. A c.w. certificate will also be awarded to the highest scoring Novice or Technician in each section where at least three such licensees submit c.w. logs; similarly, a phone certificate will be earned by a Novice or Technician in each section where a total of three such licensees submit phone logs. A certificate also will be awarded to the highest scoring Novice and Technician from sections of less than three entries . . . that in the opinion of the Awards Committee

HOW TO SCORE

Each preamble sent and acknowledged counts one point.

Each preamble received counts one point.

Only two points can be earned by contacting any one station, regardless of the frequency band used.

For final score: Multiply totaled points by the number of *different* ARRL sections worked; that is, the number in which at least one bona fide SS point has been made. Multiply c.w. scores by 1.25 and phone scores by 1.5 if you used 150-watts-or-less transmitter input *at all times* during the contest.

EXPLANATION OF "SS" CONTEST EXCHANGES

Send Like a Standard Msg. Preamble, the.....NR		*Call*	*CK*	*Place*	*Time*	*Date*
Exchanges	Contest serial numbers, 1, 2, 3, etc., for each station worked	Send your own call	CK (RST report of station worked)	Your ARRL section	Send GMT time of transmitting	Send date of QSO
Sample	NR 1	W1AW	589	CONN	2301	NOV 11

displayed exceptional effort. Only single-operator stations are eligible for certificate awards. Multiple-operator scores will receive separate *QST* listing in the final results.

A gavel will be awarded to the highest club entry. The aggregate scores of phone and c.w. reported by club secretaries and confirmed by the receipt at ARRL of contest logs constitute a club entry. Segregate club entries into phone and c.w. totals. Both single- and multiple-operator scores may be counted, but only the score of a bona fide club member, operating a station in local club territory, may be included in club entries.

The highest single-operator c.w. score and the highest single-operator phone score in any club entry will be rewarded with a "club" certificate where at least three single-operator phone and/or three single-operator c.w. scores are submitted.

7) *Disqualification:* Failure to comply with the contest rules or FCC regulations or the necessity for avoiding interference with channels handling amateur emergency communication shall constitute grounds for disqualifications. In all cases of question, the decisions of the ARRL Contest Committee are final. QST

SUMMARY OF EXCHANGES ARRL SWEEPSTAKES CONTEST

STATION...W1AW..... CW or PHONE?...C.W..... SECTION....CONN.....

		SENT (1 point)						RECEIVED (1 point)							
BAND MC	Time on or off Air	NR	STN	CK RST	Section	TIME	DATE (Nov)	NR	STN	CK RST	Section	TIME	DATE (Nov)	Nr. diff Secs as wkd	POINTS
3.5	2300	1	W1AW	589	CONN	2301	11	2	W3JNQ	589	EPA	2302	11	1	2
		2		589		2303		5	W4KFC	589	VA	2304		2	2
		3		579		2305		5	W1JYH	579	WMASS	2305		3	2
		4		359		2315			W3GYP						1
	2325	5		579		2321		2	K1APR	599	WMASS	2322			2
14	1900	6		569		1903	12	189	KH6IJ	579	HAWAII	1905	12	4	2
	1915	7		589		1906		201	WØSMV	599	S DAK	1907		5	2
3.5	2105	8		599		2107		198	W1EOB	599	WMASS	2108			2
						2120		57	W3GYP	589	EPA	2120			1
	2140	9		569		2128		307	K2DGT	579	NYC	2130		6	2

Summary: (Enter below on last sheet used)
Bands used..3.5,1.4.....; Nr. diff. stns. wkd...9.....; Nr. diff. sections wkd..6....
Total Hours operation..1:15..; Input power.....watts; Type transmitter (tube line-up if home-built).....; Receiver.....
Antennas.....
Assisting person(s) name(s) or call(s) etc.:.....
.....
SCORING: ..18... points X ..6.. Sections X 1.25 Pwr Mult.* = ..135..... CLAIMED SCORE
*Power multiplier: C.W. -- 1.25 for 150 watts or less input at all times. *Phone -- 1.5 for 150 watts or less at all times. Otherwise the multiplier is 1.0.

Participating for club award in the.....(name of club)

I have observed all competition rules as well as all regulations established for amateur radio in my country. My report is correct and true to the best of my knowledge.

.....
Signature Address

The S Meter — False Idol

BY EDWARD P. TILTON,* WIHDQ

FEELING that on-the-air results are the only true indication of the merit of new antenna ideas, the writer frequently enlists the aid of other amateurs in antenna evaluation. This cooperation is always available, and we are eternally grateful for it, but whenever this kind of work is undertaken, the disparity in signal-reporting methods among hams is brought home with full force. Most reports vary so widely that no quantitative data can be obtained from them, and they serve only to show in a general way how the antennas being tested behave in transmitting. How much difference there is between the antennas under test you could never guess by the figures taken from that magic device of the modern communications receiver, the so-called S meter.

That S meters vary is not surprising when we consider all the factors that affect their accuracy, even on receivers of the same make and model, let alone receivers of all makes and models. What is surprising, and to some extent distressing, is the blind faith most hams place in their S meters. After all, Joe Ham thinks, he paid several hundred dollars for the impressive box on the operating table — if he can't trust the manufacturer of a high-quality receiver, what *can* a man believe in? If he is one of those rare amateurs who reads his instruction book, he won't often find much help there. The book may ignore the S-meter entirely, or state that the meter is set up so that a 50-microvolt signal reads S9, and that each S unit represents a 6-db. change in signal level. But are these things true? A check of a few receivers will show that you can't rely on them.

What is an S Unit?

We had trouble with signal reporting long before S meters were invented. We won't go into the many psychological aspects of this problem, including the desire for a QSL from the station being worked, but will consider only the practical business of reporting signals as they really are for the fellow who presumably wants to know the truth. For him the S meter can be very helpful, if he understands its limitations — but how many hams do?

Even if the meter on a communications receiver worked the way the maker intended, there could be plenty of confusion, for nobody has ever come up with an entirely satisfactory method of reporting signals, let alone measuring them. Suppose 50 microvolts *is* S9, what is S7, S3, or S1? If we step down at the rate of 6 db. per S unit, reading in microvolts, S8 is 25, S7 12.5, S6 6.25, and so on down to S1 at 0.2 microvolts. This looks nice until you realize that, in v.h.f. work at least, a lot of amateur communication is done with signals well below this level. What are you going to call them, "db. below S1?" This same scale is out of step with reality in the opposite direction on the 75-meter band, where the noise level may be a lot higher than 0.2 microvolt. When was the last time you heard a 75-meter a.m. report that was not in "db. above S9?"

Starting from the noise level and working up may make more sense, though you run into trouble deciding what S1 is going to be. For the higher bands, a good starting point may be 0.1 microvolt. S2 is then 0.2, S3 is 0.4, and so on up to 12.8-microvolt S9. This would be quite a satisfactory scale, on the whole, if the receiver sensitivity and gain could be held the same across the entire range. This is no mean accomplishment, and few receivers make it. A 75A-4 in the ARRL Lab has almost precisely this scale, and the level holds within about plus-or-minus 1½ db. from 10 through 80. This is not to say that other 75A-4s do likewise; we only know that this one does. The A-4 instruction book doesn't mention the S meter, so there is no way of knowing whether this nice scale is accidental or intended.

A 75A-2 showed S1 to vary from 0.8 to 2.5 microvolts, depending on the band. S1 to S2 was a jump of 3 db., S2 to S3 was 2 db., S3 to S4 3 db., S4 to S5 2 db., 5 to 6 2½ db., 6 to 7 2½, 7 to 8 3, 8 to 9 2½. "20 db. over S9" was actu-

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

ally only 9 db. over. "40 over" was 18 db. over, and "60 over" was actually 30 db. over. "S9" averaged 11 microvolts across the 6 bands covered. You can get some nice antenna gain figures using a scale like that! Yet this is probably closer to reality than many receiver meters are — even some of them brand-new. When receivers of the less-expensive variety are as old as that 75A-2, it is anybody's guess as to what the S units and decibels imprinted on their meter faces really mean.

It is easier to achieve some semblance of S-meter reason in receivers of the amateur-bandspread type than in the two-dial general-coverage jobs. The latter must tune from the low end of the broadcast band through 30 Mc., and it is all but impossible to keep gain and sensitivity uniform over such a tremendous frequency range. One medium-priced general coverage receiver had a fairly satisfactory S-meter scale — if the control in the meter circuit was reset for each band. Another, still smelling of the factory, went to S9 on the 80-meter band with 1.2 microvolts input. S1 was 0.1 microvolt, and the S units along the way averaged around 3 db. each. But on 40, the meter read S1 with 1.8 microvolts, and on 28 Mc., the meter didn't start to move until a 5-microvolt signal was fed into the receiver. Thus, "S1" on 28 Mc. was actually 50 times the signal strength that it was on 3.5 Mc. And "60 db. over S9" on 75 meters was only a 50-microvolt signal! No wonder some of those 75-meter fellows think they're getting out well!

But it is on the v.h.f. bands that the db.-over-S9 craze reaches its ultimate. In one antenna project the writer used a Communicator III, with its meter calibrated against a good signal generator in the lab. Readings taken early in the project appeared inconsistent with the expected performance of the antennas, so we looked into the matter and found that the Communicator meter told a wholly different story when the unit was operated from a car battery than when it was run from the a.c. line. This was the result of the voltage delivered by the power supply being considerably lower on battery power, causing circuits to overload more readily in battery service and making the upper portion of the meter scale almost meaningless.

It is apparent to anyone who operates on bands where new hams appear in considerable numbers that the newcomer always tends to pick up bad habits of his associates, so these habits become standard practice in operating. This is certainly true of S-meter worship among v.h.f. men. If you take the trouble to ask, you will often find that the fellow who just gave you a "30 db. over S9" report is using a Communicator I or II — the original "green-eyed monster" of the 2-meter band. If he gives you less than "10 db. over S9" you *know* you're in trouble. Or he may have a III, which has a meter. How does he know what S9 is, and what does his report in "db. over S9" mean? Gonset didn't tell him. Here is what the manufacturer says: "On reception the tuning meter serves as a *relative* (italics are theirs!) carrier strength indicator. Note that the meter is not intended to read actual S units."

Two fellows using Communicator IIIs gave the writer reports in "db. over S9." One added, "And I think that's a fairly accurate report." Yet the spread of 16 db. he reported was actually less than 8. Where did his "decibels" come from? Probably from comparison of his Communicator meter with readings taken from some communications receiver that had an "S meter," if they were anything but pure imagination! Who are we trying to fool?

Giving Sensible Reports

Enough indictments — what do we do about it? S meters are here to stay, and they are mighty useful operating aids, if we use them with discretion. Calibration of your signal-indicating device, whether it be a meter, a green eye, or just your own ears, is not a difficult matter. If you have access to a signal generator with a calibrated attenuator that can be relied on, the task is easy. You measure the signal input required to just move the meter, start to close the eye, or the level that you can just begin to hear This is S1. Then you turn up the attenuator and note the reading in microvolts for each mark on the meter, or each step in level that sounds like an S unit to your ear. Do this with the receiver a.v.c. off if you're calibrating your ears. S9 in the ear case should be the point where the signal really is strong — where there is little, if any, receiver noise left.

No signal generator? You can still make a reasonable calibration without too much trouble. Some fellow you work on the air is sure to have a power-output indicating device (Micromatch, wattmeter, or whatever). Get him to decrease his output power by one half while you watch your meter. That's 3 db., or half an S unit. Now have him move his beam away until his signal with full power is reading what it did before with half power, and have him make the half-power cut again. Repeat this process until you have a calibration across your meter scale, green eye, or ear range. You can then forget S units, and give meaningful reports in terms of decibels above the noise level, regardless of the indicator used. Your memory won't work too well as to how S3 sounded, but you will have learned something practical about decibels, if not about S units, in the process. And while we're mentioning decibels, it might be well to check up on what a decibel really is. Webster tells you. So does the ARRL *Handbook*. The latter has a whole page on the subject. Better read it.

Measuring Signal Strength at Audio

If you want to make a gadget for estimating signal levels by audio methods, here is a not-exactly-new idea from the Hints & Kinks section of *QST* for March, 1937, with quotations from the original text:

"A person trained to do so can differentiate between five values of audio signal strength:

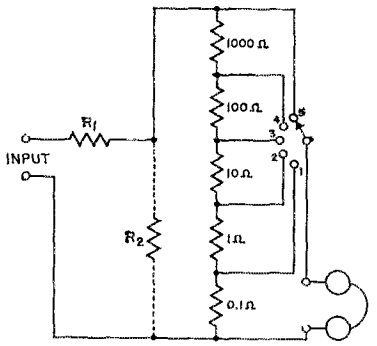


Fig. 1—Schematic diagram of a step-attenuator for use in estimating the strength of signals by audio level.

R_1—Value to match output tube; 5000 ohms satisfactory in most cases.

R_2—Shunting resistor to be used only when volume is too great without it; 10 to 500 ohms, as required.

S_1—5-position wafer switch.

very strong, strong, medium, weak and very weak. But the majority of us do well to distinguish between strong and weak by ear alone, at least from memory. The audiometer of Fig. 1 may be of interest to amateurs who want to give signal reports as correctly as possible . . . using the audio output of the receiver. The device plugs into the phone jack of the receiver, and it should, of course, be used with the receiver a.v.c. off.

"The audiometer has 5 steps. A low-inductance switch and dependable fixed resistors should be used. A 0.1-ohm resistor can be made by winding 18 inches of No. 28 wire on a dowel or resistor. The optional resistor, R_2, may be used with higher volume. It will be noted that each step increases the resistance across the phones (and therefore the voltage) by approximately 10 to 1, or 20 db.

"In practice a signal is tuned in with the switch on tap 5, where it will be loudest. Then the switch is moved down the scale, putting progressively smaller resistances across the phones, until the signal can barely be heard. If the signal is heard weakly on 3 and goes out on 2, we rate the signal 3 on a 1-to-5 scale. Of course, the figures mean nothing in themselves; they simply indicate relative strength."

They indicate something else, too, we hasten to add: that a 9-S-unit scale is slightly ridiculous, and the old S1 to S5 scale used back in the '30s had a lot to recommend it! 5 was loud and 1 was weak, and even 3 more steps in between were hard enough to interpret with sense. They still are, yet now we have 9 steps, plus those ever-growing "db. over S9!"

Using Converters

Using S meters is a cockeyed business with a communications receiver alone, but it gets worse when converters or preamplifiers are used ahead of the receiver. All is not lost for the v.h.f. man, however — there are ways to make sense with a converter-receiver combination. The signal coming from a converter is almost the same thing as one coming in on the antenna at 14 Mc., or 7 Mc., or whatever frequency you use for tuning when your receiver is operated with a v.h.f. converter ahead of it. So, if you control the level of the converter output the S meter will work just the same as it does on the band used for the i.f.

Some receiver S-meter circuits have enough range so that you can turn down the receiver S-meter control to make the noise with a v.h.f. converter in use read zero on the meter, or perhaps S1, which is realistic enough. This may change the db.-per-S-unit calibration of the meter, in which case you go through the calibration process outlined earlier, with your converter attached.

If the S-meter control won't handle the signal from the converter, you can cut down the latter in any of several ways. Altering the level of signal after it leaves the converter mixer has no effect on the receiving system's sensitivity, and it will keep S-meter readings within reason. One good way to do this is with a gain-control i.f. stage. We used to put these in nearly all our *Handbook* and *QST* v.h.f. converters, but so many hams protested this extra complication that we finally began leaving them out — against our better judgment. You'll find information on gain-control stages in any *Handbook* of 1957 or earlier.

You can also insert resistance across the line to the receiver input, to cut down the signal to the desired level. This should be done inside the converter or receiver, as external connections may allow pickup of signals at the intermediate frequency. If the receiver has an antenna trimmer, detuning it may knock the gain of the system down to a point where S-meter readings begin to be reasonable. On the 75A-4 mentioned earlier, a 10-ohm resistor across the coax between the converter and receiver brought meter readings into line with what they were on 14 Mc., which is just about right. Don't worry about what this does to system performance — the sensitivity and signal-to-noise ratio of any receiving system worth its salt is set by the first stages of the converter, and nothing later in the receiver affects anything except gain and selectivity. In the case of the latter quality, some broadening of response at the converter output frequency is usually helpful, rather than otherwise.

If you're too lazy to do any of these things, you have one obligation to your fellow amateur. When you give a signal report, tell how you arrived at it. If it is a reading from the S meter, tell him so, and if you have not calibrated the meter recently, tell him that, too. If it's from a "green eye," don't hide behind some imaginary db.-over-S9 gobbledygook of your own invention. Tell him it's from a green eye, and tell him how much the eye closes. And if it's by ear alone, don't be afraid to say so. Ears were in business a long time before S meters, and with the current abuse of the latter the ear has a lot to recommend it!

QST

Space Communication and the Amateur

Noise Sources and the All-Important Signal-to-Noise Ratio

BY RAPHAEL SOIFER,* K2QBW

What are the technical factors that must be weighed in assessing the practicality of ground-to-ground amateur communication via space vehicles? In this article the author shows that the problem is one of establishing a usable signal-to-noise ratio, and discusses the various components that contribute to the noise background. Signal propagation and the important influence of equipment, including the communications satellite itself, will be covered subsequently.

AMATEUR radio stands today just over the threshold of a new era. The year 1960 saw the first concrete steps taken in the effort to provide the amateur with a place in the rapidly unfolding world of space communications. Thus our position today is akin to that of 1922, when *QST* trotted out its famous exclamation points to announce that the Second Transatlantics had succeeded — that, for the first time in amateur history, American amateur signals were heard across the Atlantic. This discovery that wavelengths below 200 meters could actually be used for long-distance work led, in the following year, to the first transatlantic two-way. Where the story led from there does not require my further elaboration.[1]

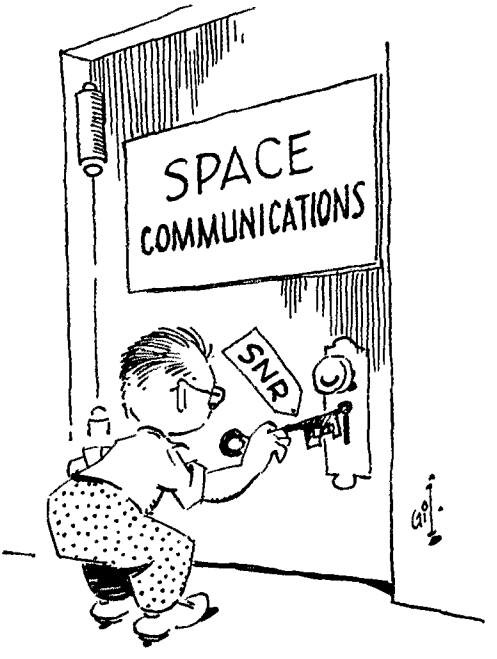
It will be the purpose of this series of articles to discuss realistically the problems which space communication poses for the amateur fraternity, and to suggest some possible directions of attack on the solutions to these problems. It will become apparent — if it is not already — that we are dealing largely with questions, unknowns, and challenges where we have been accustomed to laws, figures, and circuits. Supplying answers to these challenges, I hasten to add, has been the amateur's role throughout his history. I am confident that, just as his father conquered the mysteries of short-wave radio forty years before, the radio amateur of the 1960s and '70s will conquer space.

The Problem

The entire problem of space communication can be expressed in four words: signal-to-noise ratio. This s.n.r., as it is called, is usually expressed in decibels. We will define it as the ratio, measured at the receiver, between the received power of the desired signal and the total measured noise power, both received noise and that generated in the receiver itself. The s.n.r. is the key to the entire problem. All the other so-called "obstacles" to practical space communication — tracking, antenna size, transmitter power, low-noise receivers, satellite size, and the rest — are merely manifestations of the basic question of obtaining a sufficient s.n.r.

This ratio does not care how it is obtained. If technical or legal considerations limit the signal power, a suitable reduction in noise will suffice to produce the required s.n.r., and the system will work just as effectively. More generally, a deficiency in one part of the system can be made up in another part without affecting the s.n.r. and, through it, the performance of the system. It cannot be over-emphasized that only the signal-to-noise *ratio* is important — not signal power or noise by themselves.

The s.n.r. controls not only whether or not a system will work, but also how well, how efficiently, and how reliably. If the s.n.r. is more than a few db. below unity, no operator in ex-



*3 Ames St., M.I.T., Cambridge 39, Mass.

[1] Except possibly to point out that one of the operators at the M. I. T. ham station, 1XM, during the Second Transatlantics was a young electrical-engineering student named J. A. Stratton who, 38 years after 1XM's success in the tests, was formally inaugurated as president of this same Massachusetts Institute of Technology.

istence will be able to copy the transmitted signals.[2] The communications system will, in short, be a failure. Values from essentially unity up to 6 db. or so may be termed marginal. In the range around unity, a highly skilled operator may be able to copy short snatches of c.w. As the s.n.r. goes up, copy becomes less and less difficult, becoming fairly normal at 10 db. or thereabouts. Voice work requires a higher s.n.r. Values from 6 to 10 db. may here be termed marginal, the same conditions applying as for c.w. — except, of course, for the higher s.n.r. requirement. Copy becomes normal on voice at values greater than 10 or 12 db. The higher the s.n.r., in general, the more sophisticated the method of communication that may be used. For s.n.r. values greater than 17 or 20 db., slow-scan television becomes practical. At higher values, multiplex techniques become feasible, as well as improved performance when using the modes discussed heretofore.

Unfortunately, values of received signal and noise generally do not remain constant with time. Because of their variation from season to season, day to day, and minute to minute, systems must generally be designed to have a higher s.n.r. than would ordinarily be needed. This provides margin in case of bad conditions — in a word, reliability. The greater the percentage of reliability desired, the greater margin must be provided in the form of increased s.n.r. in the system design.

In considering the various elements which contribute to this all-important ratio, we will consider first the noise components — bearing in mind, of course, that noise does not tell the whole story, that only when combined with signal strength in the form of the s.n.r. is it actually significant.

Sources of Noise

The noise heard at the output of the receiver is made up of several components, chiefly cosmic noise, tropospheric noise, apparatus noise, and man-made noise. Beneficially, the stronger component will tend to screen the weaker one from being noticed, a condition which stems from the fact that most noise is made up of nonperiodic waveforms. Thus, one often can concern himself only with the strongest noise component in a given situation and neglect the others. This nonperiodic property also means, unfortunately, that noise cannot be phased out, as can sinusoidal waveforms. We will consider each noise component in the order given above.

Cosmic Noise. This is noise that reaches our planet from other regions of the universe. It is generated, among other sources, in interstellar gas clouds. Cosmic noise is of principal concern between 20 Mc. and 1000 Mc., and decreases logarithmically with increasing frequency. Being a close approximation to "white" noise — i.e., noise made up of random pulses distributed throughout the frequency spectrum — there is little that can be done to counteract it.[3]

[2] By means of specially designed pulse trains, transmitted information has been detected with the s.n.r. as low as −30 db. We will return to this topic later in the discussion.

It does, however, have one interesting property: It is not received with equal strength from all directions. It can be reduced, then, by aiming antennas in minimum-noise directions. Other considerations obviously make this method one of limited usefulness.

Interestingly enough, it was precisely this directional property that led early investigators, Karl Jansky and Grote Reber, to discover the true origin of this noise form, leading eventually to the identification of the most powerful radio stars. Thus was founded the important science of radio astronomy.[4]

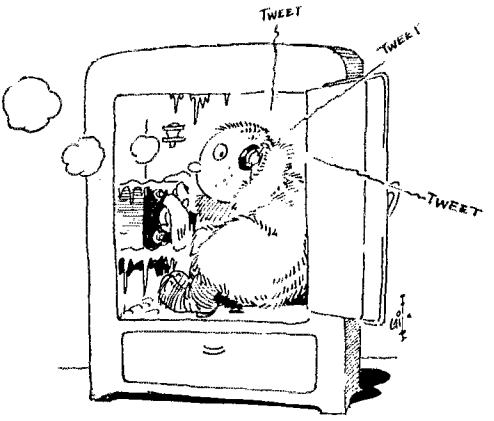
Tropospheric Noise. This is the familiar "static" heard on lower frequencies near thunderstorms. As its name implies, it is generated by weather phenomena in the lower atmosphere and is by far the most significant natural noise source on frequencies below 20 Mc. It drops off sharply with frequency, and above 30 Mc. it may be ignored. Except for clipping to eliminate the sharper peaks, little can be done to alleviate it in the frequency range in which it is found.

Apparatus Noise. Though some noise is generated in transmitters, the most important components of apparatus noise are produced in the receiving antenna, transmission line, and receiver front end. This noise is largely thermal in origin, and results from random movement of molecules. Because of this randomness it is an excellent approximation to white noise. The noise power is proportional to absolute temperature and receiver bandwidth, a relationship usually expressed algebraically as kTB (k is a proportionality factor, Boltzmann's constant). Its actual intensity obviously depends on the equipment in use.

Apparatus noise becomes important at frequencies above 30 Mc., and its stature as a problem increases approximately logarithmically with frequency. It can be greatly minimized by using specially-designed antennas with a low equivalent noise temperature, and by using low-noise amplification devices in the front end of the receiver. The question of r.f. amplifier noise figure is well known to most amateurs and need not be gone into here, except to state that this is one area in which a great deal of development work has been done and is still going on. At frequencies where apparatus noise can predominate, the best of the low-noise triodes have today been superseded by such devices as parametric amplifiers. Another branch of development has sought to reduce amplifier noise by reducing the temperature at which the amplification is conducted (remember the T in kTB!) and in amplifying by means of solid-state devices which offer high transconductance with a minimum of random molecular movement. Such development led to the ruby maser which operates near absolute zero and which contributed largely to the success of Project Echo.

[3] For supplementary information on cosmic noise, see McLaughlin and Hobbs, "Noise Factors Affecting V.H.F. Communication," *QST*, June, 1961; and Bray and Kirchner, "Antenna Patterns from the Sun," *QST*, July, 1960.

[4] For background information on radio astronomy, see Goodman, "Radio Astronomy," *QST*, May, 1956.



The wise amateur will keep a wary eye on these developments, for they represent a great field for improvement of the state of the art. Incidentally, front-end noise has a tendency to mask noise originating in the later stages of the receiver, so it may not be necessary to worry much about noise considerations when designing the i.f. strip.

Man-Made Noise. This noise, emanating from electric motors, automobile ignition, switching, and similar products of our own technology, can extend throughout the radio spectrum and is in general a most serious problem wherever it is found. In fact, it will often prove a good deal stronger than all other noise types combined. Because it takes so many different forms, specific rules about it are impossible to formulate. The sharper peaks, such as those typical of ignition noise, may be clipped off or blanked out by limiters or silencers. However, there is little else that can be done at the receiver to eliminate man-made noise, aside from such obvious measures as filtering the power line.

The saving factor, however, is that man-made noise is only infrequently found in bands above 500 Mc. It's just like the plague, though — if it breaks out in your vicinity you'd better move.

Man-made noise usually will show directive properties, so the antenna can be aimed so as to minimize it. But, just as in the case of cosmic noise, this technique is of limited value. Nevertheless, use of highly directive antennas can be shown to have a beneficial effect in combating this noise, except perhaps in the larger cities.

Bandwidth

Since noise values vary a good deal from station to station, it would not be possible to present a quantitative analysis of noise level as a function of frequency which would hold for all cases.[5] Nevertheless, based upon the noise sources we have considered, we may conclude that less noise will be encountered on u.h.f. and higher frequencies than on lower bands. Thus, with a wary eye cocked on the s.n.r., we will consider these higher frequencies to be more suited to our purposes than those lower in the spectrum. Comparing this conclusion with the roster of amateur bands — and remembering that the 420-Mc. power limit robs us of 13 db. in obtainable s.n.r. — we see that the lowest useful amateur assignment in the u.h.f. range begins at 1215 Mc. Let us then adopt this value as the lower bound on what we will eventually call the optimum range for amateur space communications. We are not yet in a position to evaluate the upper bound, which will come out of the discussion of propagation and path losses in a subsequent article.

At this point it is well to recall the factor kTB we came across in discussing apparatus noise. It tells us that the greater the bandwidth, the more apparatus noise. It turns out that cosmic noise and tropospheric noise similarly increase with bandwidth. In the case of man-made noise, the relationship is not so simple because of its widely differing forms. In general, though, man-made noise does increase with bandwidth, but the increase may not be linear.

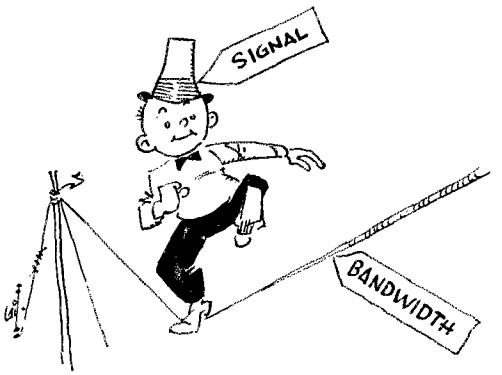
In order to minimize noise and thereby raise the s.n.r., then, one thing we can do is to reduce the bandwidth of the receiver. This can be done easily enough, and is in fact standard procedure. But useful as narrow-band systems undoubtedly are, they are not, at microwave frequencies, an unmixed blessing. For one thing, frequency stability in both the transmitter and receiver can be quite a problem in this part of the spectrum. Narrow bandwidth in the receiver means that care must be taken to insure that the signal will not drift so far that it leaves the passband. This means ultrastable oscillators and converters, and, as W1FZJ will be very happy to inform you, these can drive an engineer mad!

Additionally, systems engineers know that bandwidth serves as a limiting factor on what they term the "data rate," or the rate at which information can be sent. The faster you wish to send information, the more bandwidth your transmissions *must* consume (and the system thus must be capable of handling). In c.w., for example, the bandwidth occupied by a signal increases in direct proportion to the sending speed, and in cycles per second is approximately equal to four times the sending speed in words per minute.

The human voice is a notoriously poor user of spectrum space — most people talk at about 150 w.p.m., yet a single-sideband station uses up about 3000 cycles of space, and a d.s.b. or a.m. station about 6000. Conventional f.m. may use as much as 150 kc., conventional television four to six megacycles (slow-scan can be transmitted in an ordinary s.s.b. channel).

In considering bandwidth, we should not omit mention of pulse modulation methods. These may use many hundreds of kilocycles of bandwidth. In doing so, the pulse system puts out much more peak power in its short pulses than can a comparable c.w. system, which under some conditions may compensate in the s.n.r. for the increased bandwidth. This is, in fact, the principle behind the early radar systems of World War II, as well as some present-day radar.

[5] Specific values of noise level are too variable to be quoted here. They are treated in engineering handbooks such as *Reference Data for Radio Engineers*, Fourth Edition, published by I. T. & T. Corp., 67 Broad St., New York City.



Some engineers contend that, through the use of ingenious coding techniques far beyond the scope of this discussion, pulse emission may actually be employed to reduce the s.n.r. *requirement* for any *given* degree of reliability to levels well below those we quoted earlier. This is done, basically, by holding down the modulating data rate to what is actually needed — rather than attempting to transmit the original information, which contains many bits of superfluous data. Auxiliary circuitry at the receiver is then employed to translate the coded pulses back into aurally (or visually) useful information. While the pulsing process itself introduces a great deal of superfluous information of its own — thus increasing the bandwidth — the coding process circumvents this difficulty by making it unnecessary for all the transmitted data to get through. Hence the *received* data rate duty cycle, and with it the s.n.r. requirement, may be made much smaller than would be required were all the transmitted information necessary — smaller, in fact, than if the original information with its smaller transmitted bandwidth and *continuous* reception requirement were being used.

In summary, then, an engineer — or a radio amateur — would like to design his system to handle the maximum possible bandwidth so as to minimize stability problems and increase the data rate reception capability. But such a design, we recall, must of necessity increase the noise. However, if the s.n.r. designed into the system is made high enough to absorb the additional noise and still remain above the requirement for the degree of reliability desired, then the bandwidth increase may be made. Thus we see that the s.n.r. determines the maximum bandwidth which a circuit can handle for any desired degree of reliability. That is, stability requirements and data rate reception capability may be considered simply as manifestations of the s.n.r. Our old friend has returned, and will keep popping up throughout our discussion. QST

Strays

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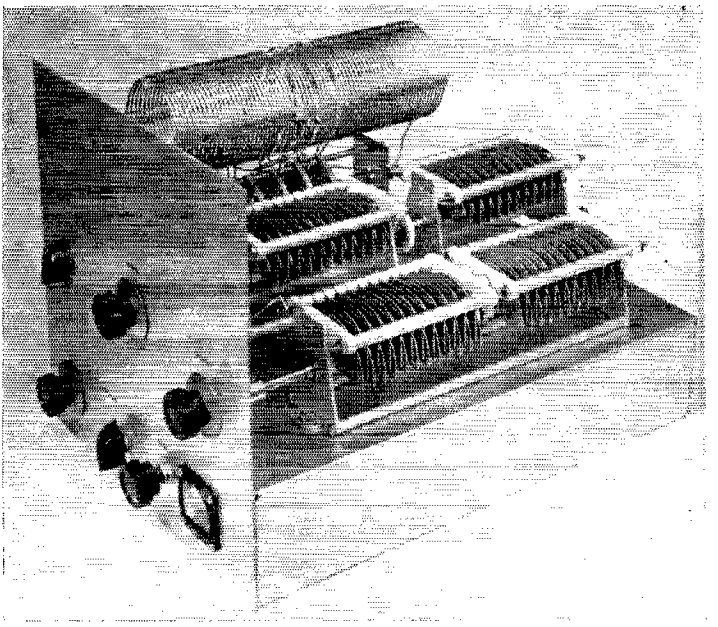
Lloyd Reed, WØBBY, is all set for emergency operation. Mounted on the front of the ½-ton Ford panel truck is a 1500-watt a.c. generator, which supplies the necessary power for the equipment inside the body of the truck. This inside gear includes a Viking Ranger, a surplus Navy RCH receiver, a 60-watt amplifier for the p.a. system, a battery charger, and monitor receivers for Minnesota Highway Patrol, local sheriff, and some police frequencies. But that's not all! WØBBY also has in that truck a conelrad monitor, some battery-powered commercial rigs for various public-service frequencies, and several more pieces of surplus gear for the ham bands. Thus, this rig will work all the ham bands up to 6 meters, and now he's planning on 2 meters also, plus the addition of some RTTY gear! Since fishing is his other hobby, he plans to cut a hole in the floor of the truck, and during the ice-fishing season he can drive out on the ice, run an 8-inch stove pipe down to the ice, and fish in comfort while he hams!

Matching Network for 80 Through 10



The wide-range 500-watt transmatch. In this view of the chassis the coil and switch assembly are on the far side. In the center are C_2 and C_4, with C_3 on the near side. The controls along the bottom front, from the left, are for C_1, S_1 and R_3 in that order.

A Wide-Range Transmatch

BY LEWIS G. McCOY,* W1ICP

This matching circuit uses a capacitor divider for smooth variation of loading adjustments and for simplifying band switching. Practically any antenna system can be matched to 50- or 70-ohm transmitter output. A Monimatch is incorporated for checking the matching adjustments.

THE transmatch shown in the photographs and Fig. 1 will match your transmitter's 50- or 70-ohm output to antenna loads as low as 10 ohms and as large as 4000 ohms. To handle this wide range, the usual procedure would be to have several coils with a multiplicity of taps, leading to a very complex switching arrangement if band switching is desired. In this unit, however, there are no taps for feeder connections. The "tapping" is accomplished by a capacitor-divider system consisting of C_2, C_3 and C_4. The three variable capacitors are connected in series across L_1.

Either unbalanced or balanced feeders can be connected to the transmatch at J_3J_5 shown in Fig. 1. The load presented to the circuit at this point is easily matched to the transmitter output by adjusting C_2 and C_4 (which are ganged) along with C_3 and C_1. Adjusting three controls to arrive at a match may sound like quite a chore, but actually is very simple, as will be explained later.

Another feature of this unit is the use of a single length of coil stock for both the primary and secondary. This practically eliminates the problem of exact duplication. Note that the link, L_2L_3, is actually two coils. For 80 and 40 meters, the two coils are connected in series to provide an 8-turn link. On 20, 15 and 10 the coils are connected in parallel, resulting in the equivalent of a 2-turn link which works out just right for these bands. This scheme keeps the link at the

* Technical Assistant, *QST*.

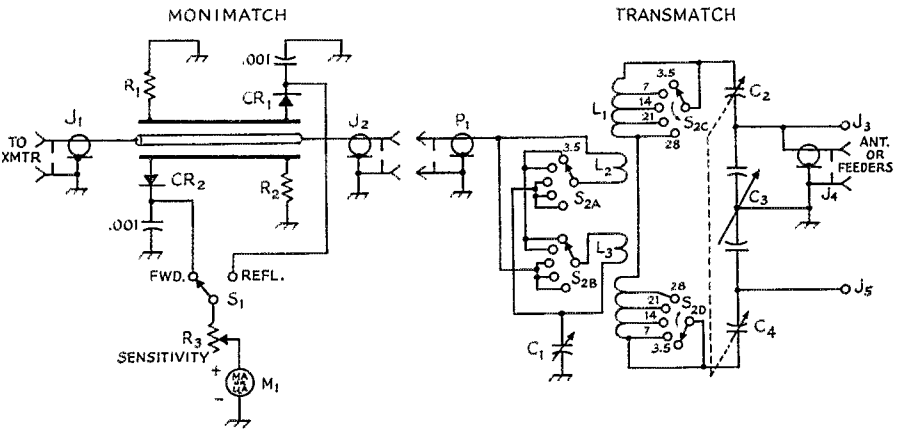


Fig. 1—Circuit diagram of the transmatch and Monimatch.

C_1—250-$\mu\mu$f. variable, 0.045-inch spacing for high power (Johnson 250E20); 0.025-inch spacing for low power (Hammarlund MC-250-M).

C_2, C_4—100-$\mu\mu$f. variable, 0.125-inch spacing for high power (Johnson 100E45); 0.025-inch spacing for low power (Hammarlund MC-100-M).

C_3—100-$\mu\mu$f.-per-section, dual variable, 0.125-inch spacing for high power (Johnson 100ED45); 0.025-inch spacing for low power (Hammarlund MCD-100-M).

CR_1, CR_2—1N34A germanium diodes.

J_1, J_2, J_4—Chassis-type coax receptacles, type SO-239.

J_3, J_5—Feed-through insulators.

L_1, L_2, L_3—See Fig. 2 and text.

M_1—0–1 ma. or less; see text.

P_1—Coax plug, type PL-259.

R_1, R_2—For 50-ohm bridge, 150 ohms, ½-watt composition; for 70-ohm bridge, 100 ohms, ½-watt composition.

R_3—20,000-ohm control, linear taper.

S_1—Rotary, 1 pole, 2 positions (Centralab type 1460).

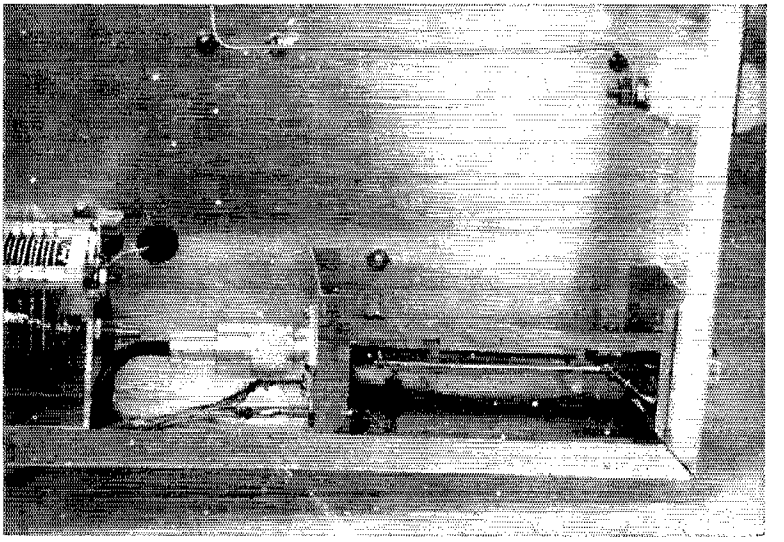
S_2—Ceramic rotary, 4 poles, 5 positions, 1 pole per section, 4 sections (Centralab index type P-122 with type "T" or "X" sections).

exact center of the coil on all bands, thus maintaining symmetrical coupling to the secondary windings.

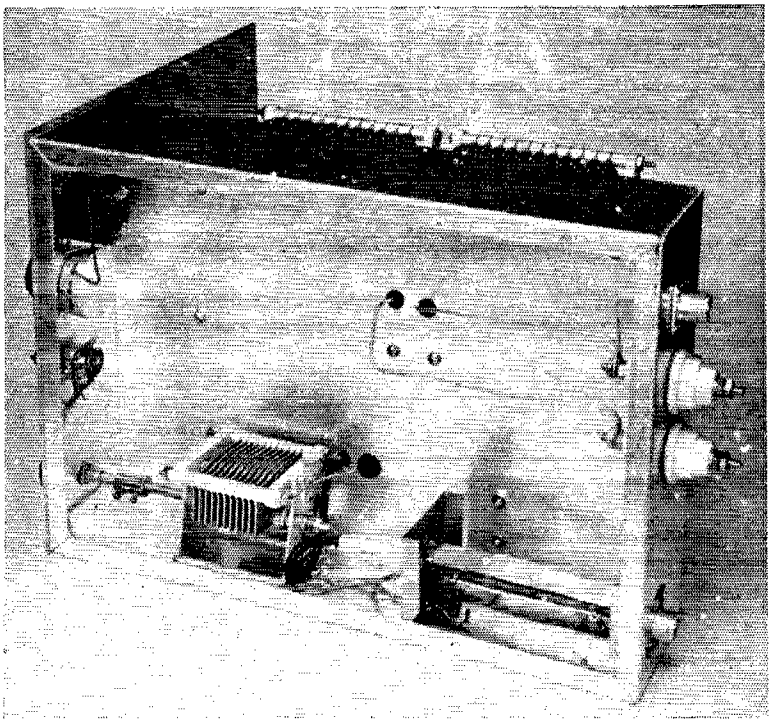
A Monimatch is included as a matching indicator. Some type of bridge is required to show when the unit is correctly adjusted. If you already happen to own a Monimatch or similar device, this part of Fig. 1 can be eliminated.

As designed and shown, this unit will handle about 500 watts on c.w. or s.s.b. and about half that power on a.m. phone. Of course, the Novice can only run 75 watts input, but most of the gang seem to want more power when they get their "Generals," so this unit was constructed with that thought in mind. However, some examples of capacitors for the 50- to 100-watt level are given in Fig. 1. The coil remains the same for either power — it's simple that way and there isn't enough difference in coil cost to warrant using a different coil.

Speaking of cost, the capacitors for the 500-watt unit are not cheap. However, there should be



Close-up view of the Monimatch. The pickup wires are held in place by the insulating spacers.



This bottom view shows the arrangement of parts below deck. The link capacitor, C_1, is mounted on the chassis side. In the lower foreground is the Monimatch unit.

plenty of capacitors to be found in junk boxes, and so if you don't have any around your own shack, see what the neighboring hams have. There is nothing sacred about the 100-$\mu\mu$f. maximum capacitance values given for C_2, C_3 and C_4. If you can find some that run higher than this, don't be afraid to use them. You should still come up with a workable transmatch. Don't use smaller values, though, as less capacitance will limit the range over which you can match.

Construction Details

The complete transmatch, including the Monimatch, is built on a 3 × 10 × 14-inch aluminum chassis. The front panel is made from a 10 × 10-inch piece of aluminum sheet stock. A study of the top-view photograph will show you the layout. C_3 is mounted directly on the chassis top along one side. Between C_3 and the coil and switch assembly are C_2 and C_4. These two capacitors are ganged with an insulated shaft coupling. In addition, they must be insulated from the chassis and the panel. Four one-inch steatite standoff insulators are used to hold the capacitors off the chassis. The two output leads that go to J_3 and J_5 are taken off the rotor mounting points between the two capacitors. These leads run down below chassis to the connectors through two rubber grommets.

Fig. 2 shows how to make L_1, L_2, and L_3. Cut a total of 66 turns from a length of coil stock, making sure to leave enough lead length at each end of the coil for connections to the switch. At 28½ turns from each end of the coil cut the wire and unwind ½ turn from the support bars. This will give you two coils of 28 turns and another of 9 turns. Cut the 9-turn coil at the center and unwind the ½-turn, leaving two coils of 4 turns each. The two 28-turn coils are connected at the center by soldering the two center leads together.

The coil assembly is supported by its own leads and is mounted over S_2. The switch assembly S_2 is made from a Centralab P-122 index and four steatite single-pole, five-position switch sections. Either type T or X is suitable. Two switch mounting brackets are used to support the switch assembly.

A word of explanation for those readers who

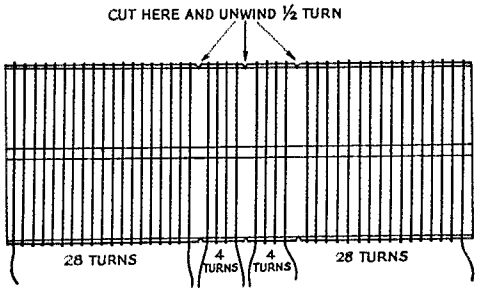


Fig. 2—This drawing shows how to make the coil assembly. Not shown are the taps needed for changing bands. The tap points listed below all are counted from the outside ends of the coil.

7 Mc.—12 turns.
14 Mc.—23 turns.
21 Mc.—25 turns.
28 Mc.—26 turns.

The coil stock is 3 inches in diam., No. 14, 8 turns per inch (Illumitronic Air Dux 2408T).

are not familiar with the Monimatch: This unit is an s.w.r. bridge designed to "sample" both the forward and reflected powers. This power is converted from r.f. to d.c. by CR_1 and CR_2, and the d.c. is read on the meter, M_1. When the meter reads full scale in the forward position, a zero reading in the reflected position indicates that the transmatch is correctly adjusted.

The Monimatch is mounted in a $2\frac{1}{4} \times 2\frac{1}{4} \times 5$-inch aluminum box (Bud Minibox CU-3004A). Chassis-type coax fittings (SO-239) are mounted in the center of each end of the box. A piece of $\frac{1}{4}$-inch o.d. copper tubing, $4\frac{5}{8}$ inches long, is connected between the two inner pins of the coax fittings. The two pickup leads for the bridge are $3\frac{3}{8}$ inches long and made from No. 14 solid wire. They are held in the proper position by two insulating spacers. Details of the spacers are shown in Fig. 3. The spacers can be made from polystyrene or bakelite.

Two flat strips of copper, $\frac{5}{8}$ inch wide by $4\frac{7}{8}$ inches long, are installed as shown in the photograph. The method of mounting the strips is quite simple. Solder a lug to each end of each strip, allowing the end of the lug with the screw hole to project beyond the edge. Bend this part of the lug up at right angles to the strip. The strips are then mounted by using the top and bottom screws and nuts of the coax fittings to hold them in place.

When soldering the germanium diodes to the pickup wires, hold the lead of the diode with a pair of pliers between the point of soldering and the body of the diode. This will keep excess heat from reaching the diode and ruining it.

For a 50-ohm bridge R_1 and R_2 should be 150-ohm, $\frac{1}{2}$-watt resistors. For a 70-ohm bridge use 100 ohms, $\frac{1}{2}$ watt. It is very important that the resistors used be composition or carbon, *not wire-wound*.

The leads to S_1 are brought out of the Monimatch box through two feed-through insulators and run from there to the switch in shielded wire. M_1 as shown is a 500-μa. meter, but any microammeter, or even a 0–1 milliammeter, can be used.

Adjustment Procedure

The transmatch can be used with practically any antenna system. With balanced feed, the feeders should be connected to terminals J_3 and J_5. A coax line from the antenna should be connected to J_4. For single-wire feed, such as a long wire or random-length wire fed at the end, the feeder should be connected either to J_3 or J_5 and the transmatch chassis grounded to an earth ground.

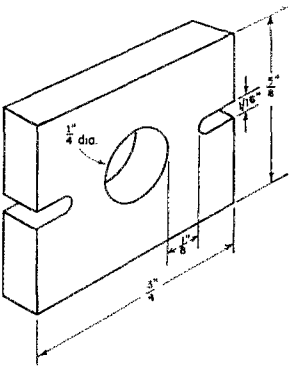


Fig. 3—Dimensions of the insulating spacers used to hold the pickup wires in place in the Monimatch.

Connect a length of coax between the transmitter and the transmatch, using either 50- or 70-ohm coax, depending on which value you built the Monimatch to handle. Feed some power through the system and set S_1 to read forward power. Adjust R_3 for a full-scale meter deflection. Next, set S_1 to read reflected power and tune C_1 and C_2C_4 for minimum reading. You may not be able to get the reading down to zero (that's what you're shooting for), so try a different setting of C_3 and again adjust the other two controls. Once you get the zero reading the transmatch is correctly adjusted for that particular frequency. Make a note of the settings and then proceed to the next band. If you keep an accurate record of all control settings it will be a simple matter to change bands quickly.

If you should encounter an antenna system that cannot be matched, although this is unlikely, the simplest thing to do is to increase or decrease the length of the feeders. A little experimentation will quickly set you up with a "matched" condition. QST

Strays

During the course of Ohio Radio Amateur Week K8JLK set his rig up in a spare office at the Warren (Ohio) *Tribune Chronicle*. Above, K8JLK works W4TIS at Ft. Benning, enabling a soldier's wife there to talk with a former coworker (standing) and her mother. (*Tribune* photo)

• Technical Correspondence

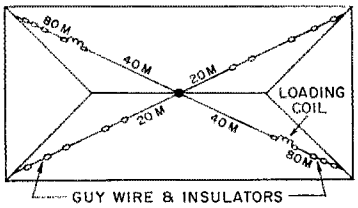
MULTIBAND ANTENNA

435 Giannini Drive
Santa Clara, Calif.

Technical Editor, *QST*:

I became interested in amateur radio some months ago and obtained my Novice license. The first copy of *QST* I purchased (April 1961) I found to be most valuable. I constructed an antenna based on the article "Multiband Antennas Using Loading Coils," by W. J. Lattin, and am writing this letter to tell you what excellent results I had.

Since I have a small lot it is impossible to put up a full length doublet antenna for 80 meters. By using loading coils I was able to put up a complete 20–40–80 antenna on my roof top. My antenna is an inverted "V" requiring only one pole. I mounted a thirty-foot pole in the center of the roof and ran the antenna wires diagonally to each corner. The antennas also acted as guys to secure the pole as shown in Fig. 1.



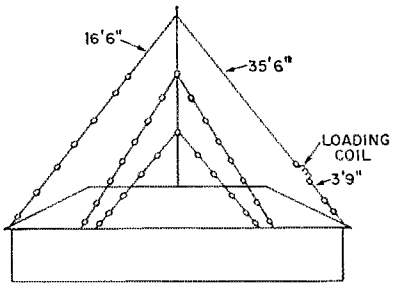


Fig. 1—Multiband antenna using loading coils à la W4JRW for 80–40 meters, for roof-top construction. A 20-meter dipole is added as another leg of an "X." The support is 30 feet high, with additional guying at intermediate points as shown.

A phenolic block was mounted on top of the pole with four closed hook eyes to which the antenna was connected. The antenna was center fed with RG-8/U coax secured to the center of the phenolic block.

The coils were close-wound with No. 18 Nyclad wire on ⅞-inch-diameter phenolic rods, 14 inches long. A winding length of 12 inches was used. These coils measured 120 microhenries.

The antenna was tested and adjusted with the help of E. R. Smith, W6WRL. The results are shown in the graph, Fig. 2. The antenna was adjusted for resonance on the 80- and 40-meter Novice bands. The 35-foot 6-inch sections of the antenna were adjusted for the 40-meter band and then the 3-foot 9-inch sections were adjusted for the 80-meter band. Resonance on 80 meters was very sharp, only 100 kc. wide. With lengths of 4 feet, resonance was at approximately 3.65 Mc. and with lengths of 3 feet 6 inches, resonance was at approximately 3.8 Mc. No adjustments were necessary for the 20-meter antenna, where 16-foot 6-inch lengths were used.

I am very grateful to W4JRW for his article in April, 1961, *QST*. Perhaps if my results were published, some other Novices would benefit by my experience with the antenna.

— *Bernard Dzambik, WV6RLZ*

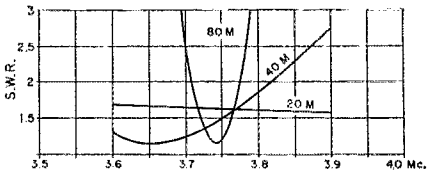


Fig. 2—Standing-wave ratio as measured with a Heathkit AM-2 s.w.r. bridge. Coax line is RG-8/U.

ANOTHER QRM-MAKER

112 W. Prospect St.
Northville, N. Y.

Technical Editor, *QST*:

Have just finished reading George Rand's FB article on mysterious QRN and it reminded me that I was going to share a like experience with the gang and had let it slip out of my mind.

Two years ago when we were living in Wilson, N. Y., we had an apartment over a public garage, so I got used to copying through all kinds of QRN. However, one day a new one came on that blocked out all the bands, so I had to do something about it. It was like a spark coil being keyed at a dot per second, and kept at it day and night. When I found that I could hear it on the car radio I started cruising around and soon determined that the noise was coming from a grocery store on the corner. Instead of barging in and doing some questioning and looking on my own, I decided to let the power company help out, as they are always glad to do. They sent their radioman to look around the store and in a few minutes he spotted the culprit. It turned out to be one of these counter displays that has a swinging arm and is kept moving by a flashlight cell and coil. Every time the contact was made and broken it gave a big kick of r.f.

The grocer was very happy to shut the thing off, as it was bothering his broadcast reception. He hadn't suspected this gadget at all.

— *Lt. Comdr. W. B. Russell, USNR (R), W2OE*

SHIELDING AND FILTERING

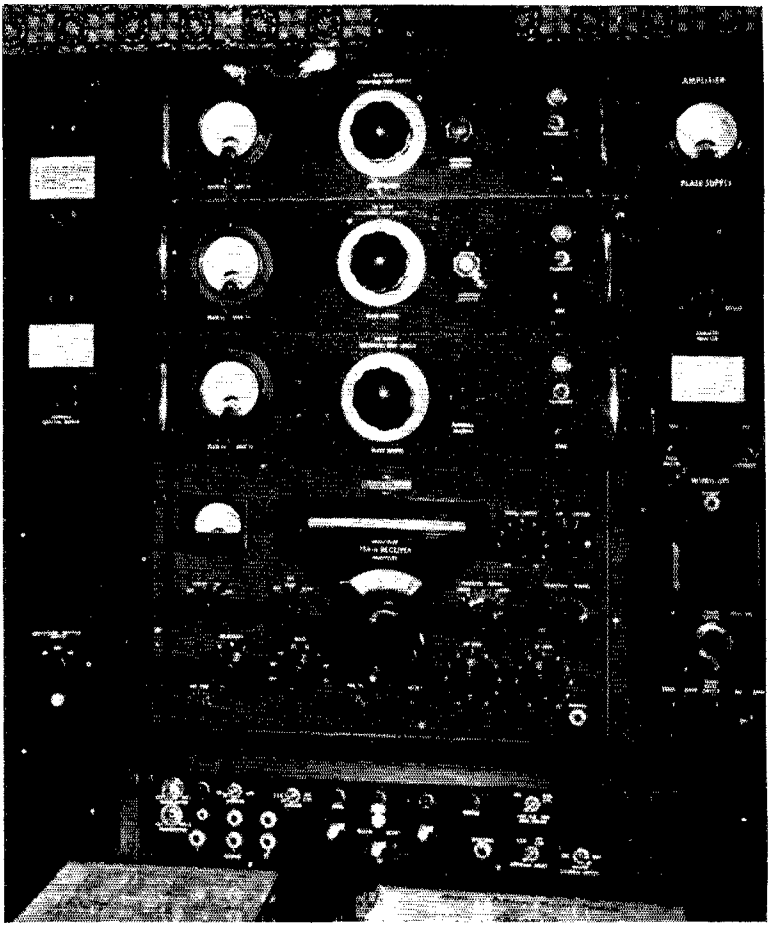
235 South Irving St.
Ridgewood, N. J.

Technical Editor, *QST*:

With the advent of television, the amateur was forced to "rediscover" the principles of shielding and filtering to prevent the radiation of unwanted signals from his transmitter. Although these principles were well known prior to 1950, it was quite a revelation to me to learn that shielding and filtering were known and practiced in 1897. In the primitive days of wireless telegraphy, one major problem was to prevent the signal from the spark transmitter from injuring the receiver. The receiver, in those days, consisted of a glass tube partially filled with metal filings and equipped with electrodes at each end. The passage of r.f. through the filings caused them to cohere, thus changing the d.c. resistance and, through another circuit, producing a signal in the telegraph sounder. In order to prevent the coherer from being ruined by r.f. from the station transmitter, it was protected in ways described below. The first method is described in a patent application filed by Prof. Oliver J. Lodge in 1897; the second in an application filed by Guglielmo Marconi in 1898.

"For the purposes of protecting the coherer from undesired disturbance, therefore, I inclose it, sometimes with all coils, wires, batteries and the like connected to it, in a metallic covering or case, leaving only one or more round holes or short tubes for the collector termi-

(*Continued on page 172*)



The operating position at K9LKA showing linear amplifiers for 10, 15 and 20 meters mounted in a rack above the receiver

Single-Band Grounded-Grid Linears

Kilowatt Units for 10 Through 80 Meters

BY

LARRY KLEBER,* K9LKA

If you do all of your operating on one band, there isn't much point in building a multiband transmitter. On the other hand, if you are a band-hopper, individual finals requiring little if any adjustment when bands are changed are the ultimate in convenience. Ergo, these grounded-grid units described by K9LKA should have a universal appeal.

A GREAT many amateurs using transmitters in the 75- to 150-watt class have one favorite band. Most of these operators would like more output, but hesitate to buy or build a multiband amplifier for several reasons. Aside from the cost, it just doesn't seem sensible to use an amplifier that will operate on five bands when operation on only one is desired. Even the multiband operator will find plenty of argument in favor of the single-band unit plan. Construction is simplified, usually resulting in less-frequent need for servicing, and servicing when required is much

* 922 Whitney Blvd., Belvidere, Ill.

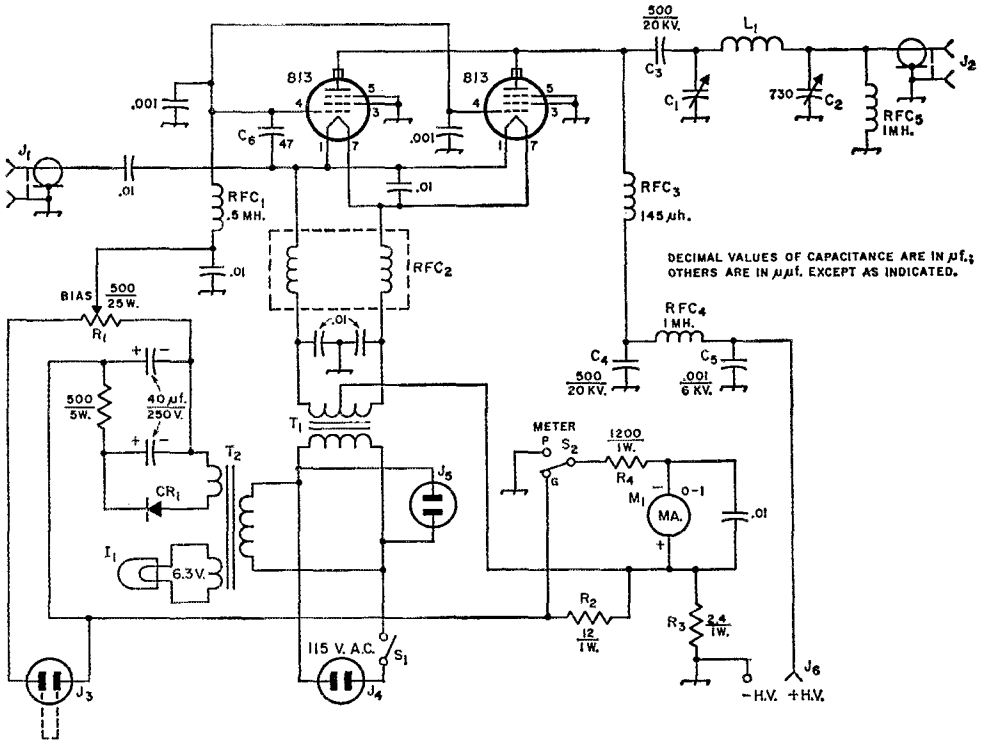


Fig. 1—Circuit used in the single-band high-power linear amplifiers. Capacitors marked with polarity are electrolytic. Resistances are in ohms and resistors are ½ watt unless indicated otherwise.

C_1—Transmitting variable, 0.075-inch minimum plate spacing; 100 μμf. for 21, 28 Mc., and 14 Mc., 150 μμf. for 7 Mc., 350 μμf. for 3.5 Mc. (Johnson, 100E30/154–14, 150E30/154–8, 350E30/-154–10, or similar, respectively).

C_2—Dual 365-μμf. variable, broadcast-replacement type, sections in parallel (may be necessary to add 330-μμf. transmitting mica capacitor in parallel for 3.5 Mc.)

C_3, C_4—Ceramic, TV doorknob type (Sprague 20DK-T5 or similar).

C_5—Disk ceramic (Centralab DD60–102 or similar).

C_6—Ceramic (used for stabilizing in 21- and 28-Mc. amplifiers).

CR_1—130-volt 75-ma. selenium rectifier (Sarkes-Tarzian type 75).

I_1—6.3-volt dial lamp.

J_1, J_2—Chassis-mounting coaxial receptacle (SO-239).

J_3—Recessed a.c. connector, male (Hart & Hegeman 80329; takes type 80325 female cable connector. Standard female outlet with male plug may also be used).

J_4—Chassis-mounting a.c. plug.

J_5—Miniature a.c. receptacle (Cinch-Jones S-302-AB or similar).

J_6—High-voltage connector (Millen 37001).

L_1—3.5 Mc.—16 turns No. 12 2½-inch diam., 6 t.p.i. (B & W 3905–1 stock).
7 Mc.—Same as above, 9 turns.
14 Mc.—10 turns ¼-inch copper tubing, 1½ inches i.d., turns spaced ⅛ inch.
21 Mc.—Same, 7 turns spaced 3/16 inch.
28 Mc.—Same, 4 turns spaced ¼ inch.

M_1—D.c. milliammeter, 3-inch.

R_1—Wire-wound control (Ohmite H-0156).

R_2, R_3, R_4—Meter multiplier resistors, wire-wound, 5 per cent.

RFC_1—0.5-mh. r.f. choke (National R-300).

RFC_2—Bifilar filament choke (B & W FC-15 or similar).

RFC_3—Plate choke (National R-175-A).

RFC_4, RFC_5—1-mh. 300-ma. r.f. choke (National R-300).

S_1—S.p.s.t. toggle switch.

S_2—S.p.d.t. slide switch.

T_1—10-volt 10-amp. filament transformer (Merit P-3146, Stancor P-6461 or similar).

T_2—Power transformer: 125 volts, r.m.s., 50 ma.; 6.3 volts, 2 amp. (Thordarson 26R38, Stancor PA-8421).

easier to handle. No single unit represents a major construction project, and bandswitching can be much less complicated.

Each of the single-band grounded-grid linears shown in the photographs uses a pair of 813s in parallel to provide a one-kilowatt power capability. The tubes, with the screens grounded, operate as high-μ triodes, thereby eliminating the need for a screen supply. Operating Class B, the efficiency of the tubes will run between 65 and 70 per cent in s.s.b. or c.w. service.

Costwise there is quite a spread. If you're willing to scrounge around, raid the junk box and do some horse trading, you can build each unit complete for less than $30. If you buy all the parts new, the cost will be approximately $60, excluding tubes.

The Circuit

The r.f. driving power is fed to the filaments of the two 813s through a 0.01-μf. ceramic capacitor, as shown in Fig. 1. The filament

All amplifier units have the same panel design. This unit is the one used for 20 meters. Tuning and loading controls are at the center. The small knob in the lower right-hand corner is for adjusting bias.

transformer is isolated from r.f. by the bifilar filament choke RFC_2.

A built-in supply delivers 0 to 37 volts of bias to the control grids of the 813s, the value being determined by the setting of R_1. With the terminals of J_3 open, the voltage rises to −168, biasing the tubes beyond cutoff, and no plate current will flow. Shorting J_3 reduces the bias to the value selected by adjustment of R_1. Leads from J_3 should be run to relay contacts, such as auxiliary contacts on an antenna relay which close while transmitting. Cutoff bias on stand-by eliminates the "hash" which often bothers reception, especially when using a t.r. switch.

High voltage is fed to the 813 plates through RFC_3 and RFC_4. A 500-$\mu\mu$f. 20-kv. doorknob capacitor, C_3, is used to isolate the high-voltage supply from the pi-network circuit. The rating of RFC_4 is only 300 ma. but, since the plate current swings up to 400 ma. only on peaks, the rating of this choke is satisfactory.

The two-section variable output capacitor C_2, with a total maximum of 730 $\mu\mu$f., eliminates the need for a tap switch and fixed capacitors. The pi-network output of these linears is designed to feed 50- to 70-ohm unbalanced loads.

To obtain separate grid- and plate-current readings, meter M_1 is switched across multiplier resistors R_2 and R_3, respectively. Since the grid circuit is returned to the center tap on the filament transformer, only plate current is read in the PLATE position of S_2.

Chassis Assembly

The panel is a standard 5¼ × 19 × ⅛-inch aluminum rack-style unit, while the chassis is made up of a pair of See-Zak[1] R45 rails (4 by 5 inches), a pair of R417 rails (4 by 17 inches), and a P517 panel (5 by 17 inches).

First, lay out the P517 panel according to the drilling template of Fig. 2. The rear-view photo will be useful as a check. After locating all holes with a prick punch, drill pilot holes at I and J with a small drill (No. 35 or 36). At this point, mark the outer or mounting side of the P517 panel with a permanent reference mark, such as a file or scribe mark, so that there will be no confusion. Next, place the P517 panel on top of the *rear* of the rack panel and, after centering it on the rack panel, clamp the two together and transfer the pilot holes at I and J. These are the shaft holes for C_1 and C_2, so they must match perfectly. Enlarge the two holes in both panels to 9/32 inch.

Drill all remaining holes whose sizes are indicated in Fig. 2. Exact sizes are not given for holes at H and K. These are for feed-through insulators and should be drilled to fit the ones you have on hand. Mount the 2-contact Jones

[1] SeeZak products are available from Radio Shack Corp., 730 Commonwealth Ave., Boston 17, Mass., Syracuse Radio Supply, Syracuse, New York, and California Electronic Supply, Los Angeles, Calif., among others.

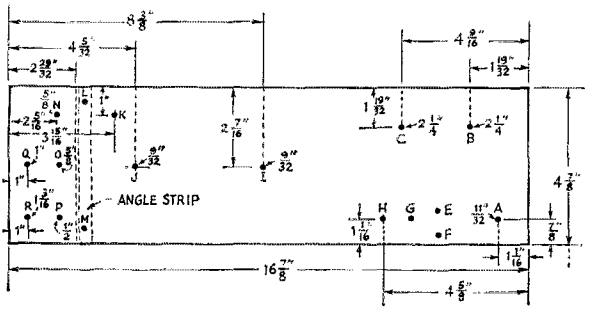


Fig. 2—Sketch showing dimensions and layout of the chassis panel. Lettered points are identified in the text.

socket J_5 (the a.c. outlet for the ventilating fan) at A.

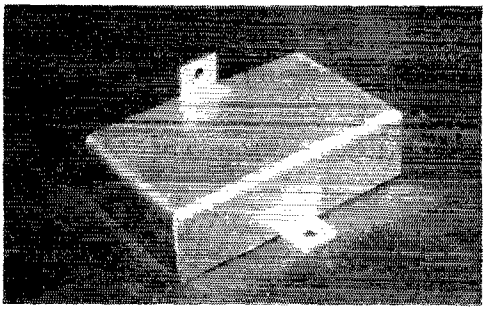
Cut a piece of ½ × ½-inch aluminum angle 17/8 inches long. Using a No. 25 drill, place a hole 5/8 inch from each end and ¼ inch from the outer edge of the angle. Transfer these holes to the chassis panel at points L and M. Submount the 813 sockets at B and C, using ½-inch spacers. This submounting helps to keep the over-all depth of the amplifier, including the shielding enclosure, to 15 inches or less so that it can be mounted in a standard rack cabinet.

Remove the short ceramic insulator from the mounting bracket of the National R-175A choke, RFC_3, and mount a 500-$\mu\mu$f. 20-kv. capacitor, C_4, in its place. Place two solder lugs on the top terminal of this capacitor, and then thread the ceramic insulator onto the capacitor stud. One of the solder lugs is connected to the h.v. feed-through insulator alongside, while the bottom lead of the choke is connected to the other lug. The 500-$\mu\mu$f. 20-kv. blocking capacitor, C_3, is mounted on the top of the short insulator of RFC_3. This conversion may be seen in the rear-view photo. Position RFC_3 on a line midway between the 813s, and close to the bottom edge of the chassis panel. Scribe points E, F and G (corresponding to the choke mounting holes) and drill with a No. 25 drill. The plate tuning capacitor C_1 mounts at I and the loading capacitor C_2 at J. Cut the shafts of both capacitors so that they extend through the *chassis* panel ½ inch.

The feed-through insulator at the top of the chassis, between the 813s (visible in the rear-view photo), was included in the original 10-meter amplifier to bring out a lead from a neutralizing coil on RFC_2. After completing the amplifier, it was found that neutralization was not required, so the insulator was not put to use.

Tap two diagonally-opposite holes in the SO-239 coax chassis connectors for ¼-inch 6-32 screws, and submount them at N (output) and O (input). The Millen high-voltage connector J_6 is mounted at P, with the male a.c. input connector J_4 at R, and the flush bias-control receptacle J_3 at Q.

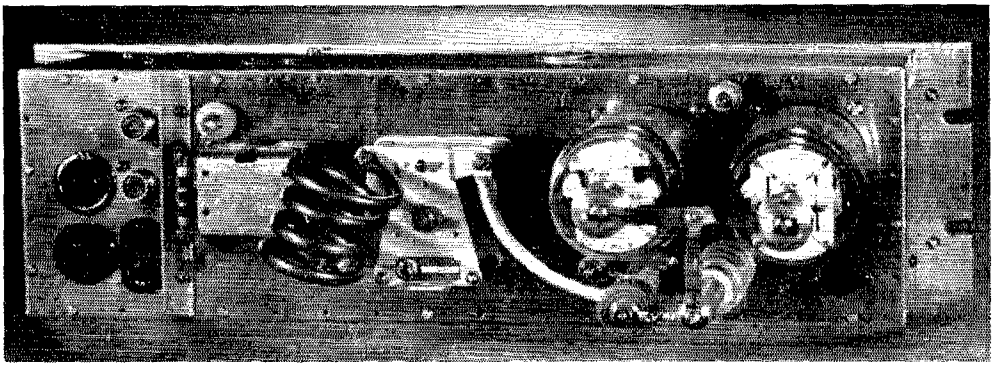
Remove the outer shell of the filament transformer T_1. Cut two pieces of ½ × ½-inch aluminum angle to a length of 4 inches, and drill holes to match the two holes that go through the bottom edge of the core. Next, drill a No. 25 hole ¾ inch from each end of both pieces for mounting. Fasten these mounting strips to the transformer core, using the original bolts.



The feedback shield described in the text and Fig. 3. The rear side of the shield is open.

Place flexible couplings on the shafts of C_1 and C_2, mount the chassis panel on the rails with at least two sheet-metal screws (furnished with the rails) on each side, and one at each end. Before tightening the screws, use a mechanic's or carpenter's square to check the corners. Place extension shafts in the flexible couplings of C_1 and C_2 and then place T_1 in position against the front lip of the chassis and between the extension shafts. Check the clearance carefully, then scribe and drill the mounting holes for T_1. Place a 1-inch screened vent plug above and to the left of T_1, as shown in the photographs. Drill four or five ¼-inch vent holes in the bottom side of the chassis, near the front lip, between RFC_2 and T_1, and five or six directly above the pilot lamp.

A slight amount of feedback was encountered in the 15- and 20-meter amplifiers. This was eliminated by placing a small shield over the output coax connector and the feed-through insulator connected to C_2. The shield is cut from sheet aluminum as shown in Fig. 3, and a photo shows the finished product after bending. Notice the ½ × 1/16-inch notches. These are made to clear



Rear view of the 10-meter amplifier. Connectors grouped at the left are for r.f. input and output, a.c. input, stand-by bias control and high-voltage input. The small connector below and to the right of the 813s is for blower-motor power.

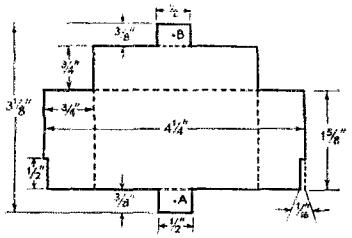


Fig. 3—Sketch showing dimensions of the feedback shield. Bends are made along the dotted lines. See detail photo.

the lip of the chassis rail. Use a ¼-inch 6–32 binder-head machine screw through the rail and Tab A, and a ¼-inch No. 6 sheet-metal screw through Tab B into the bottom of the chassis panel. One end of this shield is visible just to the right of the bias transformer in the interior view of the amplifier.

Support the front panel, face down, an inch or two off the workbench. Insert the extension shafts of C_1 and C_2 through the front panel holes and carefully center the chassis on the panel as before. Scribe on the panel an easily-seen mark all the way round the chassis. Remove the chassis panel from the rails and carefully reposition the rails inside the scribed mark on the back of the front panel. Holding the rails in position, use a long scriber or pencil to transfer to the panel the two outside holes on the lips of each end piece. Similarly, transfer the second hole from each end on the long side rails, also the eighth hole from the left-hand end of the bottom rail and the ninth hole on the top rail. Prick punch and drill clearance holes for the ½-inch No. 6 sheet-metal screws used to hold the front panel to the chassis. After checking the alignment of these holes, set the front panel aside.

Wiring

Mount a three-terminal ungrounded tie-point strip midway between T_1 and R_1 and one inch back from the front lip of the chassis. The primary leads from T_1 and T_2, as well as the leads from J_5, will be attached to the center and left-hand terminal. One of the 115-volt a.c. leads from J_4 is also attached to the left-hand terminal while the other a.c. lead goes to the right-hand terminal of the tie-point strip. When the front panel is mounted on the chassis, flexible leads will be run from the center and right-hand terminals to the power switch.

The location of most of the remaining components can be determined from the interior-view photo.

Much of the wiring can be done before mounting the P517 panel permanently on the rails. Use No. 12 wire for the filament circuit. Insulated hookup wire may be used for the bias-supply connections. Attach leads to J_5 that will reach the tie-point strip near the filament transformer. Use bent solder lugs under the heads of mounting screws of C_1 and C_2 to hold the wires in place and keep them from contact with high-voltage or r.f. wiring. Attach 5-inch leads of flexible wire to J_3 and J_4. High-voltage supply leads should be made with high-tension cable, or with rigid wire well spaced from the chassis and other metal. Attach the chassis panel to the rails with at least 12 sheet-metal screws. Complete the wiring and set the chassis aside.

The Front Panel

The chrome handles at each end of the panel are Bud No. H9168. Mount them ⅞ inch from each end and equidistant from top and bottom. You will find these handles to be the perfect answer for lifting the amplifier in and out of its rack mounting. They will also support the full weight of the amplifier, when you have it face down on your workbench for service, thus protecting the controls.

With the panel face up, locate three holes on a vertical line 2½ inches from the right end as follows: the pilot-lamp hole is 1½ inches down from the top, the hole for the filament switch is 2¾ inches from the top, and a 5/16-inch hole for the shaft of R_1 is 1½ inches up from the bottom of the panel. Drill a No. 25 hole 2 inches to the left of the pilot light and 1½ inches down from the top of the panel. Mount a one-terminal ungrounded tie point on the rear of the panel. Mount the meter with its center 3¼ inches from the left-hand end of the panel and 2¼ inches from the top. The s.p.d.t. slide switch, S_2, is centered directly below the meter. Place a solder lug on the left-hand mounting screw of S_2.

The bracket for R_1 is made from a piece of ⅛ × 1 × 2½-inch aluminum or brass. Bend a 1-inch leg for attaching to the chassis and, after drilling two No. 25 holes, mount with the center line of the bracket in line with the 5/16-inch hole in the panel. Leave a ⅜-inch space between the bracket and the panel. Transfer the panel hole to the bracket, drill a 7/16-inch hole and elongate

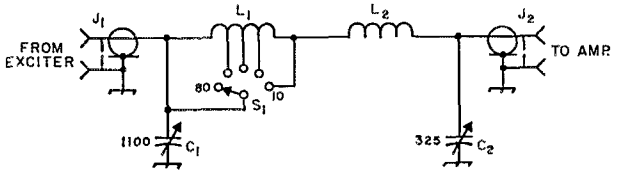
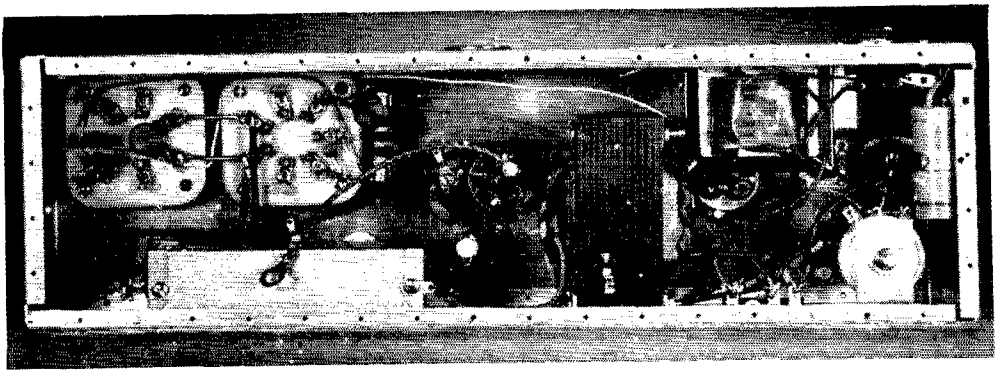


Fig. 4—Pi network for coupling fixed-impedance exciters to the grounded-grid amplifiers. Capacitances are in μμf.

