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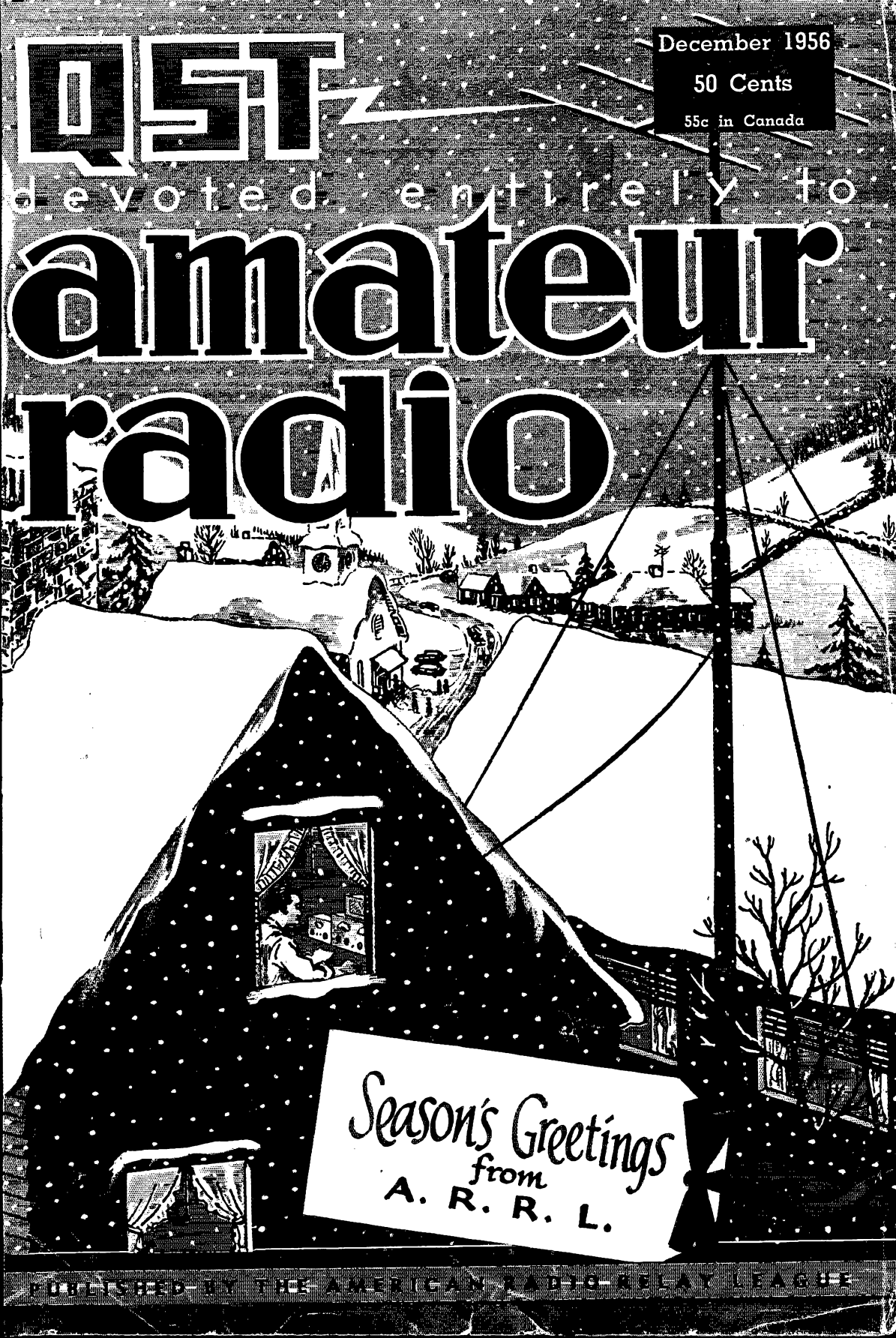

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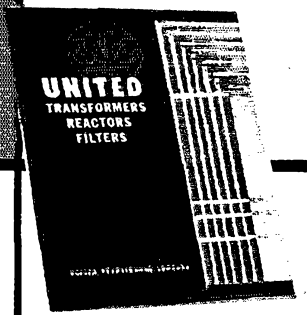
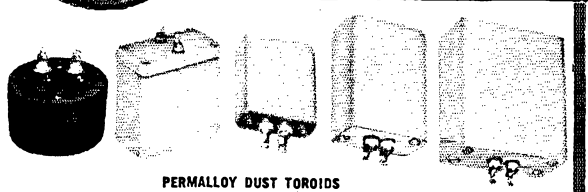
The Most Complete Transformer Line in the World . . FROM STOCK

A quarter century of specialized experience and original research has gone into the development of UTC catalog items. Covering the range from tenth pounce units to others weighing hundreds of pounds, UTC stock items are available for virtually every application in the electronics field. Each of these items carries a plus value — . . UTC RELIABILITY, highest in the field.



Write for your Copy of Catalog '56



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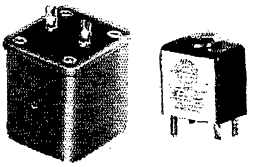
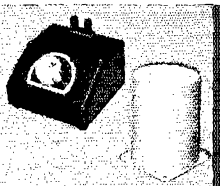
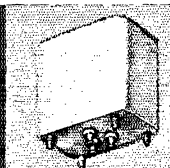
Maximum Accuracy and Stability



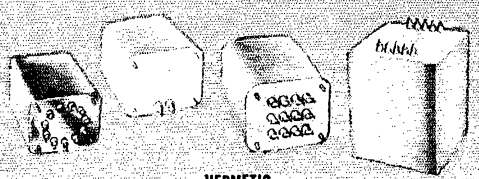
VARIABLE INDUCTORS
Standard and Hermetic



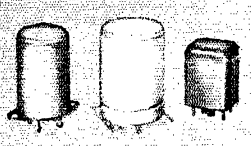
LOW FREQUENCY INDUCTORS and INDUCTANCE DECADES



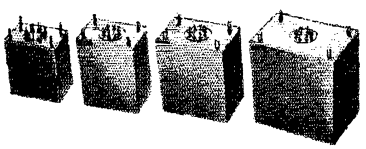
LOW PASS, HIGH PASS and BAND PASS FILTERS . . . HERMETIC



HERMETIC
Power, Plate, Filament Transformers and Reactors



HERMETIC AUDIO COMPONENTS
for Every Application



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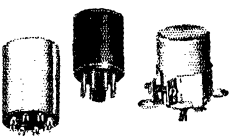
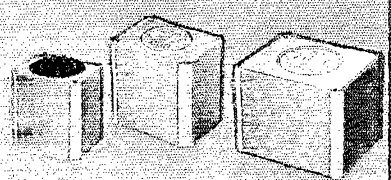
DOTS
Transistor Transformers
Smallest Size–Highest Power

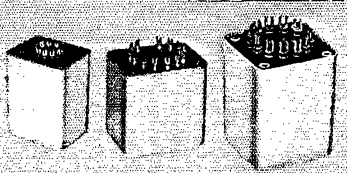
SUB and SUB-SUB OUNCER TRANSFORMERS
Audio Miniatures



OUNCER and PLUG-IN UNITS



LINEAR STANDARD SERIES
Tops in Fidelity



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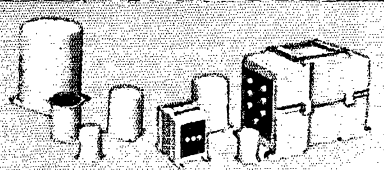
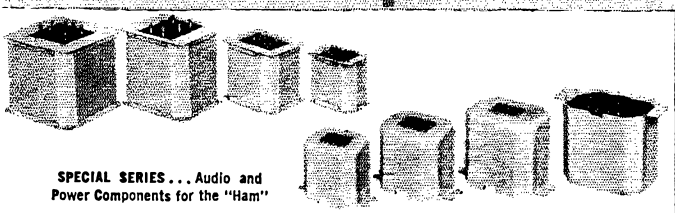
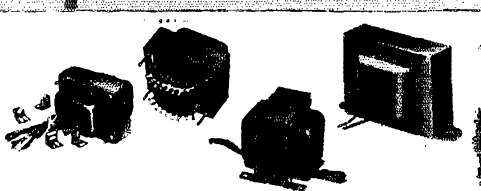
High Fidelity Favorites



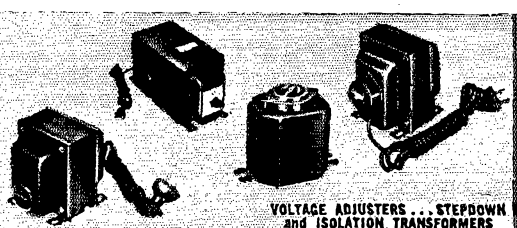
COMMERCIAL GRADE AUDIO and POWER COMPONENTS
for Industrial Use



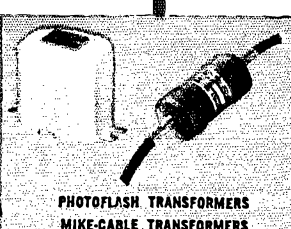
SPECIAL SERIES . . . Audio and Power Components for the "Ham"



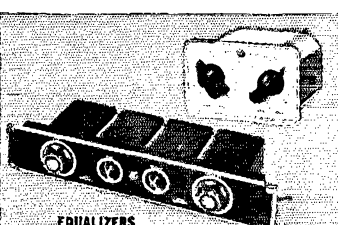
REPLACEMENT TYPES



VOLTAGE ADJUSTERS . . . STEPDOWN and ISOLATION TRANSFORMERS



PHOTOFLASH TRANSFORMERS
MIKE-CABLE TRANSFORMERS



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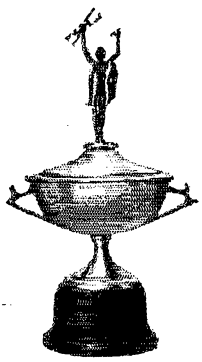

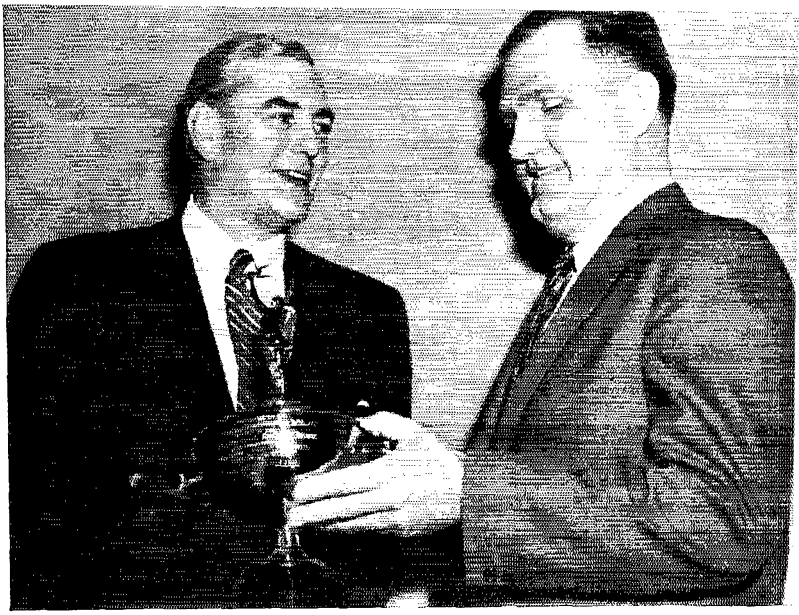

Herbert Hoover, Jr., W6ZH/K6EV, the undersecretary of state, congratulates the 1955 Award winner, Robert W. Gunderson, W2JI0.

Many Types of Public Service Can Qualify Amateurs for 1956 Edison Award!

JANUARY 3 is closing date for nominations for the 1956 Edison Radio Amateur Award. Because only candidates whom you nominate by letter are eligible for the Award, you will serve the best interests of the entire amateur group by naming a candidate. Nominating time is growing short . . . act soon!

Award recognition can result from many different activities. See the partial list at right. An amateur you know may have distinguished himself in one of these ways, or by other public service. If so, be sure to submit his name.

It is easy to name a candidate. For nominating-letter rules, and terms of the Edison Award, see this same page in the September issue of this magazine. Or write to *Edison Award Committee, General Electric Co., Schenectady 5, N. Y.*

HERE ARE TYPICAL ACTIVITIES THAT MERIT AWARD RECOGNITION:

Emergency communications work in a disaster, such as a flood, hurricane, tornado, or explosion.

Relaying messages from remote points for the benefit of isolated servicemen and civilians.

Civil-defense organization work.

Training novices, or otherwise encouraging and assisting amateur activities and interests.

Helping amateurs or others with their specialized problems, through professional knowledge and experience.

Publishing a book or other literature that contributes to amateur or general scientific knowledge or procedure.

Helping disabled or physically handicapped amateurs or others.

Designing and constructing radio equipment for use by persons in remote parts of the world, who do not have access to regular commercial communications channels.

Weather reporting; radio assistance to state or local traffic and police authorities; co-operation in forest-fire prevention and control.

Progress Is Our Most Important Product

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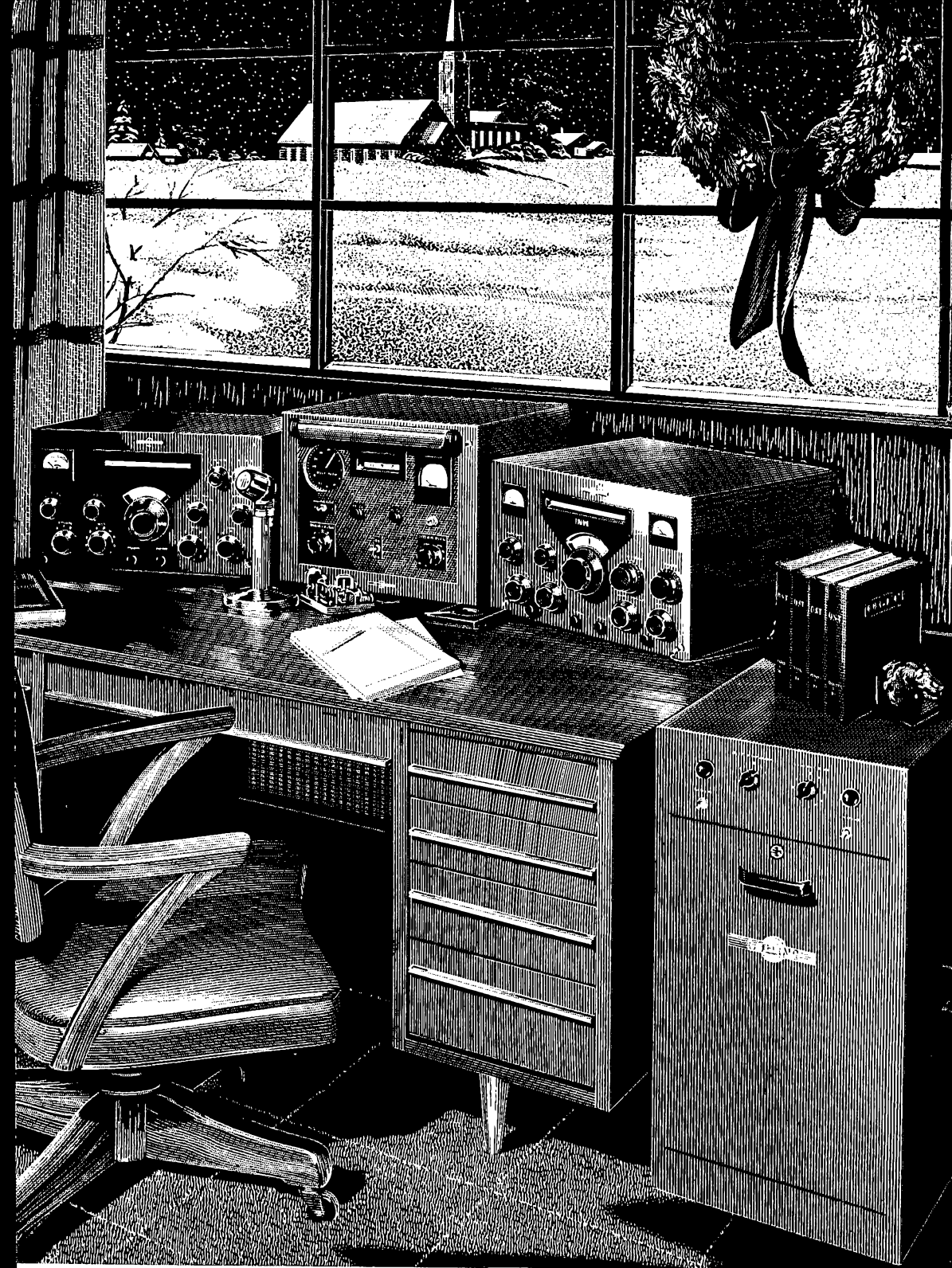

Best Wishes for the Best Christmas Ever

A COLLINS SSB rig can be yours now with Collins time payment plan.

QST

DECEMBER 1956

VOLUME XL • NUMBER 12

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

OFFICES

38 La Salle Road
West Hartford 7, Connecticut

TEL.: ADams 3-6268 TWX: HF 88

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INDEXED BY
INDUSTRIAL ARTS INDEX

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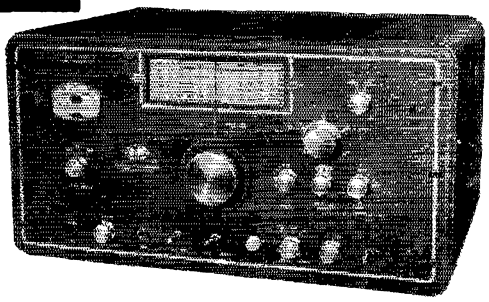
—CONTENTS—

4 steps to superior signals with B & W

(1) MODEL 5100-B—AN OUTSTANDING AM-CW TRANSMITTER

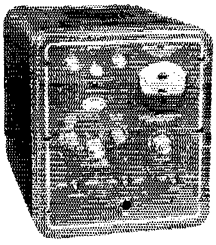
1



• high level push-to-talk AM telephony . . . 140 watts input • clean CW break-in on all bands . . . 180 watts input • sparkling SSB . . . 180 watts peak envelope input . . . when combined with the 51SB-B companion sideband generator • bandswitched throughout • integral VFO or crystal frequency control • coverage of 80 through 10 meter amateur bands • unitized construction • pi-network final • integral low-pass filter • handsome styling • TVI suppression.

Net Price $475.00

2

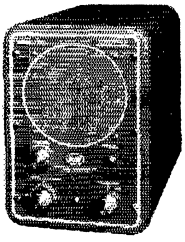


(2) Model 51SB-B Generator For Superlative SSB

- completely bandswitched
- voice operated control
- powered by 5100-B transmitter
- No wiring required
- push-to-talk • speaker deactivating circuit—TVI suppression • unitized construction.

Net Price $265.00

3

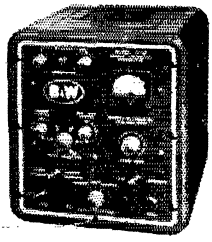


(3) Model 370 Adapter For Reception You Never Dreamed Possible

- truly exceptional SSB reception, select upper or lower sideband at the flip of a switch
- true single signal CW operation suppresses unwanted heterodyne by 50 db
- select either sideband of an AM signal
- may be combined with any communications receiver
- normal operation of your receiver is not disturbed in any way

Net Price $131.50

4



(4) Model 51SB Generator For Sparkling SSB With Your Present Transmitter

- easily added to your present B&W 5100-5100B, Collins, Johnson, or other commercial composite home built transmitters
- complete with power supply and tubes
- outstanding SSB transmission from 80 through 10 meters with frequency control provided by your own transmitter
- all the features of the 51SB-B SSB generator at left.

Net Price $279.50

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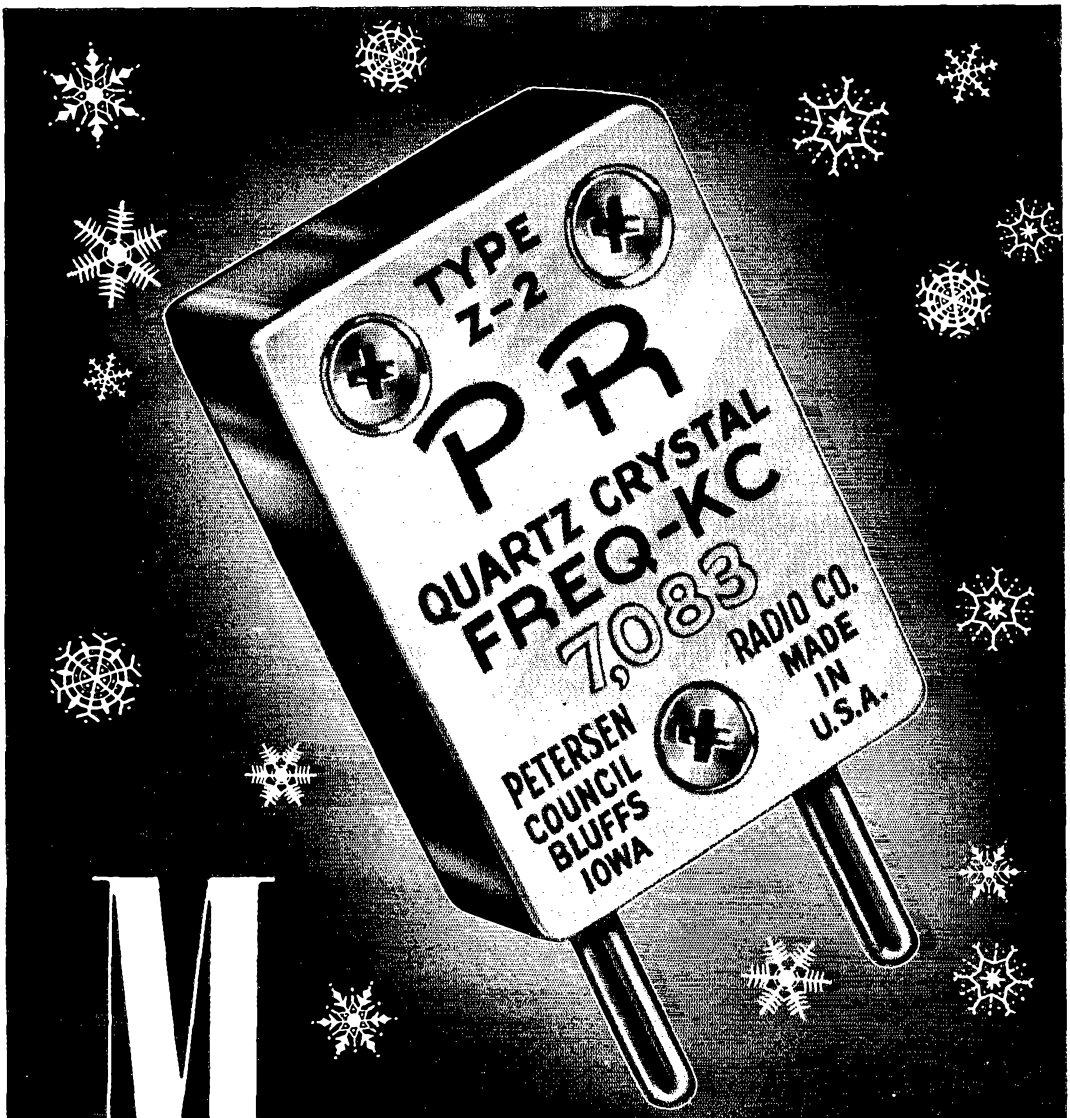
Bristol, Pennsylvania



MERRY CHRISTMAS

BILL PETERSEN, WØJRY

PETERSEN RADIO COMPANY, Inc.

2800 WEST BROADWAY, COUNCIL BLUFFS, IOWA

Section Communications Managers of the ARRL Communications Department

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

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Maryland-Delaware-D. C.	W3PRL	J. W. Gore	5707 Woodbine Ave.	Baltimore 7, Md.
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Western Pennsylvania	W3NCD	R. M. Heck	RFD 1	Sharpsville
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Virginia	W4KX	John Carl Morgan	c/o Radio Station WFVA, Box 269	Fredericksburg
West Virginia	W8PQQ	Albert H. Hix	1013 Belmont St.	Forest Hills, Charleston 4
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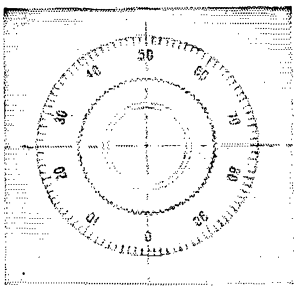
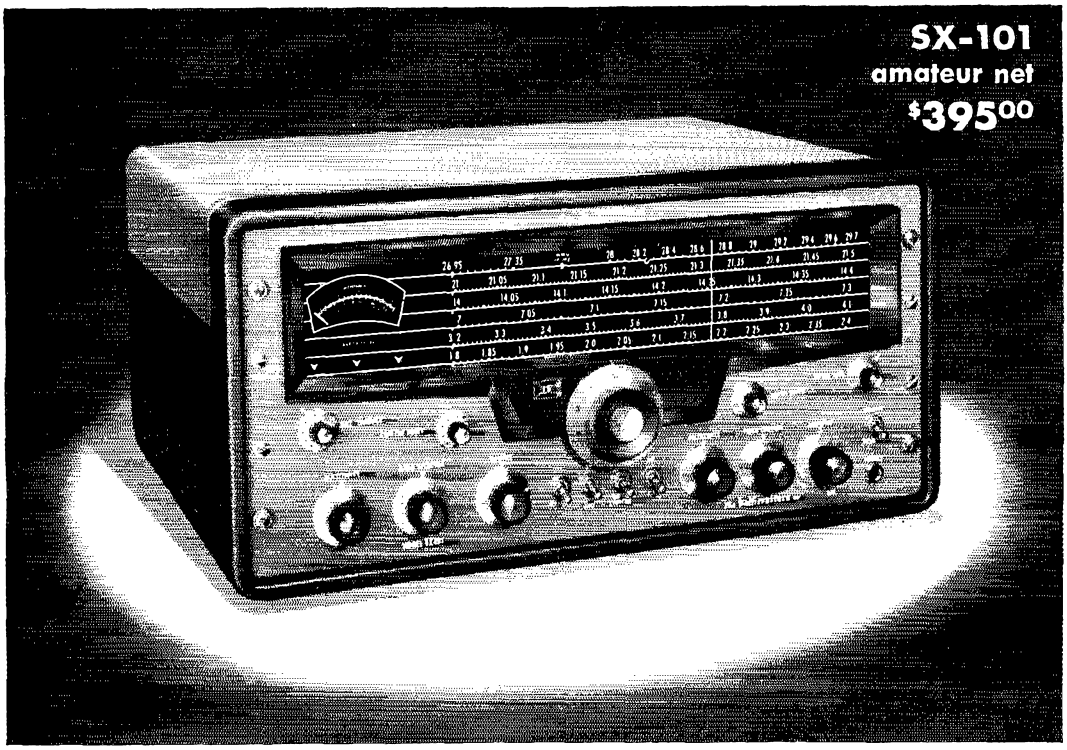
British Columbia	VE7JT	Peter M. McIntyre	981 West 26th Ave.	Vancouver, B. C.
Yukon				
Manitoba	VE4HL	John Polmark	109–13th, N.W.	Portage la Prairie, Man.
Saskatchewan	VE5HR	Harold R. Horn	1044 King St.	Saskatoon

* Official appointed to act temporarily in the absence of a regular official.



New heavyweight champion!

Hallicrafters new SX-101 receiver employs heaviest chassis in industry... incorporates V.F.O. feature*...has 2000° disc logging counter.



It's all amateur—and as rugged as they come! Hallicrafters presents the complete answer to ham reception, with every essential needed for today and for the future.

First—built like a battleship. Bigger. Heavier. Second—a marvel of stability—the result of 22 years of experience and development. Third—it brings you a long list of new features:

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PLUS: Band in use individually illuminated... built-in crystal calibrator... antenna trimmer... dual conversion... full gear drive from tuning knob to gang condensers... five steps of selectivity from 500-5000 cycles... sensitivity—less than 1 microvolt on all bands... direct coupled series noise limiter... 50-to-1 tuning knob ratio... and many more.

For full specifications see it at your Radio Parts Supplier today!

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THE AMERICAN RADIO RELAY LEAGUE, *INC.*,

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

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

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

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

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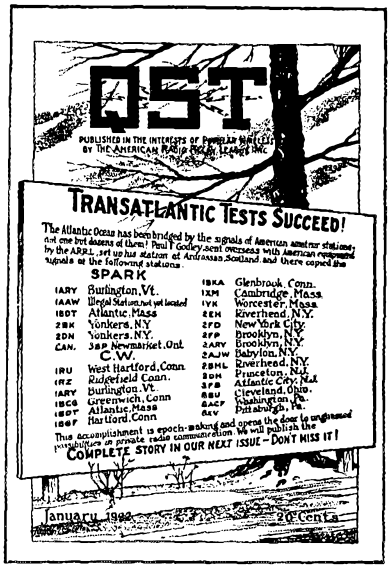
"It Seems to Us..."

TRANSATLANTICS

Just 35 years ago this month, a handful of imaginative amateur pioneers wrote into the annals of radio communications an achievement almost obscured in the wake of progress since then — the first authenticated reception of amateur signals across the Atlantic Ocean.

DX had long been the objective of our early amateur stations; year by year, improvements in equipment and technique extended the range of communication. Before World War I, a few hardy souls in the midwest had succeeded in working both coasts on spark. Shortly after the postwar re-opening, with vacuum tubes slowly coming into use for receivers, and c.w. transmitters as well, a few amateurs began to hear each other across the continent — and it wasn't long thereafter that the first two-way transcontinental contacts were made. All thoughts turned then to one objective — breaking through the fetters that bound amateur signals to our own shores. An attempt was made in early 1921, when a few high-power east-coast U. S. stations bombarded the ether in the hope of being heard in Europe. The effort failed — perhaps mainly because of inadequate organization and preparation.


QST

PUBLISHED IN THE INTERESTS OF AMATEUR RADIO BY THE AMERICAN RADIO RELAY LEAGUE, INC.

TRANSATLANTIC TESTS SUCCEED!

The Atlantic Ocean has been bridged by the signals of American amateur stations, not one but dozens of them! Paul F. Godley, sent overseas with American equipment by the ARRL, set up his station at Ardrossan, Scotland, and there copied the signals of the following stations.

SPARK

1ARY	Burlington, Vt.	1BKA	Glenbrook, Conn.
1AAW	Illegal Station, not yet located	1KM	Cambridge, Mass.
1BDT	Atlantic, Mass.	1YK	Worcester, Mass.
2BK	Yonkers, N.Y.	2EH	Riverhead, N.Y.
2DN	Yonkers, N.Y.	2FD	New York City
CAN.	3BP Newmarket, Ont.	2FP	Brooklyn, N.Y.
	C.W.	2ARV	Brooklyn, N.Y.
1RU	West Hartford, Conn.	2AJW	Babylon, N.Y.
1RZ	Ridgefield, Conn.	2BNL	Riverhead, N.Y.
1ARY	Burlington, Vt.	2DN	Princeton, N.J.
1BCG	Greenwich, Conn.	3FB	Atlantic City, N.J.
1BDT	Atlantic, Mass.	8BU	Cleveland, Ohio.
1BQF	Hartford, Conn.	8ACF	Washington, Pa.
		8XV	Pittsburgh, Pa.

This accomplishment is epoch-making and opens the door to unplanned possibilities in private radio communication. We will publish the

COMPLETE STORY IN OUR NEXT ISSUE — DON'T MISS IT!

January, 1922 20 Cents

Undaunted, the minds of the most imaginative were still occupied with the great adventure. When would it happen? The ARRL Board of Directors, meeting on the occasion of the first National Convention in Chicago, decided that, to hasten the big day, the League should send a U. S. amateur with the latest American ham gear to Europe to supplement the efforts of British and European receiving stations. Paul F. Godley, probably the foremost receiving expert in America at that time, was selected for the job. Just as it required vision for the Board to take its action, so it took imagination on Godley's part to believe that he could hear signals across the ocean. It also required confidence in a large measure: confidence in the equipment to be used and in the belief that not all the facts concerning radio propagation had been reduced to the point where the professionals could put them on paper.

This kind of vision — and confidence — backed up by suitable organization and preparation, paid off. Sitting in a tent on the cold rainswept moors near Ardrossan, Scotland, Paul Godley heard American amateur signals — more than thirty of them — in December of 1921. Eight British amateurs heard eleven Americans (all c.w.!); one Dutch and one French station heard one apiece. (As a matter of record, the first to hear a verifiable American station was a Britisher.)

We publish this month, beginning on page 50, the first portion of Sumner B. Young's "Foreword to Volume V of *QST*," which by happy coincidence covers the period of development and success — and aftermath — of the tests. We commend it to your reading so that you may learn how much we owe to the pioneering efforts of these early amateurs. Perhaps you will be struck, as were we, with the fact that what was almost an incredible achievement in 1921 is now a commonplace occurrence, so that today even the newest Novice can get on 21 Mc. to work a G as his very first contact!

Strays

The U. S. Immigration and Naturalization Service is seeking applications from qualified persons interested in radio operator positions in the Northeast, Northwest, and Southwest regions of the United States. The vacancies are in grade GS-4, with a starting annual salary of $3415. Vacancies in the Northeast region are at Ogdensburg and Rouses Point, New York and Burlington and St. Albans, Vermont. Vacancies in other regions of the United States will be filled as they occur.

Applicants must have at least two years (one year for positions in cities named above) experience as a qualified radio operator, operating coastal, marine relay, ship, radio beacon, police radio-telegraph, aeronautical radiotelegraph stations, or point-to-point radiotelegraph stations in military, commercial, or government service. Successful completion of a radio operator or radioman training course in any branch of the Armed Forces may be substituted for six months of experience.

Applicants must also have: (1) Ability to transmit accurately international Morse code by hand or "bug" at a sustained speed of 25 words a minute. (2) Ability to transcribe, using a typewriter, international Morse code received at a speed of 30 words a minute. (3) Ability to type from plain copy at a speed of 40 words a minute. (4) Ability to make routine repairs to and to maintain low power radio transmitters and radio communication receiving equipment.

Applications should be submitted on Form GS-57, obtainable at any office of the U.S. Civil Service Commission. The applications should be mailed to: Immigration and Naturalization Service, 518 Shelburne Road, Burlington, Vermont, or 790 Cleveland Avenue, St. Paul 5, Minn., or Terminal Island, San Pedro, Calif.

It looks as though some good yet inexpensive shield cans may be in the offing. The *Wall Street Journal* reports that a Western brewer is experimenting with the use of aluminum cans for his beer and ale. Also, some of the aerosol-type cans for toilet items may soon be of aluminum.

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The Radio Society of Great Britain has just advised that applications for the WBE (Worked British Empire) award must now be accompanied by $1.00 or 21 IRCs. ARRL Hq. continues to certify applicants to RSGB thereby making it unnecessary to send those five precious pasteboards abroad.

—···—

What's in a name? The last name of K6HAM is Burger.

—···—

Again — KN4KID is eleven years old.

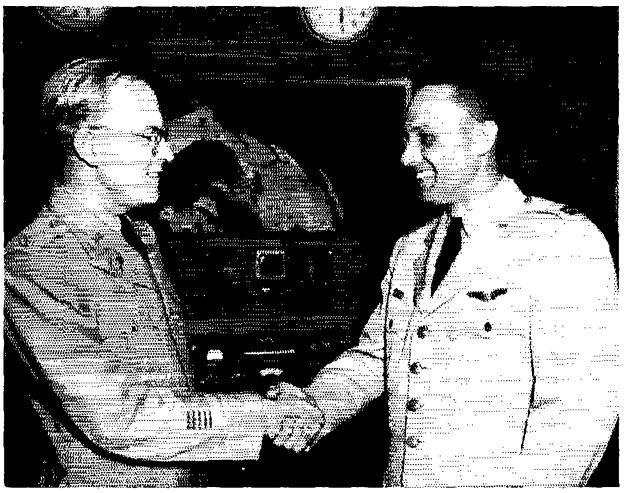
—···—

There are a number of engineer and physical science positions in the vicinity of Washington, D. C., with starting salaries of from $4480 to $11,610 a year. These are with both the Navy and the Army. Full details may be obtained by addressing a request for announcement No. 76-B to the U. S. Civil Service Commission, Bureau of Departmental Operations, Washington 25, D. C.

—···—

K6CRA, on a QSL to W9BRD, reports that he has what he believes to be the most complete card index system in existence. It covers every contact he has made since he first obtained his license in December of 1920, and he has operated amateur stations all over the world.

K6CRA is, incidentally, over 83 years old now. ARRL would be interested in getting photos of any active hams older than that.



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Major Warren H. Robson, newly-appointed Chief MARS (Army), being welcomed by Captain Walter S. Browne, jr. Chief MARS (Air Force) in the Pentagon MARS station.

«

Polarization Effects in V.H.F. Mobile

Some Evaluation Tests on Mobile Antenna Systems for 50 and 144 Mc.

BY EDWARD P. TILTON,* WIHDQ

ITS EFFECTIVENESS in working mobile stations is a time-honored argument for sticking with vertical polarization, in the areas where it is still in use. Admittedly, vertical mobile antennas are usually more pleasing to the eye, and mounting them is generally a simpler matter than is the case with any practical horizontal mobile antenna. But skipping the esthetic and mechanical aspects, how important is it that vertical polarization be used, if satisfactory coverage is to be obtained in working with mobiles on 50 and 144 Mc.?

Many horizontal antennas for 2-meter mobile use have been described in *QST* in recent years.[1] A 6-meter halo was built and described by W1MUX some years ago.[2] We know how to do the horizontal job; the question here dealt with is how much difference does cross-polarization make, assuming that a horizontal array is used at the fixed station? To tell our story we'd better start with a description of the antennas used.

Halos for 6 and 2

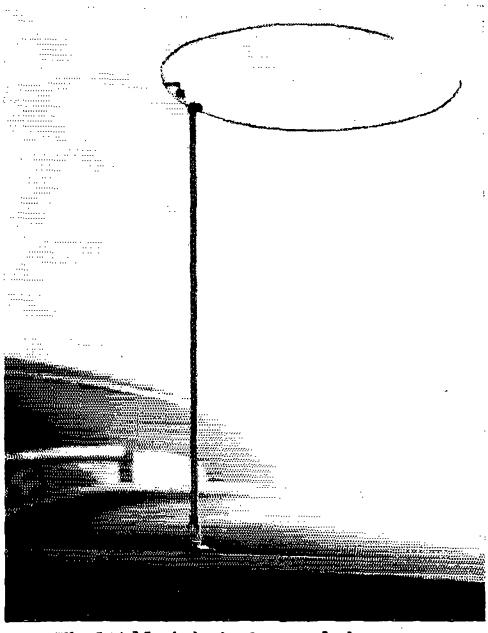
For tests on 144 Mc. we used a rather haywire halo made by the writer in a total elapsed time of about 30 minutes. Perhaps other lazy individuals who want to try horizontal mobile antennas would be interested in the mechanical details. The main support is 19 inches high. It was cut from a section of an old TV antenna element, used because it was light in weight, and because its $\frac{3}{8}$-inch size made a nice tight fit in the sleeve of a standard Amphenol male coaxial fitting. The "no-holes" mount on the rear deck (a clip of stiff aluminum fastened to the inside of the rain gutter with self-tapping screws) has a matching female fitting, and a coax lead running up to the dash where the rigs are operated.

The roof-top mounting was made of flashing copper, bent into a cube slightly larger than the coaxial fittings. The inner conductors of the two fittings are connected by a short wire inside the box, and the lips of the box are soldered to a flat plate of flashing copper, about 3 by 6 inches in size. The plate is held on the car top with black plastic tape, the bottom of the plate having first been covered with tape to prevent its disfiguring the car top in any way. A length of RG-58/U coax is brought forward to the rain gutter, and run around to the corner of the door, where it is protected by the rubber bumper on the door casing.

The halo is $\frac{1}{8}$-inch aluminum rod 38 inches long, bent into a circle. Ends of the element are about 4 inches apart, though the exact size of the circle made does not seem to be critical. The coax is run up through the tube, from the coaxial fitting at the bottom, and out through a hole near the top of the support. The black covering is cut back below the point at which the lead emerges, to allow the outer conductor to make contact to ground at that point. The hole should be of such size that the lead with its braid cover will just pull through it.

The inner conductor is the arm of the gamma match, connection being made to the element by means of a small aluminum clamp. Originally a variable capacitor was used in setting up the match. The best value was close to 25 $\mu\mu$f., so a fixed capacitor was substituted. Connection at 4 inches out from the center of the support provides an s.w.r. of under 1.5 to 1 across a considerable frequency range in this installation. Make your own adjustments of capacitor and connection point, if you like, but do it with an s.w.r. bridge, not a field-strength meter.

The 6-meter halo is a commercially-available unit known as the "Saturn 6 Mobileer," made by the Wholesale Supply Co., Lunenburg, Mass. It arrived for technical evaluation just as we were

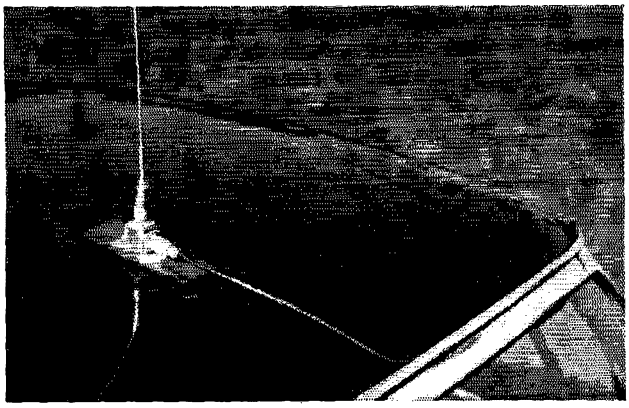


The 144-Mc. halo, in the rear-deck mount.

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

[1] "The World Above 50 Mc.," *QST*, Feb., 1956, p. 55; Aug., 1956, p. 59.

[2] Stites, "A 'Halo' for Six Meters," *QST*, Oct., 1947, p. 24.



Roof-top mounting for v.h.f. antennas requiring no holes in the car top.

starting tests on 144 Mc., so we decided to make the investigation a two-band project, inasmuch as we already had provision for operation on both 50 and 144 Mc. with vertical whips.

The "Saturn 6" was attached to a standard bumper mount provided by the manufacturer. It stands just over 6 feet above ground in this position. (An extension support for up to 12 feet or so could be used for stationary operation.) The 6-meter whip could be inserted in either the roof-top or rear-deck mounts.

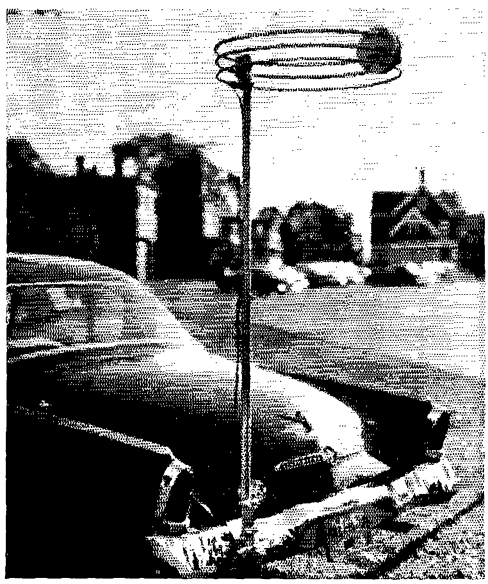
A ski-rack-mounted turnstile for 144 Mc., made by W1DXE, was borrowed for some comparisons. This was originally a single dipole, and as such was pictured in *QST*.[1] It was converted to a turnstile later, in the hope of providing better omnidirectional characteristics. It consists of two split dipoles fed 90 degrees out of phase through a quarter-wave loop of coax.

The homemade halo for 2 was tried in both mounts. It showed somewhat more directional characteristics in the rear-deck position than on the roof-top, but otherwise there was little difference in either transmitting or receiving results. Coaxial leads from all three mounts were brought up to the dash, where a coaxial switch was used to select the antenna desired. Thus, it was possible to make instantaneous changes from horizontal to vertical; while transmitting or receiving on either band. Gonset Communicators for both bands were used in the tests.

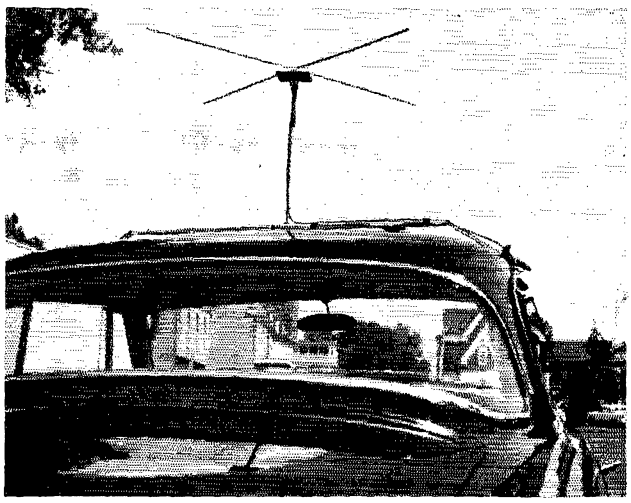
A v.h.f. mobile enthusiast for more than 20 years, with experience in all parts of the United States, the writer has observed the vagaries of v.h.f. propagation firsthand in all sorts of terrain. Most of this work has been done with vertical whips, though various forms of horizontal antennas have been tried at times. From this experience it was obvious that matched polarization paid some dividend. Equipment improvements in recent years have netted a considerable extension of our all-around v.h.f. coverage, however, even though there has been an almost country-wide swing to horizontal arrays at home stations, and thus much more cross polarization in mobile operation with vertical whips.

Where both horizontal and vertical were available at home stations, we have found frequent instances where our mobile whip received an equally good signal, regardless of the polarization at the home station. The degree to which the polarization seemed to be rolled over has been quite closely related to the roughness of the terrain. Our worst mobile-to-fixed-station coverage, with cross polarization on both 6 and 2 meters, was in the flat open country of the Middle West. As nearly all past experience with cross polarization was gained with vertical whips on the mobile and horizontal beams at the fixed station, we were curious to learn whether horizontal systems on the car would show consistent improvement, and if so, how much.

Since the installation of the quick-switch system in the car we've had little opportunity for work over flat terrain, Western New England being mostly up on edge. We have tried all the kinds of paths we can find around the Hartford area, however, and conditions simulating those of flat terrain have been found in spots.



The "Saturn 6 Mobileer," a commercially-made halo used in the polarization tests.



Ski-rack turnstile for 144 Mc., made by W1DXE. Radiators are crossed dipoles, fed 90 degrees *out of phase through a quarter-wave section of coaxial line.*

Results on 144 Mc.

We have used the 144-Mc. facilities of W1DXE-VLH extensively, as the 32-element horizontal array at that West Hartford station is more than 100 feet above ground, clearing all obstacles for a mile or more in all directions. Within five miles signals are so strong that little or nothing can be told about antenna differences, but over the mildly rolling terrain to the southwest signals get "off the pin" at about 7 or 8 miles. To the west, the route the author takes in going home each evening, a steep hill rises about 600 feet above average terrain at a distance of about 2 miles from the fixed station. Over the ridge of the hill the terrain drops even more sharply back to nearly the level of the eastern side, but the route winds behind other hills within 10 miles or so of travel. Hundreds of readings have been taken on 144 Mc. in these areas.

Out to and slightly beyond the visual horizon in open terrain the 2-meter halo shows a consistent superiority, the average in its favor being about 15 db. Very few spots can be found where the vertical whip approaches the signal level afforded by the halo, though both are entirely satisfactory. In the rolling terrain, at distances of 8 to 20 miles or so, the margin between the two decreases gradually, running mostly between 6 and 10 db.

Working over the "mountain" (apologies to Westerners) there is also some advantage in matched polarization, but it is slight. There are many places to be found, by slow jockeying of the car position, where the vertical whip provides as strong a signal as the halo, and there are spots where cross polarization shows as much as 20-db. superiority In the town of Collinsville, 12 miles and three ranges of hills to the west, some nearly dead spots can be found. Here many miles and much round-and-round-in-circles driving has shown the average gain with matched polarization to be just enough to make the difference between the two plainly audible, as little as 3 to 5 db.

On an elevated ridge in Burlington, where signals from all up and down the Connecticut Valley are strong, polarization discrimination is partially restored. On still higher elevations, where pure line-of-sight obtains, stations many miles distant show very clean polarization.

One dividend from the use of the halo on 50 Mc. was greatly reduced ignition noise, both from our own car and others. Noise from the writer's car is barely audible at moderate driving speeds, even when the limiter on the Communicator is cut out. Switching to the whip brings in a deafening clatter. Reduction of ignition noise from other cars is at least as marked when the "Saturn 6" is in use, resulting in a considerable improvement in the readability of weak signals when driving in traffic. Oddly enough, this nice state of affairs did not show to so great a degree on 144 Mc.

Another difference between 50 and 144 Mc. showed up in the course of these checks. It had been observed before in working with the vertical whips, but it became much more obvious with horizontal polarization. With horizontal antennas at both the fixed and mobile stations, the signals on 50 Mc. are much more constant in level than on 144. Particularly where the fixed station is using a good beam, the annoying flutter so characteristic of v.h.f. mobile work almost disappears. We have had no end of comments about this from fellows we've worked with the "Mobileer." Unless they watch the S meter closely they find it hard to tell whether we're moving along the highway, or standing still. The fluctuation in signal level on 144 Mc. is somewhat less with horizontal polarization than with vertical, but it is still plainly noticeable.

Some Random Observations

What is the respective merit of roof and rear-deck mounting with vertical whips? We've always assumed that the ideal place for a 144-Mc. whip was on the car top, though we have used the rear-deck mounting for esthetic reasons. Our

test setup afforded a fine chance to run down some information along this line. Identical 19-inch whips were installed on the roof and rear deck, and then switched back and forth on countless occasions. At a given spot there would be a difference between the two, as multiple reflections happened to add with one and cancel with the other, but with the car moving along there was no observable difference in average level. If anything, the car body introduced a bit more in the way of directional effects with the rear-deck mount, but the over-all advantage of the roof mount was so slight that we removed it once the testing was completed.

How good is a halo? We knew that both the 6- and 2-meter halos made our reliable range somewhat greater than we enjoyed previously with the whips, but we had no measure of their effectiveness until the 6-meter unit was tested against the 3-element portable array described in August *QST*, page 35. The latter was connected into our quick-switch arrangement a few times when we were operating from some of our pet locations. Both it and the "Mobileer" were adjusted for minimum s.w.r. at the frequency of operation, and the rig loaded to the same power

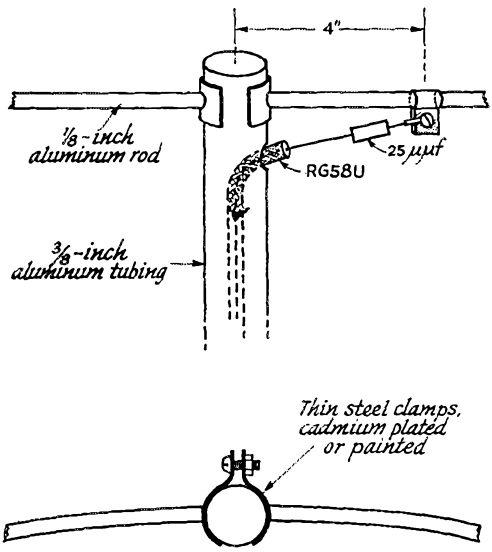


Fig. 1 — Constructional details of the 2-meter halo.

input to the antenna. Results: stations worked (at distances from local to 150 miles or so) reported the 3-element beam as two to five S-units stronger than the halo. On reception the difference was estimated at an average of 12 db. A reasonably accurate measure of received signal differential was made with a signal generator, by checking the input signal required for various degrees of green-eye closure on the Communicators.

And a Conclusion or Two

Going to horizontal polarization appeared to give us a definite edge in reliability and coverage over what we have encountered in vertical-to-vertical and cross-polarization work in the past. Certainly the horizontal combination gives improved signal-to-noise ratio, this difference being particularly marked on 50 Mc.

Horizontal at both ends of the circuit makes 6-meter mobile a real pleasure. Contacts with well-equipped home stations are almost noise-free out to 25 miles or so, in all but the worst terrain. Satisfactory communication out to 50 miles is frequently possible, and we've heard some surprisingly good signals at 100 miles or more, while driving in quiet areas. There was no DX during the period of the tests, but we anticipate that the improved signal-to-noise ratio of the halo will make 6-meter DX hunting more fun.

But cross-polarization, which is likely to cause less trouble if you have an esthetically-sensitive family, is not bad. Conversion to horizontal polarization on the part of every v.h.f. station in the country would by no means rule out the interesting and useful mobile operation on 6 and 2 by the fellow will have nothing more obtrusive on his car than a simple vertical whip.

If you would get the most out of gear for 6 or 2, installed in your car, you'll want to try the horizontal systems. If the wife will take it, you'll want something as good as W1DXE's turnstile for 2, and the "Mobileer" or its equivalent on 6. And don't pass up the portable beam idea. You'll never know the fun of v.h.f. work from the high spots until you pack along the biggest arrays for your favorite band that you can store in the rear deck of your car.

Strays

W7OE reports that Capt. Richard Ogg, pilot of the PAA plane which recently ditched in the Pacific with all hands saved, is ex-W7AOD and now W6EPJ.

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Last month on page 10 we reported a case of super-fast QSL card delivery after a QSO. This month we report a case of super-slow delivery. W5APM recently received a QSL dated April 26, 1926, from 4KW who was at that time located in Atlanta, Ga. W2LS (ex-4KW) had sent it along with this note, "Tom, are you the same 5APM of April 6, 1926? Found this card among some old QSLs."

—•••—

The National Company recently had a public showing of its Atomichron, and among those in attendance was our own W1VG. The atomichron is an atomic time and frequency standard whose fundamental escapement is the processional motion of an electron in the cesium atom. It is stated that the Atomichron is stable to within 3 seconds per hundred years and is exceedingly more precise than telescopic observations. Just the thing for timing the starting of the SS and DX Test!

Automatic Antenna Tuning for the Amateur

A Motor-Driven Unit Matching Coax Line

BY LOUIS I. HUTTON,* WØRQF

• This antenna tuner not only tunes the antenna to resonance but also automatically matches the antenna load to a 52-ohm coax line. This is accomplished by a combination of resistance and phase detectors that control motor-driven tuning elements.

MY INTEREST in the design and operation of automatic antenna tuners for amateur radio transmitters stems from two things. First, for the past year, I have been working on system problems of an airborne liaison radio set which incorporates an automatic antenna tuner. Second, the problems encountered in the design and construction of amateur automatic antenna tuners, as described in other periodicals, were similar in many respects to the troubles I had when I decided to build one. The results have been both surprising and educational.

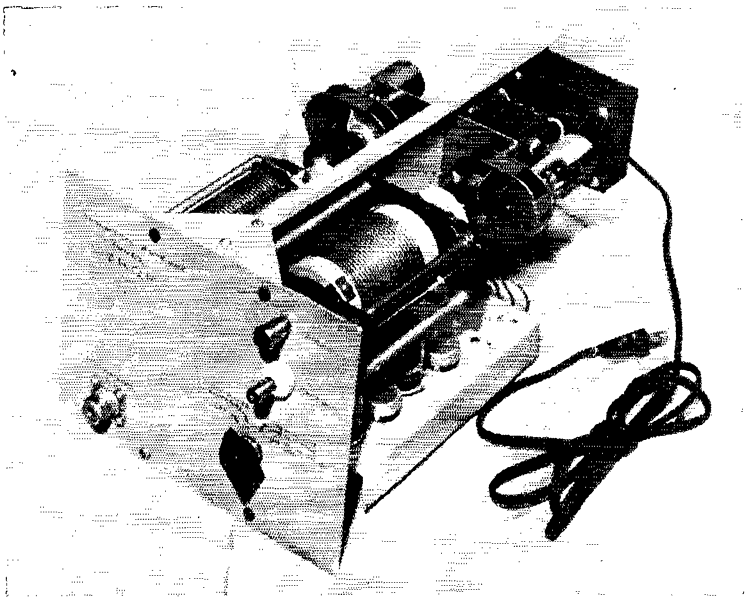
An automatic antenna tuner is basically a tuning network which is automatically tuned to match the antenna impedance to the impedance of the transmission line. In the tuner that I constructed, the tuning network consists of a variable capacitor in series with the combined antenna and shunting inductor. The tuning elements are driven by servo-motor amplifiers which are controlled by error signals from phase and resistance detectors.

The discriminator circuit I used in my tuner is similar to an assembly manufactured by the Sperry Rand Corporation, Engineering Research Associates Division, of St. Paul, Minnesota. It is used in their Type 3001 Series Airborne Automatic Antenna Tuner, and is designed to operate throughout a range of from 2 to 24 Mc.

Phase Detector

The phase detector of the discriminator circuit senses deviation from zero phase angle between the r.f. line voltage and current, and produces a d.c. error signal proportional to that deviation. When the r.f. line voltage is in phase with r.f. line current, each triode conducts equally for approximately ¼ cycle whereby their outputs cancel, leaving no error voltage. As the phase angle changes, one triode conducts for more than ¼ cycle and the other triode conducts proportionately less. Thus, one triode has a larger d.c. output than the other, and an error voltage is developed. Polarity of this error voltage is determined by the triode with the greatest d.c. output. Polarity of the error voltage changes

*641 South Pinecrest, Wichita, 18, Kansas.



The automatic antenna tuner is assembled with the phase and resistance tuning units on either side of a vertical fin. Power-supply and motor-drive units are at the rear.

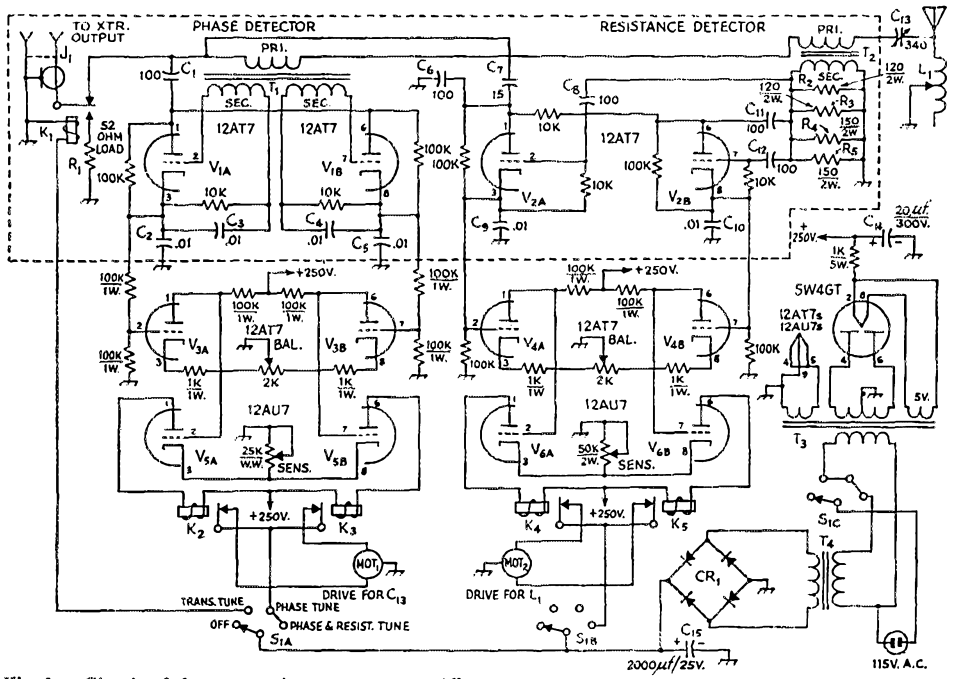


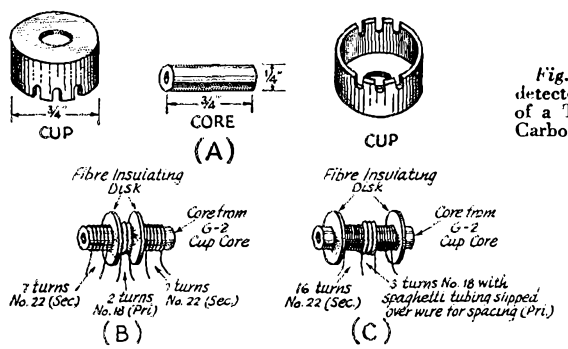
Fig. 1 — Circuit of the automatic antenna tuner. All capacitances less than 0.001 μf. are in μμf. All resistors are ½-watt composition, 10-per-cent, unless otherwise specified.

C_1, C_8, C_{11}, C_{12} — 500-volt, ceramic 10-per-cent.
C_2, C_3, C_4, C_5, C_9, C_{10} — 200-volt paper.
C_6 — 500-volt 2-per-cent ceramic (Erie CC36CH 101G).
C_7 — 500-volt 2-per-cent ceramic (Erie CC21CH 150G).
C_{13} — Air variable, 0.051-inch plate spacing (Bud JC-1529).
C_{14} — Electrolytic.
C_{15} — Electrolytic.
CR_1 — Magnesium-copper sulphide low-voltage bridge-rectifier stack (Mallory 1B12L5).
J_1 — Coax chassis-mounting receptacle — SO239.
K_1 — Relay — s.p.d.t., 3-amp. r.f. contacts, 6-volt d.c. solenoid (Potter & Brumfield KR5D).
K_2, K_3, K_4, K_5 — Relay — s.p.s.t., normally closed 14,000-ohm solenoid (C. P. Clare A-8095).
L_1 — Variable inductor, 15 μh. (Barker & Williamson 3852. See text).
MOT_1, MOT_2 — 6-volt reversible motor and gear train (equivalent to "Tiny Atom" Electric Motor and Gear Train Kit No. K-3000, Lafayette Radio Co., New York. See text).
R_1 — Eight 390-ohm 2-watt carbon resistors in parallel.
R_2, R_3, R_4, R_5 — Composition.
S_1 — Rotary switch, 3 poles, 4 positions (Mallory 3234J).
T_1, T_2 — See Fig. 2.
T_3 — Power transformer: 470 volts r.m.s., c.t., 40 ma.; 5 volts, 2 amp.; 6.3 volts, 2 amp. (Stancor P-6010 or equivalent).
T_4 — 10-volt 5-amp. filament transformer (Thordarson 21F18 or equivalent).

when the phase angle changes from leading to lagging.

Resistance Detector

The resistance detector of the discriminator circuit senses deviation from a proper ratio of line voltage to line current on a 52-ohm transmission line. The resistance detector transformer and its load resistors are designed to produce a voltage output proportional to line current over a wide frequency range. If the proper size capacitive divider input network, C_6–C_7, is chosen for the



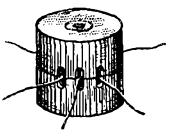


Fig. 2 — Sketches showing winding and assembly of detector transformers T_1 and T_2. (A) — Three parts of a Type G-2 cup core manufactured by Stackpole Carbon Co., St. Marys, Penna. (B) — Winding details of phase-detector transformer T_1. (C) — Winding details of resistance-detector transformer T_2. The 3-turn primary is wound over the center of the 16-turn secondary. (D) — Assembled transformer. All windings are made with heavy Formvar insulated wire.

required output load resistance (52 ohms), then the error signal from each triode will be equal, and of opposite polarity. If the load resistance decreases from this value, the line current will increase with a resultant decrease in error voltage. A reactive load, however, could give false indications of high resistance before the tuner has finished tuning. This is the reason for the grid circuitry which makes the resistance detector produce the proper error voltage by decreasing the reference voltage when the line voltage and line current are not in phase.

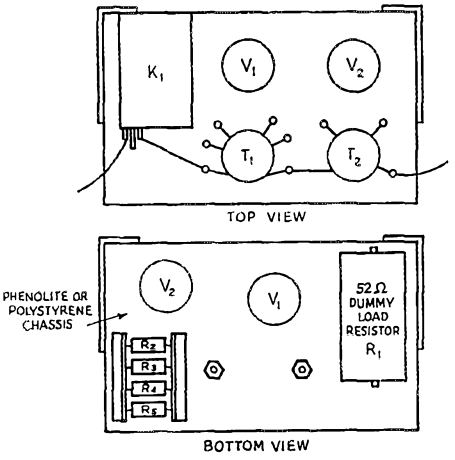


Fig. 3 — Sketch showing the layout of the discriminator chassis.

The tuning network in the antenna tuner will match a great range of antennas, but it will not match antennas having resistive components less than 52 ohms if such antennas are inductive. If they are capacitive, the reactance must be in excess of 25 ohms.

Balanced Amplifiers

The error signals from the detectors are fed to the balanced d.c. amplifiers V_3, V_5, V_4 and V_6. The basic difference between these amplifiers and those used in other equipment is in the use and operation of four individual plate relays in lieu of the usual two balanced-armature type relays. The amplified error signal releases the proper relay armature, instead of actuating the armature in this circuit. Consequently, no warm-up time is required to stabilize the balanced amplifiers. The relays are of the normally closed type, 14,000-ohm coil, part No. A-8095, by C. P. Clare and Co.

Adjustment

The adjustment procedures for the BALANCE and SENSITIVITY controls on each amplifier are the same and are performed as follows:

1) With no signal applied to the detectors, rotate the balance control to its mid-rotation position.

2) Adjust the sensitivity control until the contacts of both relays just open.

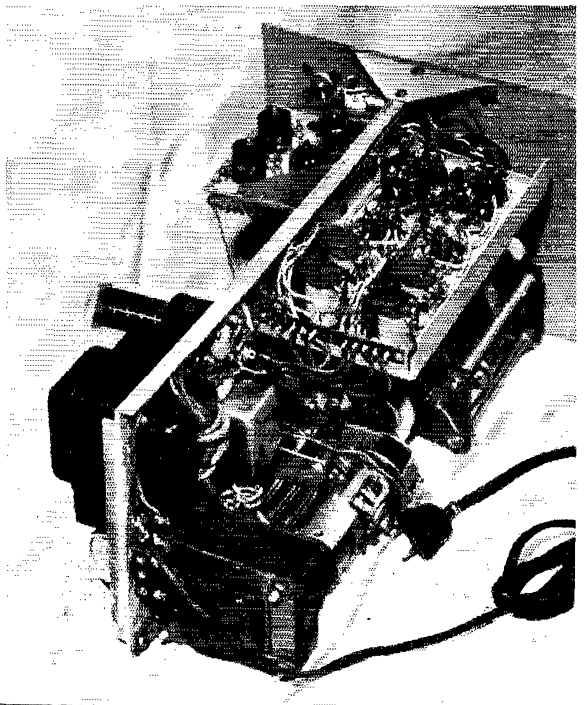
3) Rotate the balance control to determine the electrical midpoint. It should be observed that as the balance control is rotated in one direction, the contacts of one relay will close; then as the control is turned in the other direction, the contacts of the first relay will open, and the contacts of the other relay will close. This also indicates the width of the dead zone or null (range over which the contacts of both relays are open).

4) Decrease and increase the sensitivity adjustment to see if it varies the width of the null on the balance control. The point on the sensitivity control which gives the sharpest null on the balance adjustment is the spot where "hunting" between the two servo systems can be expected. It is best to start initial tests with the amplifiers adjusted to a fairly broad null, and with the balance control set to the electrical center.

5) Repeat the above steps for the remaining amplifier.

As you have probably noticed from the photographs, there is a FUNCTION switch on the front of the unit. I go through the following steps in tuning up my transmitting system. First, the transmitter and tuner are turned on. The transmitter is then tuned up on low power (25 watts)

(*Continued on page 142*)



Bottom view of the automatic antenna tuner. Components on the shelf at the upper left are laid out as shown in the sketch of Fig. 3.

Losses in Feed Lines

What (Not) To Worry About in Your Antenna

BY BYRON GOODMAN,* W1DX

SOME MONTHS AGO an article in *QST* touched briefly on losses in transmission lines.[1] The subject is an important one that can stand quite a bit of treatment, and here we will try to point out a few more of the things to consider and what to do about them. If you didn't read the earlier article, it pointed out that a transmission line terminated in its characteristic impedance has a standing-wave ratio (abbreviated "s.w.r.") of 1.0; when it is terminated in something other than its characteristic impedance the s.w.r. has some other value. All this big talk means is that if the antenna you are using (beam, dipole or Lazy Q) looks like 75 ohms at the point where the feed line is attached. you can connect a line of 75 ohms characteristic impedance (like RG-11/U or RG-59/U) and have an s.w.r. on the line of 1 to 1. Using 50-ohm line (RG-8/U or RG-58/U) would give an s.w.r. of 1.5, and using 300-ohm Twin-Lead would give a 4.0 s.w.r.[2]

Important points to remember are that (1) the antenna does not present a constant impedance at all frequencies, so it is reasonable to expect the s.w.r. to change over a band, and (2) there is normally nothing you can do *at the transmitter end* of the line to change the s.w.r. (except change the frequency), since the load (antenna) determines the s.w.r.

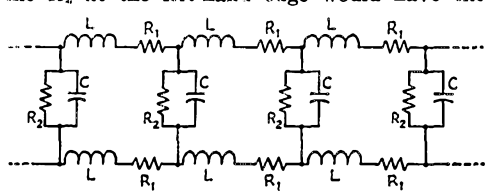
Losses

Most amateurs believe that it is imperative that the s.w.r. be as close to 1.0 as possible. It is true that a low s.w.r. is a worthwhile objective in many cases, but the importance varies. To illustrate, let's take a closer look at transmission lines.

The sketch in Fig. 1 isn't a complicated filter circuit; it is a representation of a length of transmission line. The line can be coaxial or parallel-conductor line; the sketch holds for either. Any line must be made of two conductors spaced a short constant distance apart. The conductors have resistance (represented by R_1) and inductance (L). The conductors have capacitance (C) and the spacing material has resistance (R_2). In a transmission line made of large silver-plated conductors R_1 would be lower per unit length than it would be in a line made of small conductors of a material of higher resistance. The leakage resistance, R_2, would be high in a line using quartz spacers every few feet, and it would be low in coax or Twin-Lead or other solid-dielectric line if the dielectric were of poor material like a few fly-by-night manufacturers have put in TV lead-in.

Let's get back to one other basic point. The inductance and capacitance of a transmission line don't use up any power, just as pure inductance and capacitance can't use up any power in any application. Power must be dissipated in a resistance, which can be the real resistance of a resistor (or R_1 and R_2 of Fig. 1) or the *radiation resistance* of an antenna, which is an expression used to account for the fact that the radiated r.f. is apparently used up by the antenna. (It isn't, of course; it sails blithely out into space to be intercepted by some distant amateur who QSLs promptly, you hope!)

When the s.w.r. on a line is 1.0, it means that the voltage across the line and the current in it are constant along that line. Thus in Fig. 1 the R_2 at the left-hand edge would have the same voltage across it as the R_2 at the right-hand edge, and the left-hand R_1's would have the same values of current through them as the right-hand R_1's would. (Discerning readers will realize that this is not strictly true unless R_1 is 0 ohms and R_2 is infinite megohms, but bear with us a bit.) When the s.w.r. is something other than 1.0, at points every half wave length along the line the voltage will be higher and the current will be lower than at any other point. At points halfway between these "voltage loops" the voltage will be lower (voltage nodes) and the current will be higher than at any other point. If the s.w.r. is 2.0, the voltage loop will be twice the value of the voltage node; if the s.w.r. is 4.0 the voltage loop will show four times the value of the voltage node, and so on. Obviously, at the voltage loops the R_2's of the line are going to get a chance to use up more power, and at the current loops the R_1's will eat up your precious r.f. (At least it's obvious if you remember Ohm's Law.)



EQUIVALENT TRANSMISSION LINE

Fig. 1 — **The equivalent circuit of a length of transmission line. The conductors have inductance (L) and resistance (R_1), and capacitance (C) and resistance (R_2) between them. The losses in a line come from the resistances.**

* Asst. Technical Editor. *QST*.

[1] Goodman, "'My Feedline Tunes My Antenna!'", *QST*, March, 1956.

[2] From s.w.r. = Z_0/R or R/Z_0, where Z_0 is the line's characteristic impedance and R is the load resistance. The larger number should be used in the numerator, to give an s.w.r. greater than 1.0.

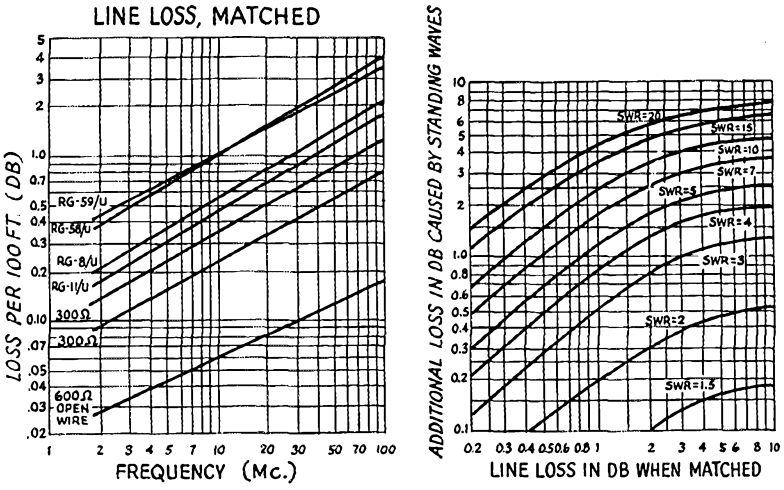


Fig. 2 — (A) Losses per hundred feet in matched lines, for several typical transmission lines. The upper 300-ohm line is for TV Twin-Lead, the lower 300-ohm line is for the transmitting type solid-dielectric line. (B) Curves showing the additional loss in a line introduced by the s.w.r.

But enough of this technical guff; let's keep the original promise about what to do about it. Let's take a typical amateur case, where an antenna is fed with a length of coaxial line. What is the loss in the line? To know this, the ham has to know the length of the line and the s.w.r. of the line. The length he can get by sending Jeeves out with a yardstick. If there is an s.w.r. bridge around the shack or around the town, it can be put in the line and the s.w.r. can be measured at several frequencies across the band. Then all one has to do is refer to Fig. 2 and read off his losses. To illustrate: Suppose the line is 150 feet of RG-8/U, and the s.w.r. is 1.5 at 21.0 Mc. From Fig. 2A, 100 feet of RG-8/U has a loss, when matched, of 0.85 db. per 100 feet at 21 Mc. For 150 feet the loss is $1.5 \times 0.85 = 1.28$ db. From Fig. 2B, the additional loss is less than 0.1 db., so the s.w.r. of 1.5 is just as good as 1.0, so far as any *extra* line losses are concerned.

However, if the s.w.r. goes to 2.5 at 21.4 Mc., the right-hand chart shows that the additional loss due to the s.w.r. is about 0.4 db., so the total line loss would be $1.28 + 0.4 = 1.68$ db.

Studying these charts will show you just where your line losses can become important and where they are negligible. A 1-db. loss means that 80 per cent of your transmitter power reaches the antenna; with a 2-db. loss 63 per cent arrives, and a 3-db. loss allows only 50 per cent to get up to the skywire. Our friend on 21 Mc. (preceding two paragraphs) went from a 73- per cent yield to a 68- per cent delivery when the s.w.r. changed from 1.5 to 2.5 and the db. loss went from 1.35 to 1.68.

If you don't have or can't borrow an s.w.r. bridge, you can guess at the s.w.r. from the formula given in footnote 2.

Reflected Power

Some of you already have, or are going to, run across an s.w.r. bridge that measures "reflected power." You have found, or are going to find, that the instruction book with the bridge says to measure the "forward power" and the "reflected power" and then apply their ratio to a chart in the book to get the s.w.r. You now, or you are going to, worry about the "reflected power" and whether or not it is bouncing back to your final amplifier to be dissipated on the plate of your output amplifier tube. Forget it. The "reflected power" isn't a real power at all. It's the reactive or "apparent power." A simple example is a pure capacitor; you put a source of a.c. across it and current flows. The product of the voltage and current gives you a figure for the "apparent power," but as you know, no real power is used up in a pure capacitor or inductance.

As a matter of fact, you can get some interesting results with a bridge that reads forward and reflected power. A transmitter that is capable of delivering not much more than 50 watts to a resistive dummy load may show *100* watts forward power and 67 watts reflected power when working into a line that has a high s.w.r. You might expect the rig to burn up, struggling to deliver all of this power, but actually all that is happening is that the transmitter is not fully loaded. The power delivered to the load (antenna) is the difference between the forward and the reflected power; in this example it is 33 watts ($100 - 67 = 33$). Your transmitter will be fully loaded (rated plate current) in this case when the difference between the forward power and the reflected power is 50 watts, which would occur at *150* watts forward and 100 reflected! (The above example was based on an s.w.r. of 10. If you're interested in the arithmetic involved, it is treated on in Chapter 3 of the *ARRL Antenna Book*.)

Selection of Transmission Lines

The charts of Fig. 2 should answer most of your feed-line questions, at least so far as losses are concerned. A length of coaxial line has no

(Continued on page 146)

Phased Array for 40 Meters

A Simple Reversible 7-Mc. Beam

BY A. E. LUX,* W7RTP

• A simple plug-in unit at the transmitter end of the feedline switches the pattern of this bidirectional beam antenna for 40 meters. It can be erected in a lot as small as 15 × 65 feet.

IF YOU HAVE ROOM for a half-wave dipole, you probably have room for a 40-meter horizontally-polarized beam! This comes close to the truth because ours casts an imaginary shadow of only about 50 by 13 feet. Yet the elements are full-sized and not shortened. Its cost, not including the poles, is under ten bucks.