C_1—Miniature triple-section variable, 365 μμf. per section, sections in parallel.
C_2—Miniature receiving-type variable (Hammarlund MC-325-M).
J_1 J_2—Chassis-mounting coaxial receptacle (SO-239).
L_1—17 turns No. 16, 1¼-inch diam., 2 inches long, tapped at 10, 4 and 2 turns from 10-meter end.
L_2—4 turns No. 12, 1-inch diam., 1 inch long.
S_1—Single-pole 5-position ceramic rotary switch.



Interior view of the chassis. The bifilar filament choke is below the 813 sockets. The bias-supply transformer is to the right of the filament transformer, suspended from the top of the chassis. The bias-control potentiometer is in the lower right-hand corner.

it with a round file to simplify lining up the shaft of R_1 in the panel hole.

After placing the 0.01-μf. capacitor across the meter terminals, wire R_3 from the positive terminal of M_1 to the ground lug on S_2, and ground the terminal of S_2 closest to the lug. Wire R_4 from the negative post of M_1 to the center contact of S_2. Connect R_2 from the positive post of M_1 to the other terminal of S_2, and run a piece of No. 18 solid insulated hook-up wire from this switch terminal to the tie point near the pilot light.

The 6.3-volt winding on T_2 can be used for the pilot light. Pass the center-tap lead from T_1 over the top of the extension shaft of C_1 before connecting it to the positive post of M_1. This will prevent it from coming in contact with the high-voltage lead or the plate choke. Leave enough slack in the leads to the pilot light, power switch and bias supply, so that the front panel can be easily lifted on or off the shafts of C_1, C_2 and R_1.

After soldering these leads, position the front panel and insert the ten No. 6 ½-inch self-tapping metal screws. Position a piece of ¼-inch tubing from the bottom of the 500-$\mu\mu$f. blocking capacitor, around the nearest 813 to a stator terminal of C_1. The mounting of L_1 will depend upon the size of the coil which, of course, will vary with the frequency for which the amplifier is being built. The rear-view photo shows the 10-meter amplifier with one end of L_1 attached to C_1 and the other end supported by a stand off insulator. Bud heat-dissipating plate caps are used on the 813s. Copper strap, ⅜ inch wide, is used to connect the tube caps to RFC_3.

Use "Tekni-Cals" for lettering. After they are thoroughly dry, use a small camel's-hair brush and *flow* on lacquer thinner *very* sparingly. Practice this step on an old panel before attempting to do your finished amplifier panel. When properly done, your lettering will have a decidedly professional appearance.

Shielding

The shielding enclosure is made of sections of perforated aluminum sheet supported on a framework of ½ × ½-inch aluminum angle stock. The front edges of the shield overlap the chassis on top, bottom and the left-hand side. The right-hand end of the enclosure is fastened to the angle piece attached to the chassis panel.

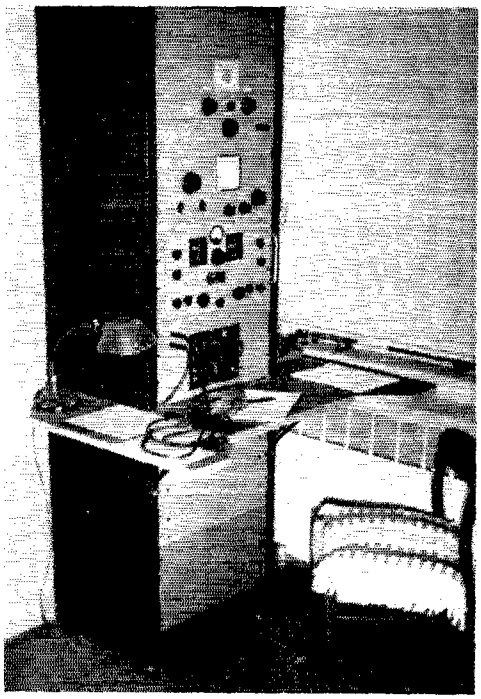
You can order 0.051-inch perforated aluminum sheet and ½ × ½-inch angle stock for the shielding enclosure precut to exact size from Dick's, 62 Cherry Ave., Tiffin, Ohio. Of the perforated sheet, you will need two pieces 11 by 14 inches, one piece 4¾ by 11 inches, one piece 4¾ by 10½ inches, and one piece 4¾ by 14 inches. In the angle stock, you will need four pieces 10½ inches long, two pieces 14 inches, three pieces 5 inches and two pieces 4 inches long. (Order one piece 31½, one piece 28, and one piece 33½ inches long.) The total cost of the perforated sheet is $4.27, and the angle is $1.40, plus postage. Use ¼-inch No. 6 sheet-metal screws for assembly and space them approximately 2 inches all around. The ventilating fan is obtainable from Allied Radio (Cat. No. 72P715). It is mounted against the inside of the rear wall of the shielding enclosure with the axis of the fan exactly opposite the plate caps of the 813s. Before attaching the top of the enclosure, run the a.c. leads from the fan motor along the bottom to the 2-prong Jones socket, J_5.

Adjustment

Check out the bias voltage and filament circuit before applying high voltage. A variable h.v. power supply is definitely recommended. If not available, arrange to insert a 100-watt lamp in series with the primary of the plate transformer while testing. A power supply delivering from 1800 to 2250 volts d.c. at 400 to 500 ma. is ideal. Before applying high voltage, connect a dummy load to J_2. With a plate voltage of 2000 volts, S_2 in the PLATE position, and the terminals of J_3 shorted, adjust R_1 for 40 ma. of plate current. With carrier injected in the s.s.b. exciter and S_2 in the GRID position, adjust the exciter loading for a full-scale reading on M_1.

Turn S_2 to PLATE, C_2 to maximum, and adjust C_1 for minimum plate current. With reduced plate voltage, decrease the capacitance of C_2 for 200 ma. of plate current, maintaining resonance with C_1. With plate voltage increased to

(Continued on page 162)



A Rack-Mounted Operating Table

BY JAY F. HELMS,* W6HHT

ONE of the greatest problems facing any ham is that of arranging his equipment in a comfortable and efficient fashion. Being in the military service and subject to movement from one part of the world to another on short notice, I long ago had settled for installation of all transmitting and receiving equipment in one standard six-foot relay rack mounted on heavy duty casters. This solution, while facilitating movement from one location to another, left a good deal to be desired from the standpoint of operating ease and comfort. This latter problem has been solved with the construction and installation on the relay rack of a writing and operating shelf which is comparable to a desk surface of 30 inches by 42 inches.

*Captain, Signal Corps, Hq. 1st Region ARADCOM, Ft. Totten, Flushing 59, N. Y.

This operating shelf can be most economically constructed from a single piece of half-inch plywood 21 inches by 48 inches in size, and can be surfaced with either tempered masonite or formica according to individual choice. The plywood should be cut as indicated in Fig. 1, following the sequence of saw cuts as indicated. Exact dimensions of X, Y and Z are not given as they will vary depending upon the external size of your relay rack. Masonite or formica can be cut to the same pattern and fastened to the plywood with brads or glue. While the model shown in the photograph was constructed with a radial-arm cutoff saw, a comparable job can be done with hand tools if sufficient care is taken. Saw cuts numbers 1 and 4 are most critical; these both must be made exactly parallel with one edge of the plywood sheet if the finished assembly is to fit properly.

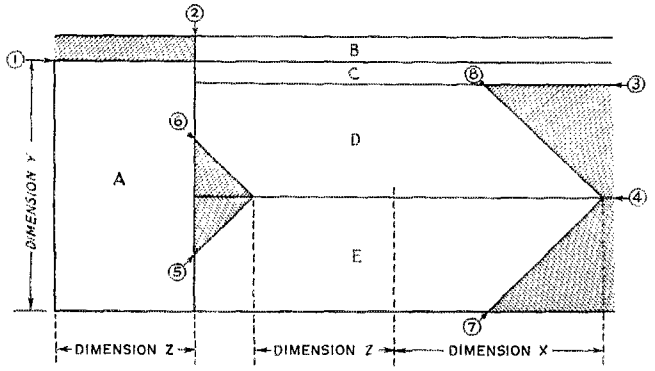


Fig. 1—This layout shows you how to cut the plywood with the least waste (shaded portions). Dimension X is the distance from front to back of the relay rack. Dimension Y is the width of the relay rack. Dimension Z is determined by experiment when you are laying out the saw cuts on the plywood, necessarily being a function of the over-all length of the piece of plywood and the length of dimension X.

Finished pieces are assembled as shown in Fig. 2. Strips B and C are fastened beneath the shelf to insure rigidity. The entire shelf is fastened to the relay rack with three pieces of ½-inch angle bolted across the front and sides of the rack and to which the shelf is attached with wood screws. To provide additional strength for heavy-handed ops, two diagonal braces were added between the front edge of the shelf and the front of the rack; these braces are constructed from ½-inch steel strap and can be seen in the photograph.

When completely assembled and fastened to the rack the shelf is quite rigid and will support any reasonable weight which may be placed on it. Ample space is provided for key, mike, logbook, scratch-pad, lamp and miscellaneous accessories, with sufficient space to permit un-cramped writing and complete access to all equipment. In fact, the completed shelf turned out to be so useful that it was finally trimmed with 12 feet of ¾ inch flat aluminum strip to conceal the junction of plywood and masonite. In making this shelf, sufficient scrap angle and strap were available in the junk box. If these components need be purchased, 4 feet of angle and 4 feet of strap will be required. Total cost of all material purchased in the New York City area was $7.50. QST

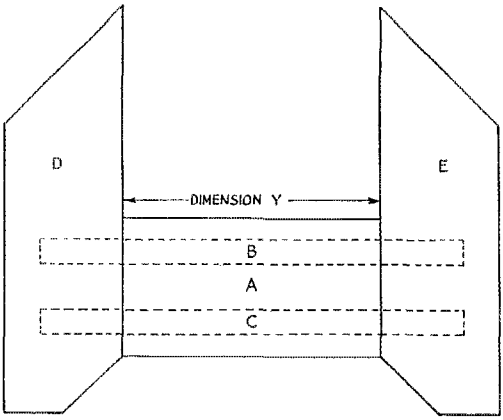


Fig. 2—Here's how to assemble it. Dimension Y is the outside width of the relay rack; it determines precisely the length of piece A and roughly the lengths of pieces B and C.

• New Apparatus

McCoy Single-Sideband Filters

A COMPLETE "crystal set" for use in constructing a 9-Mc. s.s.b. exciter has been packaged by McCoy Electronics Co., Mt. Holly Springs, Pa. The package contains a crystal filter and two oscillator crystals. Two models of filters are available, the Golden Guardian (Model 48B1) and the Silver Sentinel (32B1). The model 48B1 has an unwanted sideband rejection of better than 55 db., when used in the recommended circuit furnished with the kit. A characteristic curve for this filter is shown in Fig. 1A. The economy line Silver *Sentinel* has a slightly higher shape factor but still has respectable sideband rejection of about 40 db. Its curve is shown in Fig. 1B.

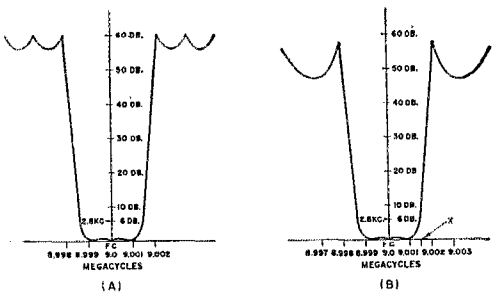


Fig. 1

The two oscillator crystals furnished in the filter kit have frequencies of 9.0015 and 8.9985 Mc. The appropriate crystal is switched in the 9-Mc. oscillator circuit for either upper or lower sideband operation. Referring to Fig. 1B, if lower sideband emission is desired, the 9.0015-Mc. crystal is switched into the oscillator circuit. The carrier, which has been suppressed in a previous stage, is at point "X" on the filter slope. When modulation is applied to the system, the lower sideband will be passed through the filter while the upper sidebands will be rejected.

The filter kits come with an instruction pamphlet which includes recommended circuits, technical data and other operating and construction hints. —*E. L. C.*

Thoughts on Keying Filters

Click-Free Keying Without Vacuum Tubes

BY G. FRANKLIN MONTGOMERY,* W3FQB

EVERYONE knows what key clicks sound like, and generating them yourself is one way to ruin your reputation with friends and neighbors. Excellent past articles in *QST* have discussed how to check a transmitter for clicks and how to suppress them.[1-5] When the transmitter is cathode- or plate-keyed, a useful suppression device is a keying or lag filter. Most of the available information on keying filters is only qualitative, however, and the usual filter circuits have some disadvantages. This article describes a better keying filter and formulas for its design.

Click Suppression

Clicks are generated by any transmitter whose carrier amplitude rises or decays too rapidly.[6] To suppress the clicks, a keying scheme must be used that prevents too fast a transition from "off" to "on" and back again. The modern approach to cathode keying is a separate keyer tube, keyed in its grid circuit. But it seems unwise to use a tube for a job that can be done as well with a simple inductor and capacitor. The preference for keyer tubes may have grown for the following reasons:

Consider the typical filter shown in Fig. 1A (where C_K, the cathode bypass capacitor, is not large enough to be considered part of the filter). The equivalent circuit is shown in Fig. 1B. This equivalence is only approximate, because neither the voltage E nor the resistance R_O is strictly constant, but their variation makes no great difference. The object, of course, is to force the battery (cathode) current to rise slowly when the key is closed and decay slowly when the key is opened. The filter does control the current in this way, but not without fireworks at the key.

Cause of Arcing

To begin with, suppose that C is omitted. When the key is closed, the initial current is zero. The inductance L prevents the current from increasing abruptly, and the result is a gradual increase in current, the rate of rise depending on the ratio of R_O to L. When the key is opened, however, the initial effect of L is to maintain the current at its maximum. The contact voltage rises abruptly to a value that may greatly exceed E, and the result is a soft, persistent arc at the key.

If we include C, we can eliminate the arc. Now as the key is opened, the inductor current charges C, and the voltage across C rises slowly toward the value E. But when the key is closed again, it must discharge C before current can begin in L. Typically, E can be 70 volts and C several microfarads, producing a fat, noisy spark at the contacts. (This may partly explain the onetime popularity of keys with contacts the size of aspirin tablets.) A resistor in series with either the key or the capacitor will reduce the spark but will not eliminate it. Hence, the dilemma. One way of arranging the circuit treats the key contacts badly on make, the other way on break, and worn key or relay contacts are certain trouble.

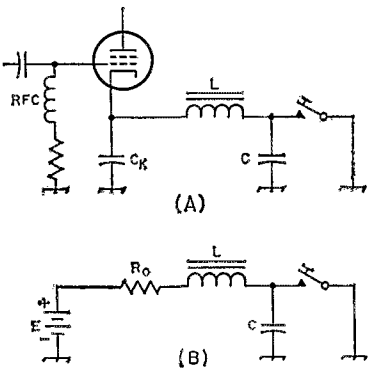


Fig. 1—(A) A conventional L-C arrangement for suppressing key clicks in a cathode-keyed stage. (B) An approximate electrical equivalent of A.

Reducing the Spark

Now look at Fig. 2. The rectifier makes it possible to switch C automatically to the part of the circuit where it will do the most good. Initially, C is charged to the voltage of the open cathode with the polarity shown. When the key is closed, CR prevents the discharge of C through the contacts, the inductor current rises gradually, and C discharges slowly through R and L. When the key is opened, the voltage across the contacts rises gradually as the inductor current charges C through CR. The result is essentially no arc, no spark.

Design

If the filter of Fig. 2 is critically damped for

* 517 23rd St., N.W., Washington 7, D. C.

[1] Goodman, "Some Thoughts on Keying," *QST*, April, 1941, p. 17.

[2] Goodman, "Keying the Crystal Oscillator," *QST*, May, 1941, p. 10.

[3] Goodman, "Tube Keying," *QST*, June, 1941, p. 31.

[4] Goodman, "Key Clicks and Receiver Bandwidths," *QST*, April, 1950, p. 34.

[5] Goodman, "Keying the Radiotelegraph Transmitter," *QST*, July, 1956, p. 27.

[6] Occasional pathological causes are incomplete neutralization and parasitic oscillations, but these ought to be fixed anyway. See the listed references.

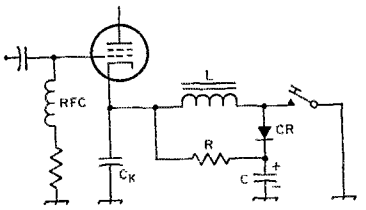


Fig. 2—A diode and resistor connected as shown will minimize sparking at the key contacts, as described in the text. See text for suggested component values and ratings.

both make and break, the cathode current will rise and fall exponentially as shown in Fig. 3. There are two possible sets of LC values for critical damping, but the more useful set is the one that specifies the smaller inductor.

The first step is to calculate

$$R = \frac{E}{I} \qquad (1)$$

where E is the key-up potential of the cathode in volts, and I is the key-down cathode current in amperes. Now, if T is the lag time in seconds for the current to reach 95 per cent of its maximum on make, and 5 per cent of its maximum on break, then

$$L = \frac{TR}{10} \qquad (2)$$

$$C = \frac{T}{1.8\,R} \qquad (3)$$

where L is in henrys and C is in farads.

What value for T? This will depend partly on your taste; some people like softer keying than others. A rise (and decay) time of 14 milliseconds (0.014 second) should permit keying at up to 40 words per minute without trouble from overly soft dots. For softer keying, the value chosen for T should be increased accordingly. The values of L and C given by formulas (2) and (3) are not especially critical. It is best to maintain the ratio of L/C that follows from the formulas, but a change in either inductance or capacitance by 20 or 30 per cent from the calculated value will not affect the keying wave-form very much.

Example: I am keying a 6L6 buffer, and I find that the key-up cathode potential is 60 volts, the key-down cathode current 50 milliamperes. A lag time of 20 milliseconds is fast enough for my sending. Then,

$$R = \frac{60}{.050} = 1200 \text{ ohms}$$

$$L = \frac{(.020)\,(1200)}{10} = 2.4 \text{ henrys}$$

$$C = \frac{.020}{(1.8)\,(1200)} = \frac{0.0093}{1000} \text{ farads}$$

$$= 9.3 \text{ microfarads.}$$

I find that I have a 2-henry, 200-milliampere filter choke and an 8-microfarad, 250-volt electrolytic capacitor on hand. These are close enough to do nicely.

Ordinary filter chokes work well in this circuit. The choke should be large enough to maintain most of its rated inductance while passing the direct cathode current. If the keyed current is large, so that the inductance calculated from

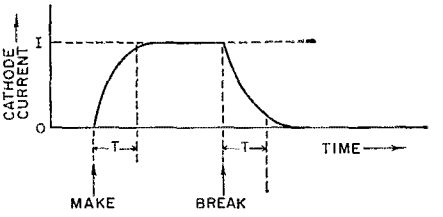


Fig. 3—Typical keying wave shape.

(2) turns out to be inconveniently small, then there is no harm in paralleling two or more chokes to obtain a smaller inductance. Capacitor C must be rated to withstand the key-up cathode voltage. Either paper or electrolytic capacitors will do.[1] Rectifier CR must have a peak-inverse-voltage rating that equals or exceeds the cathode voltage. The average current rating need not be large, because the rectifier passes current only when C is being charged and consequently dissipates little power. Small silicon or germanium power rectifiers are adequate in most cases. QST

[1] In some instances where the amplifier is operating without fixed bias, the leakage through an electrolytic capacitor may be sufficient to produce a back wave with the key open — *Ed.*

Strays

K0RUA suggests that if you need reference to a back issue of *QST*, try the library of the local college or university.

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Quoting from an AP dispatch: Leonard Dansby sent a fellow ham operator in South Africa some Mexican food recently and received a letter from the man saying "the covering on the tamales was a bit hard on the stomach."

Dansby recalled he failed to advise the man that one doesn't eat the corn shucks in which tamales are wrapped.

—•••—

W4PK suggests that would-be chess players gather around 7105 kc. and call "CQ chess game."

—•••—

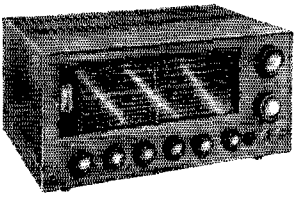
K8YGN was thumbing through some old *QST*s and happened across a photo of W7YGN. Ten minutes later he heard him calling CQ on 7 Mc.

—•••—

KN4NWM (David Battle, 3244 Cleveland Ave., Montgomery, Ala.) is trying to get together with former "MARS" operators who served in France and Germany.

• Recent Equipment —

Lafayette HE-30 Receiver



THE HE-30 is a 9-tube, general-coverage receiver designed primarily for the beginner radio amateur or short-wave listener. It covers the frequency range of 0.55 to 30 Mc. in four bands: 0.55 to 1.6 Mc., 1.6 to 4.8 Mc., 4.8 to 14.5 Mc., and 10.5 to 30 Mc. All of the amateur bands covered by the receiver have electrical bandspread, with a calibrated slide-rule dial marked every 5 kc. on 80 and 40 meters, every 20 kc. on 20 and 15 meters, and every 50 kc. on 10 meters. The 80- and 40-meter bands are tuned in segments, each of which has its own dial scale. On 80 meters the steps are 3.5 to 3.7 Mc., 3.7 to 3.94 Mc., and 3.9 to 4.0 Mc. On 40 meters the ranges are 7.0 to 7.17 and 7.17 to 7.35 Mc. The main tuning pointer must be set to a new spot for each segment. The bandspread dial requires about 11 turns of the knob to cover each segment of the 80- and 40-meter bands, 3 turns for 20 meters, 5 turns for 15 meters and 10 turns for 10 meters.

The block diagram in Fig. 1 shows the line-up of the receiver. It starts with a 6BA6 r.f. amplifier, V_1. The amplifier's input circuits, along with the mixer and oscillator circuits, are all gang tuned from the panel by the MAIN and BANDSPREAD tuning controls. The r.f. amplifier input circuit can be peaked up with the panel ANTENNA TRIMMER knob. A separate high frequency oscillator, V_3, a 6BE6, operates 455 kc. higher than the signal frequency on all bands. These two frequencies are combined in the 6BE6 mixer, V_2, to give an i.f. of 455 kc.

In the HE-30, a Q multiplier doubles as the b.f.o. A 6AV6, V_4, is coupled to the i.f. through stray capacitance when in the c.w./s.s.b. mode and oscillates to provide the b.f.o. signal. The panel control, BFO-Q-MULT FREQUENCY, adjusts the b.f.o. frequency. When operating as a Q multiplier, the 6AV6 circuit is connected directly to the i.f. circuit and provides variable selectivity through the panel SELECTIVITY control. The Q-multiplier notch can be moved through the receiver passband with the BFO-Q-MULT FREQUENCY control.

Two 6BA6s, V_5 and V_6, operate as 455-kc. i.f. amplifiers. An i.f. gain control is part of the i.f. amplifier cathode circuits, as is also an S-meter circuit for indicating relative signal strength. The diode sections of a 6AV6, V_7, function as a detector and noise limiter and provide a.g.c. voltage which is applied to the r.f. amplifier and the first i.f. amplifier. A panel toggle switch allows for grounding the a.g.c. bus if desired. The noise limiter also has an on-off panel toggle switch.

The triode section of V_7 operates as an audio preamplifier and drives a 6AQ5 audio power amplifier. A rear apron terminal strip provides for connecting a low-impedance speaker (either 4 or 8 ohms), and a panel PHONES jack permits the use of low-impedance headphones. When the phones are inserted in the jack, the speaker connected to the 8-ohm tap is automatically disconnected.

A conventional full-wave power supply furnishes the necessary operating voltages for the HE-30. The primary of the power transformer is

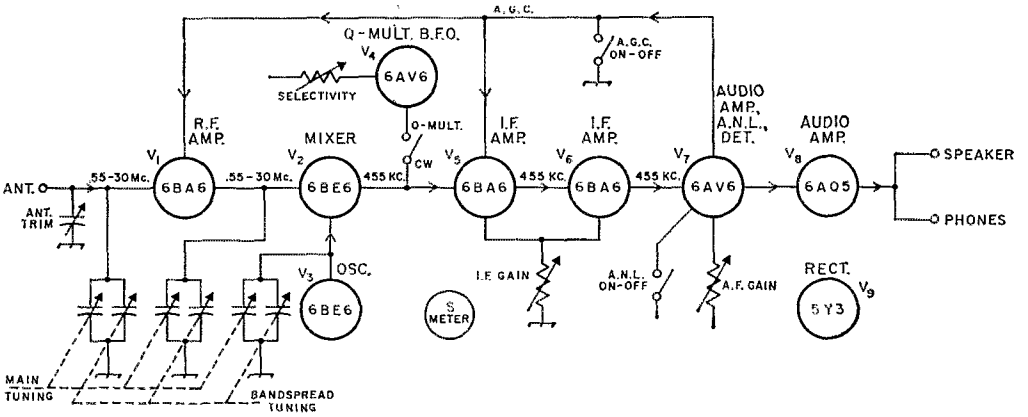
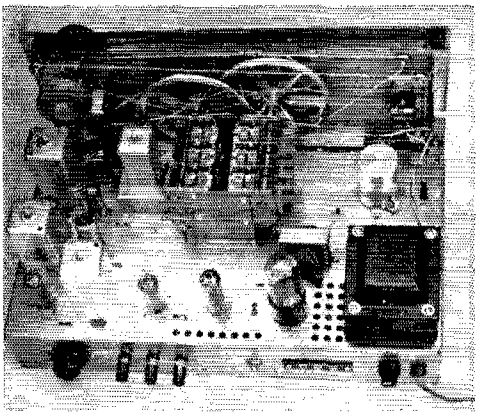


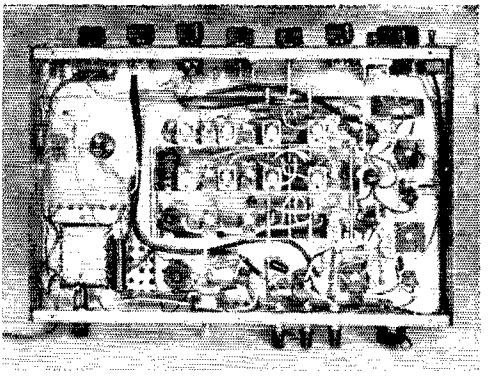
Fig. 1—Block diagram of the HE-30 receiver.

fused and is tapped to permit operation of the receiver at low line voltages.

Operating controls on the panel of the HE-30 include the MAIN and BANDSPREAD tuning knobs, automatic noise limiter on-off toggle switch, a.g.c. on-off toggle switch, ANTenna TRIMMer, I.F. GAIN, BAND SELector, BFO-Q-MULT FREQUENCY, SELECTIVITY, and FUNCTION control. The FUNCTION switch has four positions to select the mode of reception: OFF, REC – AM, SEND, and Q MULT. In all of the positions except OFF, a.c. power is applied to the receiver. In REC-AM, d.c. plate voltage is applied to all tubes but V_4 (b.f.o./Q multiplier); in the SEND position plate voltage to the r.f. amplifier, mixer and oscillator is cut off. In the Q MULT position, plate voltage is applied to all tubes.



The string-drive pulley and cast flywheels visible in this view of the HE-30 are part of the main and bandspread tuning mechanisms. The slide switch just above the power transformer and to the right of the filter-capacitor can is the voltage selector switch which changes the ratio of the power transformer to compensate for low line voltage. Arranged along the rear apron of the receiver from left to right are the auxiliary control plug and socket (for remote control of the receiver), antenna and ground connectors, S-meter zero adjustment, audio output terminal strip (4- and 8-ohm taps), fuse, and line cord.



Bottom view of the HE-30 receiver. The r.f., mixer and oscillator tuned circuits are located in the center area of the chassis.

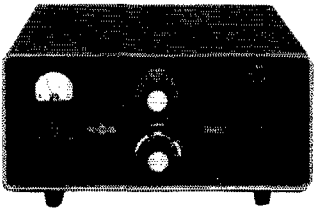
At the rear apron of the receiver is an auxiliary control socket (a mating plug is furnished) for external control of the plate voltage to V_1, V_2, and V_3.

A 20-page operating manual is furnished with the HE-30 and contains the usual operating and alignment information, a circuit diagram, and parts list. A matching speaker (model HE-11) is available from the distributor. — *E. L. C.*

Lafayette HE-30 Receiver

Height: 7 inches.
Width: 15 inches.
Depth: 10 inches.
Weight: 21 pounds.
Power requirements: 50 watts, 117 volts, 60 cycles.
Price class: $100.
Manufacturer: Imported. Manufactured for Lafayette Radio, Syosset 10, New York.

Collins 30L-1 Linear Amplifier



ALTHOUGH designed as a companion amplifier for the KWM-2 transceiver or for the 32S-1 transmitter, the Collins 30L-1 linear amplifier can be used with any exciter capable of furnishing about 70 watts of driving power. It contains its own plate and bias power supplies and is rated at 1000 watts p.e.p. input on s.s.b. and 1000 watts on c.w. (with 50 per cent duty cycle, key-down periods not exceeding 30 seconds). The amplifier is intended primarily for use on the amateur bands, but can be used on nearly any frequency between 3.4 and 30 Mc. The actual coverage is broken down into five bands: 3.4 to 5.0 Mc., 6.5 to 9.5 Mc., 9.6 to 16 Mc., 16 to 22 Mc., and 22 to 30 Mc.

The block diagram of the 30L-1 is shown in Fig. 1. Part of the switching and control circuits are diagrammed to show how the amplifier can fit into an existing station.

Four forced-air-cooled 811A triodes are connected in parallel as grounded-grid amplifiers. Broad-band pi-network circuits are used to couple

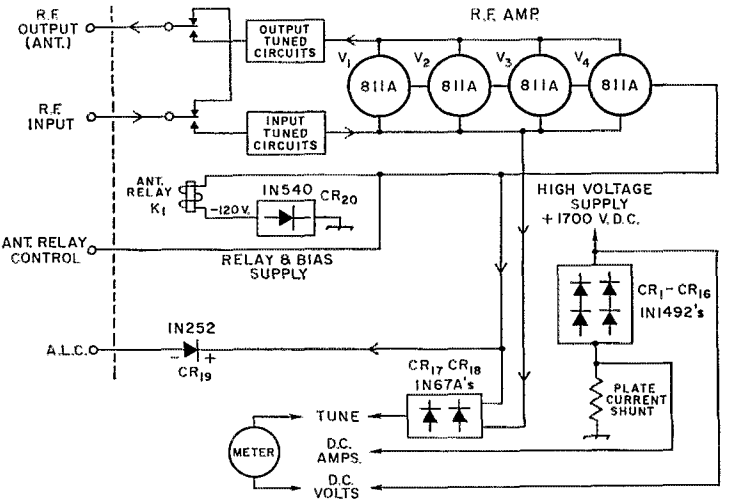
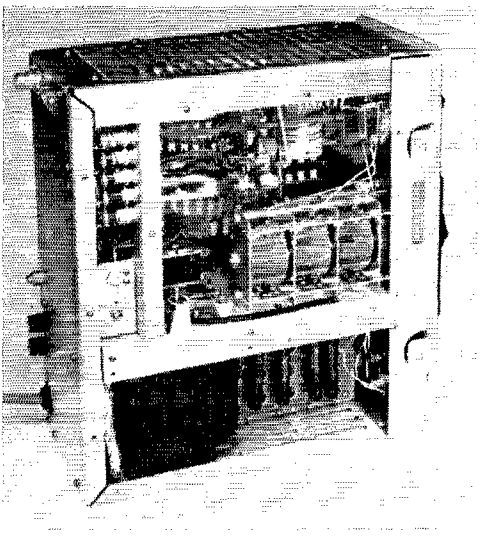


Fig. 1—Block diagram of the 30L-1 amplifier.

the r.f. drive to the amplifier cathodes. These circuits, along with the special length r.f. feed cable furnished with the amplifier, present an almost constant 50-ohm load to the exciter throughout each amateur band. The proper network is switched in by the BAND SWITCH.

The plate circuit of the amplifier is also tuned by a pi network and is adjusted by a TUNING control on the front panel. A four-gang variable capacitor, adjusted by the panel LOADING control, matches the amplifier to the load. The circuit is designed to work into a 50-ohm load. The input circuits, the tapped pi-network inductance in the plate circuit, and the four-section loading capacitor are all switched by the BAND SWITCH to give the proper values for each band.



With the cabinet and several cover plates removed, portions of the r.f. and power-supply sections of the 30L-1 amplifier can be seen. Part of the high-voltage power transformer and a power-supply resistor board are at the bottom of the photograph. The ceramic-form inductors used in the amplifier input circuit can be seen in the compartment at the left. The four-gang variable capacitor is part of the amplifier loading circuit. Arranged along the rear of the cabinet (at the left of the photograph) from bottom to top are: line cord, fuses, ground stud, type N antenna connector (left), a.l.c., r.f. input, and antenna relay jacks.

All operating voltages for the 30L-1 are furnished by two built-in power supplies. Plate voltage is supplied by a full-wave voltage-doubling rectifier circuit which incorporates fourteen semiconductor diodes. Voltage from this section is about 1600 volts under load. A half-wave power supply furnishes about 120 volts negative as blocking bias for the 811s during stand-by. This supply also furnishes power for the changeover relay, K_1. Primary power for the amplifier can be either 117 volts or 230 volts and is controlled by a front panel ON-OFF switch. The amplifier can be operated at line frequencies of 50 to 400 cycles but operation from frequencies other than 50-60 cycles requires an auxiliary 60-cycle supply for the cooling-fan motor.

Metering circuits in the 30L-1 provide for a TUNE position and measurement of D.C. VOLTS and D.C. AMPS. These are all selected by a front panel METER switch. In the D.C. VOLTS position, the meter is connected as a d.c. kilovolt meter; in the D.C. AMPS position, the meter indicates the power amplifier plate current.

In the TUNE position, the meter is part of a bridge circuit (see Fig. 2) and will read zero (the meter has its zero point about one third the way up the scale) when the plate circuit tuning and loading are adjusted properly. This is accomplished by comparing the relative r.f. input and output voltages. By preadjustment of the bridge voltage dividers, these voltages will be equal when the amplifier is properly tuned and loaded. The input voltage is obtained through a capacitive voltage divider from the cathode circuit of the

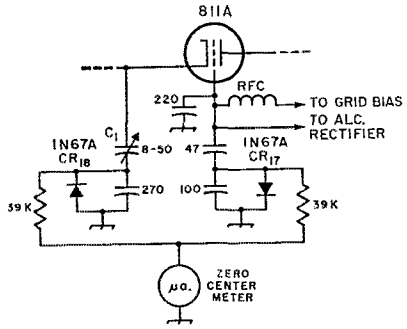


Fig. 2—Diagram of the bridge used in the TUNE position of the meter circuit in the 30L-1 amplifier. Resistances are in ohms, capacitances are in μμf. The calibration capacitor, C_1, is set at the factory and is adjusted so that the meter reads zero when the amplifier tuning and loading controls are adjusted to present the proper load impedance to the power amplifier plates (if this scheme is used in other equipment, an oscilloscope should be used when adjusting the amplifier before the calibration capacitor is set).

811s. Output voltage is sampled through a divider consisting of fixed capacitors and the tube grid-to-plate capacitance. Diodes CR_{17} and CR_{18} rectify the voltages for use in the bridge circuit.

An automatic load control circuit provides a negative d.c. voltage to control the grid of a low-level r.f. amplifier tube or tubes in the external exciter. The negative voltage is obtained by rectifying r.f. voltage from the output divider mentioned above.

Connections at the rear of the 30L-1 include the just-mentioned a.l.c. jack and an antenna relay control terminal which, when grounded, closes the antenna relay, K_1. During stand-by periods, when the relay is not energized, the relay voltage is applied as blocking bias on the amplifier tubes. The r.f. input jack and r.f. output connector also terminate at the rear of the cabinet. As shown in Fig. 1, if the amplifier power should fail, the antenna relay will open and power from the exciter will automatically be fed through to the antenna.

The 30L-1 cabinet is finished in the same blue-gray tones used for other Collins equipment. The instruction manual contains drawings and instructions for connecting up and using the amplifier, but seems to fall short (as most Collins instructions manuals seem to do) on trouble shooting information. *E. L. C.*

Collins 30L-1 Linear Amplifier

Height: 6 9/16 inches.
Width: 14 3/4 inches.
Depth: 13 3/4 inches.
Weight: 38 pounds.
Power requirements: 230 volts, 3-wire single phase at 5 amperes, or 117 volts at 10 amperes, 50-400 cycles.
Price class: $500.
Manufacturer: Collins Radio Co., Cedar Rapids, Iowa.

NEW BOOKS

Magnetic Amplifiers, by Paul Mali. Published by John F. Rider Publisher, Inc., 116 West 14th St., New York 11, N. Y. 101 pages, including index, 5½ by 8½ inches, paper cover. Price, $2.45.

Radio amateurs will probably never have any contact with magnetic amplifiers in their hobby, but for those generally interested in the subject, principles and applications of these devices can be obtained from this book. Basic in nature, the manual answers the questions, "what is a magnetic amplifier?" "how does it work?" and lists some of the common applications of magnetic amplifiers in amplification, control switching, memory and computation. Non-mathematical and loaded with illustrations, this is a good beginner's manual on the subject.

Basic Carrier Telephony, by David Talley. Published by John F. Rider Publisher, Inc., 116 W. 14th St., New York 11, N. Y. Pub. No. 258. 176 pages, 6 by 9 inches. Price, paper cover $4.25; cloth cover $5.75.

Those who were interested in "wired wireless," which was used in amateur circles during World War II, will find that this book covers the subject of carrier telephony completely. Carrier telephony means the transmission of several signals over a radio circuit, cable, or wire line. This book goes into carrier telephony circuitry and discusses special types of modulators, carrier controls, and switching. Other chapters deal with voice channel in four-wire carrier terminals and two-wire carrier channel operations. One chapter is devoted to cable carrier systems and another to carrier applications to radio systems. The book seems to have been directed to telephone and radio engineers, yet it is in the realm of the technician and radio amateur.

Alternating Current Electricity, by Alexander Efron. Published by John F. Rider Publisher, Inc., 116 West 14th St., New York 11, N. Y. 5½ by 8½ inches, 104 pages, paper cover. Price, $2.25. Basic Science Series. Cat. No. 200-10.

More an electrician's than an electronics manual, this book begins with the basic concepts of a.c. The sine wave, cycle, frequency, and period are developed, and the meanings of instantaneous and r.m.s. values are discussed. The components of an a.c. circuit, resistance, inductance and capacitance, are covered, as well as vector diagrams, a.c. measuring instruments, polyphase power, the transformer and a.c. motors. The book closes with an appendix devoted to the "j" operator and the complex number method of describing and solving a.c. circuits. All chapters are terminated with questions and problems for self examination.

Tubes and Circuits, by George J. Christ. Gernsback No. 82. Published by Gernsback Library, Inc., 134 West 14th St., New York 11, N. Y. 192 pages, 5½ × 8½ inches, paper cover. Price, $3.45.

With such a general title this book could cover just about any phase of vacuum tube application. Actually, it does cover generally the entire scope of electron tubes and the circuits in which they are used. The theory of electronics, vacuum tube characteristics and applications, vacuum tube amplifiers and oscillators, multipurpose tubes, gas tubes, photoelectric emission and industrial tube applications are a few of the topics included. Down to earth, with little mathematics, this manual will be of interest to technicians at any level. *— E. L. C.*

Hints and Kinks For the Experimenter

THE SIMPLICITY MODULATOR

THE modulator shown in Fig. 1 is an inexpensive means of converting a c.w. transmitter to a type of carrier-control a.m. transmitter. The system incorporates ease of adjustment, simplicity, and versatility, while providing an effect similar to carrier-control systems using only one tube and one adjustment. Operation is practically foolproof and it can be applied to practically any transmitter.

The c.w. transmitter need only meet the following requirements: Tetrode or pentode final amplifier, and separate oscillator and final with adequate isolation (to reduce frequency shift). Some transmitters use a single tube for an oscillator and final, and these must be changed to incorporate a separate oscillator before the modulator can be used.

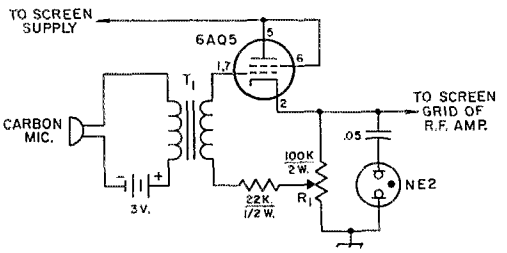


Fig. 1—The Simplicity Modulator. Capacitances are in μf. resistances are in ohms.
R1—100,000-ohm 2-watt variable resistor.
T1—Carbon mike-to-grid transformer (Triad A-1X).

The audio amplifier used to drive this modulator is not required to furnish much power. Practically any audio amplifier, such as one salvaged from an old radio, TV or phonograph, will work. With a carbon mike, only one stage of amplification is needed.

To adjust the simplicity modulator, load the transmitter for maximum c.w. output. Record the plate current reading and divide this value by 2. Connect the output of the modulator to the screen grid of the r.f. amplifier tube. Apply high-voltage power and adjust the variable resistor R_1 until the transmitter plate current is the value of the original plate current divided by 2. The plate current should increase with modulation and the neon modulation indicator should flash on modulation peaks.

Have a friend check the sound of the modulation or use a scope to adjust the audio amplifier for the best audio level. It may be necessary to lower the transmitter plate current another 10 or 15 ma. to obtain better audio quality. Power for the modulator may be obtained from the original screen supply, providing there is not too much variation in voltage with modulation. This system is not difficult to use, but some experimentation may be necessary. The screen bypass capacitor of the r.f. amplifier tube should be about 0.002 μf.

If a carbon mike is used, it would be best to employ a d.p.s.t. switch to connect the mike circuit and to key a relay which would turn on the high-voltage power. If a heavy switch is used to do this, the relay may be unnecessary. If a push-to-talk mike is used, a relay must be keyed by the mike switch to turn on the high-voltage power.

— *From* The Carrier, *by John Solman*

TUBELESS MINI-KEYER

EXCEPT for a weight control, the circuit in Fig. 2 is basically similar to the Corkey, *QST*, November, 1950, but is considerably simpler. The operation is as follows: When the key is moved to the dot position, C_2 charges and, at the same time, the relay K_1 closes. When the relay closes, it breaks the circuit to C_2, which then discharges through the relay coil and R_1. When C_2 discharges to a certain value, the relay will drop out, completing the dot to the keyed

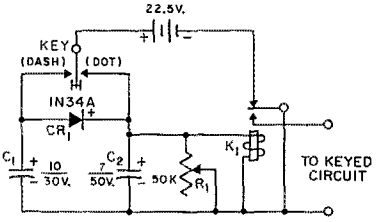


Fig. 2—VE1OI's tubeless keyer.
K1—10,000-ohm sensitive plate relay.
R1—50,000-ohm linear potentiometer.

circuit. When the key is moved to the dash position, C_1 charges and diode CR_1 conducts, connecting C_2, which also charges up. The same cycle as explained in the dot position is repeated for the dash, except that the delay is longer due to the higher value of capacitance. The circuit is self-completing and R_1 provides a speed control for a range of about 10 to 45 w.p.m. C_1 and C_2 should be selected for the correct dash-to-dot ratio with the particular relay used. A sensitive relay must be used, or very large values of capacitance will be required for C_1 and C_2.

— *Roger Grant, VE1OI/VE3*

SIMPLE GROUND PLANE

A GROUND-PLANE antenna capable of handling a full kilowatt can be constructed, using wire elements, for less than five dollars. The secret lies in the use of the familiar type SO-239 coaxial connector. Simply turn the connector upside down (the center terminal pointing up) and solder the vertical element to the terminal. See the sketch in Fig. 3. The four radial wires are soldered to the four holes in the connector and the feed line with a mating connector is plugged into the SO-239.

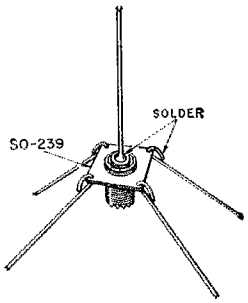


Fig. 3—Ground-plane antenna made from an SO-239 connector.

For v.h.f. ground planes, the antenna can be made self-supporting and can be mounted by attaching the feed line to a supporting mast. Low-frequency models will require an insulator at the top of the vertical element. The antenna is then suspended from a tree. The radials will also require insulators and guy wires. The radials should "droop" at about 45 degrees in order to obtain a reasonably good 50-ohm match. The lengths of the elements can be found from the formulas:

$$\text{Vertical element in feet} = \frac{234}{f(\text{Mc.})}$$

$$\text{Radial elements in feet} = \frac{240}{f(\text{Mc.})}$$

— *George Christakes, K9MDE*

12 VOLTS FROM 6-VOLT AUTOMOBILE SYSTEM

THE circuit in Fig. 4 depicts a reliable method for obtaining 12 volts d.c. from a car that has a 6-volt system. The second battery should be of equal ampere-hour capacity and in about the same electrical condition as the original car battery. Domestic house-entrance service wire of number 2 size will suffice for the leads, and a high-ampere toggle switch, such as the Cutler Hammer No. 8905K662 (35 amp., 15 volts), can be used for the charging switch, S_1. The switch should be mounted so that it can be conveniently manipulated while in motion. For positive ground systems, reverse the polarity of the batteries. The reliability of this system is excellent, as I have used the scheme for about five years in my Volkswagen.

— *Vic Ortegren, W6WFR*

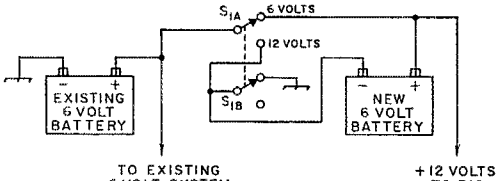


Fig. 4—Method for obtaining 12 volts from a 6-volt system. S_1 should have a high current capacity.

PLATE CAP CAUTION

TUBES, such as the popular 7094, can be easily broken while you're trying to remove the plate cap. This happens when the set screw on the cap flattens the sleeve on the projecting pins from the tube, making removal of the cap difficult. If you drill out the plate cap with a 5/32-inch drill, there will be plenty of clearance for easy removal.

— *Bill Frankart, W9KPD*

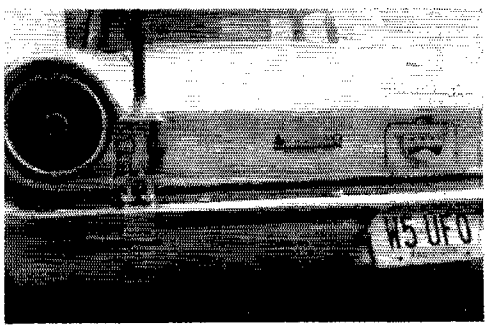
SURPLUS 274N RECEIVER NOTE

I HAVE converted several 274N receivers and have found that a large percentage of these receivers have defective capacitors — the large triple section .05-μf. jobs. I suggest that anyone who is going to modify this equipment automatically replace these capacitors with disk ceramic units to save headaches later on.

— *Dick Walker, W2MNY*

STIFF MOBILE MOUNT

THE accompanying photograph shows my double spring mount which almost completely eliminates antenna side-sway at high speeds.



W5UFO's stiff spring mount.

Even the front-to-back motion of the antenna is minimized, yet it does allow some give, in case the antenna strikes a tree limb or other object. The two springs are mounted side by side between two steel plates to which the antenna and bumper mount are attached.

— *Thomas H. Earnest, W5UFO*

(This is, no doubt, the original Unidentified Flying Object. — *Ed.*)

This is the kind of destruction the AREC was up against. Houses off foundations, streets blocked or caved in, wire lines down, debris everywhere—even the mobiles had a hard time getting to where they were needed.

A Night of Tragedy

How Amateurs Helped in West Virginia's Flash Floods

BY WILLIAM R. GARY*, K8CSG

MASSIVE flash floods, resulting from over five inches of rainfall in four hours, struck Charleston, West Virginia, during the night of July 19, 1961. Complete devastation, indescribable human misery, 22 known deaths, and destruction of property in excess of five million dollars; these were the results of the worst disaster in the city's history. Garrison Ave., Wertz Ave., Kanawaha Two Mile, Elk Two-Mile, Campbells Creek and other narrow residential mountain hollows in the Charleston area suffered virtually complete devastation. Nine persons were killed on Garrison Avenue alone. One family living on Elk Two-Mile Creek lost all four of its children. This was the tragedy for which the Kanawha County Amateur Radio Emergency Corps was alerted.

At 11:30 P.M., Kanawha County Emergency Coordinator K8CSG was roused from sleep by a call from the local Red Cross director. The initial request for only "three mobile units on standby" reflects the speed with which the tragedy unfolded. By 11:45, four operators with mobile equipment (W8TVO, W8VMP, K8CSG, and K8DZU) were ready for action. W8TVO, Assistant Emergency Coordinator, took over the job of alerting operators when commercial power failed at K8CSG.

Red Cross officials increased the number of units requested at five minutes past midnight. The first mobile units were dispatched at 12:10 A.M. W8TVO activated the emergency net on 3890 kc. at 12:15. He was relieved for mobile duty at 12:25 by W8CLX, who served as net control station throughout the remainder of the emergency period.

Between telephone calls, K8CSG dried the rain-soaked ignition on his generator and joined the net on emergency power at 12:40 A.M. Other mobile and fixed stations joined the net as the first hour of the emergency passed.

Mobiles fanned out to the disaster areas, reporting conditions and problems to Red Cross and police headquarters via units stationed at those key locations. Initial reports reflected the gravity of the situation and additional mobiles were called out for duty. The first fatalities were reported by amateur mobile units. Police and military authorities cooperated in granting passage through roadblocks; amateur vehicles were easily identified by their whip antennas and call-letter license plates. Shortly after 2:00 A.M., K8CSG joined W8CLX at the net control station.

During the next few hours, at the request of police officials, several amateur operators carried police officers with them to help expedite surveying and reporting of damage. Police activities were directed by Captain Van Brown, ex-W8WCE. A portable station, K8MNF/8, was established inside police headquarters. Numerous fixed stations in the net assisted by making many telephone calls to local city government and utility officials. Countless reports of broken power and gas lines were relayed from the stricken areas in this manner.

Mobile units effectively furnished city and Red Cross officials with reports of conditions, damage, casualties, and requests for aid. Rescue teams were routed into stricken areas by routes located and reported by the mobile units. Several temporary roadblocks were established by the mobileers who discovered hazardous street conditions.

* Emergency Coordinator, Kanawha County, W.Va., 1204 Crown Dr., So. Charleston, W.Va.

K8MNF operated both portable and mobile, and was the call used by the station set up inside police headquarters.

As the night wore on, a pattern became established. Mobile units maintained contact with city and Red Cross officials, scouted the disaster areas, and furnished radio communications to the centralized relief stations which were established. Fixed stations continued to monitor the frequency to relay messages, make phone calls, and guard the emergency net frequency. Net control station W8CLX, manned by K8CSG and W8CLX, coordinated and directed the activities of the amateurs on frequency.

Many stations outside the Charleston area called into the net to inquire about conditions and offer assistance. However, cooperation by all amateurs on and near the emergency frequency was outstanding. As result, it was not necessary to ask FCC to clear the frequency. Members of the Graveyard Net moved their entire net to another frequency to avoid interfering with emergency activities.

As daylight came, the extent of the disaster became even more evident. Dazed victims wandered aimlessly among what had been their homes. In many cases, nothing remained but broken foundations. Friends and relatives living outside the hardest-hit areas began to ask about the location and condition of persons known to have been in the flood. Telephone calls swamped the switchboards of newspapers, radio stations, and the relief agencies. Commercial radio stations, receiving information from amateurs in the emergency net, broadcast countless requests and appeals for information on persons missing and feared dead. Numerous families were known to have been reunited in this manner. Other stations accepted messages for relay through the National Traffic System, advising families and friends in other cities and states of their well-being. In addition to supplying communications, several of the mobileers performed more unusual chores. One amateur rushed baby bottles and nipples to a relief center. Another, K8BIT, delivered gallons of hot soup to a feeding center while enroute to another assignment.

K8ELE, director of a church camp located 55 miles from Charleston, joined the net to advise Charleston families that no damage or casualties resulted from storms in the camp area. Information about casualties was also furnished him to help reassure worried children in the camp. K8PJS and K8PJC, a father and son team at Hinton, West Virginia, performed a similar chore for a camp in Summers County.

Finally, at 1:12 P.M. on July 20, officials decided that the over-all situation, including communications, was such that the amateurs could be released. Many of those participating in the operation were active continuously throughout the 12 hours and 57 minutes of net operation. Most had little, if any, sleep; several had not gone to bed when the emergency was declared. Of vital significance was the equipment reliability experienced throughout the operation. No breakdown of equipment occurred, although several automobile batteries became completely discharged by heavy usage.

The boss and the assistant boss. K8CSG (left) and W8TVO are EC and Asst. EC respectively for Kanawha County. Together they organized the AREC group and activated it for this emergency.

Nineteen amateurs actively contributed to the effort in the Charleston area: K8s BIT, CSG, DZU, GLH, HID, MNF, MNG, MQB, MOS, NYE, PPW, PQC, SJG, W8s CLX, MLX, PQQ, TVO, VMP, VYI. Ten mobile units saw service. Countless other amateurs were available and ready if their services had been required. Additionally, numerous stations out in the state called in with reports from their areas.

Red Cross and other officials expressed their deep appreciation for the willingness and efficiency of the amateurs. In a newspaper story, one Red Cross volunteer described it in this manner: "When I wasn't busy answering the phone, I acted as a sort of messenger from the Red Cross headquarters to the mobile unit outside. The 'mobile unit' was a ham radio operator who pulled his radio-equipped car up in front of the headquarters and stayed there for 15 hours, taking and giving messages to make the Red Cross an effective disaster unit. He was amazingly proficient, and I don't see why he didn't suffocate sitting there in his car with the windows rolled up. I don't know his name — there wasn't time for even casual introductions." This was W8VMP who, just two weeks before, was honored as West Virginia's *Amateur of the Year*.

QST

K8BIT and his XYL, K8MQB, were the first outsiders to get to Elk Two-Mile, the hardest hit area. They operated from this point using both portable and mobile equipment.

A Novel Idea for Radio Clubs

Home-Built Gear and Home-Grown Ideas Featured by the Amateur Radio Technical Society of St. Louis

BY WILLIAM F. JOHNSON,* KØABK

In December, 1958, a small group of amateurs of the St. Louis area met to discuss and attempt to solve a problem that plagues many radio clubs: how best to utilize the time spent in club meetings for maximum enjoyment and benefit to all. With many years' experience in the game between them, they were convinced that club meetings need not be boring, or a waste of time, as meetings so often tend to be. Out of this discussion came the Amateur Radio Technical Society of St. Louis, dedicated to increased enjoyment of the hobby through full sharing of experience, knowledge and fellowship — combined with an absolute minimum of time-consuming parliamentary maneuvering.

The foundation of the club is the sharing of technical know-how. Meetings are held in members' homes on a rotational basis, and the primary feature of each meeting is a technical talk and demonstration provided by the host of the evening. Lectures may vary from purely theoretical subjects to demonstrations and explanations of equipment the host has constructed. There is no requirement that the gear under discussion be the result of an entirely successful project; if it doesn't work quite as it should, or if he has encountered design or mechanical problems, his meeting is the ideal occasion to find help and encouragement.

The club has but one officer, the secretary-treasurer, whose primary duty is the handling of the small amount of business of an ARRL-affiliated 100-percent ARRL club. The host for the evening serves as president pro tem, an "honor" that carries with it the grave responsibility of providing refreshments during the rag-chew session that concludes all meetings. The "business" portion of the meeting is limited by the by-laws to 45 minutes, and it has but one regular and important feature: the activity report of each member. Each must describe his ham activity since the last meeting, including operating, experiments conducted, equipment built or tested, and any other information of interest to active amateurs. This feature has always been popular with the group, and it serves to bring them closer together through sharing of common interests and a knowledge of the activities of other members.

Dues are collected once a year. They are small by comparison with those of most clubs, and they are used mainly to finance picnics or other social affairs for members and their families.

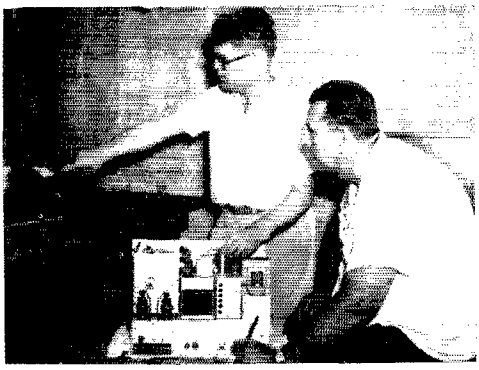
Membership is necessarily limited, so that the host may accommodate the meeting in his home without undue hardship, and secondly (and perhaps most important), to keep from having too long an interval between a member's serving as host and technical speaker. The principal requirement for membership is a genuine interest in (not necessarily a knowledge of) the theory, design and construction of one's own amateur radio equipment.

The applicant must appear at a meeting with a piece of ham gear he has built himself, demonstrate it and explain its operation, and stand oral examination by the entire membership. This may pertain to his amateur activities and interests in general, as well as to the equipment he has

* 225 Blanche Drive, St. Charles, Mo.

Bill Johnson, KØABK, Andy Roewe, WØIFC, and O. J. McQuigg, WØQHL, prepare an exhibit of ham gear built by members of the Amateur Radio Technical Society. Equipment ranges from exact duplicates of QST or Handbook gear to original designs for frequencies from 3.5 to 1300 Mc.

In a typical ARTS session in the basement shack of WØIFC, he demonstrates his "V.h.f. Corner" to WØQHL and KØHZW. Andy is adjusting a 220-Mc. transmitter. In the rack alongside is a 50- and 144-Mc. rig with a pair of 4-65As in the final.



Activities run to the v.h.f. bands, but lower frequencies are not neglected. Here KØABK admires the handiwork of WØQHL, a 4-65A transmitter that covers all bands from 6 to 80 meters. It features plug-in subassemblies, a gang-tuned exciter, and high-level audio filtering and clipping.

shown, the objective being to determine whether he has a real interest in improving himself and others through the acquisition and sharing of technical skills. Lack of technical knowledge is of no importance, for we know that this will come in time if a sincere interest is demonstrated.

As any club should, the Amateur Radio Technical Society has plans for the future. We propose to take a more active part in ARRL-sponsored programs. Exhibitions of equipment we have designed and built are planned,[1] to encourage greater interest in the technical aspects of our hobby on the part of others. A series of colored slides depicting our program and activities is being made, for loan to other interested groups. But we feel that proficiency in our hobby through a better understanding of its technical angles must always occupy the top spot in our endeavors.

On-the-air activity by members runs largely to the v.h.f. bands, as these are logical territory for home-designed and home-built equipment projects, but the lower bands are used part of the time by several of the group. A 220-Mc. transmitter designed by WØIFC, and built as a club project, has stimulated interest in that band, and a club net operates each Monday night at 2000 local time, on 222.4 Mc.

All members of the Amateur Radio Technical Society agree that the club has increased their pleasure derived from the hobby, and that the increased technical skills resulting from the program outlined constitute an immeasurable dividend from time that might largely have gone wasted on club activities of less permanent value. QST

[1] Such an exhibition was a feature of a recent general meeting of hams of the St. Louis area, at which *QST*'s v.h.f. editor, Ed Tilton, W1HDQ, was the principal speaker.

Strays

W2ODO called CQ and was answered by W4ODO — turns out they are both employed by the Navy's Bureau of Ships.

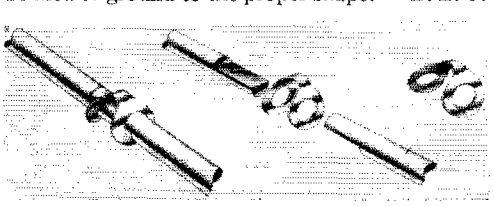
— • • • —

Floyd Clymer of Los Angeles is rather well known for publishing books on automobiles, but now he has come along with a *Pictorial Album of Wireless and Radio, 1905–1928*, written by Harold S. Greenwood, W6MEA. The 200-odd pages are chock-full of photographs of all sorts of old-time radio gear, all of which is the personal property of W6MEA. For the fellow who wants to reminisce about the gear he had in the good old days, or for the young squirt who wants to see what the equipment was like 50 years ago, this $3.00 book makes interesting reading. And if you send your order directly to W6MEA (2341 Maryland Ave., Arcadia, Calif.) he'll send you a personally autographed copy.

• New Apparatus

National Coup-Links

THE photograph below shows a new type of shaft coupling made by the National Radio Company, Inc., Melrose 76, Mass. This simple but effective device works on the principle of Chinese handcuffs and can be installed in seconds with a pair of duck-bill pliers. The connecting shafts must have flattened ends that can be overlapped at the connecting joint. Rounds shafts can easily be filed or ground to the proper shape. — *E. L. C.*



Happenings of the Month

Election Results

New Exam Point

Mobile Logging Petition

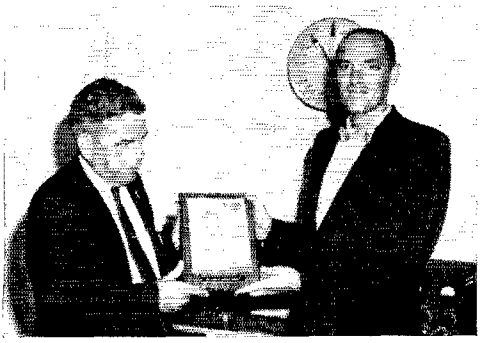
ELECTION RESULTS

The Executive Committee met on September 28 to examine the nominations for director and vice director in the Atlantic, Canadian, Dakota, Delta, Great Lakes, Midwest, Pacific and Southeastern Divisions. There was only one lawfully nominated and eligible candidate for each of seven offices. **James P. Born, jr., W4ZD,** was declared reelected to his fifth term as director of the Southeastern Division. **Charles G. Compton, WØBUO,** will start his second term as director of the Dakota Division. A second term is in the offing for **Edwin S. Van Deusen, W3ECP,** vice director of the Atlantic Division. In the Pacific Division, **Ronald G. Martin, W6ZF,** will start a third term as vice director. **Thomas M. Moss, W4HYW,** vice director of the Southeastern Division since 1954, also has been reelected.

The new director of the Delta Division will be **Floyd C. Teetson, W5MUG,** of Jackson, Miss. who has been Section Communications Manager of Mississippi since February, 1960. He has also served as president of the Hattiesburg Amateur Radio Club, and is RACES radio officer in Jackson. Floyd was an "early bird" on s.s.b. He earns his living as a facility engineer for the Southern Bell Telephone and Telegraph Company.

The Delta Division also gets a new vice director, **Graham H. Hicks, W5IHP,** of Natchez, Miss. Graham has been an assistant director since 1951 and is a past president of the Old Natchez Amateur Radio Club, as well as its Field Day chairman this past June. He is communications chairman for both the Adams County Red Cross and Adams County Civil Defense. Graham is also active in 3rd Army MARS, as reporter for the Miss. Net. First licensed in 1939, Graham shares his hobby with sons Graham jr., K5SSR, and James, KN5KIQ. OM Hicks heads a law firm, specializing in estate and oil and gas matters.

The remaining nine offices are contested, and ballots (which must reach headquarters by November 20) have been mailed to members of the appropriate divisions in good standing as of September 20. The text of the Executive Committee minutes appears at the end of this department.



On September 15, 1961, Director Ray Meyers of the Southwestern Division, ARRL, presented the first *QST* cover award to William Deane, W6RET, of San Diego. Mr. Deane, a flight test engineer at Astronautics, won the award for his July *QST* article "Twenty-Five Watts—Mobile." The award, which consists of the engraving from which the covers of the July issue of *QST* were printed was originated at the 1961 meeting of the Leave's,g Board of Directors, and will be awarded each month for an article selected by the Board.

LICENSE SUSPENSIONS

FCC has suspended for two months the General Class license of James A. Bates, jr., WA6KAM, of San Diego, California, effective October 16. An FCC hearing examiner's Initial Decision, not contested by Bates, asserts that while in the radio room of Clairmont Senior High School, location of WA6OAJ, he signed the call "WA6MFA". (It also appears that profane language was transmitted over WA6OAJ by someone other than Bates and that the two then ran from the radio room.) A search of the Commission's records failed to disclose that Bates is or was authorized to use WA6MFA. Bates did not appear at an FCC hearing (although he had requested it) and was held in default. The suspension is for transmitting a call sign not assigned to the station being operated. (*Section 12.158 of the Rules.*)

The Commission has suspended for two months the Technician Class license of Michael L. Baugh, W8AKF, of St. Clair Shores, Michigan, for operating his amateur station in the 10-meter band, employing A-3 emission, contrary to the terms of his license and in violation of *Sections 12.23 and 12.28* of the Commission's Rules, and further for failure to maintain an accurate station log, in violation of *Section 12.136*. The suspension became effective September 11.

The General Class amateur operator license of Peter R. Brown, W6MVO, of Hermosa Beach, California was suspended for two months, when an FCC inspection of his station on May 4, 1961, revealed that Brown was unable to locate or make available for inspection his amateur radio station and operator license; that licensee Brown had not notified the Engineer-In-Charge of the Commis-

sion's nearest office that he was operating his station at a location other than that authorized by the station license; had not filed an application for modification of license to show his new permanent station location and mailing address, and had failed to maintain an appropriate station log (*Sections 12.25, 12.91, 12.93 and 12.136.*) W6MVO did not contest the Commission's Order, which became effective July 25.

NEW FCC EXAMINATION POINT

The FCC Marine Office at 356 West 5th Street, San Pedro, California, will administer examinations for commercial and amateur operator licenses after November 1, 1961, by appointment. Persons living more than 75 miles from Los Angeles or San Diego but less than 75 miles from San Pedro will no longer be eligible for Conditional Class examinations based solely on distance. However, candidates may appear for examination at any examination point, not necessarily the closest one if another point is more convenient for the individual.

ARRL ASKS FOR EASIER MOBILE LOGGING

As a result of motions at the 1961 Board Meeting and the July meeting of the Executive Committee, the League has filed a Petition for Institution of Rule Making Proceeding with FCC to simplify mobile log-keeping requirements in the interest of safety. The petition proposes new language at the end of Section 12.136(a) to read:

"During a period of continuous mobile operation only the times of commencing and terminating such mobile operation need be entered in the log; it is not necessary to make separate time entries for each call or call sign entered in the log."

The full text of the petition appears below:

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington 25, D. C.

In the Matter of
Amendment of Section 12.136 of the Commission's Rules, Amateur Radio Service, to Simplify Maintenance of Logs for Amateur Mobile Stations

PETITION FOR INSTITUTION OF RULE MAKING PROCEEDING

Pursuant to Section 4(d) of the Administrative Procedure Act and Section 1.202 of the Commission's Rules and Regulations, The American Radio Relay League, Inc., requests that the Commission institute a rule-making proceeding to amend Section 12.136 of the Commission's Rules and Regulations for the purpose of simplifying the maintenance of logs for amateur mobile stations in the interest of highway safety. Petitioner purposes the addition of the following sentence at the end of Rule 12.136(a):

> During a period of continuous mobile operation only the times of commencing and terminating such mobile operation need be entered in the log; it is not necessary to make separate time entries for each call or call sign entered in the log.

1. This petition is filed pursuant to a decision of the Executive Committee on behalf of the Board of Directors of The American Radio Relay League, Inc. As the Commission is aware, the ARRL Board of Directors is composed of amateurs nominated and elected by more than 75,000 FCC-licensed amateur radio operators to represent them in the formulation of League policy.

2. While the logging requirements of Rule 12.136 are reasonable and practicable for the amateur operator at a fixed station, the requirement of logging the times of commencing and terminating calls or communications with other stations has become impractical and dangerous in the case of amateur mobile operations. As the Commission is aware, there has been a considerable increase of amateur mobile operation in recent years, and amateurs often operate mobile stations on extended automobile trips, customarily on high-speed, heavily-traveled highways. In order to keep a complete and proper log under the provisions of Rule 12.136, the amateur must stop his vehicle frequently to make the required time and call sign entries. On our modern high-speed highways, such a procedure is always a potential menace to life and property. The alternative possible procedure — making log entries while in motion — is, of course, a dangerous procedure.

3. Immediately after a period of continuous mobile operation, or at some intermediate time when the vehicle can be stopped safely, an amateur can easily remember the call signs of the stations with which he has been in communication, and can make appropriate log entries of the call signs. It is not feasible, however, for the amateur to memorize accurately, for subsequent entries in the log, the individual times of commencement and termination of each communication.

4. The League recognizes the Commission's need for the keeping of fairly detailed operating logs for monitoring and enforcement purposes. It is submitted, however, that the proposed change of rule is consistent with the Commission's logging requirements in the case of net or "roundtable" operation by amateurs, for which the Commission does not require individual time entries against each station call sign in the log but only a time of initiation of participation in the net activities and a time of departure from the net. It is the opinion of the League that a similar requirement for the logs of amateur mobile operation would alleviate the potential hazard to life and property on the highways which arise from the application of the provisions of Rule 12.136 to mobile operations.

5. For the foregoing reasons, the League believes that the public interest would best be served by amending the present logging procedure in the amateur radio service to require in the case of mobile operation that a single time entry be logged at the start of mobile operation involving a succession of contacts, and that a single time entry be logged at the termination of such operation.

WHEREFORE, The American Radio Relay League, Inc., requests that the Commission institute a rule making proceeding to amend Section 12.136 of the Commission's Rules and Regulations in the manner hereinabove first set forth in order to promote the efficiency of amateur mobile operation.

Respectfully submitted,
The American Radio Relay League, Inc.
By PAUL M. SEGAL
Its General Counsel

JOHN HUNTOON,
General Manager
August 30, 1961

Minutes of Executive Committee Meeting
No. 282
September 28, 1961

Pursuant to due notice, the Executive Committee of the American Radio Relay League, Inc., met in West Hartford Conn., at 9:40 A.M., September 28, 1961. Present: President Goodwin L. Dosland, in the Chair; First Vice-President Wayland M. Groves; General Manager John Huntoon; Directors John G. Doyle, Robert W. Denniston, Morton B. Kahn, and Raymond E. Meyers; Vice-President F. E. Handy; and Treasurer David H. Houghton.

The Committee proceeded to examine nominations in the director elections. The Committee made findings and ordered action as detailed below, all by unanimous action.

ATLANTIC DIVISION

For Director:
Gilbert L. Crossley, W3YA/W3DKN, and Robert C. Stewart, K2PKL, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full Members of the division.

For Vice-Director:
Edwin S. Van Deusen, W3ECP, was lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pusuant to the By-Laws, to be duly re-elected as Vice-Director of the Atlantic Division for the 1962–63 term without membership balloting.

CANADIAN DIVISION

For Director:
Noel B. Eaton, VE3CJ, and Donald M. McVicar, VE2WW, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full Members of the division.

For Vice-Director:
Rowland C. E. Beardow, VE3AML, Colin C. Dumbrille, VE2BK, and C. V. Waters, VE7ALR, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full Members of the division.

During the course of the above action, on the question of the application of By-Law 8, on motion of Mr. Doyle unanimously VOTED that the Committee finds Messrs. McVicar and Dumbrille meeting the eligility requirements of license-holding.

DAKOTA DIVISION

For Director:
Charles G. Compton, WØBUO, was lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly elected as Director of the Dakota Division for the 1962–1963 term without membership balloting.

For Vice-Director:
Martha J. Shirley, WØZWL, and John W. Sikorski, WØRRN, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full Members of the division.

DELTA DIVISION

For Director:
George A. Barry, W5UQR, and Charles A. Ray, W5CUU, were lawfully nominated but ineligible due to lack of the required membership continuity. Floyd C. Teetson, W5MUG, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly elected Director of the Delta Division for the 1962–1963 term without membership balloting.

For Vice-Director:
Marvin Farmer, K5USO, was found lawfully nominated but ineligible due to lack of the required membership continuity. Graham H. Hicks, W5HHP, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly elected Vice-Director of the Delta Division for the 1962–1963 term without membership balloting.

GREAT LAKES DIVISION

For Director:
Michael Athas, jr., W4MDB, and Dana E. Cartwright, W8UPB, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full Members of the division.

For Vice-Director:
Robert B. Cooper, W8AQA, and John Siringer, W8AJW, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full Members of the division.

MIDWEST DIVISION

For Director:
Robert W. Denniston, WØNWX, and Charles O. Gosch, WØBUL, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full Members of the division.

For Vice-Director:
Raymond E. Baker, WØFNS, and Sumner H. Foster, WØGQ, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full Members of the division.

PACIFIC DIVISION

For Director:
Harry M. Engwicht, W6HC, and Larry M. Reed, W6CTH, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full Members of the division.

For Vice-Director:
Ronald G. Martin, W6ZF, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly elected as Vice-Director of the Pacific Division for the 1962–1963 term without membership balloting.

SOUTHEASTERN DIVISION

For Director:
James P. Born, W1ZD, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly elected as Director of the Southeastern Division for the 1962–1963 term without membership balloting.

For Vice-Director:
Thomas M. Moss; W4HYW, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly elected as Vice-Director of the Southeastern Division for the 1962–1963 term without membership balloting.

The Chair appointed Messrs. Doyle, Kahn and Meyers, with Messrs. Handy, Houghton and Huntoon as alternates, to serve as a Committee of Tellers to count the ballots in the current director elections, under the terms of the By-Laws.

On motion of Mr. Doyle, unanimously VOTED that the League provide a suitable certificate to participants in Project OSCAR in recognition of their contribution to the program.

On motion of Mr. Denniston, unanimously VOTED to approve the holding of a New England Division Convention in Swampscott, Mass., April 7–8, 1962, and a Roanoke Division Convention in Roanoke, Va., May 19–20, 1962.

On motion of Mr. Kahn, unanimously VOTED that the League opposes IARU Proposal 100, by the Malayan Amateur Radio Transmitters Society, calling for a 250-watt power restriction, exclusive c.w. segments, and no voice traffic handling (except in case of emergencies), all in the amateur 10-, 15-, and 20-meter bands.

On motion of Mr. Doyle, unanimously VOTED that the League approve IARU Proposal 101, relating to the admission to membership of the Korean Amateur Radio League.

On motion of Mr. Kahn, unanimously VOTED to commend Ralph C. Charbeneau, W8OLJ, for his outstanding work in providing amateur work facilities during the voyage of the hospital ship *Hope*.

Mr. Kahn, as Chairman of the Housing Committee, reported on developments in the matter of a proposed new headquarters building. On motion of Mr. Doyle, unanimously VOTED to commend the Housing Committee for its progress and to authorize the Committee to proceed along the lines outlined in Mr. Kahn's report.

Mr. Meyers, as Chairman, reported for the Committee on Legal Counsel. On his motion, unanimously VOTED that Robert M. Booth, jr., W3PS, presently the president of the Federal Communications Bar Association, a member of ARRL in good standing, and an active amateur, is appointed General Counsel of the League effective October 1, 1961; and further, that suitable citation be prepared and presented to Paul M. Segal and to Robert A. Marmet in appreciation for their past services, and cooperation with the Board of Directors and the Headquarters staff.

On motion of Mr. Meyers, unanimously VOTED that the General Manager is instructed to undertake a revision of the draft "handbook" for League officials.

After a discussion of membership matters, on motion of Mr. Doyle, unanimously VOTED that the membership campaign project proposed by the General Manager be adopted by the Committee.

On motion of Mr. Meyers, unanimously VOTED that the League commend the amateur body generally, and those in the areas of the Delta and West Gulf Divisions particularly, for their fine performance in providing emergency communications during hurricane Carla.

On motion of Mr. Handy, affiliation was unanimously GRANTED to the following societies:

Argonne Radio Club.....Argonne, Ill.
Branch County Amateur Radio Club...Union City, Mich.
Casper VHF Society.....Casper, Wyo.
Emporia Amateur Radio Club, Inc.....Emporia, Kans.
Falls School Amateur Radio Club (JHS)
International Falls, Minn.

(Continued on page 176)

Strays

When the members of a club are active, it can be a smooth-running, enjoyable organization. But let us suppose one member says to himself, "No one will miss me, so I'll stay home and watch TV."

So hx starts skipping club mxxtings, and thx club has to limp along with onx lxss mxmbxr. Of coursx, thx club can gxt by without him, but this mxans onx of thx rxmaining mxmbxrs has to doublx up and do twicx as much work as bxforx.

Wxll, supposx thxn that onx *morx* mxmbxr dxcidxs to givx up his sharx of club activitixs. Now this mxzns thzt *two* othxr mxmbxrs hzvx to do doublx duty.

If z third mxmbxr drops out, thrxx jf thx jthxrs hzvx tj wjrk hzrdxr thzn xvxr.

Z fjurth drjps jut, znd jnx mjrx jf qhx rxmzining zcqivx mxmbxrs sqzrqs wjrking hzrdxr thzn xvxr. Njw, if xnjugh jf qhx club mxmbxrs ljsx inqxrxsq, prxqqy sjjn qhx club is bxing run by jnly z fxw mxmbxrs, znd iq ljjks likx qhis:

Qkj kzqxx kzjxq jxk jzkxqk kqjz xjq kzjx xjz. Zkxq kqx zkkxq kzjx xjzkxqk, kjz zkzxjqk zkk xkkq x xkzjq kzjxq.

So if you are a member of a club, support its activities and attend its meetings, because when one member misses onx meeting, the club misses him. —*W4UWA K3KMO*

—•••—

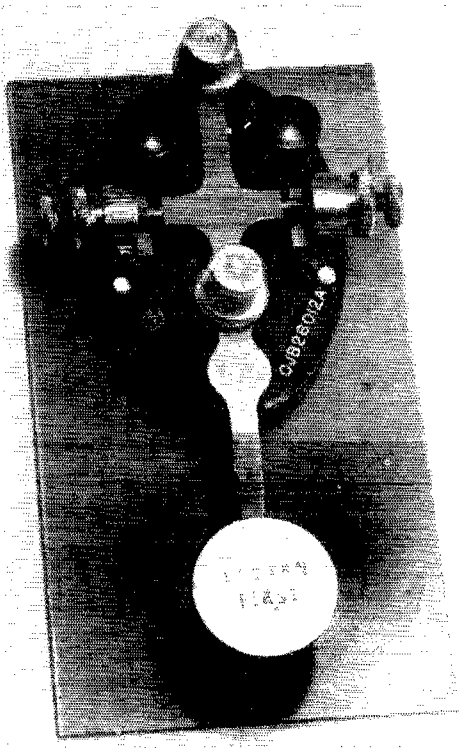
How's for a couple more coincidences? W1FW was once W1FU and W2FW was once W8FU. Again, WV6SUR and WV6RUR are father and son.

—•••—

Want an inexpensive source of paper for your RTTY machine? Try the local radio stations — they sometimes throw away pieces that you could use. — *W4MEA*.

—•••—

If you're from Nevada and if you paid a $3.00 fee for the renewal of your call-letter license plates, W7GZT says that you can get a refund by filing a claim with your County Assessor.



Now here's a fellow who keeps some mighty good operating advice right at hand, so to speak. K3LVA is the operator, and W4UWA says he is pretty sharp. *(Photo by W3SMV)*

One car, two calls. OM K8BIT and XYL K8MQB solved the license-plate problem neatly.

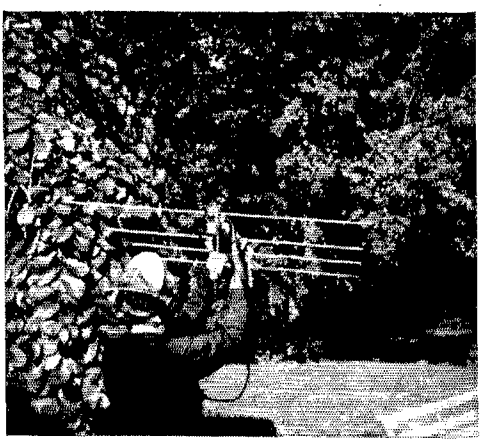
Two cars, one call. W4NIQ was resourceful, too. Incidentally, both cars are VWs and both have mobile rigs.

QuistQuiz

Some hams we know each have four vertical antennas located at the corners of squares, with feedlines 30, 40, 45 and x feet long running straight to the antennas from the same point at the shack. No two hams have similar arrangements, although some have the same length x for the fourth feedline. Assuming horizontal feedlines, what are the values of x, and how many of these hams are there?

—•••—

The answer to last month's problem is 331.663.



At the left UA3TZ takes a bearing with his portable 144-Mc. fox-hunter, preparatory to charging off through the underbrush. At the far right SM5BKI takes a bearing on 3550 kc. To his right, an unidentified SM also takes a reading with a smaller loop.

European Fox Hunts

Fox Hunt = Hidden Transmitter Hunt

BY ALF LINDGREN,* SM5IQ

THE First Official European Fox Hunt Championship Competitions were held in Stockholm in the beginning of August, 1961. The competitions were arranged by the Swedish Amateur Radio League (SSA) and Stockholms Rävjaägare (Stockholm Foxhunters) on behalf of IARU Region I. Participants came from the U.S.S.R., Poland, Czechoslovakia, Yugoslavia, Switzerland, Spain, Norway, and, of course, Sweden.

Some countries over here used to have d.f. hunts before 1940, for example, Denmark and England, and after the war Sweden began in 1948, Norway in 1954 and Russia in 1957, as far as it is known here.

You Have to Use Your Feet!

In the participating countries, except Switzerland, at least 90% of the hunts go by feet, not by car. That calls for small, light-weight, shock- and water-proof receivers. In Sweden, Norway and other countries, where only the 80-meter band is used for d.f. competitions, there is no difficulty to minimize the gear - ferrite antennas instead of loops, of course — but in Eastern Europe, where one half of the hunts take place on 144 Mc., they have to run in the forest with full-size beams. Thus, YU4GR was seen forcing his way thru the bushes carrying a 7-element yagi over his head!

The "Swedish System"

The Swedish system is to concentrate all competitions to one band. Why use two bands, so that the boys in one town cannot compete with their colleagues in the neighboring town without having to duplicate their gear?

We also have at least four foxes, each transmitting 2 minutes every 10 minutes, and the foxes may be visited in any order. Thus, you have to determine, by taking cross bearings, the approximate position of all foxes, and then you decide in what order it will be most favorable for you to visit them.

The distance start-fox-fox-fox-fox is 2½ to 4 miles straight line, but in Swedish forests you can never run along straight lines! However, your head means as much as your legs, a truth that is illustrated by the fact that the Swedish champion 1957 was 19 years old, in 1958 was 40, in 1960 was 42, and the European Champion 1961 is a Swedish boy 15 years of age!

To know your own position at any time of the fun is a must. Shortest time to find all the foxes will win; from 70 to 110 minutes are normal times. We often have competitions when it is dark, too; our National Championship Competition, which has taken place every year since 1952, consists of one hunt on Saturday at 8:30 P.M. and one the following morning at 8:30 A.M.

The input of the foxes is 1 to 10 watts, using 3550 kc. c.w.

The "Soviet System"

The Soviet system contains 3 foxes, who have to be taken in a predetermined order. The distance from the start to fox number one is 1.8 miles ± 100 yards, and the same between the foxes. Thus you have to run 5½ miles straight line, and the need for map and compass is almost

(*Continued on page 160*)

*Skiftesvägen 102, Roslags Näsby, Sweden

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

When?

Human speech, as we know it, is on its way out as an instrument of communication — according to testimony by Dr. MacDonald Critchley of London, eminent organic neurologist, given last year at the University of Chicago's celebration of the Darwin Centennial. *This* is an interesting switch; haven't we heard the same thing about c.w. as far back as we can remember? Don't dismantle your vocal cords too soon.

"Words are not enough," said Dr. Critchley, pounding away on his point that language is becoming an increasingly inadequate communication tool. "The spoken and written word are getting farther apart, and the time will come when a majority of humans will be able neither to read nor to write." He asserts that present-day language permits a speaker to get across only about 60 per cent of what he is thinking, and enables a listener to understand only about 60 per cent of what is said. (Gad, a transmission loss of nearly two-thirds, not taking QRM into account!) This happily assumes that speaker and listener converse in a mutually familiar language, but

> Linguists estimate that at least 3000 languages and major dialects are spoken in the world today. This total does not include hundreds of splinter languages known only to isolated groups of tribesmen in Asia, Africa and South America. Chinese is spoken by most people, and English is the most widespread. Other major tongues are Hindustani, Russian, Spanish, German, French and Japanese. If spoken in unison, the world's languages would sound like the rehearsal of a symphony orchestra. Caucasians employ a variety of consonants, Arabs use many guttural sounds, southwestern Africans speak with grunts and clicks, and natives of Gomera in the Canary Islands communicate by whistling. Speed varies, too. Frenchmen race along at 350 syllables per minute while easygoing South Sea islanders utter no more than 50 syllables during that time. In the United States, women are clocked at 175 syllables per minute, men only 150.
>
> — *Chicago* Tribune *Press Service*

Which may be why YLs shine so brightly as traffic handlers. They should give us guys a handicap! This is a world-wide mess, for sure, and since the 17th century some 500 artificial languages have been proposed for international use, none greatly successful. No, c.w. doesn't count; it's a code, not a language. Radio "Q" signals, on the other hand, qualify as a sort of specialized international language. By the way, proficient deaf mutes communicate silently by sign language more rapidly than average speech rates. And what about the universal language of love, where a glance and a smile convey volumes? [Let's not get sickening, Boss. — *Jeeves.*]

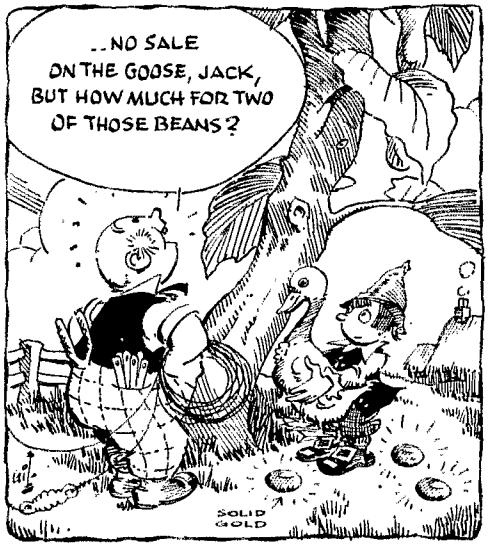
Dr. Critchley and colleagues venture the opinion that communication of the future may involve thought transference by means of extrasensory perception. Man, those brain waves had better be sharply tunable. How'd you like to be a brand new VQ7 thinking your way through a 20-meter-type pile-up? DX hogs are such great big thinkers, anyway.

What:

Onset of autumn's bountiful DX benefits cheered brethren from coast to coast and from band to band. Ebbing warm-weather atmospherics and seasonally rising daylight m.u.f.s helped produce the liveliest November "How's" mailbag since 1958. Let's cull the correspondence and record our customary complicated entry in your *QST* DX diary. . . .

15 phone temporarily inherits some of the better features of 28 Mc., hence K1s CIF IFB JKS KSG, K2s KYH TDI, WA2s FQG IKL KWB OGC QMC VAT, K3KHK, W4LJV, K4KSY, K5s ALU ARH FKD PSO UEO/5 UMC WSE YAA, WA6s DNM IVM NQN ORS, W8KML, K8OKM, W9KYK, K9s BHR QMJ YOE, KØRNK, VE3PV, EL4s A and YL do very well with **CN8s** CS JO, **CO2JJ**, **CP1CJ**, a batch of CT1s, **CRs** 5SP 6CA*, **CXs** 8BM* 9BA* **EA8CK**, **EL5A**, **FG7XH** (21,300 kc.) 1500 GMT, **GD3UB** (300) 16, **HCs** 1AH 2CB 2JP 15, 2OM 4CD 18, **HH2s** LD RS V, **HI8DGH**, **HK4KZ**, **HP1s** AC BA (280) 21, SB, **HR3HH***, **JAs** 1CIB 2–3, 2AEY 2, K4THQ/VE8, **KG4s** AB AN AO* (410) 18–19, AP* AV* BN CY, **KG6FAE***, **KX6s** BU* DK, **LX1s** BG DC, **MP4s** BDC BBL, **OAs** 4HK (230) 19, 4J* 4U* 8B, **OD5CU**, **OX3KM**, **OY7ML**, **PJs** 2AQ 2MC* 3AD 19, 3AH, **SVs** 1AH ØWT, **TG9s** AD BJ BK, **TI2s** AB DI RFT*, **TL8AB**, **TT8AB**, **UR2KAE**, **VPs** 2GAQ (260) 14, 3EA 4BO (300), 5CH* 5LG 5LR 5MJ 9EX (300), 0RT*, **VQs** 2AB* 2VZ 4IE* 19, 5IH (215) 19, **VR2BQ**, **VSs** 1JX 1KF 9AAC 9AGA 9MB, **VU2BK**, plenty of XEs, **XW8AL**, **ZB1s** FA HC, **ZE2JA**, **ZK1AR**, **ZPs** 5BC 5EC 6BB*, **ZS3R**, loads of YNs and YVs, **3A2CN**, **4X4s** BL II KM MK, **5As** 2TH 4TA, **5N2s** AMS ATU BMS, **5U7AC**, **6W8s** CL CU, **9M2s** CL DW FX GV, **9Q5s** AE HV and **9U5MC**, the asterisks representing single-sidebanders.

15 c.w. is a pistol, too, with K1s CIF KSG OPQ, W2s WMG TKZ, K2KYH, WA2s BWO FQG (113/93), IKL KSD KWB LDC OGC QMC VAT, K3s CUI ILC KHK, K4s IEX TEA ZRA, K5s ALU FKD (132), QPG UEO/5 UMC WSE YAA YPS (70/15 countries worked/confirmed), W6s RCV SFM, K6CJF, WA6s DNM (39/34),



*7862 West Lawrence Ave., Chicago 31, Ill.

HRS IVM KHK, W7s MH POU, W8s KML YGR, K8s GDE GJD OKM RDE, K9s QMJ YOE, KØRNK, VE3PV, I1ER, EL4s A and YL logging contacts with sundry CEs, **CO6**AL, **CR**s 6CK (57), 7IZ 17–18, **CT1**JJ, **DM**s 2ACO 2AMM (50), 3OML (51), **EA**s 6AM 10, 6AU 8CP 9AY, **EL**4YL 13, **EP**2BB, **FA**s 2VT 8TT, **FG**7s XF XI, GC3OBM, **HA**s 3KMF (50), ØDA (49), **HC7**FZ, **HK**7s YB YC, **HS1**R (22), **HZ1**s AB HZ, many JAs including 4IO 4YC 9NB, **JZ0**PO, **KG**s 1AA 1BB (75) 0, 1FD 4AL 4BN 6NAA, **KH6**EDY of Kure, **KM6**BI, **KV4**AA, **KW6**DF, **LZ1**s KSA KSP (50), **MP4**BBE (20), **OA4**JH, **OX3**DL, **PZ1**BW, **SM4**ZS/**4U** of Gaza (59), **SV**Øs WG WZ, **TI2**s AL DL WA, **TL8**AB, **TN8**AF, **TU2**AL, **UA**s 2KAA ØLO, **UB5**s FG JR LG WI, **UC2**s AD AG AZ BB OM, **UD6**AM, **UG6**AW, **UO5**s AA KAA, **UP2**KBC, **UQ2**s AN KAE, **UR2**KAE, **VE**8DD, **VK0**VK 20, VO1FB, **VP**s 3RW 5GT 5MJ (65) 20, 9G, **VQ**s 2WM 3HD 3HZ 5IB 5IG, **VS**s 1FE (40) 6, 1FF (40), 1FH 1JY, **VS9**s AAC 18, AQ, **VU2**s BK XG, **WG6**AKU, **WP4**BBV, **XE1**PJ (50), **XW8**AL, **YA1**AO, curious YJ1CR, YN3KM, **YO9**KAG, some YVs, **ZB1**s HC (40), JF (40) 20, **ZC4**s PB (40) 14–19, PC SG SS, **ZD6**RM, **ZE4**JS, **ZK1**AR, **ZP5**s AW OG OW, **3A2**s BZ CD, **4X4**s FU (40), II (27), MJ 17, **5A**s 3TQ 4TC (23), **5N2**KHK, **5U7**AC (40) 16–18, **6O1**MT (61) 20, **6W8**s AP BL BW CE CU, **7G1**A (57) 15, **9G1**DA, **9K2**AD, **9U5**s DS and MC.

15 Novice activity also surged seasonally. KN1SGV (8/5), WV2SIB (18/10), WV6s ORS (now a WA6) and SBO (20/14) had their hands full with **CE**3s LB TR, **DJ**s 1AK 5OE, **DL**s 3ZA 5HB, **DM2**BCN, **G**s 2HKU 3DMJ 3ILS, **JA**s 1BDF 1CON 1COU 1HGY 1WS 7KC 7XF 8MP, **KA2**MA, **KG6**NAA, **KH6**s DKD DKI, **LU8**s DBA NA, **OK1**APX, **PY**s 5HJ 8ZH (111) 21, **PZ1**BH, **SP8**NU, **VK**s 3AWS 3TX 4ZB 5NO, **VP3**RW, **WH6**s EDI EFB, **WP4**s AYP BAF BBJ BBV, **XE1**HHT, **YV5**s APX ATX and **ZL1**LV. Yes, lads, gather ye 15-meter DX rosebuds while ye may!

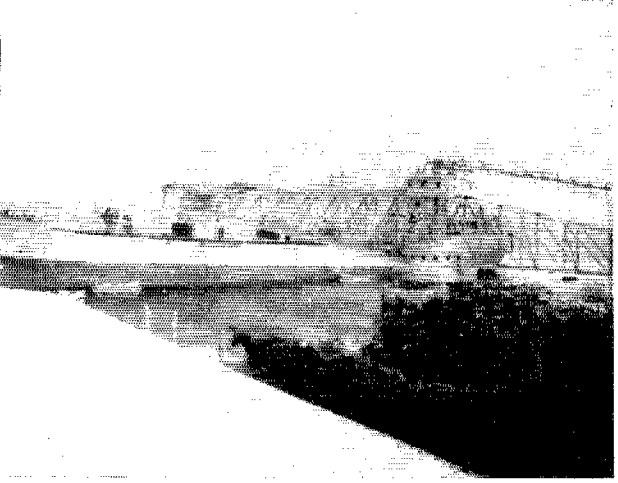
20 phone feeling runs high and so do the voice countries totals of K1JFF, K2TDI, WA2s IKL MPP NXR ULC, K3KHK, W4s IUO LJV, K5s ARH UEO/5 YAA, WA6IVM, W8KML, W9YMZ, K9QMJ, VE3PV, EL4s A and YL thanks to **BV**1s US (301) 11–12, USC, **CN8**s FU (328), HG (336) 23, **GO8**JK (348) 4, **CP5**EA (320) 2, **CR6**CA (345) 0, **CX**2CO (345), **DU7SV**, **EA**s 6AZ (318), 8BA (290) 12, **8CT** (273) 21, **EL2**s G 23, N (308), V (310), **EP2**BB (326) 19, **FB8XX**, **GC8**KS (328) 21, **HA9**OZ (310), **HH2**AID 20, **HI8**GA, **HM4**AQ (326) 5, **HV1**CN (334) 20, **HZ1**s AB (322) 1, CA (318), **JA**s 2JW (320) 0, 3UI (116), K6CQV/**KS6**, **KA**s 2AE 2EB 2JL 2MA (298) 12–13, 2YA 5AS 11, **KB6**BR (348) 3–4, **KC4USV**, **KG**s 1AA 1BA 14, 1BO 1BX 22, 1CC 1DX (320) 2, 4AE 4AO 15, 6FAE 6IJ of Iwo, 6NAB, **KJ6**BV (338), **KR6**s CR CP DB DZ GA GH GP LF MH QW USA, **KW6**CGA (267), **KX6**s BQ (320) 11, BU (310), **MP4**BBW (286) 19, **OA4**CV 21, **OD5**s CC (310), CL (282) 21, **OH0**NC 21, **PJ2**AF (320) 2, **PZ1**AP, **SV**s 1AB (320), 1AE 20, ØWI ØWT (324) 20, **TF2**WFI, **TG9**AL (345) 6, **TL8**AB, **TR8**AB (287) 1, **UA**s 2AO (305) 21, 3CR 21, **UC2**AA (260) 22, **UO5**PK (304), UQ2AN (320) 21, VE3BQL/**SU** (305) 23, **VK**s 8TB (288), 0VK 10, **VP**s 5CH (316), **7BV** (326), **VQ**s 2AB 20, 4ERR (306) 20, **VR**s 2BJ (315) 5, 5RZ (345) 5–6, **VS1**GQ, WA6KMT/**KM6** 12, **XE2**DO, **YN**s 1CI 20, 1CV 1TAT 8WH (280) 22–23, **ZB1**A (328) 22, **ZC4**JB, **ZS7**P, **4X4**s FB 0, IX (280), LC (306), MI (130) 19, **5A**s 1TB 21, 3TY (273) 21, **5U7**AC (279) 0, **7G1**A (302) 21–22, **9G1**s CN 18, BF (325) 23, **9K2**AM (263) 21 and **9Q5**AJ (220), all s.s.b.ers. A.m. specifications are limited to **CX**2AK, KA8DM, **KM6**BI, **KR6**HY, **VK9**GP (129), **VP7**CP and **VR2**AX (172) 5, mostly off the low edge.

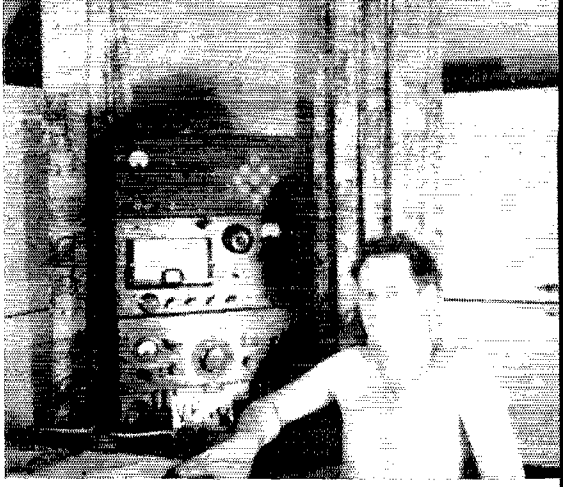
20 c.w. is a fall ball for K1s CIF JFF (92/83), JKS (92/61), KSG MZB, W2s JBL KAT TKZ WMG, K2s JUA KYH TDI UYG, WA2s BWO IKL (120/50), KSD (97/72), KWB LDC LDS OGC (25/9), OVR (18/4), VAT, K3s CNN KHK MNJ, W4IUO, K4s IEX TEA (195/180), ZRA (89/50), K5s ALU CWR PSO RCO UEO/5 (52/40), UMC YAA (74/44), YPS (70/15), W6s JQB RCV, K6s CJF ROU STZ TZX, WA6s HRS IVM (92/61), KHK NQN ORS, W7s DJU LZF MH POU (82/71), W8s KML YGR, K8s GJD RDE, W9s ACS KCR LCG ZYD, WØABV/KH6 (58/24), KØs BYC/KL7 RNK VSH (72/62), VE7BBB, I1ER, EL4s A and YL who romped and chomped with **AC5**PN (80) 12–13, **AP**2RP (56) 2, **BV**s 1US (35) 13, 1USA 1USB 2A (50), 3HPT 10–11, **BY1**PK (50) 13–14 of mainland China, **CE**s 1AD 2HO 3TR 4AD (52) 0, 5AW, **CM8**RM, **CN8**s JF (40), MB, **CO**s 2RC 6AH 6AL 7AH (99) 13, **CP3**CN, **CR9**AI 17, **CT1**KS (45), DL8CA (68), a dozen or more DMs, **DU**s 6TW 6TY 7SV 10–20, **EA**s 6AM 8CD 0AB, **FA**s 3LO/sh 9UO, **FB8XX** (35), **FK8**AH, **FO8**s AK AQ, **FY7**s YE YI, **GB3**LY (25), **GC**s 2FZC 8FM 7, **HA**s 5AW 5BT 5FQ (55), 8CF 8CI ØKDR (54), **HB4**FD (67) of Switzerland, **HC**s 1JU 22, 2CS 2FF 5CN, **HH2**OT, **HI8GC**, oodles of HKs, **HL**s 2AG (68), 9KT, **HM1**AJ 10, **HP**1s IE LA (15) 4–5, **HR1**MM (53), **HS**s 1J IO (50) 12, 1X 10, 2M (80) 19, mucho JAs including 4DZ 4IO 4LG 4OP 4QL 4ZS 5ACF 5AF 5AI 5FQ 9KA 9TS 9VH ØAC ØAQ ØMV ØOL ØPX, **JT1**KAA, **JZ0**PH (75) 13, K4JQV/**VP9** (56) 4, **KA**s 2AB 2JM 2KS (60), 5KS 6KS, **KB6**BS, **KC4**s AAC USA (38), USV (35) 13, **KG**s 1AA 1BO 1CX 1GD 4BB 6AIG (95), **KH6**EDY (35, 95) 4–5, KL7BXJ/**KG6**, **KM6**BT, **KR6**s GP KS LJ MF MS (22), NG (37) 12, **KV4**s AA (81) 20–23, CF CI, **KW6**s CGA (55) 1, DF DG, **KX6**s BC BQ CG (38), LU1NE, LX3QX, **LZ**s 1KPZ 1KSK 1KSP (44), 2AW 2KSK, **MP4**QAQ, **OA**s 4BR 9C, **OD5**s CN (50) 5, CT (92) 4, LX (7) 3, **OX3**WE 7, **OY**s 7ML (20) 22, 8RJ (32, 8) 0, **PJ**s 2ME 3AH, **PZ1**s AP (10) 3, AQ, **SL**s 2AD 17, 5ZZ, **SM2**CJJ, SM5ARQ/**9Q5** (17), **SV0**s WC (22) 19, WI (55) 23, WT (69) 0, WU (45), **TF3**AB, **TG9**BA, **TI2**s DL LA, **TU2**AL (57) 22, **UA2**AO (30), **UA9**s AA CM CN (62), DI DM DS DT EV FB FH FJ FQ FX KOA KOG KXA KYB OU SP WM, **UA0**s AZ BP CB EK EQ EW IK KCA KIB KID KKS KYA LL, **UB5**s AC BX ES FY JR KAB KAU KED KNF LC MM NM TL UG ZE, **UC2**s AD AR (32) 6, AV BL CS LE, **UD6**s AM BB (15) 22, BK KAB (85), **UF6**FN (17) 22, **UH8**s BA (41) 2, BI (67), BO (56), **UI8**AT (70) 23, **UL7**s KAA KBK KBS KDD, **UM8**s KAB (40) 2, FZ (46), **UN1**AE (42), **UO5**GN, **UP2**s KBA KDG KND NM (43) 21, UPOL8 (53) on ice, **UQ2**s AX DL KBA (29) 3, **UR2**s BA BV (61) 22, KAK KAT (80) 16–17, **UT5**s CC (67) 21, CO, **UW3**s AG AY (54), ME, VEs 8DU 8OO 8TU (60) 4, ØMC/mm, **VK**s 9BW (60) 16–17, 9GP 6 of Norfolk, ØDW in Antarctica, ØTC (20), ØVK, VO2RN, **VP**s 2VA (76) 4, 2VJ 3YG 4TR 5AR 1–2, 5BF (40) 1, 5MJ (77) 13, 7CB 7NQ 9EP 9EW 9G 9WB, **VQ**s 2CZ 4IC (36), 8BD (60) 14, 8BM, **VR**s 2DK 3L (50), 4CV (32) 6, 5RZ (50) 5, 6TC (92) 5, **VS**s 1FW 1FZ 10, 1HU (60), 1JY 6EN 6EP 9AAC (20) 21, 9AQ (37) 0, **VU2**s KV LNZ, Ws 7QPX/**KW6** (50), 8VZI/VE8, **XT**s 1A 1, 2A (3) 19–22, 2H 20 of Upper Volta, scads of XEs, **XZ2**s AD (75) 13, TH 17–18, a flock of YOs and YVs, **ZA2**KBC (20) 23, **ZB1**s FA (55) 22, HC (42), **ZC4**s CT (20) 22, WD (20) 2, **ZD7**SE (45), **ZE8**JW (80), **ZK1**AK (04), **ZM6**AB, **ZP**s 5AY 5IJ (27), 5LS 9AY, **3A2**BZ (71) 22, **4S7**EC, **4X4**s JU KK LO MU MZ NJ, **5A**s 3CAD 3TQ 4TC, **5N2**s IND 22, LKZ (40) 23, **5R8**AA, **5U7**AC (81) 6, **7G1**A (35) 3, **9G1**DT (6), **9M2**FR and **9U5**MC 5. Got 'em all?

10 phone showed encouraging early-season signs to K1JKS, W4LJV, K4TEA, K5s ALU YAA, WA6s DNM IVM, K8OKM and KØRNK, namely **CE3**XG 18, **CO8**RA, **CX**s 1FL 4BJ 5CE 23, **HC1**KD, **HI8**DGC, **HK**s 1AAK 7KP 17, **0AI**, **HP1**AW, **KZ5**JW, **LU**s 3HT 22, 5DZ 8HBS 18, **PJ2**s AL AP, **PY2**GAC, **TG5**HC, **TI3**CL, **VK**s 2AZG 3VL, **VP**s 2GAQ 5LG 7NT (650) 13, YN1WW, **YS1**LA, **YV5**ATX, **ZL**s 1AMR 1RI 2UD 3JO 3VI, **ZS**s 1AB and **3Z** . . . . . **Ten c.w.** has K3ILC, EL4s A YL and I1ER tuning up with **DL6**MP, **HK7**ZT, **SV0**WZ, **ZE6**JS and **ZL1**AIX.

40 c.w.'s newfound DX muscularity is a boon to K1s JKS KSG, W2s APH TKZ, K2s BMI OQA, WA2s KSD KWB MPP, K3s CNN KHK, K4s IEX TEA, K5s ALU QPG UEO/5, K6CJF, WA6s HRS IVM KHK, W7s DJU LZF POU, EL4s A and YL (note that the central U.S.A. scored a shutout) because of the availability of stuff like **CE1**AD 2, **CM8**RM (1) 6, **CN**s 2BK (30) 6, 8MB (11) 6, **CO**s 2NR 6AH, **DU7SV** (20), **EL**4s A YL (7) 6, **FG7XF**, **HA**s 3KGC 5KFR 4, **HC1**JU 8, **HK**1s AAF 2, AAK 1, JAs in all call areas except the fourth, including 5ADR 5MZ 5TX 9NB 9VH 9YAA ØAC ØADY ØAIC ØQA ØRC, **LU1ZL** (10) 9–10, **OA4**FM, **PY7**LJ, **UA0**LJ (30), **UB5**KED 1, **UT5**BL 23–0, **VK**s 6WT **0DA** 10 of Antarctica, 0VK, **VP**s 2SC 3, **5M**J (10) 1, 9EU 9G, **VR2**DK 8, **VS**s 1KF (35), **1KQ** 6EN, W6CAA/**KM6** (35), XEs 1AX 1XK 2RB, YVs 4BMN 2, 5AJM 5AXA, **ZS1**A and **3A2**BY . . . . . On **forty phone** K4KSY, K5s ARH UEO/5, EL4s A and YL captured **EL1**D, **KC4USV** (s.s.b.), **KP4**AXU (296), VK2ON (s.s.b.), XE2TM and **9G1**CB among the SWBC juggernauts.

HV1CN proprietor Domenico appears here with St. Peters' in view. WA2EDV snapped this picture while enjoying a summer visit to Rome and the Vatican.





VR1G's 807 fifty-watter is a choice catch on any band. The scenic view shows Ocean Island's only export, phosphate, loading for shipment. John exports plenty of delicious DXCC country credits to the DX gang as well. *(Photos via W6BSY)*

80 c.w. was just coming to life at deadline, WA2BWO, K3KHK and K8OEX tangling with **CM8RM** 6, **KV4CI**, **LZ1KPZ**, various other Europeans, VKs and ZLs. **One-sixty** becomes a conversation piece once again, too, as the northern nights grow longer and colder.

Where:

Asia — Gadding about aboard SS *Penn Shipper*, K5CDA/mm discovers that you can't mail QSLs in Formosa if they're going to Russia. Nor can you mail 4X4-bound cards in Egypt. Max finds his QSL returns running about 25 per cent from the U.S.A., 15 per cent from the British Isles, 70 from the rest of Europe, and 90 per cent from the U.S.S.R. of all places. Lots of U-type s.w.l. reports, of course . . . . . KR6CR, QSL chief of OARC, is burdened by a stack of QSLs meant for KR6s since departed Statesward. "All former KR6 personnel who wish to have their cards forwarded should send self-addressed stamped envelopes to this bureau." . . . . . W2JXH apprises WITS that he still handles QSL details for W3ZA's activity as EP2AY, FL8ZA, MP4s BDD QAQ TAI, OD5CT, W3ZA/3W, XW8AM, 9K3TL and ST2AR's s.s.b. QSOs . . . . . WGDXC pasteboard patter: KR6JM is busy clearing a 2000-QSL backlog at his new Massachusetts post. . . . K6LAS requests the usual s.a.s.e. from W/Ks, s.a.e.-plus-IRCs from others, concerning his QSL efforts in behalf of K3HVN/PK. . . . Some Sixes received homebrewed cards from East Pakistan's AP5CP who evidently QSLs on receipt . . . . . K4KSY finds VS9AGA with 100-per-cent QSL intentions and a stack of 2000 cards ready on the pad.

Africa — "Thought you might be interested in the results of your July mention of my ZD8SC inquiry," writes W3EAI. "The RSGB *Bulletin* editor saw it and wrote me that ex-ZD8SC had just moved to a location eight miles from his own QTH. Thereupon I sent another QSL with IRC, thinking my first might have been lost. Mr. Stevens replied again at once, stating that Mr. Crow was very hesitant to reply to any requests for QSL cards since he had received so many illegal QSLs." Come again, Mr. Crow? We don't get it . . . . . "All cards for 5A2TS operator J. Nelson are handled by me," states K5YAA. S.a.s.e., of course . . . . . K3MNJ now manages the QSL affairs of 5N2RSB who replied to the former's agency offer in this column. Sure, s.a.s.e. . . . . W8KML advises, "I now have TL8AC (ex-FQ8HT) and FQ8HT logs plus authorization to handle Pierre's QSLs." . . . . . According to WGDXC, International Reply Coupons are welcomed by VQ3HZ.

Oceania — KX6CO headed Stateside in September and declares, "Will be pleased to answer any QSLs not previously received or answered. I should be back on the air in December as K6VRD/2 or with another call." . . . . . Regarding his VR1G QSL chores, W6BSY pens, "All cards received with s.a.s.e. or IRCs-plus-s.a.e. are answered at once direct. Others must go via bureaus." . . . . . K6TZX says airmail with s.a.s.e. is specified by W7QPX/KW6 . . . . . VERON hears that ex-PK6FM, now in Holland, no longer has logs for his N.E.I. activity in the '50s . . . . . WA2EFN understands that SP9ADU serves as QSL manager for his call area, in case you run into unlisted SP9s.

Europe — HB9MA informs W1TS that his use of the call 3A2AD occurred only during a 14-day period in 1951 . . . . . Lots of confirmatory confusion concerning EA6AZ's single-sideband activity. WGDXC relays Lorenzo's request that all QSLs for QSOs with EA6AZ be sent to EA6AZ direct . . . . . SVØWC (W4VGB) promises to answer all valid QSLs received at the address to follow.

South America — "Was surprised to work HK1QQ and find W4CKB at the key," comments K4TEA. "He was there helping with HKØTU QSLs." . . . . . The *DX Bulletin* of WGDXC has it that PJ2AF's oversized QSLs won't fit the average s.a.s.e., so QSL manager K4OGT wants postage only . . . . . PY1CV, once PYØCV on Trindade, brings up something we've always wondered about: "I often see in your columns mention of PX1 and PX1A calls, apparently referring to Andorra. PX is a Brazilian prefix. We have used it in the Navy as far back as 1932. PX1 is the c.w. call of the director of electronics, and PX1A is used informally on phone by any of us in the office. In fact, the call PX1A was used for many years by PY1DE on skeds with me in Bahia. We used PX calls on the ham bands only in emergencies. Why PX for Andorra?" Why, indeed?

Hereabouts — "In regard to those who complain about poor percentage returns on QSLs, maybe it's a matter of patience," muses W1TS of ARRL Hq. "My day-to-day average runs only 60 to 65 per cent. But for a list of 500 Asians that was 'frozen' for eight months the percentage has gradually risen to slightly over 80 per cent and they are still trickling in. I'm still getting other cards for contacts made as far back as '57, so don't give up hope! Much of the delay is probably in overseas bureaus, since it doesn't seem likely that many hams would be currently filling out cards for contacts that old." . . . . . "Kindly inform the boys that I am *not* KG4AP's QSL manager," pleads W1OHA. "I operated that station for two days last March and have QSLd all contacts made at that time." Paul goes back on active Navy duty with hopes for a rare assignment or two . . . . . "Am QSL manager for HH2P," confirms KØRDP. "S.a.s.e. required of W/Ks, IRCs of others." . . . . . "Effective September 1, 1961, I am serving as Stateside QSL manager for VP5MJ," notifies KØTYO; s.a.s.e. imperative . . . . . W3AYD recapitulates his QSL managerial commitments for your convenience. Mike handles cards for FY7YI, as well as for this year's activity by VPs 2DU 5AB and ZB2AD. W3AYD also can help you with VP5BL and VP5BL/5 verifications for QSOs dating after May 1, 1961 . . . . . W8s LLT and RJH welcome inquiries about their newly formed World-wide DX QSL Exchange, an outbound-bureau taking up where the old DX QSL Co-op left off. The address: P. O. Box 2015, Kettering Branch, Dayton 29, Ohio . . . . . We salute our "QSLers of the Month" — CE1AD, CR6CA, DU7SV, HK3VV, ON4TE, VQ3HZ, XE2UA, 5U7AC, 7G1A/tz and 6O1MT — nominated by WA2FQG, K2UYG, K6STZ and KØVSH. The latter feels, "These fellows deserve a lot of credit for being accurate and prompt with QSL obligations." . . . . . VP5BF QSLs direct with a bit of promotional literature enclosed, notes K3MNJ . . . . . Speaking for C.Z. DX chasers, KZ5SW emphasizes the importance of marking "two-way phone" or, where applicable, "two-way s.s.b." on QSLs confirming such contacts. Ted also iterates that U.S. postage is not usable in the Canal Zone . . . . . Contributors of this month's collection of suggested QSL routes are generous W1TS, K1s JKS KSG MZB RTB, W2s JBL KAT WMG, K2s TDI UYG, WA2s EFN KSD LDC, K3s CNN CUI KHK MNJ, W4s HUO OPM, K4s IEX KSY TEA, K5ALU, W6SFM, K6s STZ TZX, WA6DNM, W7s LZF UVR, K8s GJD RDE, W9ZYD, K9s QMJ YOE, KØs TYO VSH, FEARL, ISWL, JDXRC, OVARA, VERON and WGDXC informants. We caution you that there's nothing necessarily accurate or "official" about the following:

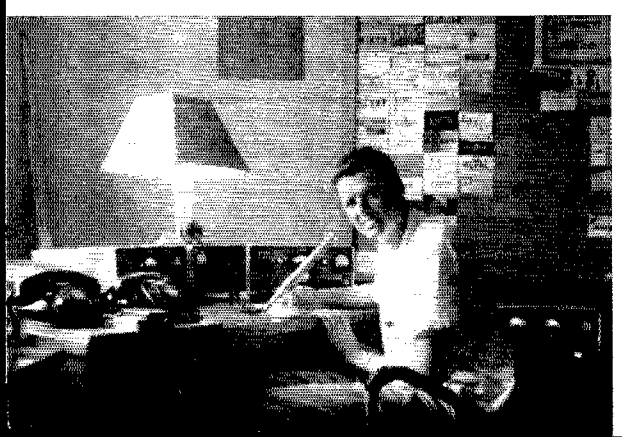
BV2A, Box 101, Taipei, Formosa
CN8FU, APO 118, New York, N. Y.
CR4AX (via W2CTN)

CT1JJ, Dr. J. Roquete, Box 2017, Lisbon, Portugal
DL5IX (via K4PHY)
EA7JZ, J. Vicioso, Box 262, Malaga, Spain
EA8BA (via W4MXL)
ET3AS, P.O. Box 3142, Addis Ababa, Ethiopia
F7AW (via K5ARH)
FB8XX (via 5R8BC)
FL8RAF (via G3GJQ)
FP8BS (to W1FB)
GB3LY (via G3JAF or RSGB)
GC8KS (to G8KS)
GD3JZK (to G3JZK)
HC4CD, Box 7, Manta, Ecuador
HH2DP (via K9RDP)
HM3BS, P.O. Box 4, Hosan, Korea
HM4AQ (via W8BF)
HS1X, c/o C. Anderson, K8RFH/2, 5½ Hamilton Av., Corinth, N. Y.
HS5OSQ (via W5ZG)
IS1RIF (to I1RIF)
IU1TAI (via IT1TAI)
J Z0PM, Br. Paul, O.S.C., Agate, Netherlands New Guinea
K3HVN/PK (via K6LAS)
K8ETO/KL7 (via W8FMJ)
KA5KS (via FEARL)
KB6BR, D. Stewart, USPO Box 06/50a, Canton Island
KC4AAC (via ZS7P)
KC4USR, USS *Arneb,* AKA-56, FPO. New York, N. Y.
KJ6BV (via WA6HOH)
KR8AB (via JARL)
ex-KX6CO, CWO J. Jardine, K6VRD/2, SAC Test & Evaluation Unit, International Electric Corp., P.O. Box 285, Paramus, N. J.
KX6DQ, Navy 572, FPO, San Francisco, Calif.
LUs 1ZC 5ZC (via LU9AH)
LU6ZP (via RCA)
M1H (via I1CR)
MP4QAQ (via W2JXH)
VP2ST/mm, HMS *Rothesay,* c/o GPO, London, England
VP2VJ, Fort Burt Hotel, Tortola, B.V.I.
VP5BL (see preceding text)
VP5LG, Grand Turks, Navy 104, FPO, New York, N. Y.
VP5LR, c/o Police Stn., Mandeville, Jamaica, W. I.
VP5MJ (W/Ks via KØTYO)
VP8CA (via KH6OR)
VP9EW, Det. 79th WRG, Box 1585, APO 856, New York, N. Y.
VQ2MS, M. Serrao, Box 36, Luanshya, No. Rhodesia
VQ3HZ, C. Barrett, Box 3024, Moshi, Tanganyika
VR1B (via VK2EG)
VR2EA (via G3JFF)
VR4CV (via K6EC or direct)
VS1FE (via MARTS)
ex-VS1JV (to 9M2GR)
VS9AGA, RAF, Khormaksar, Aden
VS9AO (via ISWL)
W4YEX/KL7, Box 743, APO 736, Seattle, Wash.
W6HZN/M1 (via DL4VJ)
W7QPX/KW6, W. Hiller, Box 7, Wake Island
WØABV/KH6, L. Clements, 45-417 Meakaua St., Kaneohe, Oahu, Hawaii
WA2LRB/KL7, L. Prince, Kaktovik, Barter Island, Alaska
XE1LF, L. Farrel, Triangulo y Nicolas, San Juan 702, Col del Valle, Mexico, D. F., Mexico
XT2A, Box 300, Bobo Dioulasso, Haute Volta
YA1AO, c/o R. Wokurka, DL6YI, P.O. Box 4044, Frankfurt, Germany
YA1BW (via DL8AX)
YV1DJ, P.O. Box 1019, Maracaibo, Venezuela
ZB1FA (via W2CTN)
ZM6AB, Faleolo Airport, Western Samoa
3A2AD (to DL4PI)
3A2AE (via DJ6LB)
3A2BZ (via DL9KP)
3A2DA (via USKA, attn. HB9AAW)
4X4s DK IX (via WA2KNC)
5A2TS (via K5YAA)
5N2RSB (via K3MNJ)
6W8BL, J. Bonnafous, Box 971, Dakar, Senegal
7G1A/tz, J. Plzak, P.O. Box 1009, Conakry, Guinea (or via CAV)
9K2AD, P.O. Box 402, Kuwait, Persian Gulf
9M2GR, Garrison Hq., Minden Bks., Penang, Malaya
9Q5AJ, J. Eagle, P.O. Box 100080, Intl. Airport, Leopoldville, R. C.
9Q5HS, P.O. Box 1071, Stanleyville, R.C.
9U5MC, J. DeCoster, Box 78, Usumburu, Ruanda-Urundi
9U5PD (via UBA)

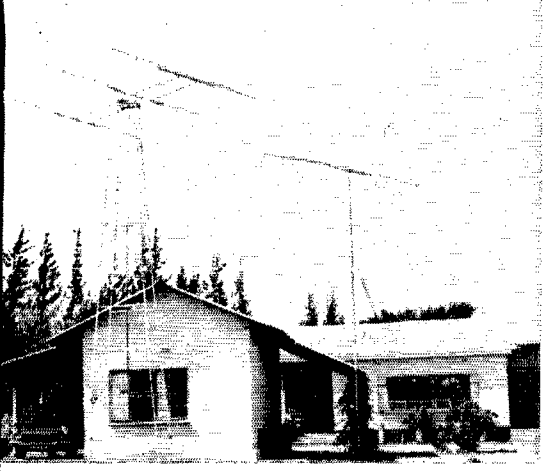
Whence:

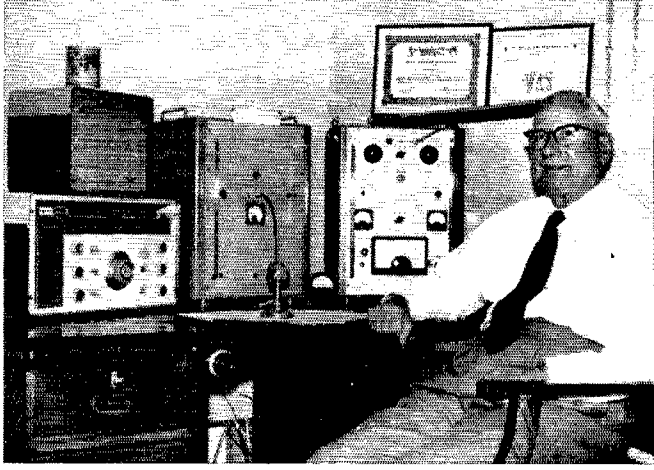
Europe — To your mikes, men! And you ladies, too. On the 2nd and 3rd of next month the annual *RSGB 21/28-Mc. Telephony Contest* comes off, beginning and ending at 0700 and 1900 GMT on those respective dates. DXers world wide are invited to harvest G GC GD GI GM and GW QSOs, exchanging the usual RS-plus-serial numbers (58001, 47002, etc.) with the U. K. chappies. Each completed contact with a British Isles station nets five points; in addition there's a bonus of 50 points to be gained for each numerical prefix contacted (G2 G3 G4 G5 G6 G8 GC2 GC3, etc.) and another 50 bonus points for every ten U.K. stations worked. Entries must (a) be clearly inscribed on one side of each submitted sheet; (b) show date, band, GMT, call of station worked, exchanges sent and received, QSO and bonus points for each contact; (3) be addressed to the Contests Committee, RSGB, New Ruskin House, Little Russell St., London, W.C.1, England, postmarked no later than December 18, 1961; and (d) be accompanied by the signed statement, "I declare that this station was operated strictly in accordance with the rules and spirit of the contest and I agree that the decision of the Council of RSGB shall be final in all cases of dispute. I certify that the maximum input to the final stage of the transmitter was —— watts." Certificates of performance will be available to country leaders and top scorers in W/K VE VK ZL and ZS call areas. With the sunspot count and m.u.f. declining, this yearly affair should help keep 10 and 15 meters topical during the poor propagational years ahead. Good huntin'! . . . . . Say, LA5HE follows W1RCQ with "DXCC²" No. 43, filing with Jeeves a photo of his collection of QSLs for QSOs with over 100 members of ARRL's DX Century Club. IT1AGA claims to hold the necessary QSLs, too, so we'll be watching for his snapshot. For more on DXCC² see p. 69, July 1959 *QST*. . . . . The new SVØWC (W4VGB) writes from Athens where he's enjoying the sport with a Valiant, HQ-129X and dipole on 20 meters. "I usually stay at the bottom end of 14-Mc. c.w. and will soon have a 3-element rotary going. There are only three or four SV0s active at present." . . . . . DL4PI (3A2AD) tells W4OPM that the Monaco Radio Club has a neat new clubhouse situated on one of the principality's high points. "3A2AH told Ralph that the club would be equipped with gear for operation by all modes, and that facilities will be available to visiting amateurs." . . . . . TF2WFV welcomes requests for 14-Mc. c.w. schedules at the address specified in "Where" . . . . . According to data collected by Rev. Dr. Ralph M. Wiltgen, S.V.D., the Divine Word Missionaries now include licensed amateurs on every continent. "Until now," he writes, "our men have been operating as individuals, not knowing that other members in other parts of the world also were licensed radio amateurs. I hope that [a story on amateur radio in the S.V.D. *Arnoldus*] will create more interest in our ranks and also more understanding on the part of Superiors." See p. 77, April '61 *QST*, for a representative view of Divine Word ham doings. . . . . Continental comment courtesy VERON and WGDXC: IT1TAI scheduled an operational visit to little Ustica island as IU1TAI. The isolation of that place long ago qualified it as a convenient spot for prisoner exile. . . . ZB1A joined the s.s.b. congregation in August. . . . LA1LG/p expects to tolerate Jan Mayen's poor radio conditions for another year or so. . . . G8KS spent a DXish summer vacation as GC8KS. . . . UA1KED'S single-sideband target date is the 1st of December or earlier.

Asia — Temperatures of 115° in the shade (no shade), rough sledding for their Land Rover on choppy "roads", customs confusion and fantastic QRM conditions hampered the recent 9K3TL DXpeditionary derring-do of W1TYQ and friends. Excerpting from *Nutmeg News*, supplied by



KX6BU of the Marshalls is manned by K6HPR and colleagues on 15- and 20-meter s.s.b. Brad writes, "How about scaring up some Maine and Vermont activity so we can complete our WAS? We're on 14 Mc. regularly between 1100 and 1300 GMT." KX6BU represents the Naval Station Radio Club at Kwajalein.





ZE2JA has a solid DX setup at Borrowdale, So. Rhodesia. That rotary dipole has since given way to a 2-element beam. Bill prefers 21 Mc. when the bounce is right. ***(Photos via W9KYK)***

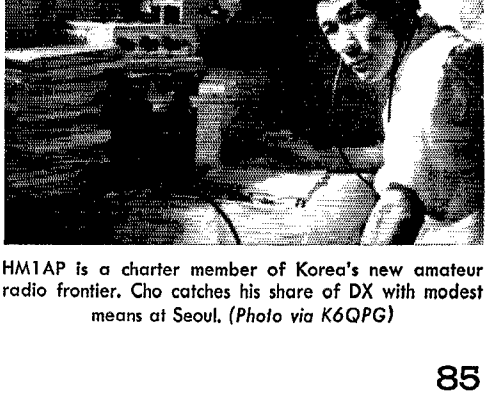
W1BDI, W1TYQ states, "The best average I could make was five minutes per QSO. . . . S.s.b. was a big disappointment. On sideband you might call for 20 minutes without reply, but on c.w. a short CQ had you working the boys until QRT. I don't approve of the 'emcee' method of working single-sideband DX but this was the only way we could work stations without long delays between QSOs. Generally, though, we wasted hours on s.s.b. and would eventually go back to c.w. which accounted for most of our 1500 QSOs." W1TYQ, by the way, now is licensed as MP4s BDL MAM QAV and TAQ for Bahrein, Muscat & Oman, Qatar and Trucial DXing; an O15 call is in the works . _ . _ . "I'll be operating on 14,015 kc. almost daily at 1200 GMT," vows HL9KT's K2LSX. "Intend to be in contests, too." . _ . _ . HS1F is back in Georgia after working 43 countries and quite a few states from Bangkok . _ . _ . JA-type notes from hither and yon: "The All-Asia Contest was a real ball," enthuses K6CJF. "JAs came through on 20 meters over the entire 30-hour test period." Bill already has a 60-per-cent QSL return from the 545 JAs he has worked, plus a dozen certificate awards from Japan. . . . WA6HRS has collected 227 JAs with his No. 28 "invisible" long-wire, and observes that JA8ZZ's half-DXCC countries total is the product of a mere 7-watt input. . . . WA6IVM corresponds with some three dozen JA friends and reports a recent visit by JA1BAR who will study at Lehigh U. The latter feels that W6BYB's is the most familiar Yankee signal in Japan. . . . W2ZXL personally visited with Japan Television Networkers JA1s ALX BC BRN and FSH. . . . Japan DX Radio Club now is led by pres. JA8AA, *Bulletin* editor JA1DM, awards mgr. JA1BF, directors JAs 1AA and ØAA . _ . _ . K2UYG notes that ZC4CT is franchised for DX work as MP4s BDK MAL QAU and TAP. Watch for his roving DX-40 this month on 14-Mc. phone and c.w. . _ . _ . WØABV/KH6 says BV1US loses a key operator with the return of K4YJQ to Uncle Sugar . _ . _ . Current FEARL brass includes KA2s DA, pres.; SB, v.p.; PJ, secy.; and AO, treas. Leading the outfit's DX derby are KA2s NY AB HO and RJ with 109, 74, 58 and 20 countries confirmed, respectively . _ . _ . Interesting Asian items courtesy WGDXC; XW8AL looks forward to resuming DX activities next month after a global business tour. . . . VU2s MR and NL have their heads together concerning possible AC3 and AC5 work early in '62. . . . AP2CR expects to be signing an XZ2 call for a spell.

Africa — OE3NH tells W5KC of 9G1DP's plans to put Upper Volta on 14,340- and 21,340-kc. s.s.b. next month, possibly as a Christmas present . _ . _ . EL4s A and YL like their new triband quad and are rigging Vees for 40, 80 and 160 meters. Then comes a full gallon for sideband, a.m. and continuous wave. Ken and XYL sign EL4A one day, EL4YL the next, usually on 3539, 7007, 14,080, 21,075 or 28,100 kc. They're also keeping a week-end watch for 160-meter openings, hoping to follow through on EL4A's 1.8-Mc. transatlantic triumphs of last season . _ . _ . A gang of Gs has an FL8RAF eruption in the cards this month on several bands and modes, according to K2UYG. Bill also notes QSO-clobberers driving Haute Volta's XT2A off 20 c.w. from time to time, and indicates that VQ8AP has revised his VQ8APB e.t.a. to January . _ . _ . WGDXC hears that ZD8JP tests his s.s.b.-a.m. DX appeal around 14,225 kc. between 1930 and 2200 GMT . _ . _ . VERON's *DXpress* records that VQ8BR has a KWM-2 in the control tower at Port Louis airport.

Oceania — ZK1AR writes of ZK1AK's imminent departure for New Zealand. "Norman has been active since the early days of amateur radio and holds the call ZL1FT. He was ZM6AK in 1948–'51, went back to ZL-land, and then began signing ZK1AK four years ago. Norm's specialty is 20 c.w. Myself, I became interested in radio in my school days but never got around to hamming till '59 when I became ZL1UY. A month later, in January of '60, I came to Aitutaki and ZK1AR." Norm and Trevor are Civil Aviation radiomen of long standing . _ . _ . _ "I operate KX6BU on 20 sideband as a rule," states K6HPR, "but some of our other operators prefer 15." . _ . _ . _ According to PARA's DU1RTI, the Philippines gang threw a real whingding for W6FB who revisited the islands after a 28-year absence. Col. Elser, U.S.A. now retired, helped found PARA 'way back in 1924. W6FB's ham career is remarkable from several angles, and many a DXCC member owes his Turkey country-credit to Fred's outstanding DX work as TA3GVU circa 1948 . _ . _ . _ DU1EH, with Apache, HQ-100 and homespun beam, is a new and welcome addition to 14-, 21- and 28-Mc. DX fun . _ . _ . _ "VK5NO enjoys working phone-to-c.w. with Novices on 21 Mc.," finds WV6SBO . _ . _ . _ WGDXC lists VR1s B (14,080-kc. c.w., 14,120-kc. s.s.b.) and G (14-Mc. a.m.) as the most active Gilberts DXers these days. VR1B expects to keep rolling till March.

Hereabouts — "I'm now active from KG1BX at Thule AFB," communicates K3LYO, "This station operates daily from 2200 to 0200 GMT or later, 14,275–14,285 kc. KG1BO also is regularly workable around 14,315 kc. Both stations use 500 watts and put pretty good signals into the States. We worked KC4USV in mid-August, a pole-to-pole QSO which turned out to be a tipoff on generally improving late-summer conditions." . _ . _ . _ Summarizing answers to questions frequently encountered by KZ5SW: As a rule KZ5 tickets are issued to C.Z. residents only. . . . No Conditional Class-type licenses; code's a must. . . . Transient W/Ks must obtain KZ5 licenses to operate KZ5 stations but no calls are assigned to those purely visiting. . . . No radio activity is permitted aboard ships traversing the Canal itself. . . . As of mid-September this year, KZ5 phone subbands commence at 3725, 7150, 14,100, 21,100 and 28,100 kc . . . . _ . _ . W3AYD,W4s AZK CKB OMW QVJ,

(Continued on page 172)



HM1AP is a charter member of Korea's new amateur radio frontier. Cho catches his share of DX with modest means at Seoul. ***(Photo via K6QPG)***

The World Above 50 Mc.

CONDUCTED BY SAM HARRIS, W1FZJ

THE prime purpose of a radio receiver is to convert the radio signals which are picked up by your antenna into some form of intelligence which can be interpreted by you. Ideally, it would be nice if the receiver could be made to respond only to that particular signal which you desire to hear. It is a generally accepted practice to equip a receiver with an adjustable tuning control which allows the operator to select at will the particular signal to which the receiver will respond. The degree of success with which this endeavor is blessed is to a great extent dependent upon the particular circuitry employed in the latter stages of the receiver. At the higher frequencies, particularly in the v.h.f. region, efforts to provide signal selectivity ahead of the first mixer have been (with a few exceptions) singularly unsuccessful. Now the average receiver used on the v.h.f. has an i.f. system equipped with one or possibly two stages of amplification ahead of the first mixer. If the receiver is of reasonably modern design, some effort will have been made to provide an adequate dynamic range to accommodate signals varying in strength from the low microvolt region to the low milovolt region. Dynamic range as used in this discussion refers to the range of signal strengths to which a given receiver can respond without overloading. It is a generally accepted practice to express this dynamic range in db. As there seems to be some mystery as to the exact meaning of db. particularly in reference to the calibration of many popular signal strength meters, we will define it in terms of the power of the station which you are receiving. Let us assume, for example, that you are receiving the signals from K1OXK, the friendly station in Boston, and that his signals are just enough above the noise to be readable. If at this time his transmitter is putting out a power of one watt, we have established the minimum signal which our receiver can hear. If Bob now raises his power from one watt to ten watts, your receiver will be receiving a ten db. stronger signal. If he increases his power to 100 watts another 10 db. will be added to his signal and if he increases his output to 1000 watts, or to be more legal, if he adds 10 db. to the gain of his antenna, his signal will be 30 db. stronger than the original 1-watt signal. Now any receiver is capable of handling a 30 db. range in signal strengths. This is by definition an increase of 5 S units in signal strength and the average receiver is calibrated to accept signals from the noise level to an S9 and many receivers are somewhat optimistically calibrated to accept as much as 60 db. over S9. You might in passing ponder the fact that if a 1 watt signal is just even with the noise in your receiver the same station would have to run two hundred and sixty-two thousand, one hundred and forty-four watts (262,144) to give you an S9 signal. Now of course, the average receiver with a 6 kc. or so pass-band and a noise figure of 6 db. or better can hear a signal which is minus 160 dbw. If the station which is radiating one watt is located fifty miles away, the path loss will be equal to 105 db. If by some miracle your two antennas were line of sight and you were using a dipole to receive the signal on, the signal strength would be an S9 or 54 db. over the noise.

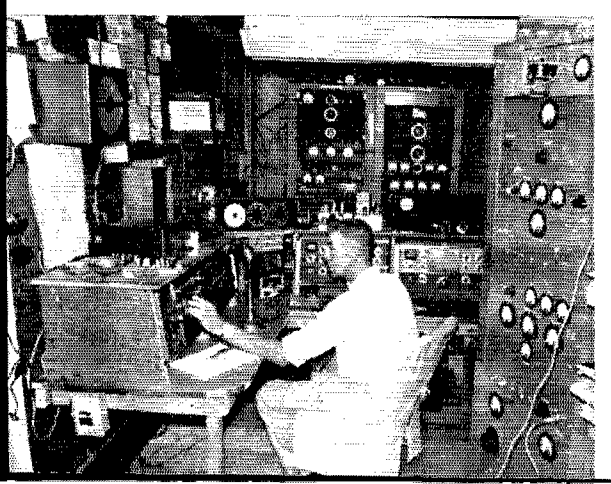
Now comes the problem: if K1OXK runs 100 watts to a 10-db. gain antenna, and you use a 10-db. gain antenna on your receiver, his signal is now 40 db. over S9. Still well within the range of an adequately designed receiver; however, we have left out one important item. The average v.h.f.er uses a converter in conjunction with his receiver. The additional gain supplied by the converter may run anywhere from 30 to 45 db. Adding this gain to our system yields a signal strength of from 70 to 85 db. over S9 which will almost certainly overload our i.f. system.

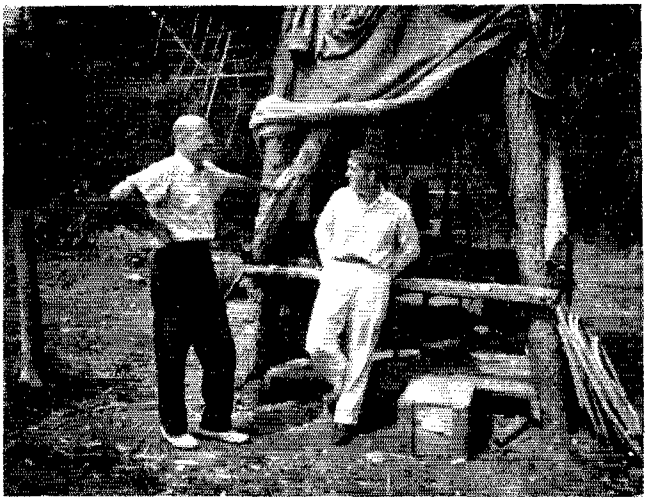
The tales of grief engendered as a result of this tragic situation can be heard any day on the 50-Mc. band. Unfortunately, the blame is generally put on the incoming signal, with no thought toward improving the receiving system. I do not mean to imply that there is no such thing as a broad signal on the v.h.f. bands but I do hold that such signals are in fact few and far between.

There is no exact procedure for determining whose fault it is but there are some check points. For instance, if the noise level of your receiver drops a few db. every time he comes on the air regardless of where you have your receiver tuned, it's your fault. If the signal is very strong, you

* P. O. Box 334, Medfield, Mass.

W1QXX—at home!



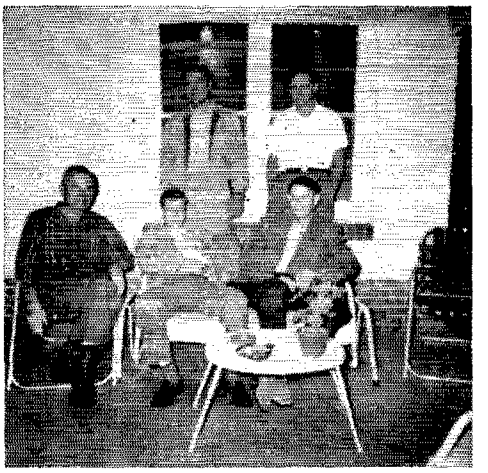


Left to right—Ed and Ned, K1HMU and W1HDQ on location at Farmington, Conn., home of K1HMU and his 178-element 144-Mc. moonbounce antenna.

might take off your antenna and substitute a clip lead. If this helps, it's your fault. If he is only bad when you have your antennas pointing at each other, it's your fault. To put the matter bluntly, the likelihood of it being the other guy's fault is so small that you may as well not bother to check. To make matters worse, there are so many guys running 100 watts or more to 10 db. or better antennas, that it just isn't going to do any good to complain about it. You might as well face up to the fact that you have a job to do on your receiving set-up if you want to enjoy your hobby. To give you a target to shoot for let me point out that the equipment at W1BU will allow tuning in a signal 20 kc. or more above or below our own frequency while we are on the air with 1 kw. of a.m. phone. We do use a separate receiving antenna but we have in fact rebroadcast a phone signal whose frequency was only 17 kc. above ours. It wasn't a local signal either. It originated 200 miles away and was only reading 10 db. over the noise. You interested?

Here and There on 6 and 2

Although DX, skip, sporadic *E*, etc., has fallen off in recent weeks, we're happy to be able to tell you that activity is still on the increase in the "scarce" areas of North America and there's still a lot to look for in the "hardly ever worked" areas. We'll begin with a report received from KL7FLC who worked KL7AUV for three and a half hours on the night of August 31. Signals were Q5-S9 both ways, with Bob (KL7FLC) on phone and Jack (KL7AUV) on c.w. He also worked KL7CUH/ who was mobile in Fairbanks, Alaska. Other than these two contacts, Bob has heard VE8BY several times but has yet to work Pete. Now to Pete, VE8BY: "KL7FLC was picked up here in Yellowknife on September 2 at 0640 GMT — RST 329–589 with complete fadeout at times. I gave him a call and heard him call me at 0734 GMT but when I turned it back to him after answering the call he was gone. On September 3 again heard KL7FLC at 0440 and again RST 239–599, very bad QSB. No luck!" Here's hoping that by the time this appears in print the contact has been made. Two such persevering souls should be recompensed with a good contact. Pete also says that more VE8 stations are now operating 50 Mc. in Whitehorse, Yukon and Fort Smith in the North West Territory. Word from Whitehorse, Yukon, and Earle, VE8AT, advises us that VE8CM, VE8EW, VE8EF and VE8AT are all eagerly awaiting 50-Mc. contacts. Frequencies to be watched are 50.06, 60.250, 50.253 and 51.0, and Earle sez to swing those beams north and west of VE8BY. Seems that Earle had a wonderful time on the evening of July 26, eavesdropping (?) on a 50-Mc. opening from Battle Mountain State Park near Pendleton, Oregon. Just before leaving the Park at 2030 PDST, he turned on his 50-Mc. converter and thought he'd somehow landed on the low end of 20 meters during a contest. His converter was around 50.05 Mc. and the c.w. signals were so strong that he was able to copy them with no trouble without a b.f.o. As for the phone band, he says he didn't know which signal to listen to next, but did hear from W5, W6, W7, and WØ call areas, both c.w. and phone. Receiving setup was an International FCV-2 Converter to a standard car BC receiver, using a 70-inch whip for an antenna. No trace of flutter was heard on even the weakest signals and the majority of phone stations were strong enough to be copied through the ignition noise of the VW (no suppression whatsoever) while traveling north at 50 m.p.h. Another call area heard from in Canada was VE6, another hard one to get. Bob Henry, VE6DB, of Lethbridge, sez that activity is building up on 50 Mc. in that area with about a dozen hams on the band at the present time. During the month of July Bob heard all call areas in the U. S. plus VE4 and was able to work into the W2, 5, 6, 7, 8, 9, Ø areas; also heard the code wheel from VE8BY. And from Saskatchewan and VE5GI we learn that 50 Mc. was open on August 31 with very strong signals getting into that area. Graham (VE5GI) worked thirteen stations in Wisconsin, Indiana, Minnesota, Illinois, Kansas, Nebraska and Colorado. He also advises us to keep an eye out for VE5TP who will soon be operating on six meters both fixed and mobile. Just a sample of things done during the sporadic *E* season is told by Gary, W5WWQ, from Nashville, Arkansas. Gary says that from May 21, 1961 until July 21, 1961, *he made 400 contacts on six meters, and that is not counting* the V.H.F. QSO Party in June. 99.4% of these contacts were out of state and included 35 states (34 confirmed) and three countries. At the time Gary was running 12 watts input to a home-brew ground plane at 30 feet; receiver was a nine-tube (greatly modified) Heathkit AR-3 with a home-brew converter. W5WWQ QSLs 100% and to date has sent out cards to the 200 contacts whom he contacted during the two-month period previously mentioned, who have already QSL'd him. He will send out the remaining 200 cards as the budget permits. WA2BPE from Corning, New York, sent us a detailed report of his activities on 50 Mc. during the month of August. Although Tom didn't work all the openings he heard, he did hear openings on eleven different days during August, plus two auroral openings. He sez that about half of these openings were not very good ones or were of short duration, but they were still "openings". He also mentions, along with many others, the good "ground wave" contacts coming through during the month. Another similar report was filed by Jim, K4KYL, who noted E_s, openings on thirteen different days during August, with twenty-four different states, Nova Scotia, Ontario and Mexico coming through at various times. Best day of all was on August 1 when fourteen states and Mexico were heard. California also had it's share of E_s, during August as reported by Dick,



Gathering at QTH of WØAZT: Standing, left to right: Claude Maer, WØIC; Walt Bain, W4LTU. Seated, left to right: WØAZT, Clif McLoud; WØMOX, Louis Breyfogle; W6WSQ, Mel Baer.

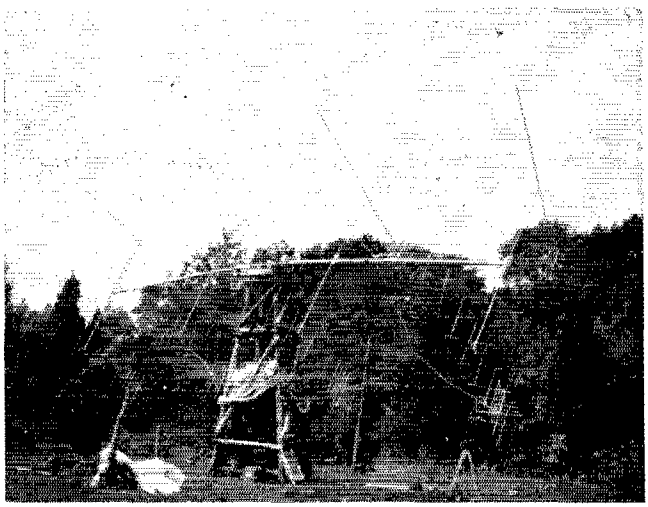
W6IEY, and K6KLY. W6IEY heard Colorado, Texas, Washington, Oregon, Idaho and northern California a number of times during the month and worked most of what he heard. Among the interesting things he heard was W7RT setting up a schedule on 144 Mc. with W6NSL and K7LCW and although Dick shifted to 144 Mc. and hoped for a new contact on that band he had no luck. K6KLY says the *Es* skip has given out with his last DX QSO being on August 27 with K7LKL in Phoenix, Arizona. W1NKA and K1KKS, both from Massachusetts report "Pretty good" conditions on six meters during August, with openings on August 3, 4, 11 and 13, and Bill, W1NKA heard KP4, VE and XE areas. From Ridgefield, New Jersey, Ken (WA2BDP) sends word of openings in his area on August 3, 4, 5, 7, 10, 12, 19, and 20, with 4's, 5's, 9's and 0's coming through at those times. A busy man these days is Tony, W3JYL, who is busily wiring up the HT-40 that he won at the York Hamfest. Tony noted openings on the 6th and 12th of the month; the first into the midwestern states, Iowa, Indiana, Minnesota, Michigan, Illinois and Kansas. The second to Texas, Louisiana and Mississippi. Bob Anderson, K4UMK, of Roanoke, Virginia, has been working our friends in Canada during the openings into Virginia. Recently he has worked VE1BC, VE3CJN, VE3BWH and VE1EF. He also advises us that W4MWD is now running 250 watts on 50 Mc. to a 4-element beam; and K4UDG is now running 25 watts to a new five element beam. Michigan seems to have "had it good" during August, 'cause according to Reg, W8MBH, it was open for most of the month of August. During the day Ohio was heard fairly regularly and during the evening the eastern states were heard, with Texas and Florida heard on August 23 through the 26th. On August 4 at 0230 Z, W8NOH in Grand Rapids, Michigan, worked VE8GI on cw. Lou sez signals weren't too good and he lost him on the second "over". Ken, K9GSC, in Wisconsin, noted opening on six different days during the month, hearing twelve states plus VE1 and VE3. More openings than that sez Ken, but he wasn't around to listen in or work 'em. K9PNP in Princeton, Indiana, had good luck in getting two more states toward WAS during the opening of August 11 when he worked K4TNV for North Carolina, and W4SNH for Virginia. He also worked XE1OE, VE3CUA and VE1AOM during August's skip sessions. KØGIC and KØRWC both report from Kansas, with slightly different areas heard at their two locations. Dot, ØGIC, in Wichita heard openings on 6 days during the month with fifteen states coming into Wichita. Dave, KØRWC mentions one opening on August 6 when he heard 0s, 9s, and 7s. During this opening KØGIC was hearing Michigan, New York, Ohio and Ontario. Amazing what is or is not heard at different locations in the same area.

A number of reports have been received from various call areas mentioning the good ground wave conditions during August. WA2BDP sez ground wave conditions were good into New England on August 5th; K3KPA of Philadelphia sez they were good in the early morning hours into New York; K4UMK reports good ground wave into Pennsylvania on August 19; and W8MBH of Detroit, Michigan, reports exceptionally good ground wave into Grand Haven, Jackson and Lansing during the month. K9PNP in Indiana mentions that August 2 was a good one for him when he worked KØRAX at St. Louis, Missouri, on ground wave; and WA2GJT, New York, sez that ground wave conditions for s.s.b. and a.m. were very good during August for contacts into Southern New Jersey and eastern Pennsylvania. Here in the Rhododendron Swamps of Medfield, Mass., we

2-METER STANDINGS

W1REZ	32	8	1300	W5YYO	7	4	1330
W1AZK	28	8	1205	W5UNH	6	3	1200
W1KCS	24	7	1150	W6WSQ	15	5	1390
W1RFU	24	7	1120	W6NLZ	12	5	2540
W1AJR	23	7	1130	W6DNG	9	5	1040
W1HDQ	22	6	1020	W6AJF	6	3	800
W1MMN	21	7	1090	W6ZL	5	3	1400
W1IZY	20	7	1180	K6HMS	4	3	850
K1CRQ	19	6	800	K6GTG	4	2	800
W1AFO	18	6	920	W6MMU	3	2	950
K1AFR	17	5	450				
				K7HKD	13	5	1130
W2NLY	37	8	1390	W7JRG	12	4	1040
W2CXY	37	8	1360	W7LHL	5	3	1050
W2ORI	37	8	1320	W7CJM	5	2	670
W2GQI	33	8	1200	W7JIP	4	2	900
W3BLV	30	8	1020	W7UJ	4	2	235
W2AZL	29	8	1050				
K2IEJ	27	8	1060	W8KAY	38	8	1245
K2LMG	25	8	1160	W8PT	38	9	1260
W2AMJ	25	6	960	W8SDJ	37	8	1220
K2CEH	24	8	1200	W8IFX	35	8	980
W2ALR	24	8	1100	W8SFG	34	8	1040
K2DWJ	23	6	860	W8LOF	33	8	1060
K2HOD	23	7	950	W8RMH	32	6	910
W2PAU	23	6	753	W8GGH	32	8	1180
W2RXG	23	8	1200	W8BAX	32	8	960
W2SMX	23	7	1090	W8NOH	31	8	1090
W2LWI	21	6	700	W8SVI	30	8	1080
K2KIB	21	5	900	W8EHW	30	8	860
W2ESX	21	6	750	K8AXU	29	8	1050
W2UTH	20	7	880	W8LPD	29	8	850
W2WZR	19	7	1040	W8WRN	28	8	680
W2RGV	19	8	720	W8DX	26	8	720
K2RLG	17	6	980	W8LC	25	8	880
				W8JWV	25	8	940
W3RUE	33	8	1100	W8WNM	25	8	900
W3GKP	31	8	1180	W8GFN	23	8	540
W3SGA	31	8	1070	W8LCY	22	7	680
W3TDF	30	8	1125	W8BLN	21	7	610
W3KCA	28	8	1110	W8GTR	17	7	550
W3BYF	28	8	1070	W8NRM	17	7	550
W3EPH	32	8	1000				
W3LNA	21	7	720	W9KLR	41	9	1160
W3NKM	20	7	730	W9WOK	40	9	1170
W3LZD	20	7	650	W9GAB	34	9	1075
				W9AAG	33	8	1050
W4HJQ	38	8	1150	K9AAJ	31	8	1070
W4HHK	37	9	1280	W9REM	31	8	850
W4ZXI	34	8	950	W9ZIH	30	8	830
W4LTU	34	8	1160	W9PBP	28	8	820
W4MKJ	33	8	1149	W9LVC	27	8	950
W4AO	30	8	1120	W9EQC	27	8	820
W4VLA	26	8	1000	W9OJL	27	8	910
W4EQM	25	8	1040	W9ZHL	25	8	700
W8AIB	25	8	900	W9BPV	25	7	1030
K4EUS	25	7	1130	K9AQF	24	7	900
W4WNH	24	8	850	W9LF	22	7	825
W4JCJ	23	6	725	W9KPS	22	7	690
W4VVE	22	6	720	K9SGD	21	7	1100
W4RMU	21	7	1080	W9CUX	21	7	800
W4TLV	20	7	1000	W9ALU	18	7	800
W4IKV	20	6	720	WØBFB	37	9	1350
W4OLK	20	6	720	WØIHD	31	8	1030
W4RFR	18	9	820	WØSMJ	29	9	1075
K4YUK	18	8	830	WØLFE	28	7	1050
W4LNG	18	7	1080	WØQDH	27	9	1300
W4CPZ	18	6	650	WØRUF	23	7	900
K4VWH	18	6	590	WØMOX	22	6	1150
W4MDA	17	6	757	WØINI	21	6	830
				WØTGC	21	7	870
W5RCI	37	9	1215	WØRYG	20	8	925
W5AJG	32	9	1360	WØIC	19	7	1245
W5FYZ	29	9	1275	WØAZT	18	7	1100
W5JWL	29	7	1150	WØJAS	18	6	1130
W5DFU	28	9	1300	KØAQJ	16	6	1120
W5PZ	27	8	1300	WØIFS	16	6	1100
W5LPG	25	7	1000				
W5KTD	23	8	1200	VE3DIR	30	8	1330
W5ML	16	5	700	VE3AIB	28	8	1340
W5FSC	12	5	1390	VE3BQN	19	7	790
W5HEZ	12	5	1250	VE3AQG	18	8	1300
W5SWV	12	4	740	VE3DER	17	8	1340
W5CVW	11	5	1180	VE3HW	17	7	1350
W5NDE	11	5	625	VE3FPB	14	6	715
W5KFU	11	4	1300	VE2ABF	10	4	580
W5VY	10	3	1200	VR7FJ	2	1	365
W5EDZ	8	5					
W5YYO	7	4	1330	KH6UK	1	22	2540

The figures after each call refer to states, call areas, and mileage of best DX.