The antenna consists of a pair of open-wire folded dipoles spaced 1/10 to 1/8 wave length,[1] the wires in each dipole being spaced 12 inches. Wood-dowel spreaders, boiled in paraffin, maintain the spacing. Six are enough for each element. The elements are a half wave length long as calculated by

$$\text{Length in ft.} = \frac{468}{f_{\text{Mc.}}}.$$

They are made of No. 10 or No. 12 wire.

One of the wires in each folded dipole is, of course, opened at its center where a half wavelength of 150-ohm TV Twin Lead is connected. Feeders one wave length long could also be used. In calculating the length of the feeders, don't forget the velocity factor which will be about 0.77. The formula for feeder length then becomes

$$\text{Length in ft.} = \frac{0.77 \times 492}{f_{\text{Mc.}}}.$$

It is very important that the two halves of the system be identical if optimum results are to be expected. Each side should be adjusted to resonate at the same desired frequency. At W7RTP this was done with an Antennascope and grid-dip meter at the feeder terminals.

Fig. 1 shows the general plan of the antenna. At W7RTP, the antenna elements are in the form of inverted V's about 50 ft. high at the center and perhaps 30 ft. at the ends. This was done to conserve space. Two TV masts support the center, although one with a crossarm would do.

Phasing

It is desirable to have a phase difference of about 140 to 150 degrees, since this gives a good compromise between gain and front-to-back ratio.[1] The phase can be shifted 180 degrees by simply transposing one feeder and connecting it in parallel with the other. However, 180-degree

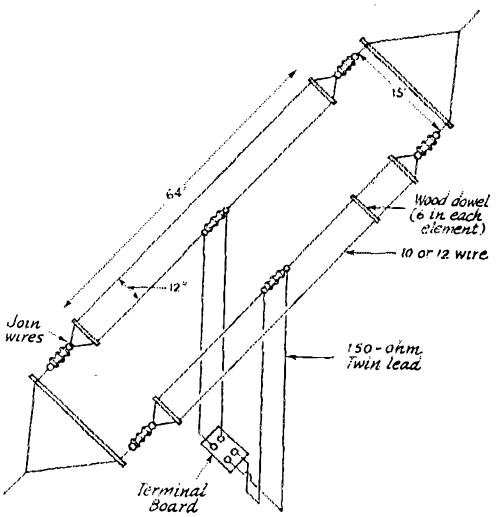


Fig. 1 — Sketch of the 40-meter phased array with folded-dipole elements. The terminal board is fitted with four banana jacks.

phasing results in a bidirectional pattern (front-to-back ratio of 1). The remaining 30- or 40-degree (180 − 30 = 150) displacement is accomplished by a phase-shift network.

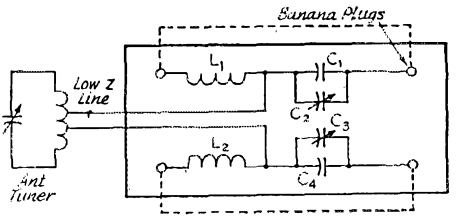


Fig. 2 — Schematic of the plug-in phasing unit. The banana plugs are arranged to fit the jacks in the antenna terminal board. Dashed lines indicate shorting straps that are used while the circuits are tuned to resonance. Values used by the author are:

C_1, C_4 — 200-$\mu\mu$f. transmitting mica.
C_2, C_3 — 100-$\mu\mu$f. variable.
L_1, L_2 — Approx. 1.8 μh. (See text for details).

The network, shown in Fig 2, is very simple. It consists of a pair of series-resonant circuits which should be identical. Various values have been tried. I am now using a capacitance of 250 $\mu\mu$f. and the inductance is adjusted so that when the capacitor and coil are connected in parallel,

* P.O. Box 633, Goodyear, Arizona.

[1] Moxon, "Two-Element Driven Arrays," *QST*, July, 1952.

the circuit resonates at the desired frequency with that amount of capacitance. The resonant frequency can be checked with a g.d.o.

The capacitor is made up of transmitting micas shunted with a variable for final tuning. Broadcast replacement-type variable capacitors should be a suitable substitute, although they may be a little hard to adjust unless a vernier dial is used. The two coils should have an inductance of about 1.8 μh. each. Strip coil stock, such as Air Dux or B & W could be used for the coil, but I made my own using No. 12 wire. The coils are self-supporting and have 10 turns 1¼ inches in diameter, 1½ inches long. Care should be used in making the coils as identical as possible.

The capacitors and coils are mounted on an insulating board fitted with banana plugs at the four corners. The antenna feeders are connected to a terminal board of similar dimensions fitted with jacks to fit the plugs. Antenna directivity may be reversed by simply reversing the plug-in unit on the terminal board. The antenna will be directive at right angles to the direction of the antenna on the side that has the capacitors in the feedline.

The array is fed by a short length of low-impedance Twin-Lead, connected as shown in Fig. 2. The impedance at the input end of this section of line measured about 55 ohms on the Antennascope.

With one of the antenna feedlines permanently connected to the terminal board, connect the other feedline temporarily. Tune in a good signal that you know is in the direction of the antenna directivity. Then transpose the wires of the temporarily-connected feedline to determine which connection gives the maximum signal. When this has been determined, the second feedline can be connected permanently. Now reverse the plug-in unit. You should observe a drop in signal strength of at least 20 db. Now do the same for a station in the opposite direction. Next, call CQ and pick the one you want.

The theoretical gain of an antenna of this type averages around 4 db. The front-to-back ratio will vary with the amount of phase shift. With the compromise shift set by the values of capacitance and inductance given above, ratios of 30 db. have been observed, with 20 db. as an average.

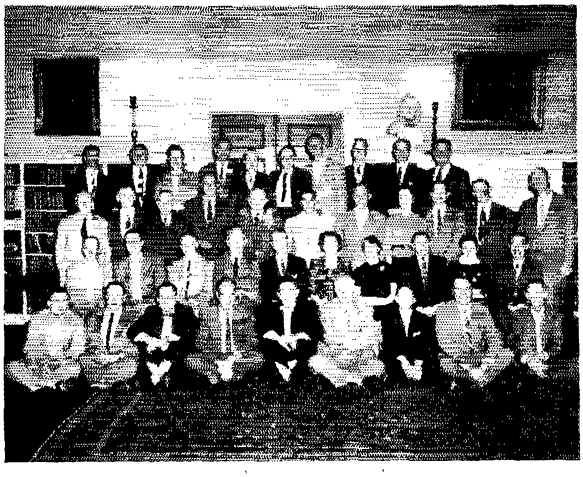
Only one attempt was made to work DX since the antenna has been put up. This resulted in two S9+10 and one S8+ reports from JA-land, plus good reports from East Coast stations within a period of three hours.

Strays

There have been all sorts of amusing cases of interference reported, including such victims as electric guitars, record players, hearing aids, and the like. The AP has just released a story on the weirdest yet. It seems that whenever the organist at a church in Blackpool, England, clicks down a stop for strongs, he gets instead a British weather report. A flick of the diapason stop is liable to bring in more weather information. British technicians are working on the problem, and the only sure thing right now is that the interference is not being caused by British hams.

K2HQI sends us the following AP story, quoted in its entirety, having to do with the International Reply Postcards which we mentioned on page 66 of *QST* for August, 1956.

"The Post Office Department announced today [Oct. 15] that it would shortly issue a 4-cent international postal card and a new 8-cent double international reply-paid postal card, each carrying the Statue of Liberty stamp in red, white and blue. The card will have a first-day sale in New York City Nov. 16 during the National Postage Stamp Show."



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It was strangely quiet in New England on the evening of Sat., Oct. 13th. The few that went chasing DX found the pickings easy and the competition practically non-existent. Why? Because that was the night of the 6th Annual N.E. DXCC meeting, at the Harvard Club in Boston. In the picture at the right are, left to right and front to rear: W1JEL, HX, BFT, ADM, FH, DSF, ABJ PFA & JNV — LHZ, WK, BHI, AXA, PST, FTJ, VFK, ZW, RYJ & QGJ — LOS, NS, LQ, NAV, QNC, GKK, JCX, YYM, WPO, RB & KQF — WLW, WTF, BOD, ZDZ, BLO, YZG, KNU, CTW, VCJ & FFO.

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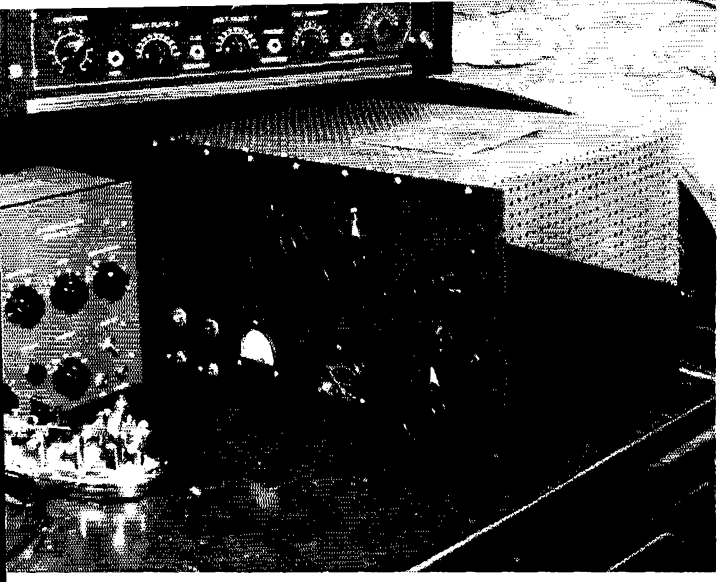


A compact medium-power linear amplifier with a built-in power supply. Along the upper portion of the panel, from left to right are controls for C_7, S_1, and S_3. Below are filament and plate power switches with their indicator lamps, the plate milliammeter, output r.f. ammeter, and the control for C_8. Above the latter is the knob of S_2.

The 4X150A as a Grounded-Grid Linear

Compact Construction for Medium-Power S.S.B.

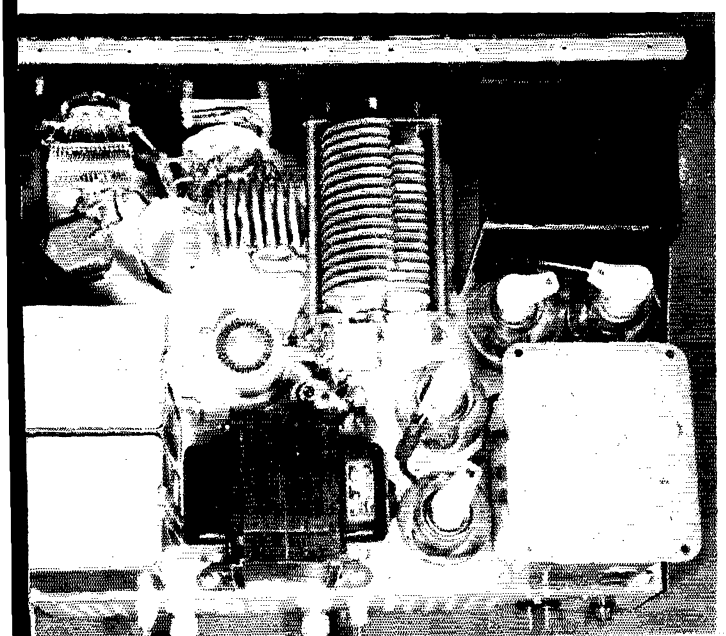
BY L. J. JENSEN,* WØMIQ

• This relatively small package contains a band-switching grounded-grid linear amplifier delivering up to 150 watts p.e.p. to a low-impedance load. Power supply is included, and the unit can be driven by an exciter with an output of 20 watts. The output circuit is a pi-*L* network.

WITH 4X150A TUBES increasingly plentiful in JAN surplus, and with their replacement by 4X250B's in commercial equipment, their application in grounded-grid amplifiers deserves attention by amateurs. The tube is small physically, but it has considerable power ability. As an amplifier with grounded screen and control grid in s.s.b. linear application, a single tube will take 300 watts input on peaks with ease. Direct drive from an exciter is facilitated by the separate cathode. The triode connection with grounded-grid input results in an input impedance of about 80 ohms — a good match for the majority of current s.s.b. exciters. And a power of 15 to 20 watts will drive a 4X150A to full output.

Use of pentodes and tetrodes in grounded-grid service is frowned on by tube designers when both the grid and screen are tied to ground. If the reasons for this anxiety are understood, it is still practical to operate the tubes without

*20 West 9th St., Kansas City 5, Missouri.



The 4X150A and its pi-section output circuit occupy the upper left-hand portion of the chassis. The remainder of the chassis is devoted to the bridge rectifier and its filter components. The rear edge of the chassis is generously perforated for air intake.

grid bias and screen voltage. For example, application of a two-tone audio sine wave for more than very brief intervals will overheat the grid and send the tube west. Normal instantaneous voice peaks, however, can be handled without difficulty.

Circuit

The schematic of Fig. 1 and the illustrations are self-explanatory. Switching is rather mandatory for changing bands quickly and hitting the right *L/C* ratio. The mechanical problem is relieved by the use of a 6-position ceramic switch S_1. (Separate positions are used for 80 and 75 meters.) This is in surplus, new stock, and is available from plentiful supplies at 98 cents each (Radiolab, Inc., 1612 Grand Ave., Kansas City, Mo.). The *L* section (L_4) on the output of the pi network is not a "must", but it is very convenient for optimum loading when shifting to another antenna or using a multiband affair.

Construction

Components are assembled on a 13 × 17 × 4-inch aluminum chassis. The panel is a standard 10½ × 19-inch section of aluminum, fitted with chassis brackets. A steel base cover is used on which rubber feet are mounted at each corner. The shield cover is cut easily from Reynolds hardware-store thin perforated stock and fastened with sheet-metal screws. The perforations are necessary for proper ventilation. A piece of Reynolds aluminum channel is used as a lip for the shield across the top back of the panel. A 6-inch-square opening is cut in the top of the shield directly above the tube, and an access door is made from ¼-inch hardware cloth bound with flattened channel.

The 4X150A needs constant cooling, including stand-by periods when plate voltage is off. It is mounted in an Eimac 4X150/4000 air-system socket. A 3000-r.p.m. phonograph-replacement

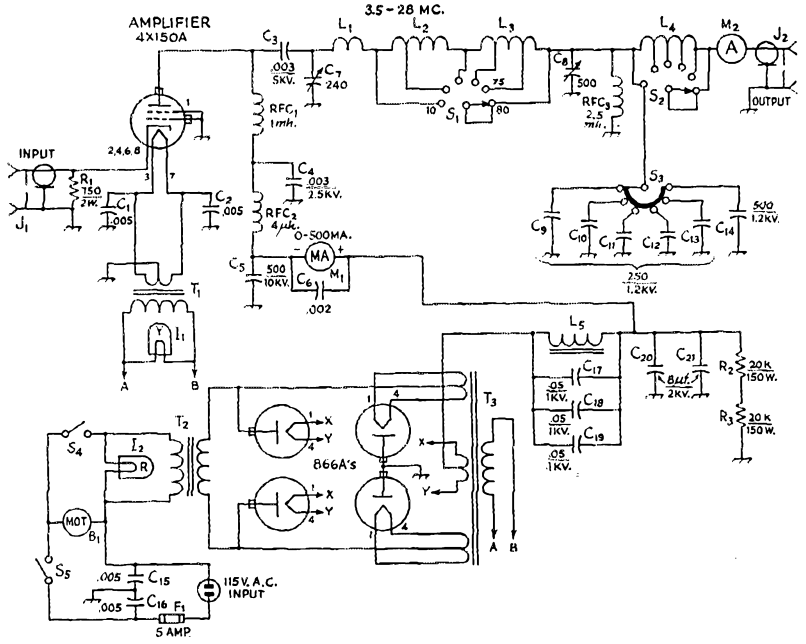
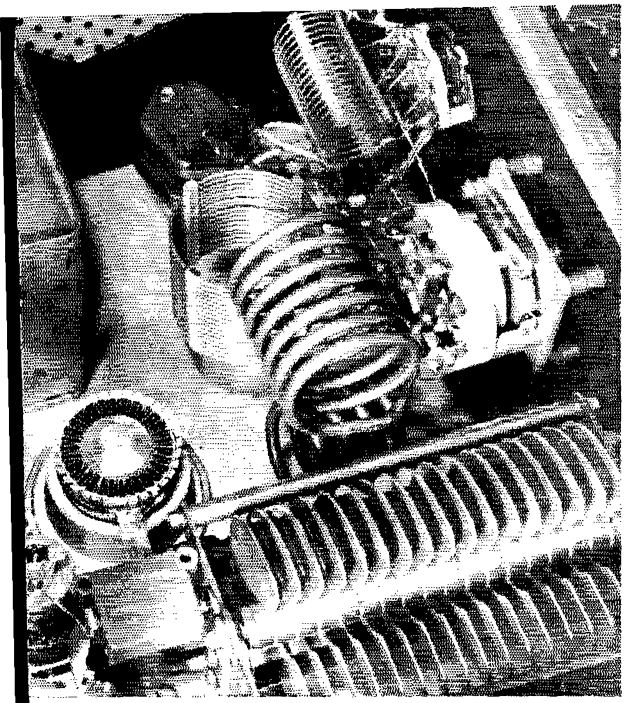


Fig. 1 — Circuit of the 4X150A linear amplifier. All capacitances less than 0.001 μf. are in μμf.

B_1 — Phonograph motor with 4-inch fan, or equivalent.
C_1, C_2, C_{15}, C_{16} — Disk ceramic.
C_3, C_4, C_5, C_9, C_{10}, C_{11}, C_{12}, C_{13}, C_{14} — Mica.
C_5 — TV-type ceramic.
C_7 — 240 μμf., 0.1-inch plate spacing (Cardwell PL-8031).
C_8 — 500 μμf., 0.045-inch plate spacing (Johnson 500E20 or equivalent).
C_{17}, C_{18}, C_{19} — Oil-filled (cases must be insulated from chassis).
C_{20}, C_{21} — Oil-filled.
F_1 — 5-ampere fuse.
I_1 — 115-volt neon panel lamp, yellow (Dialco 95408 with NE51 bulb).
I_2 — Same as I_1, red.
J_1, J_2 — SO-239 coax connector.
L_1* — 4½ turns ⅜-inch copper tubing, 1 inch i.d., 1¾ inches long.
L_2* — 7 turns ⅜-inch copper tubing, 1½ inches i.d., 2¼ inches long, tapped at 3 turns from L_1 end.
L_3* — 17 turns No. 14, 2-inch diam., 2 inches long, tapped at 7 and 16 turns from L_2 end (B & W 3900).
L_4* — 16 turns No. 16, 1-inch diam., 2 inches long, tapped at 1, 4, 7, 12 and 16 turns from L_3 end. (*Taps and interconnections made with strips of copper flashing.)
L_5 — 14-h., 60-ohm, 40 — 400-ma. swinging filter choke (Stancor C-1404 or equivalent).
M_1 — 0 – 500-ma. d.c. milliammeter.
M_2 — 0 – 4-amp. r.f. ammeter.
RFC_1 — 1-mh. 600-ma. r.f. choke (National R-154).
RFC_2 — 4-μh. r.f. choke (National R-60).
RFC_3 — 2.5-mh. r.f. choke (National R-100).
S_1 — See text.
S_2 — 6-position ceramic rotary switch, nonshorting.
S_3 — 6-position ceramic rotary switch, progressive-shorting (Centralab PA-2042).
S_4, S_5 — 10-amp. toggle switch.
T_1 — Filament transformer: 6.3 volts, 2.6 amp. required.
T_2 — Plate transformer: 1700 volts, 450 ma. (Thordarson 21P85, 21P87 or equivalent).
T_3 — Filament transformer: two 2.5-volt, 5-amp. windings; one 2.5-volt 10-amp. winding (UTC T-17).



A close-up view of the pi-section inductor arrangement. Included is the 4X150A in its air-system socket.

motor, fitted with a 4-inch fan, is mounted immediately beneath the tube socket, with its three bracket supports on rubber grommets. The motor is supported by a small aluminum plate mounted on Reynolds aluminum channel spanning the chassis. A series of holes in the back of the chassis provides air intake.

Connection to the plate of the 4X150A requires special attention. Around the plate cooler Eimac "finger" stock is bound with two turns of No. 18 bare wire which is twisted tightly at its ends. The ring of finger stock formed is removed and the wire soldered to the finger stock. Where the ends of the wire join, a strip of copper for a plate lead is bound and soldered.

R.f. choke RFC_1 is turned upside down on its mounting bracket, and its terminal connections are reversed. The tube plate lead is then connected to the terminal on the short stand-off insulator. The blocking capacitor C_3 fits under the plate tuning capacitor, being suspended on copper-strip leads between a rear stator terminal of C_7 and the terminal of RFC_1. C_4 is fastened to the rear end plate of C_7 by one of its terminals and a small spacer. The other terminal of C_4 is connected to the top terminal (ground end) of RFC_1 which is also connected to RFC_2. The bottom end of RFC_2 is supported on a feed-through insulator that carries the high-voltage line back to the plate milliammeter M_1. A copper strap connects this feed-through also to C_5 mounted alongside.

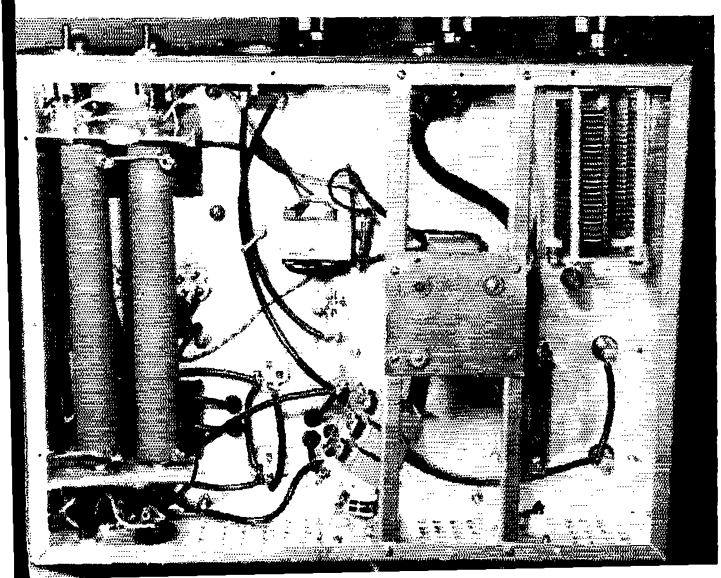
Power Supply

A well-regulated plate supply is a requirement, since idle plate current is 20 ma. and peaks average 200 ma. The supply should produce from 1200 to 1500 volts at full load. A swinging choke is an asset. It should be followed by at least 16 μf. of filter capacitance and a rather stout bleeder. Regulation of some supplies can be improved by tuning the filter choke with a shunt capacitor as shown in Fig. 1. In this particular instance, optimum is a few hundred micromicrofarads, plus or minus, centering on 0.15 μf. The supply shown produces 1450 volts under full load, and 1475 idling.

If a center-tapped transformer (approximately 850 volts each side of center tap) is used with the bridge rectifier, its current rating should be twice the expected d.c. load current. A conservative rating would be 450 ma. However, where the load is of an intermittent nature, such as c.w. or s.s.b., a transformer with a rating of 300 ma. should be adequate.

The power-supply components are mounted on the rear portion of the chassis. Those shown came from an accumulated junk box, but

(*Continued on page 144*)



This bottom view shows the manner of supporting the ventilating fan on aluminum channel stock. The bleeder-resistor units are to the left. The filament transformer is near the top center. The three filter-tuning capacitors, C_{17}, C_{18} and C_{19}, near the bottom center must have an insulated mounting. C_8 is in the upper right-hand corner.

A Simple Crystal Switcher

Adding Operating Convenience to the Novice Station

BY LEWIS G. McCOY,* W1ICP

THE FREQUENCY ALLOCATIONS of the Novice bands are such that it is impossible for the operator to use a single crystal for more than one band. This, of course, means that for the Novice operator to operate on 80, 40, and 15 — or 2 — he must have a different crystal for each band. In addition, many Novices find it is to their advantage in dodging QRM to have more than one crystal for the band or bands they use. The crystal switcher described here serves two functions; it provides the operator with the convenience of crystal switching and serves as a storage place for unused crystals. If you have ever misplaced a crystal you know how important this latter point can be. Another feature of the unit is that it can be built to accommodate the larger style crystal holders, the type with ½-inch diameter pins and ¾-inch spacing. While the unit shown in the photographs will take only 5 crystals, it can easily be modified to accommodate as many as 12 crystals. This can be done by changing S_1 (Fig. 1) to a 12-pole switch and adding the appropriate number of sockets.

In the unit shown here, one socket (X_3) is a 5-pin socket. The spacing between Pins 2 and 4 is the same as the pin spacing of the larger type crystal holders. The other two sockets (octal) will each take two of the FT-243 type holders.

A 3 × 4 × 5-inch aluminum box was used for the unit shown in the photographs. This size will easily accommodate an additional three sockets if the builder wants to add crystals. First, mount the switch and sockets on the chassis, while the soldering iron is warming up, and then make the few connections that are necessary. In wiring the unit, use direct leads of No. 18 or 20 tinned wire. Solder lugs under one of the nuts on the mounting screws at each socket are used for the ground connections. A 10-inch length of 300-ohm Twin-Lead is used to connect the switcher to the crystal socket of the transmitter; it runs out the rear of the housing through a rubber grommet. At the unit, one side of the Twin-Lead is connected to the arm of the switch and the other side to the common ground. When inserting P_1 into the crystal socket of the transmitter, be sure that the ground side of P_1 is connected to the ground side of the crystal socket. If desired, the builder can dispense with P_1 and solder the ends of the Twinlead to the appropriate terminals of the transmitter crystal socket.

Parts for the crystal switcher should cost less than $2.00, and the unit will more than repay you in operating convenience.

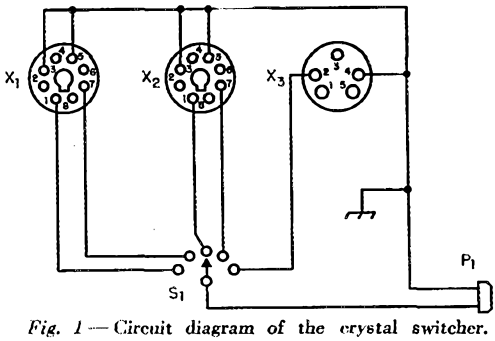
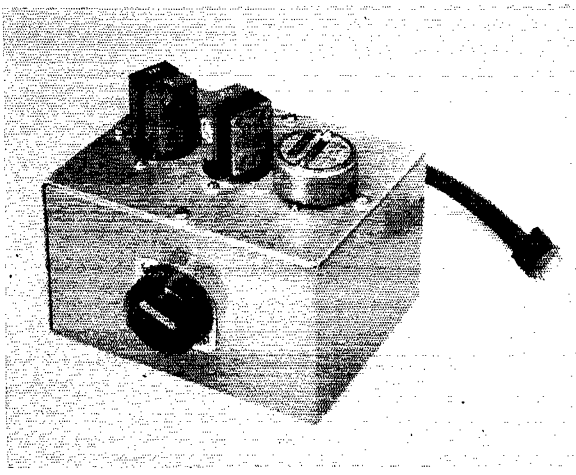


Fig. 1 — Circuit diagram of the crystal switcher.
P_1 — Plug for crystal socket (Millen 37412, Mosley type 301).
S_1 — Single-pole, 8-position (5 used) (Amphenol type 36-1).
X_1, X_2 — Octal socket.
X_3 — 5-pin socket.



This simple unit can be used with any transmitter that has a panel-mounted crystal socket with one side grounded, to provide crystal switching. The short length of Twin-Lead plugs into the transmitter crystal socket; it runs out the rear of the switcher through a rubber grommet. Shown here with a 5-pin socket and two octal sockets for a total of 5 crystals, it can be modified to accommodate as many as 12 crystals.

*Technical Assistant, *QST*.

• Recent Equipment —

The HQ-150 Receiver

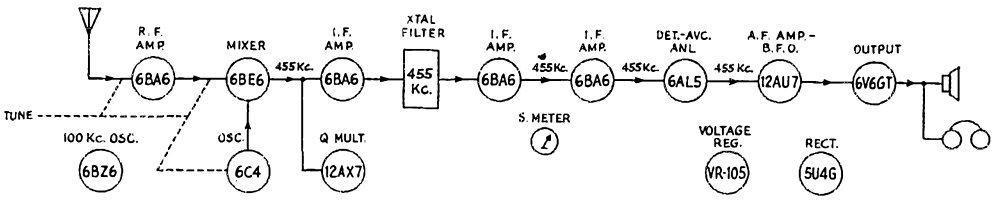
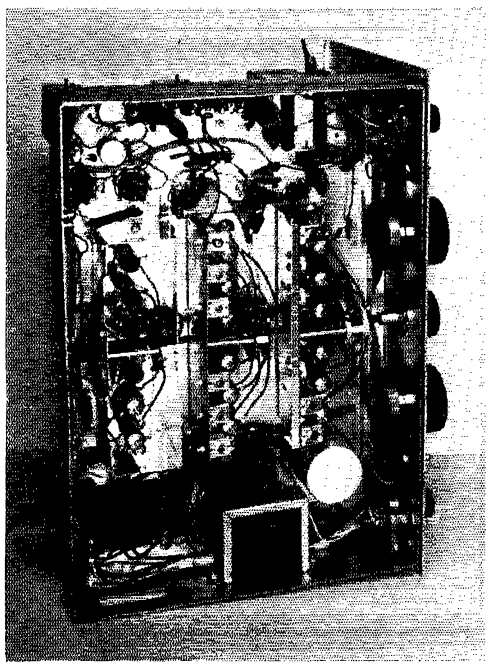


Fig. 1 — Block diagram of the HQ-150 communications receiver. The VR tube stabilizes the screen voltage on the r.f., mixer and first two i.f. stages and also the plate voltage of the 6C4 oscillator.

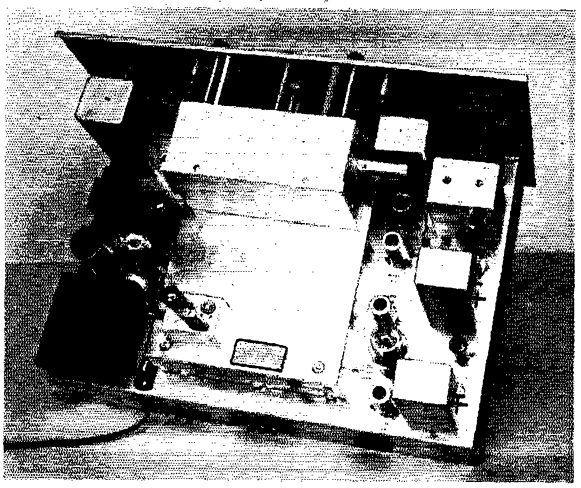
THE BASIC FEATURES of the Hammarlund HQ series of receivers have long been known to many amateurs. Starting with the HQ-120 back in the late '30s, the basic design has evolved through the postwar HQ-129 and the miniature-tube HQ-140 and HQ-140A. The receivers in this line have always been characterized by two-dial tuning for continuous coverage from the broadcast band to above 30 Mc., a wide-range crystal filter (a Hammarlund invention), and smooth tuning with a simple but highly satisfactory drive mechanism. Good automatic noise limiting on a.m. signals has also been a consistent characteristic.



A view underneath the chassis shows the flywheels on the tuning drives. The circular shield can at the lower right houses the underside of the b.f.o. socket.

Currently, this line of development is represented by the HQ-150, a receiver that bears an obvious relationship to its predecessors but which has a definite personality of its own. The tuning range of .54 to 31 Mc. is covered in six bands; the band-spread tuning capacitor is operative on the four high-frequency ranges above 3.2 Mc. The amateur bands at 80, 40, 20, 15 and 10 meters are shown in direct frequency calibration on the band-spread dial (300° of scale), so it is only necessary to switch to the desired range and set the band-set dial correctly. To insure precision in this action, a 100-kc. crystal-controlled calibrator oscillator is included in the HQ-150, so it is an easy matter to set up the receiver "on the nose" near any 100-kc. multiple or band edge. Typical tuning rates of the band-spread knob are 6 revolutions to cover the 7-Mc. band and 5½ to cover 20 meters.

A block diagram of the HQ-150 is shown in Fig. 1. Following the tunable front end and entering the 455-kc. i.f. amplifier, a *Q* multiplier is used at the output of the mixer. This *Q* multiplier has provision for either NULL or PEAK operation, so that an interfering carrier can be nulled out or a desired signal can be peaked. Panel controls associated with the *Q* multiplier are a switch for selecting the mode of operation or turning off the multiplier, a frequency control for moving the null or peak across the i.f. range, and separate controls for adjusting the null depth or peak height. Following the first stage of i.f. amplification, the signal passes through a crystal filter with five degrees of selectivity. The crystal filter band width at 6 db. down ranges from a few hundred cycles in the sharpest position to slightly over 2 kc. in the broadest. With the filter switched out, the i.f. band width is 5 kc. at 6 db. down. With a *Q* multiplier and a crystal filter, the operator has a number of different selectivity conditions to play with, and any HQ-150 owner would be quite negligent if he didn't spend some time in learning how to use the selectivity to best advantage. With a choice of two rejection notches (multiplier and crystal) and two peaks, or one notch and one peak, a knowing operator



In the HQ-150, the Q multiplier is housed in the shield compartment on top of the tuning-capacitor shield (upper center).

should be able to combat today's QRM fairly well.

Two more stages of i.f. amplification follow the crystal filter, and then the signal is rectified in the diode detector and passed along through the audio amplifier. The techniques are straightforward here, but a little later on we'll show the S-meter circuit, just in case you might find an application for it in some other piece of gear.

The r.f. stage and the first i.f. stage are gain-controlled manually in the cathode circuit, and these plus the second i.f. stage are tied in to the a.v.c. system. The gain of the last i.f. stage is maintained constant at all times. Higher-than-minimum bias is used on the last two i.f. stages, presumably to improve their signal-handling capability and increase the dynamic range.

The automatic-noise-limiter circuit is the conventional series-diode arrangement.

We have been in a number of ham shacks where one of the earlier HQ receivers was in operation, and many a time we have seen a large knob on the band-spread tuning, replacing the small knob that was furnished with the receiver. Apparently, word of these modifications reached the manufacturer, because the latest HQ receivers sport $2\frac{5}{16}$-inch diameter tuning knobs. These, coupled with the smooth crimp drive and the heavy flywheels on the shafts, make fine tuning an easy job.

The S-meter circuit is shown in Fig. 2. This circuit uses the meter to measure the voltage difference between an a.v.c.-controlled cathode and

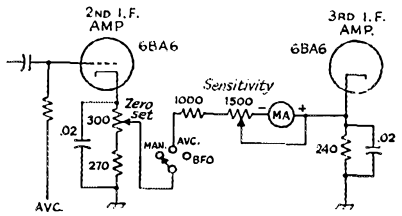


Fig. 2 — The S-meter circuit of the HQ-150.

a reference voltage. In the HQ-150 the reference voltage is that appearing across the cathode bias resistor of the last i.f. stage, but it could be derived from any stable source. As the cathode current through the controlled tube reduces with an increase in a.v.c. voltage, the drop across the cathode resistor decreases and more current flows through the meter. Chassis controls permit setting the sensitivity over a wide range; the receivers are set at the factory so that 50 μv. gives a reading of S9. — *B. G.*

Strays

The Twentieth B.E.R.U. contest will be held on January 26–27 under the sponsorship of the Radio Society of Great Britain. Canadians interested in participating may send a postcard to ARRL Hq. for a copy of the complete rules, which have changed somewhat from previous contests.

Please, no requests from U. S. hams. The contest is only for members of the British Empire.

K2HBZ sets his sites on the heights! A real-estate broker, he has been specializing in finding high locations for brother hams.

—•••—

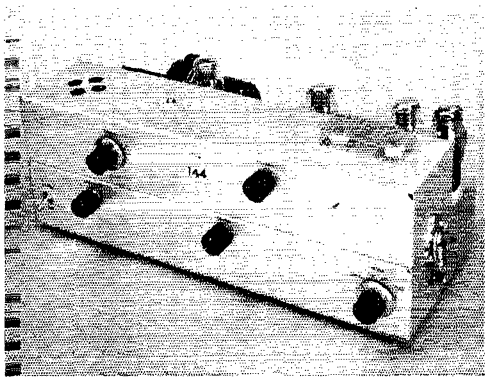
K4IYE wants to claim the fastest QSL delivery on record, because 2.67 seconds after he worked K4GRN the QSL was there. A bit of fancy computation makes it obvious that the two stations must have been not more than 30 yards apart, if that!

• *Technical Topics* —

Linear Amplifiers for the V. H. F. Man

UNTIL SINGLE-SIDE-BAND usage brought the term back into the amateur language, the linear amplifier was almost unknown to most of us. If you had asked a typical group of 1950-model hams how a linear amplifier worked, you'd have gotten a shrug of the shoulders and "Who uses linears?" for an answer. Even today the chances are that not too many hams outside the side-band ranks could give a good explanation of their operation.

But the word linear is becoming well known in v.h.f. circles, thanks to the introduction of at least one commercial version for operation on 50 or 144 Mc.[1] The popularity of this companion to the Communicator has led many v.h.f. men to thinking of homebuilt linear amplifiers, principally as a means of stepping up their power level without going to the trouble and expense of building higher-powered modulator equipment.



The questions these customers of the ARRL Technical Information Service ask give ample evidence that the limitations (and the possibilities, too) of the linear amplifier are little understood by most of their potential users. "Please send me the diagram of a linear amplifier using an 829B, to go with my Communicator," is a typical request. Fellows on lower bands ask for linears that use 6146s. Investigate the linear situation, and you find that an 829B linear amplifier could not be made to deliver more than 10 to 15 watts output on 144 Mc. Obviously, that step-up from the Communicator level is not worth what it would cost to build. Where, then, *does* the linear fit into the v.h.f. picture?

If it fits at all, it is into the power bracket above 200 watts input, roughly. Here big tubes that work well above 50 Mc., and the power supplies to run them, begin to cost real money. High-level plate modulation is even more of a strain on the pocketbook. There is a good financial reason why nearly all v.h.f. stations are in the 100-watts-and-under category. A worthwhile step up from the 100-watt level costs more than most v.h.f. men are willing or able to spend.

A good linear amplifier will come high, too, but it does offer the chance to get up to 200 watts *output* on phone, with nothing more than a Communicator or some similar low-powered phone rig as a driver. If you're willing to readjust the amplifier for c.w. operating conditions it is possible to put 700 watts or more into the antenna with the same amplifier on c.w. This is an ideal setup for most v.h.f. stations, where high power is more often wanted on c.w. than on phone.

The amplifier shown below and on last month's cover will be described shortly in *QST*. It runs up to 500 watts input on c.w., and with a driving power of 10 to 15 watts it will deliver 350 watts output.

Operated as a Class AB_1 linear amplifier, it requires no driving power at all. When it is used with a Communicator, a dummy load must be inserted between the two units to swamp out a major portion of the Communicator's output! Yet in this service, the amplifier delivers over 100 watts output, modulated — a really potent signal on 144 Mc. Two 4X250Bs instead of one would double these figures.

The Gonset Linear Power Amplifier[1] uses two 826s, which, being triodes, do not have the power gain that is possible with a tube like the 4X250B used in the W1VLH rig. The Gonset amplifier does give a power increase of 10 db. or more which is distinctly worthwhile. It does this by following an important rule for linears — use tubes with a husky plate dissipation.

The principles of a.m. linears were covered thoroughly in a Technical Topic by Grammer in February, 1956, *QST*. We're not going to repeat him here, but note that he emphasizes that the maximum you can get from an a.m. linear is equal to about *half the rated plate dissipation* of the tube or tubes used. Thus our 4X250B job gives over 100 watts output; the two 826s deliver 40 to 50. If these amplifiers were converted to Class C operation, with plate modulation, they'd give up to three times the power output, and probably run cooler doing it.

Still that big phone signal with only a few watts output from the driver and no costly modulator looks good. And it is good, when all the costs are totalled up. But the advantages are not gained without paying the full price. One of the factors we've not yet talked about is adjustment of the equipment. On c.w., anything goes — or almost anything. A well-designed amplifier, plate modulated, is not tricky in adjustment. Any of its operating conditions can be varied quite a bit

[1] "VHF Linear Power Amplifier" Recent Equipment Oct. 1955, *QST*, p. 42.

before anything much goes wrong with the signal. But the linear must be set up right, or it won't play. Or at least it will sound somewhat less than good.

We ran across an owner of a new Gonset Linear on 6 the other day. He sounded terrible, and everyone was telling him so. His modulation level was low, and when he tried to raise it by talking louder he got only distortion. We suspected that he had not yet read the instruction book, so we suggested that he increase the antenna loading and then reduce his grid drive, until the output was well below the maximum that could be obtained. When this was done the distortion vanished. He had missed another basic fact of linear amplifier operation: the linear cannot be run at its maximum c.w. output. You have to leave some for the modulation upswing. It must also be operated within close tolerances. Overdrive it, or underload it, and the thing simply will not follow the modulation of the drive stage as it must if it is to be *linear*. If it is not linear, it will sound undermodulated or distorted; and likely both.

So, to get your money's worth from a linear amplifier you need to adjust it with care, and watch its operation closely. With our cover amplifier you begin by setting the fixed bias level so that the plate current is about 100 ma. Provision is made in this unit for regulating the screen voltage at 350. Plate voltage can be anything from 500 to 1500 volts, so long as the no-drive plate current is held to around 100 ma. with the bias control. Now you couple to the driver stage.

Remember this is a Class AB_1 amplifier. It is not going to draw grid current at any time. The grid voltage will be the only evidence in the grid circuit that drive is being applied. Start with little or no drive, without modulation, and then as the driving voltage is increased, output will appear and the plate current will rise. When the drive is increased to the point where the tube just starts to draw grid current, adjust the antenna loading for maximum output with as much plate current as you feel safe in running, up to 400 ma. Something like a Micromatch, connected in the line to the antenna is very helpful here.

Now back off on the drive until the plate current drops to 200 ma. and apply modulation. If the amplifier is operating linearly its plate current will be the same whether or not you are modulating. Talk up until grid current just shows on modulation peaks. If the plate current changes with modulation, try more antenna loading and reduce the unmodulated grid drive to keep the plate current at 200 ma. Continue this until the plate current stays steady whether or not you are modulating up to the grid-current point. A modulation indicator such as a neon or fluorescent lamp should show the normal modulation brightening even though there is no change in plate current.

To determine the safe operating conditions for the linear in a.m. service, we must go back to a statement made earlier: that the best output we can hope for will be no more than about half the rated plate dissipation of the tube used. With the 4X250B this will mean a maximum of 375 watts input and 125 watts out. To play safe it is well to be satisfied with less, expecially at the frequencies this amplifier is designed for. Experience has shown that it runs nicely with 1500 volts on the plate and 200 ma. plate current, delivering better than 100 watts to the antenna.

It is important that the driver stage be well modulated. If it is not emitting a good-quality signal, the linear will certainly not do so. But if the driver is modulated cleanly and well, the characteristics of the signal radiated by the linear will be equally good, if it is adjusted properly. This would indicate that general use of linear amplifiers could help to clean up the mess we find all too frequently on our phone bands today.

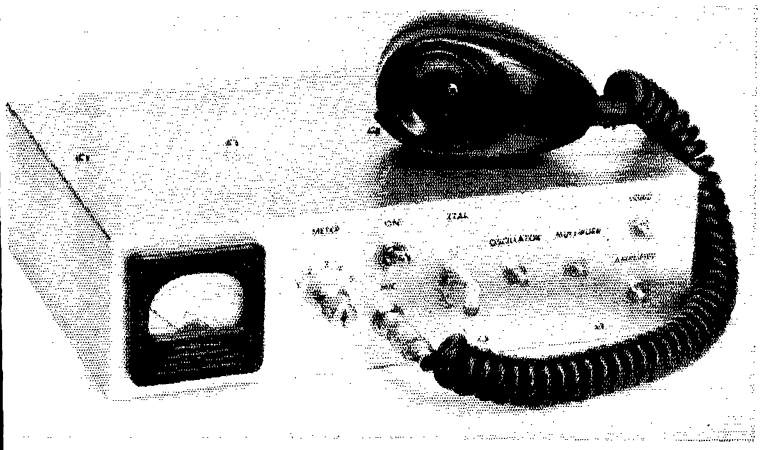
Getting a 5-watt phone rig to work properly should be a relatively simple matter. From there on to a good sounding signal of up to 200 watts or so of output is mostly a matter of getting the linear to operate with complete stability, and show upward modulation. This should not be difficult, if adjustments are made with a little care, and checked regularly.

The amplifier, which will be described by W1VLH in full detail at a later date, can be shifted from linear operation to full-power c.w. or high-level modulation service with a minimum of fuss. Control of bias and regulation of the screen voltage at either 350 or 250 volts, facilitate this. Provisions for these adjustments are included in the unit itself. Visible in last month's cover photograph, also, is a power absorbing load for the Communicator. This device, an unheard-of thing in v.h.f. circles (fancy cutting *down* the grid drive!), permits the Communicator to be operated at its normal condition as to tuning, and still furnish plenty of driving voltage for the linear amplifier.

A quick change to c.w. can be made merely by adjusting the grid drive to the amplifier until it reaches maximum output. This will enable you to run the output up to 150 to 200 watts with no other adjustments. But if you switch out the attenuator you can increase the output to 250 to 300 watts, even with the Communicator as a driver. With more driving power (about 15 watts output from the driver would be nice) the 4X250B can be run up to its rated input of 500 watts c.w., or 300 watts plate-modulated phone. The efficiency under these conditions will be very fine indeed, and it will be found that the one small tube will deliver nearly as much useful power to the antenna as more conventional rigs that run up to twice the input.

And if you're thinking of going to single side band, an amplifier like the W1VLH rig puts you in business as soon as you have developed a few volts of s.s.b. output on 144 or 220 Mc. A commercial s.s.b. exciter and an oscillator-mixer are all you'll require, if you want to get there the easy way.

— *E. P. T.*



The 50-Mc. mobile transmitter is built into a 7 × 11 × 3-inch aluminum chassis (Premier ACH-425). S_1 on the front wall is flanked by the meter at the left and J_1 and S_2 at the right. The control shaft for C_1 is centered in between the crystal socket and the multiplier tuning control, C_2. The amplifier tuning capacitor, C_3, is at the lower right-hand corner, directly below the output capacitor, C_4.

A 10-Watt 50-Mc. Mobile Transmitter

Complete Phone Rig Operated from a 300-Volt 100-Ma. Power Pack

BY C. VERNON CHAMBERS,* W1JEQ

• Numerous AREC members, c.d. operators, and still others who go mobile just for the fun of it, have found the 50-Mc. band to be one of the best for reliable communication with low power. Those who have yet to try this popular band will be pleasantly surprised at the results obtainable with a simple transmitter of the type to be described. This rig does a real man-sized job without working the car battery to death. Total current drain from a 6-volt battery is only 8 amperes or so and, of course, the load drops to approximately 4 amperes with a 12-volt electrical system in use. The layout uses only 4 tubes — 2 each for the r.f. and the audio circuits — and can be put together in a few hours' time. An inexpensive vibrator-type power supply rated at 300 volts and 100 ma. will handle the complete transmitter.

ALTHOUGH this crystal-controlled mobile transmitter is complete with audio and r.f. circuits, it is extremely simple to construct, test and operate. The circuits are conventional in every detail and constitute the minimum amount of gear with which a stable 50-Mc. phone signal of reasonable strength may be generated. The r.f. amplifier operates with a d.c. input of 10 to 12 watts, and the entire transmitter loads the car battery only slightly more than does a standard automobile broadcast receiver.

A meter-switching circuit is included and provision is made for push-to-talk control of external antenna and power relays. The standard 54-inch broadcast whip may be used as the transmitting antenna if there are objections to a special 50-Mc. radiator.

Layout and wiring of the transmitter is simplified by using subassembly-type construction. Enclosing the subassemblies and all other components in a shallow aluminum chassis facilitates under-the-dash mounting of the unit.

The transmitter was designed to work with the most inexpensive power supply readily available — a 300-volt 100-ma. vibrator pack. The type 5763 in the r.f. amplifier is an inexpensive tube that can be used to full capability with this type of supply. A 12-volt equivalent (6417) that may be substituted without modification of the circuit is available. The exciter and the audio tubes may be wired for either 6- or 12-volt operation.

It might be well to point out that the exciter is husky enough to drive a larger amplifier tube such as the 2E26. However, before full advantage can be taken of this modification, it will be necessary to include audio and power equipment having higher output ratings. Of course, these requirements will add considerably to the cost of the transmitter.

Circuits

The oscillator-doubler section of the transmitter uses a type 12AT7 dual-triode as shown in the circuit diagram, Fig. 1. One half of the tube, V_{1A}, operates in an overtone oscillator using a 25-Mc. crystal. Feedback for the oscillator is controlled by a fixed capacitor, C_5, as described in an earlier article.[1] The plate circuit, C_1L_1, is resonated at 25 Mc. and output from the stage is capacitance coupled to the grid of the doubler tube, V_{1B}.

The straight-forward doubler circuit is resonated at 50 Mc. by the parallel-tuned plate tank, C_2L_2. Output from the doubler is capacitance coupled to the r.f. amplifier tube, V_2.

The r.f. amplifier works straight through at 50 Mc., uses grid-leak bias and has a balanced

* Technical Assistant, *QST*.

[1] Tilton, "Overtone Crystals — How and Where to Use Them," *QST*, March, 1955.

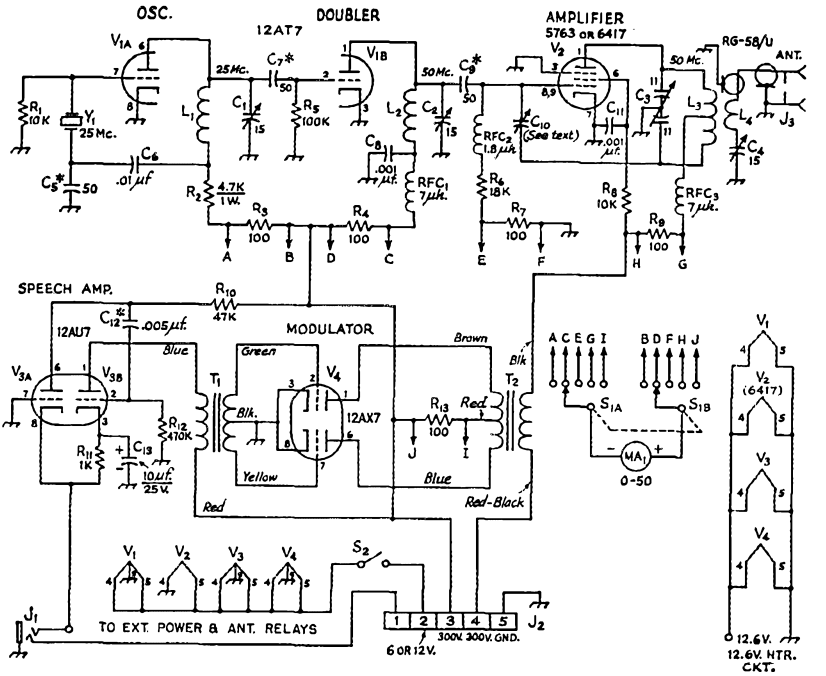


Fig. 1 — Schematic diagram of the 50-Mc. mobile transmitter. Capacitors below 0.001 are in μμf. C_{13} is an electrolytic capacitor. * Indicates a tubular ceramic. All other capacitors not identified below are disk ceramic. All resistors except R_2 are ½ watt.

C_1, C_2, C_4 — 15-μμf. variable (Hammarlund MAC-15).
C_3 — 11-μμf.-per-section butterfly variable (Hammarlund MACBF-11).
C_{10} — Approx. 0.4 — 5 μμf.; see text (Erie 532-B).
J_1 — Three-circuit microphone jack.
J_2 — 8-contact (5 used) male connector (Amphenol 86-RCP-8).
J_3 — Coaxial-cable connector (SO-239).
L_1 — 2.2 μh., 18 turns No. 20, ⅝-inch diam., 1⅛ inches long (B & W 3007).
L_2 — 0.25 μh., 7 turns No. 18, ½-inch diam., ⅞ inch long (B & W 3002).
L_3 — 1.2 μh., 12 turns No. 20 tapped at center, ⅝-inch diam., ¾ inch long (B & W 3007).
L_4 — Output link, 3 turns No. 20 insulated wire, close-wound over center of L_3.
MA_1 — 0-50-ma. d.c. milliammeter (Triplett 227-T).
RFC_1, RFC_3 — 7-μh. r.f. choke (Ohmite Z-50).
RFC_2 — 1.8-μh. r.f. choke (Ohmite Z-144).
S_1 — 2-pole 5-position phenolic selector switch (Centralab 1411 or 2 type 1f wafers mounted on P-121 index).
S_2 — S.p.s.t. toggle switch.
T_1 — Driver transformer, single plate to Class B grids (Thordarson T-20D76).
T_2 — 10-watt modulation transformer, variable ratio, primary rating 70 ma., secondary rating 60 ma. (Merit A-3008).
Y_1 — 25-Mc. crystal (International type FA-9).

plate circuit (C_3L_3) so that a conventional neutralizing system may be used. C_{10} is the neutralizing capacitor. Output from the amplifier is coupled to the antenna feed line via a series-tuned coupler, C_4L_4, and the output jack, J_3.

One half of a type 12AU7 is used in the grounded-grid input circuit of the speech amplifier. The second half of the tube, V_{3B}, operates in a Class A driver stage which is, in turn, transformer-coupled to a Class B modulator. The modulator tube, V_4, is a type 12AX7. D.c. voltage for a single-button carbon microphone is obtained by connecting the microphone in series with the cathodes of the 12AU7.

S_1 switches the 50-ma. meter to read plate current of the r.f. stages, grid current of the r.f. amplifier, or modulator plate current.

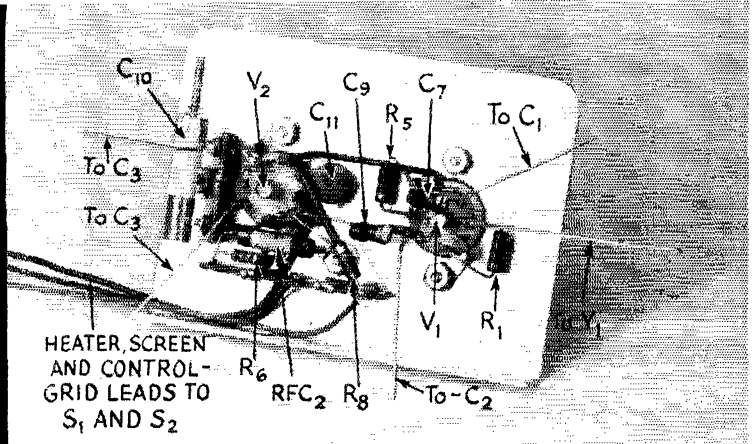
S_2 is the heater on-off switch. The heater circuit shown connected to S_2 is for 6-volt operation. A 12-volt heater circuit is also shown in Fig. 1. Notice that the 12-volt circuit requires that a type 6417 be substituted for the 5763 and that Pins 9 of V_1, V_3 and V_4 are not used.

The power jack, J_2, for the original transmitter is an 8-prong connector. However, a 5-terminal connector will accommodate all of the wiring shown in Fig. 1. The push-to-talk contact on the microphone switch may be returned through J_1 to Terminal No. 1 of J_2 so that external antenna and starting relays may be conveniently controlled by the operator.

Construction

The photographs of the transmitter and the two subassemblies show clearly the arrangement of all components. Before the parts are mounted on the subassemblies, it is advisable to use the brackets as templates for locating and marking the bracket-mounting holes in the main chassis.

The tubular trimmer, C_{10}, used as the neutralizing capacitor, has a rated minimum capacitance of 1 μμf. The minimum capacitance is reduced to a still lower value (0.4 μμf. and suitable for neutralizing a 5763 or 6417) by sliding the tubular stator plate out and away from the



The bracket for the r.f. subassembly measures 2⅞ by 4 inches and has a ½-inch mounting lip at the bottom end. The tinned wires extending away from the unit should be about 2½ inches long, and the insulated leads at the lower left-hand corner should be approximately 15 inches long. Pin 9 of each socket faces toward the bottom of the assembly.

tuning-slug end until only half of the plate rests on the plastic form.

Leads between the r.f. subassembly and the panel-mounted components should be made with No. 14 tinned wire. Ordinary hook-up wire is used for the rest of the wiring except for the coaxial lead (RG-58/U) between L_4 and J_3.

Meter shunts R_3, R_4, R_7, R_9 and R_{13} are mounted directly between the sections of S_1. A 5-terminal (1 terminal unused) tie-point strip, mounted above C_1 and C_2 as shown in the interior view, is used to support the coaxial-cable end of L_4 and the B-plus ends of R_2, RFC_1 and RFC_3.

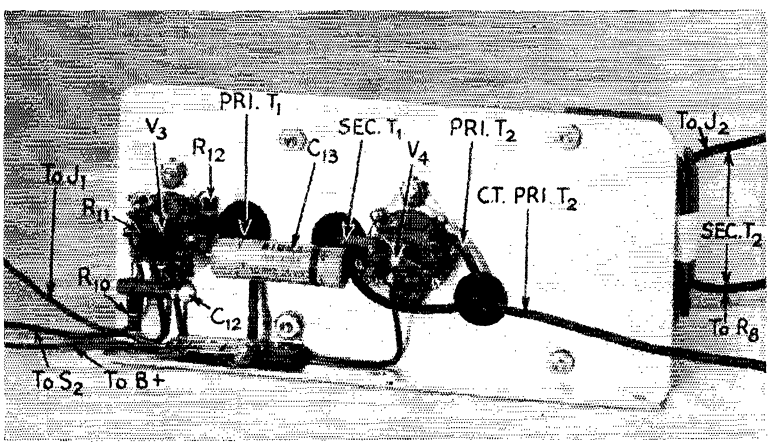
Testing

A standard a.c. power supply that will deliver 300 volts at 100 ma. may be used during testing of the transmitter. Heater-current requirements are 1.65 amp. for 6-volt operation and 0.825 amp. for the 12-volt circuit. Do not connect the plate supply to the r.f. amplifier power terminal (Pin 4 of J_2) at this time. An overtone crystal ground for operation in the 25- to 27-Mc. range must be placed in the crystal socket and a dummy load should be available. Five No. 44 pilot lamps connected in parallel with short leads provide a good load for testing.

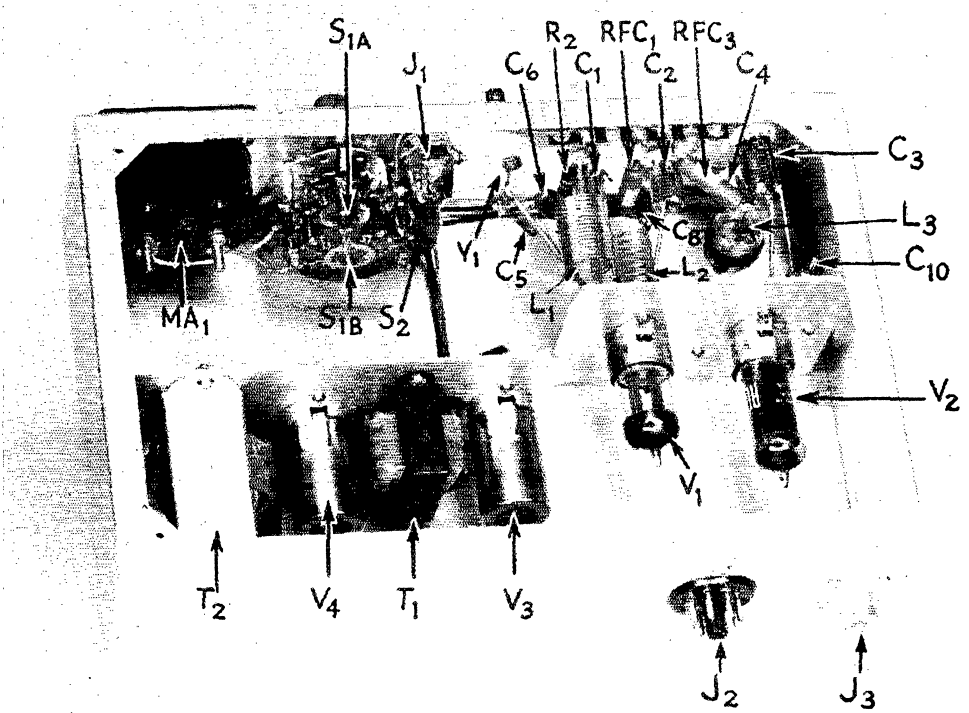
To test the exciter (remember that plate power is not to be fed to the amplifier at this time), turn on the heater supply, close S_2 and switch the meter to read oscillator plate current. After a few seconds of warm-up, apply plate voltage to V_1 and, as quickly as possible, tune C_1 for minimum plate current. To repeat, perform this operation rapidly because V_{1B} runs without bias unless the oscillator is delivering output. Switch the meter across R_4 and then tune C_2 for minimum doubler-stage plate current. Now switch the meter to the amplifier grid circuit and retune C_1 and C_2 for maximum grid current. A recheck of the current readings should show oscillator and doubler plate currents of approximately 10 ma. each and an amplifier grid current of 3 ma. or so.

Now, slowly rotate the amplifier plate tank capacitor, C_3, through its full range while observing the grid-current reading. If the current suddenly fluctuates during the tuning of C_3, adjust the neutralizing capacitor, C_{10}, until this effect is eliminated.

Turn off the power supply and connect a jumper between Pins 3 and 4 of J_2. Connect the dummy load to J_3, adjust C_4 to minimum capacitance, switch the meter across R_9, and then turn the plate supply on. Adjust C_3 for minimum amplifier plate current — approximately 25 ma. Simultaneously increase the capacitance of C_4 and readjust C_3 for plate-circuit resonance until the amplifier plate current is 35 to 40 ma. and the load lamp indicates maximum output. At 51 Mc. (the frequency used during testing of the original transmitter), the transmitter is



The 2⅞ × 6-inch bracket for the audio section has a ½-inch mounting lip along the bottom edge. Tube sockets for V_3 and V_4 are mounted with Pin 9 of each facing toward the top of the assembly. Wires for connection to B+, J_1 and S_2 should be 9 or 10 inches long.



An interior view of the 50-Mc. mobile transmitter with the 7 × 11-inch bottom cover removed. As seen in this view, the r.f. subassembly at the right is 3 inches down from the top of the unit. The bracket supporting the audio components at the left is 4 inches down from the top edge. J_2 and J_3 are mounted on the wall to the rear of the r.f. tubes.

tuned for maximum output with both C_3 and C_4 set at approximately half total capacitance.

After the amplifier is fully loaded, it is advisable to retouch the tuning of the oscillator and the doubler stages. After these adjustments, the grid current to the amplifier should be around 2.5 ma.

The microphone may now be plugged into J_1 and the meter switched to read modulator plate current. Voice signals applied to the microphone should cause the load lamp to show increased brilliance, and the modulator plate current should jump 20 to 25 ma. above the no-signal value of 6 ma.

Additional bench testing of the transmitter should not be necessary. However, the total cathode current of the speech-amplifier tube (approximately 10 ma.) can be checked by means of a milliammeter plugged into the microphone jack, J_1. Measurements made with a high-resistance voltmeter should show about 230 volts at the screen grid of the 5763, 80 volts at the plate of V_{3A} and about 10 volts at the cathode of V_{3B}. Voltage measurements concerning V_3 should be made with the microphone plugged into J_1. The voltage drop across the microphone (no signal applied) should be around 3.5 volts.

Mobile Installation

Either a 50-Mc. whip or a 54-inch broadcast antenna may be coupled to the transmitter in the mobile installation. In general, a standard ham-type whip is the preferred antenna. The windings of the antenna and power-supply relays should be connected between Pin 1 of J_2 and the car-battery output line. If the microphone has no push-to-talk switch, the relays may be operated by means of a s.p.s.t. toggle switch connected between J_1 and ground.

The tuning procedure with the transmitter installed in a car is identical to that used during bench testing of the rig. However, to assure optimum performance, it is advisable to tune for *maximum output* as indicated by a field-strength meter[2] rather than to *assume* that maximum output is obtained with the amplifier loaded and tuned for the plate-current dip.

[2] See Mobile Chapter, ARRL *Handbook*.

The Poor Man's Signal Slicer

Using the Product Detector to Advantage

BY SAM CANTER,* W6TSQ

• Here's the story of an amateur who built a simple gadget that would take advantage of the product detector's usefulness in heterodyne reception. At the same time he added a little selectivity to his receiver by using a good i.f. transformer at a lower frequency. The result is the "Poor Man's Signal Slicer," a useful device for c.w. or s.s.b. reception.

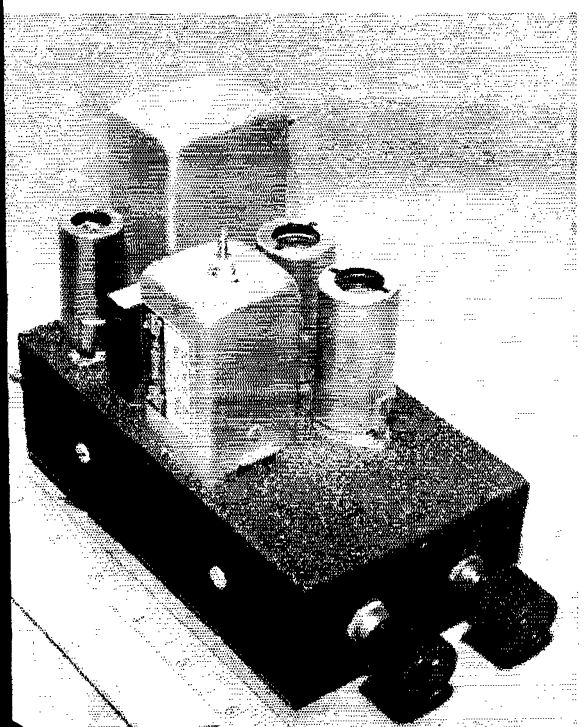
CROSBY'S ARTICLE on product detectors [1] was both interesting and enlightening. Its only fault, in my opinion, was the perfunctory treatment accorded their capabilities for superior c.w. reception. Understandably, the article dealt mainly with s.s.b. reception and cited, as a by-product, the advantages of the product detector for c.w. use. Since many more hams use c.w. than s.s.b., it would seem more logical to stress the product detector's superb c.w. performance. However, a properly functioning product detector automatically provides for excellent s.s.b. reception.

The "Poor Man's Signal Slicer" described here will permit running the r.f. gain wide open at all times no matter which type of signal is being received. This mode of operation is much to be desired since it provides the best signal-to-noise ratio. Moreover, the a.v.c. can be left in operation, and, for those of us who *must* have an S-meter indication before we can give a signal report, the regular receiver indicates signal strength at all times regardless of whether a.m., c.w. or s.s.b. is being received. The main features of this slicer, though, are the small outlay of cash and the slight modification required on the regular station receiver. Considering that most junk boxes already contain the majority of the components, an expenditure of less than $15 should cover the bill. The only item on which economy should *not* be practiced is the 50-kc. i.f. transformer. I used a Miller No. 1898-AX, which has a band width of 1500 cycles and is adjustable from 48 to 52 kc. Any transformer of similar quality may be used or can be fabricated from TV horizontal oscillator coils. The conversion of the usual 455-kc. i.f. of the receiver to 50 kc. permits a substantial increase in selectivity and noise reduction. Of course, if your present receiver already has sufficient selectivity, the 6BE6 stage and associated components can be omitted, and the signal input fed, through a suitable capacitor, to the grid of V_{1A} (Fig. 1). In this case, a d.c. grid return resistor of approximately 250,000 ohms must be provided directly from grid to ground, in place of the return furnished by the secondary of the 50-kc. i.f. transformer. At any rate, the b.f.o. of the slicer must correspond frequencywise to the frequency being detected.

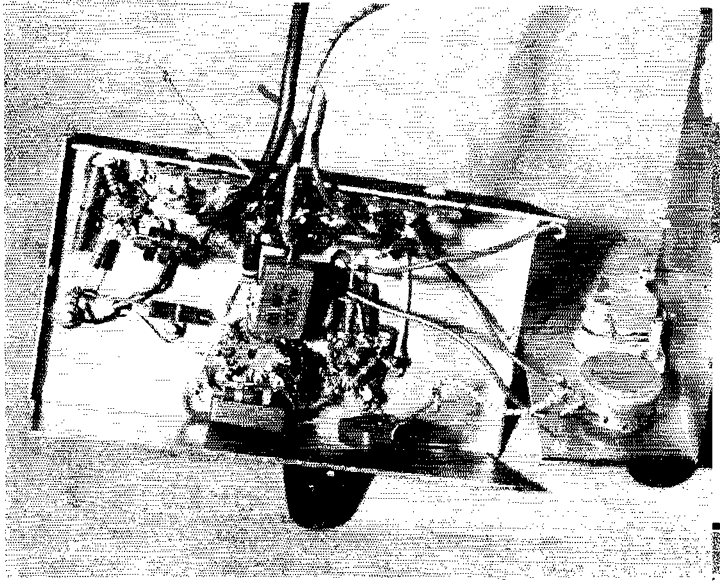
The basic circuit is similar to Crosby's. The additions are the 50-kc. conversion stage and the 50-kc. b.f.o. with variable injection. The latter was found to be very useful in adjusting the injector voltage for best reception. The input for the 6BE6 is obtained by connecting a short length of shielded wire from C_1 to the "hot" or "top" side of the secondary of the last i.f. transformer which usually runs to a diode plate in the regular receiver. A convenient way is to connect the wire to the appropriate pin of the diode

*2580 Polk St., San Francisco 9, Calif.

[1] Crosby, "Reception with Product Detectors," *QST*, May, 1956.



The "Poor Man's Slicer" is an outrigger unit that heterodynes from a 455-kc. i.f. to a 50-kc. product detector through a selective transformer. The two controls are b.f.o. trimmer and injection. The 6BE6 is at the left, next to the crystal and the selective transformer.



The b.f.o. trimmer and injection controls are mounted on the panel. A three-position switch shown in the schematic was mounted in the receiver at W6TSQ, although it could have been incorporated in the Slicer.

detector. This transformer is then repeaked and forgotten, since this connection is permanent. The audio output of the slicer is introduced into the receiver by breaking one lead, as shown in Fig. 1.

Switch S_1 was originally wired so that only the b.f.o. (V_{2A}) was inactivated when in the PRODUCT DETECTOR position. Although the additional selectivity was there, signal strength fell off. I pulled this tube out of the socket entirely to see what effect the change in current through the common 1000-ohm cathode resistor would have. The signals came up in strength considerably, lost some of the bassiness normally resulting from band-width restriction, and still retained the added selectivity. An unexpected dividend was the definite squelching action between signals. Accordingly, S_{1B} was required to remove the plate current from both triodes. The a.m position was included for broader-band reception and easier listening when occasion permitted. Also, this is the only position in which the a.n.l. may be used, since switching to the slicer automatically bypasses the usual diode a.n.l. circuit of the regular receiver.

The crystal Y_1 can be obtained at a surplus outlet. It can be either 405 or 505 kc. Suitable crystals are those marked "Channel 292" (405.55 kc.) and "Channel 364" (505.55kc.). The slight differences in frequency are compensated for when the 50-kc. transformer and b.f.o. coil are resonated. Should there be difficulty in getting these crystals to oscillate, vary the capacitance across the 750-μh. choke in the 6BE6 screen lead. The next step is to adjust the 50-kc. b.f.o. coil until it "swishes" to zero beat. Then adjust the 50-kc. i.f. transformer for maximum noise and you're in business. Remember, S_1 must be in the "CW-SSB" position when adjusting

(Continued on page 170)

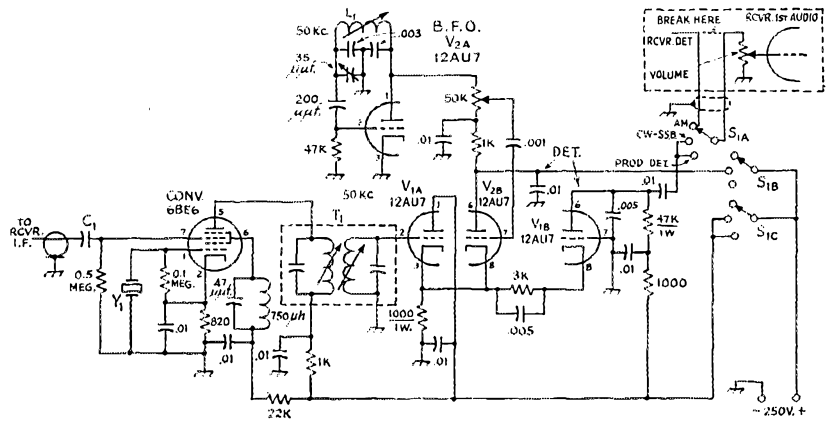


Fig. 1 — Schematic diagram of the "Poor Man's Signal Slicer." All capacitances in μf. unless otherwise noted; all resistors ½ watt unless otherwise noted.

C_1 — 1 to 10 $\mu\mu$f. Use lowest value that gives acceptable signal. Do not overload the Slicer with too much signal!

L_1 — 50-mh. adjustable inductor (Miller 1883).

S_1 — 3-pole 3-position wafer switch.

T_1 — 50-kc. i.f. transformer, 1500-cycle band width (Miller 1898-AX).

Y_1 — 405- *or* 505-kc. *crystal. See text.*

Modernizing the C.W. Clipper-Filter

Signal Limiting and Increased Selectivity for Better C.W. Reception

BY E. LAIRD CAMPBELL,* W1CUT

IN THE SIX YEARS since the "C.W. Accessory" was described in *QST*[1] it has continued to prove its worth as a means for avoiding shattered eardrums, in addition to giving a boost to the over-all selectivity of the receiver. However, extended experience has shown that a few changes would be desirable in the interests of increased effectiveness.

There are times when the best results are secured with the selective audio circuit following the clipper. On other occasions it is better to have the selectivity precede the clipper. Since it is a simple matter to provide a switching arrangement so that either combination, clipper-to-filter or filter-to-clipper, can be used at will, this has been done in the unit described here.

The new version also has a clipper circuit with an adjustable threshold, a feature that was lacking in the earlier model. This allows the operator to preset the level of incoming signals to a comfortable point. No signals will be heard louder than this predetermined level.

The new unit has greater selectivity than the old one, partly as a result of finding that the audio-frequency Q of a small power-supply filter choke can be improved by removing the mounting frame and increasing the air gap.[2] Other factors that boost the selectivity are a lower-impedance driving system which uses a step-down transformer instead of a cathode follower to insert the signal into the resonant circuit, and the use of higher reactance values in the tuned circuit.

The present circuit, shown in Fig. 2, also includes an inexpensive power supply. The unit's power requirements are small and could be obtained from a receiver power socket, but since most amateur receivers are already overloaded with outboard attachments, the power supply was included with the unit to leave the receiver power socket available for other accessories.

The Clipper Circuit

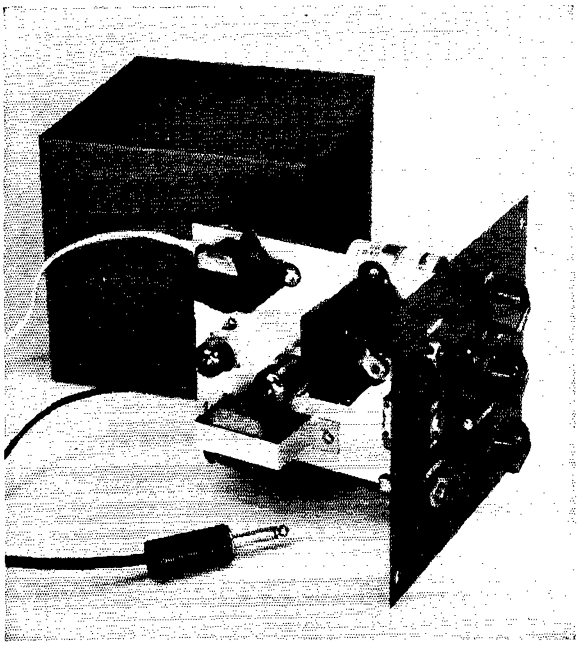
The clipper used in this unit is a series-type diode noise-limiter. For those not familiar with the circuit the following may be of interest: Since a diode conducts only when the plate is at a positive potential with respect to the cathode, that portion of an applied signal which makes the plate negative will be clipped. Either the positive or negative side of the signal can be clipped, depending on how the diode is connected.

A positive-peak limiter is shown in Fig. 1A. When the positive (with respect to ground) portion of the input wave is applied to the limiter there is no current flow through the tube when-

*Technical Assistant, *QST*.

[1] Grammer, "An Accessory for C.W. Reception," *QST*, July, 1950, p. 11.

[2] Grammer, "120 Watts of Audio without Driving Power," *QST*, December, 1954, p. 19.



A view of the filter-clipper removed from its case. Plug P_1 is in the foreground. Note the method of mounting choke L_1, which is placed at right angles to the power transformer T_2.

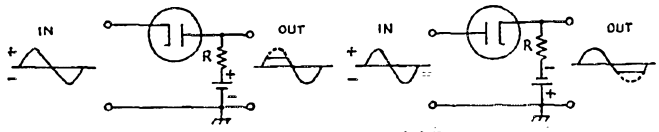


Fig. 1 — Positive and negative series diode limiters.

over the input voltage exceeds the positive bias voltage on the plate. During the negative half cycle the tube conducts because the plate is more positive than the cathode. The current flowing through resistance R develops the output voltage.