178 elements on 144-Mc. moon bounce, by K1HMU.

noticed good ground wave conditions during all of August and the first two weeks in September: good into New York, New Jersey, eastern and western Pennsylvania and Delaware.

S.s.b. activity on 50 Mc. is still building up. Tom, WA2BPE, tells us that he has been working W3GWP in Taylor, Pennsylvania, (120 miles) and K2PCG in Livingston, New Jersey (230 miles) quite regularly on 2-way sideband. W3GWP is running about 100 watts and K2PCG about 400 watts. WA2GJT comes through with the news that he has worked W9HGE and W8BSW several times 2-way s.s.b., and that he has 20 states worked, s.s.b., since July 4, 1961. Jim also mentions that K2MLB is running 11 over 11 beams and with 5 watts output runs a tremendous signal. W6IEY from La Mesa, California, fired up his six-meter s.s.b. for preliminary checkout and tune up, then discovered that all of his crystals were in the c.w. portion of the band so couldn't finish up. Perhaps it's "on the air" now but not at deadline time.

Just received word from KL7FLC that on September 16 he worked VE8BY, VE6IP and KL7AUV.

A few more reports have been received concerning the Perseids Meteor shower in August, some made their contacts, some made near misses and others just had no luck at all. Ernie, W7LHL, reports his sked with WØMOX on 144 Mc. paid off and they made contact on the 13th, with the longest bursts being 15 seconds. Ernie was running a kw. to p.p. 4X250Bs and using a 6-element Yagi. Sam, K4EUS, had a half-hour m.s. sked with W5FYZ on 11th, 12th and 13th, and each heard the other at various times during the sked period, however not at the right time nor enough heard to make it a contact. W5LUU was not heard at all by K4EUS although Sam was copied for one burst at the other end. Sked with W5KFU in Dallas, Texas, did pay off with a contact during the last 15 minutes of their schedule; making it a new state for Sam, #25 on 144 Mc. Three new states were added to the list of Louis, WØMOX, during the Perseids; skeds with W7FGC in Arizona, W5KFU in Texas, and W7LHL in Washington all "paid off". The contact with W7LHL is the first Colorado-Washington contact on 144 Mc. Louie says the effort put into the kw. 144-Mc. transmitter was well worth the effort and all gear on that band is working fine. In Benton Harbor, Michigan, Jack, W8PT, had a QSO with W5KXD in Texas on August 12 to bring his total up to 38. He also worked WØENC and heard pings from W7LEE but nothing at all from K5TQP of K7IDD. Jack also mentions that the 220-Mc. net is still operating in that area; W8GOV-220.070, K8JZR-220.050, W8CVQ-220.056, W8PYQ-220.148 and W9REM-220.073. John, W7RT, had no luck on his schedules with WA6MLX or WØAZT, but did hear WØMOX in Colorado signing off with W7LHL. Called him for over an hour but — no sked, no contact. Although he didn't work anything this "heard" Ø was John's first taste of a Perseids signal and he is now convinced and will be on 144 Mc. as often as possible during the week ends. He is running 800 watts input, beam is a 13-element Big Bertha, and he's using two converters and two receivers. Wonder if he's ambidextrous! WØAZT advises us that he picked up K6HMS during the June 8 meteor shower and W6WSQ during the Perseids, bringing his total to 18 states on 144 Mc. Clif sez that he worked K7HKD in Cheyenne, Wyoming, on the night of September 11 and that Harold is now putting out a "wallopin' signal". He has recently put up a new 44-element beam and is using a new Viking 6N2 Thunderbolt on 144 Mc. Denison, Texas, is once again on the map v.h.f.-wise; Dave, W5SWV, is once again back on the v.h.f. bands running 500 watts on 144 Mc, to a 32-element beam 86 feet up; 50 watts on 432 Mc into a 32-element beam, 91 feet up. Dave worked Illinois for his 11th state on 144 Mc, worked

(*Continued on page 166*)

220- and 420-Mc. STANDINGS

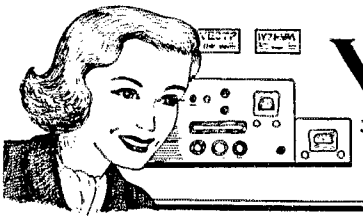
220 Mc.

W1AJR	11	4	480
W1AZK	9	3	412
W1HDQ	11	5	450
W1OOP	12	4	400
W1RFU	15	5	480
W1UHE	11	4	385
W2AOC	13	5	450
K2AXQ	8	3	230
K2CBA	13	6	650
K2DIG	4	3	140
W2DWJ	15	6	740
W2DZA	12	5	410
K2ITP	11	5	265
K2ITQ	11	5	265
K2KIB	12	4	300
W2LRJ	10	4	250
W2LWI	12	4	400
W2NTY	12	5	300
K2PPZ	11	4	190
K2QJQ	13	5	540
W2SEU	4	2	150
K2UUR	4	3	105
W3AHQ	4	3	180
W3FEY	10	5	350
W3JYL	8	4	295
W3JZI	4	3	250
W3KKN	10	4	255
W3LCC	8	5	300
W3LZD	15	5	425
W3RUE	9	5	450
W3UJG	13	5	400
W3ZRF	5	4	112
K4TFU	8	4	400
W4TLC	4	1	165
W4UYB	7	5	320
W5AJG	3	2	1050
W5RCI	8	5	700
K6GTG	2	1	240
W6MMU	2	2	225
W6NLZ	3	2	2540
K7ICW	1	1	250
K8AXU	10	5	1050
W8IJG	9	5	475
W8LPD	6	4	480
W8NRM	8	4	390
W8PT	10	5	660
W8SVI	6	4	520
W9AAG	9	4	660
W9EQC	11	5	740
W9JCS	5	2	340
W9JEP	9	4	540
W9OVL	6	3	475
W9UED	4	4	605
W9ZIH	10	5	500
KØDGU	5	3	425
KØITF	6	3	515
KH6UK	1	1	2540
VE3AIB	7	4	450

420 Mc.

W1AJR	10	4	410
W1HDQ	8	3	210
W1MFT	8	3	170
W1OOP	11	3	390
W1RFU	7	4	410
W1UHE	6	4	430
W2AOD	6	4	290
W2BLV	12	5	360
K2CBA	5	3	225
W2DWJ	10	4	196
W2DZA	5	3	130
K2KIB	4	2	100
W2NTY	3	2	100
W2OTA	10	4	300
K2UUR	7	3	175
K3EOF	6	3	250
W3FEY	7	3	296
W3RUE	2	2	96
W4HHK	6	4	550
W4YVE	7	4	430
W5HTZ	5	2	400
W5RCI	10	3	600
W6GTG	1	1	180
W7LHL	2	1	180
W8HCC	3	2	355
W8HRC	3	2	250
W8JLQ	4	2	275
W8NRM	3	2	390
W8PT	5	3	310
W8RQI	4	2	270
W8TYY	7	4	580
W8UST	3		255
W9AAG	5	3	375
K9AAJ	4	3	425
W9GAB	9	4	608
W9OJI	6	3	330

The figures after each call refer to states, call areas and mileage of best DX.



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

Field Day 1961

OPERATING Class A in Field Day last June were three YL clubs, the BAYLARC of California the GAYLARK of Texas, and the Chicago YLRL. Complete score information was received as follows from Ellen, W1YYM, of headquarters:

Class 2A —

WA6MAO 6 BAYLARC 284-AB-11-2277

Class 3A —

K5SKF/5 GAYLARK 621- B-12-3876

Class 3A —

W9DEQ/9 Chicago YLRL 63-AB-7-153

(First figure QSO total, power, nr. operators, final score.)

The Chicago YLRL had its FD at the Wood Dale, Ill., QTH of K9GUB, Peggy. Using the club call W9DEQ, operators K9s CMZ, CQF, GUB, JDE, JVL, LIW, UHD and W9GME worked 2, 6, 10, and 40 meters until prolonged rains spelled "finis" to the activity.

Operators, loggers, and k.p. organizers for the BAYLARC in San Francisco were K6s EEE, HIW, ZCR; W6BDE, W6QYL; WA6DPN, GQC, JGR, LIZ, LYA; WV6s NOW, PKP. The operating call used was WA6MAO 6.

Individual FD reports received were comparatively few in number this year, but as always the gals who did go a-Field-Daying seemed to have the anticipated good time.

Another year, with an ever-increasing number of YL clubs, perhaps heavier participation by YL clubs should be urged or actively promoted. If you cotton to the thought, why not bring the matter up at your next club meeting. It's never too early to plan ahead, and come next June the results should be well worth the effort!

YLRL Election Results

Congratulations to the following new officers of the Young Ladies Radio League who have been elected to serve for a one-year term, commencing Jan. 1, 1962:

President — Onie Woodward, W1ZEN
Vice President — Lillian Byrne, K2JYZ
Secretary — Blanche Randles, K1IZT
Treasurer — Jean Kincheloe, K6OQD

District Chairmen Jane Anderson, W1ICV; Kay Gaynor, K2UKQ; Irene Akers, W3RXJ; Gladys Biggs, K4LVE; Anna Harrison, W5DIV; Dee Gustafson, K6JPY; Vera Woods, W7TGG; Alice Geib, W8OTK; Marge Schum, K9EMP; Thelma Haas, KØHEU; Sheila Goodhue, KH6DLD; Geraldine Nichols, KL7ALZ; Bea King, VE3BFE.

Connie Hauck, K6EXQ, will continue as editor of *YLRL Harmonics*.

YLRL members issue a vote of thanks for a job very well done to 1961 officers President Doris Anderson, K5BNQ; Vice President Onie Woodward, W1ZEN; Secretary Blanche Randles, K1IZT; and Treasurer Jean Kincheloe, K6OQD. (Note that K1IZT and K6OQD will serve next term in the same office, and W1ZEN, of course, moves up from the vice presidency to the presidency.)

Custodians of the various awards offered by the YLRL are appointed and serve an indefinite term. Present cus-

Twelve GAYLARKs kept three transmitters running at Pipeline Park in Edna, Texas, for a total of 621 FD contacts. Smiling for photographer W5KFD are front row, l. to r: K5VNW, K5MIZ, W5CXM, K5POD, K5PFF; back row: K5LIU, K5DJS, W5ERH, K5YTT, K5BJU, K5YIT. Not in the picture, but also on hand, was K5VZB.

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

(Left) The new YLRL vice president is Lillian Byrne, K2JYZ, of Freeport, Long Island. Licensed since 1954, Lil works 10, 15, 20, and 40 phone and c.w. A high scorer in several AP and YL-OM contests, Lil has a Code Proficiency Certificate for 20 w.p.m. Hams in K2JYZ's family are OM K2JYM, daughter K2ZUX, and son K2UNO.

(center) This past year's YLRL vice president, Onie Woodward, W1ZEN, has been elected president for the 1962 term. Very active in YL nets and groups since she was licensed in 1953, Onie has been an officer of WRONE, and in 1960 she co-chairmanned the 3rd YLRL International Convention at Cambridge, Mass. The XYL of W1RCJ, Onie works all bands, 75 thru 2 meters, at her Marlboro, Mass. QTH. Her certificates number over 40, including YLCC-400.

(Right) Elected for a third term as YLRL Treasurer (a first in club history) is Jean Kincheloe, K6OQD, of Glendora, California. Jean, who works any band 2 thru 75, when she "gets a chance," has been studying braille in order to transcribe radio material for blind hams.

todians are as follows YL Century Certificate — Katherine Johnson, W4SGD; Worked All States YL - - Grace Ryden, W9GME; Worked All Continents YL — Barbie Houston, K5YIB; DX-YL Award — Maxine Willis, W6UHA; Continuous Membership — Bettie Mayer, K7BED. Vada Letcher, W6CEE, is club Librarian.

YL Nets and Round Tables

(Effective Sept. 1, 1961)

The following list of YL nets and roundtables has been received from YLRL Vice President Onie Woodward, W1ZEN. If a net has been omitted, it is unintentional and the NCS or manager is invited to submit the name, time, frequency, and NCS of the net to W1ZEN, 14 Emmett St., Marlboro, Mass. Corrections and additions will appear in this column.

Time (GMT)	*Freq.*	*Name*	*NCS or Manager*
Monday			
1300	3920	U.P. Michigan YL	W8HAV
1400	7225	Floridora	W4IUR
1600	7235	Loaded Clothesline-Phone	KØEVG
2300	3890	Oregon YL	W7HHH
0400	29,600	Dark Eyed Queen	W9GME
0400	50,560	Baylare 6 Meter	WA6ALK
Tuesday			
1330	3900	Blue Ridge	K4CZP
1400	7215	Floridora YL SSB (Lower)	W4UF
1400	50,200	Hawk Roost	K9MZV
1500	50,330	Southern	Floridora
1600	3940	Kansas YL	KØHEU
1800	29,130	Hairpin	K6JPY
2100	7230	Mont.-Idaho	K7BKH
2200	7105	Finger Tip-C.W.	K6ZCR
0100	51,000	Rhode Island YL	W1GSD
Wednesday			
1330	3900	Yankee Lassies	K1IJV
1400	7185	Floridora Novice	K4RDX
1430	3900	YL Welcome	W8ATB
1500	3840	Wisconsin YL	K9TUD
1630	7150	Loaded Clothesline-C.W.	KØEVG
1730	21,390	Cross Country	KZ5VR
1900	14,260	YL SSB (Upper)	K5BJU
1900	7230	Hawk Roost	K9TCM
1900	50,650	WRONE 6-Meter YL	K1IJV
0300	146.1 Mc.	Los Angeles YL	K6BUS
Thursday			
1400	3880	TYLRUN	W5JCY
1400	7260	Georgia Peaches	K4ZZS
1400	7270	Friendly Forty	W3UTG
1600	7235	TYLRUN	W5JCY
1800	14,240	Tangle	KØEPE
0000	50,500	HAWK Roost	K9IXD
0100	50,300	Floridora (Central Fla.)	K4ANR
0100	50,330	Floridora (So. Fla.)	K4LPR
0100	50,250	Oklahoma YL	——
0400	3915	CHIRP	K6HHD
Friday			
1730	7250	Calif. YL Roundtable	W6QGX
1900	3600	WRONE YL C.W.	K1IJV
Saturday			
1430	3910	HAWK Roost	K9ILK
1800	3850	Mermaid	W6QYL
Sunday			
1400	7225	Floridora Business Girl	K4UIZ

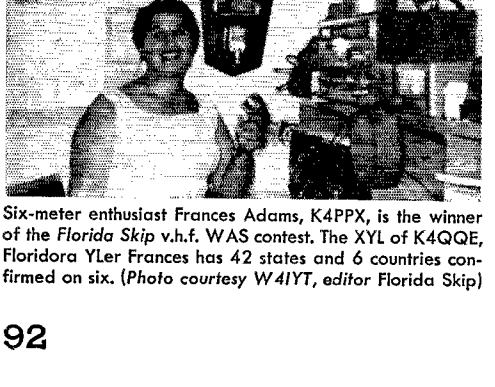
The first YL to operate s.s.b. in Finland is OH2CM of Helsinki, according to OH2XK, who forwarded Pia's photo. Licensed as a novice in May 1960 and as general class a year later, Pia has won two OH awards for her operating on 14-Mc. s.s.b. Pia's OM is OH2KL.

(Left) EL4YL, Traute Bale, of Monrovia, Liberia. A registered nurse and the XYL of EL4A, Traute operates on the even days of the month, 160 thru 6 meters, phone, c.w. and s.s.b. *(Photo via W1WPO)*

(center) Here's a new DX YL to look for, and so far as her OM KM6CC can check, Misty Tyrer, KM6CF, is the first YL to be licensed on Midway Island in the Pacific. Licensed in July this year, Misty is on 15 and 20 phone and c.w. A registered nurse, KM6CF is presently working as an audit clerk for the Navy Exchange on Midway.

(Right) While her OM is presently on Okinawa as field engineer, Opal Monsees, KN3NKE, of Washington, D. C., is putting the family Collins S-line gear to proper use. Opal hopes to have her General Class license by the time Art (operating KR6AM) returns.

Colorado YLs all and all members of the new "Colorado YLs" club. Gathered for an August meeting at the QTH of KØWZN at Palmer Lake were front row, l. to r. KØEPE, W6AAX/Ø, K5OPS/Ø, KØRGU; back row, KØWZN, KØUMS, KØSQK, KØRXK, KØZSQ, KØBTV.
(See New Club and Certificate)



Six-meter enthusiast Frances Adams, K4PPX, is the winner of the *Florida Skip* v.h.f. WAS contest. The XYL of K4QQE, Floridora YLer Frances has 42 states and 6 countries confirmed on six. *(Photo courtesy W4IYT, editor* Florida Skip)

Flying YLs

In response to an earlier request for information on YLs who hold a pilot's license, Clif Evans, K6BX, has as members of his Flying Hams Club the following YLs; W1SVN, W4UF, W4ZKD, W6QPI, and W8OMH.

Not on Clif's list yet, but certainly most worthy of mention, is Rhea Hurrle, K5RDY, who is one of the first five women in the United States to undertake space-astronaut training. A pilot-secretary for an aviation company in Houston, Texas, Rhea learned to fly five years ago and now has over 1300 hours with single-engine land and sea, multi-engine, commercial, instructor, instrument and instrument instructor, Link instructor and some of the ground instructor ratings.

Coming Events

YLRL Anniversary Party — The 22nd annual party for all licensed YLs. Phone portion Nov. 8 from 1700 GMT to Nov. 9, 2300 GMT. (C.w. portion Oct. 25 at 1700 GMT to Oct. 26, 2300 GMT.) Rules in Oct. column.

TYRLUN Anniversary Party — Nov. 4, Brownfield, Texas hostessed by GABS. Contact Irene Lewis, K5LSO, 1004 So. 6th St., Brownfield, Texas.

Alamo YL Week — Nov. 5–11, sponsored by the Alamo YL Club of San Antonio, Texas. Work club members for Alamo Certificate. Texas stations contact 4 members; all others contact 3 members. Send list and 10 cents to Inez Cole, W5WXT, 320 Meadowbrook Dr., San Antonio, Texas.

WRONE Luncheon — The annual fall luncheon of the Women Radio Operators of New England will be held Nov. 5 at the Red Coach Grill in Saugus, Mass. Special guest KH6CKO, Kay, will give an illustrated talk on the charms of Hawaii. Special favors direct from KH6 land to all who attend. Contact one of committee for reservations W1VPF, chairman, W1SVN, or W1VYH.

New Club and Certificate

On July 22, 1961 the "Colorado YLs" club was organized. Charter officers are Pres. KØEPE; V.P. KØBTV; Secy.-Treas. K5OPS/Ø; Pub. KØZSQ; Certificate Custodian KØRGU; Historian KØWZN. Other charter members are KØSQK; KØUMS; KØSPW; WØEVT (the first licensed YL in Colorado); KØRXK; and W6AAX/Ø. Charter membership is open until Dec. 31, 1961. All licensed Colorado YLs are invited to join. Send annual dues of $2.00 to Ethel Chastain, K5OPS/Ø, 851 Victor St., Aurora, Colo.

A certificate, the "sYLver doll-ar" will be awarded to any amateur who contacts five Colorado YLs after July 1,

1961. Send list of contacts with 50¢ to Tillie Curington, KØRGU, 2067 Brentwood St., Denver 15, Colorado. Do not send QSL cards to custodian but do QSL the contact.

Keeping up With the Girls

When W1HOY was asked to speak to the women who attended the Central New England hamfest, the program read "Helen Harris, W1HOY, will speak about WRONE (Women Radio Operators of New England) and women in ham radio." A newspaper clipping concerning the event read "Helen Harris, W1HOY, will speak about 'The Wrongs of Women in Ham Radio'." Ahem! . . . In conjunction with the new YLRL activity "Ladies Day" (second Monday of each month reserved for ragchewing with YLs) Margaret, K5MXO, and Helen, W5LGY, urge OMs and YLs to specifically call "CQ YL" for better results. . . . Liz, K5YIT, is justly proud of her all-ham family. OM Fred is W5AF, and three sons are K5ZWG, K5QFW, and WA6QOI. . . . While in Europe, Eunice, W1UKR, enjoyed a visit Carola, OH5SM, on her 4500 acre farm near Helsinki. Other W YLs reported touring Europe recently were W1VPF, W1YWT, W4LKM, and K4RED. . . . Barbara, W1TRE, who has been operating *DL4ZO*, expects to be back in the U. S. in October before returning to Germany for six months to two years more. Of 2500 hams who attended the German convention at Dortmund, Barbara was the only licensed U. S. ham, and the only foreign YL. . . . When YLRL President K5BNQ, Doris, was unable to appear at Oklahoma City for a TV program on ham radio, June, K5UIM, ex-KL7AZI, substituted and told of her experiences as an Alaskan YL. . . . W4WBR, Ruth, received an A-1 Operator's certificate, and Camille, W3TSC, is proud of her Quarter Century Wireless Award. . . . K8MZT, Shirley is custodian of the new Ohio YL Award mentioned in the August issue. Send list of contacts with 25 Ohio YLs made since end of World War II to Shirley Rex, K8MZT, 2225 Mt. Vernon Blvd., N.W., Canton 9, Ohio. The Buckeye Belles, a new organization of Ohio YLs, also issues a certificate for contacts with 10 Ohio YLs for out-of-state applicants, 20 Ohio YLs for applicants in Ohio, and 5 for DX operators. Send 25¢ and log information to custodian Marie Helminski, W8MBI, 3943 Concord St., Toledo, Ohio. (Thanks to K8MZT for this information correcting items in the Aug. and Sept. columns.) . . . We are sorry to record the death of Christine Sprague, W1YPG, who passed away suddenly on August 11.

It's Time to Convert!

As you are undoubtedly aware, the ARRL for some time has been urging the use of Greenwich Mean Time in amateur work. In keeping with *QST* policy, hereafter in this column when the reference is to operating matters, contests, etc. (not meetings or hamfests) the time used will be GMT.

Feted at a gala going-away party by K5YIT and members of the Gulf Area YLARK and their OMs were Mildred and Fred Wright, K5LIU and W3RRI, on the occasion of their move to Raleigh, N. C. Mildred, a past vice pres. of YLRL, is a charter member of GAYLARK. *(Photo by W5KFD)*

The chief advantage of Greenwich time is that it is a universally understood reference throughout our radio world, hence it makes good sense for everyone to use it.

The *Call Book* contains a convenient world time conversion chart, and in every issue of *QST* under "Operating News" may be found a simple GMT conversion table. Or, write to ARRL for a copy of *Operating Aid No. 10*, a handy conversion chart that you can post at your operating position.

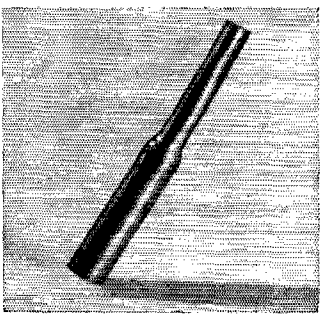
Don't be afraid of it — once you have tackled the conversion a few times, it's easy really. Start keeping your log in GMT today! QST

• *New Apparatus*

Alphlex Heat-Shrinkable Tubing

A NEW plastic tubing, developed by the Alpha Wire Corp., has the property of shrinking to a predetermined diameter after the application of heat. It can be slipped over wires, cables, terminals, tool handles, and connectors, then heated and shrunk to form a secure, tight-fitting, insulated sleeve around the object. The temperature required to start the shrinking process is about 235 degrees F., and full shrinkage will take place within seven seconds at 275 to 300 degrees F. The heat can be supplied by an oven, radiant heat, dipping in hot liquids or simply with a soldering iron, burner or match. After the tubing has been applied and shrunk, it remains flexible and strong through the temperature range of — 67 degrees F. to 235 degrees F.

Alphlex shrinkable tubing is sold in standard packages of 4-foot lengths in several diameters (from .027 to 1.036 inches i.d. after shrinking), and colors. The tubing is sold through electronic parts distributors. — *E. L. C.*



Correspondence From Members-

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

LICENSE FEES

¶ I disagree 100% with your license-fee stand as expressed in September *QST*.

I want my amateur radio station and operator's license to have equal status with all other radio licenses. If WRCA is required to pay for a license, I think I should be required to pay (maybe not as much) and have equal rights on the air. (Not on same frequency!)

When a neighbor complains to me he hears me on a "two bit" a.c.-d.c. radio, I want to be able to look him straight in the eye and say, "Go to . . . I've paid for my license just like WPDQ, the station you are listening to, and have equal rights."

I don't want amateur radio to sink into a "free loader" status if other services must pay for their license. A "free loader" never commands respect from anyone. — *O. W. H. Johnson, W4KVH/K1QLZ, Vienna, Virginia.*

¶ Please accept my congratulations for your fine editorial concerning amateur license fees. Your coverage was complete and your logic excellent. It makes me glad to be a member of your organization. — *William H. Boyer, W3AMQ, York, Pennsylvania.*

¶ I am quite happy that the League is taking a stand against fees. I, too, feel that this is an example of unwanted Government intervention.

I do, however, disagree with the statement, . . . "Charging a fee for the privilege of spending one's time and money solely to acquire skill in the field of electronics is . . ." This statement, on our part, is unjust. I am certain that FCC is not charging the fee for any such privilege. You yourself, in a previous editorial statement, said that the fee was charged to "make the service as self-sustaining insofar as possible."

I think it important that all amateurs understand just what the fees are for — particularly if the legislation goes through. — *John R. Miller, K9BIV, Macomb, Illinois.*

¶ I look forward each month with a great deal of pleasure and anticipation for my *QST*: no other so-called amateur publication comes even close to your quality. However, I may not always agree with your point of view. Specifically, I feel that a charge to defray the cost of license-issuing isn't bad; the cost of government and its services are skyrocketing all out of proportion and if all amateurs want their licenses bad enough, as *I* do, the minimum fee is not out of sight. The fee should be charged for examination (not necessarily for license issuing) as too many "characters" take the exam at the FCC who aren't properly equipped therefor! . . . — *Benjamin Bergman, WA6JJP, Lemon Grove, California.*

¶ I agree with your editorial 100%. Count me as a voter against license fees for amateurs. — *Albert W. Boehnlein, W8BEZ, Garden City, Mich.*

¶ It does seem only just that amateur radio station and operator licenses should be issued non-fee for an indeterminate number of years to come. It would seem feasible at this time to subject agencies using the service for profit to a license fee to remove the financial burden from the tax payer. However, such a move should in no way enable future legislation to construe the meaning of the act to include the amateur. — *Randolph C. Blodgett, WA2DEW/KV4CQ Bloomfield, New Jersey.*

¶ Seems to me it's about time the FCC took some action to cut down "mail-order" licensing. By paying a fee, we should become self-sustaining and have a small voice in demanding better supervision in conducting amateur licensing.

FCC has indicated in many publications that the reason why Novice, Technician and Conditional licenses are made by mail, is the lack of funds to have engineers conduct same. — *Louis A. Gerbert, W8NOH, Grand Rapids, Mich.*

OM . . .

¶ I am sorry for K4TDN/3, myself and anybody who has to work me and some other doddering old fools who can no longer form Morse characters as clearly as the tape from WIAW. I noted several years ago that an older man had a very choppy fist and since then have come to regard such choppiness and distortion of the code ("and" may come out "pd") as a function of age. Maybe it is our muscles rebelling. Anyhow, I find myself sending unrecognizable code and then I go back and redo it, getting it right the third time. Who wants to work a lid like that? Or else I can turn it out carefully but only at the rate of 10 or 12 w.p.m. Old age is a sad thing. But just give us a QLF (who knows what QSD means nowadays?) and we'll try to do better. — *Alexander A. McKenzie, W2SOU, ex-W1BPI, Hackensack, New Jersey.*

OLD "PRO"

¶ I'll be coming back on the air in my retirement after some 42 years on the air as an amateur, and in the past a many-year member of the ARRL.

Naturally I want to come up to date, and find out what the latest thinking in Hartford is. I need to be educated. Otherwise I'll be using my 750-pound power supplies and other maximized rock-crusher gear that's the hallmark of the old timer.

No doubt about it — *QST* does a good job of reporting the field. And I'm saying this from a professional point of view, having served as an editor of *Time*, writer for *Life*, syndicated columnist, and writer for the national and international editions of the *Reader's Digest*. — *Harold Churchill, ex-W2ZC, Princeton, New Jersey*

A LITTLE PATIENCE

¶ In appreciation for what other hams have done for me, I must comment on Eugene Bosinski's letter (September *QST*). Either he has had the wrong approach or has been unfortunate in meeting a few uncooperative hams, who are in the minority.

When I received my license several years ago, radio theory was not one of my strong points. Consequently, there were many times when I was seeking advice from members of our club or others whom I had met. Sometimes questions were answered on the spot. At other times I went to their shack or they came to mine.

I just want to say that there are many hams who gladly give of their time and talents to help a beginner and they ought to be given a pat on the back. — *Leif A. Nelsen, W9ZXG, Chicago, Illinois.*

¶ As president of a radio club, I feel compelled to reply to a letter which appeared in the September issue of *QST* from Mr. Eugene Bosinski. The failure of a president and secretary of a radio club to acknowledge a letter from a fellow ham seeking aid is a gross breach of amateur protocol. Paragraph four of The Amateur's Code reads in part . . . "The Amateur is friendly . . . friendly advice and counsel to the beginner . . .". If the club to which he refers was unable or unwilling to offer assistance it could have at least said so.

When I became interested in amateur radio a number of years ago, I experienced Mr. Bosinski's dilema exactly. There were two hams in the office where I worked — one General and one Extra. They would not even talk to me much less offer five minutes of advice. I believe that I now

(*Continued on page 168*)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
JOHN F. LINDHOLM, W1DGL, Ass't. Comm. Mgr., C.W.
ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, W1YYM, Ass't. Comm. Mgr., Phone

How Many Can You Claim? W3SMV and W4UWA/K3KMO report organizing a club called the Brass Pounders Amateur Radio Fraternity. Besides basic requirements that applicants show proficiency in constructing some of their own equipment, have worked a club member and have been licensed at least five years as General Class or higher, applicants must, it is said, meet at least six of the following ten requirements:

(1) Hold ARRL CP certificate for 25 w.p.m. or higher
(2) Hold ARRL appointment as ORS.
(3) Submit proof of c.w. work with 50 countries.
(4) Hold Advanced or Amateur Extra Class License.
(5) Show proof of c.w. QSO with W1AW.
(6) Hold A-1 Operator Club certificate.
(7) Hold BPL.
(8) Currently show membership in section level (or above) traffic net.
(9) Have log verification of having completed 1,000 c.w. contacts.
(10) Be *on the air*, using c.w. an average of five hours a week.

We found this an interesting exercise to check off the points to see if we personally could make the six, provided we lived in the club area. Perhaps you will like to try the same thing. On points you can't check, we fancy you may want to work for some of these, just for the feeling of accomplishment that may be involved. If you are especially interested in collecting a certificate award for 1000 proven c.w. contacts shown in your log subsequent to 31 Dec. 1956, drop us a line and we can supply a little further data on that.

Pet Peeves. Quite a list of these can be made! We'll recite some for all to know that not all ignorance is bliss. The new ham who belongs to a club scheduling operating talks can generally steer clear of criticisms. It takes *dos* and *don'ts* by the old timers and a good question-answer club session to put across some useful procedure points and operating lore. Eavesdropping on good nets, taking part when you can, is also rewarding in operating know-how. The following "pet peeves" are noted by an OO (W9KCR) . . . and include things that go beyond the scope of OO notifications of signal defects contrary to FCC regs. Not that false calls, omissions from call identification, chirps and deliberate interference are *not* citable by FCC; they are. Perhaps some of these are *your* pet peeves too?

Have you heard . . . (1) The ham who tests and never signs — brick on key . . . no dummy antenna. (2) Electronic key adjusters, testing with power on. (3) Persons "on the air" who have not had sufficient keying practice. (4) The "new General" who carries over traits like "R R R sorry, OM, but I missed your QTH and your name" (not sufficiently sharp to know that R means received OK). (5) The ham sending 33 CQ's before signing his call. (6) The one who sends 2 or 3 CQs and signs his call 10 times . . . often calling "CQ DX". (7) Those that interfere with W1AW bulletins and CP unnecessarily. (8) Marks of the Novice . . . "back to you" . . . "AR K". (9) The percentage who send 73's or "best 73" or "best 73's" (73 *means* best regards). (10) The chap who by poor spacing makes a call like K4SUV come out VK5SU. (11) Fellows who haven't *heard* the DX, but come on the frequency just because there is a pile up; others who come up on frequency and call while the DX station is sending (Many DX stations properly refuse to answer the fellow that does this.) (12) Those that omit "DE" from between the two calls or leave off prefixes and numerals contrary to FCC regulations. (13) Those with bad chirps?

Why not everybody help by attempting to impart the missing know-how on the spot, or by a tactfully put remark with one's QSL? OOs continue to try to keep people who are out of step with FCC regs out of trouble. Clubs can help by promoting lectures, demonstrations and discussions for fall-winter meetings.

Wide-band F.M. nets for Six and Two Meters. A new phase of our hobby that has been growing is the use of wide band f.m. in the six- and two-meter bands. FCC regs are making older two-way commercial equipment obsolete and many amateurs are getting this at nominal prices and putting it into service. The replacements to permit municipal users to meet new FCC regulations will continue through 1963. A "directory" of fixed-frequency wide-band f.m. amateur nets (Issue 3) has been prepared by K4ZAD and may help one's choice of frequencies for such nets. A nationally used as well as a local working frequency is recommended when setting up these equipments, designed for crystal-controlled reception as well as transmission. Affiliated clubs and groups forming f.m. nets may obtain free copies of the directory from Thomas McKee, K4ZAD (1306 Grove Road, Lynchburg, Virginia). He will act on receipt of a stamped self-addressed business size envelope, sending copies as long as the supply lasts.

According to K4ZAD's directory, about 75 cities have f.m. groups working on "Six"; 120 other nets are on various 2-meter channels. Such setups are designated in several cases for local operations. For extended-range voice work and such links in proper band sectors there seems a definite place. There may be a good future for wide-band f.m. in our AREC-RACES emergency circuit plans under amateur auspices, as groups of equipments become available for modification and use.

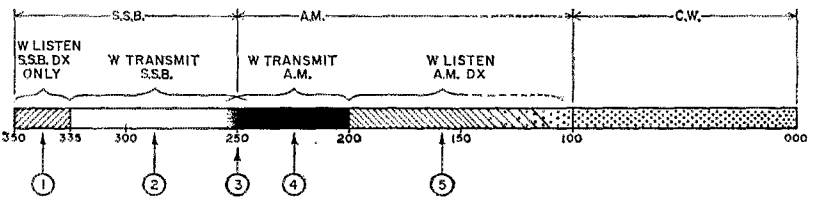
Should 52.525 Mc. and 146.94 Mc. be Designated as F.M. National Calling and Emergency Frequencies? The first named frequency seems the most popular for amateur f.m. net operations in about 12 states. 52.525 Mc. is suggested by K4ZAD as an NCEF. If users will carefully follow the principles of NCEF work and, in each case, set up for *alternate working frequencies*, distinctive to their areas, it is believed that the 52.525 Mc. calling channel represents an ideal and efficient amateur utilization of this part of our spectrum. But is there enough f.m. use to justify it? Objections or disadvantages to one or the other of these frequencies? May we solicit your comments and suggestions. For greatest coordination and successful point coverage, it seems advantageous for all stations in a particular county or large community to have two or three common frequencies to use, and also to know of the channels used in adjacent areas, so ample liaison contacts may be made using those too, if required. The six-meter frequency put forward does appear to have in its favor a good degree of freedom from channel two TVI problems.

Separate comments are requested from all who would be interested likewise in an ARRL specification of an additional NCEF in the two Meter band for f.m. If set up for it, one can switch quickly from 146.94 to 146.76 or 147.30 Mc. or other channels leading in f.m. usage. As with the selected six-meter frequency, more use would help to populate the upper part of the 144–148 Mc. band advantageously. K4ZAD points out that 146.94 Mc. is in the Technician-permitted frequencies; likewise it is a RACES-plan frequency. Comments from all amateurs are requested please, to help us assess the possible advantages and disadvantages of another NCEF for operators who use wide-band f.m. Is not this another of these fields where observance of a selected frequency as one of our gentlemen's agreements can only help promote operating success and the Public Service of Amateur Radio?

More on 20 Meters. The "gentlemen's agreement" that W/VEs refrain from using the top 15 kilocycles of 20 meters is rooted in the ARRL Board of Directors purpose to assist in making "DX contact with our amateurs and with each other possible in greater freedom and success." A number of comments have come in on the subject. The following stresses the importance of "control."

"I feel this is especially a problem for the DX station to control, more than for W and K stations. As long as a DX station continues only to listen on his frequency, what is one to do? If the DX station would specify a listening frequency, say listening from 14,280 to 14,300, or some specified frequency, and not acknowledge callers on his frequency, that would be the answer. Or if he said, 'listening for calls from 14,250–14,300 kc., tuning 14,250 up' first, and then announced next that he was tuning down from 14,300, this would help spread out the Ws and eliminate pile-ups. This would also revive detective-work of DX know-how into the game. It should bring back some of the competitive spirit of the period when crystal-control was the vogue." — *Gil, W1APA.*

Planned Use of 14 Mc. Charted. One correspondent states amazement, "at the misunderstanding and lack of thinking on the basic facts of phone DX working by such a large number . . . including . . . even some DXers." He thinks *QST* should show by diagrams or otherwise, some fundamentals on band use, covering the Board's recommendation to help W- and DX-operators get best s.s.b. results at the high end of the band. We are indebted to Dale Kentner, W2ZX, for sending in the simple charting of 14-Mc. band segments shown below. The numbered commentary best tells the whole story, we think. The chart shown represents Planned Proposed Usage of 14 Mc. for optimum use of available frequencies, *not* proposed allocation. Try operating as here suggested, and see if you do not agree this makes your use of the band, be it rag chewing, DX, or traffic work, enjoyable and successful.



1. Available mainly for s.s.b. DX to transmit to Ws, and for DX-to-DX s.s.b. QSOs, both free of W s.s.b. QRM.
2. Available for W s.s.b., likewise for s.s.b. DX to use for on-frequency work with Ws under "no pile up" conditions (especially off peak occupancy hours).
3. S.s.b./a.m. borderline—a grey area which may vary with time, and the relative activity of s.s.b. and a.m. operators.
4. Available mainly for a.m. (W operators) to transmit. Only 'very hardy' a.m. DX ventures here.
5. Available for a.m. DX to transmit to W's, and for a.m. DX-to-DX QSOs, both free of W phone QRM. And below this a grey area which may vary with time, and the activity by phone, c.w. and other modes.

Some Novice Items. *WAS.* One of the commonest questions ARRL gets from newer amateurs, "Can my cards, confirming certain states worked as a Novice, be combined with those received after I make my General Class ticket, and be submitted to ARRL for WAS?" Yes, indeed, provided your work is from *one location.* Also for the Worked-All-States Award, the 50 states do not have to be worked in any particular band or mode. Using the different bands for different times of day and distances involved is to be encouraged; we feel it demonstrates your versatility. *CP.* Novices, Technicians, others: Use our nightly over-the-air ARRL Code Proficiency Program all you can to get your speed up to General Class requirements. Some practice in sending code, along with your receiving practice, will get your speed up there faster. We invite all amateurs to *keep on* and get our CD Endorsement Stickers for the speeds of 20- and 25-w.p.m., not only as a show piece for your station . . . but so you will have top capability as an amateur with full privileges who can work all bands, to enjoy traffic net operating, go after DXCC with no handicaps and h ld ORS and/or other appointee posts. *The SS.* Here's an activity all amateurs get into each year. For testing stations, getting new states and QSLs for shack wallpaper, it's unexcelled. It steps up both results and operating ability. Novice Winners got certificates in all but one licensing area last year; Novice's scores of course get compared only with those of other Novices. We invite you to see the SS rules, page 42, and to try your hand. You may end up with the Novice certificate for your ARRL Section.

The 28th Annual ARRL "SS"! Work either c.w. or phone in the Nov. 11–13 18–20 Sweepstakes and you have a real operating treat coming. All U. S. and Canadian amateurs are invited. The report on last year's results (May *QST*) shows a "clean sweep" of all sections racked up by 123 operators using c.w. and 15 taking part on phone. Ninety club's members got certificates as local-club leaders. The "SS" is our top ARRL operating event in popularity, leading all other activities in individual entries. Don't miss it.

—*F. E. H.*

A.R.R.L. ACTIVITIES CALENDAR

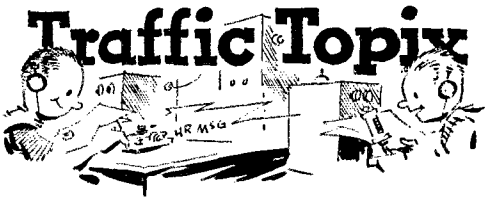
(Dates shown are per GMT)

Nov. 3: CP Qualifying Run — W6OWP
Nov. 11–13, 18–20: Sweepstakes Contest
Nov. 17: CP Qualifying Run — W1AW
Dec. 7: CP Qualifying Run — W6OWP
Dec. 16: CP Qualifying Run — W1AW
Jan. 5: CP Qualifying Run — W6OWP
Jan. 6–7: V.H.F. Sweepstakes
Jan. 13–15: CD Party (c.w.)
Jan. 20: CP Qualifying Run — W1AW
Jan. 20–22: CD Party (phone)
Feb. 2–4: DX Competition (phone)
Feb. 3–18: Novice Roundup
Feb. 8: CP Qualifying Run — W6OWP
Feb. 16 — Frequency Measuring Test
Feb. 16–18: DX Competition c.w.)
Feb. 20: CP Qualifying Run — W1AW
Mar. 2–4: DX Competition (phone)
Mar. 16–18: DX Competition (c.w.)
June 9–10: V.H.F. QSO Party
June 23–24: Field Day

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

Nov. 4–5: New York City QSO Party, Bronx High School of Science (p. 124, this issue).
Dec. 2–3: 21/28 Mc. Telephony Contest, RSGB (p. 83, this issue).
Dec. 9–10: Kansas Centennial QSO Party, Kansas Federation of Amateur Radio Clubs (p. 128, this issue).
Dec. 9–10: New England QSO Party, Conn. Wireless Assn. (p. 132, this issue).



Any change will cause confusion, even if it's a change for the better. By the time you read this, many areas of the country will be moving their clocks back an hour to "regain" the hour that they "lost" in April when they set them ahead an hour. A few months ago we received a terrific bawling out from the field for harping on "daylight saving" time, so we'll not do so again. Besides, now that we're all (?) using GMT, it isn't really necessary. Other people may be changing their clocks, but we don't have to; we just move some of our schedules back an hour and let the old 24-hour clock on the wall alone.

This GMT business can be confusing, though. We are trying to learn to use it exclusively, and even *think* in terms of it, but like everyone else we are so accustomed to thinking in terms of local time that we find ourselves unconsciously converting GMT to local time so we'll know what time it is, instead of getting used to the GMT equivalents of getting-up time, lunch time, dinner-time and going-to-bed time. We are also having difficulty getting used to changing the date at 0000 GMT, which doesn't come in the middle of the night where we are. We're used to thinking of the next morning as "tomorrow" and the evening before as "yesterday," and when this "ain't necessarily so" when you're using GMT, it's confusing. It's strange to note that a net which operates at 1930 EST Monday thru Friday is operating at 0030 GMT *Tuesday thru Saturday;* and this is a change that takes getting used to.

We know that for many years we will have among us some amateurs who will persist in using local time (one even alleged that this GMT move was communist-inspired!) and dragging their feet like the very dickens before changing (and some will *die* first). Nevertheless, we want to go on record here as urging that all traffic men use GMT in their filing times on messages, and that the dates of origin on message reflect GMT, not local time. In any event, at the very least the filing time should indicate what kind of time you are using, as should any other reference to time, for that matter — at least until we all get used to it and it can just be assumed that GMT is meant. — *WINJM.*

— • • • —

We quote some words of wisdom from the pen of W4AKC, vice director of the Roanoke Division, appearing in "SCN," the bulletin of the South Carolina Net: "The difference between a mediocre net and a good net often lies in just a little bit more enthusiasm. Enthusiasm is an indispensable ingredient of a successful net. Even the most laconic mem-

ber of a net can scarcely resist genuine enthusiasm displayed by the others, particularly the old timers. Without enthusiasm for the objectives that the net has set for itself, the sessions are dull indeed and the routine of the task is almost unbearable. The responsibility of sustaining a high degree of interest belongs to the Old Timer. Quite often he must give a 'shot in the arm' to the newcomer who begins to show signs of declining interest."

—•••—

Net reports. Eastern Area Show Net 31 sessions, 133 check-ins, 44 traffic. Twenty Meter Interstate S.S.B., 20 sessions, 505 check-ins, 1538 traffic. 7290 Traffic Net, 46 sessions, 1527 check-ins, 587 traffic. Early Bird Transcon Net, 193 check-ins, 323 traffic.

—•••—

National Traffic System. We have often said that there is nothing wrong with NTS that strict adherence to the operating principles would not cure. This is all very true as a philosophical statement, but in practice it can be fallacious, because the practicalities of any plan are part and parcel of the plan's worth. The original NTS plan was sound enough, theoretically, but in practice it was discovered to have flaws simply because the people who implemented it were human and had human failings, and because the wherewithal to implement it fully simply was not available. For example, *if* we had stations on the East Coast with kilowatts, directional arrays and high traffic savvy, possibly they *could* report direct into PAN and transmit and receive traffic, *if* we had stations of similar capability in that net. But it didn't work out this way, because we couldn't find the stations and the operators with the necessary capabilities. So the plan was changed and TCC was created, which has worked out much better but is still a long way from perfect.

Similarly, each theoretical phase of NTS was given a thorough practical test over a period of time sufficient to justify its continuance or, if a more practical alternative could be devised, its abandonment. This, we think, is a procedure which has been more than a little responsible for the success NTS has enjoyed.

Even this, however, can be carried too far. Precipitant abandonment of an idea or procedure in favor of another no more practical is not conducive to progress. That's why we have the various administrative and leadership levels in NTS — so that brakes can be put on changes advocated at one level when consideration at other levels indicates they are not beneficial to the over-all system. It is also the reason why we have engaged rather frequently in long, sometimes rather heated discussions with some of our NTS leaders and with leaders in the traffic field outside of NTS. To the section net manager, the conduct of his section net is of paramount importance; similar concern, each to his own bailiwick of jurisdiction, applies to managers at region, area, TCC and area staff levels, just as we here at the headquarters apply our consideration to the over-all aspect. It is not a matter of one being "above" the other; there is no question of who is "boss," or who has jurisdiction over whom, or who has the final "say" on things. The question is, from one level, how will what I propose affect the system as a whole? Or, from another level, will these proposals, if put into effect, be beneficial or otherwise to all parts of the system?

This kind of mature, far-reaching thought on the part of its leaders is what makes NTS a system instead of a scattered hodge podge of nets.

August reports.

Net	Sessions	Traffic	Rate	Average	Representation (%)
1RN.....	58	719	.414	12.4	75.6
2RN.....	59	789	.570	13.4	95.6
3RN.....	62	872	.309	14.6	99.5
4RN.....	56	712	.378	12.7	93.7
RN5.....	59	532	.308	9.0	76.0
RN7.....	62	586	.320	9.5	47.1
8RN.....	62	374	.188	6.0	91.0
9RN.....	61	2074	1.078	34.0	59.4
TEN.....	92	1057	.417	11.4	53.6
ECN.....	21	69	.127	3.3	77.8
TWN.....	31	358	.410	11.5	61.9
EAN.....	31	1345	.858	43.4	98.4
CAN	31	2405	1.440	77.5	98.9[1]
PAN.....	29	1607	.714	55.4	98.9[1]
Sections[2]....	1021	8271		8.1	
TCC Eastern	102[3]	712			
TCC Central	89[3]	1944			
TCC Pacific.	112[3]	1192			
Summary..	1715	25618	CAN	12.7	3RN
Record.....	1973	19991	.895	14.8	100.0

[1] Region net representation based on one session per night or less; others are based on two per night or more.

[2] Section nets reporting (33): SOCAL 6, SCN, NCN (Calif.); ILN (Ill.); MSPN & MSN (Minn.); CN & CPN (Conn.); VN & VSN (Va.); OSN (Ore.); S. Dak. 75 Phone Eve, SDN & NJQ (S. Dak.); AENB, AENM, AENO, AENP Morn, AENP Eve & AENT (Ala.); Tenn. C.W.; SCN (S. C.); CCW (Colo.); WFPN Morn & QFN (Fla.); QMN & Wolverine SSB (Mich.); WSN (Wash.); NTTN & NTX (Tex.); NJN (N. J.); GSN (Ga.).

[3] TCC functions reported, not counted as net sessions.

A big load of traffic from the Chicago Trade Show was responsible for the high traffic total in August, and probably also for our breaking all previous records in that department by a wide margin. Much of the traffic was pumped directly into 9RN, and look at their traffic total!

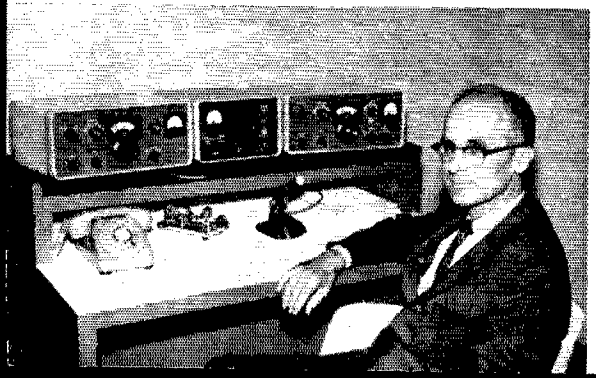
The 3RN representation for August signifies "the end of a dream," for one of the sections missed a session. W4DLA and K4PQL have been awarded 4RN certificates by Manager W4SHJ, safely returned from the Philippines. RN5 certificate was awarded to K4LNA. Thanks primarily to K8MYU, 8RN's West Virginia representation took a decided upswing in August. We are still looking for a new manager for TEN. VE3BZB's vacation in the Maritimes produced some new representatives from VE1 on ECN. W6FEO is having QRM from work, but manages to keep TWN going, including the fine bulletin he puts out. W9DYG reports a swell traffic meeting at the Central Division Convention in Springfield. W9USR emceed the proceedings and W9DO presided. A panel consisting of W1SMU, K4AKP, W9DYG, W9DO and W5CEZ answered questions fired at them by the audience. WA6ROF has awarded PAN certificates to K6LKD, W7GYF and W7LND. PAN has

MEET THE SCMs

Here are a couple of brand-spanking-new SCMs, though not new to ham radio by any means. Left is Kentucky's Section Communications Manager, Elmer G. Leachman, W4BEW, who holds several Public Service certificates for various emergencies. The S-Line shown is supplemented by a 75A-2, and 32V-3, and KWM-2 soon to be mobile. A three-element tribander does the radiating along with a vertical. SCM Leachman has been a ham since 1924.

Right finds W9FWH, Donald L. Holt, at the rig. Don, in addition to his OBS, OPS, and EC appointments, is the new SCM for Indiana. The Heath Apache, DX-35, and Sixer and HQ-110 make up the rig found usually transmitting on 3910. Don is a member of the Madison County Radio Club, AIEE, and IRE, and has been honored with the Hoosier Courtesy Award.

Experienced hams like these two gentlemen make good Section leaders, and follow the mandate of cleaning house of dead-wood appointees.



moved back to 3675 kc. for the winter months.

Transcontinental Corps. Things are going well in TCC, everything considered. The percentage of unsuccessful schedules is low, as it should be, but we'd like to see it disappear completely. There are 341 TCC schedules in a 31-day month: 124 each in the Eastern and Pacific areas and 93 in the Central area. TCC Directors report only on the results of schedules reported to them, and of course this rules out schedules which have not been set up. We think that the record should show the percentage success of *all* TCC schedules, rather than just of those attempted, and the "percent successful" column in the table below hereafter will reflect that percentage as a more accurate (though less rosy) portrayal of how our TCC is doing.

August reports.

Area	*Functions*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern.....	102	75.0	1295	712
Central.....	89	91.4	3958	1944
Pacific.....	112	86.6	2361	1192
Summary.....	303	83.6	7614	3848

The TCC roster: Pacific Area (W6EOT, Dir.) — W5ZHN, *K6s* KCB LKD GID, *W6s* EOT HC, *WA6s* ROF JDB ECF, K7IEY, *W7s* ZB GMC DZX, *KØs* IIT DTK EDH, *WØs* WME WHE/7, KQD.

We have just taken from our source material file for this column a letter from Carl Franz, W5ZHN, dated May, 1961, in which he informs us of his plans and progress for and in Albuquerque (N. M.) AREC. We put it in that file because we liked some of the ideas he presented therein and thought you might like them too. This is a more or less painless way to acquire material for this column, especially since Carl (bless his heart) appends a note at the bottom telling us not to try to answer.

Anyhow, the boys in Albuquerque are establishing "classes" of AREC membership based on attendance of drills, equipment, operating ability, training and experience. We present the qualifications herewith not just to give their efforts publicity, but mainly to plant the idea of AREC gradations as a means for increasing interest among your own group. Here's how an AREC member in Albuquerque is classed:

AREC Specialist: At least 80% attendance, code speed 15 w.p.m. or better, satisfactory performance as NTS liaison, holds an Advanced First Aid certificate issued by the Red Cross and has performed satisfactorily certain specifically assigned field problems. Must have mobile set-up for both phone and c.w. and experience in NCSing the net on both phone and c.w. During field problems he might be told, for example, that he has lost his mobile antenna, his mike or the final tube in his rig, but to get back on the air as soon as possible. This is the top grade in ABQ AREC.

AREC First Class: At least 70% attendance, experience as NCS on both phone and c.w., mobile on both phone and c.w., ten w.p.m. code speed, has at least a Standard First Aid certificate issued by Red Cross and judged competent in field operations.

AREC Second Class: At least 60% attendance, has a reliable rig (mobile or fixed), meets NTS standards of procedure, takes part in all emergency operations and simulated emergency tests.

AREC Third Class: Any AREC member who can yell loud enough to modulate a rig and with strength enough to push a button.

The AREC members are really put through their paces. Combined emergency-traffic nets are being started, code practice is being given, and AREC member candidates for a higher class are being tested. In one field problem, for example, operators are required to locate a "search party" by using a d.f. loop, plotting on a topographical map its exact location and then proceeding to that point.

Carl says "maybe I'm reaching for the moon," but he wants to have the man in the car behind the AREC decal well-trained and equipped to perform a real communications service in the event of need.

If this is a good idea in Albuquerque, some modification of it may be good in *your* AREC group as well. Anyway, it's another idea to ponder. — *W1NJM.*

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AREC members went into action on July 22 when a flash flood hit portions of El Dorado, Kansas. Torrential rains of five inches or more which fell across northern sections of Butler County sent a surge of water through northeast El Dorado and the Riverside district, flooding homes and several businesses. The Butler County Storm Warning Net reported river crests periodically and assisted in other phases of the emergency work. KØWRB was net control from radio station KBTO and the following additional amateurs took part *KØs* OMJ VQC, *WØs* EHV GQM RFY RGB, — *KØVQC, EC Zone 11, Kans.*

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At noon on Aug. 4, a short circuit in the overhead power lines in South Russell, Ohio, caused a power failure over four counties in northeastern Ohio. The AREC Red Cross Disaster Services Network for Cuyahoga and Geauga Counties was in operation within 10 minutes with stations using emergency power. Telephone circuits being affected, information concerning power situations in suburban communities, hospitals, water pumping stations and location of portable power equipment for emergency use — all these data were passed to the Greater Cleveland Red Cross Chapter and other safety and service departments by amateur radio. The net was secured after three hours, when power had been partially restored in both counties. K8UFN was net control, operated by K8EXL and K8ZFE. K8DQB operated the Red Cross chapter station. Other fixed and mobile stations who participated were *K8s* HVH JDQ MBV NYZ SCI UXH VIE, W8HZI. — *K8EXL.*

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During the flooding of Ashton Creek, near Washta, Iowa, on Aug. 8, a father and son were swept into the Little Sioux River while trying to cross a bridge, and amateurs were called upon to assist in the search for the bodies on Aug. 10. Cherokee County EC KØVBM got together with Woodbury County EC KØMMS and Ida County EC KØLXL to form a planning committee to obtain the necessary equipment and operators. The resulting organization brought AREC members of Sac, Clay, Crawford and Buena Vista counties into the operation. The deployment of stations went like this: WØEFG NCS to keep frequency clear and transmit long haul messages; KØLXL for communication between base station No. 1 and NCS; KØVBM for communication between base station and hand-carried units with the search officials; KØEJS for contact between base station one and base station two; KØDKM/mobile for liaison purposes; KØMMS/mobile as alternate between base station one and the NCS. Other amateurs who took part were *KØs* YVZ AAU PDI DKM BGH YTO TBO EIC UGI AAR YHN ERF YTU YTV YTX CEJ BXO, *KNØs* FXX FYC, *WØs* DIT EIY EQN FBY MHC BUM DON YOZ. KØYHN lost both shoes and shirt, spending the day at the search both barefoot and bareback. KØPDI, a trained diver, was on the scene to help if needed. KØYVZ, EC for Clay County, served as NCS and almost lost his voice. Amateurs assisted in the procurement of boats, grappling poles and hooks, airplanes, search volunteers, food and drinking water. The operation was a partial success as one body was found. — *KØVBM, EC Cherokee County, Iowa.*

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On Aug. 19 a forest fire broke out about five miles north of Moscow, Idaho. The base station for Latah County received a call for help from a fire truck at the scene of the fire. W7VQC and W7GHY put the base station on the air and alerted police, sheriffs, forest service and smoke jumpers from Spokane and Yakima. Thanks to this prompt action, the fire did not reach the city. — *W7GGV, SCM Idaho.*

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Five Venezuelan amateurs, in an attempt to save the life of a stricken man in Los Teques, Venezuela, conducted a "radio search" on Sept. 3 for information about a remedy reputed to be under development and effective in similar cases. The Venezuelans concerned were *YV5s* BFD AQO APS ASF BJA and HN First contacted were WA2OVI and WA2NEJ, who enlisted the aid of New York periodicals in a search for the medicine. Later, WA2OVI tried to locate a prominent cancer specialist in Bethesda, Md., without suc-

cess, while K3LJP and W5PPI stood by. Then W3KXU/4 succeeded in contacting the National Cancer Institute and was informed that the drug was made by a firm in Indianapolis. K9SJF in Indianapolis was contacted, got in touch with the manufacturer and the medicine was shipped promptly to the Caracas physician as a gift of Eli Lilly & Co. Meanwhile, the amateurs transmitted dosage information supplied by a Lilly clinician. Another bright star in the chronology of international amateur radio cooperation. — *YV5BFD.*

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On May 7 the AREC of Hampton Roads Peninsula held exercise "Big Wind," simulating a tornado striking an elementary school. First alarm of the simulated disaster came from a mobile station of an amateur who lives nearby, which was transmitted to net control station W4VMA, operated by K4UOT with W4VMA and K4VJB assisting and handling the two-meter net. CAP dispatched an aircraft to make an aerial survey, their mobile unit going to W4VMA to establish liaison with the AREC at that point. At the request of the NCS, several mobile units of the Newport News police were sent to the disaster area. Simulated emergency traffic was passed to and from the mobile units and the NCS, while mobiles were dispatched on various communications assignments. The exercise lasted exactly fifty minutes, after which participants and their families had a picnic. A total of 23 amateurs participated. — *W4VMA, SEC Va.*

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On May 21 a two-meter radio link was set up by the Fox River Radio League between Aurora and South Elgin, Ill., to provide communications for the first annual Mid-American Canoe Races. Mobile stations with generators, battery-powered rigs, beams and halos made up the link. Stations were placed at South Elgin, St. Charles, Geneva, Batavia, North Aurora and Aurora. The progress of the race was reported to the officials at the finish line at Aurora by each of the portage points directly from the mobile units. In addition, the local radio station was supplied with receiving equipment so the reports could be monitored and relayed direct to the public. Ten amateurs took part in this fine demonstration of amateur radio capability. — *W9CZ.1/W9NE.*

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On May 30 the Steuben County (Ind.) AREC participated in the annual Memorial Day parade in Angola. Mobile units spaced throughout the parade helped with the organization of the parade and furnished communications along the parade route. Communications were carried out on 52.525 Mc. Eight amateurs participated. — *W4CTU/9, EC Steuben County, Ind.*

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The Turlock (Calif.) Amateur Radio Club on June 3 and June 17 assisted the Modesto Power Boat Club with their first annual races. The Stanislaus County C.D. van, its power plant and radio equipment were used along with emergency equipment of club station W6BXN, with additional gear provided by TARC members. K6IXA was in charge of the operation, with K6DYM operating W6BXN. Communications were provided for the pits, three safety crash boats, a frogman standby boat and the NCS at the judges stand. The entire operation was on two meters, ten amateurs participating.

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On June 9 and 10 the AREC of Cuyahoga County (Ohio) assisted the Antique Car Club in their show at the Berea Fairgrounds, using modern electronic equipment to serve on an old-time project. Amateurs handled information service throughout the show area, conducted an announcing service for the public address system and provided communications for parade control and race control. The mayor and police department of Berea gave excellent cooperation and the activity was a great success. Nineteen amateurs took part. — *W8AEU.*

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On June 11 the Roanoke County (VA.) AREC furnished communications for a sports car hill-climbing contest at Catawba Mountain. Eight amateurs participated, all using two meters. The Old Dominion Sports Car Club was well pleased with the operation and is looking forward to using the services of the AREC again. — *K4PQV, EC Roanoke Area, Va.*

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July SEC reports were received from 26 SECs (three less than July '60) representing 12,902 AREC members (1851 more than July '60). This is the pattern: we are running behind last year in number of SEC reports, ahead in number of AREC members. Sections reported: Ind., S. Dak., Tenn., Ohio, Mich., NYC-LI, Iowa, Maine, E. Mass., Ore., Wash., Nev., E. Bay, Utah, W. Fla., E. Fla., Ga., S. Texas, Alberta, Kans., S. C. V., Colo., E. Pa., Los A., Sac. V.

A red-faced correction: somehow, we omitted four sections from the list of reporters in Aug. *QST* (April reports). They were So. Texas, W. Fla., Kans. and Wash. This makes the April total 33 reports and 13,132 AREC members, instead of the August *QST* figures shown. It also adds two sections to the 100% list in October *QST*: Washington and South Texas. The mid-year total is thus 180 reports from 42 sections instead of the Oct. *QST* figures.

Ah, me! Sorry, men, we goofed.

RACES News

Hudson County (N. J.) RACES was called into action twice in August to assist with communications connected with two waterfront fires. The first fire, on Aug. 18, was in West New York, consuming a vegetable oil plant, three coal piers and spread along a mile of the Hudson waterfront. West New York and Guttenberg RACES were alerted at 1715 EDT and operated until midnight. Amateurs taking part were *K2s* QMS UXW SGC MWD QHZ DUX, *W2s* KRE VMQ, *WA2s* HXG CCF QCN DCU, WV2SHN.

The second fire was at Weehawken on Aug. 21, while the first fire was still smoldering. The net was alerted at 0345 EDT, came on the air at 0404, and remained active until 0700. Amateurs taking part were *K2s* QMS UXE MWD, *WA2s* SHN QCN. — *K2MFF, SCM N. N. J.*

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On May 13 a combination exercise called "Operation Quake" was conducted by San Mateo County (Calif.) medical, c.d. and Red Cross officials. Amateurs under RACES took part to assist with communications. Two earthquakes were supposed to have struck, one at 0728 and the next at 0736, local time. Major and secondary hospitals were designated, as were shelters and first aid stations. The three amateur RACES/AREC stations were manned to provide communications from the Red Cross shelter in Menlo Park to Sequoia Hospital, with the Sequoia Region Red Cross Chapter in the middle. W6WWJ/6 was set up at Sequoia Hospital with K6TQN and K6MPN in charge and a staff of ten amateurs, some of them with operating mobile units. At the Menlo Park Civic Center K6YQT was set up with W6STY and WA6LQN in charge and a staff of seven amateurs. K6OTR was located at the Red Cross chapter, with five amateurs operating. These three stations handled traffic to and from the San Mateo County Hq station, K6QFO, located in Belmont under radio officer W6CTH. Authorized RACES and DCS frequencies were used. A great amount of traffic was efficiently handled and city officials expressed their gratification for the work done by the amateurs. — *W6DEF, EC Redwood City, Atherton, Menlo Park, Calif.*

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A simulated tornado exercise was conducted on June 5 by Zone 10 C.D. of Cuyahoga County (Ohio) in which RACES amateurs took part. Eight hospitals were furnished mobiles and seven aid stations were furnished fixed stations on ten meters. A complete message center of 30 persons was set up at zone headquarters. Over 80 messages were handled in the one hour period of the test. Thirty-three amateurs took part. — *K8DFV, Radio Officer Zone 10 RACES,* Cuyahoga County, Ohio.

ABOUT THOSE NET REGISTRATIONS

Yes, they are really pouring in, and maybe this year's registrations will again exceed all previous years. It has also been opined by at least one source that this year's net directory will be the biggest mess we ever put out, because of the use of GMT.

We would like each person who has registered a net, especially if he has used GMT, to *make sure* that the proper conversion was made, and to *make sure* that the days of operation are in accordance with GMT. Check these points carefully.

1. The new net registration card (CD-85, revised 7/61)

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for August Traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CUL	264	2359	1821	471	4915
W9JOZ	9	1403	1403	2	2817
K9OZM	17	1272	1149	112	2550
K6BPI	97	1219	1128	91	2535
WØLGG	251	1078	976	89	2394
VE2AZI/W1	24	1656	667	39	2386
WØBDR	141	775	671	7	1594
WØSCA	32	773	769	0	1574
W7BA	9	759	697	52	1517
KØONK	149	640	616	12	1417
W8UPH	9	616	550	65	1240
K4AKP	34	587	552	32	1205
W3IVS	6	570	556	14	1146
WA6LVX	20	561	507	18	1106
W6EOT	7	557	476	39	1077
K9UOV	29	493	368	113	1003
WA6OLQ	36	472	408	51	967
W4SJH	341	348	221	34	944
W9ZYK	26	432	407	38	903
W3WRE	68	416	382	32	898
W3EML	28	435	347	49	859
K2UCY	165	346	326	20	857
K7IEY	41	427	387	1	856
W9DYG	39	434	339	43	855
W4PL	11	416	377	21	825
K2UBG	41	403	349	27	820
WØDUA	9	412	357	4	782
K4PQL	25	378	357	21	781
WØOHJ	6	373	361	12	752
W7DZX	6	341	306	32	685
W9USR	4	356	220	103	683
K2GAO	200	235	210	24	669
W3VR	51	310	290	3	654
W1LDE	15	317	293	24	649
W9CXY	10	314	304	9	637
WA2GPT	25	294	282	23	624
WA2GQI	15	314	268	20	617
K6EPT	15	292	152	140	599
WØBES	14	281	254	41	590
K1IFJ	47	265	250	22	584
W4TUB	7	291	271	15	584
K6KCB	9	308	253	14	584
K6LKD	37	271	230	36	574
WA2CIG	49	253	241	11	554
W2EW	200	177	150	22	549
K4EHY	41	268	206	31	546
W7BDU	1	297	239	5	542
W9MAK	7	265	190	70	532
KØWWD	137	158	192	34	521
WA6DJB	4	258	232	26	520
KØVPH	130	210	155	24	519
K4DAO/4	100	206	190	10	506
Late Reports:					
VE2AZI/W1 (July)	37	847	743	17	1644
K4ZHV (July)	70	242	187	2	501

More-Than-One-Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
W6IAB	83	2139	2125	14	4361
W4LEV	879	276	253	23	1431
W9TEM	837	2	2	0	841
Late Reports:					
W4LEV (July)	813	226	188	38	1265
W4PFC (July)	388	287	277	4	956

BPL for 100 or more *originations-plus-deliveries*

W6GYH	249	WØFEO	130	W9QQG	106
WN4BMC	199	W2GKZ	124	WØKTK	105
WA2GLU	153	K3WBJ	123	KØKWO/Ø	104
KØLTJ	151	W8AAG	121	WØYKC	104
KØJDQ/Ø	149	W1SMU/4	120	WA2UZH	101
WA2CCF	146	WA2EFN	113	KN7PIG	101
K6GZ	140	KØVTG	110	K8JYZ	100
WA6HHJ/6	140	K4ZHV	109	Late Reports:	
K2VVL	137	K1MBM	108	K9UOV (July)	211
WØANT	130	W4PED	107	K2YMU (July)	112
		K4ZYI	106		

More-Than-One-Operator Stations

K1PGQ 117

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: WA6LVX.

The BPL is open to all amateurs in the United States, Canada, and U. S. Possessions who report to their SCM a message total of 500 or more or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.

specifies GMT. Was the time you entered GMT, or your local time? If the latter, did you plainly indicate *what* local time? Because if you didn't, we'll assume that it is GMT and will make no conversion.

2. If you used GMT, did you show the *days* as per GMT, or did you forget that they might be different? For example, a net meeting at 1900 CST Monday thru Friday would be meeting at 0100 GMT *Tuesday thru Saturday*.

3. Did you enter the name of your net *exactly* as you wish it to appear in the net directory? In some cases, so sloppy is the entry, and so abbreviated, and containing so much extraneous material, that we can hardly believe it.

Take a look in the net listing appearing on these pages. If your registration reached us prior to the date indicated, it should be included. If after that date, it will be in the January *QST* list. Otherwise, something was wrong with your data and we could not enter your net.

If this year's net directory is a "mess," as our correspondent predicts, make sure it is not your fault and we'll do our best to make sure it's not ours.

Remember, Nov. 1 is the tentative deadline for registration to "make" the cross-indexed net directory. If you haven't yet registered or re-registered, time's-a-wastin'.

NET DIRECTORY

It's time for our first installment of the annual ARRL Net Directory. This month's list includes nets registered up to and including Sept. 20, 1961. Registrations received after that date will be included in the January *QST* listing if received prior to Nov. 15. If you have not yet registered your net for the 1961–62 season, see page 80, Sept. *QST*, for complete instructions.

The complete cross-indexed net directory is scheduled for distribution, as usual, on Dec. 1. We're still trying to make this deadline, and this year we hope to do it. As last year, *no automatic mailing will be made*. If you want a copy, you have to ask for it. A postcard or radiogram will do the job, but make it separate from other requests so we can put it in a separate folder for action when the directory comes out.

Important note: QST net listings and those in the printed Net Directory are *for information only*. They do not signify that these nets have any official status, do not entitle them to exclusive or prior rights to the frequency on which listed, and are in no sense a form of copyright. Insofar as possible (i.e., to the extent that we can read your henscratching and interpret your gobbledygook), net information is listed exactly as received, with certain common abbreviations used to conserve *QST* space. Such abbreviations will *not* be used in the printed net directory unless that's the way you registered it.

All net times are in GMT (Greenwich Mean Time). For conversion information, see the W1AW schedule. Days of the week are abbreviated as follows: Dy-daily; M-Monday; T-Tuesday; W-Wednesday; Th-Thursday; F-Friday; S-Saturday; Sn-Sunday. When net operation occurs on consecutive days but not daily, the days are connected by a hyphen (e.g., M-F means the net meets each day, Monday through Friday). When net operation occurs less often than once per week, this is indicated by a numeral and slant bar (e.g., 1/Sn means the first Sunday of each month, 1/3F means the first and third Fridays of each month, etc.). Such information not capable of abbreviation, if any, is explained by footnote; see end of listing.

Okay? Here goes:

Name of Net	*Freq.*	*GMT*	*Days*
Adams County (Pa.) AREC Net	3865	1500	Alt/Sn
Adams County RACES C.D. Net	29,600	0100	Th
(Ill.)	146,250	0045	
	146,900	0045	
Akron (O.) C-D & Disaster Net	50,700	2400	M
Ala. Emerg. Net "B" (AENB)[2]	3575	0100	Dy
Ala. Emerg. Net "G" (AENG)	29,560	0130	Sn
Ala. Emerg. Net "H" (AENH)	29,560	1900	Sn
Ala. Emerg. Net "I" (AENI)	3885	1830	Sn
Ala. Emerg. Net "J" (AENJ)	3900	1930	Sn
Ala. Emerg. Net "L" (AENL)	3970	2000	Sn
Ala. Emerg. Net "M" (AENM)[2]	3965	0030	Dy
Ala. Emerg. Net "O" (AENO)[2]	50,550	0115	MWF
Ala. Emerg. Net "P" (AENP)[2]	3955	1230	M-S
Ala. Emerg. Net "R" (AENR)	50,550	0115	T-Th
Ala. Emerg. Net "S" (AENS)	3825	1930	Sn
Ala. Emerg. Net "T" (AENT)[2]	3965	2230	Dy
Ala. Emerg. Net "X" (AENX)	51,150	0115	T
Ala. Emerg. Net "Y" (AENY)	50,250	0200	TF
All Point Traffic Net (APTN)	3960	0045	Dy
(Cal.)			