A series limiter connected for negative clipping is shown in Fig. 1B. When the positive half of the cycle is applied the tube conducts because the plate is more positive than the cathode and a voltage is developed across R. During the negative half the tube conducts only so long as the input voltage is less negative than the bias voltage on the cathode.

In either case, when the tube is conducting, the amplitude of the output voltage is somewhat less than the input voltage because of the voltage drop in the diode.

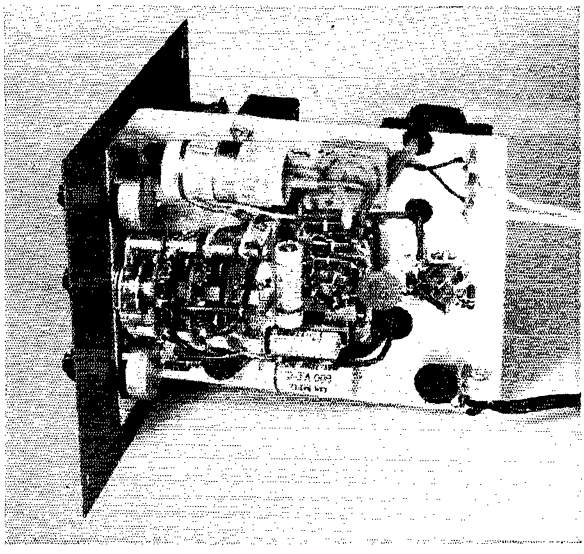
We can combine the positive and negative limiters by simply connecting the two in series, thus obtaining both positive and negative clipping. (Clipping both sides is necessary in a purely audio circuit.) Also, by applying a controlled amount of positive voltage to the plates of the diodes we can control the level or magnitude of clipping in each. Control R_1 in Fig. 2 adjusts this voltage; clipping will begin when the peak audio input voltage reaches a value greater than the preset bias voltage on the plates of the diodes.

In order to obtain a symmetrically-clipped output wave form the resistors in the diode circuit must have the proper values. Those shown in Fig. 2 are good starting values and should be satisfactory. However, if an oscilloscope with good audio-frequency response and an audio generator with good sine-wave output are available, the output wave shape from the limiter can be observed and the resistor values adjusted for the most symmetrical wave form. If this test is made the audio generator is fed into the clipper at P_1 and the scope X input is connected across the output of the unit while switch S_1 is in the "clipper" position.

Selective Audio Filter

The frequency response of the selective circuit inserted after V_{2A} is shown in Fig. 3. The curve reaches a peak at about 900 cycles and has a null at about 1800 cycles. The peak frequency is determined by the combined values of L_1, C_1, and C_2, while the notch frequency is that of the parallel-resonant circuit L_1C_1. The signal is fed in through the low-impedance winding of T_1. If different peak and null frequencies are desired the values of C_1 and C_2 can be changed; for raising the notch frequency the capacitance of C_1 should be made smaller; to raise the peak frequency reduce the capacitance at C_2.

The curve shown has a sharp peak with relatively broad skirts. A look at this curve would make one think an expensive toroidal inductor would be needed. However, selectivity of this order can be obtained with an inexpensive power-supply choke. We used a Thordarson type 20C59 filter choke which, at 1000 cycles, had a



Side view of the unit. Switch S_1 is located at the front center with the filter capacitor C_3 above it. Leads running away from the unit are the a.c. line cord and the cord for plug P_1.

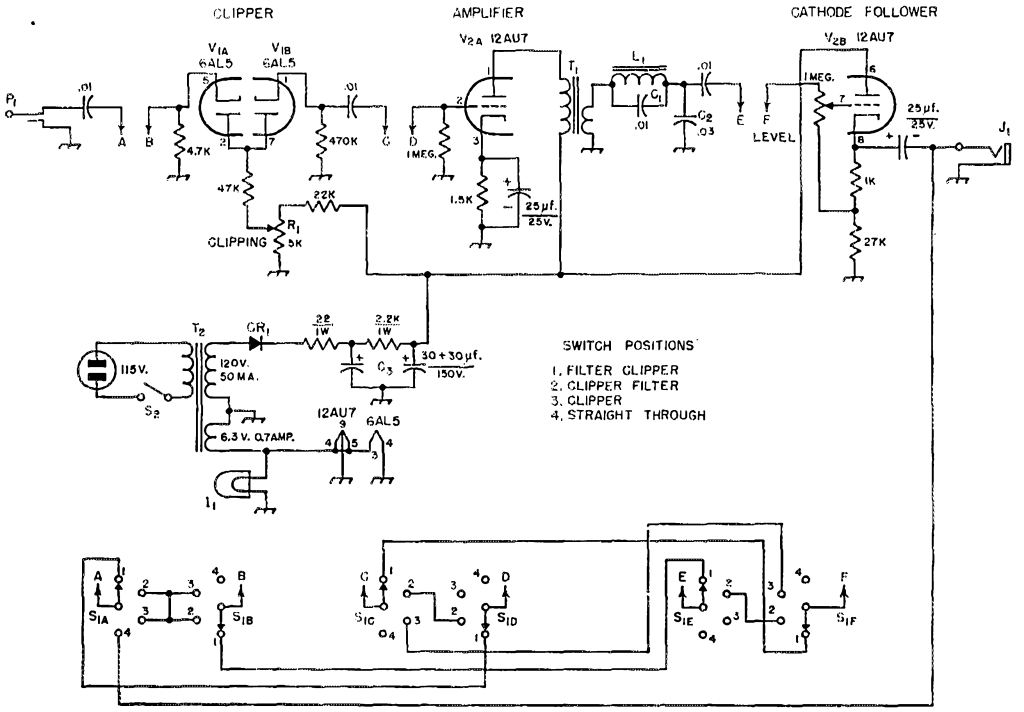


Fig. 2 — Schematic diagram of the clipper-filter. Resistors are ½ watt unless otherwise specified; capacitances are in µf; 0.01-µf. capacitors not listed below are ceramic.

C_1 — .01 plastic tubular capacitor (Sprague Telecap).
C_2 — .03 plastic tubular capacitor (Sprague Telecap).
C_3 — Dual section 30-30 µf. 150-volt electrolytic (Sprague TVA 2434).
CR_1 — Selenium rectifier, 50 ma. (Federal 1224).
I_1 — 6.3-volt pilot light, 60 ma.
J_1 — Open-circuit phone jack.
L_1 — Filter choke, 5 hy. 65 ma. (Thordarson 20C59). Modified; see text.
P_1 — Phone plug.
S_1 — 6-pole, 4-position, 3-section rotary switch (Centralab PA-1020).
S_2 — S.p.s.t. toggle.
T_1 — Output transformer 7000–10,000-ohm pri., 3.2-ohm sec. (Thordarson 24S52).
T_2 — Power transformer 120 v. 50 ma.; 6.3 v. 0.7 amp. (Thordarson 26R32).

measured inductance of 7 henrys and a Q of about 5. Removing the frame and the "I" laminations increased the Q to 18 even though the inductance dropped to 800 millihenrys.

If a broader band width is desired, such as was used in the earlier model,[1] a loading resistor can be inserted in series between the ungrounded side of the secondary of T_1 and the parallel circuit L_1C_1. A value of 3000 ohms will broaden the curve to about 500 cycles at 6 db. down as compared with 100 cycles in the new unit. A 3000-ohm potentiometer can be used so that the band width can be made variable. Of course, as the resistance is increased the output from the unit will decrease and the "level" control will have to be adjusted to restore the same output level.

Switching and Power Supply

The rotary switch S_1 is used to provide different combinations of the clipper and filter. The circuits available are: clipper to filter, filter to clipper, clipper alone, and straight through. To simplify the wiring diagram the switching circuit is shown separately in Fig. 2.

The output stage is a cathode follower which has sufficiently low output impedance to allow the unit to be used with all types of headphones. The phones plug into jack J_1. As the cathode follower is not used in the straight-through position, a gain control is provided so the output volume can be set to the same level as the receiver output, thus keeping the headphone level constant when switching from straight-through reception to other functions.

Power for the clipper-filter is obtained from a half-wave rectifier power supply which uses a TV-booster type transformer, T_2. Adequate filtering is provided by the RC network. About 110 volts d.c. is obtained from the supply under load.

Layout and Construction

The filter-clipper is built on a 5 × 5½ inch aluminum chassis with a two-inch lip. This is secured to the front panel by the two potentiometers and rotary switch S_1. A 6 × 6 × 6-inch steel cabinet encloses the unit. Steel is preferable to aluminum because L_1 is sensitive to stray magnetic fields (which would show up as hum at the output) and the steel cabinet aids in shielding. The aluminum chassis is mounted in a vertical position with the transformers and tubes on one side and rotary switch and small components on

the other. One layout precaution should be observed: Place the filter inductor L_1 as far as possible from the power transformer, and mount the two units with their cores at right angles. This will minimize hum pickup by the inductor.

Before mounting L_1, it will be necessary to remove the mounting frame and the "I" laminations. The frame is removed easily by prying out its two legs and then lifting it from the core. The "I" laminations are in the form of a bar lying across the top of the "E" core.

By remounting the choke with a nonmetallic strap the Q will remain high. Use a strip of heavy cardboard cut to the same width as the core, about $\frac{5}{8}$ inch, as a clamp for mounting the inductor. The cardboard clamp is fastened to the chassis with two $\frac{5}{8}$-inch square aluminum washers that can be cut from a piece of scrap. It is very important that the clamp be nonmetallic. If aluminum or other nonmagnetic materials are used the Q will be adversely affected and the selectivity of the filter will suffer.

The switch wiring shown at the bottom of the schematic diagram can be done before mounting S_1 in place. After the switch is mounted the wiring between it and the other components can be completed.

The large dual-section filter capacitor is connected to the chassis by a mounting clamp furnished with the capacitor.

Using the Clipper-Filter

The wiring should be checked before the unit is turned on. If everything looks in order, apply power by closing S_2, insert plug P_1 in the receiver phone jack and turn switch S_1 to the "out" or straight-through position. Tune the receiver until a c.w. signal is found and adjust the receiver controls for comfortable copying.

Now turn S_1 to the "clipper" position. In order to become familiar with the action of the clipper these steps should be followed: Adjust the "clipping" control so no clipping occurs (maximum positive bias on the diode plates). Set the "level" control on the unit so that there will be no apparent change in the strength of the c.w. signal when switching from "clipper" to "out" and back to "clipper." Then turn the "clipping" control until the positive bias is low enough to cause limiting to start; the point at which limiting begins can be recognized by the fact that the signal strength begins to decrease. Back off slightly with the "clipping" control so that the signal strength in the phones is just at the original level.

No signal will be heard louder than the original reference signal with the controls set in this manner. Tuning the receiver without the use of the limiter shows signals of all strengths, some so loud as to be ear-breaking; but switching to "clipper" will make these big ones drop down to our "comfortable" preset level. Annoying key clicks will disappear, too, because the clipper is effective in reducing all types of impulse noise.

To satisfy yourself as to the clipper's ability to chop ignition noise, switch the clipper in and out while tuning around the 10- or 15-meter bands where this type of noise is usually present.

It should not take long to become familiar with use of this unit. However, there are many applications for the clipper-filter which can only be discovered by actual use. The "clipper-to-filter" position is best suited where the audio selectivity is required and a high level of impulse noise is encountered. However, where impulse noise is not a factor the "filter-to-clipper' position is best. Because of the saturation characteristic of limiters, a strong signal being received along with a weak one has the tendency to take command, making it impossible to copy the weaker one. By using the selective audio filter first, peaking up a weak desired signal and attenuating strong interfering ones, the desired signal takes command in passing through the limiter, and can be copied over the interference.

In order to peak a desired signal the receiver b.f.o. or tuning control should be adjusted so the pitch of the signal is 900 cycles. Since the selectivity curve is rather sharp, any adjacent undesired signals will fall short of the peak and be attenuated. If the receiver b.f.o. has sufficient range to tune 900 cycles or more on both sides of zero beat, the undesired signal can always be placed on the notch side of the peak. Since this side of the peak is steep (see Fig. 3) anything a few cycles up from the peak will drop down in the notch and be attenuated.

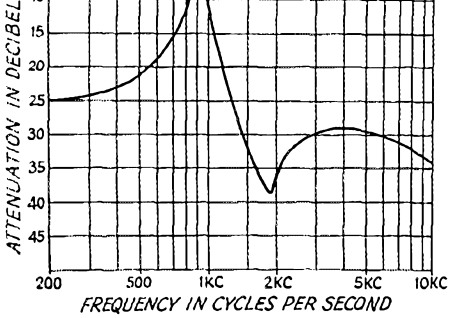


Fig. 3 — Selectivity curve of the audio filter.

Those who have never used a peaked audio filter can get the "feel" of peaking a signal by making practice runs on almost any type of signal — teletype, c.w. or an unmodulated carrier. By means of the tuning control or b.f.o., swing the beat note through the audio spectrum, and note the pitch at which the peak is heard. After a few dry runs the peak tone will become familiar and you are ready to try separating a desired signal from interference in a crowded portion of the band.

With no key clicks from your neighbor ham, no ignition noise from the nearby highway, and a 900-cycle c.w. note singing from the phones, piercing through interference, what more could you ask?

Conelette

A Simple Conelrad Alarm for Home or Mobile Use

BY HERMAN LUKOFF,* W3HTF

• The Conelette is a simple 1-tube alarm unit that can operate independently of other station equipment. It has provision for both visual and aural monitoring.

"CONELETTE." Sounds like a French receiver, doesn't it? Actually, it's English for small Conelrad receiver and indicating device. The prime objective in building Conelette was to develop an inexpensive, simple, but yet reliable, Conelrad alarm. True, a standard a.c.-d.c. broadcast set could be used, but it requires having one in the first place, and tying it up in the second. In addition some sort of alarm indicator has to be added in any event, since audio from the loudspeaker can be very annoying.

The transistor approach was considered because of the low power requirements and education to be derived from using the new component. However, Conelette draws an inconsequential amount of power (0.3 ampere at 6 volts, and 3 ma. at 250 volts) compared to the average rig or receiver, and no battery replacements are necessary. In addition, there is no danger of damage from r.f. fields in the immediate vicinity.

* 909 Glenview St., Philadelphia 11, Penna.

Circuit

The circuit of Conelette is shown in Fig. 1. It uses one 12AX7 high-μ twin triode. One half of the tube, V_1, is used as a detector in conjunction with a high-Q tuned circuit. Regeneration is employed to further decrease the band width and increase the sensitivity. A high-resistance plate load feeds directly to the grid of second half of the 12AX7, V_2, which is used as a voltage amplifier with a neon bulb as an output indicator. V_2 is operated close to cut off by virtue of the positive cathode voltage supplied by R_1. In this condition, little plate current flows through R_2, and insufficient voltage is developed to fire the neon bulb.

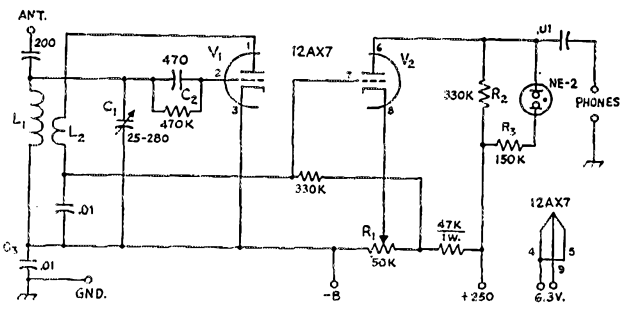


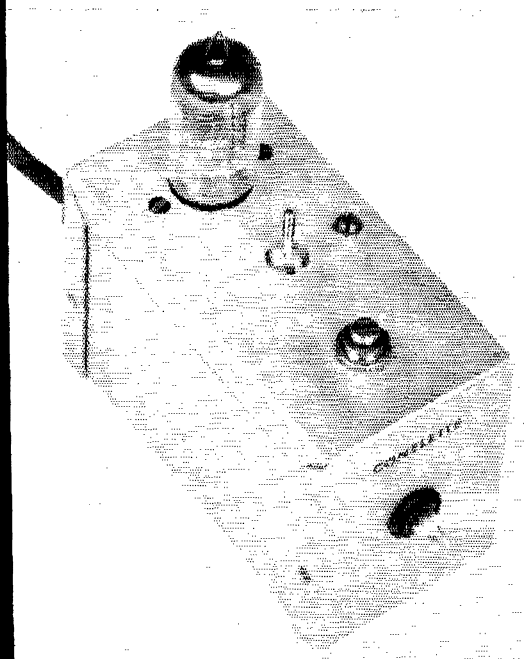
Fig. 1 — Circuit of the Conelette. All capacitances less than 0.01 μf. are in $\mu\mu$f. All 0.01-μf capacitors may be disk ceramic.
C_1 — Mica padder (see text).
C_2 — Mica or NP0 ceramic.
L_1 — Variloopstick.

With signal present, the grid of V_1 will be driven more negative because of rectification. The plate voltage of V_1, previously at a low value, will swing more positive and start V_2 conducting. Sufficient V_2 plate current will flow to cause the neon bulb to light.

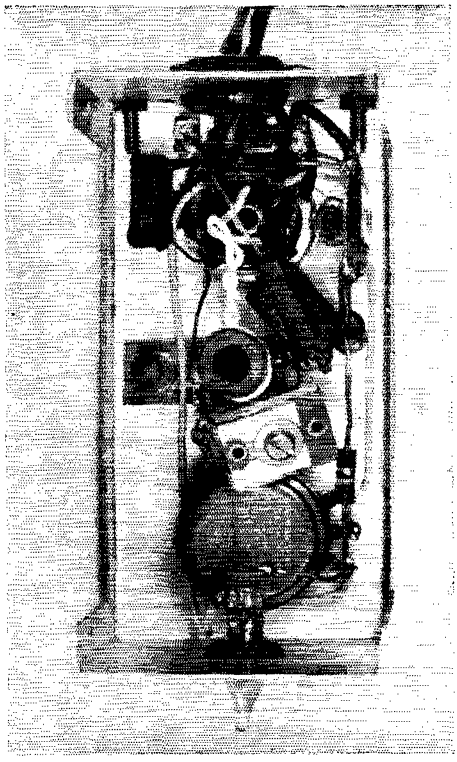
Conelette employs a fail-safe circuit. When tuned to one of the local broadcast stations the neon bulb will be on. Failure of tube, power, or an actual Conelrad alarm will turn the bulb off.

Construction Detail

Conelette may be built into a Minibox 4 by 2¾ by 2 inches. A three-wire cable brings heater



The neon indicator of Conelette is mounted in the front end of the enclosing box. The trimmer capacitor, Loopstick and tube are in line on top.



Interior view of the simple Conelette.

and +B voltage from the communications receiver. Many receivers have auxiliary power brought out to a rear terminal strip. Mine did not, so that it was necessary to use an octal adapter plug inserted under the audio output tube to rob plate voltage from the screen-grid pin, and heater voltage. It is necessary to use 180 volts or more for Conelette.

L_2, the feed-back winding, consists of 4 turns of insulated wire on the body of the Loopstick, between the terminals and the inductance L_1. C_1 is a padder capacitor used as a tuning element. It is soldered in place directly across the Loopstick terminals.

The neon bulb is centrally mounted on the front panel with a snug-fitting grommet. Visibility is excellent from all angles. The tube, potentiometer R_1, and Loopstick, mount through the top of the box. Phone-tip jacks, an antenna-ground terminal strip, and power-cable exit are provided on the rear panel.

For those who do not wish to rob power from the receiver, or who want a completely independent unit, the circuit of a separate power supply is shown in Fig. 2. Do not connect the

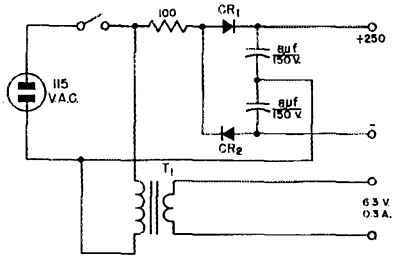


Fig. 2 — Circuit of a simple power supply for the Conelette. Capacitors are electrolytic. CR_1 and CR_2 are 130-volt, 50-ma. selenium rectifiers. *Do not ground negative terminal to chassis.* T_1 is a filament transformer.

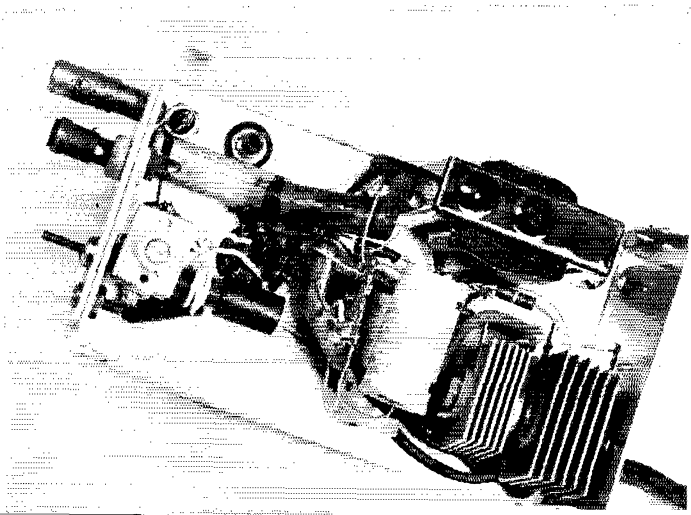
negative power-supply lead to the chassis, or ground at any point. C_3 provides d.c. isolation and r.f. grounding so that there is no danger of shock. The chassis ground on Conelette should be connected to the receiver-transmitter ground system for maximum signal strength. A complete Conelette with power supply in a $5\frac{1}{4} \times 3 \times 2\frac{1}{8}$-inch box is shown in one of the photographs.

Adjustment and Operation

The sensitivity of Conelette is such that a 4-foot antenna wire is generally adequate for city use where powerful broadcast stations are present. It may be necessary to use a longer antenna for operation in the country or for lower-power broadcast stations.

After power is applied to Conelette, turn R_1 until the neon bulb just extinguishes. This is the proper point at which to operate and is the most sensitive condition. Temporarily plug a pair of headphones into the tip jack for station recognition. Tune C_1 and L_1 until a station is heard. Slide L_2 close to L_1. If L_2 is poled correctly, the signal should get louder. If L_2 is moved too

(*Continued on page 176*)



This model has a built-in power supply.

A Low-Noise Preamplifier for Satellite Tracking

BY V. R. SIMAS*

• Here is the low-noise preamplifier-mixer developed for use in the Minitrack system of tracking the earth satellite. The first r.f. amplifier is a special low-noise tube, but other components are familiar.

IN A PREVIOUS ISSUE of *QST*[1] (July 1956) it was shown that a low-noise receiver is desirable for tracking the proposed earth satellite. This article describes a preamplifier and converter fashioned for this purpose.

This circuit is designed to provide low-noise amplification of the satellite signal and means of converting this signal to a lower frequency for further amplification. The low-noise type GL-6299 tube in the first stage provides sufficient power gain to prevent any significant contribution by the second stage to the over-all receiver output noise. In turn, the preamplifier itself has sufficient voltage gain (about 10), including the conversion loss of the mixer-converter, to maintain this noise figure nearly independent of the noise figure of the receiver following.

The preamplifier, as shown in Fig. 1 and the photograph, uses the grounded-grid configuration for both first and second stages. For our application this circuit has advantages over the cascode arrangement, although the noise figures obtainable are equivalent. These advantages include greater inherent stability, freedom from neutralizing requirements, and ease of alignment procedure. Ordinarily, band-width considerations prohibit the use of the grounded-grid circuit for the first stage; however, the required band width for tracking purposes is such that the grounded-grid configuration may be used.

The calculated noise figure of the first stage, using the type GL-6299 planar triode, is approximately 2 db. The measured noise figure of about one-third of a representative group of these tubes closely approximates the calculated value, most of the remainder increasing it to about 2.5 db., a few exceeding 3 db.

While the single amplifier built utilized the type GL-6299, the noise figures of other tubes have been calculated and are tabulated in Table I. These tubes can be expected to provide a noise figure approaching the value listed.

The derivation of the equations necessary for noise figure computations is beyond the scope of this article. However, some very good approximate formulas will be given which it is hoped will allow a simple direct solution to the noise-figure problem.

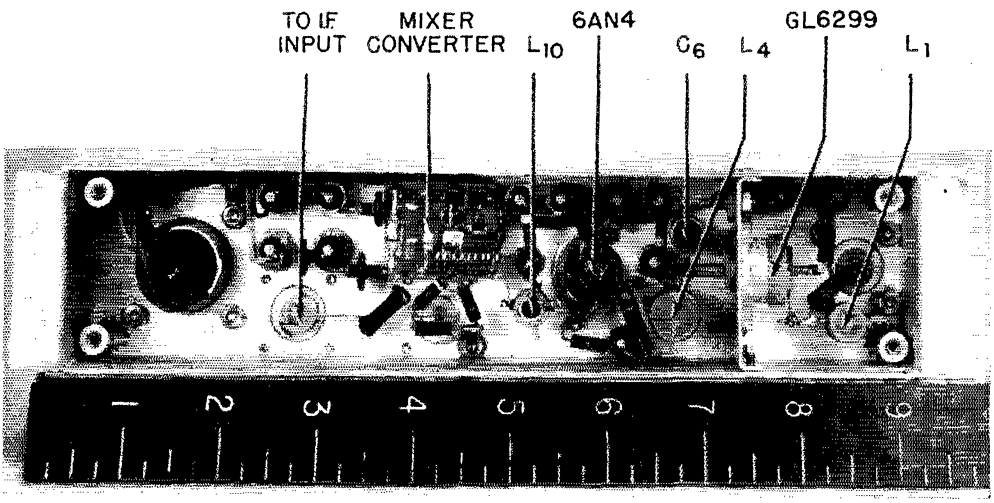
The optimum noise figure for a grounded-grid stage is given approximately by:

$$F = 1 + 2\sqrt{(G_1 + B\,G_t)\,R_{eq}}$$

*Naval Research Laboratory, Washington 25, D.C.

[1] Easton, "Radio Tracking of the Earth Satellite," *QST*, July, 1956, p. 38.

Components and wiring of the preamplifier are contained in a channel-shaped chassis with the 6299 mounted in a partition as shown. Power connections come through the multiconductor receptacle at the extreme left.



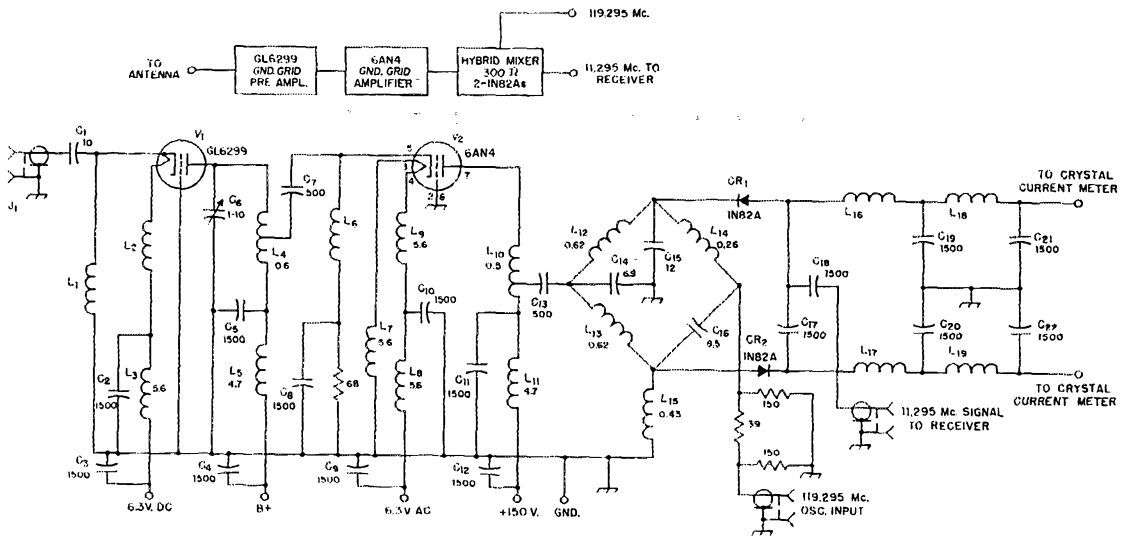


Fig. 1 — Circuit of the low-noise preamplifier-mixer for satellite tracking. Capacitances are in μμf., inductances in μh. Resistors are ½-watt composition. The d.c. heater supply for the GL6299 is not strictly necessary; a.c. may be used.

C_1, C_7, C_{13}–C_{18}, inc. — Tubular ceramic.
C_2–C_5, inc., C_8–C_{12}, inc., C_{19}–C_{22}, inc. — Stand-off type (Sprague 508C or Erie 326).
C_6 — 10-μμf. trimmer (JFD VC-11).
L_1 — 0.21 μh.; 5 turns No. 16, ⅝-inch diam., 12 turns/in.
L_2, L_6 — 3.9 μh., self-resonant at 108 Mc.
L_3, L_7, L_8, L_9 — 5.6-μh. r.f. choke.
L_4 — 0.6 μh.; 10 turns No. 16, 7/16-inch diam., 12 turns/in., tapped 2 turns from bottom end.
L_5, L_{11} — 4.7-μh. r.f. choke.
L_{10} — 0.5 μh.; 7 turns No. 18 (CTC type LS-6 form), tapped 2¾ turns from bottom end.
L_{12}, C_{13} — 0.62 μh.
L_{14} — 0.26 μh.
L_{15} — 0.43 μh.
L_{16}–L_{19}, inc. — Self-resonant at 11.3 Mc.

Note: L_2 and L_6 are Jeffers type 104, made by Jeffers Electronics Division of Speer Carbon Co., Dubois, Pa. L_3, L_5, L_7–L_9 and L_{11} are type 102 coils made by the same manufacturer. L_{12}–L_{15}, inclusive, are type 102 coils with turns removed to give the specified inductance. The type 102 and 104 coils are wound on forms approximately the same size as a ½-watt composition resistor. Other small r.f. chokes of the same approximate inductance may be used. L_{16}–L_{19}, inclusive, are specially-wound pie-type coils; chokes having high impedance at 11.3 Mc. may be used.

Where G_l is the loss conductance of the input and output coils, G_t is the transit-time conductance of the tube and B is a constant. G_t and R_{eq} are functions of the tube used. R_{eq} is approximately equal to $2.5/mg$ for triodes and B is usually taken as 5.

Impedance "Matching"

In order to obtain the optimum noise figure it is necessary to transfer the impedance of the source to a value which makes the noise figure a minimum. The equation for this optimum transferred impedance is given approximately by:

$$R_{s\ opt} = \sqrt{\frac{R_{eq}}{G_l + B\,G_t}}$$

Although there are circumstances where the optimum transferred impedance is equal to the input impedance, a mismatch is generally necessary for optimum noise figure.

The optimum transformed impedance for the GL-6299 at 108 megacycles is about 400 ohms, which necessitates a considerable mismatch indicated by the fact that the input impedance of this tube is about 100 ohms. Oddly enough, in spite of the variations between tubes the optimum transformed impedance at 108 Mc. usually falls between 400 and 700 ohms, signifying that the circuit of Fig. 1 is close to optimum for most triodes. The new ceramic planar triode, 6BY4, is a notable exception. Its extremely low transit time conductance, 35 micromhos at this frequency, and relatively high equivalent noise resistance requires a transformed source resistance of approximately 1500 ohms for noise matching conditions.

The circuit illustrated in Fig. 1 has been designed for an antenna impedance of 50 ohms, which is transformed to 420 ohms by C_1 and L_1 according to the following equation:

$$(50)\ (420) = \left(\frac{1}{\omega C}\right)^2 = (\omega L)^2$$

At 108 megacycles C_1 is equal to 10 μμf, and L_1 equals 0.21 microhenrys, resulting in the coil

(*Continued on page 172*)

TABLE I

Tube	Equivalent Noise Resistance	Optimum Transformed Impedance	Transit Time Conductance	Noise Figure
GL6299	125 ohms	417 ohms	130 ohms	2 db
6BY4	500	1500	35	2.2
416A	50	400	50	.9
6AN4	250	550	160	2.9
6AK5	385	670	160	3.3

Two Thousand QSOs Later

The Neckar Valley Radio Club in Luxembourg

BY KURT FRITZ,* DL1CR

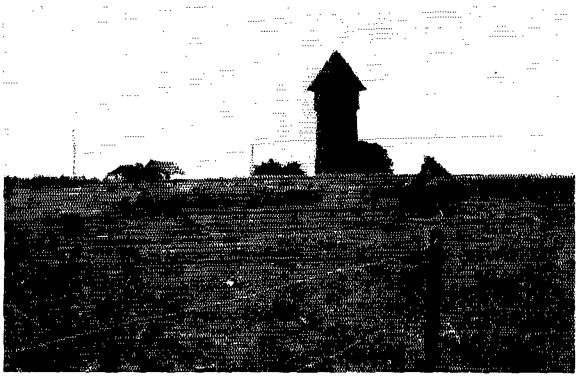
IT ALL BEGAN in a cool, windy November night last year, when Rolf, DL3AO, and myself were joined by Hel, DJ1BP. We talked shop and were just admiring the guys of last year's DXpeditions, when Hel suggested, "Why couldn't we do a thing like that, too?" Yes, why not? But where to go? You must know that all of our members who could be won for such an object are students, which meant expenses were not to exceed 100 Deutsche Mark or some $25. And this excluded any expenditures for the rental of a car. But transportation was later on provided for in a generous way by Helmut, DL9CI, and his father.

Well, where to go now? What would our fellow hams like to work most? First of all, Vatican City; every active ham will know why we did not go there. Then San Marino — knowing of DL1CU's threefold failure in securing a license it was nothing doing. Pelagian Islands are too far always. Albania is behind the Iron Curtain: Monaco was too well covered by earlier expeditions: Andorra was very well taken care of by PX1EX this and last year. "But what about Luxembourg?" was thrown into the discussion. There we were. In the heart of Europe, some 400 street kilometres from Stuttgart, was a country that played hard to get, on telegraphy at least. To prove our point, hams were interviewed in QSOs during the following weeks, how they would appreciate a contact with Luxembourg. Response was so encouraging that preparations were begun immediately.

A letter to DL1JB of DARC effected one to LX1AI of RL, who answered to the effect that foreigners were but never granted amateur licenses in Luxembourg, at the same time promising, however, the aid of RL in possible negotiations with the Administration des PTT. It was learned later, after an exchange of letters between the Bundepostminister of the Federal Republic and the Directeur des PTT of Luxembourg, that on a mutual basis hams of both countries could operate in the neighboring lands. Foreign stations set up hereby in Luxembourg for a stay of less than one month will use their home call with a /LUX suffix, such with a longer sojourn will get a LX5 call. With the way thus cleared, actual business began. Early August was set as working date, because school holidays started in this month.

Logistics

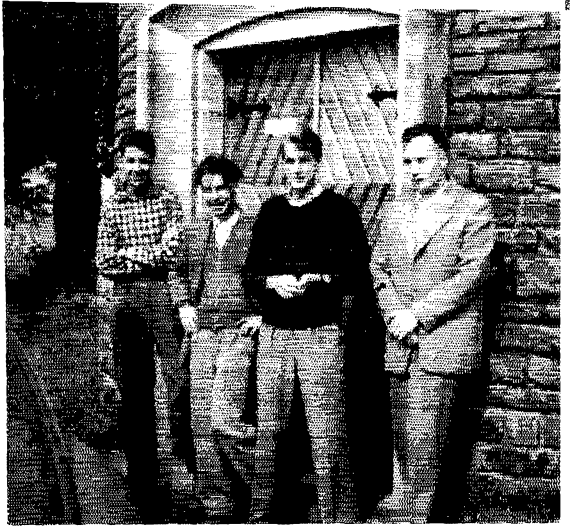
Different jobs were assigned to each participant. So Helmut, DL9CI, was chief of transportation, which included looking for and finding an ideal transmitting site; Rolf, DL3AO, was caretaker of antennas and housing, the tents he procured were used for sofas only, though; Harold, DJ2MB, acted as chef and gasthouse proprietor, who served two brands (and two kinds at that) of coffee every day, also soup and bread for dinner. The label of the soup bag was shown around always, too, but this was merely self-defense. Nevertheless, three cheers on those stout men who kept the basement kitchen and QRP gas stove running. Finally, myself, Kurt, DL1CR, signed responsible for transmitter, power supply, and converter. To those, who reported T8 it might be said here, that we fetched our power from a garage 500 feet away, which resulted in an appreciable voltage drop every time the key was pressed. I sincerely hope, however, that nobody's heart broke when he sent us T8 instead of something worse, merely because you do not give T7 to a /LUX.



Le chateau d'eau, as see. from a southeasterly direction.

And now, the Neckar Valley Radio Club to Luxembourg. We started to collect parts here and there on Thursday afternoon, took farewell from parents and friends at a party at the "Hirsch" on Thursday night, could still be

* Katharinenstrasse 64, Esslingen, Germany.



Left to right, the operators: DJ2MB, DL3AO, DL9CI, and DL1CR.

♦

found packing on Friday morning, August 10, did an amazing job of filling every nook of a Volkswagen with radio gear and even managed to squeeze in four full-sized hams. Having wept wet all our handkerchiefs nothing could hold us back any more and so we left, driving over the Autobahn on to the Palatium mountains and down to the Moselle valley, with pitifully little time to appreciate the beautiful landscape and wines. Near Trier the border was crossed with the formality of depositing security for our equipment on the Luxembourg side of the border. Luckily nothing had to be unpacked, and the list of parts which was prepared for the customs officer was cut into half by said gentleman in order to fit a form. We arrived in the City of Luxembourg on Friday night, half an hour too late to reach the post office for our licenses. So we unsaddled for the night in Luxembourg, taking a stroll through the town before turning in. Luxembourg is an old fortress and many structures point to this past. We were sorry to have to leave that fine city so soon. Finally, our Volkswagen stopped at the foot of the Chateau d'eau of Hosingen. This water tower has been destroyed during the war and rebuilt afterwards much more to fit our needs than the old one could have done, as we were told later. A power line led up to our chateau, ending abruptly 150 feet before it. Now how?

Strategy

First ask the maitre of Hosingen for permission to use the tower, which was granted readily and free of charge. We were even allowed to sleep there. This suited us excellent, of course. The tower was built like a giant smoke stack, with a narrow staircase spiralling up along the inner wall until the first floor was reached some 50 feet above ground. Then you entered a closed room, which had two windows and the ceiling of which was formed by the concrete water tank. Other stairs brought you up to the second floor and another closed room, the inner walls of which were the sides of the water tank, the outer ones were of wooden boards with plenty of windows. Fellows, you cannot dream up a better place for your stations. High, free, good ground conductivity, in short — perfect. Incidentally, Radio Luxembourg wanted to erect a powerful short-wave station on a hill very close by but was denied. So they started building a bit further away. This only to strike home the fact how good our site was.

Second we had to introduce ourselves to the local gendarmes, to whom Monsieur Knaf of the PTT had already announced us. He was a most cooperative man, our thanks to him.

Third we needed power. The local electrician was interviewed but could not help us directly. He lended us 150 feet of cable, however. This came in very handy, because we finally got electric power from the garage mentioned above and had to run our power line through the shop and then over a vegetable garden. But from there we were high enough to use our own cable, the insulation of which was not beyond any doubt. Electric power is rather expensive in Luxembourg, by the way, because the country has no coal pits of its own and practically no water power. But since our rig ran at a little below 10 kilowatt hours per day we could endure. We did not meet one person who had not been helpful and friendly; we even were invited back.

Fourth, antennas. We had selected 80 metres tilted long wires for ease of erection and coupling to the transmitter tank. The driven end was some 60 feet above ground, the far end about ten. We used three of those wires hung up after taking compass bearings. One ran 70 degrees West, the second due South, and the third 80 degrees East. There was a difference of about two S-points even with reception. So every antenna did what was expected of it.

Many a metrekilogram had been done in the mean time carrying our gear up to the second floor. But then, for what purpose does a ham go on vacation? Again we managed. A table was nailed together of the lid of the case in which the power supply was carried and some laths, the case itself served as a stool. The table had a length of 20 inches and a width of 15 inches. On it a BC-342 was placed, on that stood the transmitter, at the receiver's side stood bug and send-receive switch and before it, log book and pencil. If you start calculating now you will arrive at the result that something had to hang over; it was the receiver. The BC-455 10 and 15 metres converter swung on a string from the left handle of the BC-342. In general, string is a most useful tool on expeditions or field days, replacing insulators, nails, etc.

Operations

Then we began. On 80 metres, Saturday night. CQ de DL1CR/LUX K. DL1CR/LUX de DJ1BP. Well, well, the first contact with good

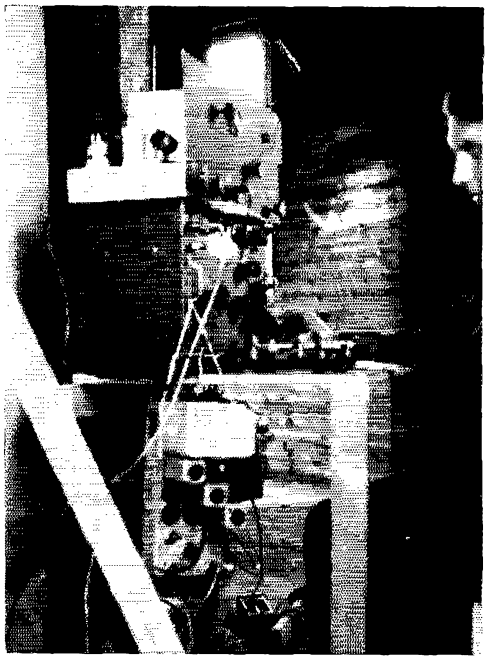
old Hel of our home town. All OK. Pse QSP all well to our parents. CU daily at 2200 CET on 80. 73 SK. QRZ? Nothing, nothing . . . nothing. How about eating something and worry later? OK, let's go. It was a long time since morning anyway. After supper. Still on 80. CQ de DL1CR /LUX K. Nothing. Try a long call with /LX. Breathless: pse K. Finally an answer. Think of this: there we were with a S8 or 9 signal all over Europe, and a dozen QSOs in two hours on Saturday night. That's Europe. I was too tired to care too much now, the others had fallen asleep already. So after putting in the 20 metres coil set I retired also. When I woke up again, Rolf, the happy early riser had already knocked off a few log book pages of W6s and W7s. And then the spark had struck. As early as Sunday morning a prediction was wagered, 600 QSOs during our stay. Oh . . . it's too much. Final score 1967 contacts, 66 countries, pretty sure WAS, and always being called.

May I insert a brief run-down of the transmitter here? It was homebuilt back in 1949 when the first Germans got their licenses after the war. Consisting of four stages it is running 90 watts input on all bands, having given dependable service on two European field days and now in Luxembourg, never losing its characteristic T9c, at least so it sounded to us. If your signal reports were truthful, you can obviously get whatever you want with 100 watts and good antennas. The better ones for us were KH6, TI, FY7, YN, YS, VS4, VS6, HK, and JA.

We wanted to give as many hams as possible a new country for WAE points. So we shared the 21 operating hours per day between the four of us, thus always having a fresh operator at the controls. During day hours we hopped bands: 40, 20, 15; 10 was dead whenever we listened. After our daily sked with Hel at 2200 CET we QRZd on 80, but after one or two QSOs this band was satisfied. Needless to say that we were rather disappointed by European response. We would have felt let down if you Americans had not been around. So tnx a meg fer clg.

From 1700 to 0900 CET we were doing business. Starting on 15 until the band closed around 2300, then we QSYd down to 20. I would not want to do it forever, one week is enough, but it was grand. Being called nights long by dozens of stations at the same time, working all call areas of the USA at the same time, having Middle and South Americans in between. I wish every ham would live to hear it. At home I live in a valley, no beams allowed, no long wires possible, longest antenna 20 metres, and now this. What a difference!

Pretty soon QSOs were stripped down to bare essentials. Excuse us, OMs, if we did such a rush job, but the next station appreciated, we think, that he had not to wait so long. We were thus able to make up to two contacts per three minute period. Congratulations to you Ws on your fine operating and for taking hint to K against KN. It made our job much easier. You know, a BC-342 is not the sharpest of receivers.



The case of the dangling converter!

Tactics

A remark now from *our* point of view on how to work DX. We liked being called during a QSO, when our station was about to sign clear and the breaking in station was 1 kc off our stations frequency simply signing de WXXX once or twice. Nothing of our call, we know you mean us. This way we had a new call, could close with our first station, could call up and give a report to the next one. That is fast and ideal but not possible in every case. No point is seen calling 20 kc. off frequency, because if we should advise so the pile-up would be there. If you are stronger than the others so much the better for you, but nevertheless be as short as possible and then QSY. If you are weak you must depend on your luck that you chance on a free channel: sign your call as often as possible, three or four times. We often took a S6 station not because he was weak rather because he was in the clear, while a few cycles to his side S8 stations were undecipherable. A weak station should never try to call on zero beat, it should call some 5 kc. to either side. He must wait longer in most cases, but eventually the pile-up zero beat will be so that we start searching the fringes. Never call into a QSO that by the DX station is considered a rare catch. He won't rag-chew and he will be back the sooner for you if he gets all OK the first time. And finally, don't be embarrassed if the DX station does not give his name, QTH, and QSL address every time. Try to catch on to that while you listen, it will be appreciated.

Well, we worked whomever we could copy, we did not discriminate against anybody. If we

(*Continued on page 146*)

• Thirty-Five Years Later

Elsewhere in this issue WØCO and the editor discuss the facts and significance of the trans-Atlantic Tests of 1921. In reading over the original reports and also the 1BCG Commemorative Issue of the *Proceedings of the Radio Club of America*, several of the names stood out as being familiar even to some of the younger squirts. We thought you might find it of interest to hear a little about what has happened to some of the crew that participated in the original trans-Atlantics. It was not possible to do a sleuthing job on everyone involved, but we did get some info from Paul Godley and several of the original 1BCG crew.

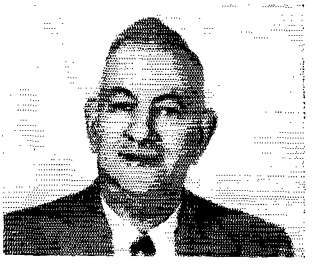
John Grinan, who was the chief operator at 1BCG, was for many years associated with various commercial enterprises in radio, and was chairman of the board of Grinan Estates, sugar and rum manufacturers in Jamaica. He operated amateur VP5PZ for several years, but in 1940 converted it to broadcasting and donated it to the Jamaican Government. He has recently retired from business and lives in Florida.

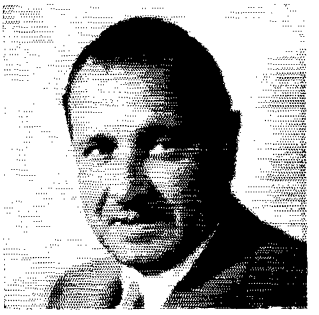
Ernest Amy is president of Amy, Aceves & King, a firm of consulting engineers in New York, and is active in the Radio Club of America.

George Burghard is still an active amateur, W2GEC, and is an executive of the Continental

Paul Godley

John Grinan





George Burghard

Paul Godley has been active in radio engineering throughout the years, and heads up the Paul Godley Company, a firm of consulting radio engineers which was organized in 1926. In October of this year he wrote us as follows:

"The tests of 1921 were, certainly, epochal. Those who participated could never forget them. Quite aside from these, however, I find deep satisfaction in the knowledge of pioneer work done in effectively adapting DeForest's 'Audion' and Armstrong's circuits to amateur use — and, especially, the initiation and 'sale' of the philosophy that, for survival and growth after War I, the League *must have* an authentic handbook and a salaried Headquarters staff.

"Amateur radio is a highly fascinating and educational hobby. Yet, together with Maxim, I have always, first of all, held it to be a priceless national asset, as it has proved to be. Every amateur has reason to be proud of its contributions to the nation and of the part which, directly or indirectly, it has played in the spreading of cultures 'round the world.

"This carries my best wishes to fellow members of the League wherever they may be."

Godley's assistant operator in Scotland was D. E. Pearson, a district inspector for the Marconi Company. A letter to the Radio Society of Great Britain brings word that he died several years ago.

Sales Co. in New Jersey. It is interesting to note that although he was one of the original 1BCG crew he has just within the past few weeks sent in his cards qualifying him for his WAC certificate!

Another pioneer of the 1BCG team was the late Maj. Edwin Armstrong, who is well-known to all of us for his regenerative, super-regenerative, superheterodyne, and f.m. circuits. Still another was the late Walter Inman, who in later years was a trustee of Duke University and a participant in various activities of the Duke tobacco family. The original holder of the 1BCG call was Minton Cronkhite, who was president of an electric company in Connecticut and now lives near San Diego, Calif.

Of interest to us all in this brief view of a few of the men who participated in the trans-Atlantic tests of 1921 are their accomplishments at the time and their subsequent history. All of these men contributed mightily to the stature of amateur radio by their pioneering skill, and all of them continued to be successful in their chosen fields throughout the years. Coincidence?

One Island—Two Rare Countries

Sint Maarten and Saint Martin

BY D. REGINALD TIBBETTS,* W6ITH, PJ2MC, FS7RT

IT WAS A GREAT DISAPPOINTMENT not to be able to give the DX boys both French Saint Martin and Dutch Sint Maarten when I made the trip to the island in February, 1956. In addition to operating FS7RT, the first licensed station from a brand new country on the French side, I had hoped to secure the Dutch license and operate from Dutch Sint Maarten — a separate country for DXCC. The laws of the Netherlands Antilles prevented my being allowed to operate at that time but the groundwork was laid for possible future licensing.

In May, after extensive negotiations, it seemed possible that a Dutch license could be secured, but with many an "if." First, I would have to take the Dutch license examination on Sint Maarten and successfully pass it. In addition, the proposed station would have to be actually set up, inspected and certified as acceptable by the Dutch authorities.

Willing to take this chance for success, I left home on June 12 with the XYL Louise and my 17-year-old son Jon. Since ample time was available, a Collins KWS-1 and 75A-4 together with an FT-100 three-band trap rotary for 10-15-20 meters was shipped ahead by air. In addition, the FS7RT KWS-1 and 75A-4 which had been stored on St. Croix was taken along. This gave a complete station setup, plus a complete spare.

At Sint Maarten

After arrival on Sint Maarten, headquarters were set up at the Little Bay Hotel on the beautiful bay of the same name about three miles west of the Dutch capital of Philipsburg. The hotel was completed last year just before the visit of Queen Juliana and Prince Bernhard of the Netherlands. One cottage unit of the hotel was built especially for the Queen and furnished as the Royal Suite. We were fortunate enough to secure this suite for our stay on the island.

The Director of Communications of the Netherlands Antilles, Mr. R. H. C. Van Haaren, arrived a few days later from Curacao to give me the license examination, which was successfully passed and PJ2MC assigned.

A beautiful welded steel flagpole had been erected in front of the royal suite to fly the standard of the House of Orange-Nassau — the royal crest of the Netherlands. This caught my eye as being an excellent support for the beam antenna. The concrete base was dug out, the flag pole tipped against the building, beam and rotator set on top and the pole raised back into position. An ideal beam support resulted, 45 feet above the ground and well over 100 feet above the nearby Caribbean and unobstructed for over 200 degrees from Northeast to West.

The hotel has a 50 kva. diesel power plant which furnishes three-phase 208 volts, plus 110 volts, 60 cycle a.c. A two kva. powerstat across one 208 volt phase supplied 125 volts to the equipment regardless of the line voltage, which was somewhat variable due to the hotel's ice-making machines, refrigerators, and electric hot water heaters.

The KWS-1 and 75A-4 were set up, inspected by Mr. Van Haaren and approval given for PJ2MC to be on the air.

The first CQ was on 15-meter side band on June 16 at 1850 GMT with W6TTB being the first station contacted. Others in order were KV4BB, W4KMU, W4API and my home station W6ITH.

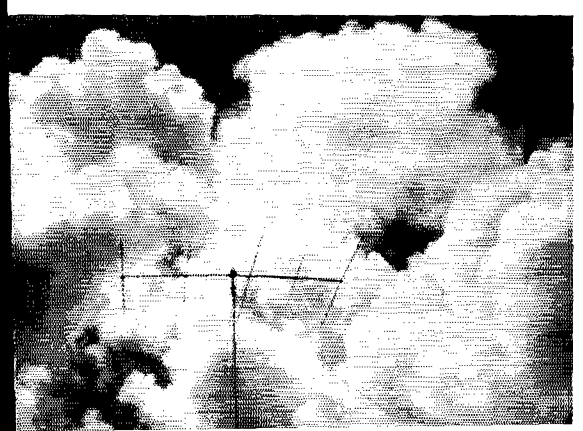
Continuous operation on 15- and 20-meter side band was maintained for the rest of the day and evening with several hundred stations worked.

Fifteen meters was open around the clock with hundreds of European, African, South American, Asian and Oceanic stations being heard in addition to the usual North American stations. At times it seemed that all of Europe was calling PJ2MC and this fact was often commented on by European stations themselves.

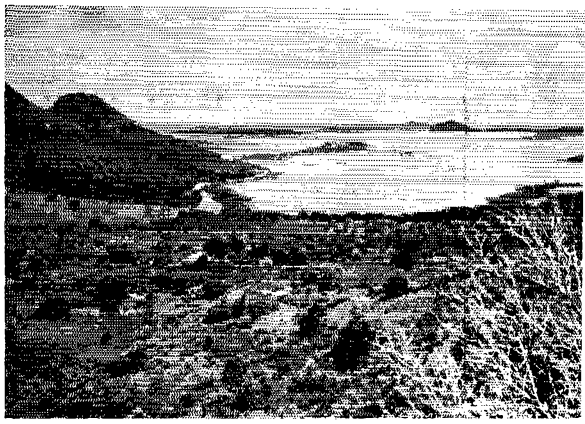
Back to Saint Martin

One of the questions most frequently asked was, "When are you going over to the French side of the island?" Original plans called for a day or so of operation on the French side just before leaving to give stations I was unable to contact during my February trip a chance for that rare country. The question was soon asked so often that it became obvious that I would have to get on from both FS7RT and PJ2MC regularly. Fortunately, since I had the extra complete spare KWS-1 and 75A-4 with all accessories on the island plus the 1500-watt power

* P.O. Box 1000, Moraga, Calif.



The PJ2MC antenna



Looking eastward to the sea

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plant, I set up again at the cottage at Bellevue Plantation near Marigot in French Saint Martin. An automobile had been rented so that it became merely a matter of traveling a distance of about 15 miles between PJ2MC at Little Bay and FS7RT at Marigot. Beginning June 23, operation of PJ2MC and FS7RT was alternated — usually spending a day or evening at one and then the other. In this manner many stations were able to get two new countries.

Since plans called for being on the island for a month, some time was available for visits to places on both sides of the island. The numerous beaches and valleys were explored and a beautiful headland overlooking the Caribbean alongside of a lovely sandy bay beach were earmarked as a possible site to build a home someday.

Travelogue

Many people think the Caribbean is hot and uncomfortable in June and July. Actually, the weather was almost exactly the same as during our first visit in February. The temperature is from 70 to 85 degrees and there is always a cool breeze blowing. The few evening hours spent in New York and several days in Florida on the way there and back were much more uncomfortable — warmer and with considerably higher humidity. The cool trade winds are a natural air conditioner.

Present-day vacationers will find that this sunny spot, far from a busy, bustling world, presents ideal opportunities for rest and recreation. They will enjoy the charming scenery of this evergreen island and the beneficial influence of the healthy, subtropical climate. They will gather new energy at the sparkling white beaches, whose unbelievably clear waters are delightful for swimming all year round.

But no less pleasant than lingering on the romantic coast with its capricious inlets, bays and beaches, is a sightseeing tour of the mountainous countryside. With almost every turn of the road a new vista unfurls before the eyes. Always beyond the soft green hills and the lush pastures, there is the Caribbean sea in its ever changing splendor of cobalt blues to light aquamarine.

Many of the natives greet each other with the expression "Man — be you," and then go into conversation which uses only a few words actually spoken out of whole sentences. They seem to understand perfectly, since each asks the other the same questions.

North of Marigot on a side road we came upon a building that seemed to be only part of a house — a house cut in half. Inquiry revealed it was exactly that. It seems that the couple who had owned it wished to separate. The local magistrate told them they would have to divide their property. So they went home and with saws cut the house in half. The two halves were moved a short distance from each other on the divided land and remain that way — the house that is half-a-house.

It is extremely difficult to find the owners of property. Property is often divided up in each generation and a single piece may belong to as many as twenty or thirty individuals. Some of these may have moved from the island years ago and their whereabouts completely unknown. Besides, the natives feel a piece of land for pasture is more useful than money.

It is truly amazing how self-sufficient the people of the island are. They make their own vanilla extract by soaking the beans in rum, and add orange peel from small wild native oranges which make it far removed from the artificially colored and artificially flavored extracts sold in our supermarkets.

After the heavy rains, numerous crabs come out of the ground. The natives collect these crabs at night by torchlight as they walk along the roads. They snare the crabs with a forked stick and pop them in a sack. They take the crabs home and place them in a box or barrel with corn or grain. After a few days the crabs are cooked and make a most appetizing dish.

During our stay the native mangos were in season. Each day we tried different varieties. In spite of so many fruits that grow wild, it is extremely difficult to buy any. The natives just

(*Continued on page 170*)

♦

A typical street scene

QST—Volume V

Part I† *— Foreword to Sumner B. Young's (WØCO) Index*

HERE IS one of the most important volumes of *QST* ever published. It began with the August, 1921, issue, and ended with the July, 1922, number. Included within its pages are many stories of enterprise and of achievement, together with a partial record of a development of paramount importance — the amazing broadcast boom which began in the fall of 1921, and which threatened the very existence of amateur radio in the U. S. A.

This boom immediately created too many complications to be handled under the woefully-inadequate Radio Act of 1912 so the Department of Commerce hastily renewed its efforts to acquire from Congress some effective means of regulating all classes of radio stations (including broadcast stations, in particular), before utter chaos should result.[1]

Still another consequence of the boom was a sharp upturn in the circulation of *QST*. As of March, 1922, it exceeded the total number of licensed amateur radio stations in the country by more than 3-to-1.[2]

Now, the vanguard of this oncoming horde of

† For previous installments see following *QST* references: "*QST* — Volume I," October, 1954; "*QST* — Volume II," February, 1955; Part I of "*QST* — Volume III," March, 1955; Part II of "*QST* — Volume III," April, 1955; Part III of "*QST* — Volume III," June, 1955; Part I of "*QST* — Volume IV," July, 1955; Part II of "*QST* — Volume IV," August, 1955.

[1] After some difficulty, I believe I have deciphered (from the *QST* articles to be cited at the end of this footnote) the correct sequence of the events which had occurred in the legislative and regulatory fields between early 1920 and late 1921:

(a) Early in 1920, a preliminary international conference was held in Paris. It produced a report (i.e., a "protocol") known (variously) as the "EU-F-GB-I Protocol" or as the "Allied Protocol." The U. S. Dept. of Commerce sent a representative to this meeting.

(b) At some time prior to July of 1920, Mr. Hoover appointed a committee which represented all American radio interests; and he requested them to study this protocol, and to suggest any changes "necessary to adapt it to the needs of our country."

(c) At some period of time after July, 1920 (not mentioned in *QST*), the Hoover Committee drew up suggested wave-length allocations which met with unanimous approval on the part of all American radio interests. It also "prepared valuable modifications of the protocol." If Congress had enacted a law putting the Committee's recommendations into effect, the amateurs would have been "assigned" (broadly speaking) a band extending from 180 to 200 meters, for spark, and a band running from 180 to 250 meters, for c.w.

(d) In the summer of 1921, another conference of international nature was held in Paris, attended by technicians. Their task was to prepare a final set of recommendations (largely as to wave-length allocations, I take it), for a set of International Regulations. The recommendations which the Hoover Committee had drawn up in 1920 were submitted to this gathering — but to no avail. The Paris experts (said to have been "dominated" by persons representing the military interests of the various countries which sent delegates) drafted recommendations "greatly at variance" therewith.

(e) In November, 1921, the Dept. of Commerce circulated the news of the Paris debacle to the civilian radio interests in the U. S. A. The reaction in our country was widespread anger, and general unwillingness to support the enactment of any domestic legislation, or the making of any Treaties or Conventions, which would implement these inequitable 1921 Paris recommendations.

(f) The end result was that the work of Hoover's 1920 Committee had come to naught.

References: "The Washington Radio Conference" (Warner), 7 to 12, April 1922; 33, July 1921; and 21, June 1921 (all in Volume IV); and 24 to 25, July 1920 (in Volume III).

[2] See the ad, at 67, May 1922, where the Circulation Manager of *QST* informed Display and Classified Advertisers that the March, 1922, *QST* was running 50,000 copies; that the demand for the magazine had been "enormous yet healthy"; and that "for the last number of months *QST* [had] grown by thousands with each issue, and this growth [was continuing] unabated." He also added that the "paid-in-advance circulation [was] growing in proper proportion to counter sales."

At 34, May 1922, Warner (in an editorial) said: ". . . The circulation of our *QST* is now close to the fifty-thousand mark and growing all the time. . . ." He thought the magazine could have little appeal to any "novice listener" until after he had "progress[d] a little." Therefore, he interpreted this circulation-growth as "represent[ing] an increase in the ranks of real amateur radio."

There certainly were some new faces at the big amateur conventions and radio shows, also. Over 40,000 people attended the Second Annual Convention and Radio Show of the Second District Radio Council, held in N. Y. City (at the Hotel Pennsylvania) from March 7th to 11th, 1922. See 32, April 1922. Attendance at the banquet (see 33, April, 1922) was 1,100. Of this banquet crowd, *QST* reported: ". . . and who do you reckon they were? It was an amateur gang in its sympathy and spirit, almost entirely so, and looking around the big ball-room we formed the conclusion that it consisted of the amateurs plus their fathers and mothers and uncles and aunts and cousins and grandparents — and that means that it was still an amateur crowd. . . ."

QST published no so-called analysis designed to classify the huge crowd which attended the banquet held at the Third-and-Fourth-District Radio Convention at the Hotel Raleigh, in Washington, D. C., on February 18, 1922. See 22 to 26, April 1922. And no similar analysis appears in the account of the National Convention at Chicago. See 7 to 22, October 1921; and 33, October 1921.

As to the number of licensed amateur radio stations in the U. S. A., see the following references: Warner, in his article "The Washington Radio Conference" (7 to 12, April 1922), at 12, April 1922, said: ". . . we already have some 15,000 transmitting stations. . . ."; and in his editorial headed "The 'Phones and Amateur Radio" (29 to 33, March 1922), at 30, March 1922, he added: ". . . Our 200-meter wave length is horribly crowded with the legitimate telegraphic business of an amateur field comprising some 14,000 transmitters, without being burdened with even the best of broadcasts from 200-meter phones. . . ."

Also note Chief Inspector Terrell's figures, found at 23, April 1922: ". . . It may interest you to know how many licensed amateur radio stations there are in the United States, as indicated by the latest reports from each district

First District, February 8	2,440
Second District, January 24	2,135
Third District, February 10	1,664
Fourth District, February 10	294
Fifth District, January 31	614
Sixth District, February 8	1,474
Seventh District, February 2	644
Eighth District, January 31	2,250
Ninth District, February 8	2,664
Total	14,179

"An increase of approximately 4,000 since the first of last July. . . ."

Note that on pages 70 to 71 of *Two Hundred Meters And Down*, Mr. DeSoto stated that a demand for *all* radio publications was one aspect of the "boom"; and that *QST* nearly doubled its circulation in one month.

novice listeners must have included some persons with technical training or scientific instincts; and (here and there) a would-be amateur must have been wondering how to join us; but even so, these figures really stagger me.

What triggered-off the 1921 broadcast boom? There's no direct answer in Volume V of *QST*, or in nearby volumes of that magazine. DeSoto's book, *"Two Hundred Meters And Down,"* suggests (in Chapter Eleven) that after Frank Conrad's station, 8XK (in Pittsburgh) began broadcasting on an experimental basis, on November 2, 1920, its programs aroused such interest that even persons who were not amateurs began buying radio apparatus, to receive them; and that the Westinghouse Elec. & Mfg. Co. (which employed Dr. Conrad as an engineer) decided to capitalize on this amazing state of affairs. It manufactured and marketed simple and inexpensive radio receivers; and several thousand were sold in the Pittsburgh area.

. . . To increase the market area, broadcast stations were erected at Chicago (KYW), and Springfield, Mass. (WBZ). Radio receiver merchandising boomed in each of these areas. The pioneer station which probably did most of all to lend impetus to broadcasting, however, was WJZ, established in late 1921. Serving the great New York City area, this station quickly aroused tremendous interest and played an important rôle in starting the broadcast boom. Other stations quickly followed. Amateurs commenced broadcasting phonograph records over their stations, to enthrall the growing audience. Newspapers put stations on the air. Large department stores and additional radio firms began broadcasting because of the advertising value.

"Broadcasting — the American system of radio broadcasting — was born. . . ."[3]

Before long, the din on 360 meters and vicinity was "something wonderful to hear." And amateur transmitters (principally sparks, but also

[3] A new *QST* Department called "With the Radiophone Folks," on the occasion of its second appearance (27 to 29, January 1922) contained a description of "The Westinghouse Radio-Phone Service." Station WJZ (Newark, N. J., operating on 360 meters, and having a "normal range" of 100 miles) is first described. Then other Westinghouse stations are listed Pittsburgh (KDKA, 330 meters), Springfield, Mass. (WBZ, 375 meters), and Chicago (KYW, 360 meters). Next we find the statement that ". . . These stations grew out of the company's experience in building radio-phones for our airplanes in France, and form the first system to be operated on a continuous and regular schedule. . . ." (29, January 1922). And in a final paragraph, on the same page, it is said: ". . . Rumor has it that the next Westinghouse phone stations to be erected will be at San Francisco and Dallas."

In an editorial called "The 'Phones and Amateur Radio," found at 29 to 33, March 1922, Mr. Warner placed the sudden upsurge of commercial radiophone broadcasting as occurring in the fall of 1921. At page 31 of the March (1922) issue, he added: ". . . Here's the story: the big corporations have put up big broadcasting stations which generally transmit entertaining and instructive programs . . . and create an immense demand for apparatus, and then they build and sell the equipment. We all know what the result has been. A year ago the radio industry consisted of a hundred or so firms, struggling along . . . counting nickels to make ends meet. Then came the boom! And now they can't keep up. In the East it is practically impossible to buy a receiving set, one has to stand in line to get waited upon only to find that the store hasn't even got the parts one wants, the factories are months behind in their orders altho some of them have tripled their production, and in general the business has taken a boom that was beyond the fondest dreams a year ago. And it's Mr. Novice who is doing the buying. He doesn't know a thing about radio and he doesn't care as long as he can hear something over it. These men have come in by the hundreds of thousands. We have no doubt that they outnumber us amateurs a hundred to one right now, and they are still coming strong. They are buying apparatus by what must be the millions of dollars worth. . . ."

The first appearance of the *QST* Department "With The Radiophone Folks" was at 31 to 34, December 1921. It mentions "a wonderful half-hour of grand opera sung by stars of the Scotti company from station 6XG of the Leo J. Myberg Co.," at San Francisco, on September 19, 1921. Then it says (31, December 1921: ". . . The entire Pacific slope was hushed for this performance. In many cities there were parties of up to fifty listening at a single station, and it is conservatively estimated that at least eight thousand people heard it."

"A station similar to the one which sent this concert has been installed by the Myberg Co., in Los Angeles, on the roof of Hamburger's Department Store. The Hamburger people are so much enthused over it that they have opened up a free school for instruction in radio, with an accommodation of 350 pupils a week."

At 31 to 32, December 1921, in the same *QST* Department, Miss Dai Buell's piano concert — "the first wireless recital exclusively piano ever given" — broadcast from Amrad's station (1XE, 350 meters, at Medford Hillside, Mass.) is prominently mentioned. Miss Buell's audience was "very conservatively" estimated at 25,000 people.

An entire book has been written about WEAF: *Commercial Broadcasting Pioneer. The WEAF Experiment 1922–1926*, by William Peck Banning. (Published in 1946, by Harvard University Press.) The A. T. & T. Co. built this station to try out toll broadcasting (where the advertiser, or the man who wants to communicate a message to the public, is the man who pays). I recommend this volume very highly.

Two adjoining items, in "With Our Radiophone Listeners," at 54, July 1922, are of unusual interest also:

(a) "Mr. E. P. Edwards, Manager of the Radio Department of the General Electric Co., in defense against the charge of holding back in the production of vacuum tubes to increase the demand, states that until last November 5,000 tubes per month kept the market supplied. In March he estimated the demand to be 90,000 per month at which time they were making 60,000. The production is now 200,000 tubes per month or about forty times as much as the production six months ago."

(b) "Dr. Lee DeForest is quoted as having said . . . that the estimate of the radio public as being a million is highly conservative. He figures that in two years it will be five million and in 1927 it will reach twenty million."

At 12, May 1922 (in "Rotten Broadcasts"), "The Old Man" thus described the mounting QRM on 360 meters: ". . . From three hundred meters to four hundred it is one grand smother of stuff they call music and speechifying and whatnot, all tangled and snarled up until if you listened to it long enough the bats would begin to show in your helfry, as sure as hellsamantrap. I used to be able to stand for it when it was only 8XK and later, KDKA, and a couple of amateurs grinding out bum phonograph records. But when the whole blooming country starts to yapping and yowling and hollering, and all of them trying to bawl their heads off on three hundred and sixty meters, it just simply unseats a man's reason. . . ."

At 61, March 1922, C. H. Starr, of Wolfville, Nova Scotia, informed the editor of *QST* that a large Toronto department store was stocking a full line of tubes, "including some of French and Japanese make."

There is an item at 51, March 1922, which mentions an early broadcasting station on the Pacific Coast. Although I have seen nothing, in *QST* or elsewhere to indicate that this station's programs inspired large purchases of receiving sets in the area which it served, I believe that it deserves mention here; because the claim was made that it was "the pioneer station in the world for the sole purpose of broadcasting." This was the station which Lee DeForest, Inc., installed in the California Theatre, at San Francisco, in April, 1920. This *QST* item states that before this station was removed to Oakland (at some unspecified date), it had transmitted about 1,500 concerts.

other types of rigs) began to create substantial amounts of interference in numerous broadcast receivers owned and operated by persons who had little or no skill in the radio art. Much of the receiving apparatus lacked proper selectivity, anyway; and the best operator in the world couldn't have excluded much of the then-current QRM.

Chief Inspector Terrell (of the Dept. of Commerce), at 23, April 1922, put it this way:

". . . With the rapid development of inland radio, amateur stations and broadcasting, we are confronted with the problem of investigating complaints of interference. . . . Until recently radio has been in the hands of people who had some knowledge of its use. Now we have receiving sets in the hands of farmers, farmers' wives, bankers, grocers, and everyone who wants to be fashionable. They have no knowledge of adjusting apparatus; in fact, I have heard much of the apparatus is so simply constructed that selectivity is impossible. . . ."

Mr. Warner stated (at 7, April 1922) that there then were "well over a half-million receiving stations in the country," along with "some sixty broadcasting stations." He also added: ". . . rumor has it that there are some five hundred applications for broadcasting pending in the Department of Commerce. . . ."

Testifying before Mr. Hoover's new committee of experts,[4] which opened public hearings in Washington on February 28, 1922, Paul F. Godley, whose words are here summarized, said:

". . . most of the trouble broadcast listeners have been experiencing thru interference has been due to the wretchedly broad-tuning receivers that [have] been supplied them in the belief that they are incapable of mastering a modern tuner, and in particular [I call] the attention of the Secretary to the publicity that in recent months has appeared in the press characterizing the amateur repeatedly as 'the American small boy'[5] and saying that he must be curbed because he was interfering with everything."

In England, Godfrey Isaacs, Managing Director of Marconi's Wireless Telegraph Co., was quoted (see an item in "Strays," at 55, June 1922), as saying:

" . . . I don't want to see 'radio flu' here. In America the boom is rather premature. The equipment in use is rather primitive and not such as we should like to see employed here. I think America is going ahead much too fast in this direction, and I can foresee chaotic conditions[6] if indiscriminate and vast use of wireless telephony comes."

Of course, the danger was, that the novice listeners, supported by the broadcast stations and the manufacturers of these wretchedly-designed receivers, would seek Federal legislation which would abolish the amateur entirely, or which would muzzle and restrict him.[7]

Warner suggested that affiliated clubs should woo the novice listeners, invite them to meetings, and try to work out satisfactory local arrangements for sharing the air.[8] Either by bilateral or

[4] In Volume V, this Committee was described by various names. For example: "The Washington Radio Conference" (7, April, 1922); "Secretary Hoover's Radio Commission" (also 7, April 1922); "The Radio Telephony Conference" 15, June 1922); "The conference called by Secretary Hoover to consider the general questions concerning the regulation of radio communications with particular reference to problems involved in the broadcasting of news and entertainment" (15, June 1922); and "The Department of Commerce's Radio Telephony Conference" (32, July 1922).

In the particular volume of *The Memoirs of Herbert Hoover* which is called "The Cabinet and the Presidency," the author (at page 140) says that he called this February, 1922, conference of experts ". . . to inquire into the critical situation which [had arisen] through the astonishing development of the wireless telephone; to advise the Department of Commerce as to the application of its [then-current] powers of regulation, and further to formulate . . . recommendations to Congress as to the legislation necessary. . . ."

The index to Mr. Hoover's book calls this conference one of the "National Radio Conferences (1922–1925)."

Mr. Hoover also says that the Conference convened on February 27, 1922 (not on February 28th).

[5] Godley also added (see 9, April 1922) that this "small boy" line of publicity had been popping-up so frequently that amateurs had begun to believe that it was propaganda which had been set afloat by "unfriendly interests."

See the "Stray" at 55, June 1922. It reads: "We amateurs are having lots of new names applied to us these days. G. H. Dacy, in the *Scientific American*, keeps up with the habit of the day by calling us 'the American urchin.'"

Personally, I find that incident very difficult to forgive.

[6] In Canada, the broadcast stations were not all being piled onto a single frequency, but were being operated on wave lengths 10 meters apart. See Russell's Report, at 46, June 1922.

[7] Warner, at 31 to 32, March 1922: ". . . Directly they [the BCLs] are going to get together and say 'These amateurs are a damned nuisance — they bust up my concerts. They ought to be kicked out.' . . . At the present time he [the novice listener] wants *all the air*, the same as we used to have all of it for *ourselves*. . . . And when all the eminent local politicians and big guns in all the towns get to telling Congress that we're a nuisance, we're likely to get the can whether we are or not. Therein lies the danger.

". . . The amateur wave and the broadcast wave are much too close together for any hope of entirely successful working.

"There will be objection to raising the broadcast wave . . .

"But that may never come about and meantime we are faced by our most serious situation of recent years. . . . We amateurs must start now to correct this situation as it relates to our own activities, and we must get busy immediately to educate the listener to the effect that he isn't alone in his glory and that he too must share. Either that, fellows, or good-nite amateur radio!

"Our hope now is in our Affiliated Clubs. . . ."

C. A. Service, Jr. (3ZA, of Bala, Penna.), in an undated letter published at 63 to 64, March 1922, said: ". . . It will not be long before the amateur novice, who listens to radiophone broadcasts and cares nothing about the radio amateurs with the transmitting set, will outnumber the latter and then look out for legislation that will try to wipe us out, put the lid on for good. . . ." (Followed by a warning to amateurs, to obey the wave-length and decrement requirements, etc.).

At 32, March 1922, Warner told the amateurs that Congressional action might be imminent, to prohibit amateur transmissions of any kind, between 8:00 P.M. and 11:00 P.M., all over the country: ". . . Why, will you believe it, we have been asked how the ARRL would regard the proposal to introduce a bill prohibiting amateur transmission of any sort between 8 and 11 P.M. . . ."

[8] ". . . You must take in to yourselves the broadcast listeners, not only because they're fine fellows when they know you right but to save your necks!"

". . . And then get busy on this interference problem. . . . If we don't want a national law shoved through against us we have got to do something quick. That something, as we see it, is to decide the matter [of quiet hours between 8 and 11 P.M.] in each community by *local option*, after we have got the broadcast listeners in to the local clubs. . . . What you must do, Clubs, is to make yourselves representative bodies, capable of reflecting the spirit of the majority of the radio public in your community, and then actually do the reflecting. Vote on it. . . .

"We must fight to the last ditch any law sponsored either by the general public or by the big manufacturing interests behind them, which proposes to prohibit amateur transmitting during most of the evening." 32 to 33, March 1922.

unilateral agreements (the latter probably the more numerous), quiet hours began to be observed in many communities.[9]

Now, it was perfectly obvious that some large-scale favorable publicity for the amateurs was sorely needed; and that they could greatly lessen their QRM to broadcast listeners, if they would only junk any spark sets to which they were still clinging, and would replace them with tube transmitters.[10]

And obvious now, but not generally realized at that time, was the fact that development and use of wave lengths down below 200 meters would provide a sound technological solution to the clash between the amateurs and the novice listeners, and would confer upon the amateurs, and upon many other radio services, benefits of huge and lasting value.

Fortunately, the successful Second Transatlantic Tests of December (1921) gave the amateurs favorable publicity on a world-wide scale. Better yet, they demonstrated the superiority of c.w. over spark, and a final stampede to tube transmitters began.

[9] The novice listeners were too numerous to be assimilated (or contacted) by the affiliated clubs. Personally, I can speak from experience, because around 1921–1922 I was Chairman of the Boston Executive Radio Council, and had the pleasure of working with such prominent amateurs as Guy R. Entwistle, P. J. Furlong, F. Clifford Estey, and Robert P. Siskind, on practical measures designed to cope with the broadcast–QRM problem and other matters. Incidentally, Mr. Charles C. Kolster, the Radio Inspector for the First District, also gave us wonderful support, and fine advice.

At Chicago, the clubs made efforts to cultivate the BCLs; and at 28, July 1922, R. H. G. Mathews, 9ZN, reported that long-distance amateur transmission was prohibited (under the "Chicago Plan") prior to 10:00 P.M. He also added that low-powered amateur transmissions, from sharply-tuned sets, could be carried on, in that city, "on low waves," and "without appreciable interference to radiophone listeners." (Just how low the power was, and how low the wave lengths were, I do not know).

At 32, March 1922, Mr. Warner said: ". . . It's a little surprising to find out that a great number of us seem already in favor of quiet hours, and in numerous communities the local amateur clubs have voted for silent air during the broadcasts. . . ."

In an editorial found at 33 to 34, July 1922, he thought that we hams were carrying the observance of quiet hours a bit too far. For example, he urged us not to relinquish (to the BCLs) the late evening hours, and the early morning hours (after midnight): ". . . We are entitled to part of the evening, and . . . you should feel perfectly free to make use of it. It has got so bad that some of us are actually afraid to touch our keys. This must not be. Amateur relay traffic must continue. Why, we know some fellows who *more* than once have been telephoned as late as one o'clock in the morning by novice listeners with an impatient request to QRT while they listened to a broadcast. If it's just an ordinary broadcast, the answer is that they've already had their inning, and if it's some special DX broadcast they're copying then they are practising the amateur DX game with the rest of us and running the chance of traffic QRM. . . .

"A little backbone, fellows! . . . We telegraphing amateurs are doing a more important work than all the broadcast listeners in the country and we are entitled to a place in the ether. See that the broadcast listener gets the lion's share of the evening in which to listen and when that time is passed, hop to it! The air belongs to us then, and altho we are perfectly willing to share it with anyone who meets us as a fellow amateur we do get peeved at being insulted because we try to unload the old hook at 10:45 . . ."

At the Second District Convention and Radio Show, held at N. Y. City, from March 7th to 11th, 1922, some headway was made toward establishing good will between the hams and the BCLs:

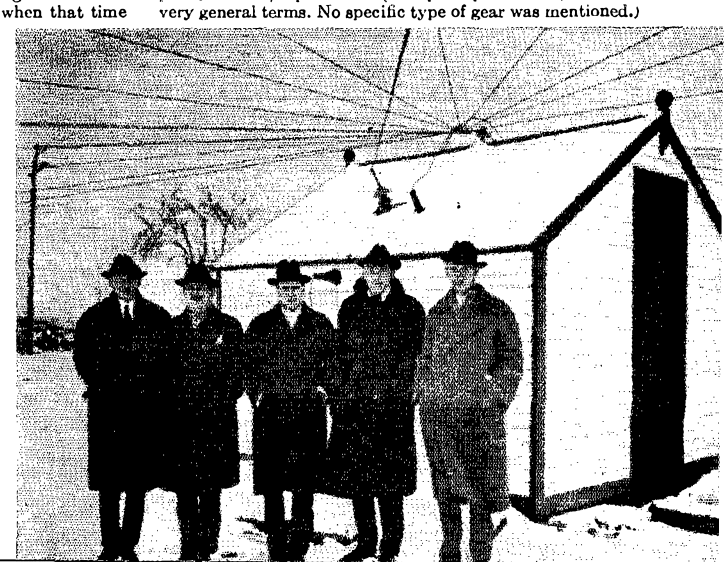
". . . The public met the amateur and liked him. The amateur was everywhere and he knew all about everything and could explain it. His jargon of technical talk completely caught the fancy of the members of the general public, and the New York papers in their accounts of the affair and their cartoons reflected not the viewpoint of the rather unhappy novice listener but the spirit of the real amateur! . . ." See 32 to 33, April 1922. And speaking in an editorial in the May (1922) issue, Mr. Warner added (at page 34): ". . . by the way that show helped wonderfully to heal the breach between the old-time amateur and the novice listener. It was the same old story — they met each other, got an understanding of each other's viewpoints, and the difficulties started disappearing. . . ."

I believe that the convention method of contacting the novice listeners also lacked any permanent utility.

In Canada, some person or persons unidentified in *QST* recommended that the Department of Naval Service compel all amateur spark stations to observe quiet hours, but that it allow c.w. transmitters to operate as usual. How this suggestion fared, I do not know. 36, May 1922. (Lorimer's Report).

Nothing in Volume V indicates a general disposition to exempt c.w. stations from quiet hour restrictions in the U. S. A. QRM problems were arising there, wherever c.w. sets were being operated from a.c. plate-supplies, or wherever rectified-a.c. plate-supplies were being inadequately smoothed. See the Stray at 60, April 1922. In addition, strong tube transmitters (according to Mr. Kruse) were "throw[ing] a dense blanket over spark reception nearby." See 23, March 1922.

[10] After the successful Second Trans-Atlantics, Sec. Hoover's 1922 experts discussed the abolishment of spark transmitters. They concluded that this should not be recommended until such time as c.w. equipment should become generally available in adequate quantities and at equitable prices. See 11, April 1922. (The principle was expressed in very general terms. No specific type of gear was mentioned.)



The 1BCG building with builders Amy, Grinan, Burghard, Armstrong and Cronkhite.

Most important of all (although this aspect of the affair remained obscured for several years), some first-class scientists, and a few gifted and far-sighted amateurs, realized that these tests had disproved certain orthodox theories about the transmission of radio waves; and they began searching for the reasons. The end results, of course, were momentous.[11]

The decision of the Board of Direction of the ARRL to send Godley to England, to listen for American signals with American equipment, was taken at a meeting held in Chicago, at the time of the League's first National Convention.[12] Viewed in retrospect, this action of the Board overshadowed all other happenings at that Convention; but that First National Amateur Convention and Radio Show was a landmark in ham history for several other reasons; and it deserves attention before we go on to describe the Tests themselves.

It was held in the Windy City from August 31 to September 3, 1921.[13] The Chicago Executive Radio Council was in charge, under a contract which it had made with the League;[14] and the staging of this gathering was one of the exploits which won the Council the Smith Cup for the most outstanding achievement in citizen radio during the summer season of 1921.[15] Some 1200 out-of-town hams, plus several hundred local amateurs, attended.[16] Fifty-odd exhibitors displayed their wares,[17] and so attractive were these exhibits, that on one occasion R. H. G. Mathews was forced to organize a snake dance through the Exhibition Hall, to round up some 400 hams, and lead them to a meeting in the Convention Hall.[18]

Amateurs from every district attended.[19] All except three Directors of the ARRL were present at a Board Meeting held at Chicago during the Convention; and two of the absentees were represented in some unspecified manner.[20]

This Convention received good advance publicity,[21] and was well-advertised.[22] Nevertheless, it was not a financial success;[23] and only about one-third of the hams who registered at the Convention attended the banquet.[24] A roll call conducted at that gathering showed that 80 clubs affiliated with the League, in 36 different states, were represented there, however.[25] And it is clear, from all accounts, that the Convention was a great achievement.[26]

[11] The late Edwin H. Armstrong, in his thoughtful and valuable Introduction to the "1BCG Commemorative Issue" of the *Proceedings of the Radio Club of America, Inc.*, published in October, 1950 (at page 3 thereof), said:

". . . At the end of World War I, overseas communication by radio was universally carried out on wave lengths thousands of meters long. Costly antenna structures were a necessity, frequently including a multiplicity of towers not far from a thousand feet in height. Maximum ranges covered were of the order of four thousand miles; maximum speeds of transmission during good periods about fifty words a minute.

"Today long distance communication is carried out on waves less than forty meters in length, antenna towers may be all of the order of a hundred feet high supported by little more than outsize telegraph poles, distances have been increased to the ends of the earth and speeds into the hundreds of words per minute.

"That this transition would occur became apparent about the end of 1926, after the inauguration of a practical short wave commercial circuit between England and Canada demonstrated a revolutionary superiority over all known methods of long distance communication, radio or wire. This, of course, is well-known radio history.

"That the first step of the transition came about in December 1921 as a result of a series of transmission tests carried out between the United States and Great Britain by amateur radio stations is not well known. . . .

"The place which these tests have in radio history . . . is appreciated by few even now. But . . . the 1921 experiment marked a turning point in radio history.

". . . The so-called knowledge of the art had been disproved and a new field of investigation opened up.

"Here was taken the first step toward bridging the gap from the long-wave transoceanic telegraph communication systems then in use to the present world-wide communication of today, an achievement that was ultimately brought about by a great discovery made through the imagination of Marconi and the engineering genius of C. S. Franklin. . . ."

Note that this Commemorative Issue was devoted to telling "The Story of the First Trans-Atlantic Short Wave Message" which was sent from 1BCG, at Greenwich, Connecticut, to Paul F. Godley, at Ardrossan, Scotland, on December 11th, 1921. This number is a magnificent piece of work, and a copy of it should be included in the library of every amateur in the world who is interested in the history of our avocation. Several articles from *QST* are reproduced, in full, and many photographs of lasting significance are included.

Long before 1926, amateurs had done valuable pioneering down below 200 meters. See the "1954 Supplement to the Foreword to the Index to Volume IV of *QST*," where I outlined some of this early work, and gave *QST* references extending into Volume VI.

[12] 15, October 1921: ". . . the Board . . .went into executive session at the Edgewater Beach Hotel where the most completely representative gathering in its history took place. All directors but one were represented and all but three were there in person. . . . Routine League business was handled, the most interesting piece of business being the arrangements made to send Paul F. Godley overseas in December to listen for the Transatlantic Tests, as told elsewhere in this issue. . . ."

See, also, the Article: "Godley to England to Copy Transatlantics," 29 to 32, October 1921; particularly at page 29.

[13] 7, October 1921.

[14] 20, October 1921.

[15] 31 to 32, April 1922. Nine prominent amateurs, under the Chairmanship of S. Kruse, 3ABI, of Washington, D. C., were the Judges. The past work of the Council "in conceiving, putting into practice and proving the workability of the 'Chicago Plan'" was also a factor. See 31, April 1922.

[16] 7, October 1921.

[17] 17, October 1921.

[18] 21, October 1921. At one of the meetings, the initial attendance was small, everybody being at the show. This produced a comical sight when Matty, rendered desperate, placed himself gavel in hand at the head of a serpentine line that wended its way in lock step thru the show in search of members, invading booths and rapidly accumulating new participants, until, some 400 in number, it returned to Convention Hall while all the transmitting sets in the show shricked out SOS and HI."

[19] See photo on front cover of the October 1921 issue. This includes: K. B. Warner, 1AW-"KP"; J. K. Hewitt, ex-2RK; A. D. McNaughton, 3HJ; B. W. Benning, 4XC; J. M. Clayton, 5ZL; V. M. Bitz, 6JD; C. H. Linsley, 7GK; Mrs. Chas. Candler, 8ZL-"OW"; H. J. Burhop, 9ZL-"HG"; and A. J. Lorimer, Canadian 2BF.

[20] 15, October 1921. The Board of Direction defaulted a ball game to the Chicago Council in order to hold this particular meeting. This was the session where the decision was taken to send Godley abroad.

[21] See 7 to 9, August 1921 "Come to the Convention!"

[22] See double-page ad, at 70 to 71, August 1921.

[23] The Council lost about $1,500.00. 20, October 1921.

[24] 17, October 1921.

[25] 17, October 1921. A photo of part of the Banquet Hall, and of some of the guests, is at 16, October 1921.

[26] See: "Our First National Convention, 7 to 22, October 1921; Editorial at 33, October 1921; and "Come to the Convention!", 7 to 9, August 1921.

The story of the Second Trans-Atlantics has never been told with the accuracy and clarity which it deserves; and in this Foreword I can deal only with some of the highlights.

A good account of the events which led up to these successful Trans-Atlantics is found in *Station 1BCG* — a paper which was presented before the Radio Club of America on December 30, 1921. It is found at 29 to 33, February 1922.

". . . The idea of transmitting American amateur signals to the Continent originated with one of the prominent members of the Radio Club of America before the world war when Mr. L. C. Pacent presented the matter for the consideration of the board of direction. Nothing definite was accomplished however, and when Mr. Thomas Styles went to France after the war, Mr. Pacent suggested that the club erect a station to attempt communication, but the proposition was abandoned as too costly at the time. Some time after this Mr. Philip Coursey of the *Wireless World* took up the matter with Mr. White of the *Wireless Press* with like result, everyone being skeptical as to the success of the affair. Then Mr. M. B. Sleeper, at that time radio editor of *Everyday Engineering*, took the idea up in earnest and laid the plans for the first amateur trans-Atlantic test but was later forced to give it up. The American Radio Relay League took up the task at Mr. Sleeper's request, where he left off, and the first test was run under their auspices. The periods of transmission, however, were too short and no signals were heard in Europe. Then it was decided by the League to have another test the following winter, making the periods of transmission longer, and to send a representative to England to receive the American signals. Mr. P. F. Godley was selected as the logical man to go to England. He sailed for England in November, 1921, . . ."

Now, Paul Forman Godley was a most excellent choice. He was skillful, energetic, and conscientious.[27] At Ardrossan, Scotland — the re-

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[27] At 9, February 1922, some of his qualifications were thus stated: ". . . . Mr. Godley is the man who first adapted the Armstrong regenerative circuits to short-wave work; he originated the variometer regenerators which made possible the wonderful short-wave DX work of American amateurs since 1914; and he was chosen to go overseas because in the unanimous opinion of the Board he was America's most expert operator in the practical reception of short-wave signals. . . ."

As of October 4, 1921, he was still looking for ideas as to receiving equipment, although he had selected some of his gear, and felt pretty sure about its merits. (See his letter at 56, October 1921).

Edwin H. Armstrong assisted him in preparing for the Tests. See 15, February 1922.

About a week before Godley sailed abroad, he checked both his regenerative and his superheterodyne receivers, at his home in New Jersey, by listening to the "very uniform" signals from Louis Falconi's fine station (5ZA, in Roswell, New Mexico). When the "super" was used, with a 9-turn loop antenna, Godley was able to make 5ZA's signals operate a 4-ohm telegraph sounder by inserting relays in the circuit. 10, February 1922; 15, February 1922.

Godley thought so well of the Armstrong Superheterodyne that when Capt. H. J. Round (of Marconi's, in England) offered him a 22-stage amplifier (of some undisclosed type) for use in the Second Trans-Atlantics, he declined with thanks. See 15, February 1922.

He tested receiving conditions near London before going to Scotland; and he found them poor, because of QRN, and also because of harmonics which almost completely blanketed waves below 275 meters. (He even heard the 39th harmonic of a GPO radio station located in the north of Scotland; and high-powered spark, arc, and tube transmitters, all contributed to this din. See 19, February 1922).

Even before testing receiving conditions near London, he had picked out Ardrossan, Scotland as a possible alternative site. 20, February 1922.

When he arrived at Ardrossan, Godley had only 30 hours within which to locate a site, erect his antenna, provide some sort of shelter for his station, and get it into operation. 21, February 1922. Suffice to say, he and his checking-operator, Dist. Inspector D. E. Pearson, of Marconi Marine Communication Company, Ltd., with a couple of laborers to help, erected a long Beverage antenna on a rain-soaked field, put up a tent, and got into operation on schedule. As to Pearson, see 11 and 14, February 1922; and the photo at 15, February 1922. On the troubles re the Beverage antenna erected at Ardrossan, see 39, February 1922. It had a single wire, 1,300 ft. long, strung on a series of short wooden poles; and it was only 12 ft. high. It was pointed straight at Chicago, Illinois.

See 22, February 1922. The far end was grounded, through a variable noninductive resistance, onto several pipes. These pipes were buried, 4 ft. deep, on a very low-lying site, near the beach. Again, see 22, February 1922. The method by which the receiver was coupled to this antenna is described at 23, February 1922. Photos of the tent are found at 11 and 15, February 1922.

From the very first, Godley felt confident that he would hear American signals. In a letter dated October 4, 1921, published at 56, October 1921, he said: ". . . Do I expect to hear signals? Yes! — lots of them, and I will not be at all surprised if Pacific Coast or Mississippi Valley signals come over to me with the same consistency as Atlantic Coast signals. It looks to me very much like a free-for-all with no favorites. I hope that all the men will take a look at the globe. I believe that they will be impressed by what they see there." See, also, the interesting discussion of great-circle distances to the British Isles, from various points in the U. S. A., at 30 October 1921. Among other things, this language is included: ". . . The most remarkable thing is that the distance to England from the northwestern states does not seem to be over six or seven hundred miles farther than from our south Atlantic states, and Mr. Godley expresses the belief that because of better refraction and reflection inland stations have fully as good a chance of getting over as north Atlantic coast stations. . . ." Before leaving for England, Godley asked some members of The Radio Club of America to build a special high-powered c.w. station (1BCG), so that he could count on receiving at least one fine signal, sufficiently loud and steady for use in adjusting his receiving setup for maximum efficiency. See 20, March 1922. As to the use made of 1BCG's signals, see 27, February 1922.

When Godley talked (personally) with many British hams, in London, before the Second Trans-Atlantics, he found that they were skeptical of success; and he felt that they were unable to decide whether he was a "nut" or was really confident (on sound grounds) that the Tests would succeed. Apparently this gloomy attitude failed to daunt him, and at London, Marconi himself gave him words of encouragement and "seemed to feel confident that the tests would prove successful." 17, February 1922. 15, February 1922, also.

However, Godley's statement at 23, February 1922, indicating that he had received a great many overseas signals at Ardrossan before the British and Dutch Amateurs had received any, appears to be erroneous. See Mr. Coursey's statement (at 26, May 1922) that ". . . the first station heard by a British amateur was 2FP, whose signals were picked up at 2:30 A.M. (GMT) on December 8th. . . ." This was only 57 minutes after Godley's unverifiable reception of 1AAW (23, February 1922), and about 2 days before Godley had heard 1BCG, on December 10th. (See 24, February 1922; and 26, May 1922. And note that Coursey, on the page last cited, places the first reception of 1BCG, at Ardrossan, as occurring "in the early morning of the 10th of December").

It is probably true, nevertheless, that Godley had read the British amateur's attitude correctly, when he stated (at 15, February 1922): ". . . A thing which stands out in great prominence is this: the American amateur has given his British cousin a surprise. I am quite certain there wasn't an amateur in all Britain who thought it could be done. I can well imagine the glad surprise which must have spread out from London, when it became known that signals were being received. . . ."

D. E. Pearson, Godley's checking operator, inside the tent at Ardrossan.

ceiving site finally chosen by him — he achieved his objectives, and made history.

The first American amateur signal heard was from a 60-cycle synchronous spark transmitter, on a flagrantly-illegal wave length of about 270 meters. The "Official Report on the Second Trans-Atlantic Tests," at 23, February 1922, describes this incident (which occurred on December 8, 1921 — Greenwich time) as follows:

". . . At 1:33 A.M. picked up a 60-cycle synchronous spark at about 270 meters, chewing rag. Adjusted for him, and was able to hear him say 'C U L' and sign off what we took to be 1AEP; but atmospherics made sign doubtful! That this was an American ham there was no doubt! I was greatly elated, and felt very confident that we would soon be hearing many others! Chill winds and cold rains, wet clothes, and the discouraging vision of long vigils under most trying circumstances were forgotten amidst the overwhelming joy of the moment — a joy which I was struggling to hold within! I suggested hot coffee at once, and Pearson voluntcered to warm it on our stove. He had put pot and bottle in his hands when I called sharply to him to resume watch! Our welcome American friend was at it again with a short call for an eighth district station! His signal had doubled in strength, and he was booming through the heavy static and signed off clearly 1AAW, at 1:42 A.M. Pearson only in time to get the AW on the tail end! We decided at once to leave settings and lay for him. About 1:50 he was in again, but recognizable only by virtue of his tone — totally unreadable!

"Having heard no more of him at 2:35, I returned from a five-minute run down the line to report a pole broken short off, and the line on the ground at a point about 700 feet from the tent. Winds very high. . . ."

"Wired Coursey: 'Rains, winds, atmospherics heavy. Working under tent. Beverage antenna, which fell during night. Heard 1AAW calling eights 1:42 Greenwich, 270 meters, fading, sink gap. Ask him continue same time nightly. Keep all signals coming. Happy! . . ."

Unfortunately, there was a mix-up in the special code which Godley was using to communicate (over the land-lines) with Mr. Coursey, in London; and when Coursey passed the news on to ARRL Headquarters, via MUU, the call 1AAW was erroneously reported as 1AAY. The holder of this call was a lad in Fitchburg, Massachusetts, who had only a one-quarter-inch spark-coil for a transmitter, and no aerial installed. 12, February 1922. Then a correction came through from Mr. Godley; and Mr. Entwistle (New England District Manager of the ARRL) hastened to Roxbury, near Boston, to check up. Here, to his amazement, he discovered that the holder of call 1AAW had not operated a transmitter for six months![28]

The conclusion that some person had illegally appropriated 1AAW's call, and had been heard by Godley at Ardrossan, was accepted.[29]

At Ardrossan, both Godley and Pearson suffered great discomforts, because of wretched weather and the inadequate shelter which the tent provided; and at one time Godley became so ill and so weary that he almost gave up, on the morning of December 14, 1921. See 37, February 1922; also 14, February 1922.

He kept a careful log; and after the Tests, he went to London and spent about 10 hours at Coursey's office, dictating a full account of his doings. 40, February 1922.

[28] 12, February 1922 (Warner). Also, note that Godley did not communicate from Ardrossan directly with the U. S. A., as to receptions of signals during these Tests. He reported to Coursey, in London; and Coursey (after checking) passed these reports onto the League Headquarters. Therefore, there was a constant delay of 24 hours, between the time when Godley heard a signal and the time when the news of its reception reached Hartford. See 11, February 1922 (Warner).

[29] On the cover of the January 1922 *QST*, it is described (under SPARK) as "Illegal Station, not yet located." At 12, February 1922, it is listed as "not yet located." And on that same page, the following language appears: ". . . We thot we were up a tree at first but 1AAW and numerous Boston amateurs advise that the call *has been heard* on the air around there and that somebody else has appropriated the call. Whoever the would-be 1AAW is, he is sticking tight under cover now, as he knows he is a law breaker, and to date he has not been located. It is a pity, too, for if he were within the law he could claim the honor of being the first station heard overseas in the tests. . . ."

To this very day, the culprit has never been located. However, there is an anonymous letter at 56, September 1922 (Volume VI), addressed to Editor, *QST*; which reads as follows: "Perhaps you have heard of a fellow who signed off 1AAW during the Trans-Atlantic tests. I had a powerful transmitter and thought I would sign 1AAW on the small chance of getting some DX stuff around the states but I never dreamed of reaching Godley. I chose the call 1AAW because it struck me as having a good swing. At the time my station was in ———— Maine but as Maine is a large state I can be assured of the fact that you will never find the station. I will give you a hint and that is, if you will draw a line 110 miles in from the coast, and parallel with the coast, my station will be somewhere in there. In a way I am scared of admitting more so that is why I won't sign this.

"I assure you that I am not as dumb as you would think. I know that you have already thought over the post mark several times but it will not do you a bit of good because I am motoring thru here and will be near New York City when you get this. I am wearing gloves in writing this so tough luck again. If I can ever be of any help to you please call on me. [Signed] RADIO FOR EVER."

This letter, as published, bears no date, and no place of origin. The postmark on the envelope is not disclosed in *QST*.

To the letter, the Editor of *QST* appended the following note: "We have no proof that the above was written by the operator that signed 1AAW during the Trans-Atlantics. The real sender may still be lying in quiet. At least we want more data before we let the matter rest. — *Ed.*"

I have found nothing more in *QST* about this 1AAW incident. If there really was a person who misappropriated the call 1AAW, and who sent signals which Godley received at Ardrossan, as described, I wish he would write to me, and tell the true story, submitting whatever proof he may now have available. — S.B.Y.

Luckily for the reputation of the amateurs in general, the success of the Second Trans-Atlantics does not rest on any such sorry (and possibly erroneous) foundation as the one above described.[30]

The next North American Amateur signal heard at Ardrossan was from station 1BCG.

Godley's log for December 9, 1921 appears to include events which happened in the early morning hours of December 10, 1921, as well;[31] and if that be true, he heard 1BCG's signals for the first time on the tenth.[32]

[30] That even an excellent operator like Godley could (and did) make a mistake when copying faint signals through interference, and under adverse conditions, is shown by his error as to the type of transmitter which station 2ARY was using. Godley's log for Monday, December 12, 1921, published at 28, February 1922, says: ". . . 2:05–2ARY (i.c.w.) 'Test.' Lots of QRM from Poldhu's press on harmonic. Other press schedules also going, and all seem to have harmonics. Makes it difficult. . . ." Now, actually, station 2ARY (owned by W. W. Redfern, Jr., of Brooklyn, N. Y.) was a spark station. See the description of it, found at page 15 of the March, 1922, *QST*, in Mr. Robert C. Higgin's fine article entitled "The Successful Trans-Atlantic Stations." In part, Mr. Higgy says: ". . . 2ARY, originally reported as a c.w. station, consisted of a one-kilowatt Acme non-resonant transformer, homemade rotary gap having 14 points running at 1800 r.p.m., condenser using a Dubilier and Marconi jar in parallel giving a total of .01 mfd. capacity, and an O.T. . . .' The station is correctly listed as a spark station, in the Table at 12, March 1922 (after other incorrect previous listings on the front cover of the January, 1921, *QST*, and at 12, February 1922, in Mr. Warner's article); but Mr. DeSoto's book, *Two Hundred Meters and Down* serves to perpetuate the error, by listing 2ARY as a c.w. station. See page 73 of that work.

The "1BCG Commemorative Issue, October 1950," of the *Proceedings of the Radio Club of America Inc.*, reproduces Warner's and Godley's articles which are found in the February, 1922, *QST* — but it fails to reprint the later article by Mr. Higgy in which the correction appears, and where the detailed description of 2ARY is found. (See 15 to 16, March 1922). This commemorative issue also omits the Table found at 12, March 1922.

This mix-up should demonstrate to the casual reader how much checking and cross-checking is necessary if the true facts about any past event are to be assembled in any given field.

Another spark station was originally reported as a c.w. station in the list shown on the front cover of the January (1922) *QST*; but here somebody other than Godley must have erred. I refer to station 3FB (Atlantic City, N. J.), which was first heard by Godley at 2:11 A.M. (GMT), on December 12, 1921. The log entry reads: "2:11 — 3FB spark. 'Test.' (QRM FUU)." 28, February 1922.

At 12, February 1922, Mr. Warner includes 3FB among a list of nine sparks heard at Ardrossan. Mr. Higgy's Article (supra) says, at page 14 of the March (1922) issue: ". . . There were seven spark transmitters that succeeded in covering the many miles to Ardrossan. One of these unfortunately cannot be located and at the present time, descriptions of but five are available. . . ." He then goes on to describe 1ARY, 2BK, 2ARY, 2DN, and 1BDT. The unlocated station obviously was 1AAW. The missing description probably was that covering 3FB.

Now, why was Higgy's list of successful spark stations *two less* than Warner's? This shortage bothered me, for a while. Then, on checking Godley's official report, I found (at 27, February 1922) that he had identified 9ZJ (of Indianapolis) only by recognizing his note and his fist — and that he had never heard 9ZJ sign his call. (See the log entry at 6:03 A.M., GMT, December 11th, 1921. 2EH had just called 9ZJ, it is true; but it may not have been 9ZJ who came back at 2EH). And I also discovered that the reception of spark sigs. from 8BU (at Cleveland, Ohio) rested only on an unchecked logging by Pearson. See Godley's wire to Coursey, dated December 12, 1921, at 36, February 1922.

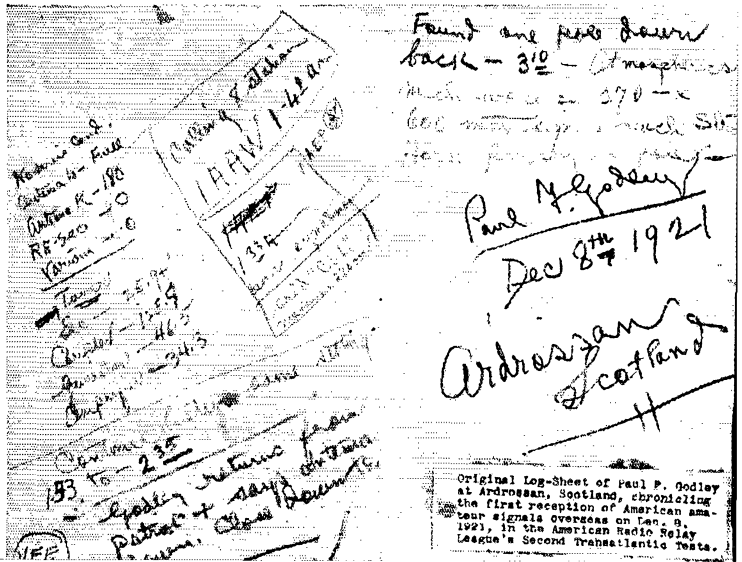
Obviously, Mr. Higgy (and possibly others) had concluded that 9ZJ and 8BU could not properly be included in the final list, under the high standards of evidence required in this Test. Just what the official findings were, on this, I do not know. They should be located now if possible.

At page 73 of *Two Hundred Meters and Down*, Mr. DeSoto said: ". . . Nine spark stations were heard: 3BP, Newmarket, Ontario, Canada; 1ARY, Burlington, Vt.; 1AAW; 1BDT, Atlantic, Mass.; 2BK and 2DN, Yonkers, N. Y.; 3FB, Atlantic City, N. J.; 9ZJ, Indianapolis; and 8BU, Cleveland, Ohio. . . ."

[31] The full log of the Tests has never been published in *QST*. Godley, in his official report, summarized part of it, and quoted other parts in full. Judging from the report, his log designated December 7th covered a period of about 21 hours which began on the morning of December 7, 1921, and ended at 6:00 A.M. (GMT) on December 8, 1921. 22 to 23, February 1922. The log designated December 8th began at some unspecified daylight hour on that date (when repairs to the Beverage antenna were made). Watch started again at some undisclosed time on the night of the 8th, and ended at 6:00 A.M. (GMT) on the 9th. 24, February 1922. The log entitled "December 9th" began some time before midnight (GMT) on the 9th, and extended beyond 6:00 A.M. on the 10th, to the time when MUU had finished sending a long-wave message to Hartford (via N. Y.), concerning the Tests. 24 to 25, February 1922. The next summarization of log entries (by Godley) expressly covers events occurring from December 10th to 11th, 1921. See 25, February 1922. The watch for signals began shortly before midnight (GMT) on the 10th. About 1:00 A.M., on the 11th, signals came in from 1BCG. Due to the garbling of a cable which Godley had sent directly to Mr. Armstrong, asking that 1BCG send *messages*, 1BCG began sending the four-letter group "MGES," over and over. 25 to 26, February 1922. Then other events began to happen, thick and fast; and the official report contains some solid quotations from the log, to cover the *remaining happenings* on the eleventh. The log for December 12th clearly covers only events beginning and ending on that one date. It recites what happened from 1:00 A.M. to 7:00 A.M. (GMT). 27 to 28, and 36, February 1922.

[32] At page 31 of the "1BCG Commemorative Issue" of the *Proceedings of The Radio Club of America* (October, 1950), Mr. Godley says that he heard 1BCG, for the first time, at 12:50 A.M., Greenwich Mean Time, *December 9, 1921*. I think he must have read his own Official Report too quickly.

At page 22 of that same commemorative issue, Mr. Armstrong mentions the fact that 1BCG got over to Godley three days running. The *last* day certainly was December 12, 1921, when the first amateur short-wave trans-Atlantic message was received at Ardrossan. See 27 to 28, and 36 to 38 February 1922. Also, see the 1950 statement, by Godley, that he copied the message on December 12, 1921. This is



Original Log-Sheet of Paul F. Godley at Ardrossan, Scotland, chronicling the first reception of American amateur signals overseas on Dec. 9, 1921, in the American Radio Relay League's Second Transatlantic Tests.

The initial reception of 1BCG, and the immediate reactions at Ardrossan, are thus described:

". . . At 12:50, after listening some time for free-for-all sparks, we swing over to c.w. and it is indeed a thrill we get when 1BCG is picked [up] on 230 to 235 meters. A harmonic from Clifden is jamming but after some adjustment this is partially nullified. Signals from 1BCG very steady and reliable. *Remarkable performance* and I wonder what power he is using. Lose him many times in an effort to 'feel out' the Beverage wire, but get him much better after adjustments terminated at 1:33. He is calling 'PF test' and signing. Sweetest song I have ever heard. Calls separated by (?). Changed operators at 1:45 A.M. His sending steady in all cases. He fades out for 30 seconds every 3 or 4 minutes but always comes back strong and steady.

"At 1:59 A.M. he calls 2BGM and says 'Phone us now,' then shuts off. Measures between 230 and 235 meters on little General Radio meter.

"Pearson and I relax, laugh with glee, and start looking for something to eat and drink. . . .

"Wired Coursey: 'Burnham owes Warner new hat. Warm rains, calm, decreased atmospherics. 1BCG calling me ending two Greenwich. Undamped two thirty, strong, steady. Congratulations.'

"The performance of 1BCG had filled me with a lot of very wonderful feelings. . . . I began to wonder whether or not 1BCG might be the only station which would get over in real style. I then decided that no one thing would forever redound to the credit of amateur radio more than the transmission and successful reception of a complete message and I wired Armstrong direct as follows: 'Signals wonderful send messages starting one Greenwich' and went to bed with a singing heart and thoughts of the coming night when we would be copying (perhaps) messages via 1BCG from Hartford, and my home, and even from Warren G. Harding himself — who could say. . . ." (24 to 25, February 1922).

On the morning of December 11th, 1921, Godley picked up 1BCG again, a little after 1:00 A.M. (See 25, February 1922). The station sent, over and over again, the four-letter group "MGES," instead of messages. According to Godley (25, February 1922), some British telegrapher "bulled" his cable, so that the word "messages" read "MGES." In any event, the operators at 1BCG, after a lengthy (but unimaginative) debate, did exactly that! [33]

From 3:00 A.M. to 6:00 A.M. (GMT) on the 11th, the signals from 1BCG were of "commercial" quality. (See 27, February 1922). At 4:05 A.M., Godley decided that 1BCG was not going to send messages; so he left him. (26, February 1922). His log, however, continues to mention reception of 1BCG at intervals thereafter — the last such entry being at 6:00 A.M. (27, February 1922).

Now, even before leaving 1BCG's signals, Godley had already logged a third American Amateur, 1ARY, at 3:49, 3:53, and 3:55 A.M. (GMT); and later at 4:37 A.M., he heard 1ARY "fully as strong and steady now as 1BCG." [34] The time had really come when there were other signals to be heard beside 1BCG's.

2FD's c.w. signals were the next: ". . . 4:49 — 2FD calling 9XAH (c.w.) Fine, clear and strong. Pearson marvels at the proficiency of amateur operators. . . ." [35]

Other signals heard, on this same morning of the 11th, were: [36]

GMT	*Station*	*Remarks*
4:53 A.M.	8ACF	c.w.
5:03 A.M.	1ARY	Now on spark. See Footnote 34, supra. 1BDT comes in, on spark, at same time, calling 20M.
5:03 A.M. Also at 5:10, 5:14 and 5:40 A.M.	1BDT	Spark.
5:18 A.M. Also heard from 5:25 to 5:30 A.M.	2FP	i.c.w. ". . . strong, very fine steady signals. Sending his code word 'HUZXJ.'" At 5:25–5:30 A.M. "still going strong and can hear him all over tent. Very steady."
5:23 A.M.	1RU	c.w. Sigs. "strong and clear sending his code word 'BPUSCU.' 1RU signs off at 5:25 A.M."
5:30 A.M.	2BML	Sigs. "strong, steady, but his note varies considerably. . . . 2BML is sending his code word over and over . . . 'FSXVG.' He is much easier to read unheterodyned."

found at page 31 of the Commemorative Issue.

"Three days running" naturally would mean that signals were received on December 10th, 11th, and 12th (GMT).

[33] Of this "MGES" episode, E. V. Amy and G. E. Burghard, at page 13 of the "1BCG Commemorative Issue" of the *Proceedings of The Radio Club of America* (October, 1950), say: ". . . On the morning of the fourth day, December 10th, we received a cable from Godley saying: 'Send MGES starting one Greenwich.' This cable was to cause the loss of a great opportunity because of misunderstanding. The staff discussed its meaning for many hours. There was no way of getting a confirmation from Godley, so we had to decide just what he meant by 'send MGES.' Those who were telegraphers said that if he wanted us to send messages he would have used MSGS as that was the proper American abbreviation for messages which he well knew. Cronkhite, who was an engineer and not an old Morse operator, was the only one who maintained that Godley wanted us to send messages. Finally he was voted down 5 to 1 and we decided that MGES was a code word and for some unknown reason that was what he wanted us to send. And send it we did from 8 P.M. until 3:00 A.M. all night long. . . ."

At page 14 of that same October (1950) issue of the *Proceedings*, these two same authors say: ". . . On December 11th, the mystery of MGES was solved by cable. What Godley had said was 'Send messages,' and the British cable operator used the English abbreviation MGES. The story is told in Godley's log. Now we really prepared to send a message which was to be the first ever sent across the Atlantic on short-waves with low power, or in fact with any power. . . ."

[34] 26, February 1922. I am sure that this refers to the c.w. signals from 1ARY. For one thing, an entry at 4:19 A.M. says: "1ARY calling 1UN (c.w.) weak." Also, see Godley's wire at 27, February 1922. Station 1ARY was one of the very few to be heard at Ardrossan both on Spark and on c.w. See front cover, January 1922; Warner's list at 12, February 1922; and Mr. Higgy's Article at 14, February 1922. Note, also, Mr. Higgy's Tables, at 12, March 1922. (These tables, by the way, include some — but not all — of the successful Transatlantic stations). 1ARY's spark set was first heard, by Godley, at 5:03 A.M. (GMT), December 11, 1921. See 26, February 1922. (1BDT's spark set was heard at the same time, calling 1BIS). Some reference.

[35] 26, February 1922. 2FD was heard again at 4:54 A.M. (GMT).

[36] 26 to 27, February 1922.

5:37 A.M. Also at 6:05 A.M.	2BK	Spark. Strong, at 6:05 A.M.
5:49 A.M.	8XV	c.w.
5:53 A.M.	1YK	c.w.
5:55 A.M.	3BP	Spark; 60-cycle synchronous. Very strong. (This was Canadian 3BP — S.B.Y.).
6:03 A.M. Also heard at 6:23 A.M.	1XM	i.c.w. At 6:23 A.M., Godley thought this might be a 500-cycle SPARK set.
6:03 A.M. Also heard again at 6:43 A.M.	2EH	c.w.

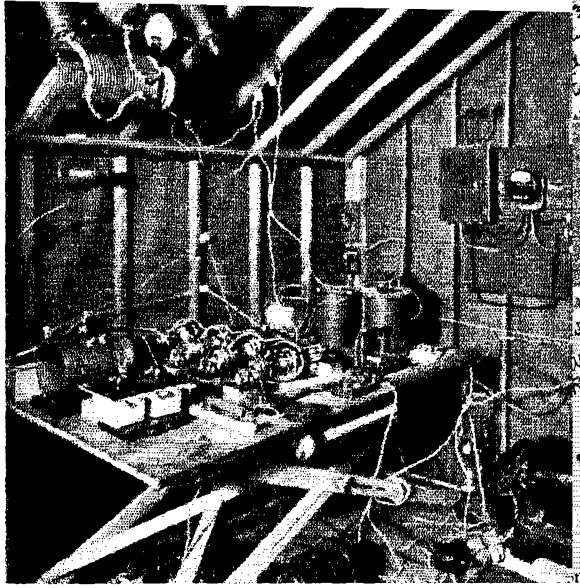
The log covering the above session adds: ". . . I am anxious for news from home, and cabled 1BCG as follows: 'Send home news.' . . ." [37] This may have been the communication which convinced the crew at 1BCG that Godley really wanted them to send messages, instead of pointless repetitions of the 4-letter group "MGES."

Receiving conditions at Ardrossan clearly reached a peak during the early morning hours of December 11, 1921.[38] But no messages came from 1BCG; and it was very fortunate that on December 12th, between 2:52 and 3:00 A.M. (GMT), reception of message number one was still possible — for the log shows that the overseas signals were then on their way out. [39]

The principal log entries, re Msg. Nr. 1, on December 12, 1921, read as follows:

"2:50 — 2EH calling 8AFD very steady. 1BCG in with messages.

"2:52 — He starts: 'Nr 1 de 1BCG words 12, New York. Date December 11, 1921, to Paul Godley, Ardrossan, Scotland. Hearty congratulations. (Signed) Burghard, Inman, Grinan, Armstrong, Amy, Cronkhite.' Received from 1BCG finishing at 3 A.M. He says 'Bi two hours.' (Last heard of him.)" (28, February 1922).



1BCG

The "1BCG Commemorative Issue" of the "*Proceedings of The Radio Club of America, Inc.*," published in October, 1950, contains photographs of pages 44 and 45 of Godley's original log book. See pages 8 and 9 of that issue. The picture of page 45 (of the log) shows the message, written out in full.

In the original log book, there is no parenthesis at the end of the 2:52 A.M. entry, containing the words: "Last heard of him." It must have been added, either by Editor Warner or by Godley, before the excerpts from the log were published in the February (1922) issue of *QST*.

This famous message was also copied (minus the first word in the text) by a Dutch amateur named Eschauzier located at The Hague.[40] After December 12, 1921, he heard no more signals from 1BCG either.[41]

Eight British amateur stations succeeded in picking up American signals during these Tests. Disregarding interim data published in *QST*,[42] the final roster of successful Britishers,[43] and the

(*Continued on page 148*)

[37] 27, February 1922.

[38] On Monday, December 12, 1921, Godley received Msg. Nr. 1, but heard and identified only the following additional stations: 1BKA, 1RZ, 2ARY, 2AJW, and 3FB. See the 6:05 A.M. entry, at 28, February 1922.

The summary entered at 7:00 A.M. on December 13, 1921, found at [36] February 1922, shows that Tuesday was a complete bust.

There was no reception on Wednesday the 14th. 37, February 1922.

Thursday, the 15th, was a dud. 37, February 1922.

The 6:00 A.M. summary, on the 16th reads: "Atmospherics, no reception." At 3:00 P.M., on that same day, Godley and Pearson decided to dismantle the station; and by 7:00 P.M., everything had been packed, and was being loaded onto a wagon. 38, February 1922. Apparently, no listening was done after 6:00 A.M. (GMT) on December 16th.

[39] That morning, Godley and Pearson began listening on short waves at 1:25 A.M. (GMT). Immediately, 1BDT's spark sigs. were heard — very strong and steady. In quick succession, 1BKA (c.w.), and 1XM (i.c.w.) were also received. At the outset, the prospects seemed excellent. 28, February 1922.

At 1:45 A.M., 1XM was in again; and at 1:50 A.M., 1BCG said: "Bi 1 hour." 28, February 1922.

Between 1:45 and 2:50 A.M., signals were heard from 2EH (c.w.), 2FP (i.c.w., strong), 2ARY (a spark mistaken for i.c.w.), 3FB (spark), 2EL (weak sigs.), and 1ARY (c.w.).

Then, at 2:50 A.M., 2EH was heard again (very steady); and 1BCG opened up once more, "with messages." He started sending Msg. Nr. 1 at 2:52; and finished at 3:00, saying "Bi two hours." After that, Godley never heard 1BCG, at Ardrossan, again. 28, February 1922.

At 3:03 A.M. "very steady" sigs. from 2EH were again logged; and at 3:11 A.M., 1RZ (c.w.) was readable. These were the last American signals heard and identified, at Ardrossan, during the tests. See 28, February 1922; 36 to 40, and 46, February 1922.

[40] 40, February 1922; 20 to 21, March 1922. Later, that same morning (December 12, 1921), at 5:58 A.M. (his local time), Mr. Eschauzier heard 1BCG again, very faintly, saying "nr. 2 nr. 2." I have never seen any account (in *QST*, or elsewhere) which has recounted 1BCG's attempts (if any) to send further messages to Godley at Ardrossan. At page 14 of the "1BCG Commemorative Issue" of the *Proceedings of the Radio Club of America, Inc.* (October 1950), it is stated that Msg. Nr. 1 was started at about 9:45 P.M., EST, and was repeated until 10:00 P.M. (which would be 3:00 A.M., GMT, December 12).

[41] 21, March 1922. Mr. Eschauzier heard 1BCG on December 10, 11, and 12, 1921, just as Godley did. 21, March 1922.

[42] For instance, the interim lists of stations heard, found at 11 and 40, February 1922; and at 20, March 1922; and the first list of British hams, located at 20, March 1922.

[43] 25, May 1922 (Coursey's official report).

Fifty-Six Field Day

Facts, Figures, and Feats

"EVERYTHING went according to Hoyle except for the weather and band conditions. About noon Sunday a severe windstorm blew down most of our antennas, also hitting two small communities nearby and severing power lines and telephone communications. We were called upon to furnish emergency communications and two mobiles were dispatched to the towns Stockbridge and Leslie. Messages and information were relayed via our FD station to Lansing to the proper authorities. Consequently, contest participation came to a screeching halt while we put to actual practice the experience that had been gained through exercises such as FD. Any multipliers for *actual* emergencies?"

Thus spoke the secretary of the Central Michigan Amateur Radio Club, in explaining why W8MAA/8 wound up 52nd in Class 2A. Well done, CMARC! Your experience should remind us of the serious purpose of Field Day, the difference between this yearly test of emergency-powered portables and such home-station events as the Sweepstakes.

Emergency preparedness is the FD theme! That's the purpose of that husky independence-of-mains multiplier in the scoring system — you have to beg, borrow or steal a generator or batteries to rate it. That's the reason home stations receive no multipliers at all — either for power input or independence-of-mains. Again, the FD motif: *get out in the field!*

Most of us did exactly that. We motored to mountain ranges and hilltops, race tracks and ball parks, farms and hunting lodges, cemeteries and beaches. Once there, we fumbled through the tribulations attending installation of from one to fourteen transmitter-receiving combinations. Came zero hour and we strove to grind out QSOs, on tenterhooks lest the skywires collapse, the generator sputter, or the equipment start smoking. We soon learned that Murphy's Law, although not in the physics textbook, was as operative as the laws of Mr. Ohm and Mr. Newton. [Murphy's Law: "If anything can possibly go wrong, it will."] Finally we had logged our 20 or 200 or 2000 contacts and it was over. Bone-tired and bleary-eyed, we mumbled "Wait 'til next year" as we packed up the gear and took off for home.

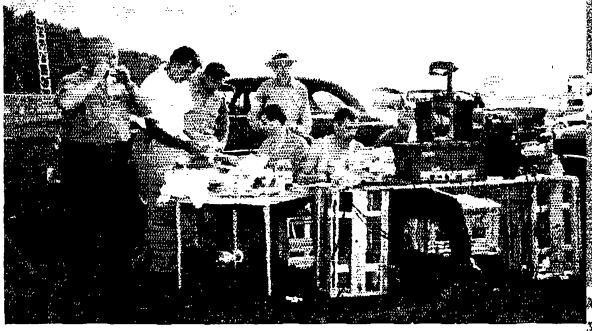
Radio and weather conditions are always zany, always unpredictable, but surely both were never worse than they were June 23rd and 24th. On hundreds of summaries, hurried jottings groused of fast-breaking windstorms and torrential rains. Even more disconcerting than the cavortings of Mother Nature were those of Old Man Ionosphere. The bands were so horrible on Sunday, particularly in the east and midwest, that contact-per-hour averages dipped to dismal lows. Presumably a few discouraged souls folded their tents and silently stole away, failing to report their results. Whatever the cause, the statistics reflect a slight decrease when compared with those of last year. In 1956, 9815 participants took part at 935 portables and mobiles, had 2298 separate transmitter-receiver setups on the air. No question about it. Among ARRL activities Field Day is still the *most* (to say the least)

For the second successive year, a California club posted the number-one score of the Field Day. This time it

CLASS A CALL AREA LEADERS

W1OC/1	13,950	KL7RN/KL7	226
W2LI/2	20,493	KP4ZA/KP4	6318
W3RCN/3	8703	KZ5JW/KZ5	4080
W4JP/4	4851	VE1FO/1	3132
W5SC/5	10,689	VE2ADX/2	2286
W6UF/6	20,790	VE3JJ/3	5787
W7HZ/7	11,700	VE4CZ/4	888
W8EV/8	15,750	VE5MA/5	378
W9RK/9	13,698	VE6NQ/6	2490
WØCKF/Ø	5910	VE7ARV/7	3813
KG4AO/KG4	1290	VO1NR/2	402
KH6RS/KH6	3240		

In the 20-meter c.w. tent of San Antonio Radio Club's W5SC/5, W5HHO and W5FZA relax while W5DIC belts away with 32V2 and NC300. The Texans grossed 10,689 points altogether, to lead Class 8A and W5-land.



Snack time at the Gary Amateur Radio Club: *standing* — sandwich-munching SWL, W9GVB, W9PUB, WN9CYZ; *seated* — W9AMW, W9MIF, W9KRJ. The crew's W9FGF/9 produced 5841 points, fourth in 3A. (*Gary Post-Tribune Photo*)

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was the Eimac Gang Radio Club of San Bruno. Ionospheric flip-flops notwithstanding, members amassed 2285 QSOs for 20,790 points in Class 13A. With 52 operators, 6 roustabouts and 3 XYL cooks sharing the chores, W6UF/6 counted

TEN HIGH SCORES

Class A		*Class B*	
W6UF/6	20,790	W3EIS/4	6575
W2LI/2	20,493	W2JBQ/2	4928
W2GSA/2	18,225	K6BKT/6	3000
K6BAG/6	17,139	W6KLZ/6	2853
W8EV/8	15,750	W9EWC/9	2739
W1OC/1	13,950	W9ESQ/9	2466
W9RK/9	13,698	WØAJA/Ø	2444
K6DTA/6	12,420	WØBBM/Ø	2354
W7HZ/7	11,700	W9DSP/9	2061
K2AA/2	11,475	W7WOQ/7	2034

on TCSs, Rangers, TBS-50s, DX-35s and home-spun items sporting 6146 and 2E26 finals. All rings were held to 30 watts input and a 15-kw. motor-generator provided ample juice.

Second was the Tri-County Radio Association of Plainfield, N. J., among the forerunners once more with 2252 contacts and 20,493 points at W2LI/2. Thirty members, eleven especially-designed FD rigs, and a 6-kw. genny were responsible for the excellent showing.

Another 11A setup, that of the Garden State Amateur Association's W2GSA/2, earned third position. GSARA's 18,225 points and 200 stations worked did the trick.

Special mention goes to Pacifico Radio Club and K6BAG/6 for a fourth-place tally of 17,139, also for registering a record *3069* contacts, a figure never before even approached. Here's how they did it: 6 QSOs on 160 c.w., 9 on 160 phone, 134 on 80 c.w., 333 on 75 phone, 420 on 40 c.w., 230 on 40 phone, 450 on 20 c.w., 221 on 20 phone, 156 on 15 c.w., 402 on 15 phone, 13 on 11 c.w., 13 on 11 phone, 17 on 10 c.w., 256 on 10 phone, 22 on 6 c.w., 124 on 6 phone, 49 on 2 c.w., 214 on 2 phone. Apparently the L.A. area was not very hard hit by the fadeout!

In Class B, W3EIS joined with W4KFC to crank out 462 QSOs and 6575 points, thereby pacing the two-man portables. Under the call

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Ramey Amateur Radio Club beehive features KP4AFW, WP4AEP, KP4UY, KP4ZD, KP4ADU, KP4ZA, KP4ABE at their 10 and 80/40 positions. KP4ZA/KP4's 677 contacts and 6318 points topped Puerto Rico entries.

W3EIS/4, Don and Vic relied on four 12-volt batteries to power the three Command Sets and a v.f.o.-807 rig. Don writes: "In spite of two lightning storms, rain-soaked h.v. leads, a burned-out dynamotor, an open relay, and a rash of other troubles, we appeared heading for a record (Class B) score until conditions deteriorated so badly Sunday that we couldn't equal our 1955 effort."

Runner-up in Class B: W2JBQ/2, efficiently assisted by W2FBA. A 2E26 rig and an SCR-522 were responsible for the 340 contacts and 4928 points. The two brasspounders have now taken part together in every FD since 1938!

A score of 3000 points brought K6BKT/6 and second-in-command K6ASK show position, and their 471 contacts was tops in Class B.

The number of mobile entries climbed to 164, a new high. Once again the Westpark Radiops, mainly because of a gigantic amount of traffic-handling, lead the Club Mobile Aggregate Listing. In fact, the first eleven scores in Class C are those of members of the Cleveland group.

Under the rules, competition is considered to be among stations employing like numbers of simultaneously-operated transmitters. Scores are therefore tabulated in this manner. Special box listings are included for those interested in geographical and high-score comparisons. For leaders in Classes A through E, see the score compilations at the end of this report.

The true spirit of Field Day is probably best exemplified, not by statistics and scores, but by the hundreds of colorful comments appended to the logs. Some are amusing, others are downright tragic. ARRL is pleased to pass along as many of these as space permits.

"A CBC unit visited the site Sunday and shot two or three hundred feet of film which was presented on the TV news Monday, in English on the CBC network Monday, and on the French language network Thursday. All did an excellent job of pointing out Amateur Radio's usefulness in time of emergency. The boys were pleased to see their

Teen-agers KN8BQO (left) and WN8GPB, portable at North Parchment, Mich., under latter's call, give the Novice segments a Class-1A workout. Six more youngsters pitched in at the controls of the Globe Scout on occasion.

bestubbled faces 'gracing' the TV screen." — *VE2CB/2.* . . . "Our group of teen-agers did the planning, installing, and operating. The usual generator troubles forced us to tear down the carburetor twice to clean out rust. Feeding a 'cloverleaf' all-band antenna with baluns made for rapid band changing. The 'big DX' was Guam and Canal Zone." — *Benson Polytechnic School Radio Club, W7YK/7.* . . . "Every time 15 meters went dead the bass would start biting. Some research is needed on that!" — *Lake Amateur Radio Assn., W4YKY/4.* . . . "Three 44-foot vertical fed with coax held cross-talk down. Use of audio shaping networks (high- and low-pass filters in mike circuit) was discontinued after tests through QRM and QRN. A folded dipole outplayed a vertical on 14-Mc. c.w." — *South Eastern Michigan Amateur Radio Assn., W8SEB/8.* . . . "First FD in our newly-acquired clubhouse shack. Chicken farmer K4DTQ donated enough birds for a barbecue and under the direction of W4UUB, our master chef, we were very well fed. We employed 1500 feet of coax to separate the receiving and transmitting antennas." — *Spartanburg Amateur Radio Club, K4JLA/4.* . . . "Bet our 37½ kw. was the biggest 'portable' (truck mounted) generator in the field. The regulator went bad in the first hour, however, so one op had to be on duty to hand-regulate the voltage for the whole session. A freak windstorm almost blew us out of business, and some log sheets had to be rescued from Biscayne Bay. The 14-Mc. phone rig, which had never failed before, blew its modulation transformer the first time it was turned on." — *Dade Radio Club, W4NVU/4.* . . . "It was found that low or fluctuating line voltages can have disconcerting effects on s.s.b. voice-control circuits. S.s.b. operators should use phonetics as receivers in the field are apt to drift and stations often call in slightly off the frequency. . . . Several Air Force jet pilots on survival training came upon us in the forest but had to leave. They couldn't stand the sight of the steaks and eggs after living on scrawny catfish for a week! They left messages for their next of kin." — *Ocean County Amateur Radio Assn., W2AFU/2.* . . . "While the score is not impressive, our Field Day was conceived in haste, ill-planned, moved with unclocklike precision, equipment went *kaput*, but otherwise was a huge success. Nobody got killed, that is!" — *Brooklyn Civic Center Radio Club, K2QDB/2.* . . . "The fellows enjoyed their first time out and will definitely make it an annual affair. Generator hash fouled up operations, but what would there be to fix next year without such troubles?" — *Petersburg Amateur Radio Club, W4EFR/4.* . . . "In the future we'll have more operators and fewer hot dog and brew samplers." — *Pocono Amateur Radio Club, W3MDO/3.* . . . "Excellent conditions and more experienced ops results in over three times as many contacts as in 1955. Aluminum extension ladders made excellent antenna supports and our pet skunk was more effective than insect spray in keeping away unwelcome guests." — *Old Dominion Amateur Radio Club of Halifax County, W4TVI/4.* . . . "Our location at Cedar Hill, Texas, is North Texas' highest point. The antenna was tied 85 feet up on a 700-foot tower which formerly belonged to an FM station. An extensive ground system there boosted our sig as much as the height." — *W5COY/5.* . . . "How about an ARRL Operating Aid on how to print legibly?" — *Anne Arundel Radio Club, W3VPR/3.* . . . "Headlight dimmer-buttons as foot switches on all c.w. rigs really cut down on operator fatigue." — *Halifax Amateur Radio Club, VE1FO/1.* . . . "All-band doublet, tuned with coax stubs for correct capacity, worked FB." — *Tecumseh Amateur Radio Club, W8QO/8.* . . . "A transmitter-disabling scheme allowed us to operate two rigs and still remain in Class 1A. Our setup was covered nicely in the local newspaper and movies were shown over KCRG-TV on two news telecasts." — *Cedar Rapids Contest Group, WØGM/Ø.* . . . "Wonderful turnout, especially from the newly-licensed hams. Please don't change the FD rules — they couldn't be better!" — *Crescent Bay Area Emergency Net, K6LDA/6.* . . . "Timed-sequence keyer performed beautifully and for once there were no complaints from the phone boys about clicks." — *Smithtown Civil Defense Amateur Radio Assn., W2GSW/2.* . . . "Worked from the only point in the United States common to four states (Arizona, Utah, Colorado, New Mexico) and three call areas. Those who contacted portables W5NSV, W5CIN or W5SGC may obtain a "507 Certificate" by QSLing to Box 24, Farmington, New Mexico." — *W5CIN/M.* . . . "The St. Paul Red Cross backed us solidly, furnishing the equipment, generator, tents, blankets, fans, clocks, tables and publicity. We had trouble getting out — lots of signals but all down in the mud." — *American Red Cross of St. Paul, WØDKI/Ø.* . . . "Our six YLs found conditions worse than awful due to complete h.f. blackout. Local OMs provided most of our points; rendezvous on all bands accounted for one-quarter

CLUB AGGREGATE MOBILE SCORES

Westpark Radiops	95,948
Amateur Radio Caravan Club of New Mexico	25,100
Phil-Mont Mobile Radio Club	15,355
Lockheed Amateur Radio Club	7402
Mobile Amateur Radio Club of South Bend	5630
Lakewood District Disaster Civil Defense Radio Club	2741
Upper Ten Radio Club	1337
Philadelphia High-Frequency Radio Club	946
Confederate Signal Corps	417
Blossomland Amateur Radio Assn.	379
Connecticut Wireless Assn.	270
Pampa Amateur Radio Club	217
Jayhawk Amateur Radio Society	180
Coffee Dunkers of Detroit	95
Delco Radio Club	90
Flint Hills Amateur Radio Club	41

Sylvania Radio Club appropriated three towers of the Electronic Defense Laboratory, Mountain View, Calif., for K6FD/6's seven rigs, wound up with 5553 points. In the foreground are K6ONR and K6FD, and a close look will reveal three more Sylvanians on the far tower.

Amid typical FD clutter of papers and pop bottles, Albany Amateur Radio Association's bespectacled K2PDO and cigar-chomping W2DIF concentrate on the task at hand. Under the call W2GM/2, they and 28 others scored 3549 in Class 6A. (*Photo by W2BKH*)

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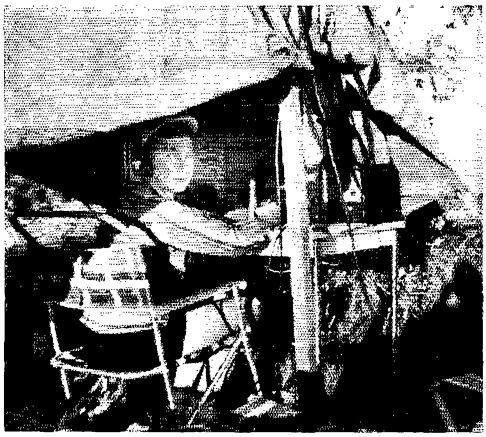
of our QSOs. We are discouraged but not defeated. After this, next year *has* to be better!" — *Polar Amateur Radio Klub, KL7RN/KL7.* . . . "Conditions were excellent, generators — for the first time in history — performed perfectly, operators were keyed to the job at hand, beams worked as the book *says*, public relations were in the highest tradition with many visitors, and the weather was ideal." — *Valley Amateur Radio Club, W7HZ/7.* . . . "Boy Scout Troop 255 of San Gabriel set up camp, erected the flagpole, and stood watch with each operator to tend to his needs and assist in cross-referencing. The Chamber of Commerce furnished QSL cards with postage. Since most were new participants, many having received their licenses as a result of our code and theory classes, we are well satisfied with our showing." — *Ramona Radio Club, K6SIR/6.* . . . "The full 1000-foot spacing minimized cross-talk QRM almost to the vanishing point. A friendly farmer donated his orchard sprayer to hold down the vicious mosquitoes. It was our year of greatest effort and preparation but two ionospheric disturbances caused disappointing results." — *Quinte Amateur Radio Club, VE3BSD/3.* . . . "A trailer-mounted PE-95 powered the gear as well as lights at four positions and the 48-cup coffee urn which kept us on our toes during the morning hours." — *Ramey Amateur Radio Club, KP4ZA/KP4.* . . . "A convenient intercom system, one 2-meter converter feeding two receivers, connected all tents.' — *Pompton Valley Radio Club, W2OR/2.* . . . "Hurrah! The 3-kw. Onan ran 25 hours without a hitch, and on 12 gallons of gasoline." — *Coastal Plain Amateur Radio Club, W4VM/4.* . . . "Stations called were not tuning as high as our 50.85-Mc. frequency and many contacts were missed. Our first try on 6 meters and not very encouraging." — *Schoharie County Amateur Radio Club, W2GBN/2.* . . . "Two positions were set up in a boatshed on the Meramec River. Screened windows eliminated the usual mosquito torture but not the oat bugs. Our motor-generator ran faithfully for 20 hours and then suddenly quit. Somebody forgot that you have to watch the oil supply as well as the gas." — *St. Louis Amateur Radio Club, WØCDA/Ø.* . . . "Annoyed by the 90° heat, W9QKE transferred our 40-meter position to his air-conditioned automobile. We really had it rough!" — *Chicagoland Mobile Radio Club, W9ILS/9.* . . . "Ended up with enough power for half of New Mexico, what with 3 PE-95s and a small kw. unit at a mountain QTH 9200 feet above sea level." — *Alamogordo Amateur Radio Club, W5IGC/5.* . . . "The hash filter on the 10-kw. job gave up the ghost at 0245 hours, after which the smaller gennies handled the load. The site was ideal, being on a sandy plateau between two small streams, a mile off the highway, good drainage, lots of privacy, and friendly neighbors. It was sunny and warm both days." — *Vancouver Amateur Radio Club, VE7ARV/7.* . . . "Our second time out as a club. We operated from Tropical Park Race Track again with antennas on flagpoles on top of the grandstand. The height was about 85 feet and we were able to put out a much better signal than last year. With folded dipoles, very little interaction between rigs was noted." — *South Miami Radio Club, K4JVA/4.* . . . "Our Novice grads participated in their first FD and are already laying groundwork for the next. Despite a rainstorm and questioning by the police, there was food aplenty and a good time for all." — *Washington Radio Club, W3CAB/3.* . . . "Our location was in a stock shelter and the 'aroma' still lingers on the equipment." — *DeWitt County Amateur Radio Club, W9MAJ/9.* . . . "Took 'til Sunday to get the 75-meter ARC-5 going, so lots of 2-meter work resulted. C.w. operation was impossible because of generator hash. We'll know better in the future." — *Trumbull Emergency Communications Assn., W1USV/1.* . . . "Our first FD went over with a bang — lots of before-and-after newspaper publicity and good cooperation on the part of local businessmen." — *WØTXP/Ø.* . . . "Very heavy rain for three hours. No failures but had to stay on cots and chairs while water ran in torrents through tent." — *Spring-Mor, W3CUL/3.* . . . "Our 1½-kw. generator was a good one. It performed the whole time without a murmur, powering radio gear, lights, soldering iron, even the clocks (which gained about five minutes)." — *Daytona Beach Amateur Radio Assn., W4MEL/4.* . . . "The club's two Vee beams terminated on sand bars in the middle of the Rio Grande River. Our location was literally *in* the Rio Grande!" — *Mesilla Valley Radio Club, W5SRW/5.* . . "The Miami Valley c.d. organization loaned us one of their new 5-kw. generators, complete with gas. We certainly had power to spare!" — *Dayton Amateur Radio Assn., W8MVV/8.* . . . "Although the tide and sand at Bryan Beach (near Freeport, Texas) were troublesome, we had a ball. We shall return!" — *Brazoria County Amateur Radio Club, K5GOI/5.* . . . "Best equipment and antenna layout we ever had but conditions were poor. How else can we account for such a lousy score?" — *Racine Megacycle Club, W9UDU/9.* . . . "Antennas were two homemade all-band trap jobs, oriented 90° apart, a system which proved far superior to antenna farms used previously. No interaction between antennas was noticed and their versatility proved invaluable." — *Radio Amateurs of Erie County, W2NWD/2.* . . . "We used folded dipoles mostly, but the real pay-off was a long wire. On 15-meter phone we were working them at the rate of one per minute. Swell to hear the fives, sixes and sevens come jumping back on CQ's." — *W2IQ/2.* . . . "Just as we were rolling nicely, an 85 m.p.h. windstorm knocked down both masts, breaking them in half. We restrung the antennas at half height and proceeded. At dawn we pieced the towers together and went to town again. Next year we hope to have better antenna supports.' — *W3MFW/3.* . . . "Had good luck with reversible beams on 7 and 14 Mc. and many FB s.s.b. QSOs. Two-rig interlock system worked fair but was confusing at times." — *Dayton Amateur Radio Club, W8CEA/8.* . . . "As evidenced by the poor score on phone, all club effort was directed toward c.w. Next year we plan a sure-five phone position to compete with the best." — *Richmond Amateur Radio Club, K4AL/4.* . . . "Procedure for indicating the ARRL section should be studied more thoroughly prior to FD. Much on-the-air confusion during exchange of section information was noted." — *W6TOD/6.* . . . "Stations were 5 or 6 deep on 7 Mc. in the late hours and a selective receiver has become a 'must.' Equipment, procedures, and activity have improved greatly since I operated FD back in the 1930's." — *W7TKB/7.* . . . "W7LOD who is totally blind did a wonderful job as our chief c.w. op." — *Gallatin Amateur Radio Club, W7ROX/7.* . . . "We endeavored to orient our antennas to favor the nearest highly-populated area (California), but heavy rain and the resultant QRN hampered our efforts considerably. Only other hindrance was fuel-line trouble on the generator." — *Harlo Radio Club, W7TRU/7.* . . . "We made it an outing for the XYLs and



W5YKE/5 (above) teamed up with hubby W5STI to put on a respectable Class-B show despite interruptions from the kiddies. "Field Day is the Ham Event of the year," Martha avers, "the one time when Perry and I can get our fill of operating."

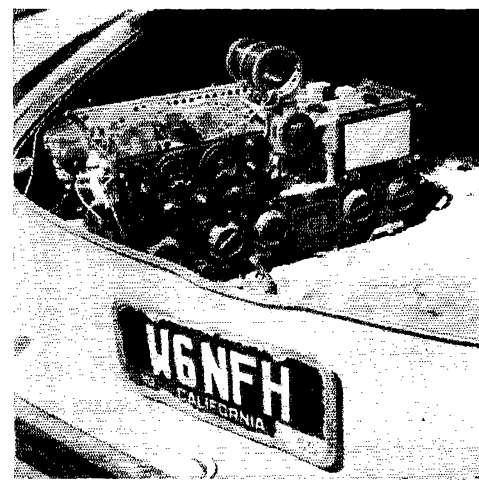
harmonics too, with the vacation facilities of Buffalo River State Park available. A special QSL, carrying map of Twin Lakes region of the Ozarks, was sent to all stations worked." — *Twin Lakes Amateur Radio Club, W5OXU/5.* . . . "W3EBY complained about weak sigs Sunday morning so I substituted my headphones for his and the signals 'knocked our ears off.' It seems that his 'phones had shipped too much water during the customary FD rainstorm." — *W3EAN/3.* . . . "Interference experienced between c.w. and phone rigs 'though they were more than 200 feet apart. Best hourly average was 35 contacts but one fellow ran off 20 QSOs in 22 minutes on 20-meter phone. Our final score (unverified) was 102,375,855 mosquitoes, swatted or gassed." — *Viking Contest Group, WØYDX/Ø.* . . . "Generator troubles, whew!" — *Willimantic Amateur Radio Club, W1TVU/1.* . . . "A B&W 5100 in tune position with plate-voltage meter across final kept power at 30 watts in. We've made every FD since 1936 and still enjoy it!" — *WTIC Radio Club, W1DJC/1.* . . . "A *tremendous* pickup in 6 meters — five times as many contacts as ever before were made there. In addition, the band obliged by opening to W7 and W5 for about two hours. The v.h.f. division contributed 1200 points to our score." — *Santa Barbara Amateur Radio Club, W6LUC/6.* . . . "Wanted: one FD week end without rain for 1957." — *Sideband Splatterings, Raritan Bay Radio Amateurs.* . . . "One thing can be said: we tried. You should hear the instructions fly when PMRC erects a mast — everybody pulling on a guy wire and hollering at the others to loosen, slacken, move in, move out, etc. First time a sledge hammer was ever used to drive a twopenny nail into a steel mast. After the skywires were up all we had to do was sit around and hope the wind didn't blow too hard and that some wise guy didn't come and swipe a tower as happened to South Jersey Radio Assn. Luckily SJRA located the loot in time to get it up again before zero hour." — *The Blurb, Phil-Mont Mobile Radio Club.* . . . "One minor difficulty arose. The phone position in the chicken house was suffering from severe interaction, so at 11:00 P.M. they moved — lock, stock, and transmitter — into an adjacent genuine Finnish steam-bath house, stuffed the 40-meter vertical down the chimney and went back on the air. Thanks to adequate ventilation and a full buffet lunch table, no one lost any weight." — *North Kitsap Amateur Radio Club, W7RGL/7.* . . . "We had six tents and a house trailer plus the main shack in an abandoned schoolhouse. A TV demonstration trailer tower for the v.h.f. beams added 50 feet to our elevation." — *Cenois Amateur Radio Club, W9NET/9.* . . . "Mutual interference was a great problem, so much so that 80 c.w. was out of commission while 40 and 75 were going and 75 was out when we were on 80. Some receivers were less susceptible to the interference but there was p enty just the same. We'll take advantage of the 1000-foot diameter circle in the future." — *Schenectady Amateur Radio Assn., W2EFU/2.* . . . "Never saw 10 and 20 so poor. Hoorah for 2, 6 and 15!" — *Anderson Amateur Radio Club, W9EKR/9.* . . . "Our site, Trout Lake, Colorado, was at an altitude of 10,000 feet. Can anyone top that?" — *Montrose County Amateur Radio Club, WØWME/Ø.* . . . "Novices were limited to 144 Mc. due to inactivity of WN's on other bands. How about more Novice participation next time! Biggest bugaboos: transmitter interaction, generator hash, Novices underfoot with nothing to do." — *Waterbury Amateur Radio Club, W1LAS/1.* . . . "Conditions were very erratic. By midnight we had only 50 contacts when we had expected to have at least 150. Something had to be done. VE3QE threw up another antenna which was bridged to 1:1 s.w.r. and the score started to climb immediately. We had hoped to improve on last year's total but it couldn't be done. Those first few hours had their telling effect." — *Blackheath Cold Beer and Hot Bun Propagation Society, VE3FT/3.* . . . "No complaints or alibis for a change. Everything and everybody worked smoothly. The enthusiasm and excitement even during the last few minutes of operation was truly remarkable." — *Jayhawk Amateur Radio Society, KØDLE/Ø.*

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 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 100 watts (multiplier of 2); C indicates over 100 watts (multiplier of 1).

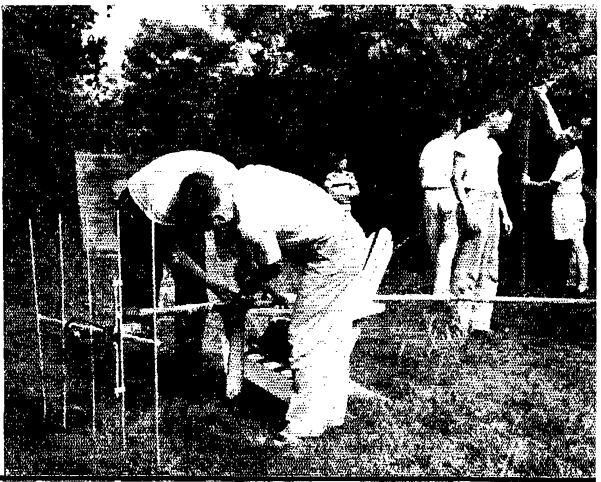
		One Transmitter			
W5EKK/5	Monzano Mt. Moonshine and Rhombic Society	660–	A– 4–	6165
W1EIA/1	Connecticut Wireless Assn	612–	A–14–	5508
WØDKI/Ø	American Red Cross of St. Paul	464–	A– 5–	4401
W8CEA/8	Dayton ARC	428–	A– 8–	4077
W7OTV/7	Tualatin Valley RC	475–	AB–15–	3798
K6LDA/6	Crescent Bay Area Emergency Net	355–	A–20–	3456
W9ZKW/9	Lake County ARC	381–	A– 9–	3429
WØGM/Ø	Cedar Rapids Contest Group	528–	AB– 6–	3366
K6GNM/6	York Mountain Boys	347–	A– 6–	3348
W4MK/4	Richmond ARC	551–	B–35–	3306
KH6RS/KH6	Maui ARC	335–	A–21–	3240
W3I8E/3	(nonclub group)	323–	A– 3–	3132
W5COY/5	(nonclub group)	341–	A– 3–	3069
W8FWQ/8	Brass Pounders ARC	292–	A–10–	2853
WØDEP/Ø	(nonclub group)	276–	A– 3–	2709



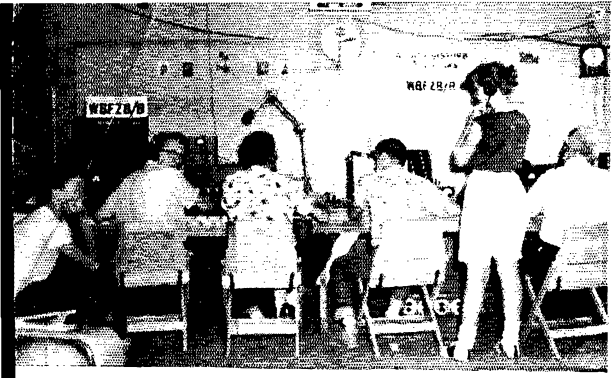
This modified ART-13 accounted for 178 75-meter phone contacts at W6NFH/mobile.

Left: W8QGB finds homemade wooden maul handy for driving tent stakes at site of Mt. Pleasant Amateur Radio Club's W8PHU/8. *Center:* W6DVL and crossbowman KN6LVN illustrate painless way to hoist skywires into pine trees for Fresno Amateur Radio Club's *W6TO/6. Right:* W3CNP, chief statistician and trend-analyzer for Beacon Radio Amateurs' W3ATR/3, maintains hourly QSO progress chart and checks operator-logger shift sheet.