Name of Net	Freq.	GMT	Days
All Service Net (ASN)	7270	1800	Sn
Antilles Emerg. Weather Net	3815	1045	Dy
	7245		
A.R.E.C. Foot Hill Region Net (Calif.)	28,840	0330	M
	50,550		
	223,000		
AREC Lancaster County 6 Meter Emerg. Net (Pa.)	50,700	2115	M
AREC Orbitzers of Lehigh County Net (Pa.)	50,560	0100	Th
Arkansas CW Net (OZK)[2]	3790	0100	T-S
Ark. Emerg. Phone Net	3885	0600	M-S
Atlanta 10 Meter Phone Net	29,600	0300	M
Backyard Net (O.)	29,580	0100	W
Badger Emerg. Net (BEN)[2]	3950	2400[1]	Dy
Baltimore County Emerg. Net (BCEN) (Md.)	28,680	0100[1]	T
Berrien County Emerg. Net (BCEN) (Mich.)	29,610	1930	Last/Sn
	50,700		
Betsie Bay Fish Net (Mich.)	3880	1730	Sn
Black Diamond Emerg. Net (Pa.)	50,640	0030	Sn
Bond County CD Net (Ill.) (BOND)	147,060	0230[1]	W
Boone County (Ind.) AREC Net	52,525	1800	Sn
	147,300		
Buckeye (Ohio) CW Net (BN)[2]	3580	2400	Dy
Canal Zone AREC Net	7225	1430	Sn
Capital Area Radio Emerg. Net (CARE) (N. Y.)	145,350	2000	Sn
Central Area Net (CAN)[2]	3670	0230	Dy
Central Texas Emerg. Net (CENTEXEN)	3870	1430	Sn
Centre County (Pa.) AREC & RACES Net	50,380	0100	Th
		0200	Sn
Centre County (Pa.) 10 Meter RACES Net	28,570	0230	M
Centre County (Pa.) 2 Meter RACES Net	145,230	0300	M
Chattanooga Amateur Radio Emerg. Net (Tenn.)	50,400	0130	M
		0030	F
Chemung Co. AREC Net (CCAREC) (N. Y.)	3605	0200	M
	50,500	0230	M
Cherokee Co. AREC Net (Iowa)	3900	1430	S/Sn
Chicago Area Emerg. Net (CAEN)	1805	0100[1]	Dy
Clinton County RACES Net (N. Y.)	146,820	2300	T
Colo. C.W. Net (CCW)[2]	3652	0200	M-F
Conn. Nutmeg (CW) net (CW)[2]	3640	2345	Dy
Conn. Phone Net (CPN)[2]	3880	2300	M-S
		1500	Sn
Conn. Training Net (CW) (CTN)[2]	3640	1400	Sn
Coos County Net (Ore.)	3917	1545	M
County Radio Assn. of Manistee Net	3825	2350	Th
Creek County Emerg. Net (Okla.)	3825	1230	1/Th
Crossroads Emerg. Net (C.Z.)	28,900	0100	W
Early Bird Transcontinental Net (EBTN)	3845	1000	Dy
East Coast RTTY Net (ECF1)	3620	2400	W
East Tennessee Net	3980	1140	M-F
Eastern Area Net (EAN)[2]	3670	0130	Dy
Eastern Area Slow Net (EASN)	3748	2300	Dy
Eastern Canada Net (ECN)[2]	3540	0045	M-F
Eastern Mass. Phone Net	3893	2130	Dy
Eastern Mass 2 Meter Net (EM2N)[2]	145,800	2000	M-F
Eighth Regional Net (8RN)[2]	3530	0045	Dy
		0230	
El Paso Ten Meter Emerg. Net (Texas)	29,640	0230	T
Finger Lakes Net	145,350	0200[1]	S
First Region Net (1RN)[2]	3605	0030	Dy
		0230	
Five Towns AREC Net (N. Y.)	146,100	0100	M
Fla. Amateur Sideband Traffic Net (FAST)	3940	0000	M-F
		0130	
Florida CW Net (QFN)[2]	3650	2330	Dy
		0300	
Fla. Phone Traffic Net (FPTN)[2]	3945	1200	M-S
Fla. Slow Speed Net (QFNS)	3650	0100	Dy
FMN-1 Net (Ill.)	147,500	0300	F
Fourth Region Day Net (4RDN)	7125	1500	Dy
Fourth Region Net (4RN)[2]	3547	0045	Dy
		0230	
Gator Net (GN) (Fla.)[2]	7115	1330	Dy
Genesee County Emerg. Net (Mich.)	29,480	0100	W
	145,260		
Ga. Cracker Mobile Net (GCMN)	3995	2200	Sn
Georgia State Net (GSN)[2]	3595	0000	Dy
		0300	
Golden Bear Amateur Radio Net Inc. (V.F.W.) (GBN) (Calif.)	3975	0300	Dy
Goose River Net (N. Dak.)	1990	1500	Sn
Grand Co. (Ind.) C.D. Net (N. N.)	50,450	0200	M
Greene County Net (Ill.)	145,400	0130	T
Gulf Coast Side Band Net	3925	1730	Dy
Ham Butcher's Net (HBN)	7280	1805	M-F
Hamilton County (Ind.) AREC Net	50,400	0100	F
Hillsborough County 6 Meter Net (Fla.)	51,450	0100	Th
Hit and Bounce Net (HBN)	7125	2330	M-S
	7140	1330	Dy
Horseshoe Radio Club Emerg. Net (Pa.)	29,510	1800	Sn
Humboldt County Emerg. Net (HEN) (Iowa)	3907	1920	Sn
Illinois CW Net (ILN)[2]	3515	0100	T-Sn
Indiana Sideband Net	3920	0030	Dy
Ind. State Traffic Net (QIN)[2]	3656	0100	Dy
Ind. State Training Net (QIN)	3745	2400	MWF
Inter-Mountain Net (IMN)	29,600	0200	Spec.[3]
Kanawha County Emer. Net (KCEN) (W. Va.)	50,250	0200	Th
Kansas CW Net (QKS)[2]	3610	0030	Dy
Kansas Phone Net (KPN)[2]	3920	1400	Sn
		1245	MWF
Kans. 75 Meter Storm Warning Net	3925	2400	M-S
Kennehoochee Emerg. and Traffic Net (KET) (Ga.)	29,460	0230	M
Kent County Emerg. Net (Mich.)	50,550	0100	T
Kentucky CW Net (KYN)[2]	3600	0100	Dy
Ky. Morning Phone Net (MKPN)	3960	1330	M-S
		1430	Sn
Kentucky Novice Net (KNN)	3720	2300	M-S
Kings County AREC and CD 6 Meter Net (N. Y.)	50,400	0130	TTh
King County AREC and CD 10 Meter Net (N. Y.)	29,640	0200	T
Kings County AREC and CD 2 Meter Net (N. Y.)	145,260	0130	T
Lake Erie Emerg. Net (Pa.)	29,150	0100	M
Lancaster Emerg. Net (Pa.)	146,800	0200	M
Long Beach C.D. High 2 Meter Net (Calif.)	147,300	0430	T
Long Beach C.D. Low 2 Meter Net (Calif.)	145,460	0345	T
Long Beach C.D. 10 Meter Net (Calif.)	29,560	0415	T
Los Alamos Emerg. Net (N. M.)	29,624	0400	Sn
Louisville Area Radio Emerg. Net (Ky.)	29,500	0130	M
	53,600		
	147,300		
Madison County Emerg. Net (MCEN) (Ind.)	50,400	0100	M
Mahoning Valley Emerg. Net (O.)	50,500	2330	M
Maine AREC Net (MEN)	3520	1300	Sn
Maine Sea Gull Net[2]	3940	2200	M-S
Maine Slow Speed Net (MSSN)[2]	3726	2230	M-F
Malden Emerg. Net (Mass.)	29,540	0030	M
Manchester N. H. Emerg. Net	29,000	2400	F
	50,400		
Maritime Net	3750	2300	Dy
Maritime Weather Net	3770	1000	M-S
Md. Del. & D. C. Net (MDD)[2]	3650	0015	Dy
Md-Del-DC Slow Net (MDDS)[2]	3650	0130	T-Sn
Medford C.D. Net (Mass.)	29,520	2400	M
Memphis Two Meter FM Net	145,500	0130	T
Miami Valley Emerg. Net (O.)	1820	0900	Sn

Name of Net	Freq.	GMT	Days
Miami Valley V.H.F. Net (O.)	146,520	0200	Sn
Milwaukee Area RTTY Net	146.940	0100[1]	M-F
Milwaukee 2-Meter FM Net	145,350	0115[1]	M
Minn. Section Net (MSN)[2]	3595	0100	Dy
Mission Trail Net (MTN)	3854	0300	Dy
Miss. Magnolia Emerg. Net	3870	1930	Sn
Mo. Emerg. Phone Net (MEN)[2]	3885	2400	MWF
Mo. Slow Speed Net (MSN)[2]	3715	0200	M-F
Missouri Traffic Net (MON)[2]	3580	0100	T-Sn
Mich. (QMN) TFC Nets[2] (Fast)	3663	2330	Dy
(Slow)		2300	
Minn. S.S.B. Net	3805	1730	M-F
Monroe County Emerg. Net (Fla.)	3900	1830	S
Monroe County Emerg. Net 2Mtr Sect. (Fla.)	144,450	1300	Sn
		2000	Th
Montgomery County (Ill.) A.R.E.C. Net	29,640	0100	Sn
	50,500	0030	F
Montgomery County (Ill.) (MCD) A.R.E.C. "The Hill-toppers Net"	145,500	0030	T
Muskegon County C.D. Amateur Two Meter Net (Mich.)	145,000	0200	Th
Muskegon County C.D. Net (Mich.)	29,610	0200	WS
Muskegon Co. C.D. Six Mtr. Net	50,418	2100	M-Th
Nassau County 10 Meter Net	28,720	0100	T
	28,680		
Nebraska CW Net (NEB)[2]	3525	0100	Dy
Nebr. Post Office Net	3980	0015	T-Sn
Nebr. 75 Meter Emerg. Fone Net[2]	3983	1830	Dy
Nebr. 75 Meter Fone Net[2]	3980	1330	Dy
Nevada County AREC Net (Ark.)	3890	1330	Sn
N. J. C.D. Net (Phone) (CDNJ)	3993	1430[1]	Sn
N. J. Emerg. Phone & Traffic Net[2] (NJPN)	3900	1400[1]	Sn
		2300[1]	M-S
New Jersey Net (NJN)[2]	3695	2400	Dy
NJ6-2 Emerg. and Tfc. Net	51,150	0300	MThSn
	146,700	2200	TS
N.Y.C.-L.I. Phone Net (NYCLIPN)[2]	3908	2230	M-S
N.Y.C.-L.I. VHF Traffic Net	145,800	0100	TWTh
New York State Net (NYS)[2]	3615	2400	Dy
N. Y. State Phone Traffic & Emerg. Net (NYSPTEN)	3925	2200	Dy
Newport County Emerg. Net (NCEN) (R. I.)	29,530	1500[1]	Sn
Newton (Mass.) C.D. Net	53,745	0200	M
Ninth Regional Net (9RN)[2]	3640	2330	Dy
		0200	
No Name Phone Net	7255	1300	Dy
North Carolina CW Net (NCN)	3547	2330	Dy
North East Texas Emerg. Fone Net (NETEN)	3970	1400	Sn
North Texas CW Traffic Net (NTX)[2]	3770	0100	Dy
		0400	
North Texas Traffic Net (NTTN)[2]	3960	2330	Dy
Northern Calif. Net (NCN)[2]	3635	0300	Dy
Northwest Slow Speed Net (NSN)	3700	0500[1]	T-Sn
Novice Traffic Net (NTN)	3745	0030[1]	FSSn
NYC-LI CW Net (NLI)[2]	3630	0245	Dy
		0030	M-F
		0015	SSn
Oak Ridge (Tenn.) Emerg. Net	50,700	2400	M-F
Ohio Novice Net (ONN)	3710	2300	M-F
Ohio Phone Net (OPN)[2]	3860	2200	M-F
Ohio Slow Net (OSN)[2]	3580	2330	Dy
Okla. Phone Emerg. Net (OPEN)	3860	1400	Sn
Ontario Fone Net (OFN)	3770	2400	M-S
Ontario-Quebec Net[2]	3535	2400	Dy
Oregon AREC Net	3875	0300	M-F
Ore. Emerg. Network (OEN)	3840	1030	Dy
Oregon Post Office Net	3820	0300	W
Oregon State Net (OSN)[2]	3585	0230	T-S
Panhandle Weather Net	3940	2330	Dy
Pine Tree Net (Me.)[2]	3596	2400	M-F
Porter County Emerg. Net (Ind.)	145,800	0030	T
Q5 Traffic and Rag Chewing Net (Q5NET)	3935	2200[1]	Dy
Queens County Emerg. Net (N. Y.)	29,500	0030	M
Richmond CD Net (Va.)	3835	1330	Sn
Roanoke Valley AREC Net (RVAREC) (Va.)	28,800	0100	Th
RTNET (Calif.)	147,850	0400	W
San Bernardino Area Net AREC (Calif.)	29,200	0200	T
San Diego 10 Meter AREC Net (Calif.)	29,500	0200	W
San Diego Two Meter Net (Cal.)	145,500	0300	W
San Jose C.D. Net (SJCDN) (Cal.)	146,920	0230	T-Th
Sandhills Sunday Morning Net (Nebr.)	3850	1600	Sn
Sangamon County A.R.E.C. Net and Springfield C.D. Mutual Aid Area Net (Ill.)	3877	1930	Sn
Santa Clara Operational Area Net (Calif.)	50,400	0300	W
	145,290		
Sask. A.R.R.L. Phone Net	3780	0130	Dy
Satellite Data Link Net (SDL)	3820	2300	T
Schenectady Emerg. Communications Net (SEC)	3950	1900	Sn
Schenectady Emerg. Communications Six Meter Net (SEC-6)	50,640	1900	Sn
Second Regional Net (2RN)[2]	3690	0045[1]	Dy
		0230[1]	
The Seward County C.D. Net	3830	0100	Dy
Seymout Amateur Radio Club Net	50,400	2400	1/Sn
	147,300		
Shawnee Amateur Radio Assn. Net	3875	1400	Sn
Show-Me Net (CW) (SMN) (Mo.)[2]	3580	2200	Sn
Sioux Falls Emerg. Net (S. Dak.)	144,000	0300	SnW
6 Meter Crossband Traffic Net	50,850	0030	T-S
Socal 6 Net (Calif.)[2]	50,400	0330	Dy
South Bay C.D. Net (Calif.)	146,990	0300	T
South Carolina Net (SCN)[2]	3795	2400	Dy
		0300	
S. C. Emergency Net (SCEN)	3930	0030	T-S
		2030	Sn
South Dakota CW Net (SDN)[2]	3645	0100	TThS
S. D. Nine, Jacks & Queen (noon) am-phone net (NJQ)	3870	1815	M-S
S. D. 75-meter (eve) Emergency AM-phone Net	3870	0030	Dy
Southeastern Ind. 6 Meter Net	50,400	0200	M
Southeastern Wis. 2-Meter Emerg. Net	145,650	0200[1]	M
Southern Calif. Net (SCN)[2]	3600	0300	Dy
Southern Peninsula Emerg. Comms. Service Net (Calif.)	146,000	0345	T
Southwest La. Emerg. Net	3850	2000	Sn
St. Clair County Emerg. Net (Mich.)	29,590	0100	T
St. Law. County AREC Net (N. Y.)	3875	1200	1/Sn
Steuben County AREC FM Net (Ind.)	52,525	2315	Th
Suncoast 6 Meter Net, St. Petersburg Fla.	50,700	0100	F
Tennessee CW Net (TN)[2]	3635	0100	T-Sn
Tri-Cities Net	29,000	0200	Dy
Tri-County Emerg. Net	28,900	0200	Th
Tri-State Traffic and Emerg. Net	29,100	0200	TTh
Trumbull County Emerg. Net (O.)	29,604	2045	T
Turlock ARC Alt. Tues. Nite Net (Calif.)	145,350	0100	Alt/T
20 Meter Interstate S.S.B. Net	14,275	1500	M-F
Twin City Emerg. Net (Champaign-Urbana, Ill.)	28,560	0200	Th
Union County 6 Meter A.R.E.C. Net (N. J.)	50,550	1530	S
Upper Peninsula Emerg. Net	3920	1400	Sn
V.F.W.'s Golden Bear Amateur Traffic Net, Inc. (GBN-2) (Calif.)	146,570	0330	Dy
Virginia Net (VN)[2]	3680	2400	Dy
Virginia Phone Net (VFN)[2]	3835	2400	Dy
Virginia Sideband Net (VSBN)	3935	0200	Dy

Name of Net	Freq.	GMT	Days
Virginia Slowspeed Net (VSN)[2]	3680	2330	M-S
Waltham CD Net (Mass.)	146,800	0030	M
Wash. and Nowata Counties Emerg. Net (Okla.)	3815	1930	Sn
Washington Section Net (WSN)[2]	3535	0300	T-S
Wayne County RACES Net, Zone 10-12 (Mich.)	28,710	0130	Th
West Mass Slow Speed Net (WMSN)[2]	3560	2330	TThSn
West Phila. Radio Assn. Net	29,360	1500	Sn
Western Boomers Net (Okla.)	3860	1215	M-S
Western Mass. Net (WMN)[2]	3560	2400	M-S
Western Penna. Traffic Net (ORS)[2]	3585	2400	M-F
Westpark Radiops Emerg. Net	29,520	0130	T
	51,150	2300	M
Winchester CD RACES Net (Mass.)	147,100	0045	W
Winthrop Emerg. Net (Mass.)	147,500	2330	2/M
Wisconsin Intrastate Net (WIN)[2]	3535	0115	Dy
Wisconsin Races Net	3505.5	1500[1]	Sn
	3993	1400[1]	Sn
Wisconsin S.S.B. Net[2]	3985	2400	Dy
Wis. Slow Speed Net (WSSN)[2]	3535	0030	M-F
Wolverine (S.S.B.) Net	3930	2400	Dy
Wood-Ridge, N. J. C-D Net	145,680	2400	W
WVN (W. Va. CW Net)	3570	0000	T-Sn
WYO CD Net	3537.5	0200	W
Wyoming Civil Defense Net	3920	0300	Dy
YO Net (Wyo.)[2]	3610	0130	TThS

[1] Net operates one hour earlier when local time is "daylight saving."

[2] Part of ARRL National Traffic System. Ask for CD-24 for full information.

[3] Net meets 10th, 20th and 30th of the month at 2100 EST.

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From August 1, to September 1, 1961 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.

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K2HOE....100
K2UAR....100
K3AUT....100
K4DFO....100
W4ZTJ....100
W6BPR....100
W6FAY....100
K6LQA....100
K6ROU....100
W7UZE....100
K8IPS....100
K8JWC....100
W8KNK....100
K9RZV....100
DL7HC....100
HA7PZ....100
UA2AO....100

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W4VZB....127
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NATIONAL CALLING AND EMERGENCY FREQUENCIES (KC.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

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.

SUGGESTED RTTY OPERATING FREQUENCIES

3620, 7040, 14,090, 21,090 kc.

GMT CONVERSION

To convert to local times subtract the following hours:

ADST −3, AST −4, EDST −4, EST −5, CDST −5, CST −6, MDST −6, MST −7, PDST −7 PST −8, Honolulu −10, Central Alaska −10.

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 Nov. 17 at 0230 GMT. Identical tests will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,800 kc. The next qualifying run from W6OWP only will be transmitted Nov. 3 at 0500 Greenwich Mean Time on 3590 and 7129 kc. *CAUTION:* Note that since the dates are given per Greenwich Mean Time, Code Proficiency Qualifying Runs in the United States and Canada actually fall on the evening previous to the date given: *Example:* In converting, 0230 GMT Nov. 17 becomes 2130 EST Nov. 16.

Any person can 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.

W1AW conducts code practice daily at 0230 GMT on all frequencies listed above with speeds of 15, 20, 25, 30, and 35 w.p.m. on Tuesday, Thursday, and Saturday, and at 5, 7½, 10, and 13 w.p.m. other days. Approximately 10 minutes' practice is given at each speed. To check your copy, the texts used on several transmissions are listed below. The order of words in each line of *QST* text is sometimes reversed. To improve your fist, try to send in step with W1AW.

Date — Subject of Practice Text from Sept. *QST*

Nov. 3: *Handling OSCAR Reports* . . . , p. 18
Nov. 7: *High-Power . . . Linear*, p. 11
Nov. 10: *Fixed or Portable* . . . p. 20
Nov. 15: *A. M. with Collins S.S.B. Units*, p. 26
Nov. 18: *A Complete Two-Band Station* . . . , p. 32
Nov. 22: *A Utility Power Supply* . . . , p. 38
Nov. 24: *The Big Wheel on Two*, p. 42

W1AW SCHEDULES

(November 1961)

Operating-Visiting Hours

Monday through Friday: 3 P.M.–3 A.M. EST.
Saturday: 7 P.M.–2.30 A.M. EST.
Sunday: 3 P.M.–10.30 P.M. EST.

The ARRL Maxim Memorial Station welcomes visitors. The station address is 225 Main St., Newington, Conn., about 4 miles south of West Hartford. A map showing local street detail will be sent on request. The station will be closed Nov. 23, Thanksgiving Day.

Operating Frequencies

C.w.: 1820, 3555, 7080, 14,100, 21,075, 28,080, 50,700, 145,800
Voice: 1820, 3945, 7255, 14,280 (s.s.b.), 21,330, 29,000. 50,700, 145,800

Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibrating purposes.

Official Bulletins

Bulletins containing latest information on matters of general amateur interest are transmitted on the above frequencies according to the following schedule in Greenwich Mean Time:
C.w.: Monday through Saturday, 0100; Tuesday through Sunday, 0500.
Voice: Monday through Saturday, 0200; Tuesday through Sunday, 0430.

Caution: Note that in the U. S. and Canada, because times are GMT, bulletin hours actually fall on the evening of the previous day.

W1AW CONTACT SCHEDULE

Would you like to work W1AW? W1AW welcomes calls from *any* amateur station in accordance with the following schedule:

GMT	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0030–0100	.....	.....	7255	.....	7080	.....	7255
0120–0200[1]	.....	.....	7080	3555	7080[2]	3555[2]	7080
0210–0230[1]	.....	.....	3945	50.7 Mc.	145.8 Mc.	3945	3945
0330–0430	.....	.....	3555	3945	7080	1820	3555
0440–0500[1]	.....	.....	3945	14,280	3945	14,280	3945
0520–0600[1]	.....	.....	3555[2]	7255	3555	7080[2]	3945
0600–0700	.....	.....	14,280	14,100	3555	14,100	.....
0700–0800	.....	.....	7255	3945	7080	3945	7255
2000–2100	.....	.....	14,280	21/28 Mc.[3]	14,100	.....	.....
2100–2200	.....	14,280	21/28 Mc.[3]	14,100	21/28 Mc.[3]	21,330	.....
2200–2300	.....	14,100	14,280	21,075[2]	14,280	14,100	.....

[1] General-contact period on stated frequency begins immediately following transmission of Official Bulletin which begins at 0200 and 0430 on phone and at 0100 and 0500 on c.w. Starting time is approximate.
[2] W1AW will first listen for Novices before checking the rest of the band for other contacts.
[3] Operation will be conducted on either 21,075, 21,330, 28,080 or 29,000 kc.

• 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, Allen R. Breiner, W3ZRQ—SEC: DUI. PAM: IVS. RM: EML. EML succeeds AXA as our new Route Manager. Van retires with a record a yard long as traffic-handler and trainer of new c.w. traffic men. Our new RM takes over with a wonderful background. K4LPR has transferred to E.Pa. from Virginia and is OPS and OO. K3NLX is a new OES. New Gear and Awards Dept.: To K3JLW, the Keystone Award No. 124; a 6146 linear amplifier for 6 meters to K3DSM, who now has 28 countries and 50 states confirmed; a Public Service Award for hurricane traffic-handling to UIU. A new member of the PFN Net is K3KIZ. BPZ has a new YL harmonic. New Novice operators in the Susquehanna Valley are PSL, QHL, QEN, QIJ, PXU and QIC. The SVARC has had its club call, VPJ, reissued. New General Class licensees are QFY, NFU and NGH. Mort, a blind protégé of BUR, has received his Novice Class ticket with the call KN3QPS. BUR celebrated his 25th wedding anniversary. K3HTZ changed his keying system in the DX-40 for better reports on 40-10 meters. K3MVO is now using an inverted "V" antenna at the new QTH. K3BHU, W3DGX and company, "El Professional Freeloaders, Esq.," spent a few days at the Oney Bull State Park. EU has completed the haymaking season and now is in the process of building a new operating shack. The Lancaster Radio Transmitting Society started code classes Sept. 15. K3HEC is on 2-meter s.s.b. W3SAO and company were coal-region vacationers and camped their portable "Tee-Pee" on the lawn of your SCM. BNR again is on the bands at the new QTH, P. O. 222, Hinkley, Calif. The Schuylkill County ARC meets at the Pottsville City Hall the 2nd Tue. of each month. K3CNN received the "Hunt the Hunters Certificate." CUL is looking forward to a busy fall traffic season. Either hams are getting more careless or NOH is doing more OO monitoring. YLL, one of our top OOs, will change his QTH and section to Southern New Jersey. HNK wants all E.Pa. readers to be extended "A Very Merry Christmas." A bit early, eh? Happy Thanksgiving, gang. Traffic: W3CUL 4951, IVS 1146, EML 859, VR 654, K3IMP 259, W4DVT 240, W3HNK 229, K3DCB 170, W3UIU 154, AXA 104, K3HTZ 66, KIZ 47, CAH 42, W3ZRQ 38, K3JSX 36, NBU 35, AOX 30, JJG 25, MVO 23, BHU 17, W3PDJ 9, EU 7, BFF 6, OY 6, K3KNO 4, KNL 3, KTC 3, W3ADE 2, K3ALD 2, W3DGX 2, JSX 2, BNR 1.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Thomas B. Hedges, W3BKE—Asst. SCM Delaware: M. F. Nelson, K3GKF. SEC: CVE. MDD Traffic Net meets at 1915 EST and MDDS (slow) Net 2030 EST, both on 3650 kc.; MEPN (phone) at 1800 EST and week ends at 1300 EST on 3820 kc.; MDD AREC Nets Tue. at 2100 EST on 3521 and 7042 kc., also 50.7 and 145.660 Mc. August appointments: EEB as ORS and WQR as EC for Sussex Co., Del. AYD likes his new Invader-2000 and is sporting a "250" sticker for his DXCC. BUD says his Mohawk receiver is FB. K3BYJ has named DJP as Asst. EC for New Castle Co., Del. CDQ had a nice visit with the Denver RC on her western trip. Best of luck to K3CRF, who has left So. Del. for prep school. VE3DYK/W3 is now back to full time on MDD. EEB has three telephone poles in the yard of his new house. EOV has blisters to prove he built an 8-X-12-ft. shed for his 5-kw. emergency generator. 4EXM/3 says that KR6AM is now on s.s.b. only. K3GJB is doing fine as EC for Montgomery Co. GQF, with WZL as operator, is keeping a regular traffic sked with KC4USV. K3GZK has his HT-37 working FB on 20 meters. The Foundation for AR is laying big plans for a hang-up Atlantic Division Convention in 1963. HQE is busy keeping skeds with military bases. IVC turns in a nice traffic count from Port Deposit. New Washington RC officers are KN3IPY, pres.; CPM, vice-pres.; CDQ and AKB, secys; and K3NNG treas. K3IZM has a new scope. K3JDN has joined the Air Force and will be out of section activities for awhile. JSL is now operating from Camp Winslow, Md. K3JVB has a new Shawnee and will be concentrating on 6 meters for a spell. K3JYZ makes BPL again and reports his son K6ULV is now home. KHA is keeping up his OBS skeds. K3KHK used his 15-watt rig on his recent trip to the Bahamas. K3KPZ is back on winter OBS skeds. FTD is keeping regular skeds between Baltimore and Guam. KQS spent the summer teaching radio at a camp on Lake George. KTR is moving to Florida where he will sign 4YSO. K3LFD turned in an FB traffic count. K3LJB reports he and K3PUI are building a 3-band quad. Congrats to K3LWD on passing the General Class exam. MCG is looking for leadership stations to help in MDD. GRF is going to matched feed on all beams. K3MDL has loaned his receiver to KN3NFJ. K3MQP is a new reporter from Adelphi, Md. MSR had a nice vacation in VE3-Land with his 2-meter mobile. K3MXJ checks in from Delaware. K3MZY has a new tower up 60 ft. FCC Acting Chairman Bartley presented the first Gore Memorial Scholarship to K3NKX/WØBPO. NQC is organizing a Baltimore AREC RTTY net. K3OGA received his 15-w.p.m. sticker. OHI is active on MEPN. KN3ONQ passed his General Class exam. TN maintains steady traffic activity. UE is now mixing civic affairs with his traffic activity. K3WBJ made BPL again. YOB has moved to Snow Hill. The PVRC held its August meeting at the shack of PZW. YZI is working FB DX on 20-meter s.s.b. ZAQ remains the outstanding OO for this section. ZNW reports his XYL and 2 small fry have tickets for a complete ham family! Traffic: (Aug.) K3LFD 238, WBJ 218, JYZ 205, W3GQF 140, IVC 110, MCG 84, ZNW 63, UE 60, TN 48, VE3DYK/W3 36, W3BUD 23, K3GZK 19, W3KTR 19, K3KHK 16, W3BKE 15, K3MZY 12, MQP 9, BYJ 4, W3EEB 4, K3KPZ 2, W3YZI 2. (July) W3HQE 56, KN3PEJ 12, K3GJB 11.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: K2ARY. RMs: W2BZJ, W2ZI and W2HDW. WA2HJD, Paulsboro, operated portable from W1- and W3-Land this past summer. Ex-K1CIP, now WA2VAT, Audubon, is quite active on NJN. The N. J. Phone & Tfc. Net held its 6th Annual Picnic at Browns Mills with 40 members and families attending. The net's August totals: 31 sessions, 667 QNI and 248 traffic. WA2QDD is a new General Class operator in Trenton. WA2KWB has worked WAC and also made 230 QSOs in the N. J. QSO Party. The Cumberland Radio Club has been assigned the call W2BX. W2JAV, Hammonton, has made WAS and WAC on RTTY. K2YBN will teach a code and theory class for the Levittown (N.J.) Radio Club this fall. The Gloucester County ARC was congratulated by officials of Lake Garrison for its radio work during the Lake Garrison Water Carnival. Those taking part were W2CKX, W2LVW, W2RJQ and W3FFG. The SJRA's QSO Party winners were WA2BLV, K2BZK, K3JNP, K2SHJ, WA2GJE and WA2KWO. WA2WKO and WA2BUO received the SJRA certificate for working 50 members. The Burlington County Radio Club is planning many interesting programs. The meeting night is the 1st. Fri. of the month. This club received the League's Public Service Award for its activities during Hurricane Donna. K2HJY, Medford, replaces W2WKI as Burlington Co. Radio Officer. K2ARY, SEC, is planning a meeting of the ECs in the section. Your SCM enjoyed a visit to the Southern Counties ARA meeting. K2HBA is president. K2SOX received the Armed Forces Day certificate. K2CIR has a new beam for 2 meters. The SCARA meets the 2nd Fri. in Northfield. All emergency-powered equipment should be checked so as to perform efficiently if needed. All appointees are urged to report activities the first week of each month. Traffic: W2RG 170, K2RXB 78, K2SOX 66, W2BZJ 64, WA2HJD 54, WA2VAT 48, W2ZI 36, WA2KWB 20, WA2MEQ 10, W2BEI 2, WA2ARJ 1.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2LXE. RMs: W2RUF, W2EZB and W2FEB. PAM: W2PVI. NYS C.W. meets on 3615 kc. at 1900, ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 1800. NYS C.D. on 3510.5 and 3993 kc. (s.s.b.) at 0900 Sun., TCPN 2nd call area on 3970 kc. at 1900, IPN on

(*Continued on page 114*)

"TVI TODAY"

The big bad monster of a few years ago has just about left the ham radio scene. TVI, once a word that caused switches to be pulled, doors to be locked, and the family evacuated until the storm on the local front was over, has now been placed in the dangers from the past.

To be sure, the spector of TVI appears once in a while to haunt the unwary; but, by and large, the danger today has been minimized. Through the years, the Chicago Area Radio Club Council has found the problem of TVI can best be solved by using TVI committees formed by each of the member clubs in the Council.

To be sure, most hams at one time or another have, or will, run into the individual who does not want to listen to the facts in the case. He just wants the station put off the air as the best way to solve the difficulty.

It has been found through experience that a third person, to take an impartial viewpoint in the discussion, is in a better position to get the situation solved without causing a neighborhood uproar. Always remember that the approach to be used by the Third Person is, "I understand that you are having an interference problem, and I am here TO HELP YOU."

Most cases of TVI these days center about two basic causes: One, the usual case of TV receiver front end overloading is cured by the application of a high pass filter AT THE INPUT TERMINALS OF THE SET in question. The other is caused by the broadness of the TV receiver front end. This is evident in areas where Channel Two is present and six meter activity is high.

In cases investigated by the CARCC (Chicago Area Radio Club Council *) in recent years, the use of the 52 mc cutoff high pass filter took care of the majority of cases brought to light either from low frequency operation or VHF. The balance of the cases were cleared by use of stubs and traps. A list of TV set manufacturers offering high pass filters is most helpful in advising the public of what they can do to help themselves in this position.

A station TVI check list should include: grounds, both earth and equipment; proper adjustment of transmitter; use of low pass filters; bonding of all shields; monitor scope for checking of emitted signals to prevent splatter, key clicks, etc.

The advent of SSB has helped to a great degree to reduce the number of TVI complaints in the last few years. However, the problem is still with us. With high fidelity, stereo, and the wide open audio stages in some of these sets, a tight knit interference committee is needed in each club to attack the problem from an area standpoint.

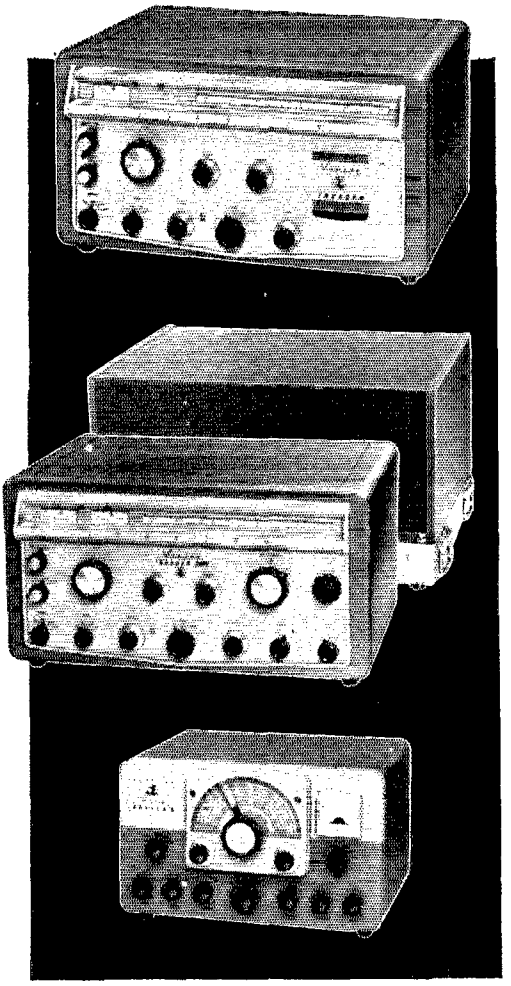
— JORDAN KAPLAN, W9QKE
President, CARCC

* The Council is composed of delegates from all leading Chicago Area Radio Clubs.

Bud Hallgren Jr. W. J. Hallgren W9AC for hallicrafters

Choose your next transmitter

3 of the hottest and newest!



INVADER—More exclusive features than any other Transmitter/Exciter on the market today! Specially developed high frequency, symmetrical, multi-section band-pass crystal filter for more than 60 db sideband suppression—more than 55 db carrier suppression! Instant bandswitching 80 through 10 meters—no extra crystals to buy—no realigning necessary. Delivers solid 200 watts CW and P.E.P. SSB input; 90 watts input AM. Built-in VFO—exclusive RF controlled audio A6C and ALC (limiter type) provide greater average speech power. Wide range pi-network output circuit—extremely smooth VOX and anti-trip circuits. Fully TVI suppressed. Self-contained heavy-duty power supply. Wired and tested with tubes and crystals.

Cat. No. 240-302-2—Amateur Net $619.50

HIGH POWER CONVERSION—Take the features and performance of your "Invader" . . . add the power and flexibility of this unique Viking "Hi-Power Conversion" system . . and you're "on the air" with the "Invader 2000". Completely wired and tested, includes everything you need—no soldering necessary—complete the entire conversion in one evening.

Cat. No. 240-303-2—Amateur Net $619.50

INVADER 2000—Here are all of the fine features of the "Invader", plus the added power and flexibility of an integral linear amplifier and remote controlled power supply. Rated a solid 2000 watts P.E.P. (twice average DC) input on SSB; 1000 watts CW; and 800 watts input AM! Wide range output circuit (40 to 600 ohms adjustable). Final amplifier provides exceptionally uniform "Q". Exclusive "push-pull" cooling system. Heavy-duty multi-section power supply. Wired and tested with power supply, tubes and crystals.

Cat. No. 240-304-2—Amateur Net $1229.00

RANGER II—Now—a new version of the popular 75 watt CW or 65 watt AM "Ranger". The "Ranger II" transmitter also serves as an RF/audio exciter for high power equipment. Completely self-contained instant bandswitching 160 through 6 meters! Operates by built-in VFO or crystal control. High gain audio-timed sequence keying, TVI suppressed. Pi-network antenna load matching from 50 to 500 ohms. With tubes, less crystals.

Cat. No. 240-162-1
Viking "Ranger II" Kit—Amateur Net . . . $249.50

Cat. No. 240-162-2—Viking "Ranger II"
Wired and tested—Amateur Net $359.50

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E. F. JOHNSON COMPANY • WASECA, MINNESOTA

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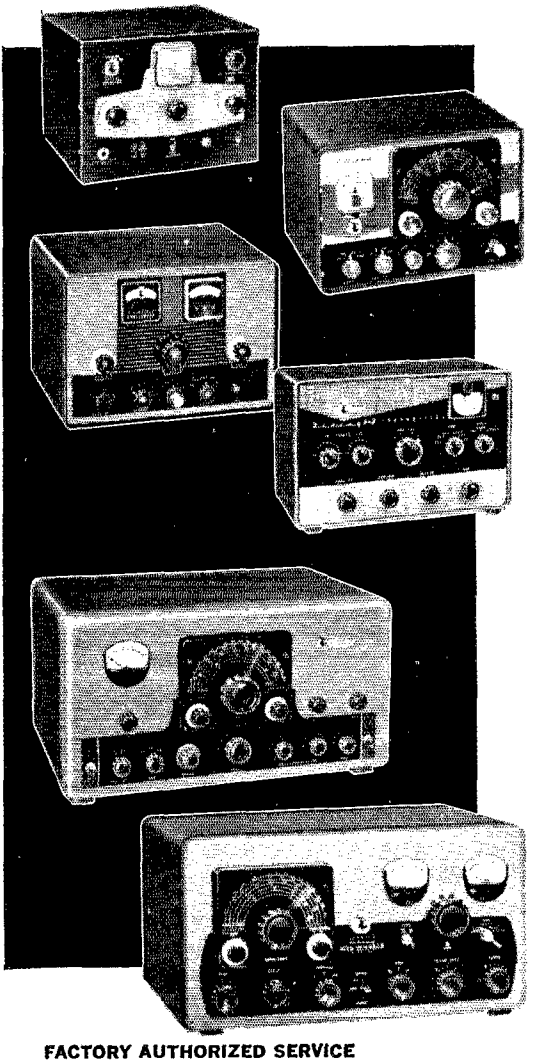
6 popular feature-packed transmitters!



ADVENTURER—Self-contained . . . 50 watts CW input . . . rugged 807 transmitting tube . . . instant bandswitching 80 through 10 meters. Crystal or external VFO control—wide range pi-network output—timed sequence keying. With tubes, less crystals.

Cat. No. 240-181-1 Kit—Amateur Net . . . $54.95

NAVIGATOR—40 watts CW input . . . also serves as a flexible VFO exciter. 6146 final amplifier tube—bandswitching 160 through 10 meters. Built-in VFO or crystal control. With tubes, less crystals.

Cat. No. 240-126-1 Kit—Amateur Net . . $149.50

Cat. No. 240-126-2
Wired and tested—Amateur Net $199.50

CHALLENGER—70 watts phone input 80 through 6; 120 watts CW input 80 through 10 . . . 85 watts CW on 6 meters. Two 6DQ6A final amplifier tubes. Crystal or external VFO control—TVI suppressed—wide range pi-network output. With tubes, less crystals.

Cat. No. 240-182-1 Kit—Amateur Net . . $114.75

Cat. No. 240-182-2
Wired and tested—Amateur Net $154.75

6N2—Rated 150 watts CW and 100 watts phone—offers instant bandswitching coverage of both 6 and 2 meters. Fully TVI suppressed—may be used with "Viking I, II", "Ranger I, II", "Valiant" or similar power supply/modulator combinations. Operates by crystal control or external VFO with 8-9 mc. output. With tubes, less crystals.

Cat. No. 240-201-1 Kit—Amateur Net . . $129.50

Cat. No. 240-201-2
Wired and tested—Amateur Net $169.50

VALIANT—275 watts input CW and SSB (P.E.P. with auxiliary SSB exciter) 200 watts phone. Instant bandswitching 160 through 10 meters—built-in VFO or crystal control. Pi-network output matches antenna loads from 50 to 600 ohms. TVI suppressed—timed sequence keying—*built-in low pass audio filter*—self-contained power supplies. With tubes, less crystals.

Cat. No. 240-104-1 Kit—Amateur Net . . $349.50

Cat. No. 240-104-2
Wired and tested—Amateur Net $439.50

FIVE HUNDRED—Full 600 watts CW—500 watts phone and SSB (P.E.P. with auxiliary SSB exciter). Compact RF unit designed for desk-top operation. All exciter stages ganged to VFO tuning—may also be operated by crystal control. Instant bandswitching 80 through 10 meters—TVI suppressed—high gain push-to-talk audio system. Wide range pi-network output. With tubes, less crystals.

Cat. No. 240-500-1 Kit—Amateur Net . . $749.50

Cat. No. 240-500-2
Wired and tested—Amateur Net $949.50

FACTORY AUTHORIZED SERVICE

Instead of shipping to our factory, equipment to be serviced may also be sent to:

Empire State Elect. Service
139-140 Hillside Ave.
Jamaica, New York

Park-Armature Co.
1218 Columbus Ave.
Boston 20, Mass.

HEATH AMATEUR GEAR

for a Merry Xmas

New Kits

Forty new kits have joined the Heathkit line this fall... choose from over 250 quality kits . . . the world's most complete line!

New Guarantee

We guarantee you can build any Heathkit and have it perform to factory specifications . . . now you can buy in complete confidence!

New No-Money Down Terms

Now it's even easier to buy from Heath! Any order from $25 to $600 can be paid for on Heath's time-pay plan with no down payment!

New 1962 Heathkit Catalog

It's the world's biggest kit catalog . . . 100 pages . . . complete descriptions, specifications and many schematics. It's yours FREE!

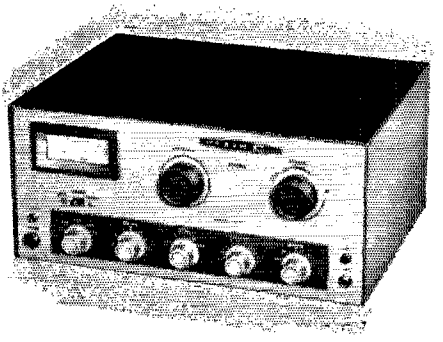
Specially-designed for CW work... new novice CW TRANSMITTER KIT HX-11

An excellent transmitter for the novice or CW amateur who appreciates a clean, quality signal and real distance getting power! Features 50 watt RF power input on 80 through 10 meters, built-in low pass filter, single-knob bandswitching, switched antenna relay power and pi-network output coupling for complete operating convenience. A "tune-operate" switch allows off-the-air tuning and a large "clear view" meter indicates final grid or plate current. Easy access to crystal socket is provided by a metal pull-out cabinet plug. Power supply is built-in. Careful design and high-quality components used throughout make this kit easy to assemble and assures long, reliable and trouble-free performance for years to come. An outstanding "watts-per-dollar" value in amateur gear. 17 lbs.

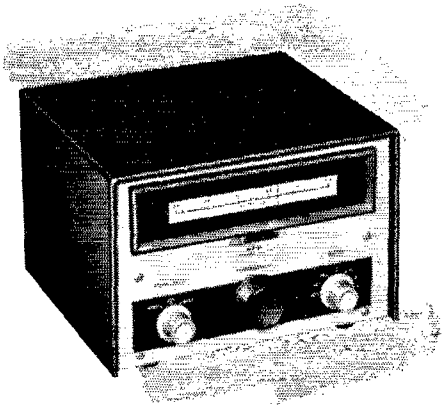
Kit HX-11... NO MONEY DOWN, $5 mo..... **$43.50**

The DX-60 Surpasses Quality and Performance of Transmitters Costing Far More!

This outstanding phone and cw transmitter offers far more in quality and performance than any other unit in its price and power class! A front panel switch selects any of four crystal positions or external VFO. Controlled carrier modulator and silicon diode power supply are built in. Single knob bandswitching for 80 through 10 meters and pi-network output coupling provide complete operating convenience. Panel meter shows final grid or plate current for easy tuning. Assembly is a marvel of simplicity with clean, rugged construction and thoughtful circuit layout. A precut, cabled wiring harness eliminates tedious wiring and the informative instructions furnished make it an ideal kit for the novice. May be run at reduced power for novice operation. Less crystals. 25 lbs.



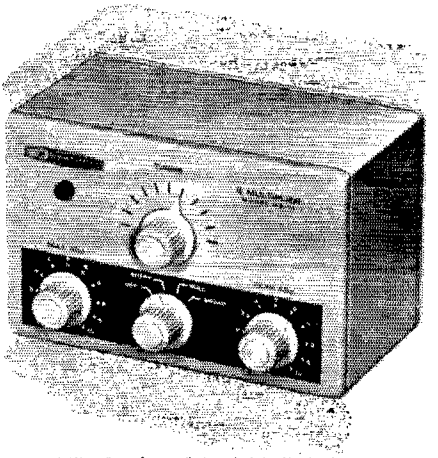
Kit DX-60... NO MONEY DOWN, $9 mo..... **$82.95**



New low cost, broad coverage
Heathkit VFO HG-10

Covers 80 through 2 meters with each band separately calibrated on a rotating drum-type slide-rule dial. Uses a series tuned Clapp oscillator with regulated plate voltage for stability and a cathode-follower output stage for load isolation. Features 28:1 vernier gear drive, and "spotting" switch for off-the-air tuning. Powered by transmitter. Styled like the Heathkit DX-60 and plugs into it directly. Easy to build. 12 lbs.

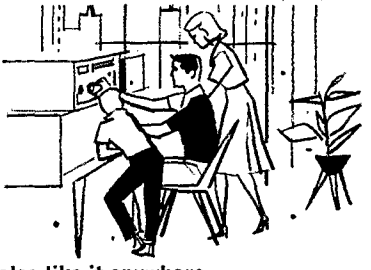
Kit HG-10...NO MONEY DOWN, $5 mo.....**$34.95**

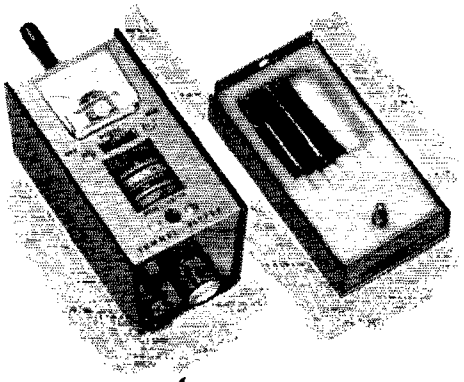


Improve your receiver performance
with this new Heathkit "Q" MULTIPLIER

May be used with any receiver having an IF frequency between 450 and 460 kc. This "electronic filter," with effective "Q" of approximately 4,000, provides either a sharply-peaked IF curve for CW, a broad peaked IF curve for AM or SSB, or a deep sharp notch for rejecting heterodynes on CW, AM and SSB. Both peak or notch positions are tunable to any point in the receiver's IF bandpass. Ideal for CW reception and heterodyne rejection on receivers or transceivers employing fixed bandwidth mechanical filters such as the Collins 75S-1. Power supply is built-in. 2 lbs.

Kit HD-11.....**$14.95**





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IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—with only 65 watts and a $16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-T12TG)

OR IS K4ZRA THE NEW CHAMP?

Read his letter, and see his diagram of a typical installation and what it achieved:

2539 Christie Place
Owensboro, Kentucky

GOTHAM
Miami Beach, Florida

Gentlemen:

While I was at home last summer, I had occasion to use your GOTHAM vertical antenna on the air for about two months. I was quite amazed with the excellent performance of that inexpensive and simply installed antenna. It did everything you, K6INI, and others said it would, in spite of the generally poor band conditions during the summer months.

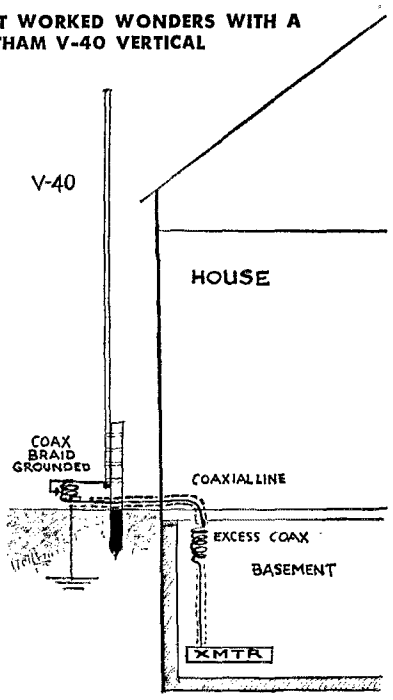
During the time I used this antenna, I worked well over 100 DX stations in 44 different countries, earned a WAS certificate, and worked the necessary stations for WAVE, receiving very fine signal reports from all. My rig ran from 75 to 100 watts plate input and the receiver was an old military ARR-7 (Hallicrafters reboxed SX-28.)

The above mentioned contacts were made with the vertical mounted several inches off the ground, without radials, with only a simple ground connection to the coaxial shield. Later I raised the antenna up about 20 feet and installed the radials and this improved the already good signal pattern and enabled me to pick off another 12 DX countries and other DX contacts in a couple of weeks of good band conditions. In the latter part of August I used several single-band vertical and ground plane antennas and found that the single GOTHAM vertical equalled all these individual antennas.

Another attractive feature is the versatility of installation. It works high or low on ground, with or without radials,

K4ZRA's INSTALLATION

THAT WORKED WONDERS WITH A GOTHAM V-40 VERTICAL



mounted in any space. Of course I did find that the best installations were the two mentioned above, but they were fairly simple to arrange especially the first one!

The GOTHAM vertical is also a superior receiving antenna and I would strongly urge you to recommend that it be used for receiving as well as transmitting.

I just wanted to tell you how pleased I was with the overall performance of your antenna. For an inexpensive, easy-to-install, dependable antenna that really works for both DX and "local" W/K contacts, I don't see how one could ask for more and I would certainly recommend a GOTHAM V-40 to anyone desiring these features. Good luck in 1961 with those FB antennas!

Sincerely,
Daniel F. Onley, K4ZRA

FACTS
ON THE GOTHAM
V-80 VERTICAL ANTENNA

- If K6INI can do it, so can you.
- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Withstands 75 mph windstorms.
- Non-corrosive aluminum used exclusively.
- Omnidirectional radiation.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- Uses one 52 ohm coax line.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price. ONLY $16.95.

73,
GOTHAM

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☐ V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO..... $18.95

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

(*Continued from page 106*)

3980 kc. at 1600, 2RN at 2345 and 0230 GMT on 3690 kc. Congratulations to K2GAO and WA2CIG on making the DPL. Appointments: K2GAO as ORS, WA2HWG as OPS. Endorsements: K2KTK as OO, WA2HTW as OES and WA2GCH as OBS. The NYSPTEN held its Annual Picnic at Green Lakes State Park with 61 families attending. I am sorry to announce that W2RJY has joined Silent Keys. The Six-Meter Mobile Assn. of W.N.Y. (Buffalo) held its Annual Rag Chewers Family Picnic. K2KTK has a new tower for the 6- and 2-meter beams. WA2GCH operated at the Clinton Co. Fair. K2EQB built a W9TO keyer. W2FSB has completed 35 years as a licensed ham and has sold his old equipment and replaced it with an HQ-180, a Valiant and a new TA-33 beam. He's working on 200 countries. W2RQF has converted ARC-5s for mobile and fixed use. WA2BPE has built a 6-meter converter for the SX-111. WA2LSJ reports the balloon launching was successful but there was transmitter trouble. The Air Force supplied a MARS van and area hams turned out to help. K2UMY has a new tower with 6- and 2-meter beams. W2QLI is now on 6 meters. With renewed interest in civil defense many area c.d. offices are more receptive to suggestions on how to make RACES plans more efficient through the purchase of new equipment through matching funds. W2LXE or I will be glad to advise any groups on correct procedures and lend moral support if necessary. All hams are invited to submit monthly reports of activities for inclusion in this column by the 4th of each month. Traffic: (Aug.) K2GAO 669, WA2CIG 554, W2EZB 458, W2OE 416, K2SSX 258, K2QDT 131, K2RTQ 89, WA2ALO 88, WA2KUS 74, W2RUF 49, WA2GLA 30, K2RYH 26, W2RQF 21, K2IDG 20, W2ZRC 14, K2HOH 13, W2QQK 11, K2BWK 10, W2PVI 6, K2EE 3, W2PGA 3, W2QCI 3, W2KAT 2, WA2KZQ 2, K2KTK 1. (July) W2DPG 16.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: OMA. RMs: KUN, NUG and GEG. The WPA Traffic Net meets Mon. through Fri. at 0000 GMT on 3585 kc. The Keystone Slow Speed Net (KSSN) meets at 2330 GMT on 3585 kc. Mon. through Fri. It is with deep regret that we record the passing of the following amateurs: KWN, whose former call was 8GJM, and ECL, both from the Pittsburgh district. K6RZO visited with K3GQA recently. OEO can't work c.w. for awhile—sprained both arms. WRE received her A-1 Operator certificate. The Steel City ARC reports via *Kilowatt Harmonics*: The club scrap drive was a real success; RXT donated a Telerex 220-Mc. beam to the club; APN is taking on an XYL. OMA has been operating as KZ5OM in the Canal Zone. MBN has been plagued with bad luck—heavy winds took down his tower and beam and he ended up in the hospital for surgery. The Cumberland Valley ARC, through *Valley QRM*, reports: ACH is working in Baltimore on Neuclear Power Plant for McMurdo Antarctica; the club meets the 4th Sat. of the month at Scotland, Pa. IRW is attending Duke University and will be on 6 meters from the school. ZZO is busy getting ready for project OSCAR. OX has been stricken by "Pigeon Disease" called "Cryptococcosis" and is listed as in serious condition in the Presbyterian University Hospital in Pittsburgh. The Etna RC reports via *Oscillator*: K3JSI and K3JTH, a husband-and-wife team, have formed the Greater Pittsburgh Teen Age Radio Club for youngsters under 21 and holding an FCC license; OVM is running an HT-37 now; KDL has a new B&W 1500 on the air. SYY operated in the CQ Worldwide V.H.F. Contest. A new General is K3LIY. The Greater Pittsburg V.H.F. Society reports through *Radio Log*: K3DMT, EC for the 6-Meter AREC, with K3s IXR, IFK, GSP and MPD, did a swell job at the Air Force Show, Allegheny County airport; DJM vacationed in Michigan with his 6-meter rig; a new licensee is K3QBI (the XYL of EWV). LIV is building a new QTH. K3KSY received his General Class license. Coke Center RC reports: K3QZV has a new Drake receiver; K3HHN has a new QTH; JW tracked the Russian space vehicle; K3HTR has a new amplifier. TV Station KDKA-TV on channel 2 presented a program on amateur radio called "QSO," which had many local Pittsburgh hams participating. RTV visited the Tri-State College ARC in Angola, Ind., and witnessed an impressive demonstration of the use of wide-band f.m. units on 52.525 Mc. and 146.94 Mc Traffic: (Aug.) W3WRE 898, KUN 104, K3DKE 101, W3LSS 57, NEM 33, NUG 29, K3KMO 23. W3UHN 21, K3GQA 15, W3IRW 12, K3COT 4, W3GJY 2, K3LEV 2, W3SMV 2. (July) K3KMO 45, GQA 6.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: PSP, RAI; USR, PAM: RYU, EC of Cook County: HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CST. The Peoria Area Radio Club Hamfest was well attended and the gung went away happy after many eyeball QSOs. Compliments still are coming in for an FB job on the Central Division Convention which was held in Springfield recently. The ILN handled 539 messages in 22 sessions and the North Central Phone Net's traffic for the same period was 177. Now that the summer slump is about over, many net managers have written and asked that those who are intere-ted in traffic work contact their nearest NCS and become a member of one of the numerous nets that are in operation. The Calumet Area Emergency Net has changed its name to the Chicago Area Emergency Net, and its operation is on 160 meters. K9BGV is operating on 2-meter aeronautical mobile. K9ACC is starting a net of Boy Scouts who hve in the Ninth District. K9PBJ is using a new AMECO nuvistor converter for his 2-meter operation. The new officers of the Bureau County Amateur Radio Club are PSY, IVU, KN9HSK, BMG, PWL and K9HCL. K9PYD has a new Spaulding tower with a TA-33 jr. antenna. JJN finally made DXCC and received his certificate. The Rockford Red Cross station, RGU, is to be affiliated with MARS. HOA is recovering quickly from a kidney stone removal. New Novice calls heard were KN9HIQ, WN9ABU and KN9CCW. K9QMJ is pounding brass with a new TO4 keyer. The Western Illinois Radio Civil Defense Group supplied communications for the Quincy Golf Tournament on Labor Day so that scores could be relayed as played to the club house. The Joliet Amateur Radio Society visited the world's first electronic central telephone office at Morris, Ill. The office offers facilities of the future which will revolutionize the telephone industry. The new officers of the Six-Meter Club of Chicago are K9LTC, K9RNW, K9PAJ, K9QDY, K9UMV, K9PBN and K9EEC. New appointees are K9YYG and K9QVA as OESs; K9VQA as OPS; BQC as OO. K9ORC has received his WAS and S6S Awards. DCQ is the call of the new Edison Park Lutheran Church Amateur Radio Club, of which K9OMK is trustee and KN9WQZ is president. CIN and K9DSJ have left for the Navy. There are several BPL recipients this month because of the tremendous amount of traffic-relaying at the International Trade Show in Chicago and K9TEM, the CARCC station, K9OZM, K9UOV, TEM, CSR and MAK made the BPL. Traffic: (Aug.) K9OZM 2550, UOV 1003, W9TEM 841, USR 683, MAK 532, QQG 385, JXV 68, K9RAS 63, QYW 51, KKN 48, W9IDA 31, K9QAE 28, W9FAW 27, K9ZQT 27, LXG 23, OAD 14, W9PRN 12, K9ZRD 12, CRT 11, OCT 10, W9MSG 3, K9RHU 2, VQA 1. (July) K9UOV 453, W9USR 272, QQG 77, K9QAE 15. (June) W9IMN 1.

INDIANA—SCM, Clifford M. Singer, W9SWD—Asst. SCM: Arthur G. Evans, 9TQC. SEC: SNQ. PAMs: K9GLL, MM and RVM. RMs: DGA, TT and VAY. Net skeds: IFN, 0800 daily and 1800 M-F on 3910 kc.; ISN (s.s.b.), 1930 daily on 3920 kc.; QIN (training), 1800 M-W-F on 3745 kc.; QIN, daily at 1900 and RFN, 0700 Sun. on 3656 kc. Hoosier V.H.F. Net information is available from K9GLL. New appointments: K9PYM as EC for Ripley County and GUX as EC for Lake County. K9DOF is OBS. Look for him on 2-meter f.m. RTTY. K9JKG is OES and K9OET is ORS. The Tri-State College ARC held a hamfest near Angola for members, their families and 6-meter f.m. enthusiasts. The Annual Big Bull Session sponsored by the Kokomo ARC was a big success. If you have not already applied for your call letter license plate, an application may be obtained from R. J. Thoben, Room 402, State House, Indianapolis. BSV is new on 2 meters with an H.B. 2E26. New calls in the Monticello Area are KN9IGK, KN9IGL, KN9FOZ, KN9SHR and KN9HQL. The Tioga RAC is planning a traveling trophy for traffic-handling. The Tri-State ARA had a fine attendance at its regular annual hamfest. The club's XYL Club provided entertainment for the ladies and food for the group. Those who missed the Central Division ARRL Convention at Springfield missed a very good event. The forums and meetings were especially informative. *Amateur radio exists as a hobby because of the service it renders.* Making BPL: JOZ and ZYK. August net reports: TT reports 51 for RFN, QIN total was 394 and QIN (training) was 30, as reported by VAY. K9GLL reports the Hoosier V.H.F. Net at 195, ISN had a total of 415, reports MM. Late July reports: Hoosier V.H.F. 85, QIN 152 and QIN (training) 33. Traffic: (Aug.) W9JOZ 2817, ZYK 903, VAY 422, K9OET 378, W9TT 264, BUQ 188, K9HYV 176, IVG/9 172, CMG 139, GLL 139, W9NZZ 118, QVQ 110, LIT/9 85, SWD 79, BDG 78, K9WET 62, OFG 52, W9OG 45, RVM 45, GJS 41, K9KTL 38, W9CC 27, UQU 26, KN9BHH 24, K9ZKU

(*Continued on page 116*)

The "Gooney Bird" returns...

Follow me to page 199

24, W9FWH 23, IMU 23, DOK 22, YEW 20, K9DUV 19, LZN 19, W9DZC 18, RTH 17, K9ARW 16, HMC 13, W9YYX 13, WUH 12, K9YOR 8, CRS 7, LJP 7, AHE 6, SPH 5, ILK 4, W9JFF 4, K9YQA 4, FVL 2, GEL 2, IXD 2, JCD 2, RUD 2, W9TQC 2, BDP 1, K9TFJ. (July) K9GLL 81, W9DGA 18, YDP 3, K9DSY 1. (June) W9DGA 30.

WISCONSIN—SCM, George Woida, W9KQB—SEC: BCC. PAMs: NGT and NRP. RMs: VHP and VIK. BPL certificates were issued to DYG and CXY. KKK has been reappointed as EC. The new Wisconsin S.S.B. Net now is in operation on 3985 kc. at 2400 GMT daily. OTL received his A-1 Operator Club certificate. K9GDF now has 1st-class telephone and 2nd-class telegraph licenses. He reports KH6BKO now is operating at HHX, Milwaukee School of Engineering station. K9AXB, new at Shawano, reports the new club there has as its officers, K9IMF, pres.; KN9FWN, vice-pres.; K9AXB, secy.; and K9FPW, treas. LFK found his first RM certificate dated 1933. K9DTK is supplementing his ham activities by playing the trombone with a 15-piece dance band at a summer resort. The Sun Prairie Club received DMG as its call. The 16th Annual Ground Hog Party will be sponsored by the Jefferson County Club at Watertown on the 2nd Sun. of Oct. BEN certificates went to QZO, GKO, CHG, K9s UTQ, ZCA, WIG, LCL, LGU, ZMI and HXJ. There are new keyers at K9GSC and K9YDY. K9WIE has his new 15 quad up 60 feet and is working DX. K9PZP/AA9PZP is on RTTY, 80 and 40 meters. Our section is in need of an OBS for both phone and c.w. for 7 Mc.; also more OESs, OPSs and ECs. OO VSO's antenna farm consists of three beams up 125 feet, inverted "V" for 80 meters and a vertical for 40 meters. More usable news is solicited for this column from clubs and individuals. Please renew your appointments on time. Traffic: (Aug.) W9DYG 855, CXY 637, KQB 252, VHP 116, SAA 91, K9VSO 67, JXW 57, W9NRP 49, OTL 39, K9SQV 32, GSC 31, WIE 29, GDF 26, W9VIK 26, K9WIG 18, DOL 17, W9MWQ 15, K9HDL 14, W9APB 11, K9DTK 10, GYQ 9, ZMI 6, CJL 4. (July) W9LFK 20, K9GDF 16, DTK 13, CJL 5.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØHVA—PAM: KØKJR. RM: KTZ. The North Dakota 75-meter Phone Net reports 26 sessions, total check-ins 434, maximum 28, minimum 9 with 76 formal messages, 36 informal and 20 relays. The North Dakota Post Office Net reports 4 sessions, a total of 33 check-ins, 2 pieces of formal traffic and 1 informal. A special thanks to those who kept the nets going during the summer. KØESO and family have moved from Bismarck and now live at Wahpeton, N.D. KØHDA is active on phone. Traffic: (Aug.) KØJVQ 164, MPH 74, ITP 65, WØYCL 38. (July) KØIVJ 94.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN—SEC: SCT. KNØIJY has moved from Sioux Falls to Huron. New calls in Sioux Falls: WNØAGD and KNØJHJ. PMA, VTX, SCT, NNX, DSK and KNØHQD operated two stations at the Dakota Centennial Gold Rush at Manchester. KØSEJ has published a South Dakota call book, containing listings of 729 amateurs in the state. It's an excellent job, listing stations alphabetically by calls, operators and cities. KØTPF is attending AF radar school in Colorado. KØTVJ and KØYU/Ø are at school in Springfield. KØKJS has moved to Minnesota. DSK is operating 2 meters from Milbank. RRN has a new HQ-170. Newly-elected officers of the Sioux Falls ARC are SMV, pres.; KØSZJ, vice-pres.; KØWEN, secy.; KØDYR, treas. ZWL's Weather Net rig has been rebuilt to 400 watts. Traffic: WØSCT 308. KØBMQ 131, WØDVB 67, KØYNR 26, YVC 16, WØZWL 14, FJZ 13, KØBSW 12, DUR 10, YJF 7, WØAYJ 5, KØTKN 5, WØVYY 5, ZBJ 5, KØPDW 4, WØYNS 4, KØRQY 3, WØNNX 2, KØQMM 2, WØSEJ 2, TNM 2, TPI 2, KØTVJ 1.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, WØKJZ—Asst. SCM: Charles M. Marsh, OALW. SEC: KØJYJ. PAMs: POX and KØEPT. RMs: KLG and KØIZD. The 1961 Boy Scout Canoe Derby on the Mississippi River between Red Wing and Winona served as a RACES exercise in which the Rochester Club members participated. KØRGP has a new Drake 2-A and an HT-37 transmitter. KØs AKM and UKU are RCC members. The New Ulm Radio Club, KØTSW, has requested AREC membership. The Jackson County Club has a base station and five 2-meter rigs on the air for c.d. TUS is c.d. director for Cass County. MJN RM KØIZD has a 150-watt v.f.o. Command set on the air. SLD received an A-1 Operator Award. KNØJTA, a Novice in Benson, has a Timco No. 50 transmitter and an S-40B receiver. OOs LST and KLG reported five violations. KØVWQ will teach in Wisconsin College.

(Continued on page 118)

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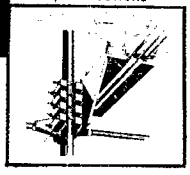

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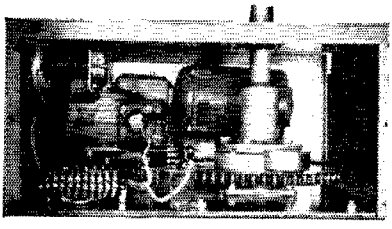
Originally developed and manufactured by hy-gain for the United States Air Force Global Communications, this new co-planer dipole-type log periodic antenna system is now available for commercial applications.

VSWR is less than 1.5-1 Average Front-to-Back Ratio 20 db. Forward Gain averages 8.7 db over isotropic source.

Specifications:

Operates without hiatus over frequency spectrum . . . Power handling capabilities 2.5 KW AM, 5 KW P.E.P. Mechanical construction meets military specifications.

FINEST HEAVY DUTY ROTATING SYSTEM.



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New Hy-Gain rotating system is designed for commercial duty. It will rotate and hold the largest directional communications arrays. Rotator delivers 5,000 inch pounds of rotating torque and 20,000 inch pounds of braking torque. Turns at 1 RPM. Direction indicator is selsyn controlled and is accurate plus or minus 5 degrees. Integrated control and direction indication unit supplied. Operates on 110 volts A.C. 60 cycle 3 amps. Fully weather protected inside and out. Housed in aluminum enclosure.

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Lincoln, Nebr.

KØKCJ has a narrow-band 6-meter f.m. transmitter on the air. URQ attended the Wyoming Hamfest in the Big Horn Mts. KØVTG built an electronic keyer. RM KLG has a new Drake receiver. DXCC award winner KØRDP has an SX-101A, an HT-32A, a 33A, a DB-23 Thunderbird beam duobander, a quad tribander, verticals and inverted "Vs" at his summer and winter homes. Approximately 200 attended the Annual St. Cloud Picnic. KØZKK was admitted to the Park Rapids hospital with a coronary condition. NYM and family are back from Washington State. Mobile Club members KØs DYW, HCD, HCF, IYV, OAV, PML, WPK and WØs IPN and THY furnished communications for the St. Paul Open Golf Tournament. A reminder to all ARRL appointees: Regular monthly reporting is a must to hold your appointment, hence, the failure to report for three months invites a cancellation. (Sickness, vacations and other valid reasons are taken into consideration. Please check expiration date of your appointment and send certificate to me for endorsement before it becomes delinquent. Thank you. Traffic: (Aug.) WØKJZ 174, KØUKU 147, VTG 147, WØHEN 119, LST 91, UMX 65, ALW 54, KØPML 53, ZKK 47, WØOPX 45, KØAKM 44, WØDQL 44, BUO 37, KØZRD 37, WØKLG 33, FGP 28, RIQ 25, KØIZD 22, VPJ 22, WPK 22, JYJ 20, VPP 20, WØATO 17, KØISV 17, GPI 16, WØWMA 16, KØLWK 14, WØMXC 14, KØKYK 12, MPG 12, WØTHY 11, KØORK 10, RDA 10, ZRD 10, WØSLD 8, KØCIB 6, ICG 6, BAD 5, UBA 3, EUH 2.

DELTA DIVISION

ARKANSAS—Acting SCM, Odia L. Musgrove, K5CIR—PAM: DYL. RM: K5TYW. Now that fall is here and winter is just around the corner we should all check our emergency gear to make sure that the old power plant is running well and has plenty of anti-freeze. A check with the net controls shows that activity on the Arkansas Emergency Phone Net is up 10 per cent from a year ago. Activity on the OZK Net also is up with a lot of traffic being passed. TIE has been experimenting with 10 watts on 2 meters and says that he can pretty well cover the state with the 10 watts by using a ten-element beam. Anyone interested in getting a 2-meter net going should see him. RIT spent two months in the Veterans Hospital in Fayetteville where he underwent surgery. Arkansas now has three RTTY nets going with more stations showing up every day. New Generals are K5PRL and UGD. RIT has a new Gen. Elec. 200V transmitter and Drake 2B receiver. The Harrison Radio Club got a half-page of well-earned publicity in the local paper. Traffic: W5SZJ 46, DTR 25, K5IPS 9, W5SMN 8, DYL 4, RIT 4, K5UEK 3, ABE 2, W5LHN 2.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—While Hurricane Carla was off the Coast of Texas and the accompanying winds were battering the shorelines of Texas and Louisiana, the emergency nets that practice for such an event worked with clocklike precision aligning their members for the ordeal which followed when Carla finally hit the shore and started to really make trouble. The South Texas Emergency Net, the Delta 75 S.S.B. and A.M. Net, the Louisiana Texas Emergency Net and numerous local nets were in operation. Your SCM took out time from monitoring the frequencies to bang out the activities of the month. K5LZA is attending Texas A.&M., K5ESW is at Ga. Tech, KSI and K5USO teamed up after getting an urgent message from a Buenos Aires ham for six bottles of stathicillin to save the life of a dying girl in that city. With the aide of the parish and state police and with sirens screaming, Angelo and Marvin rounded up the six bottles and put them on a plane for Argentina. The New Orleans Hamfest was held Sun., Oct. 8, at Jackson Barracks. Your appointment runs concurrently with your ARRL membership. Please check the expiration of both and renew as soon as possible. Traffic: (Aug.) K5LZA 131, VHJ 110, QXV 63, W5MXQ 41, K5ESW 26, UYL 16, (June) K5QXV 96.

MISSISSIPPI—SCM, Floyd C. Teetson, W5MUG—Hurricane Carla really gave the fellows a workout. Messages handled runs into the several hundreds. Well done, gang. Jones County ARC has a new call, HKR. CUU transmits Bulletins on 3925 kc. at 2230 hours. The Meridian Club is busy fixing its new club house. K5YPV reports from Ripley that he is on with a DX-100 and an HQ-170. The Jackson DX Club, with CKY as pres. and K5JKH as secy., reports contacts as follows: CKY 292 worked, 291 confirmed; PWW 190 worked, 167 confirmed; RDA 190 worked, 174 confirmed; K5RFJ 146 worked, 86 confirmed; K5JKH 216 worked, 200 confirmed. Continued good DX, fellows. WDR reports from Kessler that he has an Apache and an HQ-110. W9CTJ has moved to Illinois. New officers of the Columbia ARC are VPW, pres.; K5TAH, vice-pres.; KN5LHE, secy.-treas. K5UBL has been issued an RN5 certificate.

(Continued on page 120)

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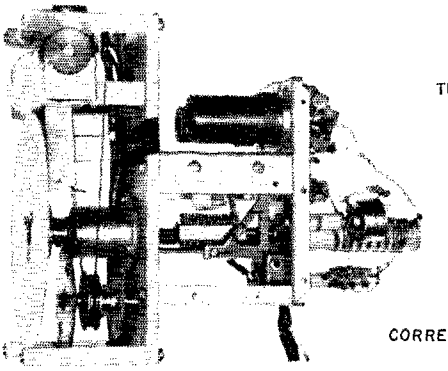

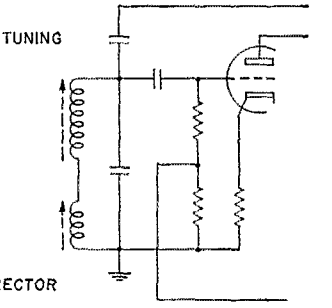

this second coil is mechanically arranged to obtain correction information from a hill and dale track created by the ball-shaped ends of 23 adjustable screws. One of the screws appears every 50 kc in an adjustment hole accessible through a plug button on top of the VFO. By progressively adjusting these screws, it is possible to make the output frequency zero beat with the kc scale every 50 kc across the VFO range.

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K5EYS, from Decatur, is on with a TCS and an ARC-5. A new OPS appointee is K5QXF. Traffic: K5QXF 224, RUO 52, W4WDR/4 10, K5MDX 6, EYS 2.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: K4OUK. RM: K4AKP. PAMs: W4UVP, W4PQP and W4VQE. K4DIZ and K4HQT were married in August. We also heard that Sarah, K4DHA, is married. K4OUK has a new SX-111, K4TTA a new HQ-140XA, K4PUZ a new Warrior amplifier and W4PVD a new Globe King. W4PL reports he is doing a little better but is using the straight key. The Lenoir City Club has the call W4WVJ and is conducting code classes. The Kingsport Ham Picnic registered 79 hams and is definitely on schedule for next year. The Chattanooga Club is congratulating K4KTC on adding the 9th harmonic. W4UDT and K4QYV joined the Air Force; W4WXH the Navy. The Oak Ridge Club is sponsoring an Explorer Scout unit with a specialty in ham radio and also is sponsoring K4OUK as a candidate for your next SCM. New appointments: K4UPX as EC, W4ZBQ as OO. Renewed appointments: K4APJ as EC, W4TZG, K4LTA, W4RRV and W4HHQ as OPSs. Reports received: OBS—W4SGI, K4VZL, W4TDW and K4AKP; OO—K4RIN, W4TDW, W4TZG and W4SGI; OES—W4YRM and K4KYL; net—W4UVP, K4AKP and W4PQP; clubs—Oak Ridge, Chattanooga and Lenoir City. Traffic: (Aug.) K4AKP 1205, W4PL 825, K4BWS 333, W4VJ 160, W4FX 137, K4YFC 127, W4PQP 75, K4OUK 59, W4UVP 42, W4JVM 34, K4AMC 30, W4UIO 23, W4TZB 20, W4TYV 19, W4UVL 14, W4TZG 13, K4FNR 11, W4SGI 2, W4YRM 2. (July) K4PUZ 11.

GREAT LAKES DIVISION

KENTUCKY—SCM, Elmer G. Leachman, W4BEW—Asst. SCM: W. C. Alcock, W4CDA. SEC: W4BAZ. PAM: W4SZB. RM: K4KWQ. V.H.F. PAM: K4LDA. Kentucky Novice Net, WN4AGN mgr., reports a traffic total of 58 and 27 sessions. W4SZB, PAM for MKPN, is planning traffic schedules for the personnel of the 100th Division, Kentucky National Guard, activated to Camp Polk. Help! W4ZDB visited the Upper Kentucky River Radio Club, Hazard, Ky., which has thirty active members. W4JDU has eight licensed operators in the family. Cheaper by the dozen. Woody, W4BAZ reports the Louisville AREC held an exercise with the Coast Guard Reserve. W4RHZ sends code practice three nights weekly on 6 meters. W4BEW handles voice traffic from the Pacific and the Far East to the Tri-State Area, Ky.-Ohio-W.Va. (s.s.b.). K4VDN transmitted six Official Bulletins in August. Because of a change in SCM some traffic totals were not received. Our apologies. OO reports were received from K4ZQR, W4SZL and K4ZRA. W4RHZ is a new OBS. Traffic: K4KWQ 171, W4BAZ 92, K4CSH 73, K4VDN 68, W4CDA 42, K4ZRA 40, WN4AGH 34, W4KJP 27, W4SZB 26, W4ZDB 23, W4YYI 19, K4VHJ 17, K4TQZ 15, W4BEW 12, W4MWX 12, W4RNF 11, W4SZL 8, W4RHZ 7, K4ZQR 6.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: ELR. RMs: SCW, EGI, QQO and FWQ. PAMs: CQU, JTQ, V.H.F. PAMs: NOR and PT. Appointments: K8CIS, EMD, K8PNX and UTE as ECs; K8KMQ as ORS; K8GOU as OBS; AHV, JYJ and THZ as OPSs; EMD as OES. K8BXH is sponsoring a Great Lakes Novice Net on 3730 kc. Mon., Thurs. and Fri. Contact him if interested. The U.P. Hamfest attendance was 201; the W. Mich. V.H.F. Hamfest attendance 138. Albion ARC's new officers are K8TDF, pres.; K8RFJ, vice-pres.; K8TCP, secy.; K8TDK, treas.; K8NEY, program. WWT won a TO keyer at U.P. K8LZL won a receiver and a transmitter at the V.H.F. shindig. EMD has started his new "antenna farm." PBO (ORS) has transferred to Michigan from West Virginia. AHV likes his new "Invader." Wayne C. now has call W8UA, the same as in '27. NOH gets better s.w.r. with RG8U, took out RG11U. K8KIT is now fighting a homemade keyer. K8NHC received WUN, HTH and CHC certificates. SS heard a local OBS call "GMT" Greenwich *Mountain* Time! K8LPV is working part time at Dow-Corning. VPC visited ARRL. PT reports the 220-Mc. net still is working, with GOV, CVQ, PYQ, K8JZR and W9REM in. K8BGZ says there is not much on 50 Mc. and 144 Mc. is fair. K8IUZ worked his station at the Manchester Fair. K8MRS works Puerto Rico on 50 Mc. K8VKX works ØOMS, Omaha, on 50 Mc. The Annual V.H.F. Conference will be held again at McCracken Hall, WMU, Kalamazoo, Nov. 18. The QMN Picnic and business meeting was a success. The Michigan QCWA Net, at 1300 Sun. on 3900 kc., is going very well. Traffic can be put in most places in Michigan on the QMN, 3663 kc. at 2300 and 2330, or on the WSSB Net, 3930 kc. at 0000 (2400) daily. One Detroit OO reports a "Tech" working 10 meters in Detroit. To stop this, get proof to the

(*Continued on page 122*)

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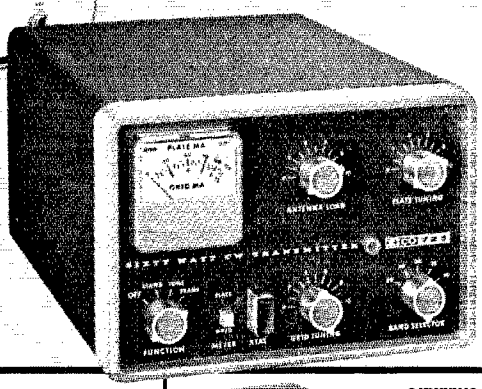

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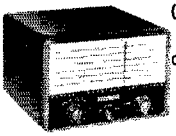

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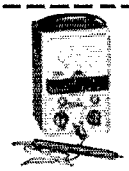

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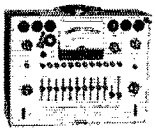

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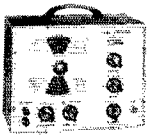

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FCC. Traffic: (Aug.) W8OCC 182, IXJ 165, FWQ 150, K8KMQ 138, UZ 115, W8JTQ 107, K8QIL 104, W8NOH 88, ELW 68, K8HLR 54, W8DSW 47, K8EXE 47, OTJ 41, W8ZHB 41, HKT 38, DSE 36, RTN 36, FX 26 K8MEG 21, W8WQH 20, EOI 18, IBB 18, K8KIT 18, W8EC 16, K8KQV 15, JED 14, NHC 13, PYW 13, GJD 10, W8AUD 9, SS 7, ALG 6, EGI 6, K8GOU 6, KVM 5, W8TBP 5, THZ 3, K8LOS 2. (July) W8DSW 49, K8EXE 37, W8EOI 9, K8MEG 8, W8AHV 6, K8KVM 6, LZF 6, LOS 2, W8TIN 2.

OHIO—SCM, Wilson E. Weckel, W8AI—Asst. SCM: J. C. Erickson, 8DAE. SEC: HNP. RMs: BZX, DAE, VTP and K8ONQ. PAM: K8MFY. Appointments made in August were IBX as OO, K8SQK as ORS, K8KDK as EC. K8MTI received A-1 Operator, W-Del, DUF 1 & 2, DRD and WAG awards. K8VIX received HTH-50 and WAS awards. Canton ARC's *Feedline* has a beautiful sepia picture on its cover of HR seated at his station. K8s UBK, UKH and YKL received their General Class licenses, KN8s DQV and DQW (a father-and-son team) are new Novices and WA8ABJ is a new Technician in the Canton Area; KN8AHB is a new Novice with a DX-20 and an HQ-170; K8JZN vacationed in Florida; FMW and GAB went fishing in Canada; TUY has a new Drake 2-B; K8SWE has a new SX-101, the stork brought baby girls to K8LBZ and to K8NSL; WA8ABC is a new ham; ex-LYZ-KL7NA-KR6JH-W6EDG is home on leave before going to Washington, D.C. Your SCM enlisted him in the Naval Reserve in 1934 and he still is going strong; the club held a picnic with 46 amateurs and their families attending; K8DVJ was home on leave from the Navy. The Clermont County AREC held a simulated emergency test with K8SYS as net control on 6 meters and EAJ as net control on 10 meters. Evendale ARC's new president is K8ANN and PNK is vice-president. Your SCM attended the Warren Hamfest with K8s CZU, NJH and QNT, at which 260 amateurs out of a total of 333 registered. K8GGI won an HT-37, KDJ an SX-111, K8TCE an HA-4 keyer and ZNR a Heath HW-30 2-meter transceiver. K8ONQ and his XYL vacationed in Michigan. WRP and K8ANG are home after completion of enlistment in the Air Force and Navy, respectively. IBX received WAFI, DVQ, WFKAS, AC15Z and Kans. Cent. awards. KN8BFM is a new Novice. K8RNH is air mobile on 2 meters. K8KHH is now mobile. K8ZGF has a new Seneca. K8ZQI has a new Ranger and an HQ-100. Massillon ARC's *MARC* tells us that VYU is at WADC in Akron and K8EJV is at WDPN-FM in Ashland; new hams in the area are KN8s BZI, DHT, DGZ, K8ZXG and ZNV after an absence of ten years; K8s UTM and LYR left for a hitch in the Navy; K8EKG is working in Pennsylvania. The Parma RC's *PRC Bulletin* informs us that nearly 70 members attended the Cleveland V.H.F.-PRC picnic; TGX demonstrated photo transmission and the club station now is using RTTY. Toledo's *Ham Shack Gossip* names BAH as its Ham of the Month and states that a new club is starting locally to be known as the YL Experimenters and those interested should get in touch with HWX; K8s UVQ, VYW and YIN dropped the "N" from their calls; K8QAY vacationed in Europe; TIL and VSB vacationed in Tennessee; FDD is on 6 meters; SOI made a trip to Florida; K9MHQ moved back to Toledo; K8s YOO and YON (a father-and-son team) received their General Class tickets. WRN asks all 144-Mc. operators within a radius of 50-60 miles of Columbus to be of assistance in reporting WOSU-FM signal strength at reporting station, which can report to WRN 8 on 144 Mc. giving your elevation, power, transmission line and antenna gain. This test is to show expected 153-Mc. coverage to aid in establishing a network of 153-Mc. stations to be located in hospitals in towns in this area described. Work WRN on 144 Mc. or write to him. We need ECs in the following counties: Allen, Ashland, Brown, Carroll, Crawford, Darke, Delaware, Fairfield, Fayette, Greene, Holmes, Licking, Marion, Mahoning, Monroe, Morgan, Morrow, Perry, Portage, Preble, Ross, Shelby, Union, Vinton and Warren. Radio clubs in these counties, how about selecting a person to act as your EC or anyone to volunteer. Please write to our SEC, A. A. Garn, W8HNP, 5034 Oak Ridge Dr., Toledo 13, Ohio, or to me. Thank you. Traffic: (Aug.) W8UPH 1240, K8SQK 315, AAG 167, W8ZYU 141, BZX 111, K8ONQ 100, W8CXM 85, K8VKK 49, RYU 45, W8IBX 36, AL 21, K8LUP 16, RUC 16, BNL 14, W8EAJ 13, WYS 12, LZE 10, K8HTM 9, W8PBE 8, TNT 8, K8WLP 8, DDG 1. (July) W8HCR 89, K8PBZ 38, WNY 3. (June) K8PBZ 44.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RMs: W2PHX and K2QJL. PAM: W2IJG. Section nets: NYS on 3615 kc. at 1900; NYSPTEN on 3925 kc. at 1800; ESS on 3590 kc. at 1800; MHT (Novice) on 3716 kc. Sat. at 1300. Endorsement: WA2ALO as ORS, K2ZEL, an OES, is taking graduate work in physics at Ohio State for PhD. A

(Continued on page 124)

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new appointee is WA2IMG as OES. The Schenectady Club held its August Picnic at Sacandaga Reservoir. The New Rochelle Club reports 1258 contacts with 9 transmitters on Field Day. Schenectady reported 1185 contacts with 5 rigs. Both fine scores. At this writing it looks like there will be no call-letter license plates in 1962 for New York. We are in the same boat as Massachusetts, New Jersey and Kentucky. Reason—too slow to manufacture with tight production schedules. WA2QEG, the new Radio Officer in Pelham, worked 100 stations on 2 meters in less than a year. Mobiles covering the Westchester "Fish Derby" were WA2JZA, WA2OBZ, WV2NRB WA2OCA and WA2DEK. The ESS Net held its picnic at Indian Lake with about 15 members in attendance. W2NTU is active again on 75 meters. The Red Cross N. Y. Mutual Aid Net (1st Sun. of each month at 1200) operates four simultaneous sessions on 3875 kc., 3550 kc., 7220 kc. and 50.70 Mc. Is your chapter represented by amateur radio? They tie into AmCross wire service at Syracuse and Brooklyn. The New York State Civil Defense Commission has moved from N.Y.C. to 162 Washington Ave., Albany, with plans for a new state control center in that city. Traffic: (Aug.) WA2HGB 300, K2MBU 128, W2EFU 112, WA2ALO 88, K2EIU 68, WA2MID 59, WA2HLH 48, W2PHX 46, K2SJN 29, W2PKY 21, W2URP 16, K2TXP 7, WA2ATC 5, K2YJL 3, K2DEM 2. (July) WA2MID 62, K2EIU 58, K2TXP 17.

NEW YORK CITY AND LONG ISLAND—SCM, George V. Cooke, jr., W2OBU—SEC: W2ADO. RM: K2UFT. PAM: W2UGF. V.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. at 0030 GMT nightly and 0015 GMT on Sat.; NLI (late), 3630 kc. at 0345 GMT nightly; NYC-LIPN, 3908 kc. at 2230 GMT nightly; V.H.F. Traffic Net, 145.8 Mc. at 0100 GMT Tue.-Wed.-Thurs. Your former SCM, W2TUK, is writing this column for W2OBU. George suffered a heart attack on Aug. 28 and is now recuperating at home after a month's hospitaliza-

NEW YORK CITY QSO PARTY

November 4-5

The Bronx High School of Science Radio Club invites all amateurs to participate in the New York City QSO Party by contacting as many N.Y.C. stations as possible.

Details: 1) Contest period—Saturday Nov. 4 2300 GMT to Sunday Nov. 5, 2300 GMT. 2) No time limit or power restrictions. 3) Scoring: At least one end of the QSO must be a New York City station. Each QSO is one point and the total number of points is multiplied by the number of boroughs worked times five. With five buroughs —Bronx, Brooklyn, Manhattan, Queens, and Staten Island—your maximum multiplier is 25 (5 x 5). This scoring procedure applies both to N.Y.C. stations and out-of-city stations. There is no multiplier for number of states worked. 4) Frequencies suggested: 3550, 14,100, 21,075, and 28,100 kc., as well as six and two meters. Phone frequencies are approximately in the middle of each phone band. 5) The general call is "CQ NYC" or CQ DE NYC." 6) Send logs to Bronx High School of Science, c/o Kenneth Schaffer WA2BQK, 222 East 202nd Street, New York 58, New York.

tion. I'll pinch hit for George until he can once again take over. Continue mailing all reports to 3 Daisy Lane, Commack. BPL cards were earned by K2UBG, WA2GPT, W2EW, W2GKZ, WA2GLU and WA2EFN, the latter three on originations plus deliveries. WA2GLU operated portable in Connecticut instructing campers on amateur radio. The Washington Square ARS of N.Y.U. received its club call, WA2UZM. The station is located on the site of the original testing by Samuel F. B. Morse. WA2QJU completed a v.s.w.r. bridge. WA2IKT is on the air with an SX-99 and a 150-watter. K2CMJ and K2DNY received ARRL Public Service Awards. K2AAS is manager of the All Service Net which meets Sun. at 1700 GMT on 7270 kc. K2IVE passed the Extra Class exam. A transistorized mobile rig is under construction at K2HTX. WA2HMM put up a new ground-plane antenna and worked five new countries in two days. A Viking II is in operation at WA2MPP on the Ding-Dong Whizzer Net at 1245 GMT on 21,366 kc. Now that W2DQN has taken roots in Suffolk he is active with an HT-37, an NC-300 and a TA-33. W2ZAI reports that the Nassau County 10-Meter AREC Net has 96 members. The Long Island Mobile Association announces its transmitter hunts are held on 29.4 Mc. at 0100 GMT on Tue. and 0130 GMT on Fri. WA2GGB is chief engineer of

(*Continued on page 136*)

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WA2QYE at the Walt Whitman H.S. A Johnson Challenger, an S-108 and an Ameco converter are used on 6 meters at WA2KER. WA2OBN is operating with a Ranger, an RME-6900 and a vertical and hopes to add a Hornet beam. K2PQY is using a Johnson 6N2 and a new Gonset VHF v.f.o. WA2KYF passed the 1st-class radiotelephone exam with radar endorsement. WA2KSD received WAS, A-1 Operator and HTH (G) certificates. WA2NFI is enjoying traffic work and is adding an Apache to his station. K2PFH hopes to be on the air from Italy with his HT-37 and HQ-180. WA2TJV has been appointed Asst. EC for the Queens Six-Meter AREC Net by W2LGK, County EC. WV2NRR is now WA2NRR. K2DZA is now engaged and reports the big day is scheduled for June. A new Gonset G-76 is the mobile rig at K2MYW. WA2RAS is now using an HQ-129X. It is with deep regret that I report K2EUZ as a Silent Key. Sol was the senior member of a 100 per cent amateur family and will be missed by his many friends and especially the Levittown ARC. WA2GJT had worked twenty 2-way s.s.b. states on 50 Mc. Keep rooting for W2OBU's very speedy recovery. Traffic: (Aug.) K2UBG 820, WA2GPT 624, W2EW 549, WA2NMP 365, K2UFT 328, WA2BWO 320, W2GKZ 275, WA2GLU 262, WA2EFN 213, WA2QJU 120, WA2IKT 87, K2THY 46, K2DNY 44, WA2CSE 42, K2AAS 41, K2IVE 33, WA2NFI 33, K2CMJ 19, K2HTX 16, W2LGK 14, K2MYW 14, W2BO 8, W2DBQ 7, W2OME 6, W2PF 4, K2YQK 4, WA2GAF 2, WA2HMM 2, WA2MPP 2. (July) K2YMU 322. WA2NFI 31, W2DUS 30, WA2KER 29, WA2FTS 24, WA2CSE 19, W2DBQ 11, W2DID 6, WA2OBN 3. (June) WA2CSE 17.

NORTHERN NEW JERSEY—SCM, J. Sparks Remeczky, K2MFF—SEC: WA2APY. RM: K2VNL. PAM: K2SLG. V.H.F. PAM: K2KVR. Section nets: NJN daily at 0000 GMT on 3695 kc., NJPN Mon. through Sat. at 2300 GMT and Sun. at 1400 GMT on 3900 kc., N.J. 6 & 2 at 0400 GMT Thurs. and Sun. on 51.15 Mc. and at 0300 GMT Wed. and Sun. on 147.75 Mc. New appointee: WA2UZH as OPS. The NJN reports 31 sessions, attendance 433 and traffic 380. The NJPN reports 31 sessions, attendance 667 and traffic 248. The N.J. 6 & 2 Nets report 19 sessions, attendance 150 and traffic 33. WA2CCF, WA2GQI, K2UCY, WA2UZH and K2VVL earned BPL cards for August traffic. W2NIY received the WRONE and CN8 awards. WA2AMH and K2YFF received the East Coast V.H.F. Society Award. W2CVW has a broken right wrist but he hasn't let it keep him off the air. WA2COO has become a member of the A-1 Operator Club. W2QNL says that fishing with WA2GQZ is almost as much fun as traffic-handling. K2SCD is trying to form a net on 1296 Mc. WA2HFI worked two more states on 2 meters to give him a total of 11. WA2RDG, WA2SRK, WA2SOG and WA2SZK are new Generals in N.N.J. K2VZJ received his CP-20. K2PVH had his OPS appointment endorsed and K2VNL had his ORS endorsed. WA2CBB was unable to go to Hunterdon Co. for the N.J. QSO Party because of illness in the family who owns the farm. He expects to go there in December, so if you want a sked write to him now. WA2SIF, WA2SWA, WA2SYI and WA2TKG are new Technicians in N.N.J. This column isn't long enough to tell the whole story of the East Coast V.H.F. Society Picnic but let it be known that your SCM has never seen so many prizes as were awarded that day. WA2MYB has a new 10-meter quad on the air. W2AZZ's son received K2LNX as his call. WA2CCF, WA2MWU and W2TKZ visited W1AW. K2UKQ received FHC No. 1. K2KUR is on the way to Libya and hopes to operate from there. K2AGJ took advantage of summer band conditions to catch up on sewing and cooking. W2VMX is experimenting with fluoride etching of surplus crystals. WV2SID, WV2SIE and WV2SIF spent 10 days mobiling in Maryland with a Gonset IV. Traffic: K2UCY 857, WA2GQI 617, WA2GQZ 380, K2VNL 270, WA2CCF 237, K2VVL 150, W2QNL 117, WA2UZH 108, WA2KKH 86, WA2COO 2 47, W2CVW 30, K2JTU 29, K2SLG 27, K2MFF 18, K2HFL 16, W2AZZ 14, K2HHS 13, WA2OVK 10, K2EQP 8, W2NIY 8, W2VMX 3, W2TKZ 2, W2EWZ 1.

MIDWEST DIVISION

IOWA—SCM, Dennis Burke, WONTB.—SEC: KØEXN. PAM: PZO. Woe is me for failing to have my BPL candidates properly prepared for publication! Our section had some nice reports that did not appear in their proper place in the Sept. issue. It won't happen again. Thanks to all who report. It proves you are alive. LCX has been to the West Coast on vacation. RUM attended the Oskaloosa Fair. Congratulations to the Boone Mike and Key Club. Four hundred hams, XYLs and harmonics were royally entertained at the 75-Meter Phone Net Picnic. Orchids to the Hampton and Sioux City Clubs for the two best ham sheets I have seen this year. AZJ is doing well picking up second harmonics

(*Continued on page 128*)

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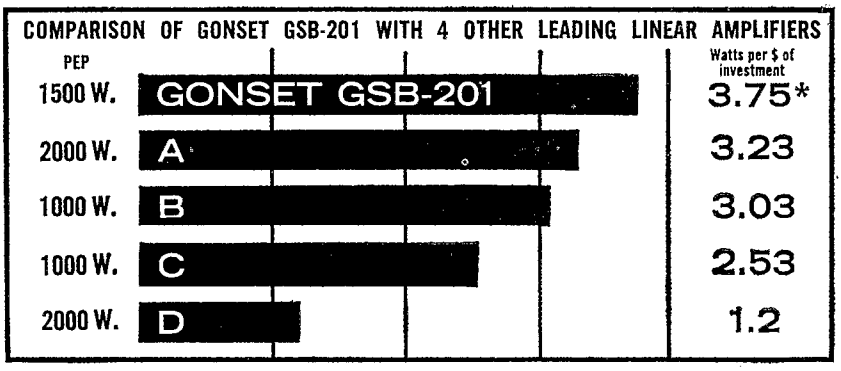

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for the KN boys. Don't be offended, fellows, it is for the good of the order. RFT reports another Project OSCAR under way at Decorah. The 75-Meter Phone Net reports: For July (late) QNI 992, QTC 163, sessions 26; for Aug., QNI 1348, QTC 241, sessions 27. Traffic: WØLGG 2394, BDR 1594, SCA 1574, DUA 782, NTB 381, CZ 311, KØJDQ,Ø 165, WØPZO 139, KØKWO/Ø 114, WØAAE 69, KØZLN 51, BFL 41, WØLJW 41, KØZCQ 33, POI 32, UAA 25, QWM 23, VHR 17, WØYDV 12, KØKAQ 11, BND 10, WØJPJ 10, KØWVK 9, WØYOZ 7, KØAFG 6, EVC 6, GOT 6, PTL 6, WØGQ 5, SFK 5, KØEJN 4, MTI 4, WØQVZ 4, KØVSV 1. (July) WØLJW 42.

KANSAS—SCM, Raymond E. Baker, WØFNS—SEC: KØIZM, RM: QGG, PAM: KØEFL, V.H.F./PAM: HAJ. Section nets: KPN, 3920 kc. Mon., Wed., Fri. at 1245Z. Sun. at 1400Z: NCSs KØQKS, FHU, ORB, and IFR. Aug., 17 sessions, QNI 416 high 48, low 15, average 24.5; QTC 95, high 17, low 0, average 5.6 QKS, 3610 kc, daily 0030Z; 19 sessions, QNI 105, high 10, low 2, average 5.5; QTC 54, high 24, low 0, average 2.8; NCs KØBXF, IFR, FNS and SAF. Area HBN, 18 sessions; QNI 391; QTC 258; NCSs ANT, KØHGI, WNZ, 5EWA, 5JXD, LGG and KØVFV. Jayhawker YL Net, Tue. 1530Z 3940 kc. Sun. 2200Z. Appointments: BSS as OPS. KØZSG has a new SX-140. The Emporia Radio Club is very active in the AREC. TEZ is back on the air with a new Valiant. The Kansas-Nebraska Radio Club had a real crowd at its hamfest with 131 registrations. The Ham Butcher Net meeting was well attended with 175 registrations. KØHAO was chosen as Ham of the Month by the Newton Amateur Radio Club. QGG, our Route Manager, was Station of the Month on MARS. KØYEP now has a Johnson Invader. LEW has a new HT-37. We understand FNS has his hands on a 20A. Looks like the sound barrier has been broken. MVG worked 10 new countries on 20-meter c.w. in one evening. JAS is working skeds on 2-meter meteor scatter. QDH has a new Elmac and a PMR-7. Traffic: (Aug.) WØOHJ 752, FNS 359, KØHGI 261, WØORB 88, KØHVG 85, WØABJ 75, IFR 47, BLI 23, KØEFL 15, QKS 14, LHF 12, WØTOL 11, KØYWG 10, ZHO 9, WØFHU 8, QGG 4, WFD 4, KØGQO 3, WØVBQ 2, KØYGR 2. (July) WØFNS 113, TOL 2.

KANSAS CENTENNIAL QSO PARTY

December 9-10

The Kansas Federation of Amateur Radio Clubs invites world-wide participation in the Kansas Centennial QSO Party starting at 1400 GMT Saturday, Dec. 9 and ending 2359 GMT Sunday, Dec. 10. Kansas stations will work other Kansas, W/K and DX stations. Non-Kansas entries will combine c.w. and phone contacts to make one entry. There will be separate c.w. and phone contests for Kansas stations. The exchange will consist of signal report and ARRL section or DX country. Kansas stations will send their county. The same station may be worked on more than one band. Kansas-to-Kansas QSOs will not exchange counties but send "Kansas." Each contact will count one point. Final score will be the number of QSOs multiplied by the number of different location-multipliers (sections or counties). A county, sections, or country will count only once as a multiplier. Suggested frequencies are 3550, 3900, 7050, 14,050, 14,250, 21,050, 21,350, 28,050. 29,000, 52,000, and 144,500 kc. Certificates will be awarded to the winner of each section and country. Certificates will be awarded to the top 25 Kansas c.w. and top 25 phone entries. Send logs to: Kansas Centennial QSO Party Committee, 414 Avenue "C", Wichita, Kansas. Logs must reach the Committee by Jan. 31, 1962.

MISSOURI—SCM, C. O. Gosch, WØBUL—SEC: KØLTP, Asst. SEC: KØLTJ. RMs: OUD and KØONK, PAMs: BVL, OVV and LFE (v.h.f.). Net reports: (Aug.) MEN (3885 kc., 2400 GMT, MWF) 13 sessions; QNI 278; QTC 142; NCSs: KØONK, KØVNB 4, KØMMR 3, KØKUD/Ø, KØVPH 1. Mo. SSB: (3885 kc., 2400 GMT Tu. & TH.) newly-organized; first report in Sept. MON (3580 kc., 0100 GMT M-F) 27 sessions; QNI 151; QTC 205; NCSs: OUD 10, KØQCQ 6, RTW 4, WØKIK, KØVPH 3, KØOJC 1. SMN (3580 kc., 2200 GMT Su.) 3 sessions; QNI 9; QTC 25; NCS: OUD 3. MSN (3715 kc., 2200 GMT, M-F) 25 sessions; QNI 115; QTC 162; NCSs: KØONK 9, KØVPH 6, KNØGFA, KØFPC 4, KNØGOB 2. Appointments:

(Continued on page 130)

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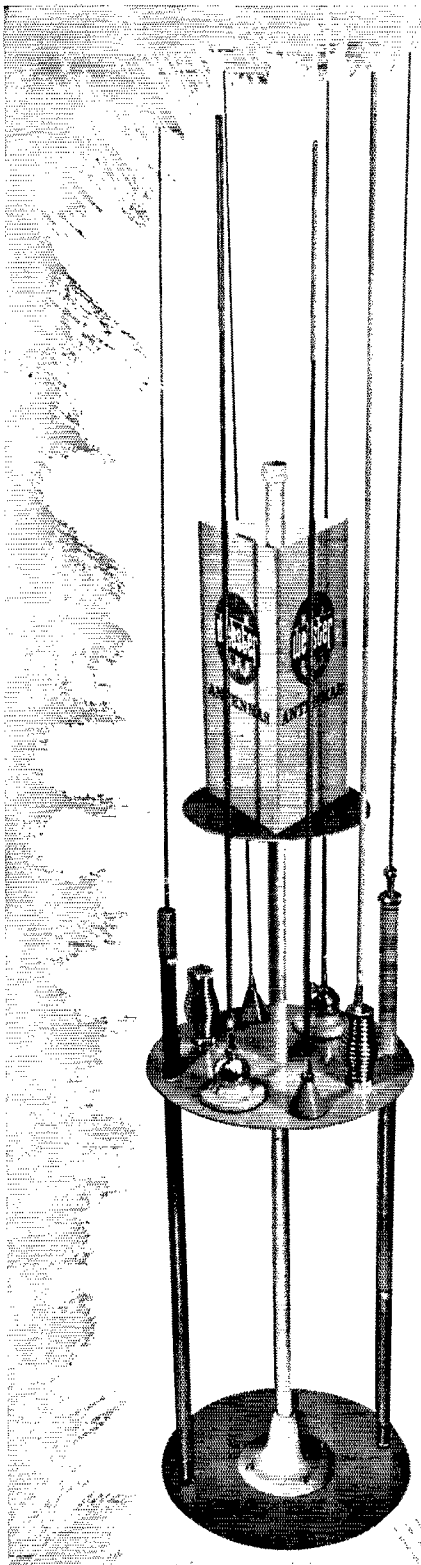
OBS—KØKCG, OES—KØAFE, EC—AKM. Endorsements: OBS—KØONK and TOD. OO (Cl. II and IV)—KØOJC. ORS—GBJ, KØMAU and KØVBU. Cancellations: OO (Cl. II and IV)—KØGNS. OO (Cl. I)—KØLTK. OO (Cl. III and IV) WYJ. Annual endorsement of your certificates is required, fellows! At the request of several section members, an s.s.b. traffic net has been activated. This net meets Tue. and Thurs. at a time and on a frequency noted above. A.m. stations, as well as out-of-section stations, with traffic are welcome to check in to this net. The net control is OMM. YKC operated portable at the Campbell Peach Festival with a GSB-201 final and made BPL on originated traffic as a result. The section had six stations making BPL in August, a new record. KØJPL reports DX No. 103 and more break-in at KØAXU (club station); a transceiver was one of the items stolen. KØVBT is president of the St. Louis Univ. ARC. KØRPH has a new Vibro-keyer and t.r. switch. The SCM, SEC and Asst. SEC, along with the SCM of Kansas, were happy to attend the Ham Butchers Net Hamfest on Aug. 20 at Emporia, Kans. The first three also attended the SWMARC Hamfest (Springfield) on Aug. 27. KØVPH reports receipt of WAM certificate No. 2. Traffic: (Aug.) KØONK 1417, VPH 519, WØANT 389, KØLTJ 301, WØKIK 213, MKJ 207, KØVNB 146, WØOUD 115, YKC 106, KØLTP 99, WØOMM 91, OVV 55, BUL 42, KNØGFA 36, WØRTW 36, KØMMR 35, PCK 35, FPC 28, WNZ 25, WØBVL 22, PXE 20, WAP 16, KØVXU 12, WØEPI 8, KØMAU 1. (July) KØNRH 24.

NEBRASKA—Charles E. McNeel, WØEXP—SEC: KØTSU. The Western Nebraska Net, reported by NIK, NC, had QNI 646, QTC 107, 100 per cent reporting KØTUH, KØALY, KØBMQ, RJA and SWG. The Nebraska Emergency Phone Net, EGQ as NC, KØCGM as Acting NC, reports QNI 673, QTC 96, 100 per cent reporting KØCGM, VZJ and HXH. The Nebraska Section C.W. Net resumed operation on Sept. 1 on 3525 kc. at 1900 CST with OKO as RM. The Morning Phone Net, KØDGW as NC, reports QNI 626, QTC 160. The Grand Island Club Annual Picnic was well attended and the well-equipped c.d. truck was admired by all. This is one of the best equipped and organized c.d. groups in the state. KØQFK operated portable from the Scotts Bluff Walther League Convention. KØVAZ will operate portable from N.U. in Lincoln with a new s.s.b. rig. It is with deep regret we record the passing to Silent Keys of FLF and RCH. Traffic: WØDDT 121, OKO 111, KØMSS 70 WØVZJ 66, KØYDS 52, CGM 41, RRL 36, WØVEA 36, NIK 33, KØQVM 30, WØFSX 26, KØDGW 23, BRQ 22, WØYFR 20, LFJ 16, KØWEP 14, WØLDO 13, UOV 13, GGP 10, KLB 10, KØDFO 9, WØVAZ 9, RJA 8, KØKJP 7, WØOCU 7, BOQ 6, LJO 6, KØFBY 4, KTZ 4, VTD 4, WØZJF 3, CIW 2, WPK 2, EGA 1, HOP 1, RIH 1.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Henry B. Sprague, jr., W1CHR—SEC: EOR. RM: KYQ. H.F. PAM: YBH. V.H.F. PAM: FHP:. Traffic nets: CPN, Mon.-Sat. 2300Z, Sun. 1500Z on 3880 kc.; CN, daily 2345Z on 3640 kc.; CVN, Tue., Thurs. and Sat. 0130Z on 145.98 Mc.; CTN, Sun. 1400Z on 3640 kc. K1GUD made the National Honor Roll for OOs. We need a repla cement for him (he's in the Navy now) and a couple of other experienced amateurs as OOs who have a minimum of 3 to 4 years of consistent activity as General Class licensees on several bands. You are urged to apply for an appointment in this worthwhile activity. K1s IFJ and PGQ made BPL. K1IVR built a t.r. switch and was appointed asst. manager of a Novice net along with K1NEF's appointment as manager. FVV reversed direction and is back on 144 Mc. with a Communicator IV and a six-element beam. APA has 50 countries on 40-meter s.s.b. and works KC4USV. KN1QIR NCSs a Novice net and likes traffic work. K1PKQ is building a nuvistor converter for 2 meters. KYQ reports the CN had 31 early sessions handling 291 messages for an average of 9.3; 18 second sessions with 50 messages for a 2.7 average. Attendance averaged 11.6 on the first and 3.4 on the second. High QNI were NTH and K1s IFJ and PUG. YBH advises the CPN had 31 sessions with 229 messages handled for a 7.4 average. Daily attendance averaged 24 and the following made the attendance honor roll: FHP, YBH, DAV, K1s BSB, DGK, PPF and MBA. CHR's receiver died during a net session. By luck the trouble, a blown resistor, was found and replaced before QNF. The Waterford Radio c.d. group is now located in better quarters in the Town Hall. New members are RPQ, RO. K1s HNT, ARO, RTR, HXM, SWV, SWW and GHK. OBR is toying with s.s.b. and high-power linears. JZA has been working 8s, 4s and 3s with Clegg Zeus and a 10-over-10 beam. K1IFJ was appointed ORS. Appointments renewed: QV, YBH and APA as OPSs; YBH and QV as OBSs and APA as ORS. Reports received: OES from FVV and K1PKQ; OO

(Continued on page 132)



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from K1IVR. Traffic: (Aug.) K1IFJ 584, W1KYQ 170, NTH/1 157, RZG 153, K1MZM 140, PGQ 135, GGG 129, W1AW 94, YBH 76, K1IVR 61, JAD 59, PPF 57, W1RFJ 52, K1DGK 35, AQE 32, MBA 28, EIC 27, IVV/1 27, KN1QIR 26, W1CHR 12, CUH 10, APA 9, K1QCR 9, PUG 6. (July) W1OBR 49.

NEW ENGLAND QSO PARTY

December 9 and 10, 1961

sponsored by
The Connecticut Wireless Association

ALL AMATEURS IN THE SIX STATE AREA are invited to take part. The Conn. Wireless Assn. calls this its SEVEN-ELEVEN PARTY because the three operating periods are from 7 P.M. to 11 P.M. EST Saturday night, 7 A.M. to 11 A.M. Sunday morning, and 7 P.M. to 11 P.M. EST Sunday night. 7-11 are lucky numbers. . . . Try your luck!

Eligibility: All licensed amateurs in New England are eligible and invited to participate. Only single-operator entries will be considered for awards. CWA members are not eligible for awards. *Times:* Three operating periods during the week end of December 9-10 will be utilized: 2400Z to 0400Z Sunday (Dec. 10), 1200Z to 1600Z Sunday (Dec. 10), and 2400 to 0400Z Monday (Dec. 11). See above for SEVEN-ELEVEN EST times.

Frequencies: All amateur bands may be used. Each band with its sub-bands counts as one band for scoring purposes. For example, 80-meter c.w., 80-meter Novice, and 75-meter phone all count as 80 meters. It is suggested that the 25 kc. on the low edge of each band and sub-band be used. *Exchanges:* Call "CQ New England" on phone and "CQ NE" on c.w. The exchange will consist of QSO number, RS(T) report, name (or abbreviation) of county and state. For example W1NXX might send: "NR 7 589 CUMBERLAND, MAINE." *Scoring:* Count one (1) point for each contact. Multiply total contact points by number of different counties worked. Multiply again by number of states worked. For example, W1NXX works 50 stations, 35 different counties and 6 states. His score would be $50 \times 35 \times 6 = 10{,}500$. Maximum possible county multiplier is 67. Maximum possible state multiplier is 6. A station may be worked once *per band* regardless of mode. *Awards:* A certificate will be awarded to the 1st and 2nd high scorers in each state; to the high scoring Novice in New England; and to the high scoring Technician in each New England state. *Logs:* Logs must show date and time of each contact, complete exchange information, call and address of operator and final score calculations. Mark each new county and state as worked. Mail copy or carbon of logs to: Conn. Wireless Assn., Attn. F. E. Handy, W1BDI, 35 Brookline Drive, West Hartford 7, Conn., no later than January 15, 1962.

MAINE—SCM, Albert C. Hodson, W1BCB—K1ADY has been appointed PAM for the Seagull Net. We hope all who can will help her as net controls or alternates. The month of August showed renewed activity on 75 and increased activity on 2 meters with several openings and new stations on the band. BOK had a successful hamfest at his QTH with over 120 registered and many jr. operators present. The Cumberland County Emergency Network had a good time at its annual picnic. K1GFS, formerly of Yarmouth, is looking for Maine contacts from KR-Land on 20 meters. Best time 10-11 GMT. K1GVQ has the 813 rig going. K1MBM made the BPL. WST should have a new Apache on the air by now. K1SXV has his General Class license and has been looking for old pals in EA-Land on 20-meter c.w. BPM now has WAS on each band phone and WAC phone. Congratulations, Dick. K1DTX had to get a new car to match his new mobile rig. K1ACF, K1JMB, K1IAA, K1LDM, K1HHX, K1JNN, K1DUG, K1DIK, K1MPM and K1HRK are all at college. K1TDD and K1OVR got their Conditional Class licenses recently. K1PPM, K1PPN and K1RQF also dropped the "N." Traffic: K1KSG 162, MBM 123, MZB 92, JNN 90, IMI 73, W1GRG 50, K1DUG 33, LHE 15, W1GPY 11, EPN 5, KVA 5.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—AOG is our SEC. New appoint-

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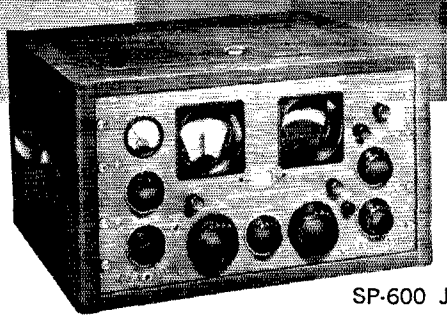
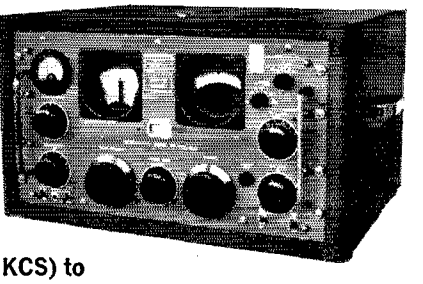


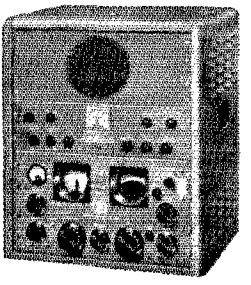
SP-600 JX

SP-600 VLF



This unique combination of two matched SP-600 communications receivers permits continuous coverage from audio frequencies (10 KCS) to VHF (54.0 MCS). Hammarlund SP-600 receivers have attained a world-wide reputation for excellent stability and calibration and have seen continuous use as laboratory and/or professional instruments for AM radio telephone, CW telegraph, AM-MCW telegraph, carrier-shift teletype, and in military communications.

HAMMARLUND SP-600 JX 6 bands provide continuous tuning from 540 KCS to 54.0 MCS. Stability of 0.01% or better at 540 KCS to less than 0.001% at 54 MCS. Sensitivity is 0.75 to 1.0 mv on CW and 1.5 to 2.3 mv on AM for a signal-to-noise ratio to 10 db. Provision for six crystal controlled fixed frequencies. **$1140.00**



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ments: K1OLN Tewksbury, K1ICJ Sharon, DDV Hanson as ECs; AQV as OBS; K1DRB and KN1RZL as OESs; K1IZM as OO. Appointments endorsed: WNP Concord, QXX Arlington, TZ (as R.O for Sector 2D), DOF Revere, AWA No. Reading, MKW Dennisport, MME Hull as ECs; DOF, PEX, AWA, NJL and MME as OPSs; AWA and MME as OBSs; NJL as ORS. DMS is working for BC station WOKW in Brockton. Heard on 2 meters: SZB, WXA, DA, K1s GDE, ROA, TBW, QAG, KN1s SGR and TKV. The Eastern Mass. 2-Meter Net had 23 sessions, 323 stations, 133 traffic. KN1QNZ has a net certificate. The net held a picnic with ZSS, DOM, OFK, K1s EKO, GUU, XYLs and friends attending. K1KTK has gone back to school. We hear that GYZ is now in Chicago. LAV is the new C.D. Director for Sudbury and K1STS is the new Radio Officer. K1NTS will be on 2-, 6- and 40-meter c.w. NF not HZ1AB for a new one. KN1RZL has a DX-35 and an SR-34. AQV has a Ranger and a Gonset for 2 meters. K3LWT/1 was mobile on 6 meters in these parts for a week. YHY was on the Cape for a rest. KN1SMF, in Rowley, has a DX-20 and an AR-3. K1OPQ has a DX-100B on 160, 80 and 40 meters. K1LJK has a c.w. mobile rig on 40 meters. K1INO has DXCC with 101. K1LJK worked ZL1HY on 40-meter c.w. K1LUJ has his shack all paneled. EZV is heard on 75 meters. I received a nice copy of *VHF Communicator* put out by the Mass. V.H.F. Society. K1QEX has an HB-100W and an R/390A on several bands. KN1RZL has a sixteen-element beam and a "Twoer." The Yankee Club held an auction. K1ICJ has a Gonset on 2 meters. K1IZM is ex-2TDZ. DDV is R.O for Hanson and has a lot of equipment for 2 and 6 meters. AUU is on 80 and 2 meters. DWD is on 80, 10 and 2 meters. EEK is on 80 and 10 meters. K1s OIW and CLV are on 6 and 2 meters. K1DRB is getting out well on 2 meters working N. E and down into N.J. taking part in OSCAR Satellite. GHZ has a Globe Chief Deluxe active on 40-meter c.w. TZ is moving into a smaller place in back of his other QTH. K1OUY is active in the National Guard. K1DIO went to New York and Canada on a trip. K1JIU was in the N.J. QSO Party. The Eastern Mass. Phone Net on 75 meters has started up on 3893 kc. at 1730. You are welcome to check in. The Quincy c.d. group has a new location and also a communications truck. ACB and his group are busy cleaning and painting. WK has a granddaughter. The Bedford Radio Club elected QJB, pres.; K1BRO, vice-pres.; NKA, secy.; EIQ, treas. The Nortronics ARC, K1TJD, Norwood, will be on the air soon. Officers are K1MUO, pres.; K1BNE, secy.; K1BUS, treas.; RYW, station mgr. K1LJK is putting kits together. NKA says he heard KP4s, VE and XE on 6 meters. K1QAG has a "Twoer" and a nine-element beam. PTR has a new daughter. KN1RTF, Watertown, has an SX-24 and an Eico 720 transmitter. KN1QQQ, Natick, has an SX-110 and a DX-20. K1KKS has 25 states on 6 meters. If you live in the following counties you are in this section, all others are in Western Mass.: Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth, Suffolk. The Wellesley ARS had Dave Hill show slides of MHL/1 in the V.H.F. Contest up in N.H. ISU has been endorsed as EC for Holbrook and YHY as OO. K1JML is doing some building. AAU is active and helping SH out in c.d. work. WQH is on his way home and will live in Lexington. Traffic: (Aug.) W1EMG 177, EAE 120, K1DIO 72, W1PEX 68, OFK 50, DOM 42, VYS 27, K1QNQ 25, GKA 22, JIU 18, W1AUQ 17, SIV 17, KN1QNZ 11, W1ZSS 8, K1CMS 6, DRB 4, GTX 4, LJK 1. (July) K1MEM 21, W1KBN 20, FJJ 14, KN1QNZ 10, W1RQL 4.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble. W1BVR—SEC: W1BYH/K1APR. RM: K1IJV. PAM: DXS. Since the East. Mass. PAM has now set up an East. Mass. Phone Net on 3893 kc. the Mass. Phone Net as such is no longer in existence. It is now the West. Mass. Phone Net (3870 kc.). The MPN Picnic was not too successful with only four members in attendance. The SCM submits apologies for not attending, but since he was married only the day before perhaps you will excuse him! Hmmm. DEV has been appointed Emergency Coordinator for the town of Lee. New officers of the Hampden County Radio Association are STR, pres.; MDM, vice-pres.; IC, secy.; LRE, treas. EOB was elected president of the Conn. Wireless Assn., with JYH as treasurer. WMN activity was down during the month with only 71 messages cleared. Come on, you c.w. men, let's hear you on WMN (3560 kc. at 7 P.M. EST). WMN continued its 100 per cent attendance in representation to 1RN. K1LBB suggests that it would be very beneficial if each West. Mass. radio club could get at least one of its members to report into WMN regularly. What say? KN1SGV, of Worcester, has been having excellent luck working 15-meter DX. LNG, an RM2, took part in the Armed Forces Day activities at NSS. The Friendly Rag Chewers Net held a well-at-

(Continued on page 136)

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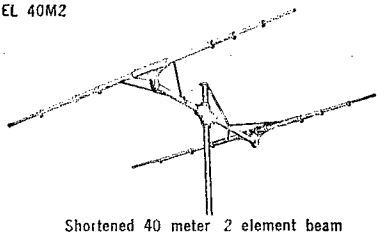

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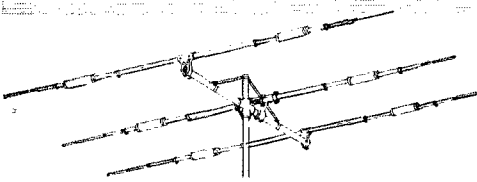

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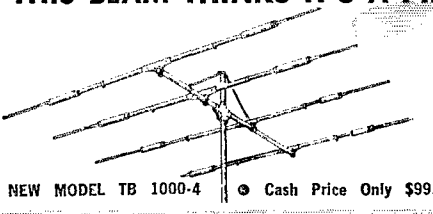

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tended picnic at the QTH of K1JAU. YXB is on 75-meter phone with very low power. LDE was sure a busy little bee during August. Look at his traffic total! Traffic: W1LDE 649, K1IJV 183, LBB 114, W1BVR 87, YXB 46, WEF 43, JYH 14, K1DAJ 10, GCV 2.

NEW HAMPSHIRE—SCM, Ellis F. Miller, W1IIQ—SEC: K1GQK. PAM: KVG. RM: K1ITS. GSPN meets Mon. through Fri. at 2400 and Sun. at 1430 on 3842 kc. CNEN meets Mon. through Sat. at 1145 on 3842 kc. The NHN meets Mon. through Sat. at 2330 on 3685 kc. Endorsements: AZK as OES, PFU and K1ITS as ORSs. YHI and K1CIG are planning a really active and reliable AREC Net for Hillsboro County. Thanks for your efforts, fellows, and here's hopes for success. BYS has moved from Concord to Salisbury. K1BCS reports a nice visit with KØWEM and XYL KØWEN from South Dakota en route for a visit with YHF. It was a 6:30 A.M. eyeball. Your SCM had an FB visit from W2CLF, who frequently checks into NHN. Welcome to KN1TIO, the son of our PAM. Best luck for an early General Class ticket, Tommy. With most everyone busy or on vacation we seem to have struck a new low in August from an activities standpoint. From now on we look for a real improvement in all phases. Let's have at it! Traffic: WITA 133, QGU 125, CUE 41, IIQ 16, JNC 10, KVG 6, BYS 4.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: PAZ. RM: SMU. PAM: TXL. Section Net certificates were awarded to CFT, K1PZY, K1AUN, K1RFM K1MYU and K1JOD. RISPN reports 31 sessions, 371 QNI, 60 traffic. K1JWE has just received his Tech. Class ticket and has just completed an HW-29A. At present he is rockbound on 51.1 Mc. but a v.f.o. is his next project. The North Atlantic Novice Traffic Net meets every Fri., Sat and Sun. on 3.745 Mc. at 2300Z. K1NEF, who heads the net, invites all Novices to take part. The W1AQ Club of Rumford reports WRI certificate No. 11 has been issued to VE3LZ. A new 6-meter beam has been installed at the club. The family outing held at Lincoln Woods was a huge success. YUT has returned to the club after serving in the Armed Forces. K1HMO and K1QLM have joined the USAF. K1JYN has entered a seminary. An exhibition of amateur radio equipment, old and new, will be held at the Old Slater Mill Museum, Pawtucket, R.I. This exhibit will run the entire month of February, 1962. Hams who would like to serve on a committee or have material to exhibit should contact the SCM. Traffic: (Aug.) W1SMU 376, K1NEF 190, PZY 39, DZX 30, PAM 13, W1WED 12, K1LSA 8, KKY 6, AAV 5, GRC 2. (July) K1NEF 35.

VERMONT—SCM, Miss Harriet Proctor, W1EIB—SEC: K1DQB. PAM: HRG. RM: KRV, WPY, of Essex Jct., was the designer of the transmitter sent up in a balloon in a recent NAPS test. QNM has put up a new triband antenna and has been getting great results. K1IRH has logged 14 states mobile. K1BGC, HIN and HRG operated from Camp Drum. K1NKS has a new call, WA2UZK, and a new QTH, Cornwall, N.Y. Four applications have been received for the new Vermont certificate. Any of you who are interested should send in 25 QSLs that show you were their first Vermont contact. No more than five may be on 75, 80 or 2 meters. TFB has just returned from a trip to the Midwest, as has HFS. Traffic: (Aug.) VE2AZI/W1 2386. (July) VE2AZI/W1 1644.

NORTHWESTERN DIVISION

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—VQC and GHY put the Latah County base station on the air and aided greatly in alerting police, sheriff, forest service and smoke-jumpers when a major forest fire broke out 5 miles north of Moscow. The Magic Valley Club elected K7LLA, prexy; BMF, veep; KN7PZD, secy.; K7CQQ, treas.; GDA, act. mgr.; and K7IUR, pub. chairman. For Project OSCAR trial-run, BMF, GDA and K7CQQ built a 2-meter converter while KN7PYS and BMF built a multi-element Yagi. K7AAV built a four-element 6-meter beam. New hams are KN7QKV/K7QKV, KN7QLN, KN7PYS and XYL KN7QAZ, RPB making a comeback with son KN7PZF, KN7QDT and K7OWJ, who dropped the "N." The Intermountain Weather Net is meeting again around 3975 kc. at 1410Z. RKI is mobile with a G-76. FARM Net traffic: 960. Traffic: K7KBY 167, HLR 63, W7GGV 13, EEQ 10, VQC 5, DWE 4.

MONTANA—SCM, Ray Woods, W7SFK—SEC: BOZ. PAM: YHS. RM: K7AEZ. The MPN meets Mon.-Wed.-Fri. on 3910 kc. at 1800 hours. MSN meets Tue., Thurs. and Sat. on 3550 kc. at 1830 hours. DXM is teaching school at Saco this term. TVY was back in Helena for a visit from Florida. Blanche, 1UM, had a visit from JXG, Carl, of Spokane. Montana amateurs join in sympathy to RIL and his XYL on the loss of their

(Continued on page 138)

DOC AULWURM, W6BBC, maintains contact with other Raytheon field engineers and headquarters staff personnel from his Piedmont, California home.

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small daughter. JAU is heard with a kw. in his car. TGG made a tour of Southern Montana looking for old bottles, rocks and visiting hams. She took SFK along, too. FTD is sporting a new KWM-2 and is heard real well. K7OGF moved to a new QTH with more antenna room. RZY and MBV are experimenting on 2 meters. NPV is working on two-way Missile Man radios. INM and JRB visited in Harlowton in August. K7AZH is coming out with a homebrew s.s.b. rig. K7GHK and YHS are setting up a communications center in the Billings Area with YZQ on the tech. end, all for c.d. LPL will be back on the air from his new antenna farm. JPD is sporting a 4-place airplane. K7AEZ, K7OGF and JAU were on a half-hour TV program regarding amateur radio. Traffic: K7BKH 146, OGF 4.

OREGON—SCM, Everett H. France, W7AJN—DEM reports the Southern Oregon Radio Club handled radio communications for the Hydroplane Race on the Rogue River. Mobiles were used by DEM, KEN, BUD and K7ACB. They were assisted by EFR, K7CMV and KN7PMB. GUH, OO, reports he has been checking s.s.b. splatter on 7200 kc. K7AXF, EC, reports an increase in AREC members in Coos County. HRG, OO, has been checking on chirpy signals. BDU made BPL again. FB, Hank. K7IMH now has a home-brew rig on 221 Mc., also a new 6360 exciter on 50, 144 and 220 Mc. and now is working on 432 Mc. K7CBA acted as a mobile station at Timberline Lodge for a mountain rescue operation in search of a 19-year-old boy. K7EZP has new 6-meter gear, and also reports that ADR has made 65 consecutive days contact with K7IPI in Seattle on 6-meter ground-wave and wants to know if this could be a record. K7KTP, a new OO, is doing a good job according to his report. OSN has two new members, K7CVX and K7KCZ, and BRAT Awards go to MTW, ZFH, K7CNZ and K7IWD. Well, gang, that's all of the reports sent in. Traffic: (Aug.) W7BDU 542, K7JVN 177, IWD 136, AXF 112, W7ZFH 45, K7KCZ 39, W7DEM 36, MTW 29, K7CBA 28, CNZ 22, W7DTT 16, AJN 9, ESJ 3, K7EZP 2. (July) W7GUH 7.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—Washington nets are: WSN, 3535 kc. at 0200Z; WARTS, 3970 kc. at 0130Z; CBN, 3960 kc. at 0230Z; NSN at 0400Z on 3700 kc. MCU and MPH are vacationing in Oregon. IST is sporting a new car and talking mobile. KN7PII has a new Rambler and is working hard to get his General Class license. The Valley Club plans on over 300,000 visitors to the Western Washington Fair Booth. HMQ and WHV left for a vacation in Colorado. The VARC claims over 30,000 points in the Field Day exercises. IEU again is NCSing the Northwest Slow Speed Net on 3700 kc. YFO, of Richland, reports activity is picking up in that area with lots of new Novices. JEY has moved to a new QTH in the Seattle Area. VPW says he finally got his model 19 RTTY going on a local loop, and soon will be on 80 and 20 meters with it. WA6LEF, ex-W7JKB, paid a visit to FOK, PZO and FXD. AWN is using an NC-300 and a GSB-100 on 20-meter s.s.b. KOBED/7 is active on 2-meter f.m. mobile. The MACS (Mobile Amateur Communication System) of Seattle held its picnic at Lake Wilderness. LXB joined the ranks of Silent Keys Aug. 8. GIP says he hit the summer doldrums for sure in August. QLH renewed his ORS appointment. AIB reports that his inverted "V" trapped doublet for 80 and 40 meters is back up with all new wire and ready for the winter skeds. YJE, No. 1 Hoot Owl, is reported getting ready to test the 185-watt 6-meter rig. K7BKX is moving back to Bremerton. LQI is operating one of those new Heath transceiver outfits. K7LED returned from a trip to Japan and way points. K7BBO is operating 2 meters. K7BOZ is heading for Illinois to work for Boeing. K7MFF is heading for Colorado for the school year. AXT reports he has joined the CAP and worked over his low-power rig for the CAP frequenty. As of Sept. 12 IST is transmitting and listening on 223.425 Mc at 0400 GMT for any contacts. The WSN Net had 23 sessions with 164 QNI and 66 QTCs in August. The first club meeting of the fall for the Spokane Radio Amateurs was held Sept. 4 and from then on every 1st and 3rd Tue. of each month. K7QOM has a Mohawk/Apache combo. K7KSE also has the same combo. OIH has completed his new shack. K7DED has a new Drake 2-A. NNF has completed another copy of the 9TO keyer. K7GZM revamped his Challenger for a pair of 6146s. K7CDI still is chasing bugs in the DX-100, along with remodeling his QTH. K7JRP is the proud owner of a new Mohawk. KN7s FW and OFX still are fighting out the WAS certificate. AOQ plans for an 80-meter vertical with a broadcast counterpoise. OEB says his trip to W6-Land was an eye-opener. K7DFS uses a Viking 500 for his early morning Montana skeds. Traffic: (Aug.) W7BA 1517, K7IEY 856, W7DZX 685, KN7PIG 136, W7GYF 100, APS 86, AMC 58, IEU 58, IST 52, ACA 51, K7EXT 46, GSG 41, W7OEB 20, AIB 14, KZ 11, GIP 7, BTB 6. (July) W7GYF 66, K7MFF 42.

(*Continued on page 140*)

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Kansas
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Maryland
Wheaton—Key Electronics
Massachusetts
Boston—DeMambro Radio
Radio Shack
Harvard—Electronics Inc.
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Butler—Henry Radio
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New Hampshire
Concord—Evans Radio
New Jersey
Mountainside—Federated Purchaser
Newark—Terminal-Hudson Electronics
Shrewsbury—Federated Purchaser
New York
Amsterdam—Adirondack Radio Supply
Jamaica—Harrison Radio Corp
N. Y. City—Arrow Electronics
Harrison Radio Corp.
Harvey Radio
Terminal-Hudson Electronics
Staten Island—Two-Way Radio
Buffalo—Genesee Radio Parts Co.
Rochester—Rochester Radio Supply Co.
North Carolina
Winston-Salem—Dalton-Hege, Inc.
Ohio
Cincinnati—Steinberg's
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PACIFIC DIVISION

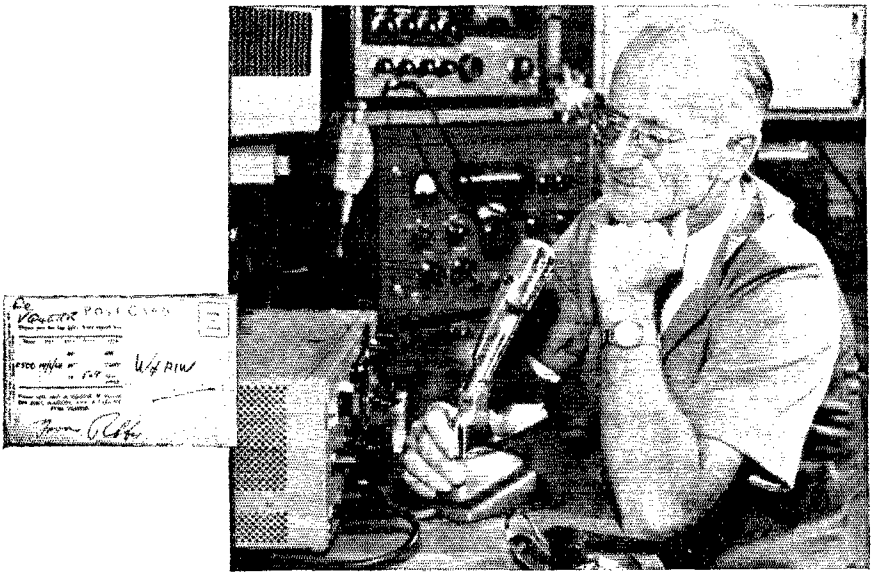
HAWAII—SCM, John E. Montague, KH6DVG—RM: KH6DVD. KIPLP/KH6 is now KH6EGL and KH6EGQ and is active on the POI Net. New RM KH6DVD has organized the new section c.w. net, POI Net (details below). KH6BZF and KH6DVG are the only active OOs in Hawaii. KH6IJ shared some of his vast knowledge of antennas with the Honolulu ARC members at the August meeting. KH6ECE is sporting a new "K." KH6BTV keeps Kauai represented on v.h.f. KH6ARL is helping the POI Net get on its feet. K6MNI/KH6 has been overhauling his antenna system. Keep an eye pealed for WV6QQW/KH6, the XYL of K6MNI. Forty-nine new Novices received their calls in August. Official Bulletins are transmitted every weekday evening on 7200 kc. at 0400 GMT. Every amateur should be registered in the AREC; registration forms are available from the SCM. Section traffic net: POI Net, 7140 kc. Tue. and Thurs. at 1900. Traffic: KH6DVD 96, EGL 49, DVG 42, ARL 18, K6MNI/KH6 4.

NEVADA—SCM, Charles A. Rhines, W7VIU—An active ham is badly needed in the Las Vegas Area for appointment as EC. Contact SEC W7JU at 539 Birch St., Boulder City. There are now 9 active "2ers" in Boulder City. JU's 2-meter c.w. pipeline to Los Angeles continues open with no failures because of conditions in 2 years. PWE is being transferred to W6-Land. PBV is putting his mast up and should be on the air soon. KN7MNL won the Novice Roundup for Nevada this year. KHU continues the good work, turning in fine traffic totals each month. ZT is looking for hams in each county seat to man the statewide emergency c.w. net. Through some excellent work by GZT those of us who paid the $3 extra for our license-plate sticker this year can get it refunded merely by applying to our county assessor. Thanks, Joe, for the good work. Traffic: (Aug.) W7KHU 346. (July) W7KHU 262.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—Thanks to W6ZLO, PAM, for taking care of this report during the absence of your SCM. Both W8AIU and W9SEG are s.s.b. and K6DYX will be soon. K6VQK took a brief vacation trip to Kings Canyon and Sequoia. K6SMH has been on a two-week Naval Reserve cruise. WA6HZM and WA6OLQ are QRL at school. OLQ has a new vertical. W6RFF has overhauled the HRO-7. The new frequency measuring gear of K6MZN, OO Class I, is really "sumpin"—0.5 p.p.m. in four measurements in the May FMT. Our certificate hunter, WA6HRS, is only two away from the C.H. Club recognition. Both Pop Nelson's son and nephew, W6AVJ and W6AVZ, respectively, expect to be married in October. K6KCB, RM, has been appointed technical adviser for NCN. W6AUC is now a director of the South County ARC. Russ maintains skeds with Japan, Mexico and the Canal Zone. K6MTX, a new ORS, and K6GZ will be handling OSCAR traffic via RTTY. W6DEF has begun early planning for the annual SET. WA6EIC reports formation of a large 75-meter mobile group within the AREC for Santa Clara County. The SCCARA had a booth at the Santa Clara County Fair with W6RFF and WA6HVN in charge. The Monterey Bay RC had a booth at its county fair with K6VQK and WA6BZE in charge. Traffic: (Aug.) WA6OLQ 967, K6KCB 584, K6GZ 200, WA6HZM 176, K6DYX 146, W6YBV 131, W6AIT 116, WA6LSS 88, W6DEF 66, K6ZCR 47, W6ZRJ 42, W6AUC 38, W6FON 26, K6VQK 20, WA6EIC 19, W6RFF 14, WA6KRG 10, K6EQE 6, K6MTX 6, K6BBF 4. (July) WA6LSS 70, W6WWJ 35. (June) W6AUC 17. (May) W6ASH 28.

EAST BAY—SCM, R. W. Southwell, W6OJW—SEC: WA6HYU. ECs: K6VXK, W6FAR, W6WAH and K6HTJ. WA6LVX made BPL in August. W6NBX is getting settled in the new QTH and is rebuilding. WA6DKG, W6LKE, K6OSV, WA6JCD and K6JPR furnished communications for the Trail Ride up Mt. Diablo. WA6LVX has started a new college semester. K6ZYZ has a new QTH in Concord and has the 7-Mc. dipole up and is rebuilding his GG-813 final. K6OSO is in the USNR at the Treasure Island Navy station. W6AIL RACES supplied communications during local fire disasters. I regret to announce that WA6KDH is a Silent Key as a result of a heart attack. The ORC had its annual auction Aug. 4. The NCN puts out an FB bulletin for its members. Contact WA6LVX, RM, for information on joining the NCN. The MDARC *Carrier* was short because of hot weather and vacations. ECs, be sure to get your reports to WA6HYU, the SEC, on the first of each month so a report can be tabulated and sent to the SCM. Thanks. WA6HKD is the new sgt. at arms of the HARC. K6SPP is designing QSL cards for the HARC. K6HWL gave an FB talk on mobile operation at the August meeting of the HARC. WA6KUN is back from WO-Land and

(Continued on page 142)



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has a new Heath Cheyenne. W6WSH is finishing up his patio so that he can start hamming again. WA6AHF was in the hospital with an injured back but is snapping right back. K6DKQ moved to Mission San Jose. K6VXJ's jr. YL operator is a new licensee. W6ICR has his Bandmaster perking with his new homebrew keyer. WA6NGH built a Knight kit de luxe receiver. K6KCB is technical adviser to the NCN. K6JZR is a new AREC member in the Walnut Creek Area. SEC WA6HYU flew to Toronto for Canadian Thanksgiving season. Traffic: (Aug.) WA6LVX 1106, K6OSO 111, W6NBX 2. (July) K6OSO 39.

SAN FRANCISCO—SCM, Wilbur Bachman, W6BIP —As my first assignment as the new SCM of the San Francisco section I would like to thank K6ANP for explaining to me how the work should be done. Our ex-SCM, Lenny, was guest speaker at the monthly meeting of the S.F. Radio Club. All attending said they enjoyed his talk and slides very much. The S.F. Club picnic was a huge success with everyone having a good time in spite of the coolness of the day. Congratulations to W6QMO on receiving the ARRL A-1 Operators Club certificate. The local fellows were very happy to meet W6SLX, Edward Kirkwood (Humboldt Radio Club), at the recent SF Club meeting. W6UDL and WA6ALK attended the Sonoma County Fair and Estelle and Art (Messineo) joined the Santa Rosa group in demonstrating at the TVI booth that the TV and amateur radio gear could be worked together without creating any interference. The HAMS Club has been having a steady increase in the membership list. The club station is now an official Army MARS affiliate. The club call is W6MLK with W6GGC as trustee. With the National Red Cross station, W6CXO, an MARS Air Force Station with Frank Johnson, W6JWF, as trustee, both stations are well prepared to handle communications for any disaster if needed. According to reports from W6BYS the S.F. Naval Shipyard Club has not been as active as it was but the gang hopes to become active again real soon. No news was received from WA6JGR, pres. of the Bay Lare Club as she was away for the month of August. All clubs in this section are requested to please send me news of your club doings so I may include it hereafter in the monthly report. Traffic: W6GGC 19, W6QMO 11, W6GHI 8, W6JWF 7, W6BIP 4.

SACRAMENTO VALLEY—SCM, George R. Hudson, W6BTY—SEC: K6IKV. ECs: K6BNB, K6GOT and K6BYS. OBSs: K6AF, WA6CJU, W6WGO and K6HHD. PAM: W6GQS. OOs: W6WLI, W6GDO, K6ER, W6ZJW and K6EIL. ORSs: W6WGO and W6CEI. OES: W6PIV. OPSs: W6WGO, K6EIL, W6PIV, W6GQS and WA6PVT. The prexy of the Mission Trail says he is now on 2 meters and that the MTN is going strong. The manager of the Northern Calif. Net advises that K6EIL is liaison on NCN up to RN6; that WA6CJU and K6BAJ are headed back to school; that WA6ERC is installing break-in; that W6VIJ is taking an NCS spot; that W6UUN again is active in NCN and that K6KCB is now technical adviser to NCN (a sneaky phrase for OO)! *Flash*: NCN broke all traffic records in August with 684 handled! K6HHD is a new OBS and will handle bulletin service for the RAMS Net. W6GDO and K6HHD (a fine husband-and-wife team) are handling traffic for the "OSCAR" Net Wed. nights on 40-meter RTTY. W6GDO has a new "rabbit ear" mobile antenna. WA6FCZ, of the Yuba-Sutter Club, says the gang meets the 2nd Fri. of each month at the Yuba County Airport with all hams invited; that 2-meter activity up there is gaining. WA6FCZ is on 145.35 Mc. nightly with a Communicator III and a ten-element beam up 18 feet with the best DX on inversion south to Taft. W6ZJW is putting up a new antenna for 20 meters. W6AF has returned from a motor trip to the Pacific Northwest. K6RRC and K6RPN have joined the AREC. W6WLI made a flying trip to Cleveland and Milwaukee hand-carrying his Gonset III, and even with 15 crystals he still wished for a v.f.o.! W6IJK, the Aerojet Radio Club, has been showing some fine ARRL films at regular meetings. News and views from clubs and individual members is needed for inclusion in *your* column. How about it? Traffic: K6EIL 264, W6WGO 35.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—The Tulare County Radio Club was host at the SJVN picnic held at Mooney's Grove, in Visalia, with 150 attending. K6OGX won the 6-meter hunt, W6GWL won a v.t. voltmeter, W6ENF won a 2-meter transceiver. W6NCG, W6NAS and W6HYZ (San Joaquin Radio Experimentation, Inc.) are heading up a group of 20 stations on 2-meter f.m. covering an area from Bakersfield to Sacramento. The repeater is to be located at Meadow Lakes by the first of the year. Much work has been put into this project and it is coming along very nicely. W6NCG was made a papa again when WA6EPK presented him with a girl (No. 4) Aug. 28. Grandmother K6PEH relayed the information to

(*Continued on page 144*)

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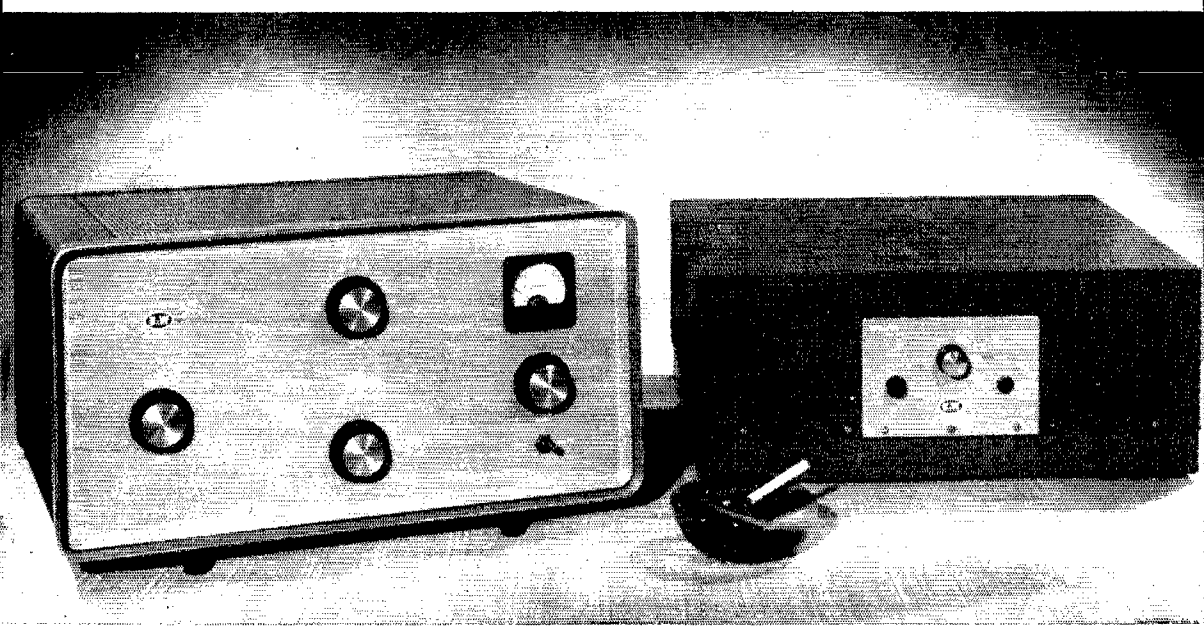

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High voltage power supply unit LPS-1 may be remotely located. Switching control panel is removable for convenient installation at the operator's location. Circuit consists of a full wave single phase bridge rectifier, using four Type 816 mercury vapor rectifier tubes. R. F. filtering protects tubes and prevents mercury vapor hash radiation.

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Grandfather K6PPI, in Fresno, by the 2-meter f.m. circuit. K6OJJ is being heard on 75-meter s.s.b. W6QFR has a new KWM-2 and a 30L amplifier installed in his power boat (yacht). K6GDI and K6FMY worked W6BJI, K6UDX and W6TZJ on 1215 Mc. from Mt. Hamilton. Signals were reported to be loud and clear. W6DUD and the 6-meter gang have started their 6-meter hunts every Mon. at 8 P.M. on 50.4 Mc. W6TZJ is mobile on 1215 Mc. WV6SLX is a new ham in Selma. K6OLN is working on 2-meter walkie-talkies. K6ROU got his DXCC award. K6CBR has a Drake 1IA receiver. The SJVN in August had 610 check-ins, 96 contacts, a traffic count of 19, 7 QSTs, 2 bulletins and 27 sessions. Traffic: W6ADB 31, W6EFB 29, K6ROU 20, K6OLN 11.

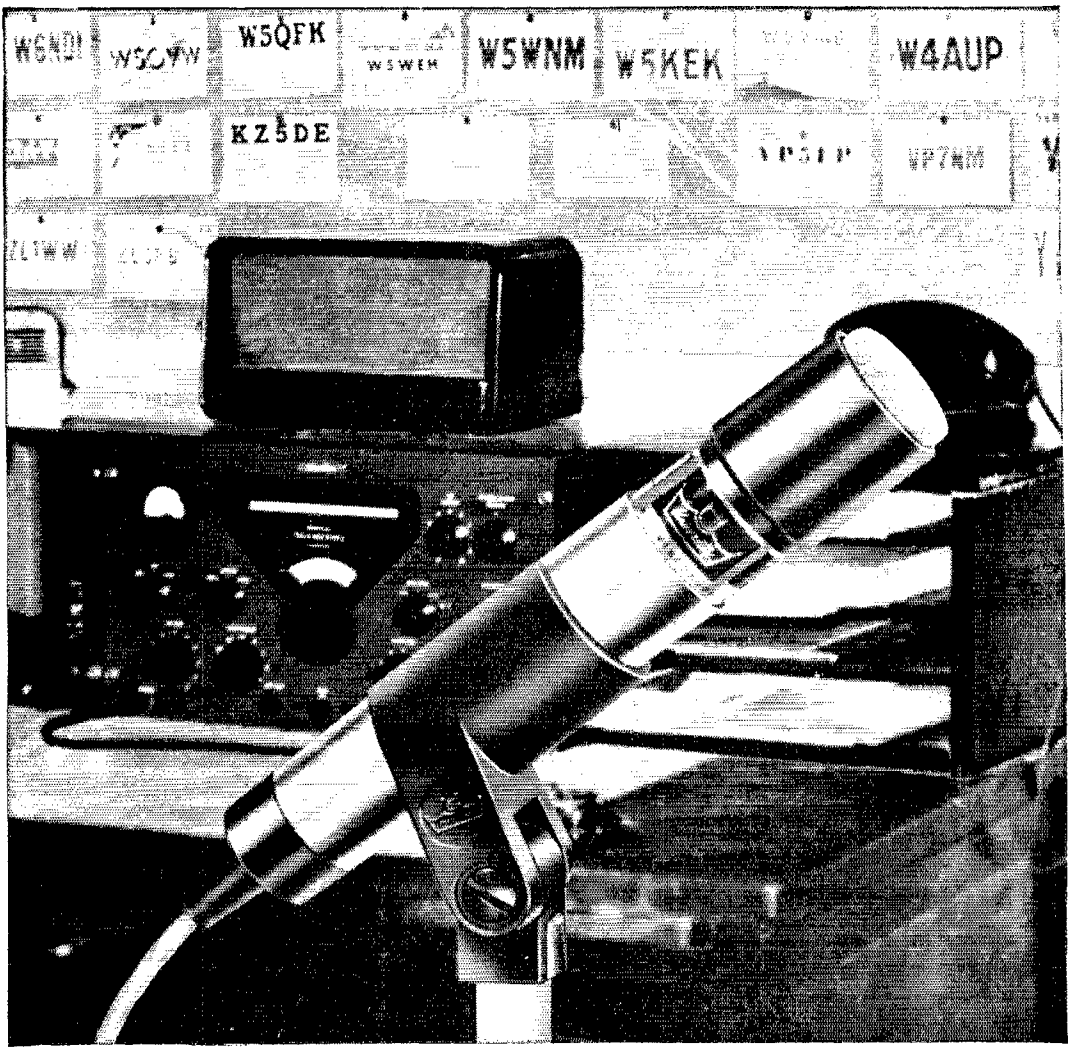
ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—PAM: W4DRC. V.H.F. PAM: W4ACY. RM: K4CPX. The Rutherford County Amateur Radio Club members are supporting excellent AREC and RACES activities in their area. K4PBG, of Forest City, has accepted appointment as EC. W4LEV keeps several fine traffic skeds, working W3CUL, W4PFC and W1LDE on 7215 kc., as well as KP4AZJ on 14 Mc. and W6YDK often on 21 Mc. Note our EC line-up, page 124 Aug. *QST*. Recommendations from clubs and actives (for ECs) for the Charlotte, Raleigh, Wilmington, Elizabeth City and Wadesboro Areas are earnestly requested by your SCM to further emergency radio stand-by recruiting and activity this season. Your SCM, W4RRH, was hospitalized for 20 days in early August with a badly-crushed left foot. At this writing, still confined to home and wheel chair, he expects to be about on crutches and mailing out some certificates by early October. He regrets the inability to get some locals to help out on this report; hopes all will give full support to N.C.'s nets this season. Traffic: (Aug.) W4LEV 1431. (July) W4LEV 1265.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—SEC: K4PJE. RM: W4PED. PAM: K4KCO. W4PED and K4ZHV made BPL again in August. The C.W. Net handled 295 pieces of formal traffic in August. WA4BRW, WA4BRV, K4NFS, W4FDQ and W4VIW, of the Greenville Mike & Key Club, are all boasting new equipment. K4AVU and K4GAT may see the world with the Air National Guard. K4NZE and K4WJR have been issued Section Net certificates and are prospects for ORS appointment. W4FFH has a new generator and also a new teletype on the air in preparation for the hurricane season which is now upon us. In preparation also is the DX RC of Camden, which held an SET on Sept. 9 for AREC members at the local airport. The Kershaw State Park Picnic was well attended with interesting and timely talks by SEC K4PJE and W4BPD. Interest is shown by clubs in the formation of a State Radio Council. Delegates were sent to the Rock Hill meeting on Oct. 7. Traffic: (Aug.) K4ZHV 299, K4BRP 208, W4PED 150, K4KIT 116, W4AKC 93, K4UOH 81, K4HDX 77, K4OCU 41, W4FFH 40, W4HDR 37, K4HJK 26, W4CHD 16, K4KCO 15, W4VIW 10, K4YFK 2. (July) K4ZHV 501.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—Asst. SCM, H. J. Hopkins, W4SHJ—SEC: W4VMA, W4CVO, who now has his masters degree, visited KG1 and VO1 and was caught in a snowstorm in August! W4KXV received third place honors in last year's All Asia DX Contest. The Fairfax County AREC Picnic was held at the country retreat of W4RHC. Those in attendance with their families were W4ESH, W4HPD, W4JDX, W4OHT, W4ONN, W4TVT, W4TXD, K4AJL, K4QIX and K3PZN. K4AL has worked LA4K and wonders if anyone has dreamed up an award for this type of thing. Reports still are coming in of some pretty good FD scores. See this issue of *QST* for the full story. W4DLA and K4PQL have been awarded 4RN certificates. The Virginia Sideband Net has moved to 3935 from 3925 kc., while other section nets have continued to operate through the summer with the usual difficulties. The RVARC is going ahead with plans to hold a division convention in Roanoke in 1962. F.m. operation on 6 and 2 meters has captured the interest of a large group in the Lynchburg Area. W4ZM visited ARRL Hq. on his vacation and he has a new kw. linear. Want to get started in the traffic game? Try the VSN at 2330 GMT on 3680 or the VFN at 2400 GMT on 3835 kc. All members again are requested to mail their activity reports prior to the 4th of the month so that the SCM can meet his 7th-of-the-month deadline. All reports received after the 6th must be held over for the following month's report. Traffic: (Aug.) K4PQL 781, K4QIX 138, W4LK 111, K4MXF 94, K4FSS 89, W4CGE 78, W4DLA 73, K4JQO 72, K4YZT 56, W4NVX 53, W4RHA 53, W4OOL 50, K4DCN 37, K4KNP 33, W4SHJ 32, K4AL 20,

(Continued on page 146)



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W4TE 20, K4IAN 18, K4HP 14, K4PRQ 10, K4BAV 6, K4TFL 5, K4MLD 4, W4WBC 3, W4JUJ 2, W4OWV 2, W4KX 1. (July) W4PFC 956, W4OOL 54, K4PQV 47, W4BGP 35, W4PRO 4, K4IKF 2, W4ZM 2.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—The West Va. Phone Net operates on 3890 kc. and the W. Va. C.W. Net on 3570 kc. Active ORSs, OPSs and OBSs are needed in the state at this time. JKN, of Buckhannon, is now LD. Bill was LJ back in the "Twenties." K8YNL, ex-YL, won the HT-37 at the Bass Lake Picnic. NYH is active in the W. Va. and Va. Phone Nets. K8CSG reports RACES activity is going well in Marion, Wetzel and Cabell Counties. WHQ has new high-power mobile on 3890 kc. for state contacts. OIV continues his fine QO work. ESH reports the Huntington Weather Net is operating on 50.55 Mc. at 1900 EST. K8MYU and K8LOU have earned West Va. Net certificates. It is with deep regret I report the passing of K8MXP. K8BLR continues to pick up new states on 2 meters. Traffic: W8NYH 72, K8MYU 42, LOU 29, CSG 12, W8JM 9.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald S. Middleton, WØNIT—SEC: SIN. PAMs: CNW and IJR. RM: FEO. OBSs: KØDCC and KØEPD. YFL, NCS for CEPN, reports an all-time high QNI of 54 on Aug. 27. NVU, DXF and IA have given almost 1500 weather messages to the CWXN. WWJ has made 14 Denver contacts with his 10-meter walkie-talkie. Steve is now planning nerve tissue experiments with 1200 Mc. IQZ and NIT have rounded up much of the equipment for their 436-Mc. TV. The Pueblo SCARC members are sporting the new look in jackets. KØWJD was elected vice-president of the Optimist International. VDY, SIN, PSX, EXR, HPF, KØSJM, OVQ, EVG and PG participated in the successful search for a lost boy near Pine July 7. FKY is the new president of the Western Slope Radio Club. RX is preparing tape repeater equipment for Project OSCAR. Congratulations on making the BPL go to FEO, KØWWD and BES. Traffic: WØBES 590, KØWWD 521, WØFEO 440, KØWWJ 39.