W8FZB/8	Muskingum AR Assn.	413-	B-30-	2628
W6AFP/6	Dot, Dash and Mash Group	258-	A- 8-	2547
WØNWX/Ø	Newton RC	250-	A- 8-	2475
W6HGY/6	Whittier Radio 50 Club	246-	A- 9-	2439
W8QO/8	Tecumseh AR Tribe	270-	A- 5-	2430
WØZWY/Ø	Sioux Falls ARC	361-	B-22	2316
KH6WO/KH6	Honolulu ARC	315-	AB-16-	2202
W9NGI/9	Society of Radio Operators	218-	AB-10-	2145
W8RTR/8	Canton ARC	210-	A-20-	2115
KØDLE/Ø	Jayhawk ARS	390-	B-35-	2340
W4TVI/4	Old Dominion ARC	379-	B- 8-	2274
W3EDU/3	York ARC	249-	A- 7-	2241
W3RVC/3	Allegheny-Kiski AR Assn	217-	A- 7-	2178
VE3FT/3	Blackheath Cold Beer and Hot Bun Propagation Society	216-	A- 3-	2169
W8MAI/8	Blossomland AR Assn.	313-	B-18-	2028
W7VPA/7	Richland ARC	312-	B-10-	2022
W8ODJ/8	Buckeye Shortwave Radio Assn	334-	B- 7-	2004
W8VPV/8	Cuyahoga Falls RC	196-	A-10-	1989
W4SKL/4	(nonclub group)	303-	B- 4-	1968
KH6AQL/KH6	Hilo ARC	299-	B-20-	1944
WØIA/Ø	Boulder ARC	182-	A-10-	1863
W7QXS/7	Astoria ARC	206-	A-20-	1854
W6IFZ/6	Richmond ARC	279-	B- 9-	1824
WØLUX/Ø	Winona ARC	268-	B-12-	1758
KH6MOP/KH6	Leeward Oahu ARC	275-	AB- 8-	1752
W7YK/7	Benson Polytechnic School RC	281-	AB- 4-	1725
W7SAA/7	Salem ARC	541-	C-25-	1698
W1EH/1	South Lyme Beer, Chowder and Propagation Society	278-	B- 4-	1668
WØDVL/Ø	Northeast Iowa RA Assn	157-	A-12-	1638
W9GHA/9	Central High School RC	216-	AB- 6-	1539
W2QW/2	Raritan Valley RC	128-	A-12-	1530
W1MX/1	M.I.T. RS	141-	A- 6-	1494
K8APE/8	Massillon ARC	140-	A-10-	1485
W7ACY/7	Tillamook Radio Communication Club	219-	B- 9-	1464
W7SSF/7	Butte ARC	218-	B-14-	1458
W2QCN/2	(nonclub group)	200-	AB- 7-	1437
W1TVU/1	Willimantic ARC	134-	A-10-	1431
W3HEC/3	Friendship ARC	159-	A- -	1431
W4EM/4	Mid-South AR Assn.	209-	B-18-	1404
W7NES/7	(nonclub group)	207-	B- 4-	1392
WØFFN/Ø	(nonclub group)	202-	B- 6-	1362
W9YIT/9	(nonclub group)	223-	B- 5-	1338
W1DJC/1	WTIC RC	123-	A- 5-	1332
W4TM/4	Jackson RC	123-	A-20-	1332
W8OAJ/3	Mercer County Radio Assn	122-	A- 5-	1323
W5BTH/5	(nonclub group)	193-	B- 5-	1308
K6EFR/6	Stockton College RC	145-	A-12-	1305
W8GXR/8	Athens RC	120-	A- 7-	1305
WØCLF/Ø	(nonclub group)	120-	A-12-	1305
KG4AO/KG4	Guantanamo ARC	190-	P- 7-	1290
W2UMI/2	Oswego County ARC	189-	B-12-	1284
K6BU/6	Marin ARC	117-	A- 8-	1278
W3YZD/3	Mt. Lebanon Civil Defense AR Assn	180-	B-10-	1230
W7VNJ/7	Casper ARC	167-	B- 6-	1152
W3DQK/3	807 Society of Central High School	101-	A- 9-	1134
W7RFX/7	(nonclub group)	101-	A- 3-	1134
KØAST/Ø	Central Kansas RC	202-	AC- 7-	1101
W1VB/1	Candlewood AR Assn.	122-	A- -	1098
W9AEM/9	(nonclub group)	182-	B- 4-	1092
W2MG/2	South Hill Oral Radio Transmitting Society	93-	A- 6-	1080
W9HAT/9	Waukesha County RAC	170-	B- 3-	1020
VE2ARC/2	Montreal ARC	143-	B- 3-	1008
W3EAN/3	(nonclub group)	141-	B- 3-	1002
K9AKS/9	Quad City ARC	111-	A- 7-	999
W5DQK/5	(nonclub group)	166-	B- 4-	996
WØSXY/Ø	ARC of Central Mo.	164-	B-16-	984
W9BMR/9	(nonclub group)	163-	B- 5-	978
W4UHC/4	Ancient City ARC	83-	A- 4-	972
W5OXU/5	Twin Lakes ARC	137-	B- 6-	972
W4MI/4	Tuscaloosa ARC	156-	B- 4-	936
W4SRX/4	Eglin ARS	154-	B-10-	924
W7TRU/7	Harlo RC	127-	B- 6-	912
WØMUO/Ø	(nonclub group)	152-	B- 8-	912
VE4CZ/4	3rd Comm. Unit ARC	123-	B- 4-	888
W1SSU/1	Plymouth ARC	109-	AB- 4-	870
W2EWT/2	KBT ARC	145-	B- -	870
VE2APX/2	St. Johns ARC	71-	A- 6-	864
K9ALP/9	(nonclub group)	143-	B- -	858
W4PPI/4	(nonclub group)	142-	B- 7-	852
W9SWC/9	Martinsville ARC	141-	B- 9-	846
W4SQE/4	Harpeth Valley ARS	115-	B- 5-	840
W1KVI/1	Portland Amateur Wireless Assn	65-	A- 6-	828
W5BPM/5	Tyler ARC	112-	B-12-	822
W7CBD/7	Idaho Falls H. S. ARC	136-	B- -	816
W5USN/5	(nonclub group)	245-	C- 4-	810
WØOIN/Ø	(nonclub group)	134-	B-10-	804
WØNQK/Ø	Fairmont RC	133-	B- 9-	798
W5DXW/5	(nonclub group)	132-	B- 6-	792
W9LYX/9	West Side Wild Cats	105-	B- 4-	780
W7ROX/7	Gallatin ARC	99-	B- 8-	756
WØIER/Ø	Redfield ARC	125-	B- 9-	750
WØZSJ/Ø	Mitchell ARC	118-	B- 6-	708
W7TKB/7	(nonclub group)	229-	C- 7-	687
W2RCX/2	Batavia AR Assn.	111-	B- 9-	666
W9HRM/9	Milwaukee RAC	111-	B- 9-	666
W8TQK/8	Barry AR Assn.	110-	B-11-	660
W3ZQT/3	(nonclub group)	109-	B- 3-	654
W5ANR/5	(nonclub group)	211-	C- 4-	633
W2AEE/1	Columbia Univ. ARC	149-	AB- 4-	614



Packing up at K2BCI/2, weary Wantagh Radio Club members dismantle 144-Mc. Yagi and lower tent preparatory to trip home.



The projection booth of a defunct theater in Zanesville, Ohio, served as comfy quarters for Muskingum Amateur Radio Association's W8FZB/8. W8TTO, W8LQB, W8LFO, W8LQB-jr., a YL SWL, and W8JMJ compose the line-up. (*Photo by W8RVT*)

♦

W6TOD/6	(nonclub group)	68-	A- 3-	612
K6QEH/6	Hea ARC	102-	B- 3-	612
W8NZ/8	Calhoun Area RC	102-	B- -	612
W1KHE/1	(nonclub group)	76-	B- 4-	606
W7IGO/7	(nonclub group)	41-	A- 3-	594
W5DKC/5	(nonclub group)	65-	A- 3-	585
K4AL/4	Richmond ARC (Group 2)	94-	B-35-	564
KØAXU/Ø	Northwest St. Louis ARC	90-	AB- 9-	564
W3KYR/3	Boys' Club of St. Marys ARC	62-	A- 5-	558
W4GNC/4	Winter Haven ARC	172-	A- 4-	516
K2SPO/2	Mohawk Valley ARC	83-	B-11-	498
W8FYH/8	Woodville ARC	53-	A- 8-	477
WØFX/Ø	Jamestown ARC	159-	C- 8-	477
W8JHD/8	Rocky River ARC	79-	B- 4-	474
W7VQB/3	Hq. ARDC MARS Group	78-	B- 4-	468
WØIGU/Ø	(nonclub group)	78-	B- 5-	468
W2JVZ/2	Greene RC	77-	B- 3-	462
W4BOW/4	Lakeland ARS	226-	B-15-	452
WØUTL/Ø	SeKan RC	71-	B- -	426
W2ZJ/2	Elmira AR Assn.	128-	C-20-	384
VE5MA/5	Moose Jaw ARC	38-	B- 5-	378
WØUAS/Ø	Kaw-Blue ARC	62-	B- 5-	372
WØYNY/Ø	Dawson RC	62-	B- 4-	372
WN8GPR/8	(nonclub group)	16-	A- 8-	369
W8RJZ/8	Ottawa ARC	28-	A- 7-	252
KN4EOI/4	Tuscaloosa ARC (Novice Group)	40-	B- 4-	240
KN6RYU/6	Fresno ARC	39-	B- 3-	234
KØAHW/Ø	(nonclub group)	26-	AB- 7-	207
VE3BAT/3	Kirkland Lake AR League	23-	A-10-	207
W4HHO/4	Charleston ARC	34-	B- 3-	204
KN9CAN/9	Milwaukee RAC (Novice Group)	28-	B- 4-	168
W9TZL/9	(nonclub group)	142-	BC-13-	150
W7WYT/7	Bozeman Junior Field Day Club	23-	B- 5-	138
W8OPU/8	Mt. Vernon ARC	54-	B- 4-	108
W5FKX/5	(nonclub group)	48-	B- 7-	96
W3ZHV/3	Mon Valley AR Assn.	8-	A- 7-	72
W2KYN/1	Knickerbocker ARC	27-	B- 3-	54
W9AML/9	Central Illinois RC of Bloomington	26-	B- 4-	52

Two Transmitters Operated Simultaneously

K2CF/2	Order of Boiled Owls	630-	A- 8-	5895
W2ARL/2	Somerset Hills RC	605-	A-17-	5670
W3CWC/3	Antietam Radio Assn.	638-	AB-22-	5403
WØYDX/Ø	Viking Contest Group	797-	B- 6-	4782
W3MFW/3	(nonclub group)	526-	A- 8-	4734
W5LFM/5	Beer, Pop and Key Clique	510-	A- 5-	4590
W2OYH/2	Morris RC	166-	A-12-	4419
W3ATR/3	Beacon RA	531-	AB-11-	4284
W9ERU/9	(nonclub group)	451-	A- 8-	4284
K6KGK/6	Pleasant Valley ARC	448-	A-14-	4257
KZ5JW/KZ5	Canal Zone AR Assn.	655-	B-12-	4080
WØTIU/Ø	Central Iowa ARC	126-	A-12-	4059
W3AJU/3	Western Pennsylvania Bellowers and Chirpers Society	643-	B- 9-	4008
W2NWD/2	RA of Erie County	438-	A-17-	3942
W3PSH/3	Abington Township AR Assn.	404-	A- 6-	3888
W2IQ/2	(nonclub group)	437-	AB-10-	3855
W9NUW/9	Wisconsin Valley Radio Assn.	438-	AB-16-	3663
W2GVV/2	Night Owl Net	403-	A-17-	3627
W9VT/9	Tri-Town RC	567-	B-24-	3552
W5NW/5	Odessa ARC	591-	B-12-	3546
K2LSA/2	State Line RC	385-	A-15-	3465
W4GMR/4	Miami Springs RC	539-	B-16-	3384
W4MN/4	Palmetto RAC	534-	B-24-	3360
W9REG/9	Tippecanoe AR Assn.	477-	AB-12-	3273
W2GTD/2	Ridgewood RC	362-	A- -	3258
W7YCV/7	(nonclub group)	358-	A- 8-	3222
W7AW/7	West Seattle ARC	327-	A-15-	3177
W3FRY/3	Frankford RC	525-	B-13-	3156
W2STJ/2	Walton Ham Group	334-	A- 6-	3006
W9BQC/9	Klix, Chirp and Splatter Society	309-	A-14-	3006
W9CAF/9	Chicago ARC	381-	AB-14-	2997
W9OVI/9	Kankakee Area RS	473-	AB-15-	2991
W6RCY/6	Merced ARC	465-	AB-24-	2964
W5MRK/5	Bartlesville ARC	348-	AB-31-	2832
W4CVY/4	Columbus ARC	461-	B-15-	2766
W6TO/6	Fresno ARC	458-	B-26-	2748
W1OP/1	Providence Radio Assn.	278-	A-12-	2745
W8ICS/8	Indian Hills RC	429-	B-20-	2724
W3FF/3	Penn Central RC	277-	A- 8-	2718
W2JC/2	Bloomfield RC	275-	A-10-	2700
K5GOI/5	Brazoria County ARC	422-	B-10-	2682
W8VVL/8	Queen City Emergency Net	114-	AB-45-	2676
W6SF/6	Stockton ARC	272-	A-15-	2673
W5UAO/5	Pittsburg County ARC	413-	B-15-	2628
W8MYV/8	Dayton AR Assn.	329-	AB- 8-	2595
WØUNT/Ø	Lawrence ARC	391-	B- 9-	2496
W4NTL/4	Anniston RC	277-	A-12-	2493
W8ZZ/8	Detroit AR Assn.	321-	AB-18-	2373
W4KX/4	Rappahannock Valley RC	238-	A-12-	2367
W9DUP/9	DuPage RC	307-	AB-10-	2340
W4QEE/4	Mobile ARC	389-	B- 8-	2334
W8MAA/8	Central Michigan ARC	259-	A-30-	2331
W2YNU/2	Ridgewood H. S. RC	232-	A-31-	2313
W4ODR/4	Memphis Naval ARC	368-	B-12-	2208
W4PFP/4	Middle Tennessee AR Assn.	324-	AB-10-	2184
W2FWT/2	Clifton RC	240-	A-15-	2160
W7BB/7	Lake Washington ARC	357-	B- 3-	2142
WØRFU/Ø	Bandhoppers RC	236-	AB-10-	2127
W5FQ/5	Meridian ARC	354-	B- 8-	2124
K4HNY/4	YMCA RC	318-	AB-10-	2105
WØWWA/Ø	(nonclub group)	349-	B- 5-	2094
W9QET/9	(nonclub group)	208-	A- 3-	2088
W3BIP/3	The DX Club	344-	B- 6-	2064
K5FBI/5	Barksdale ARC	296-	AB- 6-	2061
VE2CB/2	(nonclub group)	315-	B-15-	2040
W2NAL/2	RA of Greater Syracuse	314-	B-11-	2034
W5ZLM/5	(nonclub group)	278-	AB- 4-	2004
W5SRW/5	Mesilla Valley RC	527-	BC-20-	1986
W9UDU/9	Racine Megacycle Club	330-	B-18-	1980
K6DNL/6	(nonclub group)	301-	B- 3-	1956
WØTYH/Ø	Rochester ARC	261-	AB-10-	1890
W8AW/8	Edison RA Assn.	278-	AB-12-	1860
W1WW/1	(nonclub group)	177-	A- 6-	1836
W3CDI/3	Baltimore Polytechnic Institute RC	178-	A-11-	1827
W3QVK/3	(nonclub group)	199-	A- 5-	1791
W5HMF/5	Oil Capitol Mobile Club	297-	B- 6-	1782
W2ODP/2	Irvington RAC	197-	A- -	1772
W8RYI/8	Kalamazoo ARC	287-	B-12-	1722
W2CGK/2	AR8 of Queens	283-	B- 6-	1698
W1LAM/1	Bristol County Radio Assn.	257-	B-12-	1692
W3DUU/3	Delco RC	228-	AB-18-	1689
W3ZXF/3	Tamaqua ARC	255-	B-17-	1680
W2FB/2	Squaw Island ARC	161-	A-11-	1674
W3LAZ/3	Philadelphia High-Frequency Radio Club	160-	A-13-	1674
W3GAG/3	Philadelphia Wireless Assn.	243-	AB-12-	1656
W4MEL/4	Daytona Beach AR Assn.	251-	B-10-	1656
W8HKT/8	Niles ARC	250-	B-16-	1650
W9VSX/9	Warren County AREC	246-	B-21-	1626
W2SV/2	Sunrise RC	177-	A-16-	1593
W2ODV/2	Bayonne Civil Defense RC	265-	B-10-	1590
WØFLN/9	St. Louis Univ. ARC	161-	AB- 6-	1554
W7SO/7	Albany ARC	172-	A-10-	1548
W6SFT/6	San Francisco Naval Shipyard RC	171-	A- -	1539
W7UCA/7	(nonclub group)	229-	B- 7-	1524
W2KZG/2	Woodbridge RC, Civil Defense Group	201-	AB-10-	1482
W1ZLH/1	Middlebury Mike and Key Club	246-	B- 8-	1476
W8SG/8	Denison University RC	245-	B- 6-	1470
KØAAH/Ø	Iowa-Illinois ARC	216-	B-31-	1446
W5SXA/5	Shawnee ARC	235-	B- 7-	1410
K2IAX/2	East Aurora Teenaged RA	131-	A- 5-	1404
K2BCI/2	Wantagh RC	207-	AB-13-	1398
K7WBB/7	Beaver MARS RC	152-	A- 4-	1368
W3ZEK/3	Harrisburg RAC	224-	B-40-	1344
VE3RC/3	Ottawa ARC	244-	BC-10-	1341
W4OIX/4	Kinston AR8	221-	B-18-	1326
WØBLK/Ø	Black Hills ARC	196-	B-24-	1326
W5TSV/5	Pampa ARC	220-	B- 8-	1320
W7LAB/7	Ogden ARC	194-	B-29-	1314
VE3MRC/3	Metro ARC	120-	A-10-	1305
W9GPS/9	Polecats Emergency Corps of the Hamfesters RC	190-	AB- 8-	1293
W8LOJ/8	Thumb Area AR Assn.	215-	B-15-	1290
W9VMW/9	Cass County RC	187-	AB- 6-	1281
W7LA/7	Twin City RC	199-	B- 8-	1194
W7ECA/7	Electric City RC	132-	A-15-	1188
W1SBF/1	Meriden ARC	147-	AB- 8-	1182
K2DOZ/2	(nonclub group)	168-	B- 4-	1158
W9AKJ/9	Elkhart ARC	143-	AB-10-	1122
W8QLY/8	Mahoning Valley AR Assn.	150-	AB-12-	1116
K2HJG/2	Harmonic Hill Radio League	185-	B-15-	1110

(*Continued on page 166*)

Happenings of the Month

BOARD REQUESTS FILED

At its 1956 meeting, the ARRL Board of Directors decided to request the Federal Communications Commission to amend the amateur rules in two respects. One is an expansion of 14-Mc. phone, to add 14,300-14,350 kc. for A3 emission, but for use only by holders of Advanced or Extra Class licenses. The second is to require personal appearance before an FCC engineer of any applicant for amateur license living within 125 miles of quarterly examining points — in other words, a return to the procedure required before the mail-type examination system was expanded a few years back. The texts of the filings follow:

FEDERAL COMMUNICATIONS COMMISSION

In the Matter of
Amendment of Sections 12.23 and 12.111(d) of Part 12, Rules Governing Amateur Radio, concerning the expansion of the 14 Mc. Radiotelephony Subband

PETITION FOR RULE MAKING

Pursuant to §4(d) of the Administrative Procedure Act and §1.702 of the Commission's Rules and Regulations, The American Radio Relay League, Inc., requests that §12.23 and §12.111(d) of the Commission's Rules and Regulations be amended to provide authorization for radiotelephony operation in 14,300 to 14,350 kilocycles by amateurs holding Advanced or Amateur Extra Class licenses.

This request is filed pursuant to decisions of the Board of Directors of the American Radio Relay League at its meeting in May 1956. As the Commission is aware, the ARRL Board of Directors is composed of sixteen amateurs nominated and elected by more than 55,000 licensed amateurs to represent them in the formulation of League policy.

1. The segment of the amateur 14-Megacycle band available for radiotelephony operation has for many years been 100 kilocycles wide. Prior to World War II, that was reasonably adequate. However, the trend to voice operation in recent years has resulted in a condition of overcrowding to an extreme unusual even in amateur experience. In 1946, the League, responsive to the need for more radiotelephony space in this band, proposed to the Commission that the A3 assignment be doubled. Subsequently, so that there would be no domestic amateur questions pending during the Atlantic City Radio Conference or its preparatory phases, the League withdrew the proposal. In 1948, the failure of the ARRL Board of Directors to resubmit to the Commission a request for more radiotelephony space caused considerable dissension among the amateur body. In 1949, the Board, responsive to this continuing problem, decided that a request to make the radiotelephony assignment 14,200-14,350 kilocycles would be submitted to the Commission when the new 21-Megacycle band became available to amateurs. Such a petition was filed in September 1952. In February 1954, the Commission acted on the petition and issued a Notice of Proposed Rule Making, Docket 10927, in accordance therewith. In September 1954, the Commission dismissed the proposed amendment, stating that more experience with amateur use of the 21-Megacycle band was needed before the 14-Megacycle question could properly be appraised.

2. The 21-Mc. band has now been available to the amateur service for approximately four and one-half years. Although the peak of the sunspot cycle, which results in optimum conditions, has not yet been reached, there are openings almost daily for long-distance communication at the 21-Mc. frequency. During these regular occurrences, the 21-Mc. telephony subband is also extremely crowded. But not the slightest decrease in congestion of the 14-Mc. radiotelephony subband has been noticed. With even better propagation conditions yet to come, it is already obvious that use of the 21-Mc. band is no answer to crowding in the 14 Mc. band. This congestion continues despite a rather substantial use of single-sideband techniques in the subband.

3. A prime reason is, of course, the continued heavy growth of the amateur body. For example, in the period since the 21-Mc. band became available, the number of amateur licenses has increased by approximately one-third. All indications are that this rate of growth will continue. There is no need to point out the obvious problems of occupancy created by this increase.

4. Since World War II, the telephony subband at 4.0 Mc. has been doubled and a new telephony subband has been authorized at 7 Mc. Similar relief has not been provided for the crowded voice subband at 14 Mc. The League believes that the evidence unmistakably points up the need for expansion of radiotelephony privilege to include 14,200-14,350 kilocycles, and so petitions the Commission.

5. As the Commission is aware, the Board of Directors of the League is concerned with the lack of an incentive program in the amateur-license structure. The League believes that such a plan is necessary to foster increasing technical proficiency among amateurs to maintain the reservoir of skilled technicians and operators traditionally offered by the amateur service. With the abolishment of an advanced grade of license as a condition to use of certain radiotelephony subbands, the incentive aspect has almost completely disappeared from the amateur-license structure. An inspection of the number of new Amateur Extra Class licenses currently being issued is adequate evidence that the problem exists. The League believes that one step in the proper direction can be taken by making the requested radiotelephony addition — 14,300 to 14,350 kilocycles — available only to amateurs holding Advanced or Amateur Extra Class licenses.

AMERICAN RADIO RELAY LEAGUE, INC.
By PAUL M. SEGAL
Its General Counsel

A. L. BUDLONG
Its General Manager
September 27, 1956

FEDERAL COMMUNICATIONS COMMISSION

In the Matter of
Amendment of Section 12.44 of Part 12, Rules Governing Amateur Radio, concerning operator examinations

PETITION FOR RULE MAKING

Pursuant to §4(d) of the Administrative Procedure Act and §1.702 of the Commission's Rules and Regulations, The American Radio Relay League, Inc., requests that §12.44 of the Commission's Rules and Regulations be amended to provide that an applicant for amateur license must appear before a Commission engineer for examination if he resides within 125 miles of a point where examinations are conducted by the Commission at least four times yearly.

This request is filed pursuant to decisions of the Board of Directors of the American Radio Relay League at its meeting in May 1956. As the Commission is aware, the ARRL Board of Directors is composed of sixteen amateurs nominated and elected by more than 55,000 licensed amateurs to represent them in the formulation of League policy.

1. The present requirements were established in 1954 and eliminate, for the majority of applicants, the necessity for personal appearance for examination. For many years

(*Continued on page 178*)

Strays

Elsewhere on this page we report the passing of ex-W4AHM. W4KL relays this anecdote about him.

"He had a remarkable mind and it is of interest that although he was blind from infancy, he was able to obtain his amateur license in the 20s, at a time when present help for those unfortunates was not available. While a student at Georgia Tech, he was permitted to use a typewriter in class work. The story goes that one of his professors gave orally only those questions that were to be answered 'yes' or 'no.' The class soon learned that Cliff was the smartest student and that all they had to do was wait for him to hit two keys for 'no' or three for 'yes.' The professor soon broke this up by having Cliff put a period after the word 'no'!"

—•••—

Anyone care to quote the odds on this one? W6NGK was showing his mobile rig to a visitor from Batesville, Ark. NGK switched the rig on, heard W5EMN calling CQ (but not announcing his QTH), worked him, and by golly, W5EMN was in Batesville. To top it all off, the visitor knew W5EMN and was able to talk to his wife through the facilities at W5EMN. Do you suppose the visitor will be bitterly disappointed the next time he visits a ham shack and *doesn't* get such excellent service?

December 1931

. . . The lead article in *QST* 25 years ago was entitled "High-Power Performance from the Small 'Phone Transmitter," describing the construction and adjustment of a Class B modulator. It was a real how-to-do-it article by Lamb and Grammer on a brand-new subject that was of intense interest to many amateurs. And still is!

. . . W5CP discussed the "A B C of Formulas," in an attempt to calm those who are frightened by the formidable array of formulas which are used to explain some articles.

. . . Howard Cassler contributed an article on the improvement of the regenerative receiver using a screen-grid coupling stage, resulting in better selectivity and stability.

. . . W1QP (who, young fellers, is now K6BJ) described a crystal monitor and discussed several uses for it.

. . . W6VO took us on a "DXpedition" in Central America, which was really rugged.

. . . In the Manhattan Electric ad there were some dandy mica condensers, 40,000 volts at .001 μf. for only $25.00. RCA was offering a special Class B input audio transformer, a special Class B modulation transformer, and two matched 203As for just $74.25. And say! The Television Mfg. Co., of NYC, offered a television scanning kit for only $19.75.

. . . Of particular historical interest is the editorial, in which Warner discussed at some length the various theories concerning the derivation of the term "ham."

After W2ZY had ordered an E-Z Way Tower, it was left on the sidewalk in front of his house by the trucking company. It was too heavy for him to move that evening when he arrived home and he intended to get help the next day.

His wife said (jokingly, we hope!) that if he did not put it in the yard, the trash-collecting truck would pick it up the next day. While Lin was shaving the next morning, that's just what happened. A frantic call from Mrs. Lessig told him they were trying to lift the tower into the trash truck. Lin rushed out in pajamas and finally paid the men to carry the tower into the back yard.

—•••—

W1RDV reports an unusual 15-meter contact with W1YYQ, KL7 and KG1LH. Lee believes that this is the first time the two Arctic areas have been linked by amateur radio. Specifically, he lays claim to being the first to work, simultaneously, the two most widely separated points in North America that have ever been in contact by amateur radio. Any prior takers?

—•••—

VE7WL, a retired member of the Royal Canadian Mounted Police, says that when it comes to ham radio he unfortunately does not always get his man!

Silent Keys

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

W1EAP, L. A. Burnham, East Hampton, Conn.
W1HH, Ralph E. Brooks, Wellfleet, Mass.
W1SIT, Kenneth L. Gurney, Maynard, Mass.
W2CZJ, Henry C. Miller, New York, N. Y.
K2LLO, Albert L. Kranz, Utica, N. Y.
W2OLQ, Raymond J. Malone, Brooklyn, N. Y.
W2VQZ, John S. Marvin, Lewiston, N. Y.
W3EOI, Fernand Causse, Lester, Penna.
ex-W4AHM, Clifford Witcher, Belmont, Mass.
K4DOD, Joseph N. Woodruff, jr., Montezuma, Ga.
W4RBQ, E. Charles Buckshorn, Miami, Fla.
W5GHF, Robert E. Barr, Springhill, La.
W6HLL, Walter L. Nourse, Los Angeles, Calif.
W7PKX, Wallace J. Ritter, Sheridan, Wyo.
W7QKW, Chester E. Lyons, Bend, Oregon
ex-W8DKK, J. A. Harshaw, East Cleveland, Ohio.
W8NFY, Walter C. Gulde, Dearborn, Mich.
WØCIG, Ray W. Jordan, Detroit Lakes, Minn.
KL7ZG, Buddy L. Owens, Golovin, Alaska
ex-VK3AIR, M. Ireson, Kyneton, Victoria.

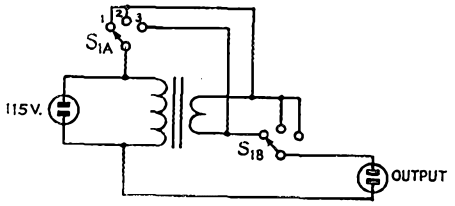
ARE YOU LICENSED ?

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

Hints and Kinks For the Experimenter

QUIST QUIZ AND LINE VOLTAGE ADJUSTMENT

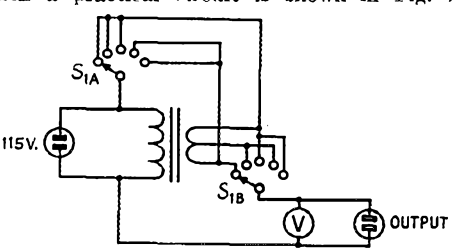
IN CASE YOU DIDN'T GET THE ANSWER to the Quist Quiz in the October issue, the solution is shown in Fig. A. In position 1 of switch S_1, the secondary voltage of the transformer adds to the line



(A)

voltage and the output voltage is the sum of the line voltage plus the secondary voltage. In position 2 the output voltage is the same as the line voltage, and in position 3 the secondary voltage subtracts from the line voltage, giving an output voltage equal to the line voltage minus the secondary voltage. In presenting the problem in October, we were a little sneaky and got the additive or subtractive effect by changing leads in the primary side. It is just as valid, and a lot simpler, to do it as shown here.

In a practical case, it would be to your advantage to use the center tap of the transformer secondary to get a finer range of adjustment. Such a practical circuit is shown in Fig. B,



(B)

with a voltmeter added so that you can check on your line voltage at any time. The transformer can be a 5-, 7½- or 10-volt filament transformer, or whatever else you can borrow from the junk box. The current rating of its secondary must be at least equal to the current drawn by your load. For example, say you have a 350-watt load, which when resistive draws a current of just over 3 amperes (350 — 115 = 3.05). A filament transformer good for 3 amperes secondary current would just be on the ragged edge, because your load may not have a power factor of 1.0, but a transformer with a secondary rating of 5 amperes would be more than enough. The other point to consider is to be sure that the center-tap connection is capable of carrying the current. This is minor, however, since most filament transformers do bring out the center tap in the same size of wire (at least) that the secondary is wound with.

WWV ON THE NATIONAL NC-300 RECEIVER

THE 10-MC. SIGNAL transmitted by WWV may be received on the Type NC-300 receiver as follows:

Clip a 330-$\mu\mu$f. capacitor from the stator of the high-frequency oscillator section of the main tuning gang (front section) to the chassis. Set the antenna trimmer to minimum capacitance and tune across the 40-meter band until the 10-Mc. WWV signal is heard.

This is a somewhat unconventional method of using the receiver, but it provides an economical and simple means of beating a crystal calibrator against WWV for insurance of accuracy.

— *Robert J. Murray, W1FSN*

MORE ABOUT THE DL4YU S.S.B. UNIT

HERE ARE TWO SUGGESTIONS pertaining to the crystal-controlled s.s.b. unit described in *QST*, June, 1956, p. 76.

1) This same oscillator may be used for 21-Mc. operation by installing a 12-Mc. tank in the plate circuit and by using a 12-Mc. crystal. A 47-$\mu\mu$f. mica capacitor in parallel with a North Hills type 120-B (3–5 μh.) inductor should make a suitable tank and, of course, a good ceramic switch should be used for activating either the 12- or the 37.5-Mc. circuits at will.

2) Mount a 50-$\mu\mu$f. variable capacitor on the panel and then connect it across the terminals of the crystal socket. This control will give the operator a little "v.f.o. action" so that he can *zero in* on s.s.b. QSO's near the crystal frequency.

— *Jim Freund, DL4YU/W5QMI*

ANOTHER USE FOR THE MOTHBALL

THE SILVER-PLATED CONTACTS of components — switches, relays, etc. — headed for a rest in the junk box may be protected against tarnish by dropping one little mothball into the storage compartment. You will appreciate how well this stunt works when you next solder to the terminals of a component so protected.

— *Neil Johnson, W2OLU*

SIMPLE SETUP FOR CODE PRACTICE

SOME OF THE NEWCOMERS who have need for simple code-practice equipment may solve their problems by hooking a pair of phones, a key

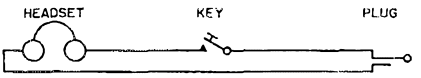


Fig. 1 — This combination of headphones, key and phone plug, plus a receiver with b.f.o., can be used for code-practice work as suggested by WN8CGF.

and a phone plug in series as shown in Fig. 1. After this combination is plugged into a receiver, close the key, turn on the b.f.o. and then tune to a steady signal, such as WWV or the carrier of a broadcast or Loran station. Naturally, you *key* the signal just as you would the output from a conventional practice oscillator.

— *Frank Fahrlander, WN8CGF*

Editor's Note: Although this general idea was described by WN9OXH at a much earlier date (Hints and Kinks, *QST*, July, 1952), we believe that the suggestion bears repeating for the benefit of those who did not see the original story.

PRODUCT DETECTOR FOR COMMAND RECEIVERS

A SIMPLE AND INEXPENSIVE adaptation of the product detector[1] to the popular Q5-er (BC-453) is used here at W4JJX. The performance of this combination, used in conjunction with a type NC-183, is most gratifying. Fortunately, the detector circuit may be built into the Command set without necessitating any socket-hole punching or outboard construction.

The circuit of the detector and the method of connecting it to the BC-453 are shown in Fig. 2. The detector circuit is identical to the one described by Crosby except that type 6SN7GT tubes are used instead of the miniature type 12AU7. This modification does not require any changes in the component values used in the original detector, but it does permit taking advantage of the octal sockets already mounted in the Q5-er. In Fig. 2, V_{1A} is the b.f.o. tube for the BC-453 (the original tube for the b.f.o. circuit having been removed) and V_{1B} and V_2 operate in a triple-triode product detector circuit. Since the b.f.o. frequency of the Command receiver is screwdriver adjusted, the original control (C_2) was set at minimum capacitance and a new capacitor (C_1) having an external control knob was installed. This provides a convenient means of adjusting the b.f.o. to center frequency to furnish carrier for a s.s.b. signal.

Modifications which must be made to the Q5-er are the substitution of 6-volt equivalents for the r.f., i.f. and mixer tubes. Naturally, this will require rewiring of the heater circuit. The types 12A6 and 12SR7 used in the audio output and b.f.o. — second detector circuits, respectively, are not replaced with 6-volt equivalents, but the sockets for these tubes are used for the 6SN7GTs of the new b.f.o.-detector arrangement.

When clearing the wiring from these two sockets, do not clip short the leads to the b.f.o. circuit and the secondary of the output i.f. transformer as these will be reused as indicated in Fig. 2. Also, while working with the BC-453, adjust the b.f.o. control for minimum capacitance. If you don't care to open up the b.f.o. can so that the minimum-capacitance setting may be readily determined at this time, the adjustment can be made after the externally-controlled capacitor has been mounted and the complete receiving system has been placed in operation. In the latter case, set the new control at minimum capacitance and make a normal adjustment with the original control. Then, simultaneously increase and decrease the capacitance of C_1 and C_2, respectively, until the b.f.o. oscillator is *walked* back onto frequency.

The fiber adjustment rods for the three i.f. transformers (BC-453) should be pulled full *upward*. The i.f. passband is so narrow under this condition that intelligibility suffers when the BC-453 is used as a Q5-er for the reception of a.m. signals. It is therefore obvious that when a s.s.b. signal using either the upper or the lower sideband is tuned into the center of the BC-453 i.f. passband, and the b.f.o. is adjusted to the proper side of the signal, the operator has a *built-in* band-pass filter that is fair if not excellent.

When using this system for the reception of single-side-band transmissions,

(*Continued on page 182*)

[1] Crosby, "Reception with Product Detectors," *QST* May, 1956.

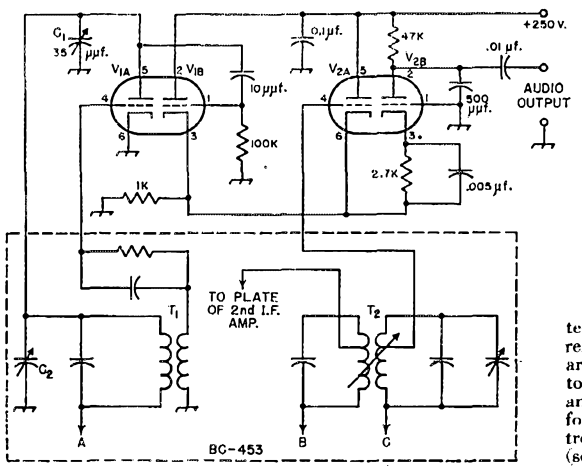


Fig. 2 — Circuit diagram of the product detector as connected to a type BC-453 receiver. All resistors ½ watt. Components inside dotted lines are parts of the BC-453. Arrows A, B and C point to receiver wiring that need not be disturbed. T_1 and T_2 are the BC-453 b.f.o. and i.f. output transformers, respectively. C_2 is the original b.f.o. control and C_1 is a b.f.o. control mounted on the panel (see text). V_1 and V_2 are type 6SN7GTs.

Correspondence From Members-

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

NOVICES ON 21 MC.

P. O. Box 871
Joliet, Illinois

Editor, *QST:*

. . . In the October issue of *QST* you ask the KN and WN boys to stay off of the upper 50 kc. portion of the Novice 15 meter band and leave it free for foreign phones to QSO with American Generals. . . .

Let me remind you, gentlemen, that below 30 Mc. Generals have a total of 3500 kc. plus 160 meters to work in. The novice has 200 kc. stacked three deep. The ratio above 30 Mc. is even worse. Get down in that mess some night and try to grab and hold a contact. Until then you won't know what QRM really is.

In the short time I have been in the field, I have gathered that the FCC originally established amateur radio for two *basic reasons*: (1) to improve the art; (2) to increase the number of proficient radio operators. Now may I ask one simple question? Is a General operator on phone beating his lungs out trying to get a QSL from South Africa more important than a 5 w.p.m. Novice trying to raise his speed to 13? I don't think so.

It is hard to imagine a single ham in this country who was born a qualified operator, but from some of the things I have read and heard, most of the boys never went through a period of learning, and therefore have no patience and little respect for those who are doing so now. Naturally, QSOing half way around the world with no wear and tear on your fist is very enjoyable, and I intend to do so myself some day, but when I do, I will do so without asking some one else to give up voluntarily what is his and what he so badly needs.

Personally, I want to do everything I can to make amateur radio as enjoyable as possible for the other fellows. The only 15 meter crystal I have is 21,200 kc. Today I am ordering a new crystal further down the band, and will discontinue using the 21.2 slot.

I want to say I am not surprised at your attitude, but am chagrined by your high-handed request to give up something that the FCC saw fit to grant. I don't believe you will publish this letter, which obviously criticizes your editorial policy. However, if you don't, I have no intention of resigning from the ARRL or giving up *QST*. They are both too important to me. I just hope you may eventually realize that your stepchild has his rightful place in radio and may some day even help you.

— *R. W. Spradling, KN9CVS*

Box 135
Elizabeth, La.

Editor, *QST:*

. . . It also works the other way around. Foreign phone on the higher bands really jam us Novices. My first 21-Mc. crystal was for 21,174, and I soon found out what phone QRM really was from reports, and in another week had to buy one for 21,108. I think it really would help both sides if you would note in the next revision of *How to Become a Radio Amateur*, and other such publications, that Novices should buy their crystals for the low end of 21 Mc. so they won't have to find out the hard way, as I have done, and also make it much easier for phone DX to get through.

I would also like to say that I think *QST* is the very best publication put out for radio amateurs, both beginners and Old Timers. Keep up the good work! . . .

— *Fred Kellogg, KN5EQW*

113 N. Roys Ave.
Columbus, Ohio

Editor, *QST:*

. . . Today there were more foreign phones working from 21,120 to 21,150 Mc. than there were from 21,150 to 21,250 Mc. I wonder if they know about the "Gentlemen's Agreement"? I know about it and try to act accordingly. I have little choice since crystals cost money. However, it sure irks me to find so much vacant space on the 21 Mc. band which I can't use. I would like to see the foreign phone stations stay above 21,150 Mc. . . .

— *T. O. Jaques, KN8AGY*

6321 Frankford Avenue
Philadelphia 35, Pa.

Editor, *QST:*

. . . I certainly would like to know why it is so imperative to keep below 21,200 kc.

I operate on all bands but our only DX is on 21 Mc. One can tune that band at most any time and find how rough it is for a Novice to complete a QSO with a DX station for the phone QRM. You wait for hours to get a chance at a DX operator. When you confidently turn off the transmitter, with pencil in hand, perspiration streaming down your honest face, with lovely visions of that QSL card that is bound to come, what do you find? Instead of that DX c.w. ham, you have got yourself a fine phone conversation.

This is not a lone instance by any means. It is consistent every day. In all fairness to the struggling Novice who has no place to go until he gets his coveted General ticket, wouldn't it be at all possible for the South Americans to listen first? They have v.f.o., and I guess they could use other DX bands.

Most General Class operators seem to be fair minded. Even if we do enjoy privileges they did not there is no reason to keep throwing it in our faces. Most Novices are serious minded and will be a credit to the amateur world later. Let's look at our point of view for a change. I am sure we all can enjoy this wonderful democratic hobby.

Thanks for your swell mag. I look forward to it so much every month.

— *R. H. Cherrill, WN8HQO*

OLDEST CLUB?

The Radio Club of America, Inc.
11 West 42nd Street
New York 36, New York

Editor, *QST:*

Under "Strays" on page 15 (Sept. *QST*), a photograph shows the Old Timers of the South Jersey Radio Association surrounding old apparatus. The caption alongside the photograph states that this association was 40 years old on June 16, 1956, and lays claim to being the oldest radio club in the states, still meeting regularly.

Regarding the claim to being the oldest radio club, I feel we should offer to be of assistance in setting the record straight. The Radio Club of America, Inc., held its first meeting on January 2, 1909, and has held regular meetings ever since.

For reference to some of this old history, we refer you to The Radio Club of America's *25th Anniversary Yearbook* published in 1934. A copy of this should be in the American Radio Relay League library. Should you not have a copy, am enclosing a copy of our 1954 Yearbook. Page three covers some of the facts of interest.

The Radio Club of America has been continuously active from its birth to the present day, and our membership has a good balance of old timers and younger men.

Anything you can do to help keep the record straight will, I am sure, be appreciated by both the South Jersey Radio Association and The Radio Club of America, Inc.

— *Frank A. Gunther, W2ALS*
President

Strays

Re the "Little Monster" Automatic Key of W1GQJ (November, 1956, *QST*, p. 25) you may recall that it uses a dual winding that involves something in the way of man hours and 20/20 vision. We have received word from Sigma Instruments that they make the Series 4 (the relay used by W1GQJ) and the series 41 (a better keying relay) with dual coils, in case anyone is interested.

—•••—

W5SVP reports what he believes to be the first s.s.b. all-continent round table in which all stations heard each other. Present on the 14 Mc. frequency on October 28th were ZL3PJ, VK3AEE, KA2FC, PY2JU, G3HRO, DL4SV, CN8GD and W5SVP. The minimum report was R5 S7.

—•••—

W7MPQ reports several long-haul contacts with transistors on ten meters. Using a 3 element beam and a power of 20 mw., Dick has worked W7OEB and KØCEM, both stations at least 1000 miles distant. The transistor transmitter consists of a 2N114 oscillator and a Philco L5108 amplifier.

—•••—

Perhaps it was inevitable. As KN5EIT starts out on his paper route each day, he calls out to his rig, "See you later, oscillator."

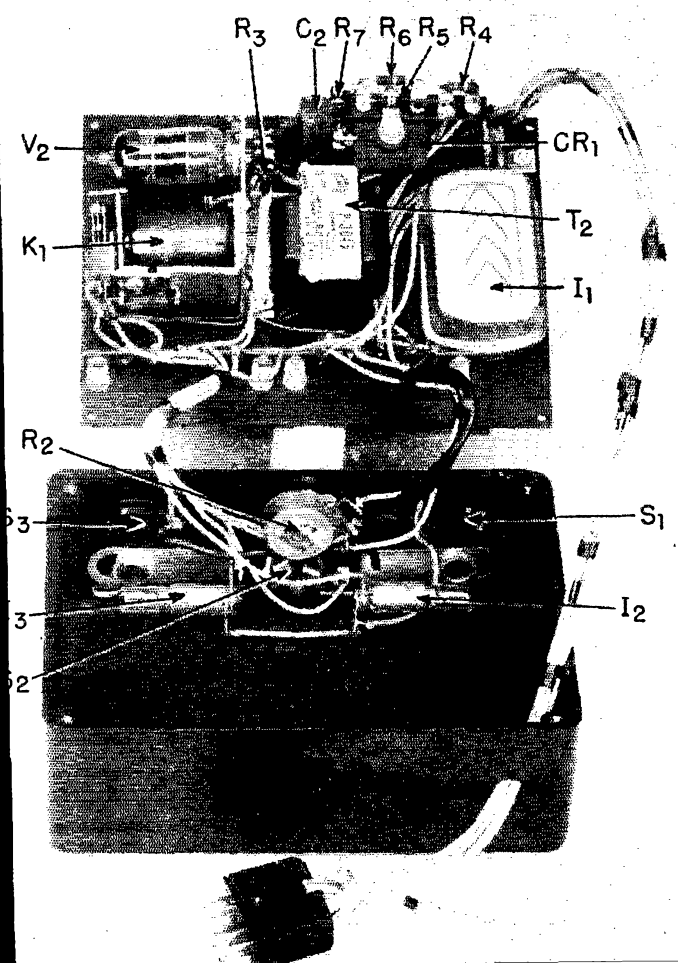
We have just learned of the passing of Mr. J. P. Shanklin, ex-W3CIJ, most recently of Cedar Rapids, Iowa, where he was with the research division of Collins Radio Co. His talent was with antennas, and in the July, 1934, issue of *QST* he described the first 14 Mc. rotary beam. His most recent *QST* contribution was in October of 1950, when he discussed the bandwidth of 2- and 3-element Yagi antennas.

FEEDBACK

W2UGO, secretary of the Wantagh Radio Club, has written in to let us know that their Field Day photos were incorrectly captioned. The one we used as a cover for October *QST* shows W2DQN in the foreground and W2ELK to the rear. The photo was taken by K2GFM.

—•••—

A couple of pointers concerning the Monimatch described in October *QST*. The diodes C_1 and C_2 are 1N34As. Also, any resistors used in building or testing the unit should be molded composition or carbon. Wire-wound resistors will give false readings, because they do not satisfy the requirement of being nonreactive.



W9UJ's sharp eyes have detected a few discrepancies between the circuit and the interior view of the Conelrad Alarm, page 21, *QST*, November, 1956. Sorry, gang, but we used the wrong photo. This interior view of the unit correctly identifies the components in accordance with the circuit-diagram designations as printed previously.

QST for

The World Above 50 Mc.

CONDUCTED BY EDWARD P. TILTON, W1HDQ

COMMENTS enclosed with logs for the September V.H.F. Party, Sept. 15th and 16th, agree solidly on one point: conditions were the poorest on record. A cold rain fell steadily on the many eastern enthusiasts who took to the high spots for the week end, and in every section of the country it appears that there was little or no favorable propagation at any time. It was the sort of week end that might have resulted in a dismal failure had activity been less widespread. As it was, we find nearly 300 logs in the pile now being checked by the Communications Department. We'll have the final scores for you next month; meanwhile, here are a few highlights.

As might be expected, there were no record-breaking scores. The top effort in the country was turned in by W3KX/3, the Electric City Radio Club, whose setup is shown in one of the accompanying photographs. They used 50, 144, 220 and 420 Mc. to pile up 301 contacts and the country's largest section multiplier, 40, for 12,600 points. A long-time holder of first place in the mythical national ranking, W1MHL/1, dropped to second. The boys of the Waltham Amateur Radio Association left the high-powered gear and the big antennas at home this time. With a more truly portable setup working on four bands, they still managed the highest station total, 302 contacts, and a multiplier of 37, for 12,099 points. The location, as heretofore, was Pack Monadnock Mountain, Peterboro, N. H.

High single-operator scores were W1RFU, Wilbraham, Mass., 9196 points on 50, 144 and 220 Mc.; W2PRF, Kinnelon, N. J., 8091 on the same bands; and W1FZ/1, Farmington, N. H., 7000 on 4 bands. In the one-band class, W2CXY, Chatham, N. J., swept the field with 213 contacts in 21 sections on 144 Mc., for 4473 points.

Top score in the September V.h.f. Party was made at this hill-top site by W3KX/3, the Electric City Radio Club, Scranton, Pa.

F2 DX Breaks on 50 Mc.!

The first country-wide opening for 50-Mc. F2 DX in the current solar cycle broke on Oct. 27th. By 0800 EST, Spanish-speaking f.m. signals and harmonics of South American commercial stations were heard in W1, 2 and 3. LU9MA, Mendoza, Argentina, came through shortly after, working dozens of eager 50-Mc. men in most of the northeastern states and VE1.

Later the band opened briefly for transcontinental communication, K6EDX, Fresno, Calif., working W3VXJ and W3MXW, near Philadelphia, between 1054 and 1125 EST. W4GJO, Ft. Myers, Fla., worked 3 Bay Area W6s and W7HEA, Milwaukie, Ore., at about this same time.

At 1443 PST, K6EDX heard DX signals from the West, and raised JA1AUH, Tokyo, Japan, at 1452. This is believed to be the first U. S. to Japan 50-Mc. QSO.

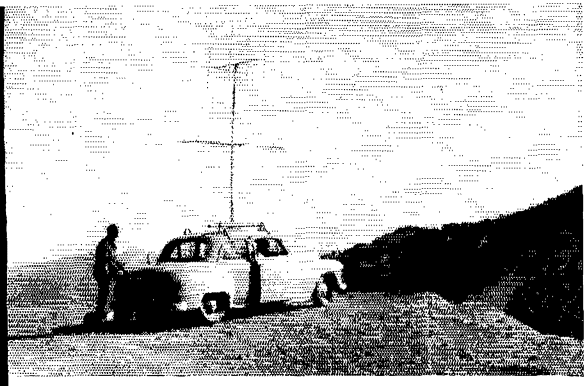
The band was hot again on Sunday, the 28th. W4GJO worked 13 W6s between 1100 and 1130 EST. Some South American DX was worked, though we have few details as yet. W5VY, San Antonio, Texas, worked PZ1AE, Surinam, for country No. 16 on 50 Mc. Back-scatter (indicating F2 DX potential) was reported in nearly all parts of the country. W9SWH, Ft. Wayne, Ind., worked PZ1AE at 0900, and reports many others did likewise.

The m.u.f. was running high early in November, with European TV, facsimile and other signals rolling into the Northeast at frequencies as high as 53 Mc. The band opened to Europe daily around 0730 EST, but up to press time no contacts had been reported. W1HDQ was heard in France by F3CT and F8OL Nov. 7th and 8th. Cross band tests with Europeans on 28 Mc. were started Nov. 11th.

That section total of 21 took some doing, with conditions near the minimum practically all the time. W2ONV, also of Northern New Jersey, worked 198 stations in 15 sections on 144 Mc., for 2970 points.

Activity on 50 Mc. was probably the most widespread in any v.h.f. contest to date. We'll have a breakdown on band use in the final report, but the growth of 6-meter activity is obvious from a look through the reports. W1HOY, Medfield, Mass., worked 199 different stations on 50 Mc. in 12 sections, for the country's top 6-meter score. Helen also thereby takes top Technician honors. W8INQ and W8SVU worked 67 and 66 stations, respectively, on 50 Mc. from Ohio.

K6GWE/6, the V.H.F. Expeditionary Society, operating from a high spot near Redwood City, Calif., worked 86 stations on 50, 77 on 144, 11 on 220, 4 on 420 and 1 on 1215 Mc., to post the top western score, 3724 points. An outstanding West Coast home-station score was that of W6BAZ, Santa Rosa, who worked 109



Nevada was represented by W6GCG/7, operating atop Mt. Rose, 10,800 feet above sea level.

stations with a multiplier of 18, for 2106 points. W6MMU, Los Angeles, went section hunting, and worked 7 out of 8 California sections, a feat perhaps never equalled by a home station in the Los Angeles area working on 144 Mc.

Scores, in themselves, are meaningless, unless they are compared with what others in the same area accomplished. By this standard, W9KLR, Rensselaer, Ind. (operated by W7VMP), led the way in a large area, with 151 contacts on 50, 144 and 220, in 18 sections, for 2754 points. W4UMF, Falls Church, Va., was away out in front below the Mason-Dixon Line, with 161 in 24, on 3 bands, for 4080 points. W8RMH, Pontiac, showed the way in Michigan, with 151 in 15, for 2310 points. W7LHL, Seattle, racked up 99 contacts on 50, 144 and 420 Mc., for 735 points. W7PUA/7 worked 90 stations on 5 bands, including 10,000 Mc., for 927 points. Low in points, but significant as to activity, W5FEG, Dallas, found 32 stations to work on 50 Mc., all in his own North Texas section.

The country's highest station was W6GCG/7, on the 10,800-foot summit of Mt. Rose, Nevada. W6GCG and K6DTR arose at 4 A.M., drove to Tahoe City, where they picked up W6CUB, and then to the summit of Mt. Rose. They were set up (see photo) just in time for the start of festivities Saturday afternoon, and operated until 2100. Being the only known Nevada contestant, W6GCG/7 was plenty busy, and they provided first Nevada contacts for quite a few of the W6s worked on both 6 and 2.

Some contestants complain that we do not give the contest enough advance publicity. The answer to this is that too many v.h.f. men do not read *QST* carefully enough. The contest dates (all contests and other operating activities) are published each month, for five months in advance, in a feature of *QST* called the ARRL Activities Calendar. It is printed in boldface type in the Operating News section. Learn to look for it, and plan your operating program accordingly. Notice is also given a month ahead, in the form of an official Bulletin, a copy of which goes to all ARRL-affiliated clubs. Next v.h.f. activity is the Annual V.H.F. Sweepstakes, the week end of Jan. 5th and 6th. You and your club will want to get into this with both feet. Full details in January *QST*.

As an indication of current 50-mc. activity, they found more stations to work on 6 than on 2

♦

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

As this is written, the m.u.f. is rising to the point where it is important to watch it daily. All indications are that, as the chart reproduced last month predicted, the curve is following the 1946 pattern. The big difference, this time, is that we have some idea of what we are about. In 1946 we were still looking for our first F_2 DX. The 6-meter population of the United States was low (we'd had the band less than a year) and in other countries it was almost nonexistent.

Today, with the exception of Europe and Australia, we find 6-meter activity in most areas of the world, and in this country it is many times the 1946 level. Actually, we are in the second year of the current DX cycle already, a few F_2 DX contacts having been made in 1955, and many in the more favorable areas last spring. The first F_2 DX of the fall cycle was worked on Sept. 30th. W5GHL, Houston, Texas, worked LU9MA, Mendoza, Argentina, on that date, and heard CE3QG. WØCNM, Grand Junction, Colo., heard LU9MA at 1545 MST, Sept. 29th.

KP4ABN, San Juan, Puerto Rico, has been hearing South and Central American 50-Mc. stations since Sept. 7th, having logged Cuba, Mexico, Guatemala, Brazil, Uruguay, Argentina and Chile, as well as occasional signals from W5 and W6. On the air the first time the night of Oct. 14th, his first CQ netted a contact with LU3EX, followed by LU6DO, LU8AE and LU4DFN. This was between 2030 and 2050 EST. XE1GE and CO2XZ were heard, presumably by back-scatter.

W5SFW, Amarillo, Texas, is keeping skeds with ZE2JE and ZE2KM, at 1815 and 1830 GCT, making 5-minute transmissions and listening the following 5 minutes. The XEs have heard a signal on 49.8 Mc. on occasions, believed to be KC2XAX, the Cedar Rapids scatter test station.

Amateurs in countries that no longer have a 50-Mc. band are expressing interest in crossband tests. G3FXB is monitoring 50 Mc. and frequencies just below the band daily. He heard U. S. signals up to about 44 Mc. Oct. 17th. He is on about 28.3 Mc. and looking for Ws who are active on both 50 and 28 Mc. to arrange for crossband work. We have written several of the European veterans of the previous sunspot cycle peak to see if more such work can be organized.

A good check on transatlantic m.u.f. is provided by the BBC TV stations. Their Channel 1 audio is on 41.5 Mc., with the video on 45 Mc. They now have a Channel 2 station on 48 Mc. audio and 51 Mc. video. The Channel 1 signal was heard almost daily in this country in the fall seasons of 1946 to 1950. The Channel 2 station is on daily from 1500 GCT (1000 EST) on.

ZL1MO, long-time v.h.f. enthusiast of Auckland, N. Z., writes that he is watching the 50-Mc. band regularly. The ZLs are now back on the old 5-meter band, with quite a few stations using the first 100 kc. above 56 Mc. They have done crossband work with Japan, *56 to 50 Mc.*, and will try the same with Ws who can listen on 56, or will work the easier route, 28–50. Week ends, between 1900 and 2200 GCT, are the most likely times. Other ZLIs interested include UZ AHQ ABL and AFX.

W8CMS, Newton Falls, Ohio, says that an SM told him on 28 Mc. that they might get permission to do 50-Mc. work temporarily when the m.u.f. gets high. We have no official information on this, as yet.

W4IKK, Rome, Ga., caught his first F_2 DX Oct. 21st. Bill began hearing Latin American signals at 0950 EST, and he raised PZ1AE, Surinam, at 1002. PZ1AE, 50.09 Mc. was heard working other W4s just before that time, and was audible for some time after. Back-scatter from many W4s, not ordinarily readable on voice, was heard during the period when PZ1AE was coming through.

The peak of the Orionids meteor shower, Oct. 18th to 23rd, saw skeds being kept on both 50 and 144 Mc. No outstanding DX has been reported, but several observers have noted an increase in the level of 50-Mc. scatter

signals. W4HHK, Collierville, Tenn., caught a fine 30-second burst from W5VWU, Albuquerque, N. Mex., on 144 Mc., at 0100 CST Oct. 20th. W5SWV, Sherman, Texas, reports several good ones from W2NLY. W4IKK copied far more than normal during several skeds with K2ITP, who runs only 40 watts on 50 Mc. There was nothing reported that approaches the Perseids results in August, however.

An interesting possibility in connection with meteor-shower (and possibly scatter) work is shown by a report from W0CNM, Grand Junction, Colo. Having heard W7QDJ, Clearfield, Utah (only 250 miles airline, but over very high mountains), when both were aiming at the Bay Area, Bob wrote Vic for a schedule. When they aimed at one another nothing was heard, but tests with the beams pointed at the Bay Area once again produced identifiable signals from W7QDJ. The circuit didn't work the other way around, probably because W0CNM was running only 50 watts input, but W7QDJ has heard W0FKY, who runs somewhat more power. W0CNM has also heard W5KWP, Santa Fe, N. Mex., less than 300 miles in the opposite direction from W7QDJ, by the same route, via the Bay Area.

As Bob points out, such distances may not be of great interest in areas where tropospheric or auroral propagation are common, but in the high-mountain country meteor back-scatter might well be the means of working some of those hard-to-get nearby states. W0CNM and W0FKY, both practically on the Utah border, have never worked Utah on 50 Mc.!

Short-distance scatter work is also reported by W4RMU, Oceanway, Fla., W4NWB, Travelers Rest, S. C., and W4IKK, Rome, Ga. The distance from Oceanway, near Jacksonville, to the other two stations is about 350 miles. W4RMU and W4NWB have worked several times on weak-signal c.w., and signals have been heard each way with W4IKK. Signals are weak, with typical scatter characteristics, though presumably the medium in this case is tropospheric.

A great aid in promoting v.h.f. communication is a file of information on the stations within your potential working radius. With this in mind, W5PDE and W5ID are attempting to compile a directory of W5s who are active on 50 Mc. They would like the following from every *active* 50-Mc. fixed station: Call, name, mailing address, power input, type of receiver, principal operating frequencies, type and height of antenna, types of emission, usual operating times and regularly-kept schedules. Similar information is desired on mobile stations on 50 Mc. in W5, plus a list of any regular routes travelled, with approximate times when the mobile gear will be in use. The essential information on any 50-Mc. nets, including the number of participating stations, is also wanted.

It should be emphasized that only stations and nets presently and consistently active are to be listed. Send the information to Bert Runyon, W5PDE, Rt. 1, Box 123-E, Shepherd, Texas. He will sort it out and W5ID will have it mimeographed and mailed to all stations listed. No charge.

W5ID, Houston, left the air in 1921 and recently returned. He finds the good fellowship on 50 Mc. much like that of the old days, when hams worked together locally more than they do today. He suggests that a complete rig in *QST*, using 829s in the final, would catch a considerable number of 50-Mc. prospects. We welcome such suggestions. What are you looking for in *QST*?

Personal get-togethers for v.h.f. men are becoming more popular all the time. General hamfests and conventions are fine, but the v.h.f.-only hamfest is a wonderful thing for activity and good feeling. Such a gathering was held in Syracuse, N. Y., Oct. 6th, the second annual affair. More than 200 v.h.f. enthusiasts showed up, coming from points as far as Boston, Toronto, Scranton, and Northern New Jersey. Technical talks were presented by W9WOK (construction techniques) and W1RUD (meteor scatter). Plans are already under way for an even bigger party next year. Congratulations are in order to the Syracuse V.H.F. Club, for a job well done.

Activity on 50 Mc. in Lake County, Fla.: 16 stations on, with more coming. Net operates Thursday nights at 1930 EST, 50.16 Mc. There are at least 10 mobiles, and transmitter hunts are held twice monthly. Thanks to W4AYV for this info.

Another 50-Mc. net holds forth in the Detroit area each Sunday evening, according to W8VYG. Frequency: 50.55 Mc. Appearance of the first YL operator on 6, K8CZP, is counted on to bring out some others of the fair sex.

Statistics on the number of stations worked by operators in various parts of the country can shed interesting light on the state of activity on our v.h.f. bands. Here are several such records: W0FKM, Joplin, Mo., *103 different stations*

ARRL–IGY PROJECT STARTS JAN. 1st

• Have you registered for the v.h.f. propagation program? Reporting starts Jan. 1st. Get registration forms in now. Details in September *QST*, Page 15.

2-METER STANDING

	U. S. States	Areas	Miles
W1FZJ	21	6	1120
W1REZ	21	6	910
W1RFU	19	7	1150
W1HDQ	19	6	1020
W1KC8	18	6	850
W1AJR	17	6	810
W1IZY	17	6	750
W1UIZ	17	5	680
W1AZK	16	5	750
W1BCN	16	5	650
W1AFO	15	5	810
W1MMN	13	5	520
W2ORI	26	8	1000
W2NLY	23	7	1050
W2AZL	23	8	1050
W2BLV	22	7	1020
W2DWJ	21	6	720
W2OPQ	20	6	970
W2AMJ	20	6	960
K2CTH	20	7	910
W2WPB	20	6	900
W2PAU	20	6	880
W2UTH	19	7	880
W2AZP	19	7	650
K2IXJ	19	6	925
W2CBR	19	6	740
K2IEJ	18	6	745
W2AOC	18	6	660
W2LHI	18	7	620
W2KIR	18	6	—
W2RXG	17	6	675
W2SHT	16	6	650
W2PCQ	16	5	650
W3RGT	28	8	740
W3RUE	25	8	950
W3FPH	21	8	—
W3KCA	21	7	—
W3GKP	21	6	800
W3KWL	19	7	740
W3NKM	19	8	680
W3IBH	19	6	650
W3YHI	19	6	800
W3TDF	19	6	720
W3BNC	18	7	750
W3LNA	16	7	720
W4HHK	29	9	1280
W4AO	23	7	950
W4HJQ	22	7	750
W4MKJ	20	8	725
W4JCJ	20	6	660
W4IDWU	19	6	675
W4UMF	19	6	600
W4JFV	18	7	830
W4OLK	18	6	720
W4VLA	17	7	825
W4WNH	17	7	750
W4TLV	16	7	1000
W4CLY	15	5	720
W4ZBU	14	5	800
W4WCB	14	5	—
W4TCR	14	5	720
W4IKZ	13	6	720
W4SOP	13	5	680
W4CPZ	12	5	650
W4UDQ	11	5	850
W4MDA	11	5	680
W4GI8	9	2	335
W5RCI	21	7	925
W5JTI	19	7	1000
W5HEH	15	7	830
W5AJG	14	5	1280
W5ABN	12	5	780
W5QNL	10	5	1400
W5CVW	10	5	1180
W5SWV	10	3	600
W5MWW	9	4	570
W5ML	9	3	700
W5NDE	8	3	520
W5FEK	8	2	580
W5VY	7	3	1200
W6NLZ	6	3	1000
W6WSQ	5	3	1280
W6DNG	5	3	600
W6AJF	5	2	640
W6RRZ	4	2	360
W6ZL	3	2	1400
W6AJF	3	2	640
W6BAZ	3	2	400
W6MMU	3	2	388
W6ORS	3	2	365
W6LSB	2	2	360
W7VMP	6	4	1280
W7LEE	6	3	1020
W7LHL	4	2	1050
W7JU	4	2	353
W7JIP	3	2	850
W7YZU	3	2	240
W7JUO	2	2	140
W8WXV	28	8	1200
W8SFG	26	7	850
W8RMH	27	7	800
W8LPD	25	8	750
W8DX	25	8	720
W8SRW	27	7	850
W8LOF	23	8	700
W8ILC	22	8	770
W8SVI	22	8	725
W8JWV	22	8	710
W8BAX	21	8	685
W8WRN	20	8	670
W8EP	18	7	800
W8PT	18	6	610
W8ZCV	17	7	970
W8RWW	17	7	630
W9KLR	27	8	850
W9ZHL	25	8	760
W9EQC	25	8	820
W9EHX	24	7	725
W9FVJ	23	8	850
W9RPV	23	7	1000
W9GAB	23	7	850
W9WOK	22	8	860
W9UCH	22	8	750
W9UED	22	7	980
W9KPS	21	7	890
W9MUD	19	7	640
W9REM	19	6	—
W9LF	19	6	—
W9ALU	18	7	800
W9JGA	18	6	720
W9MBI	16	7	660
W9JYI	15	7	560
W9LEE	15	6	780
W9DSP	15	6	760
W9DDG	16	6	700
W0EMS	27	8	1175
W0IHD	26	7	870
W0GUD	25	7	1065
W0UOP	18	6	—
W0ONQ	17	6	1000
W0INI	17	5	830
W0OAC	14	5	725
W0TJF	13	4	—
W0ZJB	11	4	650
VE3DIR	26	8	915
VE3AIB	25	8	910
VE3BQN	17	7	790
VE3DER	16	7	820
VE3BPB	13	6	715
VE2AOK	12	5	550
VE3AQG	11	7	800
VE1QY	11	4	900
VE7FJ	2	1	365

worked on 144 Mc. in 1956, up to September. W8CMS, Newton Falls, Ohio, 380 worked on 50 Mc. up to Oct. 1st. W8NOM, Wooster, Ohio, 125 on 50 Mc. through September.

W6NLZ, Palos Verdes Estates, Calif., is back on 432 Mc., and is finding the band much like 144 Mc. was in about 1949. W6BUT, Taft, puts in a signal that runs about 36 db. over the noise. This is 125 miles, over mountainous terrain. One of the weirdest QSOs on record involved W6SRK on 1215 Mc., W6ZW on 432, K6GKX on 220, W6ONE on 144, and K6HHA on 50 Mc., all working duplex!

Reducing Spurious Responses in 220-Mc. Converters

Reception on 220 Mc. is complicated, in many areas, by the presence of strong TV signals on the high bands. If you have a TV station on Channels 7 to 13 within line of sight, you're likely to hear it (and maybe little else) on 220 Mc. Various means of improving front-end selectivity and eliminating unwanted responses can be used in such cases, but perhaps the simplest is the series trap.

W4UMF, Arlington, Va., had such a bad time from Channel 11 that he used to wait until after the station went off the air to do any listening for 220-Mc. DX. With a 10-Mc. i.f. and a broad-band front end, there was practically nothing to stop the TV signal image from showing up every 15 kc. across the lower portion of the 220-Mc. band. To rectify this state of affairs, Tom made up the simple series trap shown in Fig. 1. With it connected directly

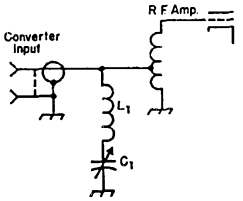


Fig. 1 — Series trap used by W4UMF to reduce image from Channel 11 in his 220-Mc. converter. Constants given below are for Channel 11. For other frequencies the coil, L_1, should be made as high inductance as possible, with C_1 tuning near minimum.

C_1 — 1.5–5-μf. miniature variable.
L_1 — 6 turns No. 12, ¾-inch diam., close-wound.

at the antenna input of the converter, and tuned to Channel 11, practically all the TV buzzes disappeared.

At least two dividends came from this simple operation. Expecting to take some signal loss with the trap, W4UMF was surprised to find signals on 220 better than they were before the trap was installed! A quick check showed that the TV signal had been biasing off the mixer, reducing the response of the converter on all signals. Still better, at least a third of the TV oscillator birdies formerly encountered have now disappeared. Apparently, quite a few had been heterodyned in by the Channel 11 emergy.

Constants given are for Channel 11, but the same method will work for other frequencies. The trap should be as high L and as low C as possible. Preferably, it should be shielded from the converter circuitry, to prevent unwanted coupling.

OES Notes

W1FVV, Windsor Locks, Conn. — First year on 50 Mc., ending Sept. 28th, netted contacts with 144 different stations in 20 states. This with never more than 50 watts output; much of it with less.

W1HDQ, Canton, Conn. — After one year of week-end schedules on 50 Mc., ample evidence has been gathered to show that ionospheric scatter is at least a marginal means of communication for amateurs. The tests made by W1HDQ (350 watts output to 3-over-3 beam, aimed southwest) were heard all the way from the Detroit area to Jacksonville, Fla., a spread of nearly 90 degrees. The tests are being suspended for the present, to permit your conductor to work on F_2 DX promotion. Our heartfelt thanks to W4s IKK NWB RMU FWH RFR and HHK for the many hours they spent in monitoring these transmissions

W0ZJB	48	W4FLW	43	W8OJN	46
W0BJV	48	W4OXC	41	W8NQD	45
W0CJS	48	W4UMF	41	W8UZ	45
W5AJG	48	W4UCH	41	W8RFW	45
W9ZHL	48	K4DJO	41	W8SQU	45
W9OCA	48	W4MS	40	W8LPD	44
W6OB	48	W4FNR	39	W8HJR	43
W0INI	48	W4IUJ	38	W8YLS	41
W1HDQ	48	W4IKK	38	W8PCK	35
W5MJD	48	W4RFR	37		
W2IDZ	48	W4AKX	36	W9BRN	48
W1LLL	48	W4AYY	36	W9ZHB	48
W0DZM	48	W4NWB	35	W9QUV	48
W0HVW	48	W4GJO	35	W9VZP	47
W0WKB	48	W4AZC	31	W9RQM	47
W0SMJ	48	W4ZBQ	34	W9ALU	47
W0OGW	48			W9QKM	47
		W5VY	48	W9IUA	45
W1VNH	47	W5SFW	47	W9UNS	45
W1CLS	46	W5LFQ	47	W9MFH	42
W1CGY	46	W5GNQ	46	W9JFP	42
W1LSN	46	W5ONS	45	W9JCI	41
W1AEP	46	W5JTI	45		
W1DJ	41	W5ML	44	W0ORE	48
W1RFU	41	W5FSC	44	W0QIN	47
W1FOS	40	W5JLY	44	W0NFM	47
W1ELP	39	W5JME	43	W0TKX	47
W1SPX	36	W5VV	42	W0KYF	47
W1UHE	32	W5FAL	41	W0MVG	47
W1WAS	23	W5HEZ	41	W0JOL	46
		W5BXA	41	W0TJF	44
W2MEU	47	W5HLD	40	W0URQ	44
W2AMJ	46	W5FXN	40	W0JHS	43
W2BYM	46	W5EXZ	38	W0IPI	43
W2RLV	45	W5HFF	33	W0CNM	42
W2FHJ	45	W5N8J	32	W0FKY	42
W2RGV	44	W5ZVF	31	W0PED	41
W2GYV	40			W0ZTW	41
K2JN8	40	W6WNN	48	W0USQ	40
K2AXQ	39	W6UXN	47	W0ZTW	36
W2BHV	39	W6TMI	46	W0VIK	35
W2QVH	38	W6ANN	45	W0WNU	34
W2ZUW	37	K6EDX	42		
W2ORA	36	W6IWS	41	VE3AET	45
K2HPN	36	W6CAN	40	VE3AIB	35
K2ITQ	33	W6ABN	39	VE1QZ	34
K2HRB	31	W6GGQ	35	VE1QY	32
K2ITP	31	W6BWG	33	VE3DER	31
		W6OJF	31	VE1EF	28
W3OJU	47	K6GTG	30	XE1GE	27
W3TIF	45	K6ERG	27	CO6WW	21
W3NKM	41			VE4HS	20
W3MQU	41	W7HEA	47	CO2ZX	16
W3OTC	40	W7ERA	47	LU9MA	11
W3FPH	40	W7BQX	47		
W3RUE	41	W7FDJ	46		
W3KMV	39	W7DYD	45		
W3MXW	38	W7ACD	45		
W3LFC	37	W7JRG	44		
W3UQJ	28	W7BOC	42		
		W7JPA	42		
W4FBH	46	W7FIV	41		
W4EQM	46	W7CAM	40		
W4CPZ	45				
W4QN	44	W8CMS	47		

Calls in bold face are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified reports.

and reporting in detail on their results, and to the scores of others who heard the scatter signal at random times and took the trouble to let us know about it. The signal was reported in Michigan, Ohio, Illinois, Indiana, Kentucky, Arkansas, Tennessee, Alabama, Georgia, Florida, South Carolina and Virginia. This with the band not "open!"

K2GCS, Eatontown, N. J. — Single-side-band rig for 50 Mc. under construction. W2NCF and W2WCM also building s.s.b. gear for 6.

W2TTM, South Amboy, N. J. — Sunday morning skeds on 50 Mc. with W1AEP, Springfield, Mass., kept since June. Distance is 140 miles. No doubt about it — morning is the time for this sort of thing. Several members of Central N. J. V.H.F. Society building solar flare indicators. (Aug. *Radio-Electronics*). Might be interesting project for 50-Mc. DX men and 144-Mc. aurora enthusiasts.

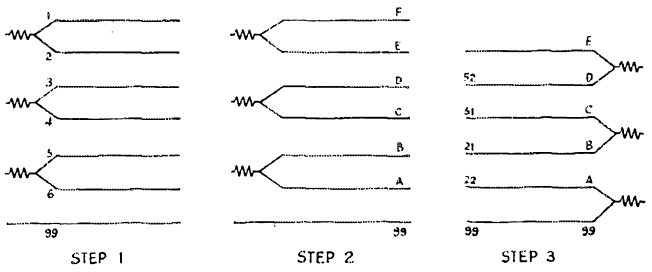
W4IKK, Rome, Ga. — Scatter tests with K2ITP, Riverton, N. J., show that 40 watts input and single 5-element Yagi (setup at K2ITP) can provide identifiable c.w. signal. Raising 3-over-3 beam above treetops made larger improvement in scatter signs than had been expected. Also helped on aurora, which seems to occur this far south more often than most people realize. Improvement on tropospheric

(*Continued on page 182*)

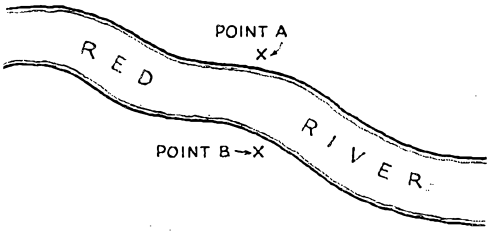
QuistQuiz

Did you get the answer to the 99-conductor cable problem in November? If you came up with more than two trips (one round trip) you worked too hard on the job. Here's how it's done:

Start at one end of the cable and number each conductor consecutively. Then temporarily connect 1 to 2, 3 to 4, 5 to 6, and so on up to 97 to 98. 99 isn't connected to any other conductor. Put on your wings or warm up the 'copter and get over to the other end of the cable, remembering to take along your "ringer" or other continuity checker. By running through the wires at that end you can find the pairs and the single (No. 99) through the process of elimination. Label the pairs AB, CD, DE and so on. (Yes, we know; you will have to use some double-letter designations.) Now connect No. 99 to A, B to C, D to E and so on. Get back to the other side and disconnect those temporary connections. You know wire No. 99 already; the wire it rings through with is marked A at the other end. Let's say it is marked No. 22 at this end. Find the wire No. 21 (B at the far end) rings through with. It must be marked C at the far end, and it may be No. 51 at this end. No. 52 must be marked D at the far end; the wire it rings through with is E at the far end, and so on. If you aren't thoroughly confused by *now*, perhaps the sketch will help you (to become thoroughly confused).



THIS MONTH'S QUIZ

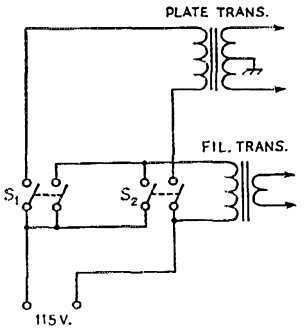


Calvin Scott, K6JOD, submits a problem that a few old timers may be able to answer, and even some of the young ones may come up with the solution. The problem: In the accompanying sketch, the object is to establish telephone communication between point A and point B on the Red River (100 feet wide, approximately). It is impossible to run a wire over the river, and it is impossible to have a cable buried in or under the river. It is also impossible to use radio, light beams, p.a. systems, and ultrasonics.

Sounds impossible, doesn't it? But there is a way.

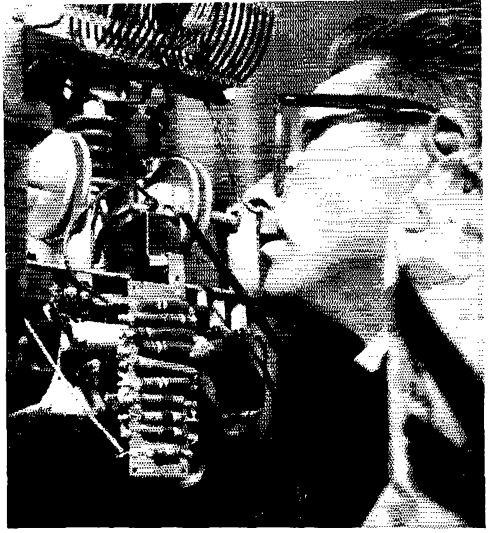
—···—

Willard Waite, W8GDQ, points out that we could have observed the safety code a little more closely by revising the October answer to the circuit shown below. By using a switch in each leg of the plate transformer, there is less chance that an accidental ground can turn on plate voltage when the rig is shut down for repairs.