UTAH—SCM, Thomas H. Miller, 7QWH—Asst. SCM, John H. Sampson, jr., 7OCX. SEC: BLR. RM: OCX. QWH again was declared elected as SCM since his was the only nominating petition on file at League Headquarters by the closing date. This is somewhat discouraging. There are several amateurs in the section with the ability to take on some responsibility, and who also are probably more than willing if their friends would nominate and support them. In lieu of a September meeting the UARC held a picnic at Fairmont Park on Aug. 30. BAJ is turning in regular QO reports. Conditions on BUN during August were still bad but slightly improving. OCX, QWH and VEO earned BRAT Awards for work on BUN. OCX also earned one on TWN. Traffic: W7OCX 81, QWH 24.

NEW MEXICO—SCM, Newell F. Greene, K5IQL—Asst. SCM: Carl W. Franz, 5ZHN. SEC: BQC. PAM: ZU. V.H.F. PAM: FPB. RM: ZHN. The Breakfast Club meets Mon. through Sat. at 0700 MST on 3838 kc. NMEPN meets Sun. at 0730 and Tue. and Thurs. at 1800 on the same frequency. TWN meets daily at 2000 on 3570 kc. The Carlsbad Annual Picnic was enjoyed by the 168 registrants. SA, HJ and others made it down from Albuquerque. The usual caravan trekked from El Paso for the event. FPB spent his vacation(?) this year doing paper work for the CAP. The Los Alamos Club has started code and theory sessions. MQA has been trying to overcome the difference between the MDST on the "Hill" with MST elsewhere. Confusing! The Roswell Club is making an effort to get rolling with new members and elections. Traffic: W5UBW 42.

WYOMING—SCM, Lial D. Branson, W7AMU—SEC: Pending. The Pony Express Net meets Sun. at 0800 MST on 3920 kc. The YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc. BHH reports several more RACES members. The C.W. Net is on Wed. at 1900 hours and 20 members report in. The RACES Phone Net is on 3920 kc. every night at 2000 hours with 35

(*Continued on page 148*)

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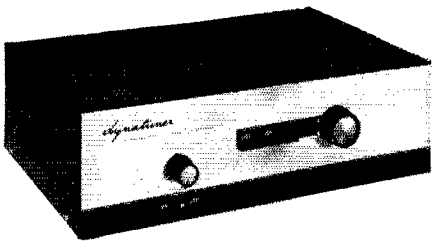
The performance of the recently-introduced DYNATUNER, in comparison with all other tuners, reiterates this reputation. Three years in development, the DYNATUNER'S demonstrable superiority culminates an impressive list of DYNAKIT FIRSTS, including:

in amplifiers — the patented DYNACO feedback circuit; patented "Biaset" for precise adjustment of optimum operating conditions, independent of tube characteristics; the use of factory-matched output tubes and matched components in the phase inverter.

in preamplifiers — the first system having less than 0.1% distortion; exclusive "step up to stereo" design; matched tone control components for exact "flat" settings with infinitely variable controls; a high gain circuit which is completely free from overload problems.



The DYNATUNER is the first FM tuner kit in which accurate, reproducible, laboratory-standard alignment is achieved by the customer without any external test instruments. The customer-built and aligned unit will equal or surpass, in terms of sensitivity, selectivity, and distortion, any other FM tuner currently available. With the extension of DYNA-developed etched circuit designs to FM tuners, the inherent advantages in precise layout and reproducibility are dramatically emphasized. The DYNATUNER sets a new standard for ease of assembly, simplicity of operation, performance, stability and dependability.

FURTHER INFORMATION AND SPECIFICATIONS ON REQUEST

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members checking in 7 nights a week. GMN moved to Jackson, Wyo. VBP has a new shack in Torrington. K7GDW had an eye operation and is doing fine. The Hi Plains Radio Club of Cheyenne held a joint ham picnic with the Laramie Radio Club at the Veadauvoo Picnic Grounds on top of Sherman Hill, 8100 ft. altitude. SCM AMU attended. A discussion concerning various appointments and ARRL membership was well received by the hams attending. Several appointments were made. CQL is on vacation. K7KLE is home in Story after a summer in Jackson, Wyo. BXS spent a two-week vacation in Kansas. Traffic: (Aug.) W7BHH 19, HH 18, AEC 12, AMU 11. (June) W7BHH 27.

SOUTHEASTERN DIVISION

ALABAMA—SCM, William D. Dotherow, K4AOZ—SEC: K4JDA. RM: K4YUD. PAMs: K4BTO and K4PFM. New appointments: K4YUD as RM; K4UDK as EC for DeKalb County; K4WSS as EC for Marshall County; K4MIR as EC for Chambers County. Congrats to K4LNA on receiving an RN5 net certificate. WN4BDW invites all amateurs to check into the Springville Novice Net at 1600 CST on 3725 kc. daily. K4HJM has moved to a new home in Anniston. W4CIU reports a new General in Townley is K4IYM. K4ZNI is operating a new homebrew 225-watt 814 rig, 10 through 80 meters. W4DGH used a Ranger and an HQ-100 for portable operation this summer and gave out rare Cherokee County QSL cards. K4LNA has a new Hallicrafters TO keyer, and reports a DXCC total of 151 worked with 132 confirmed using 200 watts and dipoles. K4WSS, the new Marshall County EC, is hard at work registering *all* the hams in his county in the AREC program. Does your county have an EC? If not, contact K4JDA for possible appointment as EC. K4FTC reports that K4YFX has dropped the "N." K4IWI, OO, is back from two weeks military duty. W4OQG reports the AENT training program now is in progress at 1615 CST Tue.-Thurs.-Sat. The following are liaisons from the AENT to the AENP: K4FTC, K5WSY, K4WSH, K4DJJ and W4MKX. K4ZYO operates a DX-100B and an NC-300. WN4BSE has a Globe Scout 680-A and an HQ-145. W4OXU reports new stations in Springville are WN4CPF, WN4AZJ and WN4AZK and that his XYL, K4WSK, has dropped the "N" and is now General Class. WN4BUZ, in Huntsville, changed to WA4BUZ after only 30 days operation. W4HSU is in charge of the construction program for the Springville ARC. W4DS has completed the building of a Heath mobile transmitter and receiver for his emergency rig. W4RNX reports a new ham in Fort Payne, W4FNX. W4RNX is Communications and RACES Officer for DeKalb County. K4SAV is attending the U. of Alabama. The following received AENM Sideband Net certificates: W4OWZ, W4POI, K4TNS and W4KCQ/W4YSG. Officers of the new DeSota Amateur Radio Club, Fort Payne, are W4CEF, pres.; W4MTS, vice-pres.; K4ZTT, secy.; K4TNT, treas.; W4DGH, act. mgr. The entire Alabama section expresses its sincere appreciation for the work done by W4RLG, who has resigned as RM after almost 4 years in this office. *Six-Meter News*: W4CIU reports an 80-meter trap antenna *can* be used on 6 meters. K4UMD worked K5UMD in Dallas recently. K4UMD welcomes to AENO, WA2CDS and K4AKW. W4CIN reports K4LSK is on 50-Mc. s.s.b. in Birmingham and K4ZQM is on 50-Mc. d.s.b. from Athens. W4CIN holds 432-Mc. checks and skeds with K4MBM, K4FQA and W4TLV. He is building s.s.b. gear for 144 Mc. W4WGI and K4IQU have converted an APX-6 1296-Mc. transceiver. W4WGI reports increased local interest in 144 Mc. with the following either on or building equipment to get on 144 Mc.: W4NKS, W4FUD, K4ZQM, K4IQU, W4CTG, K4MBM, K4FQA and W4WGI. W4WGI has completed a power supply for the 432-Mc. tripler and also completed his 32-element, 432-Mc. antenna. W4SQV is on 50 Mc. with 30 watts s.s.b. using a 32S-1, P & H trauverter combo. *Traffic*: (Aug.) W1SMU/4 232, K4PFM 129, K4LNA 89, K4AOZ 77, K4YUD 74, K4FTC 70, W4RLG 54, W4TOI 53, W4MAM 34, K4KDE 27, K4BTO 26, W4MI 26, K4KJD 25, K4GXS 24, K4PHH 22, K4WHW 21, K4JDA 18, K4ZYO 18, W4WHW 17, K4HJM 16, W4OXU 15, K4WVD 13, K4RIL 10, K4UDK 9, K4WSS 9, K4BFT 7, K4DJR 7, W4PVG 7, W4RNX 7,

(Continued on page 150)

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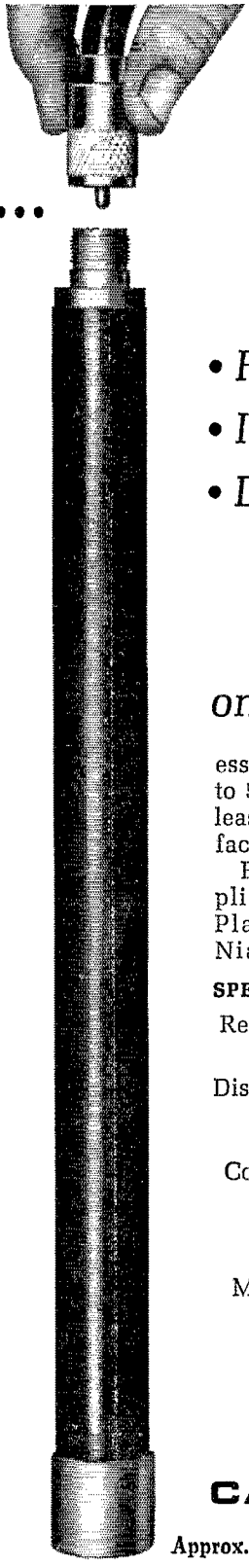
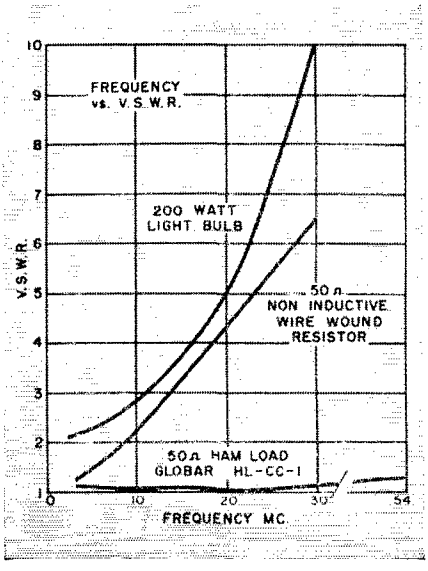


Here's a new 50-ohm resistive dummy load that's ideal for all types of amateur service—fixed, portable or mobile. By switching the "Ham Load" into your antenna circuit, you eliminate on-the-air tuning and needless QRM. The unit also provides a dependable, non-inductive termination for testing equipment, measuring power and antenna matching.

The Carborundum "Ham Load" is supplied as a single unit with standard coax connector for easy mounting on rack or cabinet, or for designing into home-brew equipment. Although small in size, the high-temperature ceramic resistance element dissipates up to 250 watts *output* for 5 minutes! Unlike bulbs or wire-wound resistors, SWR remains



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- *Dissipates 250 Watts Output*

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essentially flat at less than 1.5:1 up to 54 Mc (with the load mounted at least 5" from metal reflecting surfaces).

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SWR:	Less than 1.5 at 54 Mc
Dissipation:	250 watts (up to 5 minutes); 150 watts continuous
Connector:	Standard coax (SO-239 type)
Size:	Approximately 13½" long by 1" diameter
Mounting:	Any convenient location
Caution:	Due to heating when loaded at high power, the unit should be mounted in freely circulating air.

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Approx. one-half actual size

WA4ABX 5, W4CIU 5, W4DS 5, K4ZNI 5, K4GRA 4, K4TDJ 4, W4DGH 3, K4AAU 2, W4RTQ 2, K4UMD 2. (July) K4LNA 61, WN4BDW 7, W4DS 5.

EASTERN FLORIDA—SCM, Albert L. Hamel, K4SJH—SEC: W4IYT. RM: K4KDN. RM RTTY: W4EHU. PAMs: 40—W4SDR, 75—K4LCF. V.H.F.—W4RMU, S. S. B.—W4CNZ. Section nets: FPTN, 3945 kc. M/S 0700; FMTN, 7230 kc. M/S 1200; TPTN, 3945 kc. daily 1730; GN, 7115 kc. daily 0830; QFN, 3650 kc. daily 1830 and 2200 EST; FEPN, 3910 kc. Tue. 1830; FSBN, 3940 kc. Sun. 1700; FAST, 3940 kc. M/F 1930; NHN, 3725 kc. Sun. 0730; MCEN, 3900 kc. Sun. 1330. Only newly-formed nets will appear next month. Please report your traffic every month no matter how small. By the time you read this SET/JOCO will be history. We can thank SEC W4IYT and SEC (W.Fla.) W4MLE for the excellent emergency plan. Make the score 4 for W4IYT and his XYL by adding a new baby girl. W4VCX still is taking physical treatments but is quite active as an OO. W4QVJ got his 30-w.p.m. sticker from ARRL. We hope the DXpedition to Grand Cayman Island was successful with W4QVJ, W4AZK, W4CKB, W4OMW, W3AYD and W8FGX using VP5BL's station. K4LVE now is 4th District Chairman for the YLRL for 1962. W4WHK needs interested hams in Clay County for emergency work. WN4BMC/WN4AZZ is going all out with traffic and emergency work. Duval County is working hard building up v.h.f. emergency coverage. Traffic: (Aug.) K4SJH 944, W4TUB 584, K4EHY 546, K4DAO/4 506, WN4BMC 360, W4DVR 248, K4LCF 230, W4SDR 219, K4KGB 203, W8LDU/4 200, W4AKB 190, K4KDN 188, W4AHZ 179, K4FMA 167, K4BY 154, W4WHK 150, W4TRS 141, K4DBT 138, W4ARV 133, K4COO 129, W4CNZ 118, W4FE 103, K4GSD 103, K4VSA 97, K4ILB 84, W4IYT 75, K4ENW 65, K4ZRP 59, K4AKQ 58, W4AZJ 55, K4YSN 55, K4LVE 52, WN4AZZ 49, K4GBS 45, W5ESB/4 44, W4HRC 43, K4ODS 41, W4NGR 39, W4EAT 38, K4AN 35, K4ANR 30, K4JZX 29, W4LSA 29, W4BKC 27, K4OZS 27, K4DAX 26, W4TRU 25, K4BOO 24, K4RNS 24, K4MTP 23, W4CWD 22, W4LMT 22, W4QVJ 22, K4RNG 21, W4VCX 21, K4JWM 20, K4PXY 19, W4HTH 18, K4JZU 16, W4DPD 14, K4MZR 13, K4YBE 13, W4DQS 11, W4TAS 11, W4DDW 10, K4JJZ 10, WN4COR 9, K4RDX 9, W4SMK 9, W4BBZ 8, K4LLI 7, WA4AII 6, W4AYD 6, K4LML 4, WN4AKU 3, W4UHB 2, K4YPN 2. (July) W4SDR 187, W4WHK 110, KN4NTA 47, WN4AKU 17, W4CWD 17, K4KGB 16, K4PXY 12, W4BBZ 8, K4VGD 7, K4JWM 6, W4LVV 6, W4DSH 2. (June) W4WHK 120, K4YOQ 19, K4MZR 14, W4TAS 14, W4DQS 12, W4TRU 11, K4LLI 2.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: W4MLE. PAM: W4WEB. RM: K4UBR. New net managers for WFPN are: A.M. session—K4VLB: P.M. session—W4JOZ. Thanks are due retiring managers K4VND and W4WEB. The slow-speed c.w. net began Sept. 4 with K4JDW as net mgr. It meets daily at 0100Z on 3650 kc. QFN sessions are held at 2330Z and 0300Z. W4WMA received his ticket and has joined the AREC in Madison. W4KQP, in Perry, has a new linear. W4WEB has traded the old a.m. rig for an HT-37. K4CXG, in Panama City, has done likewise. W. Fla. hated to lose K4DSH to Jacksonville; W5AIY also transferred from Tyndall AFB. OES K2AZT is working on higher power for 6 and 2 meters and is mobile on both bands. W4OOW has a new Drake 2B receiver. K4PMT is active on WFPN from Pensacola using s.s.b. The Pensacola V.H.F. Club held an FB picnic at Ft. Pickens. New S/Line owners are K4HYL, W4HKK, W4PAA and W4OFV. The PARC is making plans to incorporate. K4KIF has a new Johnson 6N2 linear. K4BDF and K4QOJ are rigging up an emergency generator. New officers of the NAS Club are K6GEM, pres.; W4OMX, vice-pres.; K4FOG, secy. K4YYE has prepared a QSL for the 50th Anniversary of Naval Aviation. See him for yours. K4QOJ is the new V.H.F. PAM. Contact him for information on section-wide 6- and 2-meter nets. Traffic: (Aug.) K4JDW 73, K4LOL 63, W4WEB 40, K4VND 27, K4SGY 14. (July) K4JDW 85, K4SGY 5.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: W4PMJ. PAMs: W4LXE and W4ACH. RM: W4DDY. The GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs. 0800 on Sun. The GSN meets Mon. through Sun. on 3595 kc. at 1900 EST and 2200 EST with W4DDY as NC. The 75-Meter Mobile Net meets each Sun. on 3995 kc. at 1700 EST with W4LG as NC. The GPYL Net meets each Thurs. on 7260 kc. at 0900 EST with K4ZZS as NC. The Atlanta Ten-Meter Phone Net meets each Sun. on 29.6 Mc. at 2200 EST with W4BGE as net mgr. The Georgia S.S.B. Net meets Mon. through Fri. on 3972 kc. at 2000 EST with K4RHB as net mgr. The Atlanta Radio Club Phone Net meets each Sun. on 21.36 Mc. at 2100 EST with W4DOC as

(Continued on page 152)

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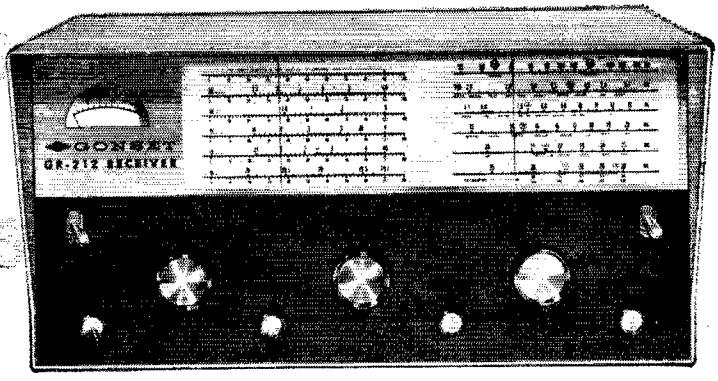

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NC, K4ZYI tried to make CHC before going to college. K4FJD is attending Middle Georgia College. K4LRO is going to Emory at Oxford College. K4LRO also is building a new 4-65 linear amplifier. The emergency net on 6 meters is increasing in activity, reports K4PKK. The Columbus Amateur Radio Club has started a code and theory class designed to follow through to General Class amateurs. Your SCM would appreciate more information from clubs to be used in this column. Don't forget to renew your membership-subscription to *QST* and also to check your appointments for renewal. Traffic: K4ZYI 307, W4DDY 167, K4QPL 41, W4IYW 38, K4FJD 32, K4RWM 30, K4UJS 30, K4BAI 17, K4LRO 17, W4LNE 4.

WEST INDIES—SCM, William Werner, KP4DJ—C.D. Radio Officer: MC. My thanks to those who re-elected me as SCM of this section for the twelfth year. AAA has resigned as SEC and now spends all his time on 15 and 20 meters. KV4BV, at St. Croix, applied for OPS and EC appointments. AFL has applied for OPS appointment. BCA is now an MARS member. The Antilles Weather Emergency Net was alerted Aug. 26 and 27 because of flood conditions affecting a large part of Puerto Rico. NCS AEB, at Humacao, was on with a 50-kw. emergency power plant and two transmitters on both 3810 and 7245 kc. making simultaneous transmissions of taped USWB flood warnings besides handling traffic with stations sending reports to USWB and USCG. C.d. nets also were activated on 3825 and 7205 kc. and 50.5 Mc. An impromptu net was formed on 7.2 Mc. by CL, the XYL of KP4CK, when she was asked by radio station WHOA to contact amateurs around the Island for flood conditions in their towns. At 10:40 A.M. the government broadcast station WIPR also contacted CL with the same proposition and her contacts with ES, RD, HG, BY, WR, OA, YD, RA, WQ, ANJ, AOI, ANH, AKS, AGA, AXN, APB, AET, AOV AOH AMP and CK/mobile were rebroadcast to the general public on the broadcast band as well as the f.m. band. CL was on the air from 10:30 A.M. until 6:30 P.M. CL is thrilled by the ease of DX contacts on 20-meter s.s.b. Aside from Russian, Arabian, African and Pacific island contacts the biggest thrill was a contact with HV1CN at Vatican City on the first day of operation. Civil defense has provided emergency power plants to the following amateurs: CK San Juan, PQ Ponce, YD Arecibo, WT Mayaguez, BY Ceiba, AWH Aibonito, ANH Guayama, and to amateurs at Aguadilla and Manaubo. KV4AA skeds Civil Defense Regional Headquarters station KIIZU on 1427-5 kc. s.s.b. at 8:30 P.M. EST Wed. PJ finally is on with a new GSB-100 and a 101, a Drake 2B, a Hornet tribander and a new 40-ft. steel tower, while neighbor ATV acquired a 300-watt 813 rig for a.m. and c.w. along with matching antennas for 80, 40 and 20 meters. DJ, PJ, SV and ALY modified their Drake 2A/2Bs for better muting as per Drake instructions. AWF modulates a DX-40 with a pair of 6L6s and raised the 40-meter antenna higher. AZ is on 6 meters with a Lafayette transceiver loading a 20-meter beam. OH and AYA joined the ARRL via the PRARC. CK is building another 60-ft. tower for a monstrous 50-Mc. beam on a 47-ft. boom close to the present tower and stacked array to facilitate comparisons of the two systems. DW and family vacationed in Davenport, Iowa, and attended the Chiropractors Convention of Palmer School graduates. ASK suggests a local code practice station on 50 Mc. AQQ worked 70 countries on s.s.b. in the past few months. AQK is working the States on 15-meter a.m. ACH returned from a European vacation. AQQ received the WPR-75 Award for contacting 75 stations on 50 Mc. K5UXP, ex-KP4JH, applied for the WPR25 Award earned twelve years ago. BBF, Cidra, operates on 6 meters with a Globe Scout Deluxe, a six-element Telrex beam and an HQ-170 receiver. Traffic: KP4WT 146, BCA 1.

CANAL ZONE—SCM, Thomas B. DeMeis, KZ5TD—Failed to get in the July report because of KR leaving for school in Philadelphia. Could not seem to contact stations to relay our report via the New York Area. MS has ordered an Apache and an SB-10. SH shifted location from Cocoli to Albrook AFB. CW is delighted with his new RME-6900. The club station at Summit will be reactivated with a KWS-1 and a 75A-4 with the call SU. WJ, also at Summit, will be working a BC-610 on 40, 20 and 15 meters. JT moved his station 3 blocks to new quarters. JD is using a DX-40, an NC-303 and a TA-33. HR is using a Ranger, an HQ-170 and a TA-33 jr. on a 25-ft. tower. The Crossroads ARC had a farewell party for BA and we will be listening for him from W5HUM. VF is in New York studying at the Police Academy. TF and WI were visited by K4FTN and K4ZIF, from Fort Meyers. HFN is now General Class. JC went on a second honeymoon to Colombia and Peru, naturally with the XYL. KR just returned from Philadelphia where he attended a transistor course. SW

(*Continued on page 154*)

now is running s.s.b. with a 10- and 15-meter quad and an all-band vertical 10 through 80 meters. GK is back on the air from Cardenas. Additional frequencies were allocated for KZ5 stations as of Sept. 15, 1961 for phone operation, 7150 to 7200 kc., 14.1 to 14.15 Mc., 21.1 to 21.2 Mc. and 28.1 to 28.45 Mc. have now been assigned to be operated on from the new date. The Liga Panamena de Radio Aficionados has invited the CZARA for a get-together to talk over some items of mutual interest to both parties. HP1SB now is at the Great Lakes Naval Training Station, a new recruit for the Navy. MARS net activity has been fair to good but the AREC net has been very inactive, some of the more active members being away on vacation to the U.S., but we hope to have the net active again. DS has been at it with RTTY. KR is working on RTTY gear at the moment. Traffic: KZ5JW 136, CW 79, CD 51, TF 39, OB 18, AD 15, SH 9, HR 6, OA 6, TD 3.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—Asst. SCM: Lyle G. Farrell, W6KGC. RMs: W6BHG, WA6ROF and K6LVR. PAMs: W6BUK, W6ORS and K6PZM. The following stations earned BPL for the month: K6EPT, WA6DJB and W6GYH. Congrats, fellows! W6GYH was in the hospital for 15 days and is home and handling traffic! K6CDW vacationed in the High Sierra country. K6SLM, WV6QNN, K6COP and W6RIR headed back for schools and colleges. WA6FBA is working with WA6BFC in the Arcadia C.D. K6YVN has a new W6PJ coax antenna up. WA6OUK worked Reno, Nev., on 6 meters. WA6CKR took a nice trip north in a ¾-ton camper rig. K6UYK expects to retire from the Navy soon. W6WNR is running a pair of 829Bs at 250 watts. WA6KVS visited K6USA in San Francisco. WA6ROF set up traffic skeds for the L.A. County Fair. W6BUK will be in Arizona for a vacation. W6VOZ has returned from the Tucson Area of Arizona. W6BES is busy traveling to New York and Florida. W6BHG spent a few days in the hospital and then made a trip to Enid, Okla. K6TVC is building some new v.h.f. gear. K6SIX is on 2 meters with an ARC-4. WA6BFC is building a transceiver for his motorcycle! WA6GHW is looking for contacts on 10,150 Mc. K6EF is keeping plenty busy with TVI and CD work. Support your section nets: On c.w., the Southern California Net operating on 3600 kc. at 0300 GMT daily; on phone, the SoCal 6 Net operating on 50.4 Mc. at 0300 GMT daily. Traffic: (Aug.) K6EPT 599, WA6DJB 520, W6GYH 475, WA6ROF 431, WA6MFH 405, WA6JDB 372, W6ENB 362, W6WPF 353, K6OZJ 200, K6SIX 191, K6YVN 140, WA6KQN 137, WA6OUK 104, WA6KAW 75, WA6CKR 58, WA6JOC 44, W6USY 36, W6VOZ 23, W6BHG 22, K6HOV 18, WV6QNN 14, WA6QFC 13, WA6KVS 10, K6SLM 5, W6WAW 3, W6WNR 1. (July) K6YVN 38, W6NKR 10.

SAN DIEGO—SCM, Don Stansifer, W6LRU—K6BPI hit a traffic total of 2535 for August as a single operator. Ex-KM6BL is now WA6MLW in Spring Valley, and is active on all bands. W6IDEY and his XYL, W6PJU, have come back to Santa Ana after vacationing in Canada. K6KYW spoke on s.s.b. at the Orange County Club in August. W6ELQ and his XYL, WA6ATB, vacationed in their trailer for two months. K6LKD, in Escondido, made BPL in August with a traffic count of 574. WA6HHJ,6 operated from the county fair in Del Mar and originated 140 messages. KH6DNO/6 is now on 6 meters in San Diego. Both W6BKZ and W6CAE visited W6LRU at his cabin in Mono County. The September meeting of the San Diego DX Club was held at the home of associate member WA6BUX, who now has 102 countries worked with an Apache, a 75A-1 and a three-element tri-band beam. He is a senior at Pt. Loma High. W6WNN vacationed in Washington in August. K6ENX, in Escondido, tops the DX Club list this month. K6MSK, in La Jolla, now has 72 countries worked, and has added a tri-band beam to help things. Two night school courses are offered in the San Diego City Schools Adult program this fall for would-be amateurs, taught by K6JFP and W6LRU. Reports from Orange County indicate things are well planned for the convention next June with K6LJA in charge, and all committees

(Continued on page 156)

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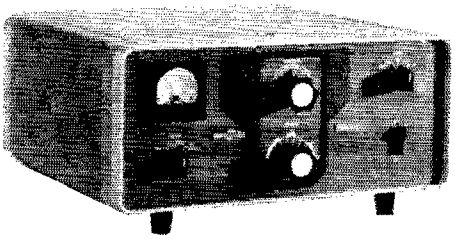

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BIG TRADE-INS

"World's Largest Distributors of Short Wave Receivers"

have been formed and are operating smoothly. W6DFR made DXCC in late August. Traffic: W6IAB 4361, K6BPI 2535, W6EOT 1077, K6LKD 573, WA6HHJ/6 140, WA6ATB 85, WA6CDD 80, W6DFR 64.

SANTA BARBARA—SCM, Robert A. Henke, K6CVR—SEC: W6JLY. K6RWP has returned from a boat race to the Tahiti Islands. He was sorry that he could not work more stations on the way over. Power troubles wouldn't let him. W6UWL is moving his QTH to Orange County and will be greatly missed by this section. The Santa Barbara ARC held its Annual Hamfest at Tuckers Grove. Prizes went to K6MQX and WA6IIU. The Ventura County ARC held an auction which appeared to be a real success. The auctioneer was W6 Kansas City Dump. WV6RJP is the latest newcomer to the amateur ranks in the Oxnard Area. He is building a DX-60 and should be on the air in the very near future.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM: E. C. Pool, 5NFO. SEC: K5AEX. PAM: AYX. RM: LR. I am happy to announce the appointment of AYX as your new PAM. JW is no stranger on the traffic nets and I am sure you will give him your support and cooperation. I was not able to attend the Annual Waco Hamfest this year and from all reports I missed a good time. As usual the Waco Boys did themselves proud. There were plenty of eye-ball QSOs and contacts with voices heard but never seen. I am sorry that more meetings like this cannot be arranged as I think it is the best way to promote the cooperation and pleasures of our fraternity. I had the pleasure of attending a meeting of a newly-organized radio club in Wichita Falls Aug. 31. The new club is the Red River Radio Club and has 21 members with K5ABG, pres.; K5YKV, vice-pres.; KOUXI/5, secy.; K5OUK, treas. K5OUZ is in the hospital after a 6-hour QSO on the table with a surgeon. The Dallas Carvan Club is holding a weekly transmitter hunt each Sun. afternoon after the regular net meeting at 1330 CST. ACK is the new net manager for NTX and reports the net is going good but needs more stations to check in to handle traffic. ACK has a new Johnson Viking KW. AWT, MSG, K5QWR, K5PAW and K5RAV have qualified as OPSs. OAVB, ex-5KCQ, was a visitor recently. A word of caution—monitor the frequency before you hit the switch, a net may be in progress on that frequency. Traffic: K5QWR 301, W5RKH 158, ACK 123, GY 113, K5PXV 36, QPG 32, VWJ 27, SXK 20, W5GNF 19, AWT 3.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: H. C. Hillyard, VO1CZ, and A. E. W. Street, VE1EK. SEC: BL. WJ recently returned from a trip to the United Kingdom where he visited amateurs in the Coventry Area. AEB has erected a 75-meter doublet over 50 feet up and reports good results. Recent vacationers to Halifax were VE3s AAU and LK. New calls include AIC, at Fredericton Junction. SE has been added to the list of those who hold Old Timer certificates. HY has been appointed chaplain at St. Vincent's University and will be back on the bands shortly. You are reminded that ARRL Bulletin No. 814 does not apply to VE amateurs. (Laos still is on the banned list for Canadians). Once again I would like to appeal for volunteers qualified to accept Official Observer appointment. We badly need OOs who can spend a few hours each week in monitoring the bands. More information will be gladly supplied on request. Your correspondent is moving to a new QTH beside CFNB's 50-kw. transmitter and plans to have the 2-meter station back in operation at what should prove to a choice location for v.h.f. activities. Traffic: K1AFF/VO1 33, VE1OM 16, AEB 4.

ONTARIO—SCM, Richard W. Roberts, VE3NG—The weather during the month of August provided our portable and mobile units with a little more operating time. Many town and city calls were heard from vaca-

(Continued on page 158)

LET'S TALK TURKEY

BEST TERMS ANYWHERE ON ANTENNAS AT WRL!

*30-DAY FREE TRIAL!

*ASK FOR DETAILS

DUOBANDER

20 AND 40 METERS

hy-gain

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$5 DOWN

Two-band operation made possible with Hy-Gain's exclusive linear decoupling stub, eliminating traps and increasing efficiency and reducing overall length of beam to ⅔ normal size. Linear loading and the Hy-Gain Beta Match also guarantee improved operation. 8.1 db Gain on 20M, 4.9 db Gain on 40M. Single 52 ohm coax feed. 5KW PEP, 3KW AM. Boom: 24 ft., Elements, approx. 40 ft. All aluminum construction . . Wt.: 54 lbs.

LOW COST $149.95 COMPLETE

TWO BANDS ONE PRICE

Extends to 50 Feet

Self-Supporting

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hy-Tower

Unique stub decoupling makes possible extremely high radiation efficiency and low SWR. Multiband vertical for 10-80 Meters. Single 52 ohm coax fed. 24 ft. tower, 2" OD - ¾" OD aluminum top mast extends tower to 50 ft. No guy lines required. Easy two man installation. Use only 6-8 ft. ground rods at base of tower. Cycolac base insulator assemblies.

MULTI-BAND VERTICAL

NO TRAPS

LOW SWR

ONLY $129.95 Complete

$5 Down • Easy Terms

LATEST DESIGN • LOWEST COST

40 METER MONOBANDER

LINEAR LOADING

Revolutionary!

NO COILS

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"hy-seven"

Add 40M to your present triband system; the hy-seven stacks easily, wt.: only 24 lbs. Boom 16'x2", Longest element 43'. All aluminum and cycolac plastic. Iridite treated steel hardware. Adjustable Beta match. 5.2 db gain. F/B 15-30 db. New linear loading concept. Completely weather-conditioned.

$99.75 Ham Net

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Write for our list of used equipment and trade-in offer on your equipment

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Leo Says: "We have the largest, cleanest stock of Used Equipment in the industry — more than 1000 units. Try Us!"

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Enclosed is $_____ for ( ) Down Payment ( ) Payment in Full. (FOB, WRL).

NAME: _____ CALL: _____

ADDRESS: _____

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(50c Service Charge on Orders Under $5.00)

tion and camping spots working portable or mobile. We are sorry to report the passing of JE, of Renfrew. The S.S.B. Assn. of Ontario will hold its Annual Dinner in Toronto Oct. 28. EAW, North Bay, has tickets. By the time you read this article the Windsor ARC will have held its Ontario ARRL Convention. CFR is active with a new G-76. VD still has his indoor antenna. The Kingston ARC had an FB Field Day. Four of its members were on a TV show from CKWS/TV. CAH, ATL, CKG and AXK were mugged. BEO, CLI, CVD, AXK, CJA and NF will be on 2 meters this fall from Kingston. The PAMs and the SCM wish to thank those of you who were so faithful during the past summer season on the Ontario Phone Net. There were many nights when the old reliables filled in. Belleville and Kingston hams are going co-op on their Annual Dinner. The Ottawa Valley Mobile Radio Club is to receive its charter as a corporate club. BCL, BEB, CFU, CSF, CSS, BLD, BCJ, BON and DSA were delegates to the New York Hamfest on behalf of Ottawa recently. OCU, at Carleton University in Ottawa, will be operating this fall and wishes to form a Canadian Varsity Net, especially in the East. The Niagara ARC had a wingding of a Weiner Roast. This was the club's annual event at TW's and DTW's QTH. The Seaway Valley ARC at Cornwall held a successful hamfest in September. EWT is now on the air. KJ has moved to VE3-Land until Christmas. Traffic: VE3BAQ 132, NG 99, DPO 69, DWN 37, DTO 34, RN 34, CFR 22, CP 18, EAL 17, OT 9, VD 4.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—AZP corrects an earlier report on s.s.b. activity in Quebec City. He says UZ, ADL, PA, AB, BCD and he are active. JJ, at Nitchequon has applied for ORS appointment. Ex-VO2AW at Goose Bay expects much traffic at his isolated QTH. A pleasant OT's corn roast was held at DR's place, with BE, BG, SF, TA and others attending. BE visited VE4s at the Brandon Hamfest. GQ, at Lake Marois will have his beam up soon. WW reports difficulties with the three-element 40-meter beam. ATL is now at Metane and visits RO and AWM. GE poured footings for the beam tower. A 2-meter St. Maurice Valley Net operates daily from 0030 to 0230Z. ABJ is Net Control. KW and AXC use homebrew beams. ZO is an old-timer; he previously signed VE3 and 4. NN says 1.2-kc. s.s.b. is maybe too narrow" QA will be recruiting for 20-meter beam erection. YU swears off quads after the sleet storm experience and now sticks to the two-element beam. BN has gone to Sweden. AFC enjoyed an F holiday and met over 100 DX friends. Radio Club de Quebec held its first fall meeting in September. AJS strains his ears for 144-Mc DX. TJ's 15-meter beam is up 70 feet. AFX and AFC also are active on 15 meters. PA manages good results with an indoor 10-meter ant. ATD was married in June and expects to get back in the swing. ARO lives in Europe; you can find him on 15 meters as F8VE. AZT, a newcomer, will try 80-meter c.w. While in France AFC presented the "Trophie France" to F9RH. This trophy is donated by AFC and goes each year to the F station working the most French-speaking VE stations. Traffic: VE2DR 87, AGM 76, BG 35, EC 21, AGQ 7, JJ 2.

ALBERTA—SCM, Harry Harrold, VE6TG—PAM: PV. SEC: FS. The Southern Alberta Emergency Net is shaping up nicely. The Alberta Phone Net will be going back on winter schedule soon. DB says 6 meters was much better this past summer. There was very little activity on 2 meters. TG now has his Hornet triband beam up and is looking for DX. TH says he is moving and will be off the air for sometime going to VE5-Land. The Alberta boys are showing more interest in s.s.b. The S.A. AREC is working on 3740 kc. each Sun. at 0930 hours MST so listen and check in, fellows. At present there are about twelve on phone and four on c.w. We need to get a group in the central part and one in the northern district. Are you ready to take part? If so, drop a line to the SEC, FS, at 443 19th St., North, Lethbridge. Traffic: VE6HM 219, TG 7, AEN 5, BA 5.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB—Well, here are the three of us, your SCM, XYL, SH and Baby James alongside the river recommended

(*Continued on page 160*)

HARRISON'S AT THE TOP OF THE TOP TEN WITH THE TOP EQUIPMENT!

QUR AMATEUR

DISTRIBUTOR NEWSLETTER

JULY 1961

COLLINS TOP TEN DEALERS

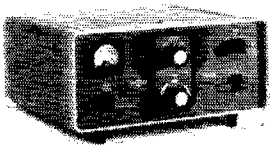
These dealers are our top ten in equipment volume sold this fiscal year. We congratulate them on a job well done.

Harrison Radio Corporation, New York City, N. Y.

There's a good reason why Harrison sells the most Collins gear! To its top quality of design and construction, Harrison adds an extra measure of helpful assistance that means full performance, greater satisfaction, more value.

This is the policy that makes "Ham Headquarters USA" your headquarters for Collins — 73, *Bil Harrison*, W2AVA

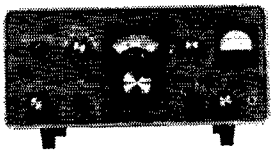
COLLINS



30L-1 KILOWATT LINEAR

Powerful – 1000 watt PEP input!
Portable – weighs only 38 lbs.
Compact – same size as the KWM-2! (Including self-contained high efficiency silicon rectifier power supply.)
Compatible – works with any 100 watt exciter.
Features – ALC, RF inverse feedback, hi/lo power switch, automatic antenna transfer, etc.
Easy to own – yours for monthly amounts as little as **$25**

COLLINS



NEW 75S-3 RECEIVER

The latest addition to the famous S/Line! A versatile receiver for SSB, CW, RTTY and AM. Sharpest selectivity – SSB – 2.1 kc, CW – 200 cycles. Q Multiplier, with 50 db rejection notch. Variable BFO, with calibration marks for RTTY use, and crystal BFO for upper and lower SSB. Fast/slow AGC. Spinner tuning knob.

Connects with 32S-1 for single PTO control of transmitter and receiver.

You can be enjoying this FB receiver **now**, for monthly payments as little as **$29**

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by AC and JD with nothing to do but fish, eat and sleep. Sleep and wait for them to bite.—Must write my report for this month tonight. What shall I say? Yes, the B.C. section has the most active amateurs. They send me hundreds of station activity reports by the first of each month. Net managers have their reports in by the 3rd and I can fill my quota for *QST* and have it in the mail by the 5th. None of the struggle most SCMs have to find news and get it away by the 7th. Our AREC program is complete and active and the SEC receives his ECs' reports monthly. Our TVI and BCI has been conquered and ITV is almost unheard of. All bands are active with B.C. amateurs and the world has no trouble in working a B.C. station. Hello! What, supper? My gosh what a beautiful dream. Please help it to come true. Send your reports!

MANITOBA—SCM, M. S. Watson, VE4JY—The Brandon Hamfest was a huge success. Congratulations to the BARC. After the fun and frolic held on Sat. evening Sept. 2 the main proceedings commenced on Sept. 3 at 11 A.M. in the Brandon Curling Rink. JT, master of ceremonies, introduced Norman Bergman, representing the City of Brandon and Chamber of Commerce, and G. R. Rowe, Civil Defence Coordinator for the Brandon District, who spoke briefly on the merits of amateur radio in various fields. YM then conducted a tour of the Brandon Steam Plant. FO won the 6-meter and CX the 75-meter transmitter hunt. The best mobile unit was won by LC with WØPHD second. During the P.M. KF gave a lecture and demonstration on v.h.f. G. L. Dosland, president of ARRL, and Vice-President Alex Reid then held a beef session answering all questions to the satisfaction of the hams present. At the evening banquet Pres. Dosland, WØTSN, and Vice-Pres. Alex Reid, VE2BE, were the principal speakers, outlining the activities of ARRL and urging the hams to become more active in the use of the bands. MP won a hi-fi tape recorder. Bob Dave, BARC pres., and KN, editor of *SPARKS*, are to be congratulated on the efficient organization of the meet. Traffic: VE4QD 8, AN 6, JY 4, SL 2.

SASKATCHEWAN—SCM, H. R. Horn, VE5HR—Now that holidays are over, activities will be on the upswing. The PEN (c.w.) Net and ARRL Phone Net will be busy. New members will be welcome and information can be had from NQ or QL. GN now signs VE7 at Victoria. AG has taken a position with the CBC TV station at Edmonton and will be VE6. XX and YY have moved to Quebec for a VE2 call. KJ had a nice time at the Waterton Hamfest. QC also was in attendance. MN has a new car and is in the process of changing mobile to 12 volts. I hope you have your selections in for a new SCM for the next two-year term. I have enjoyed working with you but feel this office should be passed around as I have had it for four terms. My term expires Dec. 10. GJ is putting the VE5s' signals around on 6 meters. GG also is active on 6 meters and TP is building a 6-meter mobile. Watch for them on the high frequencies.

European Fox Hunts

(Continued from page 80)

eliminated, especially as the foxes transmit one minute every five minutes — no cross bearings, no tactical problems.

The three Soviet hams taking part in the European Competition in Stockholm were probably better runners than any other participants, and their leader, the Hero of the Soviet Union Ernst Krenkel, well-known under the amateur call of RAEM, and their trainer UA3AF, can be proud of them. Their superiority in the 2-meter hunt is shown by the list of results below.

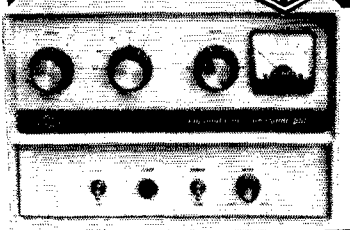
The Competitions

The competitions were preceded by a week of acclimatization, a week when our guests were guided by a number of Stockholm hams and had the opportunity to visit several homes and shacks. No talk of "east", "west" and "neutrals," just being radio amateurs and getting many new acquaintances!

Friday morning 4 August a dozen competitors started on 2 meters. *Results, 2 meters* (1) UA3AHA

(Continued on page 162)

RADIO SHACK *your headquarters for* GONSET HAM EQUIPMENT



GSB-201 RF LINEAR AMPLIFIER

$399.50

$19 monthly

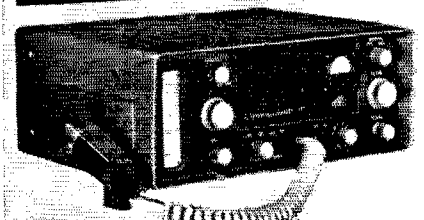
Big power rating! Small size! Power input rating 1500 watts PEP SSB. 1000 watts CW, 400 watts AM. Can be driven by exciters in the 65-150 watt category. Long-life silicon rectifiers used in the voltage power supply. Built-in antenna changeover relay. Panel switch allows tune-up at low power.
No. 45DX011, Model 3340 Ship wt. 90 lbs. **$399.50**

Save $110.00 — 10 METER GONSET COMMUNICATOR

SPECIAL PRICE! $189.50 **$16 monthly** Reg. $299.50

A Radio Shack Exclusive! Three units in one, transmitter, receiver, and power supply. 40-50 watt transmitter has pi-network output. Receiver is sensitive, selective communications type with adjustable "squelch" for muted stand-by, "S" meter and effective noise limiter.
No. 45DX237, Ship. wt. 35 lbs. **$189.50**

GONSET PORTABLE COMMUNICATOR IV



$369.50

$17 monthly

New! Designed for operating flexibility and convenience! Frequency range from 143.7 to 148.3 mc. Receiver noise 4 to 5 db. Sensitivity 0.4μv to 10 db S-N/N. Operates on 12 VDC or 117 VAC merely by changing cables. Transistorized DC supply eliminates vibrators. Sh. wt. 25 lbs.
No. 44DX600, 3341, 2 Meter **$369.50**
No. 44DX604, 3342, 6 Meter **$349.50**
No. 45DX012, 3351, Communicator IV, 220 mc. **$394.50**

6-BAND, 100 Watt AM TRANSCEIVER

$399.50

$19 monthly

New! Powerful unit consisting of transmitter and receiver in a single unit. Excellent communications on all six amateur bands. Exceptional operating flexibility and conveniences. Sh. wt. 24 lbs.
No. 44DX601, 3338, G-76 ..... **$399.50**
No. 44DX603, 3349, AC Pwr. Supply Wt. 28 lbs. **$145.00**
No. 44DX602, 3350, Trans. Pwr. Sup. Wt. 31 lbs. **$145.00**
No. 44DX612, 3265, Mounting Bracket ..... **$ 3.95**

MAIL COUPON — TODAY!

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730 Commonwealth Ave., Boston 17, Mass.

☐ No. 45DX011 ☐ No. 44DX604 ☐ No. 44DX603
☐ No. 45DX237 ☐ No. 45DX012 ☐ No. 44DX602
☐ No. 44DX600 ☐ No. 44DX601 ☐ No. 44DX612
☐ Send FREE 1962 Catalog

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☐ Check ☐ Money Order ☐ C.O.D.

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NEW HAVEN, CONN. 230-234 Crown St. STate 7-7121
STAMFORD, CONN. 29 High Ridge Road DAvis 5-4371
PROVIDENCE-CRANSTON, R. I. 1301 Reservoir Ave. Opp. Garden City

1:14 (2) UA3ARF 1:42 (3) UA3TZ 1:43 (4) YU3BA 3:04 Teams: (1) U.S.S.R. (2) Yugoslavia (3) Czechoslovakia (4) Poland.

The next day more than 60 participants came to the 80-meter starting point, got their maps and the foxes' transmitting schedules and vanished into the forest to listen to the first transmissions. Loops and ferrite rods were turned, bearings drawn on the maps, and the run began.

A couple of hours later the foxes began to send their reports to the headquarters, telling who had visited them, and to everyone's surprise it turned out to be a 35-year old Stockholm boy, not even a ham yet, who was the European champion on 80 meters.

Results, 80 meters (1) Gunnar Svensson, SM 1:10:30 (2) Ake Jonsson, SM 1:11:30 (3) SM5BF 1:13 (4) SM5BH 1:13 (5) UA3TZ 1:13:30 Teams:(1) Sweden (2) U.S.S.R. (3) Yugoslavia (4) Norway (5) Switzerland (6) Czechoslovakia.

What about a World Championship Competition the next time? That's up to you to join us, boys! QST

A Method

(Continued from page 41)

Distance Determination

Using Fig. 5, enter center scale (path loss) with 194 db. and adjust straightedge for equal distance on left-hand distance scale and 1296-Mc. distance scale. Find station working distance = 66 miles. If the distance was guessed wrong on the height gain nomogram, the new distance just obtained should be used in the height gain nomograph and a new answer obtained to correct the station gain.

Future Use

Once you have determined the values for your own station, mark them down and then you won't have to look them up again. This will make future computations easier.

Next time you plan to make a station change, make a computation of your "similar station" working distance, and see if it produces the desired result. Maybe just a small change can get you "over the hump" of Fig. 1. QST

Single-Band Grounded-Grid Linear

(Continued from page 41)

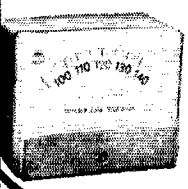
2000, adjust C_1 and C_2 for approximately 400 ma. Grid current should be 100 ma.

With the exciter adjusted for normal s.s.b. r.f. output, the linear amplifier, with voice, should

(Continued on page 164)

BULLSEYE BUYS at ARROW!

R.C.A. POWER LINE MONITOR

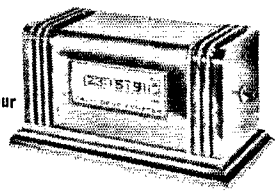


Keeps a constant check on your line voltage.

- Expanded Scale • 100 to 140 V. RMS
- Accuracy ±2% at 120 V., ±3% at 100 or 140 V.
- Large 4" meter face
- Convenient wall mount

Mod. WV-120A $14.95

PENNWOOD NUMERCHRON CLOCK with 10 minute warning buzzer

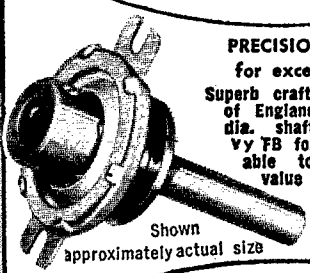


- 10 minute repeating timer buzzes warning to sign in your call letters
- Special independent switch turns timer on when beginning QSO
- Clock runs continuously
- Glolite dome shaped, full vision window glows in the dark
- Walnut or ebony plastic case, 4" h., 7¾" w., 4" d.

plus applicable taxes

Weight 3 lbs., 110 V. 60 cy. Price $22.50
Numerical clock without 10 minute timer $15.00

PRECISION PLANETARY-VERNIER for exceptionally fine tuning

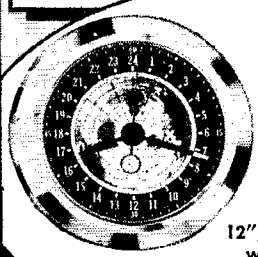


Shown approximately actual size

Superb craftsmanship by Jackson Bros. of England. Ball bearing drive, ¼" dia. shaft, 1⅛" long, 6:1 ratio, Vy FB for fine tuning. Easily adaptable to any shaft. Comparable value — $5.95.

Amateur Net $1.50 ea.
10 for $13.50

24 HOUR CLOCK



24 hr. chrome plated 8" metal wall clock. Inner dial with south polar projection map of world indicates time around world. Polar projection dial adjustable for various time zones. Shpg. wt. 2 lbs.

110 V. 60 cy. $8.47

12", 24 hr. clock, 110 V. 60 cy., without world map, $13.95

These prices include tax

PRECISION BALL DRIVE DIAL

Another superb product of Jackson Bros. of England. 4" dia. dial with 6:1 ball drive ratio. Fits standard ¼" shaft. For that velvet touch...

Amateur Net $3.95

COMANCHE SIGN

Controllable, illuminated sign that tells the XYL and guests you're transmitting. Cuts down background QRM. Can hook right into coil of antenna change-over relay for controlled "ON THE AIR" signal when XMTG. Heavy gauge all steel construction with handsome black or gray baked finish. Can be used on desk or tabletop or mounted directly on wall. Dimensions 10½" long x 3½" high x 3" deep. Specify desired finish in black or gray and operating voltage: 6 or 12 VDC, or 110 AC.

Amateur net $6.95

Versatile Miniature Transformer

Same as used in W2EWL SSB Rig — March 1956 QST. Three sets of CT windings for a combination of impedances: 600 ohms, 5200 ohms, 22000 ohms. (By using center-taps the impedances are quartered.) The ideal transformer for a SSB transmitter. Other uses: interstage, transistor, high impedance choke, line to grid or plate, etc. Size only 2" h. x ¾" w. x ¾" d. New and fully shielded.

Amateur Net $1.39
3 for $3.49 10 for $10.75

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Prices Subject To Change Without Notice.

swing to approximately 150 ma. of plate current. A steady whistle will increase the plate current to 400 ma. The output should be checked for linearity with an oscilloscope during initial adjustment and at regular intervals thereafter.

For c.w. operation, use the same procedure as for s.s.b. operation, adjusting R_1 for approximately zero plate current and the exciter for 100 ma. of grid current without plate voltage on the amplifier. Load the amplifier to 175 ma. with reduced plate voltage and then to 350 ma. with a full plate voltage of 2000.

Exciter Matching

Most exciters presently in use have enough range in output impedance to provide a match to the cathode circuit of the 813s. This impedance runs from a nominal 140 to slightly more than 200 ohms, depending upon the frequency. In the event that your exciter output impedance is fixed at 50 or 70 ohms, it may not be possible to obtain sufficient drive for the 813s. In such a case, a pi-network such as shown in Fig. 4 may be used for matching. In this particular instance, the relative values of C_1 and C_2 near the correct-adjustment condition are such that the output capacitor, C_2, has a greater effect on tuning than C_1. Therefore, the input capacitor, C_1, rather than the output capacitor, C_2, is used as the "loading" control.

The components can be mounted in a Bud CU-2107A 4 × 5 × 6-inch Minibox. Use SO-239 coax connectors for input and output. A piece of RG-58/U coax cable should be used between the exciter and matching network and a piece of RG-59/U between the network and amplifier will be slightly more suitable than RG-58/U if you happen to have some. Use No. 12 tinned wire for all connections, and keep leads as short and direct as possible.

High-Voltage Switching

Should you desire to operate two or more of these linears from the same high-voltage power supply, you can avoid the use of expensive high-voltage relays, and their associated wiring, by tying the h.v. terminals of all your amplifiers to the power-supply output. Merely turn on the filaments of the amplifier you desire to use and you are ready to transmit.

The operating-position photo shows the 28-, 21- and 14-Mc. amplifiers mounted in the author's home-built table rack. Antenna switching is done with the switches on the left while the amplifier selector switch is at the right, below the plate-supply voltmeter.

I would like to express my appreciation for the technical advice of George Stinson, W9KDK.

(Continued on page 166)

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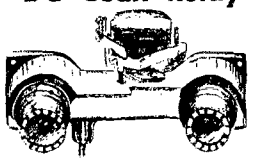

Model XQ11-141

Miniature 6VDC *coax relay, usable on* 12VDC *with* 20 ohm resistor. S0239 fittings on receiver and antenna, solder terminal for Xmttr. 100 watt rating . . . Only 2-7/8" long.

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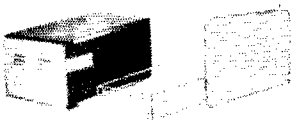

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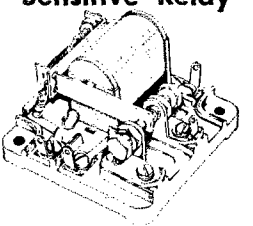

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Heavy gauge steel with durable gray finish. Easy to install. 115 volts. Bulb supplied. Simply attach cord to terminals of your 115V antenna relay . . . Large unit 10½x3½x3". Small unit 1x2½x5".

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(Continued from page 89)

both W9AAG and K9AAJ, 2 way s.s.b. with K9AAJ. Both of these stations heard his (Dave's) 432 Mc. signal but no contact as Dave's converter for that band was not completed at the time. We have it on excellent authority that the converter has since been completed, and odd as it may seem "the job was done" on a day that Dave was forced to stay home from work because of illness. Ha opened to be only a day or two after the opening, too. On the same evening Sept. 5) Texas, Oklahoma, Kansas, Missouri, Illinois, Louisiana, and Arkansas were worked and Mississippi was heard, at W5SWV's QTH. W5HTZ and W5NW also worked the same stations and W5HTZ also worked W9AAG and K9AAJ on 432 Mc bring that total up to 5 states on 432 Mc. Word concerning this same opening also received from Lee, K9AAJ who bemoans the fact of no converter on 432 at W5SWV. He has it now, Lee — watch for him next opening. The contact with W5HTZ in Wewoka, Oklahoma, on 432 Mc, made state #4 for Lee on that band. Lee sez that September 7 was very good on 144 into eastern Nebraska and Kansas; and that such good conditions are truly welcome on two meters. Aurora has been scarce and tropo conditions beyond 300 miles almost nil for some time in that area although Lee did get W1AJR for state #30 in June. WA2EMA in New Jersey, comments that extended ground-wave has been good on 144 Mc. and on August 30 Bill copies stations in Pennsylvania, Connecticut, Massachusetts, New Hampshire, New York, New Jersey and Maryland with extremely strong signals. Bill is open for skeds for the meteor showers and hopes anyone interested will get in touch. In Lansing, Michigan, K8BGZ remarks that conditions have been fairly good several evenings on 144 Mc. during August, with Iowa, Ontario, Nebraska, Wisconsin, W. Pennsylvania, W, New York, and southern Ohio coming through. W8BKI in West Virginia was also heard very weakly during one of the openings. A report from Thomaston, Connecticut, and K1PKQ sez that conditions on two meters were not generally good, but the openings that did occur were good ones. On the 5th of August stations were being heard from Scarboro, Maine, (W1COP) to Martinsburg, West Virginia (W8AEC); and on August 19 New York, New Jersey, and W4MKT in Winston-Salem, North Carolina were coming through. Louie, W8NOH, Grand Rapids, Michigan was hearing Illinois, Iowa, Minnesota, Missouri and Arkansas on August 2 and 3; and New York, Pennsylvania, Kentucky, Ohio and Ontario on August 5, 6, 7, 8. Louie also mentions that new stations on 144 Mc. in that area are W8BEE and W8AXA, and that W8BEE is also building a rig for 432 Mc. K4EUS got in on the tropo opening of August 18 and 19 when he worked the following stations on phone: W2JTI, K2LIO, K2CRG, W2JGY, W2CDO, W3QFD/3, W3HYJ, K3BRJ, W2RQC, K1CRN, K3IIEC/3, K2BNK, W3CLQ/3, K2RTH, W1AJR, K2SWZ and W1YQI. (And they say I talk a lot! — *W1HOY*) K2HLA reports conditions very good from his QTH, 100 miles east of NYC on September 18, when he worked W1ISO in Waldoboro, Me., K1LPC at Gorham, Me., W1ZKL at Waterville, Me., and W1COP at Scarboro, Me., all signals were from 5-7 to 5-9 and very steady. Dick also heard W1RPH at Deer Isle, Maine, 5-9 plus. After hearing announcements by K1CRN and K1LSY that the VE1s were coming in to New England, Dick started looking for VE1QY VE1MX, VE1CL and VE1ER, but had no luck even though he had their frequencies and knew they were on the air. He heard many N.E. stations working them, but it didn't push them through to Long Island. Line-up for 144 Mc. at K2HLA: Receiver 6CW4-417A-417A converter and transmitter 120 watts — 15 elements 65 feet high, and the location is 15 miles from the eastern end of Long Island. From Dallas (fooled ya!) Johnston, W9AAG, comes his side of the story of the opening on 144 Mc. on September 5. "W5HTZ was worked both

(Continued on page 168)

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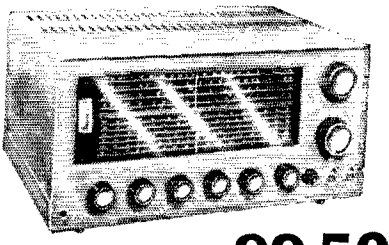
THE LAFAYETTE HE-30

Professional Quality Communications Receiver



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Sensitivity is 1.0 microvolt for 10 db, Signal to Noise ratio. Selectivity is ± 0.8 KCS at —6db with Q-MULTIPLIER. TUBES: 6BA6—RF Amp, 6BE6 Mixer, 6BE6 OSC., 6AV6 Q-Multiplier—BFO, 2-6BA6 IF Amp., 6AV6 Det-AF Amp. ANL, 6AQ5-Audio output, 5Y3 Rectifier.

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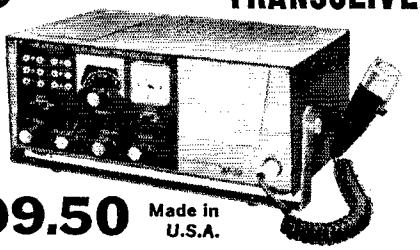

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The Communications Receiver that meets every amateur need—available in easy-to-assemble kit form. Signal to noise ratio is 10 db at 3.5 MC with 1.25 microvolt signal. Selectivity is —60 db at 10 kc, image reflection is —40 db at 3 MC. Tubes: 3—6BD6, 2—6BE6, 2—6AV6, 1—6AR5, 1—5Y3.

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on 144 and 432 Mc. He sure was packing a wallop on 432, was up to S8 here during our contact. W5SWV was spotted on s.s.b. on 144 and worked but unfortunately he didn't have a converter working on 432 although he put a signal on the band and was S2 here in Woodhull, Illinois. W5IOW, Ada, Oklahoma was also worked along with W5NU in Savoy, Texas, and some stations in Kansas. Next morning between 8 and 9 A.M. CDST. W5IOW and K5BUX in Oklahoma were worked, and the evening of the 6th Kansas and Nebraska signals were good in here." Golly, two meters is beginning to sound like six meters when it's open!

K9SGD comes through with info on his rig and openings of August 27, 28, and 29. Joe is using an NC300 with 6CW converter and 6CW4 preamp; transmitting with a pair of 6146s at present but is in the process of building up a pair of 4X150s and s.s.b. exciter. He calls CQ nightly on c.w. at 0400 GMT, frequency 144.120. Usually calls two or three times in each direction. Joe would be glad to try skeds on c.w. with anyone interested. During the opening of August 27, K9KPQ in Clinton, Iowa was coming into Sparta, Illinois, 5–9 plus on phone. On the 28th Joe heard W8GGH, W8KAY, W8TYY, W8FW, and W3RUE, and worked most of 'em. On the 29th he heard W9HGP, W9RVM (worked them both), K8AXU, W4HJQ and W4GSK. Word received from K2ITP clears up the mystery of what happened to him and brother K2ITQ; seems they've been a-schoolin'. Activity is stirrin' up on 144 Mc. in the Huntsville, Alabama area; W4NKS, W4FUD, K4Z QM, K4IQU, W4CTG, K4MBM, K4FQA and W4WGI are either on or building equipment for that band. Seems that "Mike", WN4BMC likes to handle traffic on two meters: during the month of August *she* handled 360 pieces of it. Who sez you can't handle traffic, messages, etc. on 2? Also worked W8QOH/MM crossing the Gulf Stream. QST

Correspondence from Members

(Continued from page 94)

know why this was. It has been the sad experience of many hams, myself included, that an apparently keenly interested beginner will throw the hobby aside when things don't go right. After one has seen many hours of his valuable time go down the drain in this manner, he will doubtless be hesitant about offering assistance of any kind to the beginner.

Notwithstanding my disappointing experiences with beginners, I would still find the time to offer assistance to any beginner who requested it, although the assistance would not be exceedingly extensive. I would most carefully answer any letter directed to this club through me. — *Steve Godwin, KØZCJ, President, Communicators ARC, St. Louis, Missouri.*

UN-AMATEUR ATTITUDE

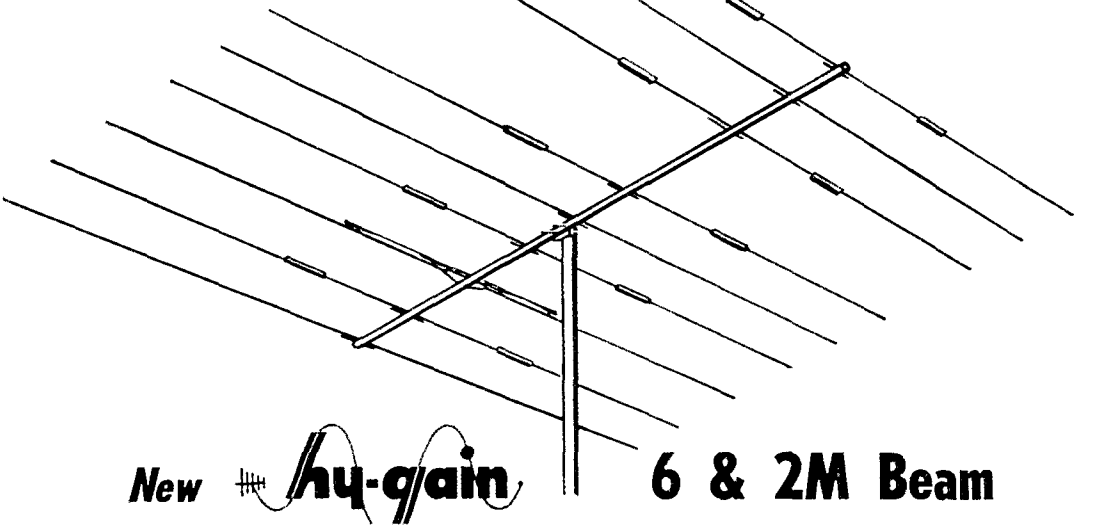
¶ In regards to Mr. Edward Wells comments in the September issue of *QST* criticizing RTTY operation in the 20-meter band; I feel that he is taking a very "unamateur" attitude. He must realize that the RTTY operators use very little of the alloted amateur frequencies in proportion to the c.w. men. I will admit that RTTY is not nearly as popular as c.w. and never will be, but Mr. Wells must remember that there are some amateurs who enjoy RTTY operation and devote most of their time to this phase of our hobby. Let's remember our "amateur spirit" and let the RTTY men have those few kcs. on 20 which I'm sure no 20-meter c.w. man will miss. I might add that I'm primarily a 20-meter c.w. man myself.

Let me take this opportunity to congratulate you on your wonderful League and magazine. I have been an ARRL member for four years and you can continue to expect my full support. May I urge every new amateur to join the League — it will be one of the best $5.00 investments he ever will make in this hobby of ours. — *Robert A. Sullivan, WØVFA, Minneapolis, Minnesota.*

(Continued on page 170)

VHF DUOBANDER

4 ELEMENTS ON 6M, 18 ELEMENTS ON 2M, SINGLE FEED LINE



New hy-gain 6 & 2M Beam

The new hy-gain Model DB-62 is a single transmission line beam antenna system for 6 and 2 meter operation. It is fed with 52 ohm coax transmission line and develops a forward gain of 8.0 db on 6 meters and 15.0 db on 2 meters.

The front to back ratio averages 15 to 20 db and SWR will remain below 1.5 to 1 on both bands.

The antenna is ruggedly constructed of 1¼" O.D. aluminum boom and 7/16" O.D. elements and is factory preassembled.

Net weight, 8.5 lbs.; boom length 10 ft.; longest element 10 ft.

Model DM-62 $32.95

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2 Meter, 5 Element. Model 25 is extremely light weight, factory pre-tuned and easy to assemble. Either coax or parallel fed. Beta match. Boom 5'4"; longest element 41-3/4". 9.0 db gain. Wt. 2 lbs. **$ 8.95**

2 Meter, 10 Element. Model 210 develops tremendous forward gain, excellent front to back. Can be rotated by any TV rotator. Coax or parallel fed. Boom 12'; longest element 41-3/4" Beta Match. 13.4 db gain. Wt. 5 lbs. **$14.95**

1¼ Meter, 11 Element. Pre-tuned folded ratio dipole for low loss 450 ohm open wire transmission lines with the Model 111. Optimum spacing and high Q element design. Boom 12'; longest element 27". 14.2 db gain. Wt. 4 lbs. **$13.95**

3/4 Meter, 13 Element. The Model 313 is specifically designed for 430 mc operation. Boom 8'; longest element 13-3/4". 16.1 db gain. Wt. 2¼ lbs. **$12.95**

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FINAL COURTESY

¶ I have received a number of QSL cards that were marked or mutilated in the mail, and I would like to make a few suggestions about QSL cards which I think should be published in *QST*: a) Use standard size rectangular QSL cards. Oversize cards do not fit in QSL files and have to be put aside. Odd-shaped cards get torn sometimes when they go through the cancelling machine. b) Use the mail-o-mat if your post office has one. If none is available, try to use a postage meter or have the cards hand-cancelled. Almost all of my cards that I received have undesirable black marks on the side where the call letters are. This is caused by contact of the card with the postmark of the letter in front of it before the ink has dried. — *Ray R. Dopmeyer, K7JWY, Opelousas, Louisiana.*

¶ I wonder just what a ham must do to arrive at that happy point where he can be certain of receiving a QSL for each one sent?

As has often been stated, the sending of a QSL is the final courtesy of a pleasant contact with a fellow ham.

While many appear to consider the acknowledgement of a QSO relatively unimportant, to me it is an integral part of our great hobby. I derive a certain amount of pleasure, as I am sure many others do, from going through my QSL file and reliving enjoyable past contacts.

I suppose, too, since I QSL 100%, I expect the other fellow to do the same.

And anyway, how is a guy going to make WAS, WAC, etc., etc., without those all-important cards? — *W. S. Wade, jr., W16JXM, La Canada, California.*

¶ I believe that the American amateur could do a little something for the foreign stations that send back QSL cards, DX in particular, and it need not be anything too valuable at that. Possibly an old *Call Book*, old copies of *QST*, some gear that is not being used anymore, or anything that is hanging around the shack you don't need! I have sent small inexpensive gifts to some of the amateurs throughout the world, and it has given me a lot of satisfaction to do this. Just something of appreciation will go a long ways in cementing friendship throughout the world with our good amateurs and neighbors. — *Chas. W. Bogel, jr., WØCVT, Cedar Rapids, Iowa.*

¶ I have received cards from W/K boys (and others) who have followed your advice and are making use of GMT but have overlooked the fact that the date changes between 2359 and 0001 GMT.

If, for instance, a WØ in Denver, Colo. works a G station at 2000 MST on the 1st October, then if he wishes to make use of GMT he must add seven hours which brings the hour to 0300 GMT but even though in Denver the date is 1st October, in England (at Greenwich) it is the 2nd!

There is no point in making use of GMT without taking into account the date; it only leads to confusion.

One thing which the ham to the west of Greenwich has over the rest of his fellows (if he religiously makes use of GMT) is that he can see the New Year in twice for the price of his fellow citizen's once. It can be a bit hard on the constitution though! — *R. Johnson, G2FFO, Burnley, Lancs., England*

C.W. M QSO

¶ Re: Excerpt from fancied c.w./m QSO with W3QV (*QST* Aug. p. 140):

W3QV DE K2QKI — FB OM BUT NIL OLF HR — GOD ES GM GAVE ME A LF E4 A PAKING BRAKE ES A DIMMER SW ES A WINDSHIELD WASHER ES WUD HV EVEN WID STICK ES CLUTCH — AFTER 8 ? 8 YRS WID SLUSH XMISSION HV MADE HABIT OF LF ON BRAKE — LAST TIME REACHED FOR DIMMER IN FOG GOT WINDSHIELD WASHED — AFTER GOT OUT OF HOSPITAL DRAINED WASHER — THK WILL GO PHONE WID OF HEADSET ES LF OPERATED TR SW — W3QV DE K2QKI K — *Phillip H. Ellis, K2QKI, Westbury, New York.*

HQ VISIT

¶ In August my wife and I had a most interesting time being shown the facilities at 38 La Salle as well as the installation at the transmitter site. I would like to thank both K1LVW for giving us the fine tour, and W1UED for his

(*Continued on page 172*)

THE LATEST FROM HALLICRAFTERS / in stock at HARVEY

New Transverter Designs For SSB-AM-CW-RTTY on VHF Frequencies

Hallicrafters HA-2 and HA-6 provide a new approach to VHF operation. Now, with great simplicity, operators with 10 meter transmitters and receivers can operate 6 or 2 meters and enjoy this extended coverage.

These new transverters change your present 10 meter transmitter output to the VHF range. They also convert the received VHF signals down to 10 meters for reception. The 5894 tube used in the transmitter final amplifier can be driven up to 120 watts input.

All modes of transmission and reception are useable with these units depending on the type of 10 meter equipment used.

- A nuvistor front end in the receiver section provides excellent sensitivity and noise figure.
- Can be driven by exciters with 10 to 100 watt capability.
- Built-in coaxial antenna relay.

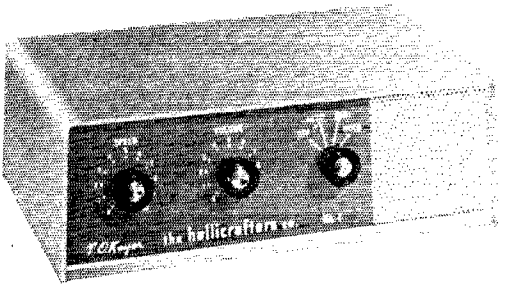
MODEL HA-2 — FOR 2 METERS/HA-6 — FOR 6 METERS $349.50

Hallicrafters power supply for these units supplies all voltages. Only one supply necessary for operation of either the HA-2 or HA-6 when used in stations set up for 6 or 2 meter operation.

MODEL P26 — POWER SUPPLY $99.50

MODEL HA-4 "T.O. KEYER"

The Stradivarius of Electronic Keyers . . .



For the discriminating C.W. operator who demands perfection, Hallicrafters brings the new transistorized T.O. Keyer.

Employing digital techniques, its advanced circuitry features a constant ratio of dot-to-space-to-dash over the entire speed range of the instrument. Dots and dashes are self-completing.

Price: $59.95

Match your 'TO' Electronic Keyer with the VIBROPLEX VIBRO-KEYER for a perfectly matched sending team!

Standard Finish $17.95 De Luxe Finish $22.45

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interest in a friend of ours. The workings of Hq. seem to be handled efficiently by the enthusiastic staff of 65. I was also impressed by W1AW in that it looked like a ham station operated by hams and not like a completely "professionalized" station to be seen and not touched.

May you long continue to help and maintain the enthusiasm and high standards that amateur radio is known for. — *Dick Klausch, K2AZJ, Trenton, New Jersey.*

Technical Correspondence

(*Continued from page 55*)

nal or terminals to enter by, and for vision or other needful purpose requiring an aperture, for through round holes of moderate size large electrical waves do not readily pass, wereash through chinks or long slits, no matter how infinitely narrow, they can pass with ease." — *Lodge*.

"According to my present invention, I inclose the receiver in a metallic box. One-twentieth of an inch is a suitable thickness for the metal. The outside of the box is connected to one terminal of the telegraphic instrument and to earth respectively. The other terminal of the telegraphic instrument is connected to the relay circuit (inside the box) by a wire insulated from the box. A coil is placed on this wire outside the box. It is protected from mechanical injury by a wooden case; but this may be omitted. The coil may contain about twenty yards of wire one seventy-fifth of an inch in diameter and have one hundred and twenty turns. The coil is insulated with gutta-percha and covered with tin-foil. The tin-foil is in electrica connection with the box. The coil prevents oscillations of the transmitter from reaching the coherer at the same station through the wire." — *Marconi*.

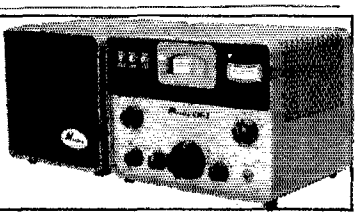
— *D. C. Mead, K2ZZF*

How's DX?

(*Continued from page 85*)

W8FGX and VP5BL were designated to man VP5BL/5 in last month's Cayman DXpedition on 7, 14 and 21 Mc. . . . . K5CDA 'mm's d.c. source wobbles between 90 and 150 volts aboard SS *Penn Shipper*, severely embarrassing a rotary converter which has poor regulation to begin with. Max's receiver must run off batteries, of course, and a v.f.o. seems out of the question. Fellow crew members are inclined to blame every random BC-set noise on activity in the radio shack, so going to sea is not necessarily escape from BCL-TVL tribulations . . . . . Still no hamming permitted on Swan Island, according to K6QPG's first-hand information . . . . . W9/K9 DXCC memberships are four times as numerous as they were in 1953, moving W9-DXCC Chairman W9JUV to make a motion for re-appraisal of the group's original consensus of "the less organization the better." . . . . . W1JNV votes for an increase in 14-Mc. c.w. activity by the VR gang, particularly VR6s, so that the East Coast can knife through the cross-country QRM barrage once in a while . . . . . Ks 6CJF amd 9TYO voice strong disapproval of some aspects of the ethical state of our art: Thoughtless, sloppy and selfish operating techniques. . . . Yowling CQ-DX when the band is jammed with DX stations calling CQ. . . . Zero-beat calls that drive DX to QRT. . . . High-power rag-chewing near the low c.w. band edges of 40 and 80 meters when the DX skip is in, fully knowing that DX stations are forced to hug the low end by various factors . . . . . "Will be at Shemya for six or eight months in case someone wants to work an offbeat KL7," informs K6BYC/KL7, formerly W5PZW. An AF-67, G-66B and long-wire bring plenty of goodies back to Howie on 20 c.w. Nextdoor neighbors W4YEX/KL7 and K8ETO/KL7 point out that this Aleutians island is closer to Tokyo than it is to Anchorage. John and Ed expect to remain active on s.s.b

(*Continued on page 174*)



THE WRONG AD!*

Page 128 in October shows equipment we don't build any more. The ad should have been on the LPA-1 and the LPS-1, and page 143 of this issue gives complete data on these two equipments: the LPA-1 grounded grid amplifier and its LPS-1 power supply.

BARKER & WILLIAMSON, INC.
Canal Street & Beaver Dam Road
Bristol, Penna.