Strays

W3FIT reports that he was recently on the air using the phonetics "France, Italy, Turkey" when he was forced to QRT by the sudden arrival of a police squad car and an emergency patrol wagon. It seems that one of W3FIT's neighbors, hearing the transmissions on a TV set, thought he had uncovered an international spy ring operating from the U.S.A. to France, Italy and Turkey. After investigation, the police advised the neighbor that instead of the FBI, he should call the local TVI Committee.



In *TIME* magazine a few weeks ago there were reported some of the doings of a "disc-less" disc jockey named Red Blanchard. Mr. Blanchard's activities were further recorded in both *LIFE* and *TIME* back in 1953 in connection with a radio show he was doing in San Francisco, and in professional life he is the head of Red Blanchard Productions, of North Hollywood, Calif. He is perhaps better known to *QST* readers as W6UYG/QYR and single-sideband author. As a result of the recent publicity in *TIME*, W6UYG has been kept rather busy answering the phone, as shown. At the left he is shown in one of his more serious moments, inspecting the final of his mobile rig. Regarding his musical activities, he wishes to be quoted as follows: "I have nothing against rock and roll, as it is only a combination of blues and Oakie music, sung with a slurred, unreadable delivery, preferably covered up with loud electric guitars played with burnt-out 807s for picks, to give that glassy-eyed effect to the music."

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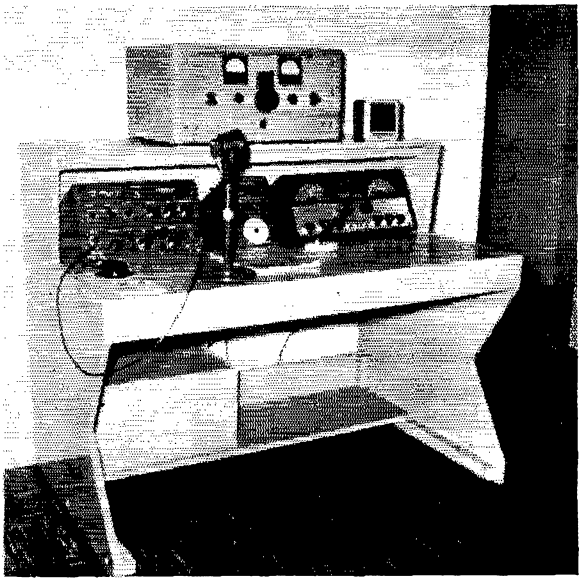
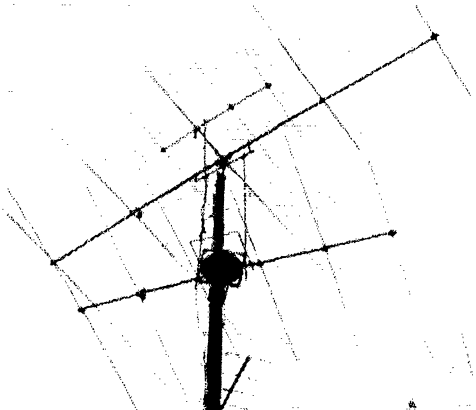


Here's another operating console that was designed with operating convenience in mind. W7EBG built it almost entirely out of ¾" plywood, with strips of 2 × 2 along the bottom edges for caster supports. It is assembled with bolts so that it can be readily dismantled for shipping. Overall dimensions are 48" wide, 40½" high, with the horizontal desk top 16" wide and the sloping portion 15" wide.

»



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There oughta be some sort of a prize to the person who can correctly identify all the antennas shown in this photo. W3MSK would have to be ineligible, of course, because that's his mast. Anyway, included in this array (ha!) are a 4-element 10-meter beam, a 5-element 20-meter beam, a 6-element 15-meter beam, and a small beam on the side for 2 meters. The pole is 60 feet high.

«

QST for

YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

W3PVH

W3YTM

W3MSU

W9UXL

YLRL Election Results

The new officers of the Young Ladies Radio League, who assume their duties January 1, 1957 are as follows:

President Betty Frederick, W3PVH, of Acme, Pennsylvania, is the wife of W3NBN and the mother of three small sons. Licensed in 1949, Betty operates several bands and particularly likes DXing and YLRL nets.

Vice-President Mildred Wright, W3YTM, can be heard almost every evening on 40 c.w. around 7050 kc. The second place c.w. winner in the 1956 YL-OM Contest, Mildred lives in Montrose, Pennsylvania. Her OM is W3RRI.

Treasurer Ethel Smith, W3MSU, knows the YLRL well, for she organized the club in 1938 and was its first president. The retiring president of the Washington Young Ladies Radio Club, which she also organized, Ethel instructs a class in radio theory for the Naval Reserve and is Treasurer of the local Chapter of the Society of Women Engineers.

Publicity Chairman Lois Zehr, W9UXL, was licensed as a novice in 1952 and became general class in short order. The XYL of W9OQI and the mother of twins, Lois has RCC, WAS, YLCC, and Code Proficiency Certificates.

Lolly Keller, W3VLX, continues for a second term as Secretary. Peg Ferber, W3RXV, starts her third term as Editor of the YLRL *Harmonics*.

District Chairmen

First — Grace Swenson, W1RLQ
Second — To be announced
Third — Barbara Houston, W3OQF
Fourth — Pearl Milholland, W4AJV
Fifth — Cindy Dougharty, W5ZPD
Sixth — Gladys Eastman, W6DXI
Seventh — June Truax, W7RAX
Eighth — Beth Koch, W8RIR
Ninth — Mary Meyer, W9RUJ
Tenth — Helen Kagen, K0BFS
VE — Ethel Williamson, VE3DTW

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

You probably won't find W1ZID under your tree Christmas morning, but we hope this picture of the charming Anne of *QST* headquarters staff will convey our very best wishes to you for a happy holiday season.

Becoming a ham in 1952 spurred Suzanne Curry, W4VTO, on to her present electrical engineering studies at the University of Florida. Suzanne frequently uses the university club station, W4DFU, for schedules with her mother, W4AGX, in Balsam, North Carolina. The photo is courtesy of OM W4CKB who, hearing about Suzanne from a fellow college ham, telephoned her and told her he owned a YLRL YL Century Certificate, which he figured would entitle him to a date. It did!

KH6 — Jeanette DeLong, KH6AFN
KZ5 — Virginia Harvey, KZ5VR
KL7 — Nancy Walden, KL7ANG

W3OQF is the new custodian of the YL/Worked All Continents Award. QSLs should be sent to Barbara Houston, W3OQF, 109 Seneca Drive, S.E., Forest Heights, Maryland. Appointment of a new custodian for the YL/Worked All States Award will be announced.

Outgoing officers W9LOY, President; W9YBC, Vice President; WØMMT, Treasurer; and W1TRE, Publicity Chairman, served capably and faithfully. Congratulations and best wishes to the old and the new officers.

—···—

W1ZPR, W2KEB, W3GZS, W4BIL, and ZS6AQF should be added to the list of YLs who are Registered Nurses. (See August and October '56 columns.)

Keeping Up With the Girls

Clubs:

Washington YLRC: The club has offered to plan the program for YLs and XYLs at the ARRL National Convention to be held in Washington in 1958. New officers are Pres. W4TVT; Vice Pres. W3RXJ; Secy. W3TSC; and Treas. W4ETR.

Chicago YLRL: At the September meeting Pres. W9DXI gave a slide illustrated talk on the earth, planets, and ionosphere, the first in the season's program of thirty-minute talks to be given by club members on various subjects relating to radio.

Los Angeles YLRC: Some 60 YLs enjoyed the tenth anniversary meeting of the club on October 13th. W6TDL, Clara, was presented with a gold gavel pin in appreciation of her efforts in founding the club a decade ago. Seven of the eight charter members were present: *W6s* DTL, NZP, TCN, UHA, UXF, WRT, and WSV. Guests included W7MUT, Sister Charlotte, the XYL of VK2US, and visiting YLs from San Diego and Northern California. W6NZP, Evelyn, and her OM entertained the girls with their collection of color slides taken during their recent extensive travels in the Far East.

Get-Togethers:

W8LGY reports that the following YLs got together for a pleasant rag-chew at the Findlay, Ohio Ham picnic in September: K8ACY, *W8s* HUX, IAA, MBI, OSD, OTK, RVP, RZN, TBT, VJO, and VZR.

Fifteen YLs and 25 XYLs enjoyed a meeting at the ARRL New Hampshire Division Convention at Concord, arranged by N. H. YLs *W1s* KGV, WVT, and WN1KNB. *W1s* RLQ, TRE, and VYH spoke on the YLRL and the Women Radio Operators of New England.

Twenty-six YLs attended a meeting of the Women Radio Operators of New England at the ARRL N.E. Division Convention in Providence, Rhode Island, on October 21st. The Rhode Island YL Club served as hostess club. At the YLRL meeting on the same program, *W1s* TRE and VYH initiated some twenty new members of the Suffering Wives of Operators Protectorate.

Awards:

W4HLF has six endorsements on her YLCC #4 (50 YLs per endorsement), and Arlie is almost ready for a seventh. . . . Code Proficiency Certificate (25 w.p.m.) and ORS for K2DSL. . . . YLCC to W7YFQ. . . . WAS to W3MDJ. . . . WAC to W1YPH.

Operating:

Newly-licensed ZS6AQM, Yvonne, of the Transvaal, is active on 40 c.w. . . . ZS6KK, Marie, now has 138 confirmed for DXCC. . . . Members of the YLRL net conducted by K2IWO Thursday at 9:00 A.M. EST on 7215 kc. voted to call the net the "Friendly Forty." The net has had 101 check-ins from 25 states and 2 VE districts. . . . From VE3AJR and W6NAZ we hear that OM JA8AA, who already has his YL/WAC, is trying for YLCC and looks for

(Continued on page 148)

W9UNY and her OM W9DWH are a pair of C.W. Hamms. Work Charlotte W. and Carl W. Hamm of Milwaukee, Wisconsin, and you'll receive their personal Worked All C.W. Hamms certificate. (W4NYX is a C.W. Hamm too.) Charlotte likes to use her Elmac AF67 and SX71 on the high end of ten, particularly when there is DX and short skip about.

HOW'S DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Why:

Time out for fundamentals? Fine. . . .

Certifications (confirmations) of QSOs are commonly known far and wide as QSLs. Obviously, the only person who can so certify communication with a station is that station's operator, or a person in possession of his log or transcript thereof. QSLs — QSO-certificates if you like — thus can be considered *primary* QSO certifications. Such primary certification is indispensable because it sifts out (1) error in call signs, (2) illegitimate QSOs plus contacts with illicit call-borrowers, and (3) "mental QSOs" claimed through wishful thinking under stress of QRM, QRN and QSB. With no reflection on his honesty, so much of this goes on that a DXer's unconfirmed countries have only academic significance.[1]

Now, then, when primary certifications are used to certify performances on the order of DXCC, WAC, WBE, *et al.*, we derive what can be termed *secondary* QSO certification, the point of this précis. These "awards" come in all colors, shapes and sizes from far corners of the globe and they number in the hundreds. Recent research by Denmark's EDR and OZ2NU produced specs on 197! Some are easy to obtain, some are difficult (some indeed impossible), some are costly and some are free. With or without fanfare, new certificates are announced in steady stream.

Why so many secondary certifications? Mainly, it's a case of radio groups and societies striving to keep up with the Joneses. Certifications of world-wide availability reflect promotional publicity on their sponsors in proportion to the popularity of the awards. Also you will note that almost every one is designed to promote QSOs with stations within the bailiwick of its sponsoring group or society.[2]

And why the instability, the output of never-ending rules revisions, among so many foreign DX awards? Well, in the first place, devising such a certification is a tricky proposition. Unless the spadework is carefully done, the initial version of a DX award is likely to be too easy or too difficult. The first possibility is most serious for it may incur a flood of applications far beyond the sponsor's administrative capability, begetting more ill will than favorable publicity. Then, too, developments subsequent to the establishment of an equitable award may force rules changes. This is why "How's" regularly urges you to correspond *with the source* of any non-ARRL certification to get complete up-to-date details before you apply. Otherwise, after knocking yourself out to work, say, six UH8s you may find to your dismay that you really needed only three UH8s, or that the requirement has been upped to a dozen, or that the award is no longer available.

This accumulating miscellaneous DX certifications is a barrel of fun; very much like cashing in white chips for red chips, red for blue, etc. But remember that certificates — *any* certificates, including U. S. dollar bills — are worth only so much as stands behind them. For fee or free the Podunk Heights Radio Club, with membership of two, can certify your QSLs for any feat from Worked-All-Lids to Heard-Everything-Now. Yet if your friends are unaware of the PHRC, its authority in such matters, and its administrative rectitude, you can't very well expect them to swoon at sight of the outfit's wallpaper. So ascertain that the certifications you would lose sleep over really *are* worth your time and IRCs. Then, good huntin'!

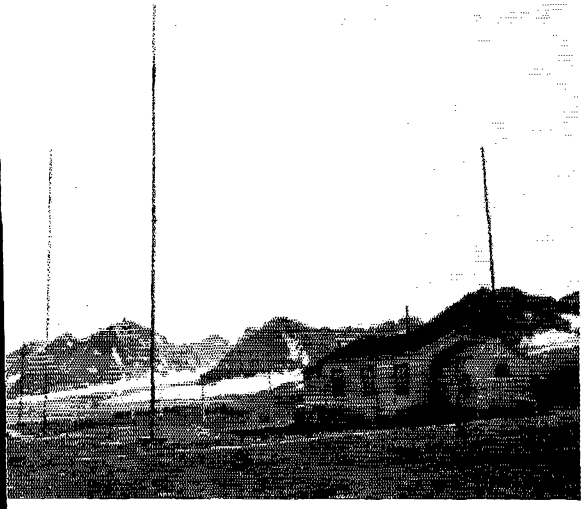
What:

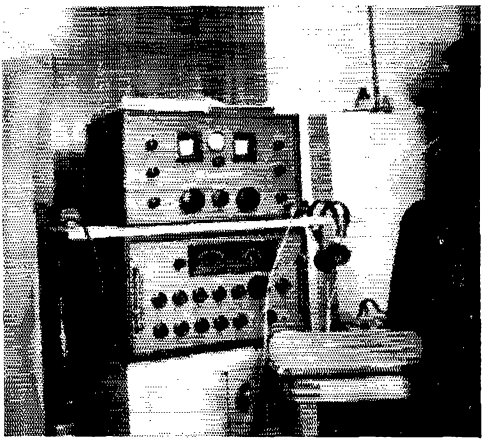
Surprising nobody and delighting everybody, our h.f. bands DXploded in a blaze of brilliant October and November openings. From the low edge of 80 to the high end of 10 the clash and clatter of skip and scatter battered headset diaphragms and 'speaker cones from Times Square to Tannu Tuva — it was *great* to be a ham!

*4822 West Berteau Avenue, Chicago 41, Illinois.

[1] For example, fast-sending CO6AJ, under widespread 14-Mc. wishful thinking and mass delusion, was worked by dozens of Ws in 1950 as KJ6AJ. He was active in the mornings and his customers evidently had no beams, or disregarded them. Outcome? Many an unconfirmed "country worked."

[2] In this aspect ARRL's DX Century Club certifications are unique: Any ham in the world can qualify for DXCC without QSOing a single station in ARRL field areas. (For more on DXCC see p. 53, February 1955 *QST*.)





Blanks adjacent to "Svalbard (Spitzbergen)" were joyously filled on many ARRL DXCC Countries Lists during August 3rd–16th when SM5KV invaded Spitzbergen as SM8KV/LA/P. At QRT-time 772 c.w. and 277 phone contacts had been recorded on bands 80 through 10 meters. All Yank call areas were worked, plus one lucky Novice, KN6OPI. SM5KV QSLd 100 per cent within two weeks of return home but invites further inquiry on the matter. Regarding the operating position at right, above, Olle (left) writes, "Kept log on my lap all the time. Try this yourself!" Then, just two days before SM8KV/LA/P closed down, our 1956 DXpeditionary spotlight swung toward VQ1JO (ZE3JO) who remained active on Zanzibar until August 30th, logging 350 QSOs with 45 countries. These two outstanding performances climaxed a year of DXpeditionary doings which saw such rarities as both St. Martins (see p. 48), the Revilla Gigedos, Aves, South Sandwich, the Comoros, Andorra, Crete, Rhodes, Liechtenstein, Luxembourg (see p. 44), Monaco and San Marino radio-activated by roving DX men. Verily, *per aspera ad astra*, DXCC!

20 c.w., ever No. 1 on the Dit Parade, supplied lyrics for tunes whistled by a colossal chorus. Callphabetically, *W1BPW* raised: Liechtenstein HB1s MX UE, **YS1**O (14,045) 22 GMT, **ZB2Q** (45) 0, *W1DBA:* **CX6**AD (25) 3, **HA4**BT (40) 5, **HH3**DL (15) 3, **KV4BO** (65) 3, **LZ2**KCS (62) 2, **SP9**s EU KAT, **TF2**WBG (15) 2, **UA9**DX (85) 1, **YO3**LM (15) 1, YV5FT (60) 1. *W1LZE:* **FB8BR** (60) who looks for Vt. W1s each Saturday at 11 GMT, **VQ8**AB (60) 13. *W1OJR:* 170/141, **CR4**AH (62) 23, **FE8**AE (48) 21, **FG7**XD (92) 6, **JA**s 1BE 5AA, **OQ5**CB (100) 21, **PJ2**ME (40) 20, **ST2**NG (30) 23, **SV1**SP (50) 4, **UA9**s DN DX, **UA0**s KAA on Dickson Island (20) 21, OM (70) 0, **UI8**KAA (60) 3, **VK9**TW (72) 11, **VS1**s GV (88) 11, GZ (18) 11, **YU2**AC (62) 0, W4EMF/**KS4** (40) 21, **YJ1**RF (48) 11, **ZD8**s 1FG (38) 23, 3D (10) 21, **3A2**BH (55) 2, **4S7**LJ (20) 1, **4X4**CJ (10) 2, **9S4**CM (25) 23 on Viking II, NC-125, 2-el. Minibeam. *W1PYK:* **OY7**ML (35) 5, **SP8**CK, **UB5**IE, via Ranger. *W2GVZ:* Crete's **SV0**WN (34) 23, **VR2**AA (32) 10. *W2HMJ:* **JA8**AA (70) 12, **KA7**HH (65) 11–12, **OY5**S (61) 21, St. Martin, **UA9**s AA KUA VB all 2–4, **UA0**KJA (82) 3, **UI8**KBA (80) 2, **UJ8**AF (53) 1–2, **UL7**CB (52) 23, **VQ2**GR (65) 13, **VS6**AE (33) 11–12, VK9 VR4, **4S7**s PT WP (32) 11–12, now has three Galapagos HC8s. *W2IVS:* **KX6**BU (22) 6, **UA9**CM (79) 5, **UR2**KAA (35) 7, **VR3**B (54) 4, nearing 100. *K2BZT:* **CR7**BS (29) 22, St. Martin, ST2, **UA9**YE (30) 2, **UD6**s BM DD (40) 3, UI8 UL7 UR2, **VU2**KM (47) 0, **YI3**AC (32) 2, **YJ1**AA (6) 20, **ZA1**AB (9) 10, ZD1 ZD3, **ZD9**AE (52) 21, 3A2, **4X4**IO (69) 21, Liechtenstein. *K2ENO:* **EA8**BF (68) 5, OKs, **YU1**DP. *K2EQD:* **LZ1**KPZ (38) 21, St. Martin, VS1 VK9 VR3 UR2, **UA9**KYB (38) 4. *K2GFQ:* YA1AM (55) 22, **ZS9**P (55) 22. *K2PIC:* **FE8**AG (40) 21, **KG1**AG, **KJ6**BP, St. Martin, **UA0**KQB, **VK9**OQ, **YI2**OT (40) 4, **ZB2**R, ZD3. *W3LMM:* notes W3MNG's sked with YA1AM. *W3TYW:* **FA8**SB, WASM's SM1BVQ, **UO5**CA (71), **ZS3**AC (81). *W3UXX:* **PJ2**CD, **PZ1**AP, **VQ2**DC, **YN1**CAA, **YO8**CF. *W3WGH:* CR7 VR3 VR4, **FF8**BT, **FG7**XC (12) 8, **VQ2**GR 2, **3V8**AN, now 106. *W3YUW:* CR7, **EL2**L (5) 0, **UB5**UA, **UC2**KAB (20) 21. *W4AUL:* FE8 FR7 OY VR3 UA9. *W4CYY:* **HI8**WL (QTH Aug. *QST*), **VR2**AK (YL?), YJ1. *W4GCB:* HH UA9, Luxembourg, **CT2**BO (30) 0, **YO2**KAB. *W4NBV:* Luxembourg, VR4 VS1 VS6 UR2, **UA0**KCA (38) 9, **LZ1**KAA, **SP6**BY, UAs YJ1. *W4SAH:* **KC4**USA, **LX1**DA, **UN1**AA (36) 3, **UO5**KBR 6, **XZ2**OM, one ZD8FC, **9S4**BN, TF UR2. *W4USM:* KJ6, **KX6**BP, **SP1**KAA, VR3, antarctican **UA1**KAE. *K4HNA:* **HA5**KBK, **SP3**PH. *W5JPC:* KJ6 VR3 VR4 for 108 worked. *W6IIM:* **DU7SV**, **FB8YY** (86) 6 in IGY-land. *W6RZS:* **CR6** 6A1 7LU, KX6NC/**KC6** (46) 11 of E. Carolines, SV1AB (36) 1, **VQ5**GC (67) 15, **YO8**MS, **9S4**AL. *W6S UQ:* **FF8**BL, OQ5RU (85) 16, **VS4**FC (10) 15, **UA9KA**B (95) 16, **ZC5**SF (13) 16, **ZS3**HX (17) 14, EL HE ZD3. St. Martin, now 135/101. *W6WLY/Ø:* **CN8**AF, **LZ1**KSP, **SU1**IM (70) 4, UC2 YJ1. *K6DNH:* **HA8**WS, **KC4**USV (50) 14 of McMurdo Sound, **LZ2**KST, **VQ4**EF (26) 15, **VU2**RM (73) 14, OQ VK9 VR3 VQ5 4S7, 140/116. *K6EYT:* **BV1**US (50) 12, **CP3**CA 18, **EL2**S, **FB8**s BX (74) 15, ZZ (30) 14 of Amsterdam Isle, GD3FBS (10) 15–20, **HI8**FR (78) 23, **KR6**RY, **OQ5**BB (35) 14, **UP2**KBC 18, **VK1**RW (121) 13 on Cocos-Keeling, **VQ2**BII (47) 15, **VU2**JK (58) 15, **ZB1**BF (80) 17, **ZC4**IP (33) 15, **ZD2**GWS, **ZK1**BS (85) 14, **ZSs** 3AC (56) 16, 3VC 7D, **4X4**GC (80) 15, **9S4**AX, UAØ UC2 UR2 VS4 ZC5 ZD9, now 131/90 with fast QSL from HR2AD. *K6HFA:* **JA2**AW, **KR6**QW (90) 15, **JZØ**ADM (60) 15 formerly PK7ADM, YV5HL (75) 7, VR4, YL ZS1RM for distaff WAC. *K6JQJ:* **FL8**AB (35) 16, **HZ1**HZ (89) 14, **I5**RAM (27) 15, **UG6**AB (32) 15, **VK1**IJ (103) 15 of Macquarie, **ZS9**R (64) 16, ZA ZC5. *K6KII:* **JAs** 3AB 7AD. *W7DJU:* **JAs** 2DA 3BN 3TT 4BB 9AA, UAs and UA9, one VS9A, SP, with 50 watts. *W7VRO:* **DM2**ACB, **FK8**AL, **HA5**BT, SLs 2AD 3AG of Swedish military, UAs galore, **UB5**s CU KAB KAG KBA KCA KEP, **VQ2**GW, YO3VA, KG1 UA9 UI8, fast 55 worked. *W7YAQ:* UAØ. *W7YKQ:* one AC4LP (90) 9, KA3CY (80) 7, **DM2**ADL (60) 6, **UA1**KAP, with Elmac AF-67 50-watter. *W8IBX:* **XE1**RM (15) 1-2. *W8KML:* **EA9**DF (80), UA1KTO/FJ (75) 15 of rare Fridtjof Nansen Land, **UL7**KBA (30) 4, UI8s, ZA. *W8YIN:* M1PDN, **ZD2**ROC (40) 23-0, UA9s, UJ8 ZD1, now 209 bagged. *W9AA:* 80-meter traffic respite for **ZS6**EX. *W9APY/9:* **CR6**CK (64) 0, **LZ1**KBL, **OY1**R (20) 12, **SP9**EC, **UA9**CC (45) 4, **VP8**BS (49) 0 of So. Shetlands, VQs 2RG (72) 7, 4DT (72) 23, **VS6**CG (10) 11-12, **ZD2**DCP (40) 21, FB8 FE8 I5 UI8 VQ5 YJ1 4S7, St. Martin, now 83/61 in Indiana. *W9KXK:* **AP2**RH (25) 13, **KB6**BA (80) 8, **UA0**s AD OE, CT2 PX UI8 VR4 ZD1 ZD3. *W9PNE:* **YO3**RD, YJ1. *W9UBI:* CR6, CX6CM, KV4BO, UAs, **UL7**KAA 9. *K9AGB:* swiftly 77/33 on EA9AP (62) 10, 23, **CN8**s BK MN, **CR6**FC, **CR7**CI, **CP3**CD, **CX1**BZ, **HC1**LE, **KG1**FR, YO2KAC, 4X4FA, CT2, DU VR4 VS1 YA1, on 250-watt linear final. *WØNLY:* **KG6**BU. *WØVKE:* **CN2**AY (8), **FO8**AY (76), **FY7**YE (40) 0, **ZD6**BX (85), EA8 HI KS4 JZØ VR3, St. Martin. *VE1PQ:* **CR6**CW (60) 20, **CR4**AG (30) 22, **EA6**AW (45) 22, **FK8**AO (90) 10, **FM7**WR (100) 10, **FY7**YB (40) 12, **JA1**s CC DO, KA2PG, **KG6**FAE (60) 10, **KR6**s AP (80) 11, SC (80) 9, **LU8ZB** (100) 23, **OY2**H (25) 0, **UN1**KAA (30) 11, **VP8**BW (83) 0, **VQ8**AG (30) 19, **ZC4**BX (20) 18, **ZP5**AY (79) 20, KB6 FL8 HI PZ1 UA9 UI8 UL7 VK9 ZB2, Crete, St. Martin, now 183 hooked for Doug. - - - - No. Calif., So. Calif., West Gulf and Willamette Valley DX Clubs volunteer the following additional 14-Mc. A1 actives for your stalk lists: **ACs** 3SQ (18) 12-13, 5PN (50) 7, **AP2**s AD M PR all (40-50) 14, **CE9AW** 2, **CRs** 6AM 7CO 7CS 7CZ, **EAs** 6AM (59) 6,

9BJ (95) 0, ETs 2US (78) 23, 3AF (70) 4, 3LF (69) 3, F9SG/FC (30) 3, FB8BK (62) 4, FF8BQ, FM7WD 5, FO8AB (109) 7, FQ8AF (60) 16, GC2FZC (80) 6, HC8GC (21) 4, HH2Y (110) 3, HK3TH (18) 1, HZ1AB 15. Trieste's 11BLF (26) 1, KA0IJ (25) 13 of Iwo, KC6UZ (72) 11, KG6AGC (51) 7, KM6FAA (76) 8, KW6s CA (21) 7, CB (65) 9, LU4s ZS (30) 3, ZV (50) 1-2, OD5s LJ (62) 4, LX (30) 3, OQ5CP (37) 15, PZ1AH (45) 20, SU1IC (10) 16, SV1SM (56) 4, UA9s HD M1 KDL KEC KOH KTT, UA0s AD CD KAD KFE KOA PA SK all 7-14, UC2s AA KAA 13-14, UD6s AL KAB 15, UF6s AM AR KAF KPA all 14, UG6s AG KAA both 4, UH8KAA (60) 12, UI8AE (70) 16, UL7AB 16, UM8s AG (32) 6, KAB (25) 15, PA (42) 15, UN1s AB (20) 5, UJ 5, UO5s AA KBA, UP2s AC AJ AS, UQ2s AB AH AP KAA 2-6, UR2s AK KAO 6-8, RAEM (70) 2, UPOLs 5 and 6 (48-60) 12-15, VKs 5TL (68) 14 of scarce N.T., 9SP (60) 3, VP3AD (65) 4, VQs 2IE 5FS (23) 15, 5GJ (35) 15, 8AD (90) 17, VRs 2BA (47) 9, 6TC (47) 9 of Pitcairn. VSs 2CV (27) 13, 2ET (76) 13, 9AG (3) 15, VU2s AC AX CS EJ HF JA JB JJ SX all 12-14, XW8AB (50) 14, YK1DF (33) 4, YV5BJ (6) 7, ZBs 1HKO (87) 5-6, 1ZR 4, 21 (90) 7, ZC4GT (62) 1, ZDs 4BT (70) 17, 8SC (82) 3, ZSs 2MI (80) 15 of Marion Island, 7C (10) 17, 9O (30) 13, 3V8BI (53) 8, 4S7s EM MG HA all 14-16, 4X4s BX FR HK IV NL RE on short and long paths, 5A2FB (32) 23, 9S4s AZ BW CH and DE all near the low edge. Dig the obvious availability of all Russian DXCC areas at present, save of course for Wrangel Isle . . . . . It is interesting to note that political shake-ups which take place from time to time in numerous countries appear to have little or no effect on their ham radio. However, current international fireworks doubtless will leave its mark and cause changes in the DX scene.

20 voice, more than ever enervated by the drain of DX blood to 15 and 10 meters, handed EA8CD, ET2US (117) 0-16, HP3FL, KAs 2NY 3CG, W4EMF/KS4, KG4AO, KX6BQ, PJ2CE, TA3US (205) 3, VP1s MC ML, 4X4s DR (105) 4, HK (140) 1 and 5A2TZ to K4HNA . . . . . W6IIM caught that ET2 plus BV1US (152) 12, CR7DU, DU7IM, Amsterdam's FB8ZZ (160) 13, OQ5FH (170) 15, VSs 1CZ (102) 13, 2DW, ZE2JH and superscrumptious ZS8I (100) 16 . . . . . The same ZS8, CR5SP (178) 5 of Sao Thome, VK1IJ (103) 15, ZD6DT (190) 15 and ZE6JY came back to K6JQJ . . . . . W0ZKE also worked those BV1 CR5 ET2 and FB8 desiderata aforementioned, as well as DU7SV (196) M1PDN who is 11PDN back home (137), Pitcairn's VR6AC (150) 5-6 and a ZE2 . . . . . K2PIC managed HI6EC and KM6FAA, while W7YKQ kept busy with such as VP2DJ (205) 5 of the Windwards . . . . . W9RBI, who had fun with our September DX Geoquiz, reckoned with LZ2KN (110) 3, M1B (125) 3-4, UC2KAB (110) 0, UP2KBC (200) 4. UR2KAA (40) 3, Pitcairn, VQs 6LQ (155) 3, 8AL (145) 14, YJ1RF (150) 11 and YK1DF (175) 3 . . . . . W1APA captured OY9LM (255) 10, and W6ITH s.s.b.d. with 5A2TP (312) 4-5 . . . . . Twenty-meter radiotelephones reported active or imminently active by Newark News Radio Club's *Official Bulletin*, NCDXC's *DXer*, SCDXC's *Bulletin*, WGDXC's *DX Bulletin*, WVDXC's *DX*, and Milwaukee Radio Amateur Club's *DX Notes: AP2Z* (105) 1, *CRs* 4AD (103) 1, 4AG, CT3AN (148) 21, DM2AFL, DUs 1FP 1JFD 9JW, EA8s AX BB BV BY CO all 2-6, EA9AZ, EL2F, FAs 8AY 9IB, FB8s BC (135) 3, BV 13, FF8s AP (142) 4, BL BP, FM7s WN (135) 3, WQ, FO8s AB (140) 6, AD, FK8AO (170) 7, FR7ZC (65) 12, FU8AC (125) 7, FY7YE (130) 1, GD3UB (190) 1, HC8JW, HI8FR, HRs 2WC 3HH 4WII, HZ1AB (130) 1, IS1s BV (178) 5, VGF, KAs 2AD 2BK 2HG 2MR 2PS 2WK 3AC 3JC 3OQ 4BE 8WK, KC4s USA USV, KC6RK (218) 6, KGs 1AG 6FAE 6GX 6IG 6NAA 6NAC 6USA, KM6AX, KT1PU, KR6s AF AP GW NP QW, KW6s CE CH 7, KX6s AF BP BU, LX1DA (180) 6, LZ1KPZ, MP4KAC (112) 14, OD5s AT AV BO all 1-5, OEs 1PC 6LS 12, OKs 1MB 2AG, OQ5FH (170) 15, OX3WW, OYs 2A (134) 8, 8A, PJ2s AB CH CM, SP5KAB (189) 5, SV0s WE (173) 3 of Rhodes, WJ WR WS (135) 1, TF2s WBC WBG WBH WBJ, TG9s AD AI AL AZ RR, UAs 1KBB 3CR 3KAB 3KAH 4FE 4FJ, UB5s KCA KLA WF, UP2AS, UQ2AN, VKs 4AC (s.s.b.), 9CS 9DB 9RC 9RH 9SP 9WP, VPs 1OLY 1JH 2DM 2KM 5ES 7NJ 7NS, VQs 4ERR (160) 14 5EK 6, VR2BC, VSs 2EK 6DM 12, VU2s ES (125) 12-13, SX, XZ2AD, YO3s CV GM VA VI RCC, YU2DB, YK1s AC AK, ZA1UB, ZBs 1AY 3, 1BG 1CA (120) 6, 2A 5, 21 (104) 6, ZD4CK, ZE6JJ, ZK1BS (100) 10, ZSs 2MI (85) 16 of Marion, 3AC (165) 14, 3V8s BA BL (163) 5, 4X4s BK BL BO FK FR GS IO LO, 5As 1TV 3TY 4TE and 9S4AX (105) 5. Evidently to hear 'em is one thing and to work 'em quite another!

15 c.w. runs a modest second to 20 in this month's code developments. Gleanings hither and yon, at *W1ETV:* provided Vt. QSOs for many Europeans, FA8RJ, YU3DH. *K2BZT:* CR6DA (55) 21, ET2RP (90) 0, JA1ACB (95) 0, ST2NG (40) 22, UC2AA (35) 17, VQ2GR (29) 23, VS6CO (103) 15, VU2EJ (70) 15, XW8AB (58) 19, a 3A2; opines, "Conditions on 21 Mc. seem disappointing compared to a year ago. Signals seem weaker, although the band is open more generally than last year." *K2ENO:* SP1KAA, UC2KAB, VQ4DT, YV5BJ, ZB1HKO, 4X4BX. *K2EQD:* HC1KD (97) 13, VS6CT (70) 19, VU2HF (65) 16. *K2GMF:* OZ4HM of Bornholm Isle. *K2PIC:* CR7BS, CR6s AI CS, FQ8AG, IS1FIC, LZ1s KBD KNB, OY7ML, UA9CC, UB5s AQ BP WF, YO2s CM CN, ZDs 1DR 4BQ 6BX, ZE1JV, 4X4s CJ DR IB, HE LX PX ST2 UC2 XW8. *W3ETC:* Europeans, SP1. *W3LII:* JA3BN, KA2KS, KW6CA, ZB1AY, LX YQ1 4X4, on 50 watts plus dipole. *W3TYW:* UA1KAC (38). *W3WGH:* DU7SV, GD3FXN, TF2WBG, VP5EM, now 106/81. *W3YUW:* UA3BF (10) 14. *K4HCS:* Euros. *K4HMS:* PJ2AN, VP6HT, YU3EU. *W4USM:* FA8CR, HA8WS, YU4HX, CR6 KW6 ST2 UC2 4X4. *W6SUQ:* LZ1WD (96) 20, 9S4AX (39) 2, XW8. *W6WLV/0:* OY1R, SPs 2DX 8CK, SV0WT, VQ5GC, FQ8. *W6ZZ:* GB3GPW, HA5BB, JA1AIN (36), KL7BSF, 4S7GE (50-60), ET2, YO8MS, an OY for 21-Mc. country No. 123. *K6KII:* CT1GE, KM6AX, KX6BU, VP6UN, YV. *W7YAQ:* JA7AD (90) 4, UB5SB (79) 18, ZC4IP (100) 15, HE VQ2. *W8SJF:* relaxed from 80-meter traffic efforts via JA3AH, OY2Z, SL5AX, UA1KAC, 3V8AN, CR6 CR7 SV0 ZD1 9S4. *K9AGB:* ST2 and VQ2 on only 10 watts with dipole. *W9PNE:* W8QOII/MM near FF8, W5UPM/MM off Malta, ZD2DCP 20. *K0CER:* PJ2AV, OE1FF, UB5. *KP4KD:* UA1BT, 4S7 for 93 on 21 Mc. *YE1PQ:* VS6. VU2RM (83) 16-17 . . . . . WGDXC and NCDXC informants suggest FL8AB (35) 22, FQ8s AK (70) 23, AR (58) 23, OD5s AV (55) 22, LI (76) 23, OQ5CP (8) 18, SP2CX (54) 20, SVs 1AB (75) 0, ØWS (76) 4, UJ8s AF (81) 16, KAA (15) 17, UO5CA, VP8BZ (55) 19, VQ2s GW (80) 23, RH (45) 23, W4EMF/KS4 (69) 0, ZBs 1AJX (63) 18-19, 2I (100) 18, ZDs 1FG (50) 17, 9AE (42) 23, 4X4s BL IO, 5A2FB (58) 16 and 9S4AB (55) 22.

15 phone's euphonious euphoria is fancied by *W1HX:* first W1 for VS4BO (190) 15. *K2MQP:* CR6AO, ET2PA, HR2MC, HZ1AB, KG1LH, K6DRJ/KW6, PJ2AO, TF2WBG, TG9WB, VPs, 5FH 8BT of Graham-land, YN1HF, 4X4s BX DR, 4S7GE, says, "Fifteen is *the* band for my money!" *K2PIC:* CRs 5SP (21) 14, 6BH, KT1WX, LX1DC, UB5WF, UQ2AN, VQ5EK, ZB2I, ZS3BC, 5A5TH. *W3TYW:* GB3GBW (just England). *W4GCB:* HZ1. *W4NQM:* up to 156 21-Mc. A3 countries on EA6AF, FC9UC of Corsica. HA1J/M1, OY7ML, UA3EG, UB5KBA, VK1IJ at Macquarie, VS4 4S7. *W4UWC:* now 94 on 15-meter phone with EA9AR, KB6BA, OD5AV *W4USM:* HP1JF, OQ5BG, VP1HA, beam to come. *W4YOK/4:* HR1UA on Adventurer at new college QTH. *K4HCS:* KA2PS (365) 12. *W5EUQ:* VP8BP. *W5UBW:* has DXCC, WAS and WAC through 21-Mc. phone work exclusively, plus GC6FQ, KC6KG, OK1MB, MP4KAC (150), TF2WBH, ZD2JHP. *W6IIM:* VE8MC. *W6ITH:* used s.s.b. for VP6CJ (333) 0, VQ4EU (440) 21, XE1A. *W6ZEM:* CR6AH (210), ET2FM (183), FM7WQ (190), GD6IA (165), JA1ANG (240), KR6RB (260), OE5CK (220), VPs 2GC (255), 5ML (195), VQ4DT (190), VQ5FS (200), 4S7YL (207), 5A1TA (225), HZ1 LX MP4 VS4 UA3. *W6ZZ:* CN8MM, CT1GI (218), JA6KY, KV4BQ (ex-KP4WN), TI2BX, VP6ZX, ZK1BS (238), ZLs in quantity, KM6 LX 5A1, plus HZ1 for No. 161, 124 on 15. *W9RBI:* JZ0ACK's Biak 20-watter (240) 13, VSs 2DB (212) 16, 6CY (220) 14, UA1BE (50) 17, VU2HW (125) 19-20, ZD8SC (140) 22-23, *HZ1 OD5 MP4 UQ2 4S7. WØZZT:* I1NU/Trieste, LX TF2, VP8BU. *K0CER:* CT1FY, HR1JP, VP6BG, KM6 . . . . . NCDXC, NNRC and International Short Wave League's *Monitor* supplement the foregoing, specifying 15-meter A3 activity by BV1US, CP5EQ/CP6, CRs 4AZ 6AA 6AC 9AH 9AL, EA8CB, EL2s D F, FB8s AK BZ, FF8s AP BP (250) 15, FM7s WD WS, FO8AD, FQ8AK, GD3s GMH IBQ, HH2JK (274) 22, KA3WG, KG4AN, W9UDX/KG6, KV4BB, KW6CA, KR6LJ, KX6BU, MP4BBW, OA0AL, OD5DA, OQs 5AJ 5GT 5GV 0DZ, OY2A (119) 5, G5RV/VP2, ST2DB, SV1AD, TF3KA, TG9s CR WB, VK9DB, VPs 3HAG 3YG 5RR (200) 19, VQs 2C 2HJ 2RH 3ES 4AQ 4DJ 4EC 4ERR 4RF 5GC (244) 21, VR2s BC CG, VSs 1AY 1FE 1FP 2DQ (232) 0-1, 6CT, VU2s JF JP, YN1s BW HO PM, YU3s BC JN, ZB1AJX, ZD6RM, ZE2KR, ZP5s CF HX KA, ZSs 3AB 3BC 9G, 3V8AP, 4S7BJ, 4X4s BL DK, 5As 1TR 2TZ and 3TV.

15 Novice activities are DXpansive and KN9DNR awaits QSLs from HA5BI, LZ1KBD, TF2WBG, YU3EX, 9S4BW and others . . . . . KN9COF appropriated DU7SV 16, LZ1KA 17, SL5AX 16, VPs 2GN 20, 6RG 1, VQ2RH 23 and YO5LC 15-16 at the rate of a country per day . . . . . CT1s 1Q SP, HA8WZ, OD5AV, TI2EA, VQ2GW, YO and VKs entertained KN4JFE . . . . . Hereabouts and thereabouts, at *KN2ROR:* CT1AP, LZ1KNB, UA1DG, VPs 4TM 6GC. *WN3HEA:* OH4XK, more Euros. *KN4HMS* (now sans "N"): WP4AFF, one UA0PAB. *KN5DZE:* Euros. *WN7CMR:* Europe, JA1VX, KA2KS. *KN8BPM:* Fs Gs, KH6AHQ. *KN9OCF:* FA8CR, WL7BWY, OH PY. *KN0DQI:* CN8MM phone-to-c.w., TI WL7 . . . . . We have inquiries regarding the top countries total confirmed by any Novice. Who can beat 99?

40 c.w.'s long-haul possibilities are explored by *W1ECH:* HH3DL, LZ1KBD, OE1FF, UB5CS, YUs 2GAB 3EU, PYs. *W2JBL:* heard FA8DA (6), ZS2HI (13), notes

that HH2Y responds pronto to an airmail QSL. *K2EQD:* TI2AM (10) 4, TI 3A2. *K2GMF:* OK3MM (12) 3, VE8OW, XE1KD. *K2KTK:* FG7s XC (80), XD. *W3YUW:* LZ1KRF (20), YU2ACO. *W6WLY/Ø:* TF3AB, ZL2MM. *W8AYV:* OE6RF, VQ5AU, YU3GP, other Europeans. *W9PNE:* JA3MC (49) 7. . . . . Novices on 40 might encounter KH6s RHX BLX, KV4BK, PY7s AFK and VCH as did ex-KN4HMS, KN9s DNR and COF. . . . . As for 80, W2DGW burned the oil for five DL-DJs, three EIs, two Gs and VP6GT, while KN6RGO found KL7AWR workable. Incidentally, 4X4CJ tells W1WPO he searches 3505 — 3520 kc. daily except Saturdays, from 0300 to 0445 GMT, should any East Coaster still need an 80-meter Asian for WAC.

160 c.w. is topical at this time and W1BB announces details concerning the '56-'57 season's specially planned DX efforts. This activity will continue a series of 160-meter transoceanic tests inaugurated in 1932 and all low-band enthusiasts throughout the world are invited to participate. Attempts at 1.8-Mc. DX contacts will be concentrated on December 2nd, 16th and 30th; January 13th and 27th; February 10th and 24th. Between 0500 and 0800 GMT on those dates W/K/VE stations are urged to call "CQ DX TEST" for five minutes beginning on the hour, listen for the next five-minute period, make the call again for five minutes, etc., till QSO is established. Yanks will be found in their 1800 — 1825-, 1875 — 1900-, 1900 — 1925- and 1975 — 2000-kc. segments (see pp. 66-67, July *QST*), while DX should be heard mainly between 1800 and 1900 kc. Those who might despair these sunspottish 160-meter days can bear in mind W1BB's 1.8-Mc. QSOs with ZS2s GE and KZ in midsummer of this year. Synchronize your chronometers with WWV and luck be with you! File results with W1BB and this department.

10 c.w. now, for a sharp change of Bandwagon pace, and the slot's a-jumpin'. Around the land, first *W1DFY:* CR7BS, EL12C (now EL1C), FA3OA, UC2AA, YO3RD. *W1ECH:* OH5RC. *W2SHT:* JA3s AB FV. *K2ENO:* CN8AS. *K2EQD:* CR6AI (43) 16, GC3HFE (95) 17, OY7ML (31) 21, ZBs 1HKO (21) 17, 2I (95) 16, 4X4FN (100) 15, JA3 CR7. *K2PHC:* FA8DA, UC2KAB, long-path VK6FL, YO3RF, JA, 4X4s BX FS. *W4USM:* CX2CF. *K4CXC:* 4X4BD, ZL, Euros, ZS2 to complete WAC requirements. *K4HNA:* ZE3JD. *W6WLY/Ø:* OK1VB, ZS. *K6KII:* JA7AD. *W7LAN:* CN8MR, DM2AEN, LZ1KDP (50), SP8CK (115), YU3KT, CR7 UC2 4X4. *W7QNI:* JA GC. *W7YAQ:* GW3BOA. *W8IBX:* GW3BNQ. *W9FTL:* LZ1WD, 9S4AX, UC2. *W9NDN:* oodles of Euros, DM2AEK, FA8CR (58) 20, JA1AXV (48) 23, OH8PP; heard BV1US (100) 23, KW6CA (22) 1, XW8AB (63) 18; worked EA1AB on *eleven*, of all places. *VE1PQ:* FA8RJ, CR7. *HZ1HZ:* K2PHC. *ZC4IP:* sundry W/K brethren.

10 phone winds up our ke.-caravan on a lively note. W4TFB depleted his QSL stock on behalf of CRs 7BB 7CO 9AH, CT2AH, EAs 8AX 9AZ, ET2FM, FB8BV, FA3JY, JAs 1EUX 3AB, KA2s EB KS WK, LX1AI, SPs 6XA 8CK, SVØWD, UC2KAB, VK9DB, VPs 2MY 8BU, YS1O, YU1AD, ZDs 4BR 8SC, 4X4s BD DR FQ FS and elusive VQ3AC . . . . . W1EKU, with 165 ARRL DXCC Countries List items accumulated through 28-Mc. A3 diligence, added CR9, DU1AP, EAØAC, FQ8AF, HZ1HZ, JAs 1ANG 1BFJ 4AH 9BE, KA2s DS NA PS, KR6AF, KW6CA, LX1AC, LZ2KN, OD5DA, SP9KAD, SVØs WE WT, TF2WBG, UQ2AN, VP5ML, VS6s AE CY, ZC4IP, 4X4FV and 5A2TC. Vern is struck by the great number of Japanese nationals now on ten, and also decries W/K laxity in observing the 28,500-kc. phone subband limit. Watch it, guys . . . . . Randomly, now, first *W1DFY:* CT2, EA8BF, OQ5GM. *W2SHT:* CR5AC, CX2FD, EL2F, HK3AB, VQ2FJ, ZE2KR, CR9 DU KA. *W3ZKH:* CR4AO, CT2, EL12H, HI6EC, KA2s KW6, KM6AX, KT1s AG PU, OE2WR, SP5AM, UA3EG, UB5WF, VPs 2MY 5RR 8BP, VQ4FK, ET2 JA YU. *W4DOU:* heard VR3D. *W4YQB:* DM3DWX, GD3IBQ, MP4KAC, OK1MIB, ZE2JE, 4X4AB. *K4HNA:* OQ5AG, VP6WR, ZS3G. *W6ITH:* ZS6OY via s.s.b. *W9NDN:* all continents save Asia. *W9RKE:* CR9, HB1MIX/HE, KB6BC, OE5CK, 5A1TA, on 30 watts . . . . . CR6BH (375) 19, CT2AL, EA8BD (455) 22, GC2RS (160) 17-18, GD3s ENK FOC UB all 17-19, OQ5BK (480), SP3SV (663) 15, SVØWJ (402) 17, VPs 3HAG, 8BR (222) 13-14, 8BY (390) 22, VQs 2RH (410) 18, 4RF (445) 19, YU2DB (482) 18, ZB2I (418) 17, ZC4VP (450) 15, ZD4s BL (330) 15, CF (250) 17, ZE6JB, ZP5IT, ZSs 3AB 3B 7C (300) 17 and 4S7YL are 10-meter vocalists freshly logged by ISWL, NNRC and WGDXC patrons. And now on to equally pressing matters. . . .

Where:

The VP8 gang is back in force and QSLs for them can be routed through RSGB. W9WHM catalogs VP8s AT, H, McLeod, South Georgia; BC, E, Roberts, Falklands; BO, T, Williams, Antarctica; BP, Maj, G, Watson, Halley Bay, Caird Coast, Antarctica; BR, G, Donnelly, Antarctica; BU, S, Ward, So, Orkneys; and BY, P, Bunch, Port Lockroy, Grahamland, Antarctica, as additions to current *Call Book* listings. Also, emend VP8s AO and BT to the Antarctica locale. VP8s BR and BU (operators and/or stations) are slated for relocation to So, Orkneys and Falklands, respectively. "VP8AQ comes back as a diesel mechanic, not a radioman, and has his own gear along," writes W9WHM . . . . . From FB8BR via W8PQQ concerning Hubert's Comoros operation: All FB8BR/FB QSL is completed and those who have not received their deserved pasteboards by the end of this month are invited to reapply. FB8BR further opines, "In my opinion the sending of $ should stop. Amateur radio operating is a hobby or a game, not a business, and IRCs are sufficient for those who want direct QSLs. Also, many enclosed $ are stolen en route, the letters never arriving, causing controversies and unamiable correspondence." W8PQQ helped things out by distributing some 75 per cent of FB8BR/FB's outbound confirmations . . . . . Australian Capital Territory VK1s now can receive QSLs via their new bureau, Box 59, Kingston, A.C.T. . . . . BARS (Burma) QSL Bureau switched address to Box 833, Rangoon. XZ2 cards also can go via XZ2OM whose QTH is less variable . . . . . At this writing W9KOK still knows nothing about VS9A . . . . . W9WHM confirms that a single IRC will bring back a direct VK1IJ card from VK3ATN . . . . . Opr. Van of BV1US returns to W6HHI this month and invites QSL inquiries regarding *his* Formosa QSOs. BV1US, of course, continues active . . . . . VK5TL, one of those rare A.N.T. fellows, asks W2CC to spread the word that he now has QSLd all stations worked . . . . . KAØIJ's present staff wants it understood that all logs and records for KAØIJ communications prior to September 26, 1956, were wiped out by typhoon. Ergo, QSL inquiries about QSOs before that date cannot be entertained . . . . . From YJ1RF via W9EU: "My log for both Macquarie and Heard Islands is still intact and I will QSL any station which has not previously received some form of [VK1RF] confirmation." . . . . . W2CGJ is dispensing PJ2ME pasteboards and states, "Self-addressed stamped envelopes will speed replies." Fred attempted to receive PJ2ME log transcripts by radio but the lunatic fringe queered the deal . . . . . From Liberia's "FCC": ". . . We have revised all EL12 calls which will now be EL1 in accordance with international radio regulations which state that amateur call letters shall consist of one digit. Effective immediately all stations using the digits 12 will use instead the digit 1. The letters in their call signs remain unchanged." The writer also points out that much EL/MM operation is unauthorized . . . . . From 4S7PT: "I sent VK1RW 300 QSL cards, so he should be confirming his contacts in the near future. We both work for the same firm, as did ZC2PJ and 4S7BW." . . . . . "If anyone wants a card direct by air it takes five IRCs for postage. . . . See that the coupons are stamped by the office of origin; otherwise the postmaster here won't accept 'em." That from the mill of AP2RH who normally prefers to use the bureaus . . . . . PY3SG advises that QSLs destined for PY3s can be addressed: LABRE, Caixa Postal 2180, Porto Alegre, R.S., Brazil . . . . . Writes ZB1AY, "Every QSO is now QSLd and the last batch is in the mail. However, if any are still outstanding after a month or so, and if they contact my U.K. address [to follow] we will be pleased to check the log and send further QSLs." . . . . . ZE3JO assures that all VQ1JO confirmations have been mailed via direct routes but invites further queries . . . . . Contrary to earlier specification, KV4AA does not relay FG7XD QSLs. Try the QTH to follow . . . . . W1s EKU HX OJR RDV UED VG WPO WPR, W2IVS, K2s BZT ENO EQD GFQ PIC, W3TYW, W4TFB, K4BAI, W6s ITH YY, K6s DNH OPI, W7s FBD YAQ, W9FTL, WØs NLY QGI, NCDXC, NNRC, OEM, SCDXC, WGDXC, WVDXC, JDXRC and WIA deserve your appreciation for these items:

BV1US (see text preceding)
CE1DJ, C. Poulsen, Box 1122, Antofagasta, Chile
CN8EB (via W3WDI or AAEM)
CN8FD (to W6VQB)
CN8IQ, Box 40, Navy 214, FPO, New York, N. Y.
CN8JR (to K8ARG)
CN8JX (to W7GGO)
CN8WJ (to SVØWJ)
CR6CK, Box 251, Malange, Angola
CX5CO, Box 37, Montevideo, Uruguay
DJ6AA (to G2DHV)
DL3LQ (to G3KCE)
EL2S (via K2JTS)
ET2FN, P. O. Box 252, Asmara, Eritrea
ET2US, P. M. Bohr, MARS Stn., APO 843, New York, N. Y.
FB8BF, A. Pievet, P. O. Box 89, Diego-Suarez, Madagascar
FB8BV (via FB8BZ)
FG7XD, G. Serge, Box 27, Ile de Marie Galante, Guadeloupe, F. W. I.
FI8BB (via REF — banned, at writing)
FK8AH (via FK8AL)
FL8AA, Lt. J. Fremont, Officier Transmissions RAISM, Djibouti, French Somaliland

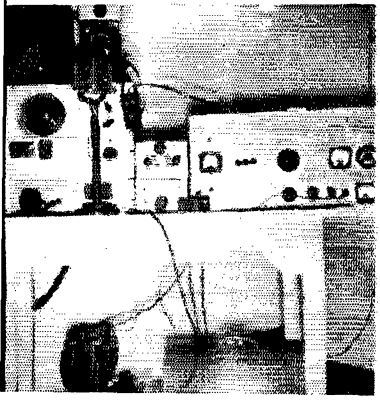
FO8AD/MM (via REF)
G3HEV/A (via G2DHV)
HB1IM/FL (to HB9IM)
HK3TH, G. E. Tietjen, Box 584, Bogota, Colombia
JZ0ACK, E. Walsh, Naval P. O., Biak, Netherlands New Guinea (or via VK5AB)
KA2KS (via W3CSW)
KA5ZS, Capt. Z. E. Sprague, USMC (W6UWL), H&MS-12, MAG-12, 1st MAW, FPO, San Francisco, Calif.
KB6BD, Canton Is., Phoenix Gp., Pacific
KJ6BS, B. K. Miley, Bldg. B, Bks. Rm. C25, N/A, Johnston Island
KW6CH, R. A. Jaentsch, Standard Oil Co., Wake Island
KW6CJ, T. D. Musson, Qtrs. C-3, Wake Island
KW6CK, E. D. Bridges, PAWA, Wake Island
KX6NC/KC6, c/o Weather Stn., Ponape, E. Carolines
OH2RW (via SRAL)
OK2AG, A. Hezucky, Padelky II, Nr. 1361, Gottwaldov, Zlin, Czechoslovakia
PJ2ME (via W2CGJ)
ex-**PK6VR**, L. D. Rickaby, VK4VR, 33 Barbridge St., Coopers Plain, Brisbane, Queensland, Australia
PZ1AR, Box 547, Paramaraibo, Surinam
SU1IM, Ibrahim Mohamed, 27 Mohamed Farid St., Abdin, Cairo, Egypt
SU1KH, Mohamed Ahmed Rashed, 83 Railroad Stn. St., Zeitun, Cairo, Egypt
TF2WBG (via W9BVW)
UA3BN, N. Stromilov, Tshukinskaja St., 2b Bldg. b. Flat y13, Moscow D-182, U.S.S.R.
UA3EG, Valentin, Ermolova St., Home No. 19, Rm. 2 Moscow 151, U.S.S.R.
UR2KAA, Radio Club, Tallin, Esthonian S.S.R.
VK1IJ (via VK3ATN)
ex-**VK1RF** (see text preceding)
ex-**VK1ZM**, B. Shaw, 22 William Rd., Herne Bay, N.S.W., Australia
VK9GV, G. V. Campbell, AWA Avn. Svc., P. O. Box 13, Lae, T.N.G.
VP8BT (via GM3CDL)
VP8BU (via RSGB)
VS4FC, Chang, G. P. O., Kuching, Sarawak
VU2RM, R.M.R. Seethamse, 18/188 Kaspa St., Rajahmundry, India
W4EMF/KS4 (via W4HYW)
XE1A, J. Lobo y Lobo, Rodriques Saro 308, Mexico 12, D.F., Mexico
YU1MB, Box 79, Pozarevac, Yugoslavia
YV4AU, P. O. Box 4573, Maracay, Venezuela
YV5HL, Hugo, Box 2285, Caracas, Venezuela
ZA1AB (via Box 88, Moscow, U.S.S.R.)
ex-**ZB1AY**, C. Lusted, Allotments Farm, S. Lopham, nr. Diss, Norfolk, England
ZB1CZ, S. Scott, Malta Workshops REME, British Forces P. O., Box 51, Malta
ZD3D, P. O. Box 285, Bathurst, Gambia
ZL4LP, H. G. Cooper (ex-ZL1AHC), CAA, Pvt. Bag, Invercargill, N. Z.
ex-**ZM6AA** (to ZL4BX)
ex-**ZM6AB**, Evelyn Scott, 266 Alamitos Ave., Long Beach 2, Calif.
ZS3AC, Box 3911, Oranjemund, S.W. Africa
ZS8I, T. E. Meyer, P. O. Box 35, Leribe, Basutoland
3W8AA, Palm. Boite Postale 109B, Hanoi, Vietnam (banned, at writing)
4S7GE, E. Gibbins, 3 Poinsettia Ave., Royal Navy Yard, Trincomalee, Ceylon
4S7LJ, c/o Fleet Mail Office, Trincomalee, Ceylon
ex-**4S7PT**, P. T. Rudd, 160 Ladbroke Grove, Kensington, London W10, England
5A2FB (via REF)
5A2TP, MARS Radio, APO 231, New York, N. Y.
5A5TH, APO 231, New York, N. Y.

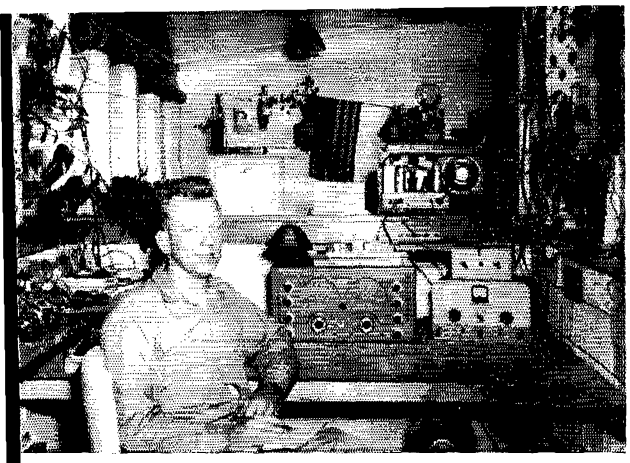
Whence:

Asia — KAØLJ, back in biz after digging out from storm debris, celebrated its DX revival with an ice-breaking WØGFO contact . . . . . Calls such as C1AAA are reported heard on ham bands in the Far East and the AC gang mentions possible C8 activity. Inchoate Red China hamdom? . . . . . JA1VE dropped in at W2JDR for a personal QSO . . . . . BV1US needs the Dakotas, Vermont and Rhode Island for the usual reason and works spot frequencies 14,050 (c.w.), 14,163 (phone), 21,200 (both) and 28,100 kc. (both) from separate control locations in Taipeh and Kaohsiung . . . . . WJDXRC DX award correspondence should go directly to JA1CJ. Certificate recipients Nos. 105 through 108 are JA3BG, CN8MM, ET2AB and W6YC . . . . . "Just received call KA5ZS and will be active on bands 40 through 10 meters using phone," pens wandering W6UWL . . . . . "Hear quite a few of the gang working this 3W8AA. . . . Those strange calls are quite a temptation but the boys should do a little checking first," mills W6RZS. True — Cambodia, Vietnam, Indonesia, Iran and Korea still have bans on file with the International Telecommunications Union, which prohibition we must lawfully observe at the behest of FCC . . . . . During the disastrous Punjab floods of '55 the Lahore Amateur Radio Club, then AP5A, lost irreplaceable equipments. So states AP2RH who continues further, "At the present time it is almost an impossibility to obtain radio spares which would be required in order to construct a transmitter or receiver. The Lahore Club are very keen to function again but, faced with the above mentioned restrictions, there is nothing much they can do." AP2RH has been given to understand that Pakistani Customs will accommodate incoming components marked "gift" and that same would be more than welcomed if addressed to A. A. Abassi, Esq., Curator, Industrial & Commercial Museum, Bank Square, The Mall, Lahore, West Pakistan . . . . . W6ITH manifests steady interest in the Spratly Islands and signs his mail "DUØRT" when dealing with the subject. Could two and two make four? . . . . . UAØs KTI and KTT represent far-off Tannu Tuva on 20 c.w. at odd intervals . . . . . G3IDC visited nine or ten Mediterranean DXCC areas during October and November, hamming a bit here and there . . . . . From 4X4CJ to W1WPO: "I am rebuilding to 6J5-6AU6-5763-6146 running 90 watts of c.w. 3.5 through 28 Mc. and, for the first time in 19 years of hamming, I shall go on phone, with a pair of 2E26s Class AB2 — hi!" . . . . . JAs 1AEQ 2JX and 3LB, workable on 40 phone, are Asian YLs brought to W6ZZ's attention.

Africa — SU1IC joyfully advises that the Egyptian amateur total doubles with the licensing of SU1s IM and KH. SU1IM, a competent op, runs 80 watts c.w., 15 watts phone, to a Marconi-1154 rig and dipole, receiving with a modified BC super. SU1KH holds a 10-watt permit, uses a v.f.o.-807 rig, coax-fed dipole and Super Pro. SU1AS, of course, remains Egypt's original licensee but SU1IC mentions no such animal as SU1JL . . . . . More on ZE3JO's Zanzibar peregrination: A prolonged spell of QRJ conditions, lack of receiver bandspread, and the churlishness of DX hogs rubbed VQ1JO the wrong way but he managed a good show. "For the first five days conditions were reasonable and I was getting contacts until around the 20th of August when conditions deteriorated into what I now consider to be the worst ten days that I have ever experienced on the 20-meter band since I became a ham in 1935. Even the VQ1 call seemed futile!" ZE3JO understands his to be the third post-war Zanzibar DXpedition, following VQ1RF and transitory VQ1RO visits. En route home he was able to fire up in Dar-es-Salaam for a smattering of VQ3JO QSOs. ZE3JO expresses heartfelt thanks to his XYL, VQ4RF, ZEs 2KV and 6JL for key assistance in the undertaking . . . . . OQ5GU returns to Stanleyville from Belgium, contemplating assaults on 7, 14, 21 and 28 Mc. immediately if not sooner. Incidentally, Belgian Congo amateur radio appears more thriving than the homeland product: ON4s now outnumber OQs by rough ratio of only 8 to 3 . . . . . "FB8YY, Adelie Land, will be on the air every day on 14,080 kc. for

Kiplingesque might be the word for 4S7PT's Colombo environment, even down to the young beach boy at far right. Pete's layout, left, feeds the dipole barely visible in the lush garden greenery, center. Employed by the British Admiralty, 4S7PT gives all this up for return home to London this month. Pete is former D21X, hopes to fire up soon again on 21 Mc. with a G label, and anticipates a ZB1 assignment come 1958. (*Photo via W3IKD*)





c.w. from 0500 to 0700 and from 2300 to 2400 GMT." FB8ZZ tells W6OWM . . . . . NCDXC notes VQ8AB's recent activity featuring the YL of the family . . . . . EA9DF *still* is bound and determined for early Ifni action, according to W8KML . . . . . K2GFQ finds W3HIL now throwing switches as ET2US, W4TFB identifies VQ3AC as ex-VQ4AC, and K6JQJ says ZD6DT is ex-VQ2DT.

Oceania — W6YY, certified as the first possessor of WAZL outside VK/ZL-proper (on phone, yet) had VP2VB/P's post-Darwin itinerary as CR10, ZC3 and Goa in that order. However, we regret to report that the *Yasme* struck a reef Oct. 24th and sank. John also suggests a check with ZL2AFA regarding a new certification available upon QSO with 15 members of the Palmerston North Radio Club. . . . . W9s AMU YFV and W6YY collaborated to supply VR3B with a sorely needed HRO output tranny . . . . . 'Tis said that ZC3AC's dread of pile-ups keeps him scarce and scarcer . . . . . Stateside call-area single-op toppers in the 1955 VK/ZL DX Test are (c.w.) W1RWP, K2EDL, W3VKD, W4KVK, W5VHR, W6BYB, W7SFA, W8JIN, W9ABA and W0BNM. W7SFA turned in the highest U. S. point total and also led the limited phone turnout. VK/ZL winners: (c.w.) VK2GW and ZL1AH; (phone) VK2AHH and ZL1MQ . . . . . W5JPC hears that KJ6BP expects reassignment to Texas around this time . . . . . F8TM confirms the activity of bamboo sailing-raft *Tahiti Nui*, bound from Polynesia to Chile and back again, and bearing FO8AP/MM as radio operator. The raft carries with her gear capable of operating 40 through 10 meters . . . . . From YJ1RF via W9EU: "I would appreciate it if W/Ks who hear YJ stations trying to drag through a little DX from South America or Europe would please give us a go. YJ1AA's 10 watts off a 12-volt battery doesn't stand much of a show when somebody hurls a kw. at him." YJ1RF's additional comments concerning the antiquated New Hebrides electronics situation reads like a lively DXpeditionary narrative . . . . . W6ZZ collected WAP No. 103, is the second non-Hawaiian station to qualify for the Hilo club's HILO-15, and has his KH6-CC sheepskin endorsed at 175 . . . . . Oceaniagrams via WGDXC: JZ0ADM's former PK7 tag was an administrative error and, besides JZ0ACK, three more JZ0s are activating for six-month hitches. . . . CR10AA expects better commercial power facilities in Dili before long but poor health limits Rui's present activity.

Europe — DARC (Germany) invites world-wide participation in its 1956 WAE DX Contest to run on scattered week ends December, 1956, through April, 1957. The two phone portions are scheduled from 1200 GMT Dec. 8th to 2400 Dec. 9th, and Jan. 19th–20th, same times. C.w. sessions are slated for Jan. 5th–6th and April 6th–7th, same times. European stations will QSO non-European stations on 3.5, 7, 14, 21 and 28 Mc., the serial exchange being the usual five-digit (phone) and six-digit (c.w.) numerals — RST001, RST002, etc. SCORING: Non-European entries will count each completed QSO as one point, each station to be worked but once per band. *Additional points* can be earned by transmitting "QSO reports" to European stations, these designated as "QTC" at one point each. Each QTC consists of three parts — (1) time in GMT, (2) station call, and (3) QSO number, of any previous WAE Test QSO. For instance, W3XXX raises DL1EE and thereby garners a QSO point; W3XXX previously worked G3DSA at 1307 for G3DSA's 131st Test QSO; so, in addition to the QSO point for his DL1EE contact, W3XXX gains another point if he sends "1307/G3DSA/131" to DL1EE. As many as ten QTC can be sent per QSO but each QTC can be sent but once. Thus, the more QSOs you rack up, the more QTCs you have available to parlay into additional points. *More additional points*, termed bonus points, are gained by working the same station(s) on three bands (5 points), four bands (10 points), and all five bands (20 points). *Multipliers* derive from DARC's WAE Award Countries List and are CT1 CT2 DL/DJ/DM EA EA6 EI F FC G GC GD GI GM GW HA HB HE HV I IS IT M1 LA LX LZ OE OH OK ON OY OZ PX SM SP SV TF UB UC UN UO UP UQ UR YO YU ZA ZB1 ZB2 3A2 9H4, H/Trieste, LA/P Jan Mayen, LA/P Svalbard, SV Rhodes, SV Crete, TA European, UA European, and UA Fridtjof Nansen Land. *For final score* multiply sum of QSO points, QTC points and bonus points accumulated on all bands by the combined numbers of multipliers collected on all bands. "Awards will be given to the amateur placing the highest score in his continent, country, or district. In case of sufficient participation, second- and third-place awards will also be considered," states DL7AA's announcement. Such winners will be winnowed from logs submitted to DARC'S DX Bureau, Fuchsienweg 51, Berlin-Rudow, Germany, postmarked not later than Jan. 31st (phone) and May 15th (c.w.). Let's clog that North Atlantic path, DROBs! . . . . . W1ZDP relays results of the VERON (Netherlands) 1955 PACC DX Contest, announced in last April's column. PAØs NN and VO took homeland honors on phone and c.w., respectively, while Ws 2CGJ 1MV 3DKT and 8KPL placed in that order for the U. S. A. on c.w. No Yank phone entries are recorded . . . . . In September an impromptu 20-c.w. emergency net saw W2HMJ, F9RS, SM5CCE and DL4AL procure and relay urgently needed medical data from Munich to Calais . . . . . LA4GF, an exchange scholar from Oslo, regularly visits W4s CHS and SGI at Oak Ridge, Tenn. . . . . ZB1AY's sudden QSY from Malta to England was occasioned by family illness . . . . . WGDXC learns that DL3AO & Co. piled up over 2000 LX QSOs this summer, Yanks accounting for 80 per cent . . . . . From HB9IM, distributor of 175 HB1IM/FL Liechtenstein QSOs on September 25th–30th: "The former call HB1XX/HE will no longer be used by Swiss amateurs visiting HE-land. According to a recent regulation the suffix 'FL' will be assigned in future." . . . . . DL4ZW tells W7QNI he'll be W7-bound around Christmas, and W6CXJ keeps the filaments hot at F7BL.

Hereabouts — From W2CGJ: PJ2ME concentrates on W/K/VE QSOs from 0200–0300 GMT, 7020 or 14,040 kc., but a v.f.o. is on order to help shake the pyramids. Victor will ignore on-frequency callers and requests consideration for his efforts at long-haul DX. W2BBK (FS7AA) is responsible for introducing PJ2ME to ham radio . . . . . W9ICL was a call-area first for both HC1ARE and YV0AA, according to W9WHM . . . . . W2QHH completed a 7-band WAS by turning the trick on 27 Mc. This should put Howy two bands up on other avid multiband WAS-collectors . . . . . W9RKE finds TI2GC attending Culver (Ind.) Military Academy . . . . . KP4KD has such fun

(Continued on page 180)

W L7BUS of Sitka finds himself quite popular on 80-, 40- and 15-meter Novice ranges. Walt's AT-1 and NC-183 will be augmented by an HT-9 sender upon acquirement of his General. Other Novice DX prefixes workable at present are KZ5, WG6, WH6, WJ6 and WP1. Anybody worked all possible Novice countries?

♦

At Camp Tuto, in northern Greenland, KG1s AG (K1WH) and AX (W2WHB) relax off duty with the Communications Section, 1st Engineer Arctic Task Force. In August KG1AG, W1BCR and KC4USA held a 14-Mc. voice roundtable which linked our polar ice caps by ham radio. For this QSO KG1AG used a BC-610, straight a.m., and KC4USA an s.s.b. gallon.

I.A.R.U. News

QSL BUREAUS OF THE WORLD

For delivery of your QSLs to foreign amateurs, simply mail cards direct to the bureau of the proper country, as listed below. (**Bold-face** type indicates a recent change from previous listings.) *W, K, and VE amateurs may send foreign cards to A.R.R.L. Headquarters for which no bureau is listed.*

For service on incoming foreign cards, see list of domestic bureaus in most *QST*s under "A.R.R.L. QSL Bureau."

Algeria: **G. Deville, FA9RW, Box 21, Maison-Carree, Alger**
Angola: L.A.R.A., P.O. Box 484, Luanda
Argentina: R.C.A., Avenida Libertador General San Martin 1850, Buenos Aires
Australia: W.I.A., Box 2611 W, G.P.O., Melbourne
Austria: **Oe. V.S.V. P.O. Box 15, Klosterneuberg, 2**
Azores: Via Portugal
Bahamas: C. N. Albury, Telecommunications Dept., Nassau
Barbados: **Geoffrey Scholey, VP6AM, 24 Highgate Gardens, Collymore Rock, St. Michael**
Belgian Congo: **P.O. Box 2696, Elisabethville**
Belgium: U.B.A., Postbox 634, Brussels
Bermuda: VP9D, James A. Mann, **Floral Lane,** St. Georges
Bolivia: R.C.B., Casilla, 2111, La Paz
Brazil: L.A.B.R.E., Caixa Postal 2353, Rio de Janeiro
British Guiana: D. E. Yong, VP3YG, Box 325, Georgetown
British Honduras: D. Hunter, Box 178, Belize
Bulgaria: Box 830, Sofia
Burma: **XZ2OM, P.O. Box 1490, Rangoon**
Canton Island: H. B. Johnson, KB6BA, U.S.P.O. 06-50000, Canton Island, South Pacific
Ceylon: P.O. Box 907, Colombo
Chile: Radio Club de Chile, Box 761, Santiago
China: M. T. Young, P.O. Box 16, Taichung, Formosa
Colombia: L.C.R.A., P.O. Box 584, Bogotá
Cook Islands: Ray Holloway, P.O. Box 65, Rarotonga
Costa Rica: Radio Club of Costa Rica, Box 535, San Jose
Cuba: Radio Club de Cuba, QSL Bureau, Lealtad No. 660, Havana
Cyprus: Mrs. E. Barrett, P.O. Box 219, Limassol
Czechoslovakia: C.A.V., P.O. Box 69, Prague I
Denmark: P. Heinemann, OZ4H, Vanlose Alle 100, Copenhagen
Dominica: VP2DA, Box 64 Roseau, Dominica, Windward Islands
Dominican Republic: Calle Duarte #76, C. Trujillo
East Africa: (VQ1, VQ3, VQ4, VQ5): P.O. Box 1313, Nairobi, Kenya Colony
Ecuador: Guayaquil Radio Club, Casilla 784, Guayaquil
EIRE: **J. Corcoran, EI5M, 194 Collins Ave., Whitehall Co. Dublin**
Fiji: S. H. Mayne, **VR2AS,** Victoria Paraed, Suva
Finland: SRAL, Box 306, Helsinki
France: R.E.F., BP 26, Versailles (S & O);
France (F7 calls only):
A/1C Thomas J. Shytle, F7EZ, Hq., US Eucom Mars Radio, APO 128, % P.M., New York, New York
Germany (DL2 calls only): Via Great Britain
Germany (DL4 calls only): DL4 QSL Bureau, APO **633,** % Postmaster, New York, N. Y.
Germany (DL5 calls only) Via France
Germany (other than above): D.A.R.C., Box 99, Munich 27
Gibraltar: E. D. Wills, ZB2I, 9 Naval Hospital Road
Gold Coast: **E. L. Lloyd, ZD4BL, P.O. Box 565, Kumasi, Ashanti**
Great Britain (and British Empire): A. Milne, 29 Kechill Gardens, Hayes, Bromley, Kent
Greece: **George Zarifis, 10 Saint Fanouris St., Panagrati, Athens**
Greenland: APO 858, % Postmaster, New York, N. Y.
Grenada: VP2GE, St. Georges
Guam: G.R.A.L., Box 145, Agana, Guam, Marianas Islands
Guantanamo Bay: **Guantanamo Amateur Radio Club, Box 55, NAS, Navy 115, F.P.O., New York, N. Y.**
Guatemala: Manuel Gomez de Leon, P. O. Box 12, Guatemala City
Haiti: Radio Club d'Haiti, Box 943, Port-au-Prince
Hong Kong: Hong Kong Amateur Radio Transmitting Society, P.O. Box 541, Hong Kong
Hungary: H.S.R.L., Postbox 185, Budapest 4
Iceland: Islenzkir Radio Amatorar, Box **1058,** Reykjavik
India: Box 1, Munnar, Travancore, S. India
Indonesia: P.A.R.I., P.O. Box 222, Surabaja, Java
Israel: I.A.R.C., P.O. Box 4099, Tel-Aviv
Italy: A.R.I., Via San Tomaso 3, Milano
Jamaica:
Japan (JA): J.A.R.L., Box 377, Tokyo
Japan (KA): F.E.A.R.L., P.O. Box 111, APO 500, % Postmaster, San Francisco, Calif.
Kuwait: Doug Taylor, MP4KAA, Box 54, Kuwait, Persian Gulf
Lebanon: R.A.L. B.P. 3245, Beyrouth
Libya: See Tripolitania
Luxembourg: G. Berger, 40 Rue Trevires, Luxembourg
Macao: Via Hong Kong
Madeira Island: **P.O. Box 257, Funchal**
Malaya: QSL Manager, P.O. Box 600, Penang
Malta: R. F. Galea, **ZB1E, "Casa Galea," Railway Road, Birkirkara**
Mauritius: V. de Robillard, Box 155, Port Louis
Mexico: L.M.R.E., Liverpool 195-A, Mexico, D.F.
Montserrat: VP2MY, Plymouth
Morocco: A.A.E.M., P.O. Box 2060, Casablanca
Morocco: (Tangier International Zone only): Box 150, Tangier
Mozambique: Liga dos Radio-Emissores, P.O. Box 812, Lourenco Marques
Netherlands: V.E.R.O.N., Postbox 400, Rotterdam
Netherlands Antilles (Aruba): Postbox 80, San Nicolas, Aruba
Netherlands Antilles (Curacao): Postbox 383, Willemstad, Curacao
Netherlands East Indies: Hr. C. Loze, PK1LZ, Burg. Kuhrweg, 47 Bandoeng, Java
New Zealand: N.Z.A.R.T., P.O. Box 489, Wellington C1
Nicaragua: YN1RA, Apartado **Postal 555,** Managua
Northern Rhodesia: N.R.A.R.S., P.O. Box 332, Kitwe
Norway: N.R.R.L., P.O. Box 898, Oslo
Okinawa: O.A.R.C., **P.O. Box 739,** APO 331, % Postmaster, San Francisco, Calif.
Pakistan: Box 2002, Karachi
Panama, Republic of: L.P.R.A., P.O. Box 1622, Panama
Paraguay: R.C.P., P.O. Box 512, Asuncion
Papua: P.O. Box 107, Port Moresby
Peru: R.C.P., Box 538, Lima
Philippine Islands: Elpidio G. DeCastro, Philippine Amateur Radio Assn., 2046 Taft Ave., Pasay City
Poland: **Polish QSL Bureau, P.O. Box 320, Warsaw 2**
Portugal: **Rua de D. Pedro V., 7-4, Lisbon**
Roumania: A.R.E.R., P.O. Box 95, Bucharest
Saar: **P.O. Box 310, Saarbrucken**
Salvador: YS1O, Apartado 329, San Salvador
Singapore: P.O. **Box 2394,** Singapore, Malaya
South Africa: S.A.R.L., P.O. Box 3037, Capetown
Southern Rhodesia: R.S.S.R., Box 2377, Salisbury
Spain: U.R.E., P.O. Box 220, Madrid
St. Vincent: VP2SA, Kingstown
Sweden: S.S.A., Stockholm 4
Switzerland: U.S.K.A., **Knutwil**
Syria: P.O. Box 35, Damascus
Trieste: P.O. Box 301, Trieste, F.T.T.
Trinidad: John A. Hoford, VP4TT, Box 554, Port-of-Spain
Tripolitania: 5A2TZ, Box 372, Tripoli
Uganda: P.O. Box 1803, Kampala
Uruguay: R.C.U., P.O. Box 37, Montevideo
U.S.S.R.: Central Radio Club, Postbox N-88, Moscow
Venezuela: R.C.V., P.O. Box 2285, Caracas
Virgin Islands: Richard Spenceley, Box 403, St. Thomas
Yugoslavia: S.R.J., Postbox 48, Belgrade

DX Century Club

The following list contains the call letters and countries totals of all holders of the Postwar DX Century Club award as of October 15, 1956. The calls of new members as well as those receiving endorsement credit during the period September 15 through October 15, 1956, are included in this listing.

• 268
W1FH

• 267
W6AM

• 265
W8HGW

• 264
W6ENV

• 263
W6MX

• 262
W9NDA

• 259
W3BES
W3GHD
W6DZZ
W6SYG
W6VFR
W8NBK

• 258
W2AGW
W5ASG
W6TT

• 257
W3JTC
PY2CK

• 256
W3KT
W6SN
W7AMX
W8BRA
W8KIA
G2PL
ZL2GX

• 255
W6CUQ

• 254
W2HUQ
W3JNN

• 253
W6RW

• 252
W1CLX
W6MEK
W9RBI
G6ZO

• 251
W3EVW

• 250
W6TS
W6VE
WØYXO
KV4AA
LU6DJX

• 249
W2BXA
G6RH
PAØUN

• 248
W1ME
W2WZ

W5MIS
W8DMD

• 247
W4TO

• 246
ZS6BW

• 245
W1TW
W8JIN

• 244
G4CP

• 243
W4TM

• 242
W3GAU
W9YFV
ZL1HY

• 241
W4BPD
W9FID
WØAIW

• 240
W6ADP
W6EBG
W6TI
W7GUV
CE3AG

• 239
W2QHH
W6GFE
WØDAE

• 238
W1ADM
W5ADZ
SM5LL

• 237
W3CPV
W3EPV
W8DAW

• 236
W2QKS
W8BKP
W9FKC

• 235
W1HX
WØELA
CN8MM

• 233
W1BIH
W3IVE
F8BS
ON4AU

• 232
W8JBI
W8UAS
VK2DI

• 231
VK2ACX

• 230
W1GKK
W8SYC

W9HUZ
W9LNM
FA8IH

• 229
W3OCU
W5JUF
W6GRL
W6QJU
W6ZCY

• 228
HB9J

• 227
W1JYH
W2DS
HB9X

• 226
W5LXY
W6NTR
W7GBW
W7HXG

• 225
W2HMJ
W4MR
W5KC

• 224
W5FFW

• 223
W6SAI
W6NNV
SM5KP

• 222
W2YW
W3DPA
W4KFC
W5ALA
W9KOK
ZS6DW
4X4RE

• 221
W1AXA
W2GT
W2JT
W6GPB
W6UHA

• 220
W1ENE
W2NSZ
W4OM
W5BGP
W5EGK
W5ENE
W5FNA
W6AMA
W8LKH
W8WZ
W9ABA
PY1GJ

• 219
W6DI
PY1AJ

• 217
W2TQC

• 216
W4DQH
G8IG

• 215
W6BPD

• 214
PY1DH
VE7ZM

• 213
W3CGS
W3KDP
W4HA

• 212
W2CTO
W2HZY
W4LVV
W6LDD
W6MHB
W8BTI
VE7GI

• 211
W2PRN
W3JTK
W3OP
W4LZF
W5GEL
W6YY
W8MPW
W9FJB
WØPNQ
G2MI
G3YF
G4ZU
SM5ARP
ZS2X
ZS6FN

• 210
W1HA
K2CPR
W2AGO
W2CNT
W3DKT
W3DRD
W5JC
W6HX
W6MJB
W8KML
W9GRV
CE3DZ
DL7AA
G3DO
G3FNN
G3HLS
KH6IJ
PY4IE
VE3QD

• 209
W2TXB
W5EFC
WØNUC
G6YQ
VE7HC

• 208
W1KFV
W4AIT

• 207
W2AQW
PY1AHL

• 206
W4NNN
W5KUJ

• 205
W1ZL
W8DHC

W8SDR
WØAZT

• 204
W2HHF
W5MMK
KP4CC

• 203
W1AB
W3ECR
W3GRF
W5CKY
W6LDJ
W6LW
W7AH
W8ACE
W8CDT
W8EWS
W8KPL
W8UPN
W9IU
OH2RY

• 202
W4RBQ
W6BZE
W6EHV
W7DL
CX1FY

• 201
W2DKF
W2EMW
W2UFT
W6PQT
W6LRU
W8TMA
WØUOX
CM9AA
KH6BA
KZ5CP
LA7Y

• 200
W1BLF
W2BJ
W3ADZ
W4BRB
W4CYY
W4QCW
W5CEW
W6BUD
W6CTL
W6EPZ
W6GAL
W6IBD
W6MVQ
W6PB
W6RBQ
W6TZD
W8DX
WØNLY
G5RV
G6QB
HB9EU
HIAIV
HISM
KP4KD
KV4BB
LU7CD
ON4QF
ZL1BY
ZS1BK

• 199
W1IAS
W2IYO
W5OLG

W6ANN
VK2NS

• 198
W2CYS
W5EB
G8KP
PAØGN

• 197
W1CH
W7HIA
W9QLH

• 196
W4LYV
ON4FQ

• 195
W6TXL

• 194
W7PGS
SM5WI

• 193
W1ZW
W4EPA
W6WO

• 192
W2DSB
W2RWE
W4PN
W8HFE
G3BKF

• 191
W1AEW
W1LZE
W1WK
W2ALO
W2BRV
W2GFW
W5DMR
W6BVM
W7ENW
W9FDX
F8PQ
G3AAE
HKN
KL7PI
ON4NC
OQ5RA
SM5CO

• 190
W2GUM
W2GVZ
W2IOP
W3ALB
W3ALX
W3JKO
W5BNO
W6EAY
W6JK
W6KYG
W6OMC
W6UCX
W9GKL
EA2CA
ET2AB
KH6CD
VE3AAZ
VO6EP

• 189
W5NMA
W8YIN
VE2WW

• 188
W2CWE
W7ADS
W7HQC
W9BQE
W9IOD
W9UXO
FA8DA

• 187
W5ABY
W9AND
TI2RC

• 186
W8EV

• 185
W1RY
W9AMU
CP5EK

• 184
W2JB
W7GUI
W8CED
W9MXX
DL7BA
HAMU
OZ7PH

• 183
W1LOP
W3IMV
W8CLR
W8PUD
W9QIY
WØANF
CN8MI
G6BS
HOJ
PY1HX

• 182
W2IWM
W2REF
W3VKD
W4NNH
W6CAE
W6SRU
HB9CX
HB9ET

• 181
W1FTX
W1MB
W2MLO
W3KQF
W4DHZ
W5RZT
W5MET
W6NGA
W8UDR
WØQVZ
GM3CSM
HXK
PAØNU
PY2OE
VE8AW
ZS2AT

• 180
W1BIL
W1BLO
W1TX
W1VG
K2BU
K2GFQ
W2IMU

W3EYF
W3LPF
W3WU
W5DML
W5LGS
W5UX
W6BUO
W6BYB
W6EYR
W6RM
W8CVU
W9VND
WØEYR
WØTKX
G2EC
ON4JW
ON4PA
OZ3FL
OZ7BG
VE7VO

• 179
W2CSO
W2GWE
W3MFW
DL7AH

• 178
W2COK
W5LHP
G2WW
VK3BZ

• 177
W1TYQ
W2LV
W3GHS
W4CYU
W6ALQ
KG4AF

• 176
W3QJV
W4JDR
W6BJU
W6CYI
W6KSM
W6MEL
W8VLK
W9AEH
DL1QT

• 175
W2JVU
W2WC
W3NOH
W5KBU
W6BAM
G3AIM
KH6QH

• 174
W1ATE
W1BFT
K2BZT
W2IJU
W2SAW
W8RDZ
W9EU
W9JIP
W9TJ
EI4X
KH6VP
MF2AA

• 173
W2BYP
W4LQN
W6DBP
W6ID

W6KEK
G3DOG
KZ5WZ
OK1FF

• 172
W6YK
WØDXF
G3DCU
HB9MQ
PAØVB
SM7QY
VE3IJ
VK4FJ

• 171
W1HRI
W2LJR
W2PWP
W2RGV
W4AAU
W4DKA
W5DGV
W5FXN
W6VDG
W8FJN
W9LI
GI4RY
LA6U

• 170
W1CUX
W1DEP
W1DQH
W1JNV
K2GMO
W2ZVS
W3AXT
W3LVF
W4VE
W5NW
W6ATO
W6KUT
W7KTN
W7PHO
W8NGO
W8TJM
W9ABB
W9TQL
W9VP
WØAIH
CT1JS
G5VT
OE3WB
OK1HI
PAØLB
PY7WS
SM5WJ
ZL4GA
ZS6A

• 169
W2PUD
PY4ZS

• 168
W2UWD
W2ZGB
W3JYS
HAY
VK5RX

• 167
W3MNG
W8LAV
HB9FU

• 166
W3HRD
W6PCS
VS6CG

• 165
W3LBG
W9KA

• 164
W8OGV
KH6LG
ON4AZ

• 163
W8AJW
WØERI
HB9MU
ON4GU
ZL2HP

• 162
W2CWK
W2LSX
W2OST
W3AYS
W6SWG
W8MWL
WØVBQ
CX1BZ
DL1LH
EI5F
G2AJ
G3FKM
PY2NX
SM3AKM
VK6SA
YV5AE
ZL3CC
ZS2AG
9S4AX

• 161
W2ABM
W2AEB
W2HSZ
W2IRV
W2RDK
W3AFW
W3VOS
W4AAW
W4HVQ
W6GHU
W6WKU
W8DUS
W8EYE
W9UIG
W9VIN
CR6AI
G2IO
GM3AVA
HB9DO
HB9KB
KV4AQ
OK1LM
OQ5LL
PAØRC
VE1HG
ZL3GU

• 160
W1BGA
W1BOD
W2AZS
W2DOD
W3MDE
W3MLW
W3RNQ
W4TP
W4ZD
W5HDS
W5PZL
W5VIR
W6BIL
W6CIS

W6LVN
W7DET
W8GLK
W8ZZU
W9RQM
DL1KB
F8EJ
G2FSR
G3EMD
HP1BR
IS1AHK
OH2TM
PY1ADA
SM6HU
VE7VC
VK3YL

• 159
W1DX
W3HER
W3WDC
W4JFE
W6FOZ
W6PZ
G6LX
GW3ZV
I1IR
OK1VW
SM3ARE
VQ2GW
YV5BZ

• 157
W1DSF
W2ITD
W4JXM
W4ML
W6NIG
WØTJ
ON4FL
PY4RJ

• 156
W2SAI
W6KEV
WØLLN
EA4CR
G3CBN
I1ALU
OH2QQ
ZS6EU

• 155
W8MFB
G2AJF
G6GN
OZ3Y

• 154
W1ZD
W2QCP
W4AIX
W7AJS
W7FB
W9UZS
CT1DJ
CT3AN
F8CW
GM6MD
SM3EP
VP9G

• 153
W1QF
W2GTP
W7KVU
W8WWU
CE3AE
DL7FW
F9RM
JA6AD
OH2NB
VE3ZW

• 152
W1LHZ
W1MUN
W2MYY
W6JZP
W6LMZ
W7EJD
W8EKK
W8YHO
W9KXK
CR6BX
G3COJ
ON4MS
SM7MS

• 151
W1JEL
W2CR
W2FXE
W2GTL
W3ARK
W3FLH
W3ZQ
W4AZK
W5CGC
W6CG
W6VOE
W7AC
W8HMI
W8HUD
W9PGW
W9YNB
DL1GU
DL3RK
DL9PX
EA3CY
GW3FSP
ON4TA
PY2AJ
PY4AJD
PY7LJ
SM5ARL
SM5DZ
VE2BV
VK3JE
VR6AE
ZL3BJ

• 150
W1AUR
W1BGW
W1IKE
W1JDE
W1JOJ
W1ODW
W2ADP
W2AYU
W2BOK
W2GVP
W2PJM
W3AFU
W3AZG
W3FMC
W3IXN
W3JNM
W3LVJ
W3PGB
W4HYW
W4THZ
W6DE
W6EAK
W6EFR
W6NZ
W6PBI
W7KWO
W7RT
W8DEN
W9ALI
W9CIA
W9MQK
W9NN
W9NZZ
W9RKP
WØFNN
G2VD
G3AKU
G5LP
G6GH
G6RC
G8KU
GM3CIX
HB9AO
HK3CK
I1AOF
I1CJW
I1IT
KH6MI
OE1FF
OK1MB
ON4GC
OZ7EU
PAØZL
VE7YR
VK4EL
VO8X
ZC4XP
ZL1AH
ZL3GQ

• 149
W2QKJ
W2UEI
W4FVR
W4TFB
W5UUK
DL1EE
DL6YK
PAØIF
ZL2QM

• 148
W7FZA
W8BWC
EA1AB
FA9RW
G8RC
HB9CE
ZS6KK

• 147
W1AH
W6DUB
W8DFQ
HB9KU

• 146
W3FYS
W3RCQ
W5LV
W6LV
W7VMP
W9TGY
WØIEV
G6RB
YV5AK

• 145
W1PKW
W2ICO
W3FGB
W5OGS
G3BI
JA2KG
PAØTAU

• 144
W9ERU
G4QD
OZ7SN
PAØHP
PY1ANR

• 143
W2BUY
W2BXY
W5ACL
W7BE
W9PSR
F3MS
LU3DH
NY4CM
SM3BIZ
VE6VK
4X4BX

• 142
W1LQ
W1NW
W4GMA
W4HQN
W5LVD
W6MUF
W8CKX
W8ZJM
W9AHP
WØQGI
DL1YA
EI4Q
G2YS
G4JZ
G8GB
G8KS
KZ5IP
VE3ADV
VP5FR
VP7NM
ZS5CU
4X4DK

• 141
W1AZY
W2ESO
W2GNQ
W2HQL
W2IWC
W2TWC
W3NCF
W4UXI
W5AWT
W5CFG
W6APH
W6ITH
W7AYJ
W7DAA
W7GXA
W7SFA
W9GDI
W9JUV
WØCU
DL1DX
DL3FM
DL4ZC
F3FA
G2FYT
G5LH
I1UA
LA5Q
SM5AQW
TA3GVU

• 140
W1JMT
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VE5QZ
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ZS3K

• 139
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PY7AN

• 138
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ZL3LR

• 137
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• 136
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• 135
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SM5PA

• 134
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• 133
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OZ8SS

• 132
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• 131
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• 130
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PAØXE
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4X4DF

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DL7CX
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G5IV
GM3CMB
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LU9CK
VE1PA

• 121
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KG6AI
KP4WD
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OK1GL
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PAØNOL
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ZS2U

• 120
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W4GQE
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K6EVR
W6NJU
W6YZU
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WØQDF
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CN8AF
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EA3GF
EA8BC
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G3BQ
G3CCN
G3ESY
G3TK
G5PQ
G6XX
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KP4TF
LA4KD
LU3EB
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OK1RW
PAØCB
PAØFAB
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SM6DA
SM7ANB
VE3AGC
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ZS6JZ

• 119
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KG6DI
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4X4DE

• 118
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VE4XO
ZS1KK

• 117
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VE7ZZ
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VQ5EK
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ZS2EC

• 116
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W4EO
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PAØRLF
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ZD2DCP

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• 114
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W6WVU
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ZS6HO

• 113
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WØSYK
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TF3EA
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VQ8HJP
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ZS6J

• 112
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WØPGI
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DL1CS
DL1HH
DL1ZN
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G2CNW
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G3IMV
G4FN
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VE3XY
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• 111
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W8PNT
W8TTS
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W9HUV
W9TMU
W9WIO
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WØSBE
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DL7AQ
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G2IM
G3CEG
G4AR
G4AU
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I1PG
OH2VF
OH4NT
PAØRL
SM2OS
SM7AOO
VQ2AB

• 110
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W2OKM
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W6DBT W6YMD F9FS VE6AO W3EIV • 102 OH2XK W6UJ PAØFD W5KCR G3CSL
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WØRIA KZ5KS KH6DQ K2EGI W6VBI W4KKX VE1BV W8SMC ZE3JL W6VZG GI3BKG
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CO2WD OE5PP OH5OE W2RWN W6WB W5BHV VE3RM W8TTO ZL1PO W6ZTW GM3BCL
CR7LU OH1NK OH7OL W2TSL W6YRA W5MCO VE6FK W8WSL ZL2GH W6ZZ GM3EDU
DJ1DF OK2DD OK1CG W3ITW W7DXZ W5TPC VE7MD W9FNR ZS4FP W7FMX GM3EFS
DL1AO PAØOK OK1JQ W3IBT W7GEB W5TTB VE7OJ W9IGK ZS5AW W7ITN GM3EOJ
DL1VU VE6GD OK3SP W3NQC W7TJ W6TGH VK2YC W9OTS ZS6AEA W7JUO GM8AT
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DL6HJ YU1AA OZ3RO W3RXM W8FCX W8AAP VP9BM ZS6OS W7ONG GW8UH
DU7SV ZD6BX SM2BCS W4AWS W8TLL W8AVB VR2CG ZS7C W8AL HB9DH
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F3CT ZL1LZ SM5TQ W4IPR W6CFB W8HZR YU1CAG WØFBT • 100 W8HSW HC7KD
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F9MS SM6DN W5MY WØRBA W8LY ZL3CP WØLBB W1BUX W8IQS I1ZFD
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• 109 F9RO W4YDT DL1PV GM3DZB DL7AP W2FXO G2DM W2HZN WØCDV OZ4KX
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I1NT GM6MS OK1XQ OK2SO GI3IVJ W4GUV GW4CX W3OHC DL6TW VE5GF
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PY1FT W2DPS HZ1KE SU1AD PAØNIC GM3RL W4LHQ HB9NL W4CRI DL9TJ VE7EH
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• 108 W6FHR OK2OS • 103 VE1BK JA6AK W5RS KH6EL W4RTX FG7XA VS6BA
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W6LGD DL3IE SM7BHF W2UPH ZS1BM OE1ZZ W6TEU OZ1W W5IX G3BDS ZS6OW
W6LN DL9GH VE3IG W2WFC 4X4BN OE13USA W6TMP PAØKE W5JLU G3BNE ZS6SG
W6PUZ F8BQ VE3KE 4X4DR

•249
PY2CK

•244
VQ4ERR

•243
W1FH

•240
ZS6BW

•234
W9RBI

•231
W3JNN
W8HGW
CN8MM

•230
W9NDA

•229
W6AM

•228
W1NWO
W8GZ

•222
W1JCX
CX2CO

•220
W1MCW

•218
W5BGP

•216
W6DI

•215
XE1AC

•214
EA2CQ

•213
WØA1W

•212
SM5KP

•211
HC1FG

•210
W8BF

•209
G2PL
ZL1HY
ZL2GX

•206
ZS6Q

•205
W8KML

•204
W4HA

•203
W2BXA

•202
W2APU
W5EFC

•201
CM9AA
G4ZU

•200
G3HLS
HSM
ZS6DW

•199
LU4DMG

•198
W8QJR

•197
W5JUF

•196
SM5ARP

•195
W3BES

•194
W6KQY

•192
CO2BL

•191
W6GVM
W8BKP

•190
W2AFQ
W3GHD
W6MBD
W9RNX
ZS6FN

•189
W5ALA
CT1CL
EA2CA
PY2AHS

•188
W1ADM
W4MKB

•187
W7HIA
G3FNN
PY4CB

•186
CO2BK
G8IG

•185
W3KT
W5ASG
W6YY
G3DO

•184
CT1PK
TI2TG

•183
W8VDJ

•181
W1MB
HAMU

•180
W8DMD
CE3AB
OD5AB
PY4KL
PY4VX
SM5LL
TI2RC

•177
KV4BB

•176
K4AIM
W5NMA
W9ROQ
HC2JR

•175
WØGKL
G6RH
PAØNU
PK4DA

•174
W1ATE

•172
W4EWY
W4OM
HB9J

•171
W1CLX
W1LMB
W2WZ
VE7ZM

•170
W3DHM
W4AZD
W5KBU
W5YLL
W7MBX
W9HB
F9HF
ZP5CF

•169
YV5AB

•168
W9QLH
YV5EC

•167
W1BLF

•166
W3ECR

•164
W4DQH
W4ESP
G5VT
KH6OR
KL7AFR

•163
W3IMV
W3UIP
W9JJF
VE3KF

•162
W8EWB
F8PQ
G5RV
PY1NC

•161
W1ENE
W3EVW
W7ADS
W9WHM
G2ZB
HASM
HBIC
HYJ
PY2JU
PY4PI

•160
W1PST
W4AAW
W4DCR
W5GXP
W6CHV
WØNCG
F9HE
G6AY
HB9LA
LA5YE
LU4DD
PY1AQT
ZL1KG

•159
W1HX
W8CLR
W8JBI
LU8CW

•158
W3GHS

•157
W2JT
W4CYU

•156
PY4RJ

•155
W8REU
PY4ZS
TI2HP

•154
W8AJW
W9FDX
ON4PJ

•153
G2MI
VP9G

•152
W5MMK

•151
W2AEB
W2EOH
W2QF
W3MAC
W7HXG
G3BID
HCAR
LU4MG

•150
W1EKU
W2VWN
W3BET
W3VKD
W4GMA
W4NHF
W6SYG
WØHX
WØVSK
DL1LH
F9RM
GM3AVA
ZS1DO

•148
W1HKK
W9BVX

•147
W4ANE
W4EEE
F8CW

•146
W2JY
W4NYN
W5DMR
G6BS

•145
W1FFO
W4JGO
W8MWL
CR6BX
HB9ET

•144
W2RGV
W2ZX

•143
W5KC
DL7BA
G2BXP
PY1FR

•142
W1BEQ
W8LAV
W8NGO
W8NXF

•141
K2CJN
W4FBH
W6ITH
W9HP
CX4CS
F8EJ
G2AJF
KT1WX
OZ3Y

•140
W1GOU
W2AKX
W4FPS
W4HRR
W6TT
W8HUD
W9EZD
WØIEV
WØPRZ
CE3AE
G6LX
HUA
KL7AON

OZ7TS
PY4LP
PY4PQ
SM5WJ
VP6SD

•139
W9VND

•138
W8JIN

•137
W5KUJ
WØANF
EI2W

•136
W2FXE
W8SDR
CP5EK
G2WW

•135
W1ARV
W2ZKG
W5CEW
W7HQC
HC2OT
LU8BS

•134
W1AUR
W1QPN
W4GIO
DL4BY

•133
W3CGS
W4TO
W5EB
W6NIG
CE1AH
EA4CX
HRM

•132
W1GKK
W1KJU
W1MMV
W2JJL
W3KVB
W6VFR
W7PEY
W8TJM
W9IOD
HCQD
HCTE
ZS1KW

•131
W2PUN
W2ZW
W4CWV
W9UUN
F8SK
G8QX
GM2DBX
HB9FU
PAØJA
VE3BDB
VS2DQ

•130
W2BQM
W2CKY
W2NHZ
W3DKT
W3DPS
W6WNH
W8ZOK
W9BZB
WØCPM
WØPUE
CN8BA
F8XP
G8KP
HAXD
HVS
ON4DH
ON4YI

•129
W2ZVS
SM3BIZ
VP6CJ

TI2LA
ZS6FU

•128
W3JNM

•127
W3AEV
F8SE
KZ5DG

•126
W1QGJ
W2YYL
W6TZD
DL4QH
ZS5CU

•125
W1CJK
W2PRN
W4DOU
WØGEK
ON4MS
PY4GC
TI2UE

•124
WØEYR
EA7EV
HRC
SM5RY
4X4RE

•123
W8AUP
W9TJ
CX3BH
F9PH
ON4AR
ZS3G

•122
W1HRI
W5HFQ
WØGUV
WØJRY
WØJYW
CT1MB
G2ALN
HZV
OQ5LL
SM5ARL
VE7VO

•121
W4BA
W4BOC
W4JCK
W9JLH
W9NLP
DL3VZ
EA9AR
G3COJ
G4JW
G8UG
GC2RS
HBJC
HZCT
OH2SE
VK7RA

•120
W1RZD
W2PBI
W2QKJ
W2SGX
W2WCY
W3BUX
W3DWA
W3HIX
W4AQR
W4DCQ
W4IYM
W4MB
W5TIZ
W6CHY
W6CLS
W6IKQ
W6MJB
W8AJH
W8BIQ

W8MRC
EA3KB
EA9BC
F8MY
HB9DY
HAOF
VE1CR
VE3BNQ
4X4DK

•119
W1CUX
W3BYL
W5JBD
W8KPT
W9YFV
HK4DF
LU3DH
LU3PF
VK3BZ
VP5FR

•118
W2VQM
W2VYH
W3EQK
W6YI
WØTJ
LA7Y
OD5AD
VE2GQ

•117
W4KAE
W6YX
W8EKW
DL4EA
EA4CM
HAIJ

•116
F3WV
HBSB
LU8FP
SM5BAF

•115
W2MFS
W3RIS
W4BVX
W7EMP
W8HRV
G3DPJ
HKDR
PY7VG

•114
W2GLF
W4NBV
W6IDY
W8ZMC
ET2LV
G3BNC
GM2UU
HCBZ
PY1AGP
TI2EV
VE2WW

•113
W2BRV
W3MMH
G5PP

•112
W4MRA
W5JJA
W7EKA
DL6VM
G4JZ
HBPW
OZ5KP
VE7AIH
ZS6LW

•111
W2PRF
W2UTH
W3DYT
W7MBW
W9CZC
W9JYU
WØGFO
CX5AF
MP4KAC
PY7VBG

VE7MS
VU2EH
YK1AC
ZS2AT
ZS2IW

•110
W1WQC
W2GIC
W2GX
W2IUV
W2TXB
W3FGB
W3HUV
W4IQG
W5HJA
W8BFQ
W8DMJ
W8LJ
W8QAD
W8TMA
W9JUV
W9LTR
WØEHF
CT1DX
CT1NT
DL1SD
DL3EA
EA2DJ
EA7EM
EI4Q
G3AIZ
G3YM
G5LN
HP1BR
HFLD
KP4ADX
LU3EB
OD5BA
OH5PE
OZ7BM
ZS1GG

•109
W1KWD
W1RIL
W4BYU
W4NDE
W5DJH
W8VQD
W9ABA
WØICL
CO2OZ
CT1PR
DL4TL
EA4DB
EA6AR
HB9CX
HB9ID
ZS6Z

•108
W1BAV
W1UWB
W2AOX
W3KTF
W3MWP
W4LIM
W6QOG
W8RVU
F9EZ
HAHW
HRLH
HTHZ
OZ5BW
PY1ANU
VK2DI
ZS5GU

•107
W2DCO
W2RUI
W4LZM
W4QT
W7HLB
DL7CX
EA3FG
F8LE
G4MS
G5OO
HB9JZ
IT1AFS
OH5NW
PY6CO
4X4BL

•106
W1FZ
W3AER
W4LRG
W7AHX
W8PUD
W8MKY
W9DPI
DL1FK
G8VB
HB9NU
HCWX
HCXJ
LU3MZ
TI2OA
VK3JE
VQ5EK
YN4CB
ZL2JB

•105
K2AAA
W2JJ1
W2ONV
W3CUB
W5PQA
W6AED
W6UYX
W8JWV
WØIOS
C2MQ
ON4RC
SU1HF
ZD6RD
ZE2JK

•104
W1BPH
W2PPS
K4BVQ
W4ADY
W4AHF
W4EBO
W4TWW
W6FHR
W8ACP
W9FHZ
W9LXQ
WØQFQ
CE3AG
EA4CK
EI2L
EI3S
F3OX
G2ALO
G6TA
G8QW
HGZ
HSGA
LU4ES
LX1SI
PY5DP
SM6SA
ZD4AH
ZP5ET

•103
W1JYQ
W1PDF
W2CGP
W2DPS
W2IZS
W2NQR
W2QWS
W3NA
W4AYF
W4EEO
W7AUS
W8EMZ
W9EWC
W9ZPT
WØUQD
DL3RM
DL4UZ
EA8AX
G2AKR
GW3CDT
HB9KU
HK4FV
HKP
IS1AYN
KG4AP
PY6CN
VK5LC
VQ4SC
YS2AG

3V8BB

•102
W2DYR
W2LV
W2PBG
W2QCP
W3BVL
W4KYB
W5JWM
W5NZE
W5ZUI
W6PWR
W6SAI
W6SHW
W7HTB
W8IWI
W8WZ
W9WXT
WØSQO
WØSUG
WØWSH
CO7GM
CT1ER
CT1FL
DL3DO
DL3TM
DL3NE
DL7AB
G2DP
G3CCO
G3XC
GC6FQ
GI6TK
GW8BW
HB9HM
HAUH
HZZG
KP4ES
LU5DC
OE5JK
ON4LJ
PAØMDW
PY6RZ
SM5FL
TA3GVU
VE3AUJ
VE7HC
VS9AH
XZ2SY
ZD1SW
ZL3LR
ZS5G

•101
W1QWU
W1RFE
W2BYP
W2LSX
W2RTX
W2UAT
W2WME
W3ORG
W3SFK
W4DEO
W4IIB
W4LPT
W4NZM
W4YHC
W5ZS
W6BYB
W6KPC
W6PKI
W8CYL
W8NML
W8NWO
W9DSP
W9LQ
WØMKF
WØNWW
CO1AF
CX3AA
DL3IR
EA2CB
EA4EP
F3PW
F9AA
G6WX
HB9BR
HASO
HCSP
HKZ
HNK
HQQ

HRB
HWAL
KP4EZ
OH2QV
VE3BQP
VP6WR
VP9L
VS1AY
YK1AA
4X4AD

•100
W1DBM
W1FQX
W1VFK
W2DSU
W2FZO
W2KSN
W2MA
W2OR
W2OXR
W2PQJ
W2SKE
W3AM
W3DZZ
W3JTK
W3PA
W3RVM
W4CRI
W4DCW
W4DSC
W4DYM
W4ECE
W4EYG
W4GLR
W4LGG
W4NQN
W4PGZ
W4PYX
W5ALB
W5ERY
W5GZ
W5SFT
W5UBW
W6LTY
W6MEL
W6OZE
W6UZX
W6ZTW
W7ADH
W8ALC
W8BGU
W8BRA
W8DXO
W8FJX
W9CKP
W9GZK
W9HMG
W9IGK
W9UJ
WØDXE
WØFUH
WØGSW
WØMCX
WØUYC
CT1QF
CX2CN
EA3GI
EI4L
G2HIF
G2LS
G2VJ
GM3DZB
HBXK
KP4HZ
LU8FAO
LX1DC
OE5YL
OH1PN
OZ7OP
PAØQJ
PJ2AF
PY1FT
PY1RC
SM3EP
SM5FA
SM6OE
SU1AS
TG9AD
VE3AOL
VE3TW
VP5AR
VQ5PBD
XE2KW
ZS1MQ

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
PHIL SIMMONS, W1ZDP, Asst. Comm. Mgr., C.W.
ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., Phone

Ready for Conelrad? It has been a full year since FCC adopted the plans to require amateurs to provide some means of monitoring the broadcast band to insure your station's silence in the event of Conelrad alerts. As reported in *QST* for last February these new rules become effective January 2, 1957. This is by way of being a 30-day reminder that your station must now have *some* method to monitor the broadcast band continuously or as a substitute be sure before going on the air and by check every ten minutes thereafter that things are "normal" or non-alerted.

Survey Success. This last summer, on FCDA request and by ARRL bulletins to affiliated clubs and appointees we asked assistance of selected amateurs in a nationwide survey of Conelrad coverage. This Conelrad test was a 15-minute one, held July 20th during Operation Alert. High interest and participation in the survey was evident, nearly 2000 usable returns (about 35%) being received. All states were heard from and leading numbers of reports received from New York, California, Massachusetts, Ohio, Illinois and Indiana. A surprising sidelight: 17.9% of those amateurs assisting in the survey *already* had Conelrad alerting arrangements effective in their stations. For improved methods of Conelrad alerting beyond having an a.c./d.c. receiver going to watch 640 and 1240 kc. and your locals, see *QST* articles in the January, June and November '56 issues of *QST*.

Holiday Traffic Opportunity and ARL Check. During the holiday season we always have a peak use of amateur message handling circuits and nets for the exchange of holiday greetings. Our traffic work consists not only of messages between hams in U. S.-Canadian operating territory but comprises that for third parties. We think it is well for us to remember that the appreciation of those outside our fraternity for any personal message service depends on the *results*. Indiscriminate solicitations of traffic that result in overloading nets beyond their capacity or swelling totals by starting messages to points were deliveries cannot be effected, will *not* result in the good will that otherwise can be generated and maintained. To get the most in your results along this line may we suggest (for any except point-to-point with a station at a delivery point): (1) Handle your traffic to be relayed via your established ARRL section net, rather than the casual or random relaying of messages. This keeps the traffic channeled in the hands of experts. It gets for you the advantages of the ARRL NTS plan of traffic interchange and systematic routing to all time zones, regions and sections of the country from each section net. (2) Use the ARRL Numbered Radiogram Texts (CD-3 is bound into *each* ARRL log book). The letters ARL ahead of the check or group count (of the actual number of text-groups sent) identify all such messages. You may ask "ARL?" to make sure any station given such messages has these standard text lists. Proper conversion must be made in all cases back to actual wording, instead of numbered texts before delivery of *any* message. (3) As you know, amateur radio traffic is non-competitive with commercial traffic, — that is, there is no guarantee of speed or accuracy or payment to insure same such as defines commercial responsibility. It is well to have this understood by originators so their expectations will not be too high, and they may be pleasantly surprised by your results!

Information on ARL check appears on page 12 of *Operating an Amateur Radio Station*. It is suggested this be reviewed to insure correct use of the numbered texts. Among club projects we note that the Oregonian Radio Society is planning on successive Sundays in mid December to visit Veterans Hospitals at Portland, Oregon and Vancouver, Washington to assist in some seasonal amateur traffic work. Besides merely a message pick-up which many clubs do, plans are under discussion to use two-meter gear or RTTY for a start-off link.

Re Harmonics (From Novice to Observer). Too many communications of late have been from Observer to Novice . . . (!) . . . the Observer cooperative reports that give the friendly warning and save FCC tickets, we mean. Our KN-WN-contingent is warmly appreciative, sometimes puzzled, and of course anxious to eliminate the radiations on frequencies where they do not belong. To study the situation, the better part of an afternoon was spent reviewing some two hundred responses received from Novices and sent to us by various observers. We just can't print all these, but it does seem worthwhile to excerpt significant comment which spells out to WNs the things to watch for so as *not* to get into trouble. It's shocking (and unnecessary besides) to be required by FCC to explain off-frequency operation or receive an OO notice a few weeks after receiving one's license.

Some typical responses to OOs:

"Found *two* places on the amplifier dial that loaded up." — *KNØ* — — — . . . "You bet I would rather hear from you, Fred, than from FCC." — *KØ* — — — . . . "Had inadvertently bandswitched my . . . to 7 Mc. using 3711-kc. crystal." — — *KN6* — — — . . . "My tank coil was broken

and I had only half the coil in circuit," -- *W7* ---... "Wondered why there were no answers to CQs. The 3.7 crystal was doubling." -- *KN2* ---... "Had a pi-net output. The short leg of the zepp feeder was doing the radiating." -- *W3* ---... "Appreciated your help in keeping me out of FCC trouble. Had parasitics all over the place and my coil was tapped for 40 instead of 80." -- *KN6* ---... "Happy there are amateurs like you willing to help." -- *WN7*... "Had the band set for 40, I think. Will check 7476 carefully." -- *W7* ---... "Got on 80 and turned band switch to 40." -- *KNØ* ---... "My rig's band switch must have been accidentally left in the wrong position while using 3.7." -- *W7* ---... "In my carelessness in testing the new rig, I used a balanced wire windom with no antenna tuner. Sorry it radiated on 40." -- *W3* ---... "Many thanks. I have received an FCC report and on that same frequency." -- *KN2* ---... "You and ARRL offer a real service." -- *WN7* ---... "I suspended operation on 40 until I had eliminated the trouble by changing my pi-network. The log says I called CQ on 7132-kc. c.w." -- *W6* ---... "Couldn't work anybody with wrong plug-in coil last Saturday night." -- *KN6* ---... "It was the first night I had been on; I have since changed the . . . kit to an 807." -- *KN9*... "Will ask two local hams to check with me. A shielded box may help." -- *VE7* ---... "My error doubling, not the transmitter." -- *KN6* ---... "No excuse for it. Just didn't take the time to use the wave meter." -- *A.L.*... "I am also adding an antenna tuner and having my frequency checked by local hams." -- *KNØ*... "I received a 'QSL' from the FCC at Grand Island for the same thing. Have now changed the rig to correct this." -- *KN2* ---... "Have been putting out the basic frequency instead of tripling to 21.6 Mc. Feel like a fool. Forgot to change my final tank coil." -- *K6* ---... "For 80 I connected a windom to my tank coil. The direct coupling caused the harmonic. Glad it was you instead of FCC." -- *WØ* ---... "I was glad to be informed I was out of line. My antenna arrangement was conducive to a 40-meter harmonic. Will not go on 80 again until I fix it." -- *WN1* ---...

All radio clubs are requested to bring out the technical solution to these problems at meetings. Manufacturers can of course help in new equipment by inserting special cautions. These include measuring output frequency before going on the air, avoiding use of the wrong crystal and wrong dip, dangers of using pi-coupling without an antenna tuning, etc.

—*F. E. H.*

W1AW OPERATING NOTE

The complete schedule of W1AW operations appeared on page 77, November *QST*. See that issue for full information on when and where to look for the ARRL Headquarters Station.

RTTY NOTES

Current RTTY operating mostly adheres to an 850-cycle shift. Plans for wider use of narrow-shift are under discussion. At a meeting in Chicago Sept. 30th, WØBP and those present discussed narrow-shift frequencies from 30 to 200 cycles as a tentative standard for those interested. After considering various technical points the group voted the region 160 to 170 cycles best for NFSK, since 160 cycles is easily developed for calibration from WWV tones (440 and 600 cycles) and 170 is a fifth of 850 cycles.

Many teletypers were present when the Sunday meeting (at Hallicrafters) was called to order by W9SPT. Notes were kept by W6FDJ and reported back by W6VPC. Papers on basic theory were presented by WØBP and W9DPY with demonstrations of Auto-Call and Auto-Print by W9TCJ. Informal talks and papers highlighted the occasion and information on converter and filter design developed by W6LDG and WØAUS was presented by W9JBT. W9MDQ spoke on practical equipment servicing and W9NOE presented his design of a keyer interestingly. W9JBT was host to early arrivals. Trips to teletype facilities in the Chicago area were scheduled Monday.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on December 19th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7080, 14,100, 21,010, 50,900 and 145,600 kc. The next qualifying run *from W6OWP only* will be transmitted on December 5th at 2100 PST on 3590 and 7128 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of *all* qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EST. Approximately 10 minutes' practice is given at each speed. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of *QST* text sometimes is reversed. To improve your fist, hook up your own key and buzzer and attempt to send in unison with W1AW.

Date	Subject of Practice Text from October *QST*.
Dec. 3rd:	*The Monimatch*, p. 11
Dec. 7th:	*A 28-Element 144-Mc. Beam*, p. 15
Dec. 11th:	*Simple Trap Construction* . . . , p. 18
Dec. 13th:	*A Single-Tube Converter* . . . , p. 22
Dec. 18th:	*The Ultra Modulation System*, p. 27
Dec. 20th:	*A V.F.O.-Driver Circuit for 7 Mc.*, p. 32
Dec. 26th:	*June V.H.F. Party Summary*, p. 63
Dec. 28th:	*With the AREC*, p. 71

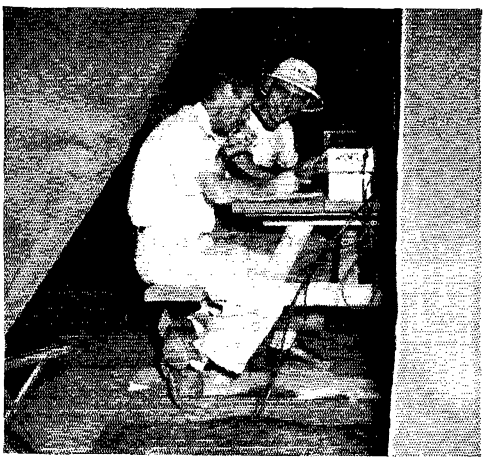
A.R.R.L.-AFFILIATED CLUB HONOR ROLL

Here is the second section, Honor Roll listings for 1956. It's a pleasure to publish this in accordance with the Board policy for special recognition of all affiliated clubs whose *entire membership* consists of members of the League. See page 83 of June *QST* for the earlier listing of additional active clubs with 100 per cent ARRL membership. Our honor list is based each time on analysis of Board-required data received in clubs' early '56 Annual Reports. In early '57 a new survey form will be sent each active affiliate for the filings on which continued affiliation and new Honor Roll listings will be based. Many clubs are now engaged in mid-season activities such as code and theory classes for newly-interested persons, civil defense, building, technical and "examination" programs for members. The following clubs will also now receive "100% ARRL Club" certifications following this listing in *QST*:

Abington Amateur Radio Club, Dalton, Pa.
Bell Gardens Amateur Radio Association, Bell Gardens, Calif.
Coffee Dunkers, Detroit, Mich.
Helix Amateur Radio Club, San Diego, Calif.
Inglewood Amateur Radio Club, Inglewood, Calif.
Jamestown Amateur Radio Club, Jamestown, No. Dak.
The Kilocycle Club of Fort Worth, Tex.
Lilly Radio Club, Indianapolis, Ind.
The Lower Columbia Amateur Radio Association, Longview, Wash.
Maui Amateur Radio Club, Kahului, Maui, T. H.
McKean Radio Club, Bradford, Pa.
Morris Radio Club, Inc., Morristown, N. J.
Nanaimo Amateur Radio Association, Nanaimo, B. C., Canada
Northwest St. Louis Amateur Radio Club, Normandy, Mo.
Palmetto Amateur Radio Club, Inc., Columbia, S. C.
Racine Megacycle Club, Racine, Wis.
Rip Van Winkle Amateur Radio Society, Catskill, N. Y.
St. Louis Amateur Radio Club, Inc., St. Louis, Mo.
SeKan Radio Club, Howard, Kans.
Skagit Amateur Radio Club, Sedro Woolley, Wash.
Sussex County Amateur Radio Association, Sparta, N. J.
The Thirteen Amateur Radio Club, Vancouver, B. C., Canada
Tri-City Amateur Radio Club, Phillips, Tex.
Wichita Amateur Radio Club, Wichita, Kans.
Yampa Valley Radio Club, Craig, Colo.

Remember the Conelrad test that we conducted during the 1956 version of Operation Alert? We promised you some statistics on your returns, and now have them, courtesy the agency under contract to FCDA to make the survey. We amateurs contributed 1922 usable reports up to the time the analysis was made. They came from all 48 states and the District of Columbia, ranging from a high of 170 from New York to a low of 3 from Nevada. Other high states in submitting returns were California (145), Massachusetts (115), Ohio (112), and Texas (94). A total of 344 reporters (17.9%) stated that they *do* have Conelrad compliance equipment as a part of their regular station equipment; 48 said they are building or planning it, and 64 merely indicated that they expected to have it in the future. The others either left the question blank or gave it a negative answer. Considering that Conelrad compliance is not yet mandatory, this is a surprisingly high percentage.

Well, you ask, is Conelrad effective or not? We have no statistical information on this, but judging from reports received here we'd venture the opinion that it is effective in populous areas, less so in areas not heavily populated, and hardly effective at all in areas of sparse population. This



West Allis Amateur Radio Club members W9ZAG (*l.*) and W9MER handle communications at W. A. Roberts Golf Course during Midwest Open tournament in Milwaukee Sept. 15th. Club members worked in shifts from the first tee-off Saturday to the last round Sunday afternoon. Ten and six meters were used with portable generators.

is as it should be; the FCDA survey will include data from thousands of non-amateurs as well as those which we contributed. What is important to us is the fact that we amateurs contributed a significant percentage of "educated" reports to the survey project and that they will assist the surveying agency immeasurably in making their analysis accurate and conclusive. Of the 5500-odd report forms we sent out to amateurs, better than a 30% return was received. Some of this was a result of affiliated clubs adopting our proposal that they reproduce the form and have each club member make an individual report. It was a "good show," fellows.

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Maritimes SCM VE1WB reports coordination between W3DOK/VO2 of the U. S. Coast Guard Rescue Unit at Argentia, and VO1T and WØCZK in assisting communications relative to an explosion aboard a Portuguese fishing vessel resulting in its eventual loss by fire. VO1T provided the liaison with the Portuguese consul in St. John, N. B. The biggest difficulty was the language barrier.

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EC W1NFG of Hamden, Conn., was alerted by the C.D. Director of Hamden on Sept. 2nd that a mass search was being organized for an infant child reported kidnaped the day before. A network was activated with W1NFG/m at the scene, and mobile *W1s* QXT and UKX assisting the searchers. Civil defense headquarters station W1WHF was put on the air, with W1UJG as operator. Mobile *W1s* ERE and SQK joined the group from North Branford. The mobiles were used to scour the far side of the wooded areas to report findings as the foot searchers emerged, and for messages regarding the deployment of refreshments from the Red Cross. Mobile *W1s* BVN ETF and TTD later joined the operation. Other amateurs assisting from home stations or as relief operators included *W1s* WHL GTG FCE DDP and RPE. The group participated in the search for eight hours on Sunday and 5 hours on Monday. — *W1NFG, EC & RO, Hamden, Conn.*

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On Sept. 11th the Radio Amateurs of Great Falls organized a search party for a missing six year old girl. The call went out at midnight and 10 mobile stations were put into operation to cover various parts of the city and county. Four men were put into each mobile unit with flashlights to carry out the search. The girl was found at 1:00 A.M. unharmed. The mobile units were dispatched from the police station. All work was coordinated with the police force. The following amateurs, all members of the Electric City Radio Club, participated: *W7s* TSG (NCS), BOZ/m BUJ/m EOI/m HAH/m BOV/m HEM/m FDH/m YLC YLD WSW/m KUH/m and WØOVY/m. — *W7KUH, SEC Mont.*

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On Sept. 23rd at 0900 CST the Eglin Amateur Radio Society's ten-meter net was called into session to handle emergency traffic caused by Hurricane Flossy. This net served Eglin Air Force Base and surrounding communities in northwest Florida. The control station, W4SRX, was located in the Command Post. Fixed stations operated from private homes in the area. Seven mobile units cruised the area, and a portable station was set up at Fort Walton Beach under the call W4MFY. W4RKH maintained contact with amateurs at greater distances on 3935 kc. The net was in almost continuous session until 2200 EST, Sept. 24th. The following additional amateurs were reported as having participated: *W4s* BJP/m CPE MFY/m PPJ KWM BVE RRF/m AOK JM WKQ UXW/m SMM/m UJP *K4s* CCR CUC FEJ JZL KOE/m HDW JOA BZW GEV AMU GKH KN4ILA W1WEX/4 W7WIO/4 W7QNN/4m W1AKF/4 W1BZK/4.

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Ten amateurs took part in a civil defense exercise in the Canal Zone on August 13th, both on the Atlantic and Pacific side. Five mobile units (*KZ5s* AP EP JJ QA AC) operated on the Atlantic side under control of KZ5BK, operating on emergency power. The mobile units were on roving assignments in the Atlantic area, reporting to two portable units handled by KZ5RM and KZ5JJ. On the Pacific side KZ5DJ, KZ5MJ operating KZ5JW, and KZ5KA operated

A.R.R.L. ACTIVITIES CALENDAR

Dec. 5th: CP Qualifying Run — W6OWP
Dec. 19th: CP Qualifying Run — W1AW
Jan. 3rd: CP Qualifying Run — W6OWP
Jan. 5th-6th: V.H.F. Sweepstakes
Jan. 12th-13th: CD QSO Party (c.w.)
Jan. 17th: CP Qualifying Run — W1AW
Jan. 19th-20th: CD QSO Party (phone)
Feb. 2nd-17th: Novice Round-up
Feb. 6th: CP Qualifying Run — W6OWP
Feb. 8th-10th: DX Competition (phone)
Feb. 12th: Frequency Measuring Test
Feb. 15th: CP Qualifying Run — W1AW
Feb. 22nd-24th: DX Competition (c.w.)
Mar. 7th: CP Qualifying Run — W6OWP
Mar. 8th-10th: DX Competition (phone)
Mar. 18th: CP Qualifying Run — W1AW
Mar. 22nd-24th: DX Competition (c.w.)

fixed stations, with KZ5DG maintaining contact direct with FCDA's regional headquarters in Thomasville, Ga., for the main control center. — *KZ5RM, SCM Canal Zone.*

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On Sept. 1, amateurs of the Pensacola, Fla., Emergency Net, supplied communications for a long-distance water skiing event to attempt breaking the record. K4DKG/4 was established as NCS on 29,560 kc., while other stations were established at check points along the route from New Orleans to Fort Walton Beach, Fla., a distance of 285 miles — W4PQW/m with W4UCY assisting at Gulf Shores, Ala.; K4EGD/m at Innerarity Point, Fla.; W4YES/m at Pensacola Beach; and K4BZN/m with W4RUF assisting at Navarre, Fla. Due to lack of ten-meter equipment west of Pensacola, W4IJF fired up on 3935 kc. to receive reports as the team approached from the west, after which he would relay to the NCS on 29,560 kc. Contact was established with K4CUC of the Fort Walton Beach group and maintained throughout the day until the exercise was concluded at 1730 CST. Although ten meters was open to W6 and W7, good cooperation was had from them in moving off the frequency. Publicity was given through broadcast station WBSR, which carried a program on the event. All stations operated at power under 50 watts. Did they break the record? Gosh, *we* don't know!

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Once again the amateurs of Dade County (Fla.) took to the highways in cooperation with the Sheriff's Dept. on Labor Day week end, Sept. 1, 2 and 3 in an attempt to cut down on highway fatalities. Mobiles patrolled all main highways reporting speeders and other violations to portable stations located near the highway, and then relayed to a temporary headquarters station at Tamiami Airport on amateur frequencies. This info was relayed on police frequencies to patrol cars in the area affected. It was quite a problem to schedule mobiles to cover all highways. Many mobiles participated all three days, putting hundreds of miles on their cars. The Red Cross supplied coffee and donuts during all 3 days at the headquarters station, K4AG/4. WCKT/TV featured the operation on a popular news program, and good coverage was given by two local papers. The Sheriff wrote letters of thanks to all amateurs participating, together with a detailed report of the operation which indicated no fatalities for the 3-day holiday week end. This is the second time in history that NO fatalities occurred on this week end which makes us all feel the effort was well spent. Forty-seven amateurs participated. — *W4IYT, SEC E. Fla.*

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Ten amateurs of the Oil Capitol Mobile Club of Tulsa, Okla., assisted on Sept. 3rd and 4th in supplying communication for a sports car race in that city. Contact was made between the flagmen at six "corner" points of the course and the officials at the judges stand. All equipment functioned well and all necessary communication was accomplished, although some difficulty was had with track and race lingo.

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Seventeen SECs reported for 4733 AREC members in August. This is an increase of three reports over August of 1955, but once again represents fewer AREC members. This is caused by lack of reports from the Los Angeles Section, probably our most populous section AREC-wise. No new sections to be added to the 32 different sections reported so far this year. Sections reporting: NYC-LI, W.N.Y., San Joaquin Valley, Santa Barbara, Ala., Wis., Wash., Santa Clara Valley, Md.-Del.D.C., Mont., Nebr., Ore., E. Pa., Colo., E. Fla., N.C., Ga.

RACES News

In the annual Simulated Emergency Test, just concluded with traffic still coming in as we write this, FCDA was represented by the personal stations of W8LBM and W8DUA who, operating on their own time, were not able to be continously active on the National Calling and Emergency frequencies. Several local Battle Creek amateurs were also on the air to assist. W8YAN, the personal station of the FCDA Region IV communications officer, also in Battle Creek, was on the air to represent that region. WØWBC was quite active from Region VI Headquarters in Denver. We have no word concerning activity by other FCDA regions in the SET, but more on this later if anything is reported.

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W9PSP, state RACES Radio Officers for Illinois, has sent us a complete outlay of the RACES organizational setup for his state — and a comprehensive job it is. Statewide communication is effected by the Target City Net, which operates on 3997 and 1803.5 kc. with regular drills Thursdays. The state is divided into a number of target areas, each of which has a target city, and each represented by a station in the net. The state net control is K9CLW, and liaison is also effected with FCDA Region IV headquarters in Battle Creek through W8YAN. Reports on each drill are sent to each member of the Target City Net Control Operator's Association.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for September traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W2KEB	38	1236	920	615	2809
WØBDR	68	765	708	21	1562
W8SCA	11	749	741	3	1504
K2WAO	1284	102	62	40	1488
W7PGY	29	729	677	52	1487
K7FAE	70	626	654	52	1402
W2KFV	9	708	459	204	1380
WØLCX	33	662	641	26	1362
W7BA	21	646	615	27	1309
W4PL	11	624	509	82	1226
W3PZW	30	575	480	95	1180
W3WG	13	540	544	22	1119
W2YRW	6	551	283	265	1105
W3CUL	87	461	381	65	994
W3WIQ	85	393	420	30	928
K5EFB	61	317	441	15	834
W6GYH	581	125	72	23	801
WØPZO	0	400	397	3	800
W5DTA/5	7	392	367	31	797
W9NZZ	226	266	0	268	758
W0CPI	6	348	328	20	702
W9TQC	24	325	304	15	668
K4DIZ	54	274	250	77	655
W1LDE	12	323	291	23	649
W9DQ	16	302	292	26	636
W8UPH	3	229	268	31	531
WØBLI	4	311	302	5	622
WØLGG	30	284	264	12	590
W3ZS8X	215	199	156	19	589
W8ELW	13	279	262	1	555
K7FEA	10	264	259	5	538
W9SWD	26	259	221	18	524
K3WCS	0	267	247	0	514
KH6QU	31	334	104	44	513
W9CXY	13	244	233	11	501
Late Report:					
W3CUL (Aug.)	84	805	662	121	1672

More-Than-One-Operator Stations

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W6IAB	28	945	751	194	1918

BPL for 100 or more *originations-plus deliveries:*

W8NCK/8	201	W4ZIZ	117	KP4WT	106
W4DDY	125	W2JGV	110	W1ZME	101
WØNIY	120	K3WBJ	106	Late Report:	
KP6AK	120			W1WSN	125

More-Than-One-Operator Stations

KØHEA 111

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: W4TYU, W9DDK, W9EHZ, W9JYO, WØLCX, WØLGG.

The BPL is open to all amateurs in the United States, Canada, Cuba, 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.

TRAFFIC TOPICS

So another Simulated Emergency Test is history, and traffic men were in on it this time much more than in previous years. Most nets of the National Traffic System conducted special sessions to handle overloads and expedite traffic delivery to Red Cross, Civil Defense and ARRL. During the week end we heard many traffic stalwarts beating it out, and the steady flow continued into the following week. W1AW copied over 400, W1NJM around 200, W1YYM 100, and W1BDI dozens, to take care of the week end traffic to ARRL, with more still coming in at this writing. Particularly noteworthy among Connecticut non-ARRL-staff members was the work of W1YBH, Con-

necticut's hard-working PAM, who handled the phone traffic almost exclusively and piled up a delivery total of over 200, with more still coming. We should also mention, while we're naming calls, the praiseworthy relay work of WØBDR, W9DO, W8ELW, W9CXY and many others.

While the hard work of individuals is worth mentioning, the greatest satisfaction we derived from the whole long-haul aspect of this year's SET was the teamwork accomplished in handling this big load of traffic, the extended effort in conducting special net sessions to avoid week end delay, and the fine operating most apparent on the part of c.w. and phone traffic men in the whole activity.

Does this sum up a perfect week end? Well, hardly. Praise for and satisfaction in a good job well done comes first, but right in the middle of it we have to face the fact that as well as we did, we could have done a whale of a lot better if *all* nets had operated on Sunday just as they normally do on other nights of the week, if more stations had monitored the National Calling and Emergency Frequencies for SET traffic, if more ECs and AREC members had originated traffic in order to obviate the monotony of traffic operators sitting on their posteriors without any traffic to handle (a thing all traffic men hate worse than DX), if there had been more QSYing off the NCE frequencies to handle traffic, and if there had been more use of the high-frequency NCE spots to expedite handling of traffic from the west coast and midwest. If SET traffic is to be classified as emergency traffic (and it should be, for best test results) it should be handled as such. Traffic from the west coast should not take two or three days to reach headquarters, much less four or five.

Now don't start throwing these criticisms back in our face by saying there weren't enough Headquarters personnel on the air, that Red Cross representation in some areas was sparse, that civil defense participation in most of the FCDA regions was nonexistent. We know it. The things that were wrong with this year's SET were wrong with all of us, and they need rectification in the future. So let's start *now* in our planning for better success of future exercises of this kind, both in the amount of traffic handled and in the speed and accuracy with which it is handled. All traffic nets are emergency nets. If yours has no emergency activity plans, it's time something was done about it.

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Heard early Sunday evening Oct. 14 on 3550 kc.: W1NJM working a G3! Teh, teh!

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Following is a *complete* list of countries with which U. S. amateurs can handle third party communications: Canada (VE), Chile (CE), Cuba (CO/CM), Ecuador (HC), Liberia (EL), Peru (OA) and Panama (HP). In addition, of course, traffic may be handled with all U. S. possessions. Any changes or additions will be listed either in this column or in "Happenings of the Month," or both. But they don't change very often. The recent addition of Panama was announced on page 49, October *QST*, and was the subject of an ARRL Official Bulletin.

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Transcontinental Phone Net reports a September message total of: First Call Area, 982; Second Call Area, 1795; Fourth, Ninth and Tenth Call Areas, 379; total, 3156. The North Texas-Oklahoma net reports 221 messages in 27 sessions, with 739 station check-ins. The Early Bird net reports 1035 messages handled during September.

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National Traffic System. We continue to get letters which very strongly indicate that many of our NTS leaders figure that the only important consideration is to get the traffic through, by whatever means. This is a fallacy. Oh, it's an important objective, all right, but it's not all there is to consider. Traffic men have had this as a primary aim since amateur radio was a pup; but in NTS we are trying to achieve it through system and organization, and therewith reliability, steadiness, accuracy and dependability. We are also trying to achieve it without depending entirely on the every-night traffic man, so that greater numbers of amateurs can be utilized. And one other important point: training of operators in the handling of record messages so that they will be qualified and able to do so in an emergency is every bit as important an objective as the handling of the traffic itself — which should not even *be* on amateur nets in normal times if it is really important.

We still do not believe that most of you have read CD-24 or, if you have, realize just what it is we are trying to accomplish. A group of amateurs working together on a spot frequency under a regular procedure to handle traffic *is* a net — a good one or a poor one, depending on many factors too numerous to mention here, but still a net. We aim to *make* all NTS nets good ones. But we go a step further in getting groups of nets together by means of liaison lines to form a *system* through which traffic can be routed progressively toward its destination. This requires a flow system and a time schedule. It requires a standard operating procedure so that nets can conveniently and efficiently work into each other. And it requires that the system be followed closely, otherwise the traffic flow pattern will be disrupted and confusion will result, making operators feel that the system is no good. Paradoxically, many NTS operators, upon finding that the system is not working because it is not being followed, blame the system itself instead of where the blame really lies: the incorrect implementation of the system.

NTS was set up on basic tenets of logic and common sense, and we still believe it can operate that way provided *only* that its operation be (1) understood and (2) really attempted. Have *you* studied CD-24?

September reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation* (%)
EAN	24	580	0.78	24.2	89.6
CAN	24	899	1.29	37.4	97.2
PAN	28	507	0.42	18.1	100
1RN	25	278	0.36	11.1	90.3[1]
2RN	25	260	0.77	10.4	98.7[1]
3RN	56	264	—	4.7	69.5
RN5	43	578	0.83	13.4	53.8
RN7	43	136	—	3.1	23.0
8RN	47	229	—	4.8	83.0
9RN	30	577	0.79	19.2	100[1]
TEN	65	1538	—	23.6	67.1
ECN	17	54	—	3.2	64.7[1]
Sections[4]	427	2936		6.9	
TCC Eastern	20[2]	228			
TCC Pacific	117[3]	708			
TCC Central		1355			
Total	854	11137	CAN	10.4	—
Record	854	11137	1.29	15.4	100
Late reports:					
RN7 (June)	47	134	—	2.8	18.7
RN7 (July)	51	112	—	2.2	17.6
RN7 (Aug.)	52	263	—	5.0	17.5
TCC Eastern (July)	9[2]	172			
TCC Eastern (Aug.)	19[2]	162			

[1] Regional net representation based on only one session per night.

[2] Reports received, not counted as net sessions.

[3] Schedules kept, not counted as net sessions.

[4] Section nets reporting: SCN (Calif.); S. Dak. 75 Phone; Iowa 75 Phone; TLCN (Iowa); CN & CPN (Conn.); AENT, AENB & AENP (Ala.); QKS & QKS SS (Kans.); WVN (W. Va.); NTX (Tex.); TNON (Tenn.); MSN (Minn.); KYN (Ky.).

We hate to keep on saying this, but it keeps on happening, so what else can we do? Records are still toppling. This September topped all others in number of sessions and traffic reported, and in "rate." Average per session seems always to be lower when a greater number of sessions are reported, which is not too surprising, nor at all alarming when you take into account that the added sessions are mostly section net sessions.

We know these statistics are of interest to most of you, but no doubt they bore some of you, and others don't know how we get them or disagree that they are significant of anything in particular. True, their significance is very greatly affected by the number of net managers reporting, by the completeness of those reports, and by net manager interpretations regarding the figures reported. We don't contend that they are a sole basis for evaluation; our only contention is that if we improve statistically we have a good indication of actual improvement, even if this improvement is largely one of greater faithfulness in reporting. If we decline statistically it might not necessarily mean a decline in actual operation but only net manager failure to report the figures we need to maintain the statistical computations. So let's keep on reporting, gang. We especially want re-

gional, area and TCC data, but we'd also like as much section net data as we can get. Section net managers, drop us a line requesting a supply of CD-125 reporting cards so you can add your strength to the overall NTS statistical totals each month.

Net activities. CAN fell below 100% representation of all regions this month for the first time, when RN5 twice failed to be represented. This is still an incredible representation record. K2AMP and K2BHQ have earned 2RN certificates. The Third Regional Net discontinued its 1830 session on October 1, but continues the 1945 and 2130 sessions. W4COU makes the following RN5 commendations: W4RLG for perseverance and reliability; K5AOV for best NCS of the month; W4BVE and W4IJK for keeping the net open during Hurricane "Flossy." VE7ASR comes across with back RN7 reports for June, July and August, but section representation from all but Washington is weak — in fact nonexistent from Montana, Wyoming, Saskatchewan, Alberta and Alaska. TEN activated all sessions during the Simulated Emergency Test and moved plenty of traffic.

Transcontinental Corps. W8UPB is bowing out of the Eastern Area TCC directorship as soon as a replacement can be found. W1EMG is doing an outstanding job on Eastern Area TCC, as is WØBDR in the Central Area. The Pacific Area TCC roster as of the middle of October consisted of 17 stations, with three additional in prospect — pretty close to a complete roster of a different station for each function each night of the week, Monday through Saturday.

The complete TCC roster as of Mid-October, 1956: Eastern Area — W1EMG, W1BDI, W1NJM, W2ZRC, W3COK, W3BUD, VE3VZ; Central Area — WØBDR, WØKJZ, WØSCA, WØDQL, W0LGG; Pacific Area — W6ADB, K6DYX, W6VZT, W7GMC, W6YHM, W6EOT, W7UJL, W6BPT, W7FRU, W7WJF, WØKQD, K6GZ, W6CMA, W6RFW, K6ORT, K6CNE, W6HC. Irene, WØKQD, says she sets aside ten minutes each day for blessing the hearts of the swell bunch of guys in the Pacific Area TCC.

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.

ELECTION NOTICE

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

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

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

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

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

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

Communications Manager, ARRL. [place and date]
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the .....
.....ARRL Section of the .....
Division, hereby nominate .....
as candidate for Section Communications Manager for this Section for the next two-year term of office.

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

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

— *F. E. Handy, Communications Manager*

Section	*Closing Date*	*SCM*	*Present Term Ends*
Yukon*	Dec. 10, 1956	W. R. Williamson	Mar. 17, 1949
Hawaii	Dec. 10, 1956	Samuel H. Lewbel	Feb. 3, 1957
Michigan	Dec. 10, 1956	Thomas G. Mitchell	Feb. 17, 1957
Minnesota	Dec. 10, 1956	Charles M. Bove	Feb. 17, 1957
Southern Texas	Dec. 10, 1956	Morley Bartholomew	Resigned
Eastern Florida	Dec. 10, 1956	Arthur H. Benzee	Resigned
Wyoming	Dec. 10, 1956	Wallace J. Ritter	Deceased
Oregon	Jan. 10, 1957	Edward F. Conyngham	Mar. 1, 1957
Missouri	Jan. 10, 1957	James W. Hoover	Mar. 1, 1957
Manitoba*	Jan. 10, 1957	John Polmark	Mar. 2, 1957
Mississippi	Jan. 10, 1957	Julian G. Blakely	Mar. 8, 1957
British Columbia*	Jan. 10, 1957	Peter M. McIntyre	Mar. 13, 1957
W. Penna.	Jan. 10, 1957	R. M. Heck	Mar. 17, 1957
Md.-Del.-D. C.	Jan. 10, 1957	J. W. Gore	Mar. 21, 1957
Santa Barbara	Feb. 11, 1957	William B. Farwell	Apr. 12, 1957
Nebraska	Feb. 11, 1957	Floyd B. Campbell	Apr. 15, 1957
Saskatchewan*	Feb. 11, 1957	Harold R. Horn	Apr. 15, 1957
Los Angeles	Feb. 11, 1957	William J. Schuch	Apr. 18, 1957
New Mexico	Mar. 11, 1957	Einar H. Morterud	May 4, 1957
Wisconsin	Mar. 11, 1957	Reno W. Goetsch	May 12, 1957
Maine	Mar. 11, 1957	Allan D. Duntley	May 16, 1957

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

ELECTION RESULTS

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

West Indies	William Werner, KP4DJ	Aug. 10, 1956
Vermont	Mrs. Ann L. Chandler, W1OAK	Oct. 10, 1956
Nevada	Albert R. Chin, W7JLV	Oct. 10, 1956
Idaho	Rev. Francis A. Peterson, W7RKI	Oct. 10, 1956
Arkansas	Ulmon M. Goings, W5ZZY	Oct. 15, 1956
Kansas	Earl N. Johnston, WØICV	Oct. 29, 1956
Western Massachusetts	Osborn R. McKeraghan, W1HRV	Nov. 10, 1956

In the Northern New Jersey Section of the Hudson Division, Mr. Lloyd H. Manamon, W2VQR, and Mr. Eugene F. Ribas, W2GEX, were nominated. Mr. Manamon received 450 votes and Mr. Ribas received 338 votes. Mr. Manamon's term of office began Sept. 25, 1956.

In the Canal Zone Section of the Southeastern Division, Mr. P. A. White, KZ5WA, and Mr. Roger M. Howe, KZ5RM, were nominated. Mr. White received 16 votes and Mr. Howe received 15 votes. Mr. White's term of office began Oct. 1, 1956.

In the Rhode Island Section of the New England Division, Mrs. June R. Burkett, W1VXC, Mr. Raymond C. Remington, W1SBP, and Mr. Gordon H. Greene, W1WQU, were nominated. Mrs. Burkett received 118 votes, Mr. Remington received 80 votes, and Mr. Greene received 32 votes. Mrs. Burkett's term of office began Oct. 15, 1956.

In the New Hampshire Section of the New England Division, Mr. John Arthur Knapp, W1AIJ, and Mr. William H. Thomson, W1WUU, were nominated. Mr. Knapp received 76 votes and Mr. Thomson received 38 votes. Mr. Knapp's term of office began Oct. 26, 1956.

Station Activities

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

ATLANTIC DIVISION

EASTERN PENNSYLVANIA — SCM, Clarence Snyder, W3PYF — SEC: NNT. PAM: TEJ. RM: YAZ. EPA nets: 3850 and 3610 kc. With the traffic nets back in full swing for the season, YAZ has taken over as RM of the EPA C.W. Net. AXA, who did such a terrific job, asked to be relieved because of the pressure of business. One of the best Simulated Emergency Tests in EPA history took place the week end of Oct. 13th. With the various county ECs running their own nets and feeding the PFN on 3850, traffic into ARRL and Red Cross Headquarters was well handled. The test showed good management, both at county and section levels. OK and OGD did a fine job as net controls on the phone net during the two-day sessions. TEJ has a new QTH with self-supporting masts for the skywires. 2YRW, net manager of the Delaware Valley 2-meter Net, reports that the following EPA stations are active in operation: CNN, DGI, FLP, VGN, WQL and MKA. YGX is studying at Villanova University. AIL is in Biloxi, Miss., operating portable 5 on 40-meter c.w. FAW and FPX have dropped the "N" from their calls. The Pocono Amateur Radio Klub is planning affiliation with the ARRL. MDO now has 169 worked and 134 confirmed with 38 zones but still is looking for Eastern Siberia and Tibet. YDX operates Wednesdays on the 20-meter band, handling traffic to and from Philco TechReps throughout the world. The annual picnic of the North Penn ARC was held Sept. 23rd with YEA and YIW winning the transmitter hunt. ALB is working on a new antenna farm. New clubs in this section recently affiliated with ARRL include the Keystone V.H.F. Club and the Penn-Mar Radio Club. OGD, Dauphin County EC, reports a surprise c.d. alert for Susquehanna, Lower Paxton Township and Dauphin County. Those participating were IBM/m, UWP, ADE, SMF and OGD. BES is training local "kids" for Novice and General Class tickets. CUL has a new Gonset 20-meter mini-beam, which she reports sure helps on long-haul stuff. NF has a new all-band mobile. GJY announces a special one-state (Penna.) award to the winner of the Sweepstakes in the State of Pennsylvania. The award, designated the Charles J. Schroeder, W3ATR, Memorial Award, is being awarded to the highest scoring c.w. or phone station in the State. Handicaps for past winners have been issued. Logs should be forwarded to GJY, 434 Glenwood Drive, Ambridge, Pa. While AMC was in the hospital he had a 2-meter Gonset along for company. NNT reports an increase in reporting from ECs of the section. Traffic: (Sept.) W3CUL 994, ZSX 589, BHC 275, TEJ 206, YDX 177, OK 117, YAZ 110, BFF 98, DHJ 92, YVX 62, ZRQ 55, DBL 37, NF 32, BNR 26, NQB 15, WUE 15, AXA 13, CNO 13, OGD 12, PYF 12, ELI 9, BBX 8, DJL 8, QLZ 8, WQL 8, DUI 6, SKU 6, JNQ 5, PVY 5, CMN 2, EMH 1, NOK 1. (Aug.) W3CUL 1672, ZGX 260, BFF 80, YGX 3.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, John W. Gore, W3PRL — AYS has just returned from a trip through the West to White Sands, Las Vegas, Boulder, Grand Canyon, Yellowstone and other points of interest taking him through W4-, W5-, W7- and WØ-Lands. Your SCM also has returned from a trip during the month of September through 6 European countries. The second September meeting of the Washington Radio Club gave opportunity to members to enjoy a sound film on "The A.B.C. of Jet Propulsion." Band openings have resulted in many in the area reporting new countries, therefore accelerating their progress toward the many DX certificates available. UE reports that the 3RN is meeting only two sessions daily effective Oct. 1st, 1956 and 2130 EST Mon. through Fri. on 3590 kc. On Sept. 24th, ONP presented "Speech Clipping and Its Application to Ham Radio" at the CARC. On Sept. 10th, NQC and LZZ gave a talk on "Using the Scope" with a demonstration. On Sept. 14th the RCARC presented a program by Mr. Roger Easton, of NRL, on "Tracking the Earth Satellite from the Amateur Aspect of the Program." The Kent Co. Amateur Radio Club, of Dover, Del., has become affiliated with ARRL. OYX reports a very successful participation of the Hagerstown group in the c.d. test alert on Sept. 13th with OXL/M, OYX at temporary control headquarters and AMX/M, FBR/M, OAY/M, CKJ and JZY participation. OYX also reports that during the week of Sept. 17-22 a message center was operated at the Great Hagerstown Fair using the ARA club call CWC/3. A total of 191 messages to all parts of the world were handled and all bands from 160 to 10 meters were utilized. Participating in this were EHA, EPX, FBR, NHR, OXL, OYX, WWM, ZGN, WN3GRH, WN3GVL and WN3GVN. Sam also reports that for Oct. 31st the Alsatia Club of Hagerstown again requested communications for the annual Mummers Parade. EQK was incapacitated for a week the latter part of September but has returned to his daily duties, for which the local group is duly thankful in order that he may continue enjoying his new car with its completely new mobile installation. The Washington Area expended a great deal of time and effort toward a program for the Washington Area Hamfest held at the Gaithersburg Fair Ground Oct. 7th with an elaborate program. Traffic: (Sept.) W3PZW 1180, WG 1119, K3WCS 514, WBJ 278, W3UE 238, BUD 59, PKC 51, COK 49, TN 22, PQ 15, WV 15, BFW 14, UCR 12, JZY 9, OYX 9, PRL 7, ZGN 7. (Aug.) W3COK 32.