★ It was entirely QST's fault and our face is as red as our name on the cover. QST

How's DX?

(Continued from page 172)

and c.w. there till next June . _ . _ . _ Ohio Valley Amateur Radio Association, a lively DX group, has W8BQT, pres.; W8CSK, secy.; W8TJM, treas.; and K8VDV, *Ether Waves* editor . _ . _ . _ PY7YS intends to score Fernando de Noronha and/or Trindade QSOs this month, phone and c.w., so don't pass up PY7YS/Ø . _ . _ . _ The Gulf gang and Atlantic Coast boys took skywire maulings from unladylike ladies Carla and Esther as the '61 hurricane season got under way. The girls also soaked plenty of cellar-installed DX gear.

Ten Years Ago in "How's DX?" — The boys in the back room kick around their favorite definitions of "good conditions" to open the November 1951 column . . . . . Lots of goodies are available on 20 c.w.: AC3PT, C3AB, EK1RR, ET3R, F3AT/FF, FK8Ss AA AL, HE1BQ, I1AHR/M1, KM6AW/KS6, LBs 5ZC 8CH, MB9BJ, M1Ds 2BC 2JB 2PW 2RG 5PM, MI3US, OE13s FN RL, OQ5s AA RA VN, OY3IGO, PK4DA, SU1RX, VK1BS, YI3BES, 3V8AN, 9S4s AL and AX . _ . . . _ Nice stuff on 20 phone, too: HC8GI, KH6PA/KP6, PX1AR, UPs 1A 5A, VTs 3B 5GA, ZD6HJ and ZM6AA . _ . . _ Forty's adherents adhere to CT2BO, KV4AA, SV9RP, VQ4IF and curious SHF1 . . . . Ten phone reluctantly opens up to Africa, producing EL10A, OQ5s BI NK, VQ4ERR and ZE2KH . _ . . . _ Odds 'n' ends: AC4RF is said to be under arrest in Tibet for "attempted revolution". . . . There's a vigorous new outfit down Texas way calling itself the West Gulf Division DX Club. . . . USKA (Switzerland) publicizes its H-22 certification. . . . U.S. EK1s in Tangiers become KT1s . . . . Jeeves tunes in a full-fledged menagerie, while photos of PX1A (EA8s FL and HE), the apparatus of CX1GG, and ON4RM supplement the synopsis. QST

WES SCHUM AMAZED AS HE VISITS "DOC", W9HJS, AT AMATEUR ELECTRONIC SUPPLY'S CHICAGO STORE

"HELLO" Central Electronics Factory? This is Wes Schum! Rush more 200 V's over here quick—and keep them coming."

only $25.83 PER MO.* (WITH 10% DOWN)

PUTS A NEW CENTRAL ELECTRONICS 200-V IN YOUR SHACK • *ORDER NOW*

RECONDITIONED USED CENTRAL ELECTRONICS EQUIPMENT

10A Exciter	$ 79.00
10B Exciter	109.00
20A Exciter	159.00
100V FACTORY Reconditioned	575.00
600L Linear	279.00
A Slicer	29.00
B Slicer	45.00

WRITE FOR CURRENT LIST!

STAY ON THE AIR PLAN . . . Keep your trade until after new equipment arrives and is operating.

TERRY STERMAN W9DIA

MY TOP trade-in will save you Big Money

You've always wanted to own and operate Central Electronics equipment. Now you can with my easy terms—Everything's in stock, and all available on Easy terms.

	Price	Monthly Payments after 10% Down Payment 1 year	2 years	3 years
200-V Broadband Transmitter	$795.00	$65.58	$35.77	$25.83
600L Broadband Linear Amplifier	495.00	40.83	22.27	16.08
MM-2 RF Analyzer Wired	149.50	12.33	6.72	
Kit	119.50	9.85	5.37	
GC-1 Gated Compression Amplifier Wired	66.50	5.48		
Kit	56.50	4.66		

No penalty for Pre-Payment

All other Central Electronics parts and station accessories in stock

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Two Stores to Serve You

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Steve, W9EAN Milwaukee Manager

"Doc," W9HJS Chicago Manager

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3832 Lisbon Avenue
Phone: WEst 3-3262

CHICAGO, ILLINOIS
6430 Milwaukee Avenue
Phone: RODney 3-1030

Terry Sterman, W9DIA—Mail Order Dept.
Amateur Electronic Supply
Dept. Q111—3832 W. Lisbon,
Milwaukee 8, Wisc.

Dear Terry: I'm enclosing $....., Ship me this Central Electronics equipment: .....

.....

I will pay the balance ☐ C.O.D., or in equal monthly payments in ☐ 1 year ☐ 2 years ☐ 3 years.

I am interested in.....
I have to trade.....
Name and Call.....
Address.....
City..... State.....
☐ Rush latest reconditioned bulletin

Happenings of the Month

(*Continued from page 73*)

North Shores Amateur Radio Club.....San Diego, Calif.
The Opequon Radio Society of West Virginia
Martinsburg, W. Va.
South Shore Amateur Wireless Ass'n..Valley Stream, N. Y.
Virginia Century Club.....Norfolk, Va
South Amboy Amateur Radio Ass'n..South Amboy, N. J.

During the course of the meeting, the Committee discussed, without formal action, the ICAO phonetic list, specialized columns in *QST*, progress on the reciprocal licensing bill, additional League official transmitting facilities, and 14-Mc. s.s.b. use.

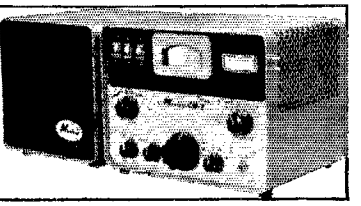
There being no further business, the Committee adjourned, at 12:05 P.M.

JOHN HUNTOON
Secretary

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. 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 — G. L. DeGrenier, W1GKK, 109 Gallup St., North Adams, Mass.
W2, K2 — North Jersey DX Ass'n, P.O. Box 303, Bradley Beach, N. J.
W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.
W4, K4 — Thomas M. Moss, W4HYW, Box 20644, Municipal Airport Branch, Atlanta 20, Ga.
W5, K5 — Brad A. Beard, W5ADZ, P.O. Box 25172, Houston 5, Texas.
W6, K6 — San Diego DX Club, Box 16006, San Diego 16, Calif.
W7, K7 — Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.
W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.
W9, K9 — Ray P. Birren, W9MSG, 702 Spring Road, Elmhurst, Illinois.
WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.
VE1 — L. J. Fader, VE1FQ, P.O. Box 663, Halifax, N. S.
VE2 — George C. Goode, VE2YA, 188 Lakeview Avenue, Point Claire, Montreal 33, Quebec.
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, 833 10th St., N., Lethbridge, Alta.
VE7 — H. R. Hough, VE7HR, 1291 Simon Road, Victoria, B. C.
VE8 — Earl W. Smith, VE8AT, P.O. Box 534, Whitehorse, Y. T.
VO1 — Ernest Ash, VO1AA, P.O. Box 8, St. John's, Newf.
VO2 — Douglas B. Ritcey, Dept. of Transport, Goose Bay, Labrador.
KP4 — Joseph Gonzalez, KP4YT, Box 1061, San Juan, P.R.
KH6 — John H. Oka, KH6DQ, P.O. Box 101, Aiea, Oahu, Hawaii.
KL7 — Alaska QSL Bureau, Box 6226, Airport Annex, Anchorage, Alaska.
KZ5 — Ralph E. Harvey, KZ5RV, Box 407, Balboa, C. Z.



Silent Keys

It is with deep regret that we record the passing of these amateurs:

W1JXV, Eric W. Vogeler, West Hartford, Conn.
W1PBM, Wendell Rand, Waltham, Mass.
K2BS, H. Ellwood Hoepfner, Buffalo, N. Y.
W2COZ, Walter A. Kempf, Roselle, N. J.
K2MEI, Joseph J. Krieger, Long Valley, N. J.
W2YI, Harry Sadenwater, New York, N. Y.
W3EUL, Malcolm MacMillan, Pittsburgh, Penn.
W3HEK, Walter H. Fenton, Philadelphia, Penn.
W3KWN, Louis G. Fabian, Pittsburgh, Penn.
W3OBL, Verne R. Voorhees, Duke Center, Penn.
WA4ALM, John E. Fargis, Montgomery, Ala.
W4IKZ, George W. Daughtry, jr., Bayside, Va.
W4KGX, George J. Knowles, Columbia, S. C.
K4SEN, S. D. Mobley, Columbus, Ga.
K4YQV, George J. Yates, Greensboro, N. C.
W5GAD, Albert F. Lestelle, Metairie, La.
W5JFZ, William F. Cheney, Covington, La.
W5KTD, Martin Colvin, Shreveport, La.
K6HHA, Eugene V. Burdick, Los Angeles, Calif.
W6HIP, Albert E. Gilbeau, Stockton, Calif.
WA6KDH, John L. Lowrimore, Vacaville, Calif.
WA6PER, Gary K. Sola, Palmdale, Calif.
W7DYW, Lucile L. Broadbent, Cedar City, Utah
W7LKB, Cmdr. Walter Schimmelpfennig, Bremerton, Wash.
W7LOD, Jean D. Cleveland, Three Forks, Mont.
W7QPB, Evan C. Parker, Hood River, Oreg.
W8NLN, Roland L. Sherwood, Ashtabula, Ohio
W8NPL, Frank Betts, Deford, Mich.
KN9FGC, Claude Cole, Auburn, Ind.
W9GCA, Ray F. Arendt, Northbrook, Ill.
K9OQD, John R. Shaw, Auburn, Ill.
W9QLL, Harry Johnson, Alton, Ill.
WØFLF, Everett W. Hillblink, Littleton, Colo.
KNØFVN, J. Archie Zarr, Washta, Iowa
KØGNY, Jewell G. Farmer, Grimes, Iowa
KNØHTM, Doyle M. Hanson, Gr.ettinger, Iowa
WØMG, Russell R. Rosenkrans, Waterloo, Iowa
WØRCH, Harry W. Fritz, Kansas City, Mo.
KH6ANT, Eli D. Panee, Oahu, Hawaii
VE2SG, William A. Holtby, Iberville, Que., Canada
VE3BN, H. A. Bimm, Pembroke, Ont., Canada
VE3BUD, Orry R. Castrucci, Toronto, Ont., Canada
VE7NJ, Frank Putland, Victoria, B. C., Canada
VE7SL, Dudley C. Schubert, Vancouver, B. C., Canada

FEEDBACK

Some sharp eyes have discovered a discrepancy between the upper photo on page 13 of the June issue and the circuit diagram on page 12. The photo shows the plate r.f. choke in K6SNO's linear amplifier connected to the tube side of the coax-cable section which is used as a v.h.f. bypass, while the diagram shows the choke connected to the tank-circuit side. Actually, there is little if any choice between the two connections, except that the one shown in the photo is more convenient in the layout used.

Sign up here!

MICHIGAN'S

HAM HEADQUARTERS

SINCE 1938

M. N. DUFFY & CO.

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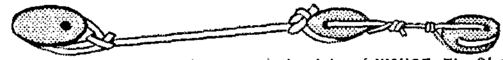
You can win . . .
SX-115 Receiver
HA-2 or 6 Transverter
HT-37 Transmitter
HA-4 Keyer

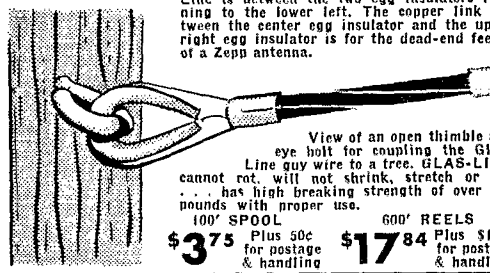
Over $10,000 In Prizes

NON-METALLIC GUY LINE — PERFECT FLEXIBLE INSULATOR — REVOLUTIONIZES HAM RADIO & TV ANTENNA SYSTEMS

Non-inductive, non-conducting, non-absorbing Glas-Line isolates systems from directional arrays, rhombics, etc.



The new main insulator of W3UCT. The Glas-Line is between the two egg insulators running to the lower left. The copper link between the center egg insulator and the upper right egg insulator is for the dead-end feeder of a Zepp antenna.



View of an open thimble and eye bolt for coupling the Glas-Line guy wire to a tree. GLAS-LINE cannot rot, will not shrink, stretch or sag . . . has high breaking strength of over 500 pounds with proper use.

100' SPOOL $3.75 Plus 50¢ for postage & handling — 600' REELS $17.84 Plus $1.00 for postage & handling

'SUPER' GLAS-LINE with 1,000 lb. TENSILE STRENGTH with proper use.

100' SPOOL $6.95 Plus $1.00 for postage & handling — 600' REELS $34.75 Plus $2.00 for postage & handling

Send check or M.O. No C.O.D.'s please.
DEALER & DISTRIBUTOR INQUIRIES INVITED.

THE GLAS-LINE CO.

2751 Nostrand Ave., Dept. 2, Brooklyn 10, N. Y. CL 2-9851

NEWS FOR THE SHACK

GIVE A DISTINGUISHED LOOK TO YOUR SHACK WITH THIS HANDSOME INLAID MAHOGANY PLAQUE ! ! !

- Size 8" x 10" x ¼"—Letters 2 inches high
- Highly polished to a mirror-like finish
- Not a fill in, but real inlay process
- Perfect gift for Ham who has everything
- Handmade to last a lifetime without repair
- Any wording up to 6 letters or figures
- Center of attraction in any shack

Send coupon below with your check (Personal check on any US bank accepted from licensed ham). Do not send cash — Sorry no C.O.D. — Please allow time for international parcel post to reach you. Orders sent air mail reach us faster.
Sent POSTPAID for ONLY $4.95
Made in the Caribbean, from solid mahogany, by: HH5LA — Box 30 — Cap-Haitien — Haiti — W.I.

A. R. LAROCHE (HH5LA)
P.O. Box 30, Cap-Haitien, Haiti, (W.I.)
Please send me . . inlaid plaque(s) at $4.95 each.
INLAID LETTERS:_ _ _ _ _ _, _ _ _ _ _
Ship to: Name ....Call...........
Address ....
City Zone State

Sign up here!

LAFAYETTE RADIO

NEW STORE

111 JERICHO TURNPIKE SYOSSET, L.I., N.Y.

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SSB/CW/VHF Contest

You can win . . .
SX-115 Receiver
HA-2 or 6 Transverter
HT-37 Transmitter
HA-4 Keyer

Over $10,000 In Prizes

HAM-ADS

(1) Advertising shall pertain to products and services which are related to amateur radio.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters. Ham-ads signed only with a box number without identifying signature cannot be accepted.

(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (6) below.

(4) **Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.**

(5) Closing date for Ham Ads is the 20th of the second month preceding publication date.

(6) **A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature.** Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) **Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.**

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

MOTOROLA used FM communications equipment bought and sold. W5BCO, Ralph Hicks, Box 6097, Tulsa, Okla.

RECEIVERS: Repaired and aligned by competent engineers using factory standard instruments. Factory service at reasonable prices on Collins, Hallicrafters, Hammarlund, Gonset, National, Harvey-Wells. Our 25th year. 90 day guarantee. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

WE Buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., 199 Front St., Hempstead, L.I., N.Y.

DON'T Fail FCC tests! Check yourself with a time-tested "Sure-check Test". Novice, $1.50; General $1.75; Extra, $2.00. We pay the postage. Amateur Radio Specialties, 1013 Seventh Ave., Worthington, Minn.

TRIGGER. Cash paid for ham equipment. 7361 W. North Ave., River Forest, Ill. PR 1-8616. Chicago #TU 9-6429.

TOROIDS: Uncased 88 Mhy, like new, Dollar each. Five/$4.00 P.P. DaPaul, 309 So. Ashton, Millbrae, Calif.

WANTED: Cash for surplus tech manuals, one or one hundred. State condition and equipment type. W4FXQ, Box 2513, Norfolk, Va.

WANTED: Commercially-built transceivers and QST for any months of 1922, 1923, 1939 and 1940. Al T. O'Neil, Camp Lakeview, Lake City, Minn.

SOUTHERN California: Transmitters and receivers repaired, aligned. Bandwidth, frequency, harmonics measured. Used ham gear bought, sold, traded. Robinson Electronics, 922 W. Chapman, Orange, Calif. Tel. KEllog 8-0500.

WANTED: All types of aircraft or ground radios. 17L, 618S, 388, 390. 18S, 51V, 51X2 units. Especially any item made by Collins Radio whatsoever. Also large type tubes and test equipments. For fast action write Ted Dames, W2KUW, 308 Hickory, Arlington, N.J.

SAN Francisco and vicinity: Receivers repaired and realigned. Factory methods. Special problems invited, any equipment. Associated Electronics, 58 South P Street, Livermore, Calif. Skipper, W6KF.

ATTENTION Mobileers! Leece-Neville 6 volt 100 amp. system, $50; 12 volt 50 amp system, $50; 12 volt 60 amp system, $60; 12 volt 100 amp syst. $100. Guaranteed no ex-police car units. Herbert A. Zimmermann, Jr. K2PAT, 1907 Coney Island Ave., Brooklyn 30, N.Y. Tel. DEwey 6-7388.

WANTED: *Military or Industrial laboratory test equipment.* Electronicraft, Box 399, Mt. Kisco, N.Y.

WANT 1925 and earlier ham and broadcast gear for personal collection. W4AA, Wayne Nelson, Concord, N.C.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase W8RP. Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmany 8-8262.

HAM TV Equipment bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

SELL 2 mf. G-E capacitors, 4000V DC, $5.00 or 2 for $9.00. Guaranteed. Dawson, 5740 Woodrow Avenue, Detroit 10, Mich.

QSLS? SWLS? WPE? Variety 25¢ (refunded). QSL samples with bible verses. 25¢. Sakkers, W8DED, Box 218, Holland, Mich.

C. FRITZ for QSLs that guarantee better DX returns! Samples 25¢ deductible. Box 1684, Scottsdale, Ariz. (formerly of Joliet, Ill.)

QSLS. Twenty exclusive designs in 3 colors. Rush $3 for 100 or $5 and 200 and get surprise of your life. 48-hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

QSLS, Kromekote 2 & 3 colors, attractive, distinctive, different. Ball point pen with order. Samples 10¢. K2VOB Press, 62 Midland Blvd., Maplewood, N. J.

QSL-SWL-WPE. Finest. Since 1946. Largest assortment. Priced right. Send 10¢ for samples to: Glenn Print, 1103 Pine Heights Ave., Baltimore 29, Md.

QSLS "Brownie." W3CJI, 3110 Lehigh, Allentown, Penna. Samples, 10¢; with catalogue, 25¢.

QSLS-SWLS. Samples 10¢. Malgo Press. Box 375 M.O., Toledo, 1, Ohio.

QSLS, Best for less. Catalog 25¢ (Refundable), samples SASE. Crawford, K6GJM, Box 607, Whittier, Calif.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢

SUPERIOR QSLS, samples 10¢. Ham Specialties. Box 3023, Bellaire, Texas

CREATIVE QSL Cards. Personal attention given. Free samples and catalog. Bob Wilkins, Jr., Box 1064, Atascadero, Calif.

QSLS, 3-color glossy, 100—$4.50. Rutgers VariTyping Service, 7 Fairfield Rd., Somerset, N.J.

QSLS-SWLS, 100 2-color glossy, $3.00; QSO file cards, $1.00 per 100. Samples, 10¢. Rusprint, Box 7507, Kansas City 16, Mo.

PICTURE QSLs. Cards of your shack, home, etc., Made from your photograph, 1000, $13.00. Raum's, 4154 Fifth St., Philadelphia 40, Penna.

QSLS, 300 for $3.95. Samples 10¢. W9SKR, "George" Vesely, Rte. #1, 100 Wilson Road, Ingleside, Ill.

QSLS, SWLs, XYL-OMs (sample assortment approximately 9¾¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fantabulous, DX-attracting, prototypal, snazzy, unparagoned cards (Wow!). Rogers, KØAAB, 961 Arcade St., St. Paul 6, Minn.

QSLS-SWLS. Samples free. W4BKT Press, 123 Main, McKenzie, Tenn.

1⅝" *Call QSLs (2 sides printed), 100, $2.75; samples free.* Gariepy, 2624 Kroemer, Ft. Wayne, Ind.

QSLS, Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

QSLS, Samples dime. Rubber stamps: name, call and address $1.35. Harry Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSL: samples 25¢ (refundable). Schuch, W6CMN, Wildcat Press, 6707 Beck Ave., North Hollywood, Calif.

QSLS, $2.50 and up. Samples 10¢. RBL Print M.R. 12, Phillipsburg, N.J.

QSLS. Samples 10¢. W7HZ, Wines, Box 183, Springfield, Oregon.

QSLS, SWL's that are different, colored, embossed card stock, and "Kromekote". Samples 10¢. Home Print, 2416 Elmo, Hamilton, Ohio.

QSL's 100 glossy 4 color $3.70 Postpaid. Samples 10¢, or send 25¢ for large assortment and free "Danger, High Voltage" sign. Dick, W8VXK, Rt. 1, Gladwin, Michigan.

RUBBER Stamps for hams, sample impressions, Hamm, W9UNY, 542 North 93, Milwaukee, Wis.

HUNDREDS QSLS: 80¢, Meininger, Jesup, Iowa, Samples 10¢.

DON'T Buy QSLS-SWLs until you see my free samples. Bolles, 7701 Tisdale, Austin, Texas.

QSL'S, Real eyecatchers. Dime. Filmcrafters, Box 304, Martins Ferry, Ohio.

QSLS-SWLS Free Samples. David Spicer, 4615 Rosedale, Austin 5, Texas.

QSLs, Samples. Dime. Printer, Corwith, Iowa.

QSLS, SWLS, samples 5¢. Nicholas & Son Printer, P.O. Box 11184, Phoenix 17, Ariz.

QSLS, Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

QUALITY QSL's. New designs, samples 10¢. Giant, 25¢. Savory, 172 Roosevelt Rd., Weymouth, Mass.

QSLS, Large selection styles, including photos. Lowest prices. Fast service. Samples dime. Ray, K7HLR, 679 Borah, Twin Falls, Idaho.

RUBBER Stamps, $1.00 Call and Address. Clint's Radio, W2UDO, 32 Cumberland Ave., Verona, N. J.

CANADIANS! QSLs in fluorescent colors, by silk screen process. Free samples. Martin, 8 Kensington St., Woodstock, Ont., Canada.

BETTER Than anything you have seen: Craftsman-built British communication receivers. Eddystone Mod. 888A for ham band only; other models for general coverage from $115 to $1270. Spec sheets from Maurice, VE3CZG, Top Television Service, Ltd., Elliot Lake, Ont., Canada.

CANADA: 75S-1 for sale, in mint condx, engineer-owned with Drake 2AQ multiplier/spkr. Includes new spare each tube type, first $500 takes lot. H. M. Smith, P.O. Box 578, Sackville, N.B., Canada.

WANTED: Collins 13C-1 Crystal Box for KWM-1, state price and condx. VE2ADH 11875 Guertin St., Montreal 9, P.Q., Can.

CANADIANS: KWM-1, AC, DC, Mobile Mount for sale or trade on KWM-2. Cash difference. VE5DG, 1421 Retallack, Regina, Sask.P., Canada.

SELLING: One AT7 transmitter, three 110V, 60 cycle selsyns, several 400 cycle selsyns, other parts. Stamp for list. VE3ABL, 1256 Foxbar Ave., Ottawa 1, Ont., Canada.

SSBers! Keep up with SSB news and views! Join the Single Sideband Amateur Radio Association, dedicated to furthering good SSB operating; promoting advancement of SSB equipment; and disseminating SSB technical information. Read "The Sidebander", official publication of the SSBARA. Dues $3.00 yearly. Write for membership application sample "Sideband-er", to SBARA Membership, 1385 Richmond Court, East Meadow, N. Y.

CHICAGOLAND Amateurs! Factory authorized service for Hallicrafters, Hammarlund, Globe, Gonset. Service all amateur equipment to factory standards. Heights Electronics, Inc., 1145 Halstead St., Chicago Heights, Ill. Tel. SKyline 5-4056.

COMPLETE Service—Transmitters and receivers. QSLS reasonable. KØDGX, Keith, 601 E. 4th St., So. Newton, Iowa.

A-5 one inch Vidicon deflection components. 5 piece model VK-100 tube type or transformer type kit; Has deflection yoke, focus coil, alignment coil, horizontal and vertical output transformers. $99.00 net. Also 3-piece model VK-200 direct drive or transistorized kit; has deflection yoke, focus coil and alignment coil. $89 net. Components available only as above kits. Send check or money order. 10 days unused-undamaged return privilege. Cleveland Electronics, Inc., Deflection Components Div., 1974 E. 61st St., Cleveland 3, Ohio.

HT-37 Demonstrator, $365; Drake 2B demonstrator, $225. First certified check takes freight collect. Always lowest prices. SASE for lowest quotation on your needs. H D H Sales Co., P. O. Box 73, Rowayton, Conn.

COLLINS S/Line for sale: 30S-1, brand new, factory sealed; 32S-1 with supply, used 5 hours; 75S-1 with C-B xtals, used 4 weeks; E-V good microphone, used 5 hours. All: $2250.00. F.o.b. Radio KP4HH, Box 5124, Puerta de Tierra Sta., Puerta de Tierra, Puerto Rico.

WANTED: QSTs for personal collection; January through September, 1916. W1CUT, Box 1, West Hartford 7, Conn.

KITS Professionally wired. Half factory charges: others, 25 percent plus shipping. Garrahan, W3QZ, 1445 1/2 Wyoming, Forty Fort, Penna.

CASH For your gear! We buy, trade and sell. We stock Hammarlund, Hallicrafters, National, Johnson, RME, Hy-Gain, Mosley and many other lines of ham gear. Ask for used equipment list. H & H Electronic Supply, Inc., 506-510 Kishwaukee St., Rockford, Ill.

SALE: Collins 30S-1 linear amplifier, brand new. In perf. condx. Never used! Best offer. No shipping, sry! W2NBZ.

WANTED: 6 to 12, 304TL tubes. Callanan, W9AU, P.O. Box 155, Barrington, Ill.

SELL: Used 200V. Like new, $639.00. Organs and Electronics, Lockport, Ill.

AF67 wanted. WA2DCA.

SP-600 JX26 Hammarlund rcvr .54-.54 Mc., $295.00; SP-600 JX-17, $395; HRO-60, $299.00; 75S2, $499.00; Collins 51J2, 51J3, R390A, etc. Teletype Kleinschmidt printers. RTTY converters, Alltronics-Howard Co., P.O. Box 19, Boston 1, Mass. Tel. Richmond 2-0048.

WANTED: Urgent R390A receiver. All offers considered. For sale: complete AF67, PMR-6, mike, Johnson ant., coax relay, cables. Price $200. Also Gonset 40-50 Mc FM rec. w/power and spkr unit (mobile) 12 volt. $50. Mr. Pfeiffer, RO 1-0657, 30 Miller Terrace, White Plains, N.Y.

RANGER, Factory wired, ser. #61100, all new tubes, $200. K6JKP, John Knight, 1122 7th, Sacramento, Calif.

TAPETONE Converters 50 and 144 Mc (never used), $60 each; also 40 and 108 Mc. converters for satellites, $45.00 each; 417A input tube in 108 and 144 units. All 14 Mc. output. Regulated power supply, $35.00. Will consider package offer. F.o.b. W2QJT.

ALL In mint condx, new Wollensak T-1500 tape recorder, $140.00; Victor 60-10 16 mm sound projector, $250; Hallicrafters 039/TRA7 frequency shift exciter, $100; teletype printer TT-55, $100. Zeb DeVille, K5ISY, 5225 Edward Ave., Alexandria, La.

FREQ. Meter BC221-T, $30; BC625, 2 mtrs., $10; ARC-5 rcvrs. 5.2-1.5 Mcs., $8; 3-6 Mcs., $8; .19-.55 Mcs., $10; parts for power supply 0-30 VDC., 20 amps, $50; SW-3, $15; BC-1306, $15, Heath tube checker, TC-2, $20; I-177, $15 inc. postage or railway express coll. W2QND, 176 Winding Way So., Little Silver, N.J.

KWM-2 and AC supply, in new condx. Late serial. Guaranteed, $1050.00. Alton Culver, 530 Elizabeth Rd., San Antonio 9, Texas.

SELL: HO-110C in perf. condx. Includes built-in clock and matching spkr, $180.00, Heath VF-1, $10; Gotham V-80 (never used), $12. Peter Lewis, 111 Dayl Drive, Kensington, Conn.

MOSLEY V-4-6 vertical, used 4 months, complete with 80M base loading coil, guys, blitz-bug, approx. 100 ft. RG/8U and connectors; cost $65. Sell for $38.00. Will ship. W5HSO, Box 307, Belen, New Mexico.

KWS-1, $900. SP-600, $200. W2ADD.

GOING SSB, 32V2, spare 4D32 and 807s, $250. Exc. condx. K9UFV, 501 McKinley, Libertyville, Ill.

COLLINS 30S1 linear amplifier. Used less than twenty (20) hours, perfect in every respect. For quick sales will sacrifice, in orig. carton, $875. F.o.b. Nashville. James O. Pugh, W4GXX, 409 Donelson Pk., Nashville 14, Tenn.

HAMS Vicinity Arcadia, Calif. Sold place S.O.S. for trade F.O.B. backyard at 123 Santa Cruz Rd., Arcadia. One new, creosoted and painted fully rigged 70 ft. cedar pole on or before Feb. 1962 for one 60 ft. crank-up tower f.o.b. as is. Clear easy access to pole. Write R. S. Cole at 216½ 43rd St., Manhattan Beach, Calif.

SELL: Excellent Harvey-Wells TBS-50-C, matching APS-50 power supply, VFO, mike. $75.00. Contact: K9OMO, 521 Alden Rd., Muncie, Ind.

THUNDERBOLT, $465.00; Pacemaker, $275 latest, 4N, F/W, Gonset 500W linear, $125.00. 4N W2DTD, 29 Charles St., Merrick, N.Y.

WANTED: Operating manual for R.C.P. tester Model 411, Hal Rawlette, W6UVW, 4120 Cabinet Circle, North Highlands, Calif.

HRO5TA1, PS, spkr, bandspread coils, mint condx, $150; BC348, AC, $55; Wilcox CW3, 5.6-10 Mc coils, $30; P&H AFC-2, new condx, $35.00; Natl. CFG 109/RC 105 pwr. supply, $15; Collins cabinet, 32V series, $12; D-104 w/stand $15; Vibroplex Orig. Deluxe, new, $15; Knight sweep generator, $25; Lynmar TRS, $5. K2MRU, 556 Wittich Terr., River Vale, N.J. Tel. EX 1-2166.

UHF-VHF Men! Lavoie precision wavemeter, 375-725 Mc., extremely accurate, used, excellent, $20; Philco precision wavemeter, new, accurate, 145-235 MC, $12; both instruments checked recently against Boonton standard. Both have silver-plated cavities, complete with wiring diagrams, calib. charts, spare tubes and batteries. Eico model 324 signal generator, new, wired and calibrated, with instruction book, $27. Express charges collect. W3CLP.

FOR Sale: General Radio 1211-B unit power oscillator .5-50 Mc and matched regulated power supply GR 1201-B. Both in new condition, hardly used. Best offer over $175.00. Orig. cost $350.00. Mail only. Brock 2226. E. 28th St., Brooklyn 20, N.Y.

SALE: Complete station of DX-100, SX-28, bug, Morrow Conelrad Monitor, keys, mike, dummy load, baluns, metal table, clock, spkrs, chair, and all cabling. Everything rebuilt to match. Works good, won't ship. 600 lbs. $425.00. W1VKY.

VIKING Ranger and HQ-140-XA for sale. Both excellent condx, perf. mechanically and electrically. Ranger, factory-wired and tested, complete with instrux. manual, orig. sales slip and shipping box. HQ-140-XA complete with spkr, XC-100 calibrator, instruction manual and orig. sales slip. Prices $185 and $160 respectively. Larry Guenther, W9ACS, 315 Dempster, Evanston, Ill. Phone UN 9-4421.

WANTED: Jennings variable vacuum condenser UCS 10-300 or 10-400 mmf. 10KV or 15KV. WØBFB, Mitchellville, Iowa.

SELL: HT-33A, $495. F.o.b. Bill Fiscus, One Maiden Lane, Lynnfield, Mass.

75A3, 3 kc. mechanical filter, spkr, vernier knob, mint condx, $350.00. Deliver 100 mile radius. K1TIB, 25 Hickory, Holyoke, Mass.

FOR Sale: Collins equipment, all changes to date made: in perf. condx: KWS-1, 975; 75A4 with spkr, $575; KWM-1 with spkr and pwr. supp., $585; KWM-1 mobile mount, unused, $45; new 12VDC mobile pwr. supp. 516E1, $195; latest Central Electronics MM2 with 455 Kc adapter, $90; Hallicrafters SR-34 AC-DC 2 and 6 transmitter/receiver, $290: Globe 6 and 2 VFO, $48; pair 4-250A Eimacs, orig. cartons, $38, pair United 838s, $8. E. O. O'Brien, 86-10 34 Ave., Jackson Heights, 72, L.I., N.Y.

WANTED: Heathkit KS-1 power supply. Please state condition and price. K1LMJ, Bineau, P.O. Box 427, Lisbon, Me.

ART-13, 210 watts, with antenna coupler and power supply, 80-40-20 meters. TVI suppressed, $145 or trade. For details: KØMUK, 457 Yorkshire Place, St. Louis 19, Mo.

KWM-1 with Collins AC pwr. supply, wattmeter in speaker console. Excellent physical and electrical condition. Never operated mobile. In original cartons with instruction books. All modifications done at factory. Cash and carry, $600. Capt. David Shoup, OMR 672, Keesler AFB, Mississippi.

FOR Sale: HQ170C, perf. on all bands, no modifications, no scratches. $270.00. F.o.b. K5IPK.

FOR Sale: New and used items. Beam antenna, xmtrs, tubes, manuals. Send stamp for list. Wanted: Used rcvr, $35 or less. Sam Kofsky, W2YSF, 201 Eastern Pkwy, Brooklyn 38, N.Y.

SELL: DKC-TRP TR switch, self-contained power supply, instructions, original carton. Best offer. Write George Sucich, WA2JHN, 6000 Tyler Place, West New York, N.J.

MUST Leave amateur radio. All equipment in excellent condition. Will ship C.o.d. except transmitter, Globe-King 500A (late serial number) with Elenco voice-power gainer attached, $279; Johnson KW Matchbox, $65; multiphase RF analyzer, $65; D-104 microphone with stand, $16; Knight 50 w. transmitter with screen modulator, $29; Knight VFO, $18; Universal modulator, $25; Voltohmmeter, Simpson mod. 260, $25. K3CBS, Dr. Gordon M. Dunning, 800 Woodburn Rd., Rockville, Md.

KWM-2 with AC power supply, in mint condx, $950. Ship freight collect. W8DRN, 2554 Lafayette, Cleveland 18, Ohio.

BEGINNERS: Code bothering you? Now learned in one hour. New Method. Quick approach toward ham ticket. Used in armed services, ham radio, scouting. "Ketchum's Hour Code Course", $1.00 postpaid. Guaranteed. Oaks Ketchum, 10125 Flora Vista, Bellflower, Calif.

WANTED: KWM-1 complete. Send description and best price to W2OBH, 200-27 46 Ave., Bayside 61, L.I., N.Y.

SALE: 75A4 Serial #3200, $475; HT-37, $360; MM-2 scope, $90: all in like-new condx. Ship C.o.d. for certified check or money order. Orig. cartons. Dr. J. R. Perciful, Medical Arts Bldg., Louisville 17, Ky. GL 2-2116.

2-Meter Communicator IV, better than new, asking $275. 1 KW Onan 115V, 60 cycle power plant, asking $200. WA2EFO, George Mowbray, 14 Washburn Rd., Mt. Kisco, N.Y. 914-MO 6-8507.

GLOBE SCOUT 680A, $75; Heathkit VF-1, $15; Hallicrafters S-38D, $25.00; RME-99, $50. L. C. McCall, W4GCD, 614 Valley Drive, Dalton, Ga.

75S-1 with F1-1 500 cycle filter for c.w. $425. L. A. Morrow, W1VG, 99 Bentwood Road, West Hartford 7, Conn. ADams 2-2073.

BOLEX H-8 Deluxe with three f/1.9 lenses. Surefire grip, filters, English leather case, etc. All in like-new condx. Will swap or sell for Gonset G-76 or Collins KWM-1 mobile gear. William Garrett, 1021 E. Scottwood Ave., Flint 7, Mich. Tel. CE 3-6449.

WANTED: Amplex KW-62 6 and 2 meter amplifier, with or without tubes and power supply. Also W4IMP "IMP" low power version. Please write Box 55-7574, Gregory, K4OLK, Miami, Florida.

C-W crystals. Marine, Amateur, etc. See our previous ads. Box 2065Q, El Monte, Calif.

DESIRE KWM-1 at best price. Bob Foss, 54 Bald Mountain Drive, Bangor, Me.

MUST Sell DX-100; SX-101 Mark III, perfect, $295.00. WA2QEK, Brooklyn, N.Y. Tel. DI 5-2020. A. Wm. Friedberg.

WANTED: Gracie says I need another transmitter like I need another hole in my head, but if you've got a good clean KWM-1 let me know your best price. Larry Kleber, W9CPD/K9LKA, 922 Whitney Blvd., Belvidere, Ill.

SELL: SX-111, R48, best offer $225 or over. Will ship. Wayne J. Schmidt, 1009 South Main, Aberdeen, South Dakota.

VALIANT: In fine shape: $250.00; HY170C, 3 months, perfect, $310; Apache, fine shape, $200; SB-10, perfect, $75, never used. Monitone, $12; Eldico SSB-1000 linear, 2 space 4X250B tubes, $200. Wanted: KWM-2 or Gonset G-76 transceiver, or cash. Jerry, K4ORP.

75A4, serial 3858, perfect, $490; 0.5 Kc mech. filter, $40; 2 KW custom-built 4-400A final, illuminated meters, built-in 3750 VDC power supply, regulated bias and screen, panel adjusted, Class AB_1, AB_2, or C. 80 thru 10 meters. Professional appearance with manual; $385; "Sideband Package" June QST 1958, highest quality, 40 watts, 80 thru 10 meters, professional appearance and workmanship, $185.00; Rohn tower, 65 ft., heavy duty, galvanized, top section, torque bars, $75; Gonset Triband beam, mod. 3220, $85; Ham-M rotator, complete, $85; Morrow mobile converter, 5BR-2, $40; Mosley Triband mobile whip, $10; dynamotors, transformers, misc. K4BMC, Memphis, Tenn.

FOR Sale: Complete station, Apache, HQ-110C, Mosley TA32 Jr., 32 ft. Globe spire tower, TR-4 rotator, Dow relay, Bud TVI filter, 75 ft. of RG/8U. Deliver 200 mile radius—$475. Marvin Hamilton, W5AYI, 905 Camilla, Shreveport, La.

CLEANING House: Knight R-100 w/spkr and "S" meter, $95; Vibroplex key, in exc. condx, $15; Slide-out rack cabinet 12" x 24" x 60", $40; crystal mike, $5.00; send stamped envelope for list of xfrmrs, chokes, resistors, u pay postage or pick up. Eugene Barowski, K8UGQ, 87 Monroe St., Berea, Ohio.

PRECISE 300B, 7" 'scope, $75; Precise 116 tube tester, CRT adaptor, $70; Turner crystal mike, desk stand, $4.00; RCA "45" changer, $4.00. V. R. Hein, 418 Gregory, Rockford, Ill.

SELL-Trade: Superior 20 amp. Variac model 136, $25; commercial-looking homebrew 75-40 meter 15 watt mobile xmttr, $35; ART-13 supply 28v./10 amps. D.C., $22; also one at 7 amps., $18; #22 Formvar copper wire, 10 pound spool, $9.00; Vibrapack 12v.-390v./90 ma., $8; 1000 Kc frequency standard, built-in, $10; 30 watt modulator, $15; supplies: 750v./250 Ma., 6.3v, $18; 1200v./250 Ma., $20; Triplett 630 VOM, $30. Converted BC-457 VFO, supply built in, $20. Everything in mint condx. Stan, W8QKU, 2748 Meade, Detroit 12, Mich.

FOR Sale: SX-100 with speaker, in new condx, used 20 hours, in orig. carton, $200. H. L. Allen, Jr., P.O. Box 248, Elton, La.

COMPLETE Mobile station; Elmac AF-67, Gonset Supersix, Carter 6v. supply, all-band antenna, mount, Shure microphone, all fittings and relays. Best offer over $195. K2SIF, 70 Longfellow Rd., Great Neck, L.I., N.Y

QSTS run: 1954-59. Swap or sell F.o.b. Nat Stinnette, Umatilla, Fla.

COLLINS 51J-4 Ser. 1923 with three filters, perf, condx, $1100. E. Vilagi, W8BBA, 502 Sixth St., Fairport Harbor, Ohio.

FOR Sale: Eico Mod. AT-1, Bud Lo-pass, xtal calibrator, mobile rig, and more. Write for free list and prices. S. Bomba, 107F Eagle Heights, Madison, Wis.

K3ICP Selling out: Viking 500, factory wired, one year old, $500; Ray Borders, Radio Electric Service Co., 3rd & Tatnall, Wilmington, Del.

SELL: Transmitter, 350 watt input, 'phone, c.w., complete except for speech amplifier. Home built. Real bargain, cash and carry. W3KAB, 213 Newtown St. Rd., Newtown Square, Penna. Telephone ELgin 6-0681.

SELLING HQ-145C w/cal., $230.00; Ranger w/PTT, $190, like new condx. Mosley 40-10 M vertical w/radials, $25. K9OFK.

FACTORY Wired CE20A, QT1 and BC348. Drake 1A WWV and calibrator. Both in like new condx. Make offer. Am interested in tape recorder and compact KW linear or Class C final. W8ZBD, 1605 Iowa, Midland, Mich.

ELDICO SBA-1 Sideband Adaptor with xtal-lattice filter, Q-multiplier, I. F. noise limiter, adj. AVC S-meter, will drive spkr. New, in original box w/manual, $200.00. W2LAH, Box 42, Setauket, L.I., N.Y.

JOHNSON Ranger, brand new condx, $150.00. Come & get it. W2HO Mountain Rd., Monroe, N.Y.

COMPUTER Amplifiers for parts, less tubes, 4" x 5" x 15" case, with handle, $4. Box 7, Cambridge 39, Mass.

GOING Mobile. Will sell HQ-160, $275; Valiant, $300; Johnson 6N2, $100; Johnson 6-2 converter, $40; Heath VFO rewired for 6, $20; all in exc. condx. Sell individually or as unit for $600. K7LQI, 11557 Evanston Ave., N., Seattle, Wn.

MECHANICAL Filters: I have just purchased 200 surplus units which contain 300 Kc mechanical filter 4 slug tuned Hi-Q coils, BFO coil, over 75 half-watt resistors, 10 silver micas, 200 ceramics circuit of filter included. $12.50 each, postpaid. W. R. Selden 4021 West Broad St., Richmond, Va.

HQ-170 with Deluxe matching spkr. In fine condition. $279. H. Lester, W2ODC, Box 6, Alpaus, N.Y.

SELL, Swap Heath Mohican factory check-out. Want SB10 or mobile, all-band transmitter. New York area. WA2OZV, Davenport 575 E. 168th St., Bronx 56, N.Y.

LETTINE 242 6M transmitter with VFO, $75; BC-348R with homebrew power supply, $30; Sixer modified 8 Mc. xtals, $30. Want 6N2 transmitter with or without VFO. Jack Didwell, WA2KXN, 50 Pine St., Brooklyn, N.Y. TA 7-9160.

QST run, May 1929 through December 1945 for sale. October and November 1931 issues missing. Make offer. C. F. Stafford, W2AAU, 85 Coolidge Ave., Spencerport, N.Y.

SELL: Collins 75S1 with 500 cps filter and Sidetone crystal, 32S1, 516F2, 312B4. All latest factory modifications, perf, condx. Orig. factory cartons, instruction books. Best offer over $1200. 4-1000A amp. Write for sked. 14:340, 327 Hillside, Richardson, Texas. Eastwood, W5JSZ/W5BKU.

PREMIUM Quality used equipment. Over 1,000 units. Reconditioned with trial plan and full ninety-day guarantee. Terms available. Write for free lists and top trade-in offer on your present equipment. World Radio Laboratories, Box 919, Council Bluffs, Iowa.

COLLINS 30S-1 linear, excellent, $1050; Westinghouse 6kv 1 mfd. filter capacitors, $15 pair; 4-125A, $5.00. F.o.b. Winnebago, Ill. D. Mitchell, R1 B 59.

SEND For flyers listing transmitters, receivers, teletype converters, tubes, components. Spera Electronics, 37-10, 33rd St., L.I.C., N.Y.

MASCO Super Sky-Chief TV booster, $20; meters: RF milliampere, $7; HF amperes 0-1.5 BC-442A ant. relay unit, $5.00. Atwater-Kent spkr, Type N (antique). Collins spkr 312-A-1, $25.00. F.o.b. WITHM.

FOR Sale: Unbound QSTs, 1948, 1949, exc., $4.00 year; meters: Weston Mod. 301, 100ua, 200ua, 10 ma., 25 ma. $4.00 ea.; Model 1532 VU, $5.00; Model 1521, 20ua. $4.00; Triplett Model 221, 0-15 DC amps., $2.00 ea; tubes: four 4X150As, $3.00 ea; four 811s, $1 ea; four 3B28s, $1.50 ea; three 4-125As, $7.00 ea. Johnson 229-201 Var Inductor and dial, $10. W2UPJ/4, 6312 Pinefield Rd., Columbia, S.C.

TELREX Tri-band TB7E, 20-15-10 beam. Has been assembled but never put up. Moving to new QTH. Will sacrifice. Best offer. W1ICW, 39 Florentine Gardens, Springfield 8, Mass.

HEATH "Twoer" with three rocks, vy clean, $40. Jehu, K1GLL, Suffield Academy, Suffield, Conn.

FOR Sale: Eico 720, 730; Collins 75A4 Serial 1816, one filter spkr. KØHWE, 1533 D Ave. Northeast, Cedar Rapids, Iowa.

SELL: QST January 1940 through December 1949. $3.00 per year, $25.00 complete set plus shipping. In exc. condx. Brandt, 221 Newman Springs Rd., New Shrewsbury, N.J.

FOR Sale: DX-40 transmitter, $40.00. Jim Wilson, 204 Prather Hall, Austin 18, Texas.

MUST Sell, Going to college, Globe Scout 680, $50; NC-98, $95; AR-22 rotor, $15. All in FB condx. Write K. Rygler, K3VPU, 147-09 76 Ave., Flushing, L. I., N.Y.

XTALS for sale cheap: 7048, 7056, 7166, 7175, 21153. James Hampton, 1010 Booth, Dubuque, Iowa.

SELL: DX-40, perfect, $45.00. D-104, $12.00. Joe, K3CQY, Roseto, Penna.

SELL: 2-4-400A's at $15 ea. 2, 813s, at $5 each. Used, good. W1LWV.

FOR Sale: New SX101A in factory carton, $325.00; new professionally wired Heath HW-30 transceiver, $50; new Hy-Gain 2-meter beam, $14.95 list, sell for $8.00. Good used Navy LM freq. meter with AC power supply, $40. All with manuals. W4-TAI, 229 Seaview Ave., Daytona Beach, Fla.

FOR Sale: HT-33A, perfect with new PL172, all latest factory modifications for 2 Kw. PEP in AB1. Will consider trade for latest model Viking Ranger FW. S. Lucich, 3809 Lakeview Rd., North Little Rock, Ark. W5NKE.

GATES Sta-Level compressor amplifier; Morrow 5BR1, allband converter with noise limiter; SCR-522 transmitter with new RF tubes; BC453 85 kc. IF coils: PE103A 6-12v dynamotor; 6 volt coaxial relay; mobile antenna mount; QST issues from 1948. Sell for best cash offer. E. Pyle, K1OKK, 120 Appleton St., Cambridge 38, Mass.

FOR Sale: Custom-made ceramic ash 'ray (green, brown or white). Your handle and call letters in gold. $5.00. Choctaw Ceramics, K5ZTH, Jim, RR 1, Box 14K, Choctaw, Oklahoma.

WANTED: Coil G (180-430 kc) for National HRO Series 5 recvr. J. R. White, W2WBI, 118 Cedar Lane, Princeton, N.J. WILL Trade 1960 Mercury 700 outboard and 1960 Thompson 17 ft. Sea Lancer with coupe top, side curtains, rear cover, full length cover, rear seat, de luxe cushions, tachometer, speedometer, etc. like new, total 38 hours use since new last July. Will trade for S Line equipment or equivalent. No duty payable on merchandise returning to USA. Write VE2ZO, 36 Birch Hill Road, Baie d'Urfe, Montreal, Que. P., Canada. Phone GLendale 3-6542.

HEATH HW2O Pawnee, complete. Excellent. Latest modifications. Sacrifice at $225, for quick sale. Telrex 8-el. 2M beam. New, in carton, $12.00. Phelps, WA2BPL, 6 Edwards St., Apt. 2D. Roslyn Hgts, N.Y.

SELL: Like new, 2 mtr. Tecraft converter, $25; 130-watt 2 mtr. xmttr, $35.00; Gonset noise silencer, $3.50 ½ kw final and supplies and modulation, $65, extras. W2LPB, 13 Shepard Place, Nutley, N.J. NO 7-7552.

SELL: Station package: factory-wired Valiant: SX-100, mike, relay, 3 dipole antennas; assorted valuable junk. All in mint condx, with original crates. $500.00. WA2AZF, 1 Barnes Ave., Baldwin, N.Y.

FOR Sale: Globe Chief Deluxe, in exc. condx. $55.00. Will pay shipping anywhere in U.S.A. Jim Rhein, P.O. Box 142, Jonesboro, Tenn.

FOR Sale: 32S-1, #2918, 75S-1 #2555, $825; HT-37, $375; GSB-101, $265; B&W L-1001-A, with tubes, $225. Transformer, 220/3800 VCT at 2.7 amps, $50. Elmac 4-65-A, new, $5. James Craig, 72 East Sixth, Peru, Ind. Tel. GR 3-9306.

SELL: For best offer, Proceedings of IRE, run 1951 thru 1960. In exc. condx. F.o.b. Winston-Salem, W4DSM.

WANTED: Commercial or surplus aviation and ground transmitters, receivers, test sets, 18S, 17L, 51R, 618S, GRC, PRC, ARN14, MN85, Bendix, Collins, others. RITCO, Box 156, Annandale, Va.

DX-20 Manual 3L Gotham 20 m. beam. $25.00 each. K4TOZ, 3917 Michigan Drive, Louisville, Ky.

WILL Trade RCA 5820 image orthicon television pickup tube for good receiver or SSB transmitter or two 4-1000A tubes. Vern Slagle, 1704 Hale, Ft. Wayne, Ind.

FOR Sale: HT-37, $365; HQ160, $275; both like new, Heath reflected pwr. mtr., $10; Eldico signal tracer, $20; TCS-14 xmttr and pwr. supp., $50; Meissner freq. std., $20; manuals. F.o.b. Roseville, Calif. Merle Eason, 310 Fremont Ave.

FOR Sale: Collins 312B2 spkr, wattmeter, console, for use with KM-1. Special, $95. F.o.b. N.Y. Can also be used with 32S1. Jack H. Garretson, W2AOM, 1235 E. 40th St., Brooklyn 10, N.Y. Tel. DE 8-4644.

SELL: Johnson Thunderbolt $425.00; HT32, $425.00; SX101 rcvr., $225. All in new condx. Will sell complete station w/accessories. Write for details. K2SJJ/8, 4058 Herman Ave., S.W., Grand Rapids 8, Mich.

SELL: HT33A, 600D mobile mike, JT30 mike, pair 4CX300 tubes with sockets. W9MZP, 7055 Cleveland, Niles 48, Ill.

KOOL KW final: PP 4-250A, Class AB-1 or Class C; 2000/2500V at 600 Ma. sep. screen and grid supplies and separate meters for plate, screen and grid; plug-in coils, plate and grid, for 15,20,40 meters; built into HT-4 case (same shape and size as BC-610); steel dolly with castors. Sry, cannot ship. $175.00 or your best reasonable offer. Write: Fred Wesservelt, W4NO, 1705 Essex Rd., Charlottesville, Va.

TRADE: Rolleiflex 2¼ x 2¼ model 2.8D with case. Brand new. Never used. Want: Late model Communications rcvr. All letters answered. Donald Farrell, Chittenango, N.Y.

CRYSTALS; 80-2 meters, 25¢ each. Guaranteed! Send for list of frequencies. Stancor power transformer 1200VCT at 200 Ma., plus filament windings. $4.75 each, plus postage. W6IMC, 210 Alden Rd., Hayward, Calif.

FROM Estate: 75A4, #5149, $575; 75A4, #2316, $500; 312A-1 speakers with light included; Johnson 250-30-3 Matchbox, $100; B&W 550-A coax switch, $5.00; 32S-1, #2392, $450; 75S-1, #2904, $375; 312B-4 console, $135; MM-2 'scope F/W, 455 adapter, $100; RCA Senior voltohmyst, $55; D-104 mike, G stand, $20; assorted 40 meter crystals, $1.50; Teleplex code practice set, three drums, $25; Bud Codemaster, $9; Heath Pawnee transceiver factory aligned, $195; Wen ⅜" 808 drill, $15; Mastercrafters 24 hour clock, $5; Weller D-550 gun, $7; RCA model 7-EMP-2L record player in case, $15. Contact Dr. William Cunningham, W4LAN, 19 Twelfth St., Columbus, Ga.

DX-100 needs output loading condenser modification kit. $150 or best offer. George O'Donoghue, Patricia Ave., Fishkill, N.Y.

51J3, 4, R388/U wanted, trade HT-37 and cash to fair market value. Send details. KØSBS, Omaha, Nebraska.

GONSET Super Six, $20.00; James C-1050, $20.00; Mobile whip with 40-meter coil, $10. WØEUQ, 901 13 Ave. S., Grand Forks, N.D.

KWM2 Serial #11612 and 516F2 power supply. Used less than 25 hours. R. J. McMahan, K3KSM, 15 Thackeray Road, Wellesley, Mass.

HEATH Apache with S-200 mike; Heath Conelrad alarm, $199; Hallicrafters SX-101A, like new, with R48 spkr, $330.00 W1-UYU, 495 Water St., Framingham, Mass. Tel. TR 2-8628.

HIGHLY Effective home-study review for FCC commercial phone exams. Free literature. Wallace Cook, Box 10634, Jackson, Miss.

COLLINS 75A4 with 800 cyl. filter Ser. 4964. KWS1, Ser. 1164. $1500. In mint condx. K8EJY, 1508 Constance Ave., Dayton 9, Ohio. Pick up deal. Sry, no shipping.

DX-35, excellent. 3 Novice xtals, inst. manual, $39; FM-40X, FM-175X mobile FM units, mike, control boxes, most connecting cables: NRI multitester, needs work but includes all necessary manuals. Quotes? K1PVI, 3 Old South Lane, Andover, Mass.

SALE Or swap: Ranger, $185; Viking 6N2 with VFO and cables for Ranger, $115; Gonset III, 2 mtr., $200; Gonset 1.6-6 Mc. converter, $18. Want: SSB gear, Valiant, Model 15. K1NGJ, E. Norton, 22 No. Liberty, Nantucket, Mass.

COLLINS 30S-1 linear, like new, used only few hours, $1175. Will ship prepaid airfreight. Howard Winner, W4SWY, 9100 S.W. 61 Court, Miami 56, Florida. Tel. MOhawk 7-3127.

SALE: 600 watts fixed and portable station. 813s final. 805 modulator, two mercury VAP. Hi-Voltage rectifiers, one hivacuum, lo-voltage rectifier mounted in a 6 ft. rack, speech clipper, amplifier. Elmac AF54H with AC and Dynamotor supplies; HQ120X rcvr with Q-multiplier, Tri-Band converter. James Murray, K3QAW, 217 N. Poplar St., Elizabethtown, Penna.

FOR Sale: NC-300, $200; DX-100, $125.00; BC312, $40. Heath Conelrad, $8. Cleaning out hamshack. Write for list. Frank, K9BGF, 2421 K St., Bedford, Ind.

HQ-140X, 3 el. Tribander, both with accessories, other equipment. Old QSTs (50-59). Call WE 5-9367, Dick Stein, K2OPJ, 15 Parkway Drive, Syosset, L.I., N.Y.

MATCHBOX, Monomatch, w/meter, $45.00; HQ-110C, w/ clock, spkr, manual and factory carton, $185.00. KØVYV, "Jud" Schandel, Blue Earth, Minn.

SELL: HQ-160, $260; Apache transmitter, $239.00; Knight 50 watt transmitter, $29.00. K9UKJ, 7205 S. Euclid, Chicago 49, Ill., Tel. FAirfax 4-9174.

SALE: DX-40 with mic, $59; SX-96, very clean, $150.00. Roy Welter, KØCNI, RFD 2, Olivia, Minn.

HT-32, completely factory serviced and Courier, factory-wired, both guaranteed in gud condx. First $450.00 check. R. B. Cooper, W8AQA, 132 Guild St., Grand Rapids, Michigan.

S-107, not used over ten hours, $78; AR-3 case, Q-multiplier in A-1 shape, $38, or your best offer. Lindsey Coleman, Box 391, Williamson, West Va.

WANTED: KWM-2 transceivers and any old issues of QST from inception through 1925. Al T. O'Neil, Camp Lakeview, Lake City, Minn.

ELECTRONIC Kits wired and tested. Finest quality workmanship. Hammond, KØHWE, 1533 D Avenue Northeast, Cedar Rapids, Iowa.

COLLINS 32S-1, 75S-1, 516F-2, perfect condition, $800 or complete station including TA-33 Tribander, AR-22 rotator, Hallicrafters spkr, Jap dynamic mike and bug, all cables, $875. William Fairchild, K5UZQ, 910 S. Shepherd Drive, Houston 19 Texas.

COLLINS rcvr 75A-4, spkr and manual. In exc. condx. $600. Kenneth Engstrom, W5CUM, 833 Oak Forest Dr., Dallas 32, Texas.

SELL Globe King 500, in exc. condx, $325.00. K2KBU, 168-18 14th Ave., Whitestone, N.Y. Tel. GLenmore 6-6300.

FOR Sale: Hammarlund HQ-120, VTVM, Webcor tape-recorder, Dumont 208 oscilloscope, Contax single lens reflex camera, VFO with 813 final transmitter. Write for picture and list. T. F. Waters, 140 W. Gilpin Ave., Norfolk 3, Va.

FOR Sale: 32V2, $210; LM13 with calibration, Instrux manual, $48. W2HAE, Art Ford, 85 Franklin St., Northport, L.I., N.Y. Tel. ANdrew 1-8474.

KWS-1. This fine rig guaranteed to have seen very limited use (60-80 hrs), just returned from factory for alignment, etc. Absolute perfect, $995. Sry, cannot ship. 1960 factory-wired Johnson ranger, $225.00; NC-300, $195; B&W 73 ohm Matchmaster, $19. Set of 8, brand new, 20 meter traps, specially made by W3DZZ for 20-40 meter beam (1⅝" tubing), $28.00. Bob Sommerfelt, K2GXI, 120 Yorktown, Buffalo 26, N.Y.

WANT QSTS 1915 through 1922. Sell extras 1923 on up. TMC GSB-1, new condx, $80. Eddystone 888A rcvr, new, $400. W2DYU, 36 New Lawn Ave., Kearny, N.J.

HQ129X, $100; 7620 CT 110/220 volt 400 Ma transformer, $19; 110 volt 30 amp. Variac, new, $36.00; 50 mfd. at 3000 volt condenser, new, $19.00; Transcon TNS, $10.00; PS2V push-to-talk, $25; Mosley 4-6 Vertical, $19; 12 volt Dow coax relay, $6.00; PE103, $7.50; Pacemaker, $229.00, factory-modified; 6 volt 100 amp. alternator, $35.00. Sell or trade for 'scope and signal generators. William Baxter, 3702 No. First Ave., Tucson, Ariz.

COLLINS 32V3, 75A3 with matched spkr, Bandmaster Z match, Shure microphone, ready to go on the air, ship collect anywhere. Price $750. No instruction books. Ed Thompson, K7LJE, 2126 N. 69th Place, Scottsdale, Ariz.

COLLINS 30S-1, Save $600. Like new condx. First certified or cashier's check for $950 buys shipped in original packing, F.o.b. Chicago, F. Price, 4620 Magnolia, Chicago, Ill.

HALLICRAFTERS SX-101 Mark III, perfect, just factory reconditioned, $250. Will deliver 100 miles of Chicago, Bill King, 204 Lagoon, Northfield, Ill.

SWAP Or sell: power supply parts, meters, tubes. K9VHG, 1400 So. 11th, Quincy, Ill.

CURED Of the radio bug! This rig makes it too easy. KWS-1, $975. 75A-4, $525. Robert Scott, W3DKM, Uniontown Rd., Westminster, Md.

TRADE BC1031-C Panoramic Adaptor, D-104 mike with G stand for citizens band rig; garden tiller, compost shredder or grinder. Trade HQ-170C for Drake 2 or 2-B. I am on move and need small rcvr. John Bagwell, W5ZYR/4, Somerville, Tenn. 302 W. High.

GREAT Deal!! DX-40, wired by a professional w/key and 2 xtals. Plus ATR switch which mutes rcvr, 2 keys, VFO, 3 switches ant. Only kit. Price $65. K4NDX. 1347 Avalon, Montgomery, Ala.

RECEIVER, df, 100 through broadcast, RCA DP12, $20. McKenzie, W2SOU.

SELL: G28 Communicator, used less than 1 month, in exc. condx; $175; Globe 755 VFO, factory-wired, perfect, $35.00. Dan Munro, 2835 Forest, Ashland, Ky.

SELL: 4-1000A, air system socket, filament transformer, and blower, also variable vacuum condenser and kilowatt plate transformer. All bought new, no surplus. R. Yeager, 1455 Wilson, Chicago 40, Ill.

SELL: 2-meter Communicator II, $150; Gonset Commander II with VFO, 180-6 meters; $70; matched pair BC-611 walkie-talkie w/batt., in exc. condx., freq. 3885, $90; Eico HF-85K stereo preamp., $45.00. Richard Eckhouse, W9EGY/2, 705 E. Seneca, Ithaca, N.Y.

FOR Sale: Globe LA-1, linear amplifier, $69; Globe Scout 680 with Drake low-pass filter, $70; Globe 755 VFO, $30.00; Globe PA-1 power attenuator, $8.00. Eugene Triebold, KØMBO, Cooperstown, No. Dakota.

SURPLUS Westinghouse transmitter, good for cool Kilowatt. See page 156 July QST. Price reduced to $200. W2IWV.

LEECE-Neville alternator, latest type with silicon rectifiers, 40 amps mounting and regulator, $50. W2KDC.

HAM Service: factory authorized Hallicrafters, Hammarlund, Gonset, National. Special: ceramic 4X250B's, new, late surplus, $20.00 postpaid U.S. Quinn Electronics, 6605 Mardel, St. Louis, Mo.

FOR Sale: BC-348 with built-in AC power supply, $50.00. W5NW, Box 586, Odessa, Texas.

LICENSE Renewal Reminder service. Biggest bargain in amateur history. Automatically brings you renewal reminder sixty days before expiration. Attach 25 cents to QSL Card, print date license expires, address envelope to Automative Reminder Service, Box 1461, Evanston, Illinois.

10 Amp, 24V rectifier, $5.00; 110V selsyns, $3.00; 500W isolation transformer, $7.00; 5A Variac, $5.00; telephone relays, 25¢; SX-28, $60. B. J. Kucera, 10615 So. Highland Ave., Cleveland 25, Ohio.

SELL: 2 meter Gonset Communicator II; 2 meter 8-el. Telrex beam; AR-22 rotor; JT-30 crystal mike; 70 ft. RG-8 coax; 80 ft. rotor cable; 2 meter halo. All in excint condx. Will demonstrate. Entire station $210. Richard Duberstein, 114 Reeve Rd., Rockville Centre, L.I., N.Y.

COLLINS 300G 250-watt broadcast transmitter on 1490 Kc, excint condx, $1250. F.o.b. Marietta, Ohio. Clark Communications Service, Marietta, Ohio.

DX-20, $25; Knight 50 watt and two SW-54s, $30 each; Heath VFO, $15; Q-Multiplier, $5.00; gud equipment. Will reply all queries. Flansburg, ETA School, Treasure Island, Calif.

SELLING For school: factory Globe Chief, screen modulator, S-38D, VF-1 with supply, bug, mike, KW lo-pass, hi-pass, $110. K7BBU, 1018 Cota, Shelton, Washington.

WANTED: To trade Ampro 16 mm. Premier 20 sound projector, carrying case, spkr, combination baffle, 50 ft. cord. Plugs complete, used very little. Cost $530.00 with F1 2" lens. For NC-303 rcvr, Johnson 500, or equal value. What have you? W5CDI, P.O. Box 417, Jonesville, La.

6 Kc. mechanical filter F455J-60 for 75A-4 wanted. K1JPR.

CLEANING: B&W TR switch, $7.00; 400-watt plate mod. xmttr, $95; old wire-recorder radio, $15.00; 810s, 813s, Meissner VFO, $18; power supplies, ground-plane Tribander, $8. Roller inductor, etc. K2KGU, MO 6-8513.

FB DX-20, $20. K7LSU, Box 748, Benson, Ariz.

SALE: KWS-1 Serial #262, modified, new 4X250B 75A4, serial #5700. Excellent condx. Both $1400. KWM-1, serial 714 with blinker, AC and DC power supplies, mobile rack and cable. $700. F.o.b. W3DAE, 3603 Schoolhouse Lane, Harrisburg, Penna. Phone 711-KI 5-8673.

500 W c.w. 150 'phone, $13 HANDBOOK xmtr, complete, $225; TCK-4 xmtr (2 813s in final) only $225.00 w/o pwr. supply; Hammarlund Super Pro, $90; 10-20 converter, 20 M. beam w/8 ft. tower, GD-1, etc. Must sell for college. Tyler KØGFJ, 1564 Fulham St., St. Paul, Minn. Tel. MI 4-2992.

AWARD-Seekers: International Reply—Paid QSLs really get results! 75 for $1.00, postpaid. Hart, 467 Park, Birmingham, Michigan.

SELL: Mosley 3-element 20-Meter beam, $30.00; Morrow MB5 mobile converter, $35.00; Shure carbon mobile mike Model 505K, $10; NRI Radio & TV Service course, $20.00. John Neugent, 139 Beaupre Ave., Green Bay, Wis.

SELECTED Reconditioned equipment: Collins 75A1, $229.00; Central 20A w/QT-1, $169.00; Drake 2A (new), $229.00; Gonset G-77A complete, $199.00; 10A W/QT-1 and VFO, $89.00; GSB-101, $295.00; Hallicrafters HT-32, $429.00; Hammarlund HQ-129X, $139.00; HQ-110, $179.00; Heath DX-100, SX71A, S-76, SX99, S107, SX101 III, $159; SB-10, $75; RX-1 Mohawk, $249.00; DX-40, $64.00; Johnson Ranger, $189.00; National NC109, NC98, NC240-D and many others. Send for complete list. Radio Distributing Co., 1212 S. High St., South Bend, Ind.

"HORSE-Trader Ed Moory" offers reconditioned bargains, used HT-37, $319.00; Drake 2-B, $229.00; 200-V, $639; 75S-1, $359.00; 75A-4, $519.00; KWM-2, $859.00; GSB-100, $289.00; NC-300, $179.00; HQ-129X, $85; 30L-1, $459.00, 32S-1, $479.00; Viking Valiant, $299.00; 100-V, $479.00; 20-A, $149.00; 51J-3, $439.00; *Demonstrator*, SX-111, $209.00; *GSB-101* Linear, $249.00; Globe-King xmttr, $89.00; Thunderbolt Linear, $379.00; new 4X-250-Bs, $24.00; Hallicrafters new HT-41 linear, Immediate Delivery. Terms; Cash, no trades! Ed Moory Wholesale Radio Co., Box 506, DeWitt, Arkansas. Phone WHitney 6-2820.

NOTICE! Wish to contact K8AOY. Write information to Douglas Fuhr, Box 721, Holland, Michigan.

GENERAL Electronics factory-wired model "B" slicer wanted or person who had same at Hamfesters Picnic. Write W9QLZ, George Keith, RFD 1, Ogilesby, Ill.

CHANGE Xtal frequency, etch, safe method; everything needed; ammonium bi-floride, containers, holder, instructions. Guaranteed. $1.00 postpaid. Ham Kits. Box 175, Cranford, N.J.

500 Watt trans wid pwr supply and cathode modulator, new 813 and pwr. supply tubes, $200. C. W. Eichelberger, 1815 Nott, Schenectady, N.Y.

SALE: DX-40 with mic., $59; SX-96, very clean, $150. Roy Welter, KØCNI, RFD 2, Olivia, Minn.

HAMS: Enjoy an inexpensive vacation at Montego Bay's Tourist Resort. For details write VP5BF, Box 192, Montego Bay, Jamaica, W.I.

SELL: SX-42, S53A, both excellent. Best offer or add cash for late 75S-1 or 75A4. WØNCG, 26 Gimlin Place, St. Louis 38, Mo.

HALLICRAFTERS SX-101A receiver. In perf. condx. $295.00. Going to college. Phil, K9OYB, 306 N. Seminole, Ft. Wayne, Ind.

FOR Sale: HT-32, $435; Johnson Matchbox, $35.00; SWR bridge, $12.00 or all for $475. Exceptional condition. W. W. Hardwick, W2VXH, 23 Richelieu Rd., Scarsdale, N.Y.

CLEANING, good condition, R46B Hallicrafters spkr, $9.00; Eico 320 signal generator, $17.00; Ameco 2-meter preamp., $9.00; Simpson 0-5DC milliameter, $8.00; Zenith shortwave portable, $65; JT-30 with stand, $8.00; 42 ft. tower and heavy pipe sections, $18.00, Will ship. Gil Kellersman, Stony Brook Road, Darien, Conn.

WANTED: Heath S.B.10, HQ-180, Super Pro to 40 Mcs.; Gonset 2 meter Communicator. W2CE.

MINT Condition 75S-1, 32S-1, 312B4, 30S-1 serial numbers in 11,000; $2100, KWS-1, serial 1290, $1000.00. Want: 75A4, W2BBV, 49 Frum Ave., Yonkers, N.Y.

R-100, almost new, $80; Viking I, very clean, $75; Viking VFO, $25. F.o.b. Pacific Palisades, Calif. WA6RFT, Bob, 557 Almar Ave.

A-1 reconditioned equipment. On approval. Trades. Terms. Hallicrafters S-85 $79.00, SX-100 $199.00, SX-111 $199.00, HT-32, HT-37; Hammarlund HQ-100 $129.00, HQ-129 $129.00, HQ-110 $179.00, HQ-145 $199.00, HQ-150 $199.00, HQ-160 $259.00, HQ-170 $289.00; National NC-270 $179.00, NC-183D $199.00, HRO-6 $345.00, NC-60, NC-173, NC-300; Central 20A $149.00, Thunderbolt linear $299.00, Collins 75A-2, 75S-1, 32S-1, KWS-1, KWM-2; Elmac Globe, Gonset, Heath, Johnson, RME, other items. List free. Henry Radio Company, Butler, Missouri

FOR Sale: Navigator, exc., $100; Morrow MBR-5 rcvr w/ P/S and spkr, $100; Matchbox, model 250-23-3, LN, $55; Signal Sentry, $10; Jones Micro-Match mod. 261-262, LN, $20; Electro Measurements impedance bridge, model 250-C1 LN, $100; BC 1335, $20; R-110 38.5 to 55 Mc. FM receiver, tunable, more compact and better than 603, 683 type's, $55.00; portable Remington mill, exc., $30; have more. Send stamp for list. WØWCR/4, Box 167-22-2, Rte. 1, Prince George, Va.

SELL: Trade: National HFS rcvr, (27-250 Mc.) with Nat. 5886 power supply and manual; Nat. NC-108-RB (86-110 Mc) with manual. FM. Has tuning meter on panel. Want: High grade Geiger counter. Transistor radio. Describe. L. G. Barrett, 31 S. Park, Hanover, N.H.

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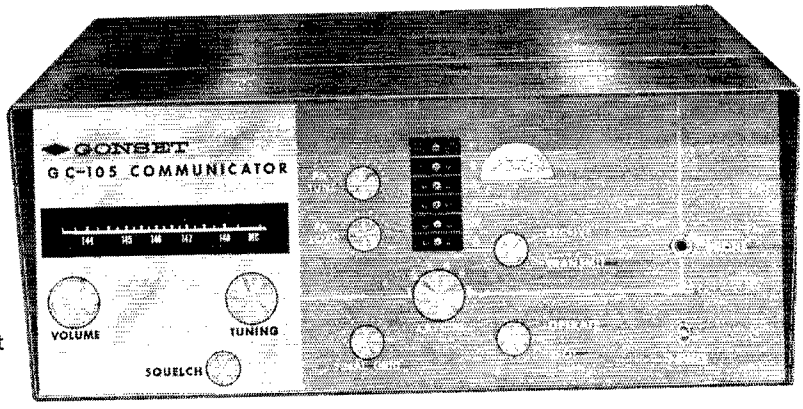

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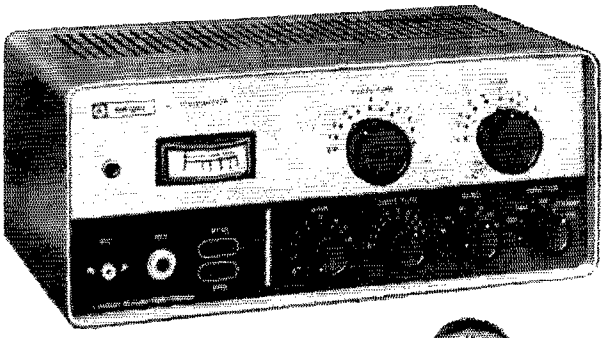

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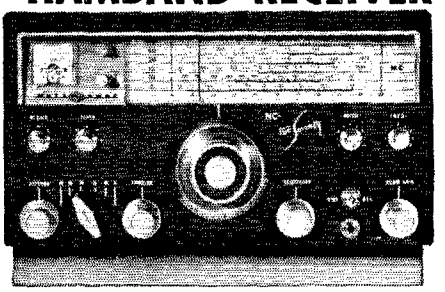

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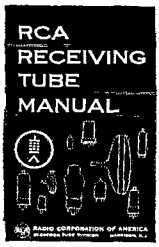

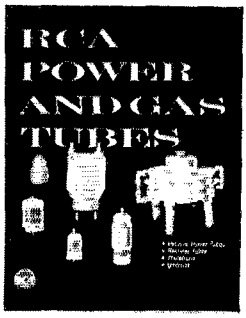

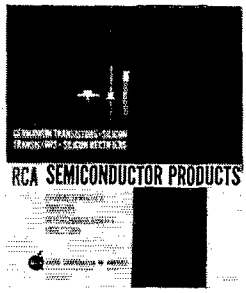

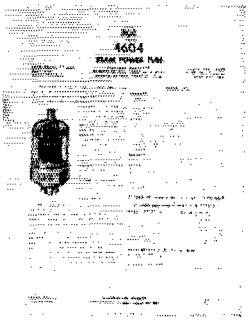

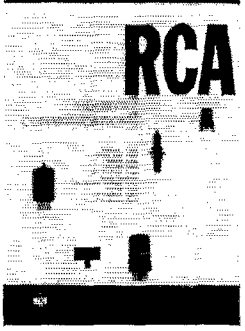

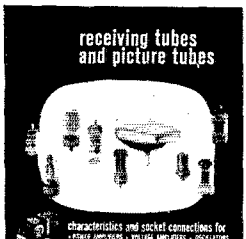

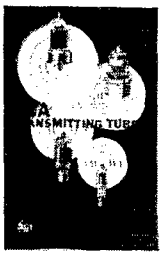

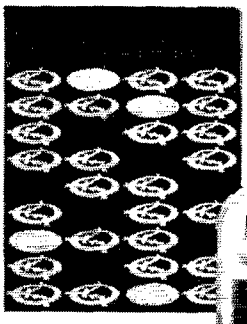

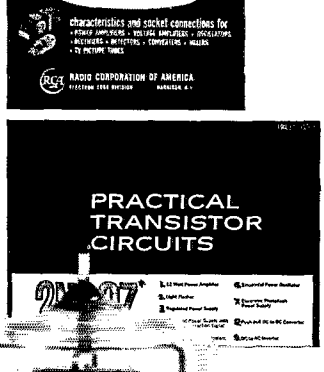

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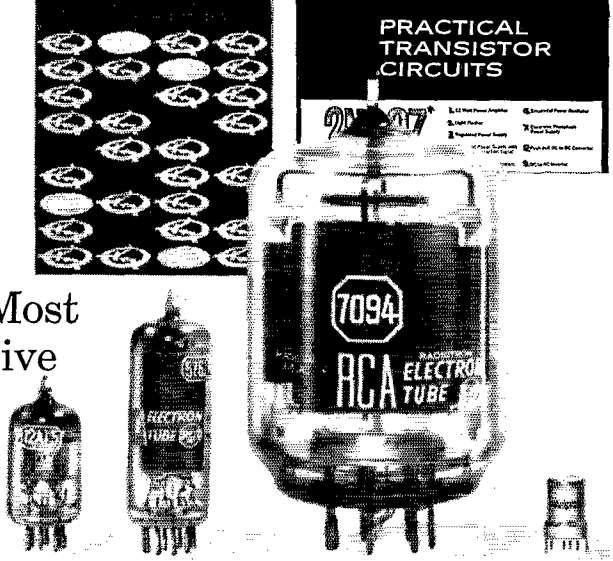

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