SOUTHERN NEW JERSEY — SCM, Herbert C. Brooks, K2BG — SEC: YRW. PAM: ZI. Appointment of the month: K2DSL as ORS. Bunny also received her CP-25 certificate and K2INQ earned her WAS certificate. Congratulations to both YLs. Our traffic total this month reached an all-time high of over 3300. K2WAO and YRW will receive the BPL award. SVV, Mercer County EC, continues to sign more AREC members. The Delaware Valley 2-Meter Traffic Net has been reactivated after the usual summer lull in traffic. The net averages eight regulars each night. LS, Pleasantville, reports nearly fifty out-of-band discrepancies detected during a few hours observation. SJRA members had a fine talk given at the September meeting by one of our Radio Inspectors. BAY has signed in RACES. K2ITP was elected secretary of the Burlington Co. Radio Club. BNF has moved to Cincinnati. K2HPV and K2ARY have been contributing their efforts in organizing and giving instruction in c.d. procedure in the Pennsgrove-Carneys Point Area. A picnic has been planned by the N. J. 75-Meter Phone Net to be held at the DVRA headquarters. ZQ. KHW, Maple Shade, is directing the installation of equipment at the town's c.d. headquarters. We will appreciate receiving monthly reports from club secretaries. The NJCD again is in operation each Sun. at 1900 on 3505 kc. A better representation from counties in this section is desired. No reports were received from the Southern Counties Radio Club or the Tri-City Club. Traffic: K2WAO 1488, W2YRW 1105, HDW 167, K2JGU 157, W2RG 155, BZJ 81, K2EWR 73, W2ZI 39, K2DSL 37, HPV 20, RFA 13.

WESTERN NEW YORK — SCM, Charles T. Hansen, K2HUK — SEC: UTH/FRL. RMs: RUF and ZRC. PAMs: TEP and NAI. NYS phone meets on 3925 kc. at 1800 hours, TAR on 3570 kc. at 1700 hours. NYS C.D. on 3509.5 and 3993 kc. at 0900 Sun., TCPN 2nd call area on 3970 kc. at 2100 hours, SRPN on 3980 kc. at 1000 hours, LSN on 3970 kc. at 1600 hours. The KBT and the RAWNY participated in a 26-hour telethon for the Muscular Dystrophy Assn. Two stations, PE and K2CZO, were set up to control mobiles on 75 meters despatched to pick up larger donations. K2s DOT, CZP, GUG, BEB, HUK, HCS and W2s CYE, ICZ and OXC were active and many others also helped. K2CZO/2 was set up in Buffalo's Memorial Auditorium and PE acted as a relay in the northern section of the town. The V.H.F. Club of Syracuse held its annual V.H.F. Roundup in Liverpool, N. Y. More than 225 were present and such notables as 1RUD, 2NSD, 1FZJ, 9WOK and VE3DIR addressed the group. I can attest to the fact that it was a bang-up affair. The Oneida Hamfest was very successful with 140 attending. I'm told that the Sidney Amateur RC Hamfest also was an FB affair. EMW received endorsement for 200 countries for his DXCC and worked VR3B for No. 211. He now is using a 30-ft. vertical. CNT now has 206 countries confirmed and is waiting for his 200-country endorsement. K2KTK made WAS. K2GWN received 30-w.p.m. CP award. The Rochester V.H.F. group had its first meeting of the season at the QTH of UTH. The RAWNY had films of the Bell Aircraft rocket ship X1-A and the radio-controlled flight at its meeting. The following have received

(Continued on page 104)

A Christmas Bonus

IN THE DAY BY DAY PURSUIT of our hobby we radio amateurs have a wonderful time. The fascination of experimenting with new circuits and equipment — the thrill of DX — the organized teamwork of net operation — the excitement of Field Day, Sweepstakes, the DX Contest — all combine to make ours an incomparable avocation. In the midst of such absorbing interests it may be that we fail to remember the one enduring reward which comes to all of us through our amateur activity.

THAT REWARD is the many lifelong friendships which we all establish directly or indirectly through amateur radio. From the day we start to work toward an amateur license we begin to make new friends. Some may live near enough to help in learning the code, building equipment, or putting up an antenna. Others are so far away that we never hope to see them in person. None-the-less, near or far, they are all close friends. Most of us have had the heartwarming experience of visiting some distant place, calling on an amateur whom we knew only through contacts over the air, and being welcomed like one of the family.

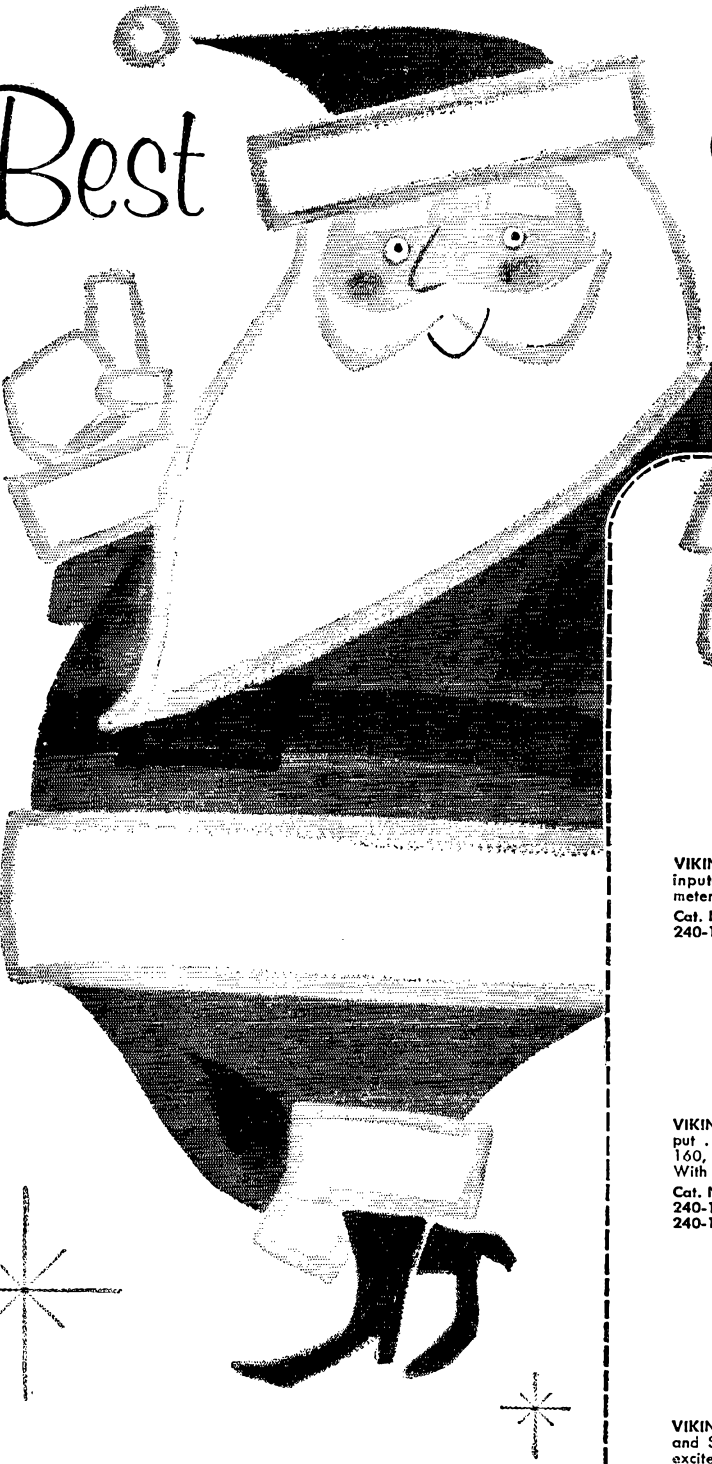
WE AT HALLICRAFTERS like to feel that those interested in amateur radio are our friends. And, at this particular season, we want to extend to all amateur enthusiasts, everywhere, our sincere best wishes for a Very Merry Christmas and a Happy New Year.

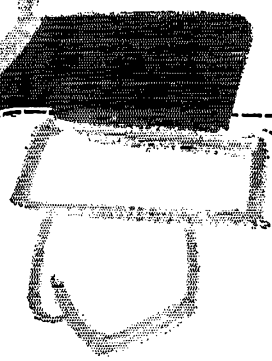
Vy 73,

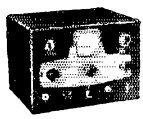
— CY READ, W9AA

Bill Halligan Jr. W. J. Halligan W9AC for hallicrafters

Best Buy

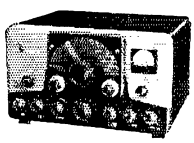






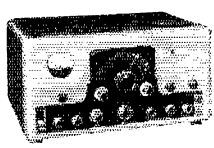
VIKING "ADVENTURER"—50 watts CW input—bandswitching 80 through 10 meters. With tubes, less crystal and key.

Cat. No.		Amateur Net
240-181-1	Kit	$54.95



VIKING "RANGER"—75 watts CW input . . . 65 watts phone. Bandswitching 160, 80, 40, 20, 15, 11 and 10 meters. With tubes, less crystals, key and mike.

Cat. No.		Amateur Net
240-161-1	Kit	$214.50
240-161-2	Wired	$293.00



VIKING "VALIANT"—275 watts CW and SSB (P.E.P. input with auxillary SSB exciter) . . . 200 watts phone. Bandswitching 160 through 10 meters. With tubes, less crystals, key and mike.

Cat. No.		Amateur Net
240-104-1	Kit	$349.50
240-104-2	Wired	$439.50

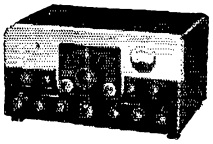
E. F. Johnson Company

2843 SECOND AVENUE S. W. • WASECA, MINNESOTA

Johnson...the *Full-Power* amateur line

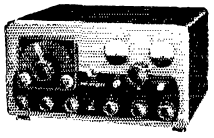
any Season

Top performance isn't simply a matter of watts. Only carefully integrated equipment design can be counted on to develop effective power that punches your signal home, every time. That's what we call "communication power" . . . and your Viking transmitter delivers it in full measure! Viking transmitters are engineered for outstanding flexibility and performance. Integrated in design from their rugged, highly stable VFO through high efficiency output circuits, Viking transmitters deliver *full* communication power!



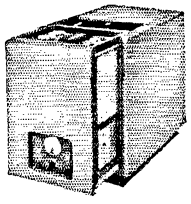
VIKING "PACEMAKER"—90 watts CW and SSB (P.E.P.) . . . 35 watts AM. Bandswitching 80 40, 20, 15 and 10 meters. With tubes and crystals ,less key and mike.

Cat. No.		Amateur Net
240-301-2	Wired . . .	$495.00



VIKING "FIVE HUNDRED"—600 watts CW . . . 500 watts AM and SSB. (P.E.P. input with auxiliary SSB exciter) Bandswitching 80 through 10 meters. With tubes, less crystals, key and mike.

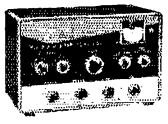
Cat. No.		Amateur Net
240-500-1	Kit	$649.50*
240-500-2	Wired	$799.50*



VIKING "KILOWATT" AMPLIFIER—1,000 watts CW, AM and SSB. Continuous tuning 3.5 to 30 megacycles. Wired and tested, with tubes.

Cat. No.		Amateur Net
240-1000	Wired	$1,595.00

Matching desk and 3 drawer pedestal. Cat. No. 251-101-1 FOB Cory, Pa. $123.50.



VIKING "6N2"—150 watts CW input, 100 watts AM. Bandswitching 6 and 2 meters. With tubes, less crystals, key and mike.

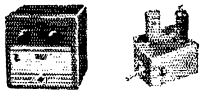
Cat. No.		Amateur Net
240-201-1	Kit	$119.50*
240-201-2	Wired	$159.50*

VIKING "MOBILE"—60 watts PA input. Bandswitching 75 through 10 meters. Less tubes, crystals, mike and power supply.

Cat. No.		Amateur Net
240-141-1	Kit	$99.50
240-141-2	Wired on special order only.	

VIKING AUDIO AMPLIFIER—Self-contained 10 watt speech amplifier. Complete with power supply and tubes.

Cat. No.		Amateur Net
250-33-1	Kit	$73.50
250-33-2	Wired	$99.50

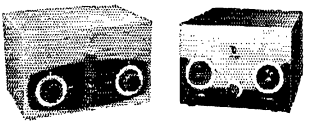


"SIGNAL SENTRY"—Monitors CW or phone signals up to 50 mc. Powered by receiver. With tubes.

Cat. No.		Amateur Net
250-25	Wired	$18.95

CRYSTAL CALIBRATOR—Provides accurate 100 kc check points to 55 mc. Requires 6.3 volts at .15 amps. and 150-300 volts at 2 mc. With tube.

Cat. No.		Amateur Net
240-28	Wired	$17.25



KILOWATT "MATCHBOX"—Handles unbalanced lines from 50 to 1200 ohms—balanced lines from 50 to 2000 ohms. Self-contained—bandswitching 80 through 10 meters.

Cat. No.		Amateur Net
250-30	Wired	$124.50

275 WATT "MATCHBOX"—Bandswitching 80 through 10 meters. Matches balanced lines from 25 to 1250 ohms—unbalanced lines from 25 to 3000 ohms.

Cat. No.		Amateur Net
250-23	Wired	$49.85

MOBILE VFO—Extremely stable, rugged, temperature compensated. Requires 6.3 volts at .45 amps. or 12.6 volts at .25 amps. and 250-300 VDC at 20 ma. With tubes.

Cat. No.		Amateur Net
240-152-1	Kit	$33.95
240-152-2	Wired	$49.95

TWO METER VFO—Replaces 8 mc crystals. Exceptionally stable. Power requirements: 6.3 volts at .3 amp. and 250-325 volts at 10 ma.

Cat. No.		Amateur Net
240-132-1	Kit	$29.50
240-132-2	Wired	$46.50

SWR BRIDGE—Provides accurate measurement of SWR for effective use of low pass filter and all antenna couplers.

Cat. No. 250-24 . Amateur Net $9.75

LOW PASS FILTER—Handles more than 1000 watts RF—75 db or more attenuation above 54 mc. Impedance: 52 ohms.

Cat. No. 250-20 . Amateur Net $13.50

*Price subject to change at time of delivery

Questions and Answers On A Mosley 3-Band Beam For 10, 15 & 20

Q. — *Why doesn't MOSLEY make a 3–band beam for 10, 15 and 20?*

A. — We do, . . . now. It's our Model VPA-73, available for immediate delivery.

Q. — *Why were you so long bringing out this 3–bander? Other manufacturers have had them for months!*

A. — Sad, but true. Sometimes we're "fustest with the mostest"—sometimes not. But ALWAYS, we make sure OUR design is sound and thoroughly proven BEFORE we ask our Ham friends to part with their hard-earned money. You see, we're Hams too !

Q. — *What are the design features of MOSLEY multi-band beams that offer advantages to the Hams?*

A. — There are numerous advantages:

1. Most MOSLEY multi-band beams, including the VPA-73, may be fed with one coax line or with separate lines to each driven element. It is advantageous to use separate feed lines where second harmonics or sub-harmonics generated in the transmitter cannot be easily suppressed. Let's take an example: Suppose you are doubling in the final and working 20 meter phone on 14,225 kc. Chances are, your rig is delivering a peach of a signal on 28,450 kc. With a beam capable of radiating on both bands and being fed with one coax line how can you possibly prevent your phone signal from cluttering up the 10 meter CW band?

2. All coils are machine wound on ceramic forms and completely weatherproof. They will not de-tune due to coil form distortion or to rain or snow.

3. A minimum of condensers are used and they are best quality air-insulated variables with locking rotors.

4. Inductive coupling of line to radiating element assures maximum energy transfer at any reasonable SWR regardless of antenna resonant frequency and operating frequency.

Q. — *What gain do you claim for the MOSLEY VPA-73? Be honest now!*

A. — We don't claim . . . we PROMISE you will get 7.5 db. forward gain and 20 db., or better, front-to-back IF you assemble your MOSLEY beam properly and install it the way a beam should be installed!

Q. — *Is that last remark just a "gimmick" to put you in the clear in case the beam doesn't deliver?*

A. — No Sir! A beam antenna has very little environmental tolerance. It is designed to function efficiently at a certain minimum height and minimum distance from objects that could interact with it. MOSLEY beams are adjusted and pre-tuned to give maximum performance at 35', or more, above ground and away from grounded metal objects. To avoid high SWR and poor front-to-back performance with ANY factory pre-tuned beam, follow the manufacturer's installation suggestions as nearly as possible.

Q. — *What are the specifications of the MOSLEY VPA-73?*

A. — 7 elements in all, working in combinations of 3 elements — director, driven and reflector — on each band. Maximum element length is 24' 6" and the aluminum boom is 12' long. Weight of beam is 61 pounds.

Q. — *How much?*

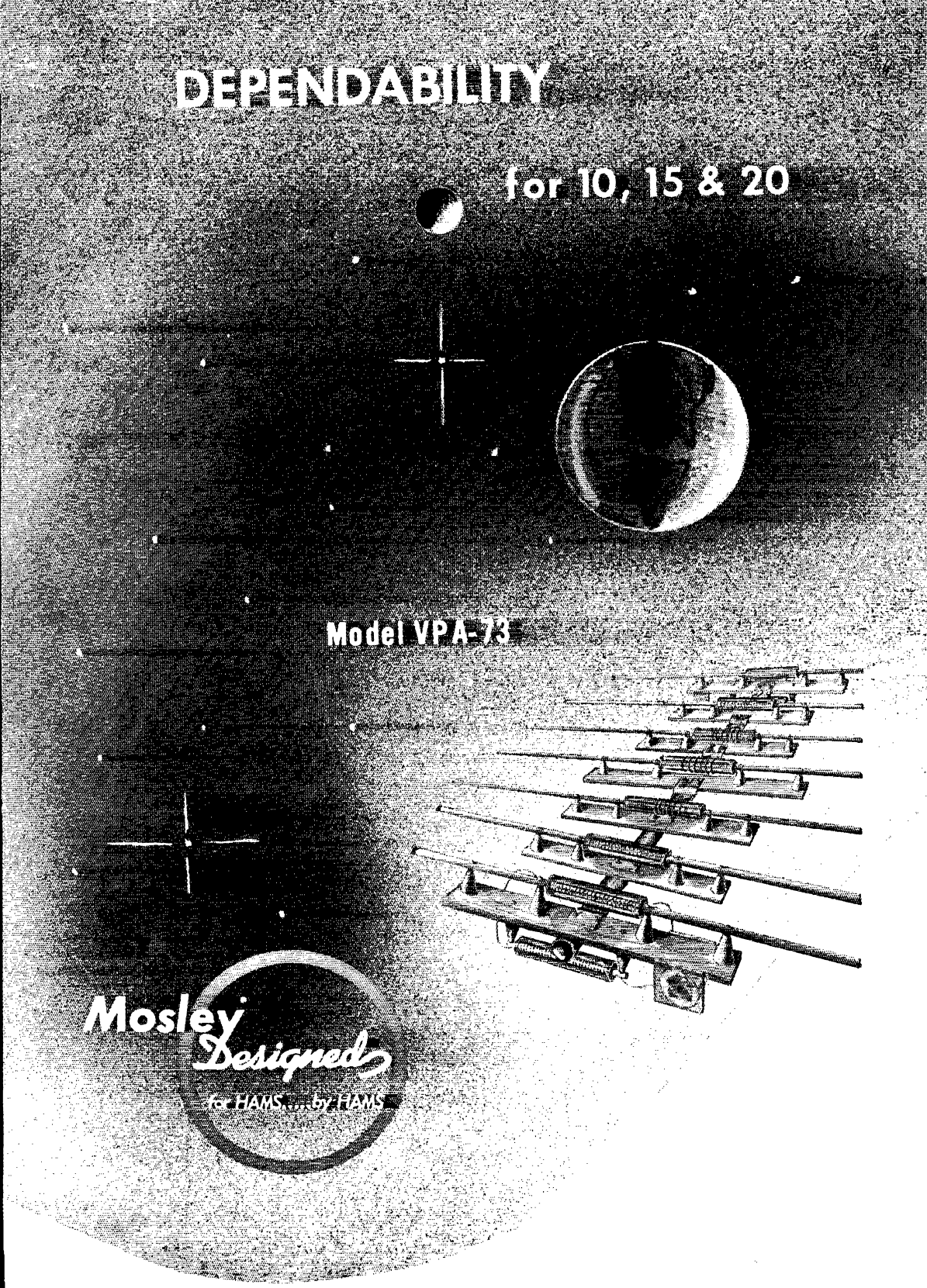
A. — Amateur Net $151.20, less coupling yoke which means you use three separate 52 ohm coax lines. $178.38 with coupling yoke for single line feed.

Q. — *Thanks for the dope! Where can I buy a MOSLEY Model VPA-73?*

A. — See your favorite Ham Dealer!

DEPENDABILITY

for 10, 15 & 20



Model VPA-3

Mosley Designed for HAMS... by HAMS

MOSLEY ELECTRONICS, Inc.

8622 ST. CHARLES ROCK ROAD ST. LOUIS 14, MISSOURI

(*Continued from page 98*)

Section Net certificates for the NYS PTEN: K2s BCU, DKW, GEK, HJP, LQL, JDD, KKD, MWS and SPO. UTH has a new PP5-125B rig on 50 Mc. and a new PP4X-150A final for 144 Mc. nearly ready. He also has a new 40-ft. tower and a 32-element beam. The Corning ARC had a full-size model of earth satellite at its September meeting. JUZ has 102 countries confirmed. PPY has a new Viking mobile rig all built up. K2DJN is in the hospital recuperating from a back operation. SJV is on the sick list. I'd like to take this opportunity to publicly thank SJV for the outstanding job he has done for us throughout the years as SCM and as a friend to all. Good luck, Ed, and we wish you a speedy recovery. K2CEH has a new tower with a 2-meter long Yagi at a 60-ft. level and a three-element 6-meter Yagi at a 45-ft. level. He is building a 4X150 rig for 220 Mc. RQF has an MD-7 modulator going and a new 40-ft. mast. BKC is rebuilding, as is ICE. Traffic: (Sept.) W2ZRC 216, PHX 169, K2IYP 152, KIR 115, W2COU 53, OE 53, CUQ 44, EMW 42, K2GWN 36, W2RQF 28, QHH 23, K2KTK 19, W2FEB 14, BKC 12, K2DG 7. (Aug.) W2BKC 28, COU 21, GWN 1. (July) W2KTK 9.

WESTERN PENNSYLVANIA — SCM, R. M. Heck, W3NCD — SEC: GEG. RMs: UHN, NUG and NRE. PAM: AER. The W. Pa. Traffic Net meets each evening at 7 P.M. on 3585 kc. The Washington County ARC reports regular meetings and a new 7½-KVA a.c. generator. SUK reports that 2BDS, president of Telrex Labs, will give a talk on antennas at the Etna High School. UEN has a new hand-rotated 10-meter beam. The Bucktail Amateur Radio Club, Inc. has been a corporation since June 28th. The Cameron County RACES plan has been submitted for c.d. and FCC approval. The BARC'S officers are SUL, pres.; RCC, vice-pres.; IIX, secy.-treas.; LEP, sgt. at arms; OGN, and RVS, directors; WII, jr. vice-pres.; WN3GBF, jr. sgt. at arms; and RMX, trustee. RMX is active on 80-, 40- and 20-meter c.w. VEF is attending Penn. State College. GBF is in the 80-meter Novice band. IIX/TYC, working 80 meters with 1.1 watts, expects to transfer to California. RLH expects to transfer to New England. HXG has a new Collins transmitter. K9EQP, ex-FTU, now is in Milwaukee. ZKY now is at Hatboro, Pa. NGZ and RGM transferred to Los Angeles. The Mon Valley Amateur Radio Club elected AOX, pres.; RCQ, vice-pres.; POY, treas.; EDM, secy. WN3FCD has a new Elmac in the car. WN3HQT is back on the air after repairs. Breezeshooters Net news as reported by UJP: F7AR, ZS1BV, another ZS and two Gs now are members of BSN. UJP retired as checker. The BSN has completed two years on the air with 10 per cent volunteering as NCS. YIT is the new BSN bookkeeper of NCS. Pennsylvania Novice Net news: ZEW vacationed in the mountains. HGT in Erie, FGT in Detroit, EXB in the South, DBH at the seashore. EGJ and AGK are going strong on 80-meter c.w. FGS went to Washington and got his General Class license. DMD, DAH, ERJ and ERK are considering 6 meters. KQD says the Horseshoe Radio Club's QSL Contest has a unique scoring system. The Allegheny Kiski Amateur Radio Assn. had the gang put up two new antennas, replacing the previous storm-damaged ones, at club station RVC. The Steel City Amateur Radio Club has a new 40-ft. tower at KWH. WIY has a new mobile. SVJ is on 40 meters. APN has gone hi fi. LKM is back from vacation. RUZ, ZPZ and SVJ attended the Akron Hamfest. SDV is back from band camp. New club members are ZPZ and Matt Walsh, who is awaiting his Novice Class license. The Mercer County Radio Assn. held a dinner for QHS, who is leaving for a job in Baltimore. YEW has a new Morrow transmitter and receiver. The Radio Association of Erie has several new members, ALD, ELR and ZAF and WNs IAF and HLM. New in town is AAC, formerly 2CSI, and BCV. The morning mobile net started by BVM and ZUL now has LMK, LSS, RMF, MMI, VNC, TLA and ZAF reporting. The regular code and theory classes headed by STK and KNQ will be held at the YMCA Tue. from 7 to 9 P.M. A new group named the Lake Erie East Winds elected YLR, pres.; YWL, vice-pres.; ZUL, secy.-treas. RTV has mobile 60 watts while traveling on business through Ohio, Michigan and Indiana and holds out at 3900 kc. Traffic: W3WIQ 928, YA 27, UHN 22, LSS 12, KUN 8, LOD 3.

CENTRAL DIVISION

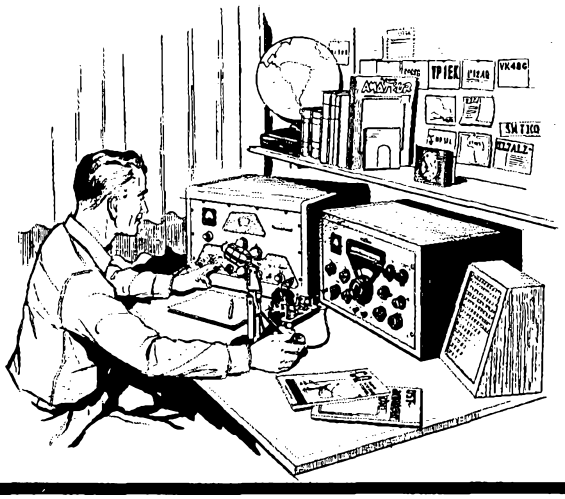
ILLINOIS — SCM, George T. Schreiber, W9YIX — SEC: HOA. RMs: BUK and AA. PAM: UQT. Cook County EC: HPG. Section nets: ILN, 3515 kc. Mon. through Fri.; IEN, 3940 kc. New officers of the Chicago Radio Traffic Assn. are HPG, REC, KA, UKY and QV. The Synton Radio Club at the University of Illinois held its first meeting in September and organized the Novice training and v.h.f. committees. LI reports that the lethargy of the Elgin city fathers is holding up the RACES plan. K9AMD has been appointed secretary of the North Central Phone Net. The net had a most successful picnic in Springfield in September with 35 members and their families present. FRP now is a resident of Florida and QIU's new call is K4KXG in North Carolina. SXL writes he has been working 10 hours a day at the job and built a two-car garage in his "spare time." PVD has a new GPR-90 receiver and tried it out in the CD Phone Contest. ØIAW writes that the Greenville College Radio Club is functioning again with seven of the older members back. DuPage County is rightfully proud of its c.d. setup; wish we had the space to go into detail. LNQ, a new OO, enjoys the CD Contests and takes time out from DX-chasing to take part. New calls heard on the ILN are YII and YYF. UBI likes the results he is getting with his new three-element all-grounded beam. OCB was the only station in September to make 100 per cent attendance on the ILN. EHY is kept to a minimum of air time by his new house. NHI, editor of *Static*, of the Starved Rock Radio club, bewails the lack of airtime also. K9CKP is rightfully proud of his third Public Service certificate for emergency work and enjoys his Viking KW. A new husband-and-wife team is composed of Novices DNS and DNT. HUX moved his QTH to Jacksonville. SKR again is grinding crystals and almost lost the knack after 20 years. K9AXT really is getting out on 80 meters with his new 135-ft. antenna. STZ is struggling to find time to complete his mobile c.w. rig. FNX, Chicago Area DXer, received the W.A.V. and W.A.V.E. awards. NN take notice. EET has been in and out of the hospital for the past year but managed to keep up on his OO and OES work. He has a 5-by-5 beam on both 50 and 144 Mc. The Vermillion County Amateur Radio Club gets out an excellent publication named *The VFO*, which is full of items of local interest. BQV has put the finishing touches on his kw. grounded-grid amplifier and now is tackling an RTTY set-up. AND still is on the semi-sick list and spends a lot of time in Florida. AWA also is in Florida and has applied for his W4 call. Twin City Radio Club news was sure packed full of items. UQT tells us that KCX has been appointed assistant manager of the IEN. We hope he persuades the boys to send in their reports. We sure have had a lack of phone reports this month. Is everyone going to c.w.? General Manager QKE, of the National ARRL Convention scheduled for 1957, still has a few donation tickets left on the receiver. Why don't you have your club secretary write him for some? By the time you read this UZ will be signing a portable four call for good. He is going to be missed in this section. Traffic: (Sept.) W9DO 636, MAK 371, YYG 173, AA 151, K9AXT 68, W9UBI 67, CTZ 58, YIX 53, OCB 52, FAW 38, BUK 36, OYL 35, PCQ 35, STZ 20, VEY 17, K9AMD 13, W9EDH 11, HPG 9, YFO 5, EHY 2, PVD 2, YMZ 2. (Aug.) W9IDA 202, K9AXL 24.

INDIANA — SCM, Seth Lew Baker, W9NTA — Asst. SCM: George H. Graue, 9BKJ. SEC: QYQ. RMs: DGA and TQC. PAMs: CMT, KOY, SWD and UXK. TQC has taken over as RM for QIN. RFN will be managed by TT for the present. UQP is now a student at Northwestern U. K5BIG is attending school at Evansville. AMW spent part of the summer on a Naval Reserve cruise. CYC is assembling a 20-meter beam. KN9EEL is on with an NC-88 and an AT-1. CAEN has added a c.w. session Sat. at 1900 CST on 1805 kc. EJI has resigned as editor of TARS *Sparks*. We will all miss his fine work, as this is one of the outstanding papers in the State. YZO has a CP-20 award. DKR and YVS have emergency generators ready for service. HSG is moving to California and will be with the Gonset Co. NH has returned from an 8000-mile trip through VE1, -2, -3 and W1-, 2-, 3-, 8-, 9 and Ø-Land. UBF worked Puerto Rico on 6 meters. The 6-meter activity is snowballing over the State. A net has been started on Wed. at 2200 EST. SWD lost all his personal possessions, ham gear, pet dog and parakeet in a fire. He expects to be back on soon from his new trailer. FFE has been in the hospital with a heart attack. SWD reports IFN evening traffic as 316, morning 189, total 505. UQP and TT give QIN as 241. RFN had 68, as reported by TQC. EHZ gives 51 for CAEN. NZZ, TQC and SWD made BPL. QOT, his XYL, URF, and brother, UOW, have the new home completed. The Hoosier Hills ARC provided communications for the Old Time Car Race held at the Mitchell Persimmon Festival. Those helping were YJD, QYQ, CTF, WHL, CTM, HBD and K9AWI. The Boiled Owl Net meets each midnight on 3904 kc. Check in and meet The Voice. The Michiana ARC has won permanent possession of the IRCC Field Day Plaque. Hope you all have your Conelrad system working. It is a must by January. Traffic: (Sept.) W9NZZ 758, TQC 668, SWD 524, ZYK 477, JOZ 468, UQP 261, EHZ 204, AB 167, EQO 159, JYO 142, KTX 128, TT 107, SVL 91, NTA 82, CMT 80, QYQ 55, DHJ 52, DKR 52, DOK 43, VNV 33, BKJ 24, SVZ 24, IMU 23, JVF 23, BUQ 22, LGD 21, PQZ 20, EGQ 19, DGA 17, WHL 16, EGV 15, UXK 14, BVR 13, CC 13, QR 13, BDP 12, EJW 11, ZSW 7, HUF 5, AZF 3, DZC 3, IGZ 3, WAU 3, YVS 1. (Aug.) W9BVR 15, DDT 10, AZF 5, LDB 2, WAU 1.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAMs: AJU and NRP. RMs: KQB and BVG. Nets: WIN, 3535 kc., 7:15 P.M. daily; BEN, 3950 kc., 6 P.M. daily; WPN, 1215 Mon.-Sat., 0930 Sun. Wisconsin mobile and c.d. frequency: 29,620 kc. CXY is working DX on 28 Mc. with a new all-band doublet when not handling traffic of BPL proportions. ILR is QRL with stamps. YRO worked the South Pole on phone. KJJ has a 30-

(*Continued on page 112*)

HEATHKITS®



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Heath amateur radio gear is designed *by* hams—*for* hams, to insure maximum "on the air" enjoyment. Good design and top-quality components guarantee reliability. Heathkits are easy to build and are easy on your budget! You save by dealing direct, and you may use the Heath Time Payment Plan on orders totaling $90.00 or more. Write for complete details.

HEATHKIT

DX-100

TRANSMITTER KIT

PHONE AND CW

- *Phone or CW—160 through 10 meters.*
- *100 watts RF on phone—120 watts CW —parallel 6146 final.*
- *Built-in VFO—pi network output circuit.*
- *Easy to build—TVI suppressed*

MODEL DX-100

$189.50

$18.95 dwn., $15.92 mo.

Shpg. Wt. 107 Lbs.

Shipped motor freight unless otherwise specified. $50.00 deposit required on c.o.d. orders.

The Heathkit DX-100 phone-CW transmitter offers features far beyond those normally received at this price level. It has a built-in VFO, built-in modulator, and built-in power supplies. It is TVI suppressed, and uses pi network interstage coupling and output coupling. Matches antenna impedances from approximately 50 to 600 ohms. Provides a clean strong signal on either phone or CW, with RF output in excess of 100 watts on phone, and 120 watts on CW. Completely bandswitching from 160 through 10 meters. A pair of 1625 tubes are used in push-pull for the modulator, and the final consists of a pair of 6146 tubes in parallel. VFO dial and meter face are illuminated. High-quality components throughout! The DX-100 is very easy to build, even for a beginner, and is a proven, trouble-free rig that will insure many hours of enjoyment in your ham shack.

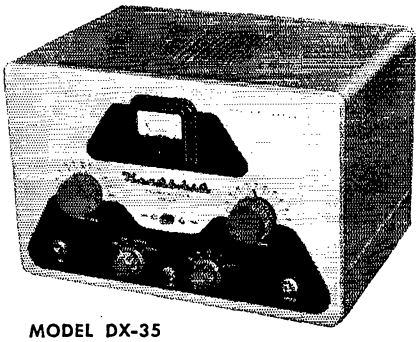
HEATH COMPANY BENTON HARBOR 9, MICHIGAN

A Subsidiary of Daystrom, Inc.

HEATHKIT DX-35
TRANSMITTER KIT

PHONE AND CW

This transmitter features a 6146 final amplifier to provide 65 watt plate power input on CW, with controlled-carrier modulation peaks up to 50 watts on phone. Modulater and power supplies are built in, and the rig covers 80, 40, 20, 15, 11 and 10 meters with a single band-change switch. Pi network output coupling provides for matching various antenna impedances. Employs 12BY7 oscillator, 12BY7 buffer and 6146 final. Speech amplifier is a 12AX7, and a 12AU7 is employed as modulater. Panel control provides switch selection of three different crystals, reached through access door at rear. Panel meter indicates final grid current or final plate current. A perfect low-power transmitter both for the novice or the more experienced amateur. A remarkable power package for the price. The price includes tubes, and all other parts necessary for construction. Comprehensive instruction manual insures successful assembly.



MODEL DX-35

$56.95

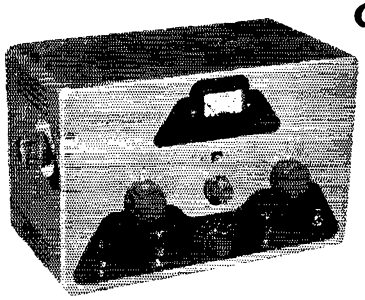
Shpg. Wt. 24 Lbs.

$5.70 dwn., $4.78 mo.

- *Phone or CW—80 through 10 meters.*
- *65 watts CW—50 watts peak on phone—6146 final amplifier.*
- *Pi network output to match various antenna impedances.*
- *Tremendous dollar value—easy to build.*

BRAND NEW

HEATHKIT DX-20
CW TRANSMITTER KIT



MODEL DX-20

$35.95

$3.60 dwn., $3.02 mo.

Shpg. Wt. 18 Lbs.

- *Designed exclusively for CW work.*
- *50 watts plate power input—80 through 10 meters.*
- *Pi network output circuit to match various antenna impedances.*
- *Attractive and functional styling—easy to build.*

Here is a straight-CW transmitter that is one of the most efficient rigs available today. It is ideal for the novice, and even for the advanced-class CW operator. This 50 watt transmitter employs a 6DQ6A final amplifier, a 6CL6 oscillator, a 5U4GB rectifier and features one-knob bandswitching to cover 80, 40, 20, 15, 11 and 10 meters. It is designed for crystal excitation, but may be excited by an external VFO. A pi network output circuit is employed to match antenna impedances between 50 and 1000 ohms. Employs top-quality parts throughout, including "potted" transformers, etc. If you appreciate a good signal on the CW bands, this is the transmitter for you!

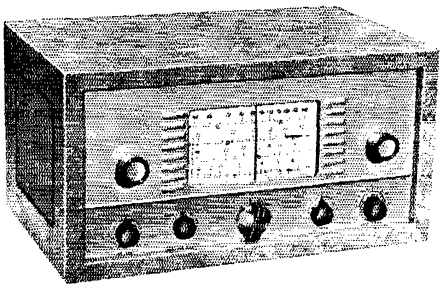
HEATH COMPANY BENTON HARBOR 9, MICHIGAN

A Subsidiary of Daystrom, Inc.

HEATHKIT

COMMUNICATIONS-TYPE, ALL BAND

RECEIVER KIT



This receiver covers 550 kc to 30 mc in four bands, and is ideal for the short wave listener or beginning amateur. It provides good sensitivity and selectivity, combined with fine image rejection. Amateur bands are clearly marked on the illuminated dial scale. Features transformer-type power supply—electrical band spread—antenna trimmer—separate RF and AF gain controls—noise limiter—headphone jack—and AGC. Has built-in BFO for CW reception. Shpg. Wt. 12 Lbs.

MODEL AR-3

$29.95

incl. excise tax (less cabinet)

$3.00 dwn., $2.52 mo.

CABINET: Fabric covered cabinet with aluminum panel as shown. Part 91-15A. Shipping Wt. 5 Lbs. $.50 dwn., $.42 mo. $4.95

Ⓐ HEATHKIT VFO KIT MODEL VF-1

Covers 160, 80, 40, 20, 15, 11 and 10 meters with three basic oscillator frequencies. Better than 10 volt average RF output on fundamentals. Requires 250 VDC at 15 to 20 ma, and 6.3 VAC at 0.45A. Incorporates regulator tube for stability and illuminated frequency dial. Shpg. wt. 7 lbs. $1.95 dwn., $1.64 mo. **$19.50**

Ⓑ HEATHKIT GRID DIP METER KIT MODEL GD-1B

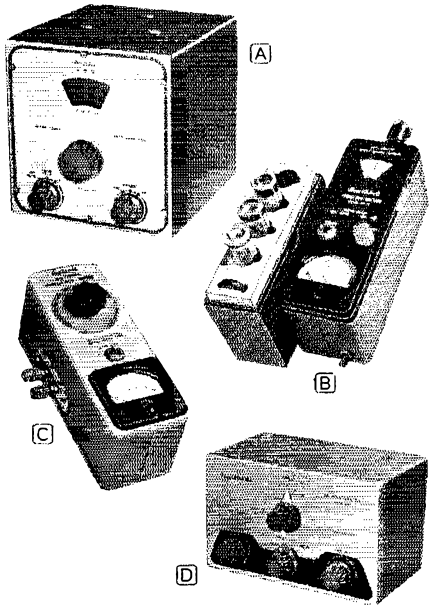
Continuous coverage from 2 mc to 250 mc with prewound coils. 500 ua panel meter for indication. Use to locate parasitics, for neutralizing, determining resonant frequencies, etc. Will double as absorption-type wavemeter. Shpg. wt. 4 lbs. $2.00 dwn., $1.68 mo. **$19.95**

Ⓒ HEATHKIT ANTENNA IMPEDANCE METER KIT MODEL AM-1

The AM-1 covers 0 to 600 ohms for RF tests. Functions up to 150 mc. Used in conjunction with a signal source, will determine antenna resistance and resonance, match transmission lines for minimum SWR, determine input impedance, etc. Shpg. wt. 2 lbs. $1.45 dwn., $1.22 mo. **$14.50**

Ⓓ HEATHKIT "Q" MULTIPLIER KIT MODEL QF-1

Functions with any receiver having IF frequency between 450 and 460 kc that is not AC DC type. Operates from receiver power supply, requiring only 6.3 volts AC at 300 ma (or 12.6 vac at 150 ma), and 150 to 250 vdc at 2 ma. Simple to connect with cable and plugs supplied. Provides extra selectivity for separating signals, or will reject one signal to eliminate heterodyne. Effective Q of approximately 4000. Shpg. wt. 3 lbs. $1.00 dwn., $.84 mo. **$9.95**



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It's simple—just identify the kit you desire by its model number and send your order to the address listed below. Or, if you would rather budget your purchase, send for details of the Heath Time Payment Plan for orders totaling $90.00 or more.

HEATH COMPANY BENTON HARBOR 9, MICHIGAN

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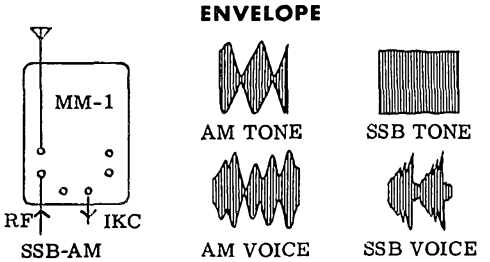
NEW MULTIPHASE MODEL MM-1
RF ANALYZER

Amateur Net - Kit . . . $99.50
Wired . . . 129.50

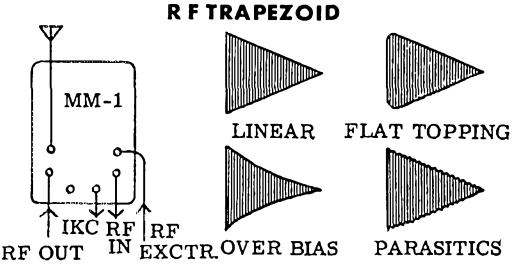
- NO TUNING required. Broadband response flat 1 MC to 55 MC at power levels of 5 watts to 5 kilowatts. Useful indications to 200 MC.
- Built-in 1 KC audio oscillator has less than 0.5% distortion.
- Automatic blanking protects CRT during standby.
- RF attenuator controls height of pattern, calibrated in 3 db steps.
- For use in "Series" with 50-72 ohm co-ax lines. A short pickup antenna is recommended for other systems.
- The MM-1 provides: SPEECH ENVELOPE patterns without annoying 60 cycle double trace.
- TONE ENVELOPE patterns automatically synchronized with self-contained 1 kc audio generator.
- AF TRAPEZOID patterns for HIGH LEVEL AM systems.
- DOUBLE TRAPEZOID OR BOW TIE patterns for analysis of LOW LEVEL LINEAR AM systems.
- RF TRAPEZOID for determining linear amplifier "LINEARITY" by sampling input and output signals. CONTINUOUS AUTOMATIC MONITORING OF SSB-AM-CW.

One compact unit provides oscillator and 3" scope for alignment of SSB exciters and general modulation analysis.

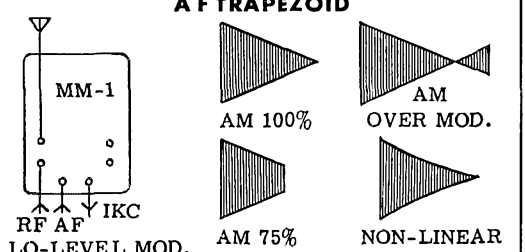
ENVELOPE



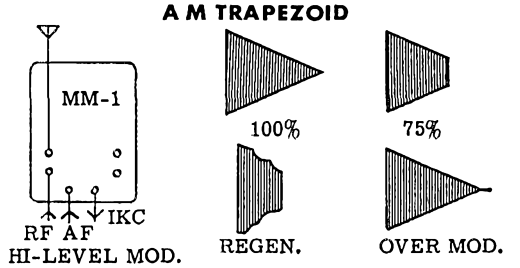
R F TRAPEZOID



A F TRAPEZOID



A M TRAPEZOID



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WRITE FOR LITERATURE

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MULTIPHASE — THE OVERWHELMING CHOICE OF HAMS EVERYWHERE.

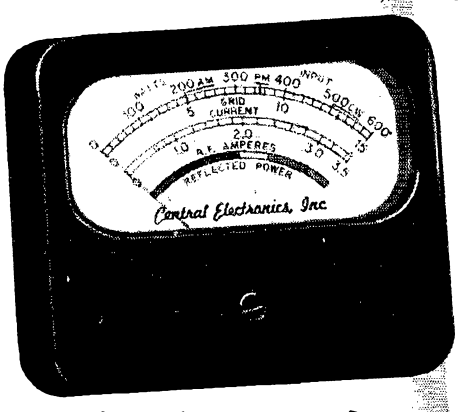
NOW a BROAD-BAND* LINEAR

MULTIPHASE
600 L
NO TUNING CONTROLS

SINGLE KNOB BAND-SWITCHING 10-160

FOR USE ON SSB, AM, PM & CW

WIRED, WITH TUBES AND BUILT-IN POWER SUPPLY **$495.00**



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METER FEATURES NEVER BEFORE FOUND IN A TRANSMITTER*

- Reads power input directly in watts
- Reads grid current
- Instantly reads output in RF amperes — no lagging thermo-couple
- Indicates reflected power caused by mismatched load
- Calibrated input levels for AM, PM and CW.

. . . and switch the meter to any position while transmitting!

*PATENT PENDING

WRITE FOR LITERATURE

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CENTRAL ELECTRONICS takes pride in presenting a product of intensive research — the new Multiphase 600L Broadband* Linear. "It is destined to change the entire concept of RF amplifier design in the military, commercial and amateur fields." There are no tuning controls, servos or moving parts other than bandswitch.

- Single 813 in Class AB_2.
- New band-pass couplers provide high linear efficiency: 60 to 65%.
- Designed for 50 — 70 ohm co-axial input and output.
- Easy to drive — Approx. 4 watts effective or 8 watts peak drive power required for 500 watts DC input.
- Built-in power supply — bias and screen regulation, 45 mfd. oil filled paper output capacitor. Excellent static and dynamic regulation.
- Extremely low intermodulation distortion.
- Automatic relay protects 813 and RF couplers.
- Excellent stability — complete freedom from parasitics.
- Effectively TVI suppressed — RF compartments thoroughly shielded and Hypassed.
- Attractive, modernistic grey wrinkle finish table model. Cabinet size: 18"W, 9"H, 15"D.

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Here's the one outfit you can get now and be equipped to communicate voice or CW the year 'round wherever you happen to be! It's the most compact fixed station you've ever seen. What's more, it can be removed in a jiffy to take along as a portable . . . or mount in your car for mobile use.

Transmitter is extremely stable, 90-watts CW, 60-watts phone, covers 80, 40, 20, 15 and 10 meters. Features simplified tune-up and push-to-talk convenience.

Receiver has exclusive Morrow "squelch circuit" to eliminate interstation noise, is sensitive to ½ microvolt on all bands.

AC Power Supply has built-in speaker, matching finish.

End Table has mar-proof mahogany sliding top, blending zolotone finish, separate shelf-compartment for log books and Conelrad monitor unit. MAH includes mike, connecting cables. A $644.90 value. **Amateur net, $595.00**

MAH with table of solid mahogany, maple or birch veneer. Amateur net, $675.00

(Antennas, mobile power supply and Conelrad monitor not included)

FOR EASY TERMS—SEE YOUR JOBBER

One compact outfit

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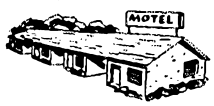
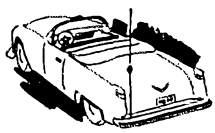


portable . . . or



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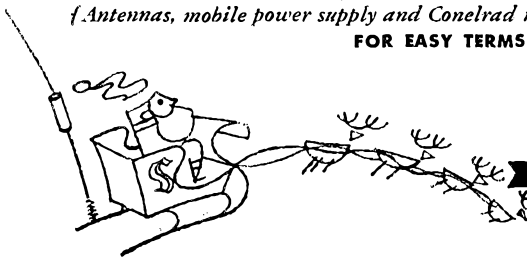

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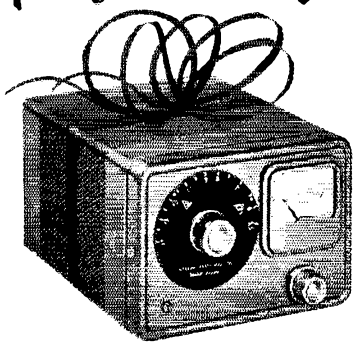
Prices and specifications subject to change without notice

The perfect GIFT for an amateur's Christmas



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Conelrad Monitor

Lets You Monitor in Silence!

A 5-tube tunable broadcast receiver with Conelrad frequencies plainly marked on the dial. AC powered for continuous 24-hour duty. Built-in speaker. "S" Meter permits visual monitoring with audio turned down. Rear jack permits relay connection to other signal devices. Compact size, 5¾" x 4" x 8".

(FCC Regulation 12.192 requires all amateurs to monitor Conelrad frequencies after January 1, 1957)

Amateur net, **$39.50**

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(*Continued from page 104*)
w.p.m. Code Proficiency sticker. K9ENQ uses a Johnson Adventurer and an S40-B with the following operators: ZAV, SRA, SPW, MCK, K9AIF, KN9CCZ and KN9EMF. OVO would like to hear of eligible EC candidates from several counties still not covered. SQM is feeding a 15-meter doublet with coax. RTP, YLE and K9AES are now at the U of Wis. A new Viproplex, DB-23, and Heath VFO now adorn KQB's shack. JWK has a new 75A-4. OTX is new in Janesville. LGR renewed his ORS appointment and is holding down the NCS spot on WIN. NRP has been ill.

WISCONSIN SECTION QSO PARTY
December 9, 1956

All Wisconsin amateurs are invited to take part in a QSO Party, sponsored by the Milwaukee Radio Amateurs' Club in order to promote friendship and operating ability.

Rules: 1) The Party will begin at 10:00 A.M. and end at 5:00 P.M. CST Sunday, December 9th. 2) All types of emission and all bands may be used, but a station may be worked only once regardless of mode or band. C.w.-to-phone operation is permitted but crossband work is not allowed. Stations are urged to work all bands from 2 through 160 meters to raise their scores. A station may compete on c.w. or phone or both, as desired. 3) The general call will be "CQ WIS." 4) Information to be exchanged in each contact will consist of the QSO Nr, RS or RST report, county, operator's name, and time of contact. 5) Logs should show times, station worked, signal reports sent and received, frequency, type emission, power input, QSO numbers sent and received, name, county. It is suggested that sheets from the ARRL Log Book be used for convenience and accuracy. Exchanges *must* be entered correctly. 6) Scoring: Count 1 point for such information sent and 1 point for such information received, for a maximum of 2 points per contact. Multiply the total contact points by the number of different Wisconsin counties worked for final score. Only contacts with other Wisconsin stations can be counted. 7) A traveling trophy will be awarded to the highest scorer, regardless of whether that score has been made completely on c.w., phone, or is a composite of both. Certificates will be issued to the first, second, and third place winners using c.w.-phone, phone only, c.w. only, Novice, and Mobile. 8) A self-addressed, stamped envelope to W9FDX will bring contest forms. Send logs, postmarked not later than January 9, 1957, to Doug Pavek, W9FDX, 5776 North 24th St., Milwaukee 9, Wis. Judgment of the Committee, consisting of *W9s* DGB DYG FDX and GIL, will be final.

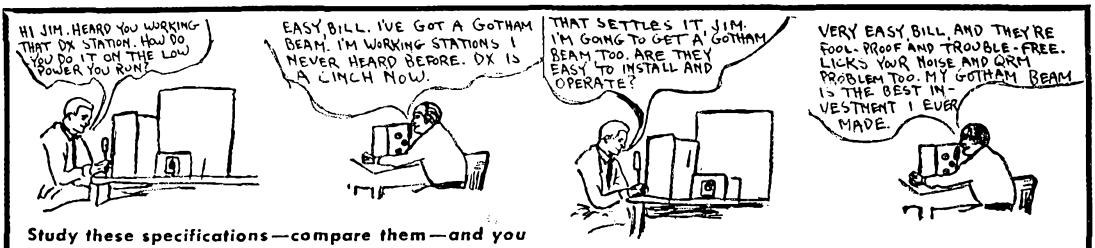
See how many Badgers you can work during the 7-hour contest period. Get on the air December 9th and meet the gang!

Best wishes for a speedy recovery. EIZ is grooming a new crop of hams in Antigo. LPU left for California but will return in the spring. CCO, now in the service, was married Aug. 31st in Colorado. OMT has a new SX-24. WIN activity keeps growing by leaps and bounds under KQB's excellent guidance. The Annual Ground Hog Party was held at Watertown, Oct. 14th. We're glad to see OVO back on his feet and going strong after his recent illness. MIN and DAJ have been having rig trouble. AQT is QRL with school work. BCB has a new all-band antenna. FBC is now in Wausau. TSI's mobile has more "punch" with the new modulator. Traffic: W9CXY 501, KQB 90, LGR 55, KJJ 50, JWN 34, MCK 27, K9ENQ 26, W9SAA 24, AZN 15, EIZ 11, LPU 6, OVO 6, SQM 5.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Elmer J. Gabel, WØKTZ — Building a new rig for three weeks and working days another three weeks has put me away behind on the happenings around the State. The North Dakota 75-meter Phone Net held 24 sessions in September, with 507 checking in, handling 76 pieces of traffic. Counting relays, this should bring the total traffic count to over 150. The total of traffic reported totals 50. Let's get our traffic reports in during the first five days following the end of each month. While on the subject of traffic, let me remind you that the FCC requires that each radiogram handled must be kept on file for a period of one year. KØCNC reports on the last club meeting and special program to arouse interest in amateur radio, with talks by AVT on ARRL, LAZ proposed classes, AZV mobile, CNC the Novice and DXing by EOZ backed up by a display of his large DX-QSL collections. KØAXZ has a new KW-1 and CND a new SX-62.

(*Continued on page 114*)



Study these specifications—compare them—and you too will agree, along with thousands of hams, that GOTHAM beams are best!

TYPE OF BEAM. All Gotham beams are of the full half-wave plumber's delight type; i.e., all metal and grounded at the center. No wood, tuning stubs, baluns, coils, or any other devices are used.

MORE DX CONTACTS

GAIN. Gotham beams give the maximum gain obtainable. Our 2-element beams give a power gain of four (equivalent to 6 db.); our 3-element beams give a power gain of seven (8.1 db.); and our 4-element beams give a power gain of nine (9.6 db.)

THE DESIGN IS PROVEN

FRONT-TO-BACK RATIO. We guarantee a minimum F/B Ratio of 19 db. for any of our 2-element beams; 29 db. for any of our 3-element beams; 35 db. for 4-element beams.

THOUSANDS IN DAILY USE

MATCHING. Matching of the transmission line to the beam is extremely simple and quick. Everything is furnished and the matching is automatic. No electronic equipment or measuring devices are required.

ALCOA QUALITY ALUMINUM

ASSEMBLY AND INSTALLATION. No special tools are required for assembly and installation. Entire job can be done by one man in less than an hour. Full instructions are included with each beam.

CONSISTENT PERFORMANCE

MAST. Any Gotham beam can be mounted on a simple pipe mast. Diameter of the pipe should be between ¾" and 1⅝".

QUICK INSURED DELIVERY

STANDING WAVE RATIO. A very low SWR of approximately 1.5 to 1 will result from following the instruction sheet, depending on the height above ground and the surrounding area. If an SWR indicator is available, Gotham beams can be quickly and easily adjusted to 1.1.

YOU WILL WORK THE WORLD

STANDARD AND DELUXE BEAMS. Standard beams in the 6, 10 and 15 meter bands use ⅝" and ¾" tubing elements; the deluxe models for these bands use ⅞" and 1". In 20 meter beams, the standard has a single boom, while the deluxe uses twin booms.

AND THE PRICE IS RIGHT!

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Send check or money order to GOTHAM — we ship immediately by Railway Express, charges collect.

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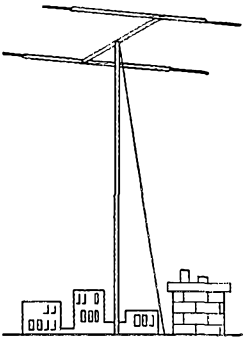
ANY electronic distributor can order a Gotham antenna for you. Here are some of the leading distributors who sell Gotham beams: Atronic Corp., Alltronics, Amateur Radio Supply, Lew Bonn Co., Burghardt Radio, Capitol, Curle, Crabtree's, Dixie, Duffy, Evans, Electronic Distributors, Emrich, W. H. Edwards, Fargo, Ft. Wayne Electronics, Graham Electronics, Henry of Missouri and Calif., Harris, Johannesen, Kinkade, Mytronic, Melrose Sales, Nidisco, Offenbach & Reimus, Purchase, Rome Electronics, Radio Electric Service, Radio Equipment Co., Radio Parts Co., Radio Supply Co., E. A. Ross, Specialty Distributing, Swan Distributing, Srepco Inc., Selectronic Supplies, Thurow Distributors, Tel-rad, Thrifty TV Supply, Universal, World Radio.



This Full Size Gotham Cost Only $21.95 And Brought In 87 Foreign Countries, All Continents And 30 Zones On 35 Watts!

Airmail Order Today — We Ship Tomorrow

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Enclosed find check or money-order for:

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☐ Deluxe 6-Element	$9.95	☐ 12-El	$16.95
6 METER BEAMS			
☐ Std. 3-El Gamma match	12.95	☐ T match	14.95
☐ Deluxe 3-El Gamma match	21.95	☐ T match	24.95
☐ Std. 4-El Gamma match	16.95	☐ T match	19.95
☐ Deluxe 4-El Gamma match	25.95	☐ T match	28.95
10 METER BEAMS			
☐ Std. 2-El Gamma match	11.95	☐ T match	14.95
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☐ Deluxe 4-El Gamma match	27.95	☐ T match	30.95
15 METER BEAMS			
☐ Std. 2-El Gamma match	19.95	☐ T match	22.95
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☐ Std. 3-El Gamma match	26.95	☐ T match	29.95
☐ Deluxe 3-El Gamma match	36.95	☐ T match	39.95
20 METER BEAMS			
☐ Std. 2-El Gamma match	21.95	☐ T match	24.95
☐ Deluxe 2-El Gamma match	31.95	☐ T match	34.95
☐ Std. 3-El Gamma match	34.95	☐ T match	37.95
☐ Deluxe 3-El Gamma match	46.95	☐ T match	49.95

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

NEW! RUGGEDIZED HI-GAIN 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.

☐ Beam #R6 (6 Meters, 4-El).....$38.95
☐ Beam #R10 (10 Meters, 4-El)..... 40.95
☐ Beam #R15 (15 Meters, 3-El)..... 49.95

Name.....

Address.....

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

Traffic: KØCNC 16, WØHVA 10, KØADI 9, WØBFM 8, KØCND 3, ATK 2, WØKTZ 2.

SOUTH DAKOTA — SCM, Les Price, WØFLP — Asst. SCM: Gerald F. Lee, ØYKY. SCM Assistants: HOH, FKE, APL, GQH, RMK, TI, MZJ and GDE. SEC: YOB. PAM: UVL, RM: SMV. The South Dakota C.W. Net had 12 sessions with QNI 84, high 12, low 2, average 7; QTC 33, high 5, low 0, average 2.7. The NJQ 75-meter Noon Net reports 20 sessions, QNI 80, average 4 per session; formal 10, average ½ per session; informals 9, average per session ¼. The 75-meter South Dakota Evening Net, RMK, NEO and SCT as NCSs, had 27 sessions, with QNI 741, high 46, low 12, average 28.5; traffic 80, high 10, low 0, average 3.07; informals 82, high 16, low 0, average 3.15. The convention at Watertown was a huge success with 378 amateurs attending. EXX swapped his SX-25 for a new NC-200. RMK has taken employment as field representative with Western Electric. DCN has taken over Larry's business. NEO has a new 600-L and an NC-300. Newly-arrived in Sioux Falls is K4GEU (s.s.b.). PHR went back to work. GCP has a mobile on the air. 9OXZ spent three weeks in South Dakota. JLI has a new Viking II. KØDYR is in the QSL business. SIR helped SMV replace the damaged vertical. SMV continues to work lots of DX. SIR is looking for contacts on 144.9 Mc. Dick Maeder, Wolsey, received the call KNØHJA the day before the convention. Several South Dakotans received greetings via KØBMM from 3BUX, 3CAI and 3BIW. ZIQ is the new treasurer of the Sioux Falls ARC. A farewell party was held at NEO's for RMK. GWS is getting married. Traffic: WØZWL 142, SCT 125, ARF 52, NEO 36, DVB 26, SMV 18, RRN 15, BQS 12, GWS 9, NNX 7, OII 6, DKJ 5, FJZ 2, EXX 1, QDV 1.

MINNESOTA — SCM, Charles H. Bove, WØMLXC — Asst. SCM: Vince Smythe, ØGGQ. SEC: GTX. PAMs: JIE and LUX. RMs: RLQ, DQL and KLG. K6EA has returned from California and is back on the air from Bemidji with a Viking Ranger. TPN is now located in Evanston, Ill. ALW bought another transmitter. The power is 300 watts. ZEL has a new VFO and a higher antenna. RLQ's job has been keeping him off of the MSN lately. RXL has been very busy as program director for the Duluth Arrowhead Radio Club. KØDNQ worked DL3WT on 15-meter c.w. FDS displayed his Paragon receiver and a spark gap transmitter of 1919 vintage at the St. Paul Radio Club. An "allocations" conference is on the books for 1959. Let us all get behind the ARRL and protect our frequencies from encroachment by other services. HKF has been very busy picking suitable leaders to head the various committees to run the coming Dakota Division Convention. RA is getting a new car so will be off the air while moving the mobile rig from one car to the other. QKA is now operating RTTY. The Mankato Radio Club has about 40 members and meets the 2nd Thurs. of each month at 8:00 P.M. at the local airport. Why not pay them a visit? QZ is ready to go s.s.b. IRM has been working DX on s.s.b. BFS is waiting for his 25-w.p.m. sticker. AZK and WQF are on 10-meter mobile. EOP and KUL have been ill but are now back on the air. RVH is busy on 6 meters and with the CAP. AZF is net control for the Minnetonka Radio Club Net. URV now has a 10-meter beam. CAZ finally got his rig on the air on 80 meters. BFV, GIW, ECY and GFE are studying for their General Class tickets. EOV and BFT now have their General Class licenses and are working c.w. DUY is attending the U. of M. Traffic: WØDQL 186, KLG 157, KJZ 143, DNM 67, UNG 59, AZF 53, ZEL 53, RLQ 44, WMA 34, K6EA 30, WØVEP 29, NNG 28, UMX 24, LST 22, BUD 20, ALW 19, KXW 19, QVR 16, BUO 15, OJG 14, KFN 13, RVO 12, PBI 11, EMZ 10, IMJ 10, VBD 10, ADI 9, NTV 9, QRJ 9, KNR 7, VJS 7, HW 6, CVD 4, MXC 4, RXL 4.

DELTA DIVISION

ARKANSAS — SCM, Owen G. Mahaffey, W5FMF — K5CMP is a new EC at Conway. YHC is working on an emergency set-up in Warren. K5DKT has been experimenting on 10 meters, doing some DXing, and cooperating as County Radio Officer for c.d. I am glad to hear that in Osceola we now have a club, the Osceola Amateur Radio Club, with DAG as secy. This is now an ARRL affiliated club and I wish we had many more. As this is my last report for this column as your SCM, I want to thank all who have contributed news items, and officers who have served, and all the rest who have helped in many ways during my term in office and hope we can help the next SCM even more.

LOUISIANA — SCM, Thomas J. Morgavi, W5FMO — GHF, ex-SCM of Louisiana, died on Sept. 22nd of a heart attack. Well-known and liked by all, he will be missed. About 100 stations were active during Hurricane Flossy with K5WAY, K5BES, W5UK, USN, TFQ, EKG, NCH, ZAK, EVZ, EKY, TKV, VAQ, K5CVK, NAR, FAA, W5ABD and ZNI carrying the brunt of the traffic load. More Louisiana stations participated in the Gulf Coast Hurricane Net on 3935 kc. K5BES has been appointed SEC and all ECs are directed to forward their monthly reports to him. SPZ has been transferred to Fort Worth. A sparkplug in the New Orleans club, we are looking forward to having him back after his tour of service in Texas. JGV has been appointed OES. Ralph operated on 6 meters and down. VAR is a new OPS and likes to handle traffic. CYF put up a new Windom antenna and is building a new speech amplifier for the BC-375. MXQ still is banging away at MARS, RN5, CAN, TXN and the Hurricane Nets. JFB is back from a South American tour. KN5GHJ passed the General Class exam. He is a member of the Jefferson C.W. Net which meets at 0800 Sun. on 7178 kc. TRQ is attending Tulane U. HNS is active on all bands with a DX-100 and is building a two-element 20-meter beam. EA is anxious to start a c.w. net. All interested parties, please contact him. "Flossy" just about demolished FMO's 20-meter beam. Your SCM has notified appointees of expiration of their appointments. Check your certificates and mail them in for endorsement. Mail in your station activities reports early. Traffic: K5AGJ 120, W5NDV 108, MXQ 94, EA 23, FMO 6.

MISSISSIPPI — SCM, Julian G. Blakely, W5WZY — Reports of Hurricane Flossy brewing in the Gulf automatically alerted the Gulf Coast Hurricane Net. JHS took the first shift, set up liaison with other nets in the area and the Hurricane Net was on 24-hour duty with coverage at every important point along the entire coast from Florida to Texas. Many stations were on emergency power because of a local failure at the height of the blow. FFF and RDA, Jackson, set up a transmitter at the United Press for the "Flossy" alert. Two meters is making strides in the State. A few of the many are RY, BSE, OER, TAK, GLO, DRP, IEO and, of course, pioneer JTI. Congrats to Jackson on the fine club newspaper. Traffic: W5JHS 60, IGW 50, WZY 6.

TENNESSEE — SCM, Harry C. Simpson, W4SCF — Asst. SCM: Richard A. Crowell, 4WQW. SEC: RRV. PAM: PFP. WQT, now back on s.s.b., has a new 10-meter beam, with another for 20 meters under construction. HJA has a new kw. on 75-meter phone and is NCS two nights a week on the very active TNON. Another fine total was made by PL, and the fact that his call was missing from BPL last month was no fault of his, but rests squarely on the over-worked shoulders of your SCM. UWA, using parallel dipoles for 80, 40 and 20 meters, as described in July *QST*, reports five new countries, but doesn't understand why the set-up works so well on 10 meters! The same active ham is working 160 meters with a 180-foot vertical (after WHUB goes off the air of course). According to K4DNG, the Middle Tennessee Six-Meter Net now has 52 active members. The usual interesting bulletins were received from the Memphis and Bays Mountain Clubs. The Memphis Club has just finished publication of a very fine and useful callbook, listing the 612 Memphis hams by call, and with street addresses and telephone numbers. UVP visited the Chattanooga and Oak Ridge Clubs. Congratulations are in order for K4DIZ on her first BPL. Theda also is a new MARS member. WGJ reports fine UA and KA contacts on 20-meter c.w. WQW, taking a well-earned vacation, reports he and his son, Rickey, burned in separate accidents, are recovering nicely. Traffic: W4PL 1226, K4DIZ 655, W4PQP 198, TZD 108, WQT 71, VJ 42, SCF 25, UVL 24, K4HJA 23, W4UWA 12, RRV 11, UVP 10, PAH 9, IGW 6, JMB 6, WGJ 4, HLR 2, TYW 1, WQW 1.

GREAT LAKES DIVISION

KENTUCKY — SCM, Albert M. Barnes, W4KKW — SEC: JSH. PAMs: YJV and SUD. RMs: ZDA and ZDB. Traffic has increased rapidly along with the increased activity of the many Kentucky nets. KYN now has an early slow-speed net at 1700 CST, plus a new Novice net (KNN) at 1900 CST on Sun. and Wed. on 3750 kc. KPN is doing very well under the terrific QRM on 3960 kc. with KSN, the new s.s.b. net, following on the same frequency. K4GEZ, president of the Lexington Bluegrass Club, is a new OO, as is K4DTI. BZY is working up a good local EC program. OMW is adding new counties on 15 meters and also is a very active OO. HSI has a new NC-300 to play with. JUI and HTO are active on 10 and 6 meters. CDA has built a new grid-dip meter which works FB. BAZ is driving a kw. with a new DX-100. Your SCM certainly enjoyed the Lexington Hamfest and ragchews with former SCMs CDA and KKG and also meeting K4AIS, SL, QCD, JCN, JSH and many others. Traffic: W4KKW 162, ZDB 104, QCD 82, K4AIS 64, W4HSI 64, BAZ 46, CDA 43, NIZ 41, ZDA 21, K4DZM 19, W4KKG 17, MWX 17, BZY 10, OMW 9, JUI 2.

MICHIGAN — SCM, Thomas G. Mitchell, W8RAE — Asst. SCM (phone) Bob Cooper, 8AQA; Asst. SCM (c.w.) Joe Beljan, 8SCW. SEC: GJH. The fall season seems to be bringing the gang back to the rigs. Traffic is on the upswing, applications for appointments are being requested and some new appointments have made the news this month. FWQ is now an ORS and the OES certificate adorns the wall of LIM. ELW is in the BPL listing again this month quite regardless of the season. This is getting to be a habit with Seth. Elections are much in the news these days and our clubs are no exceptions. The Brass Pounders Amateur Radio Club (Pt. Huron) has elected the following: RNK, pres; RNI, vice-pres.; CNT, secy.-treas.; and FWQ, program chairman. The new line-up for the Barry Amateur Radio Assn. is made up of TOX, pres.; VXL, vice-pres.;

(Continued on page 116)

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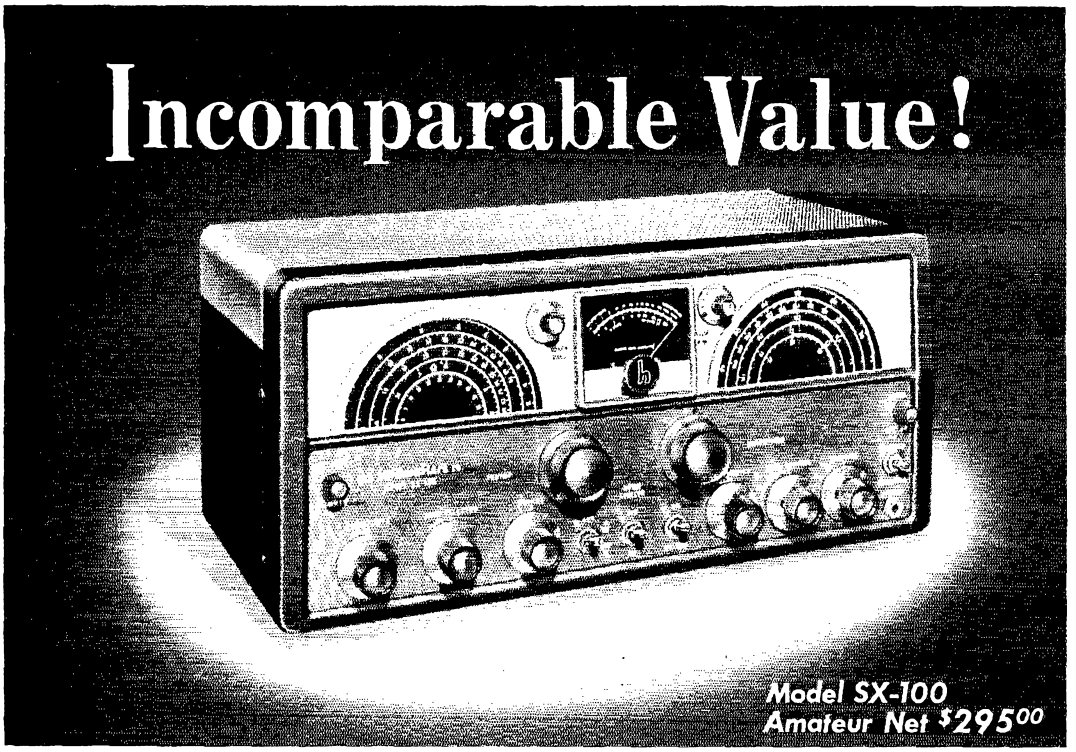

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FMM, secy.; JGK, treas.; MBM, act. mgr. The Genesee County Radio Club is proud to announce this slate: RWW, pres.; GOL, 1st vice-pres.; YKW, 2nd vice-pres.; BPD, 3rd vice-pres.; SPS, secy.; and LSS, treas. Thanks for the many club bulletins that are sent this way. They serve a very useful purpose in supplying news items. Regardless of the make up of the bulletins, they represent much work on the part of those people who publish them. DAP has a new "V" beam with 103-ft. legs doing an FB job for him. FX is QRL with the fall season QMN paper work. FGB has a kw. final in the works for winter DX. The DX fraternity members are reporting conditions better than ever. At the time of this writing it seems like a long time until the Holidays, but by publication time they will be almost upon us. Here's wishing all of you a very Merry Christmas and a Happy and Satisfying New Year from myself and the many ARRL appointees who make up our family in the Michigan section. Traffic: (Sept.) W8ELW 555, ILP 153, NTC 130, DAP 95, GKT 70, RVZ 68, ZLK 60, NUL 59, RTN 55, QQO 43, FX 37, QIX 34, TIN 32, WXO 32, AUD 31, IV 27, FWQ 25, NOH 21, OCC 17, RAE 17, SCW 15, TBP 12, WVL 12, DLZ 8, OGY 8, DSE 7, EGI 4, K8AXL 2, W8HKT 2, PHM 2, FGB 1, SJF 1. (Aug.) W8IKX 7. (July) W8IKX 6.

OHIO — SCM, Wilson E. Weckel, W8AL — Asst. SCMs: J. C. Erickson, 8DAE; and E. F. Bonnet, 8OVG. SEC: UPB. RMs: DAE and FYO. PAMs: HPP and HUX. MVJ is on 20 meters and has a new DX-100. SWZ has a new Viking Valiant. LAB has a new DX-100. OG has a new 15-meter beam. OKB also has a new 15-meter beam. BFP is married. JRG has a new 4-400A in push pull. NBK worked Cocos Keeling Island for his 266th country and also was honored by being made a member of Tops and F.O.C. WVC has a new RME-4300. OEQ left for college. HBX's mobile was classed as the best commercial installation at the Cincinnati Hamfest. He has 40 states. PBX has a new Viking Valiant and his XYL is KN8CEO. TZO has a new DX-100. Thirteen Greater Cleveland mobiles, with AEU as NCS, furnished communication for the huge Shrine Parade. QXH has moved. MGC put back up his 10-meter beam. NAF reports activities are high on v.h.f. in Dayton with about forty on 50 Mc. and fifty on 144 Mc. DAE, with his family, visited 4PL and 3MIE. NBK spoke at the Massillon ARC on DX and the club started code and theory classes in the local YMCA. NHH is working DX. OYL moved to a new home and his XYL bought him a 40-ft. tower and a three-element beam. GBJ, FRB and YHU now work 10-meter phone. NP has a new HRO-60. IJL is Toledo's ham of the month. HRS has her General Class license. GDE's XYL presented him with a jr. operator. BGU made WAS and DXCC on 10-meter phone. JYH is attending college. TWD and HWX took a trip through Northern Michigan. Toledo has a going TVI committee. Findlay, take notice. Marvel. HUX, has not received the G-77 yet. The Cleveland Area Council Amateur Radio Clubs elected YMB, pres.; CTZ, vice-pres.; PCJ, secy.; and OPC, treas. AXX received his 35-w.p.m. Code Proficiency Award. Your Director and SCM attended the Findlay Hamfest with about 375 amateurs attending. Toledo came away with two large prizes, namely, HUX a Gonset G-77 transmitter and WHA a Gonset G-66 receiver. TTJ and CRF are on 6 meters. BIM has a new NC-300 receiver. A truck backed into GAB's V-37 vertical and destroyed it. KN8BPX says the Northern Hills Amateur Radio Club will have code and theory classes for any would-be amateurs in the Greater Cincinnati Area. Contact him at 1927 Madison Ave., Cincinnati 31, Ohio. Two new appointments: SGX as OES and WFJ as OO Class IV. Traffic: (Sept.) W8UPH 631, NCK/8 201, VTP 188, QLJ 157, HXB 129, DAE 128, GFE 120, ZAU 37, SZU 33, CTZ 31, ARO 26, IIR 25, MVJ 24, STR 23, AL 20, RO 20, DG 19, HRN 18, SMK 17, WE 15, GBH 14, HPP 11, HJZ 10, WSY 10, JHH 8, PBX 8, UMH 8, LMB 6, SDI 6, EEQ 5, SYD 5, URN 5, AQ 4, MGC 4, QIE 4, YCP 4, HUX 3, STB 3, AMO 2, CVZ 2, DDW 2, PLQ 2. (Aug.) W8AXX 115, K8AEC 91, W8CTZ 41, HPP 33, HRN 26, MVJ 24, TCS 22, PLQ 16, STR 16, UMH 14, WSY 7, SYD 6, URN 4, K8CAS 1.

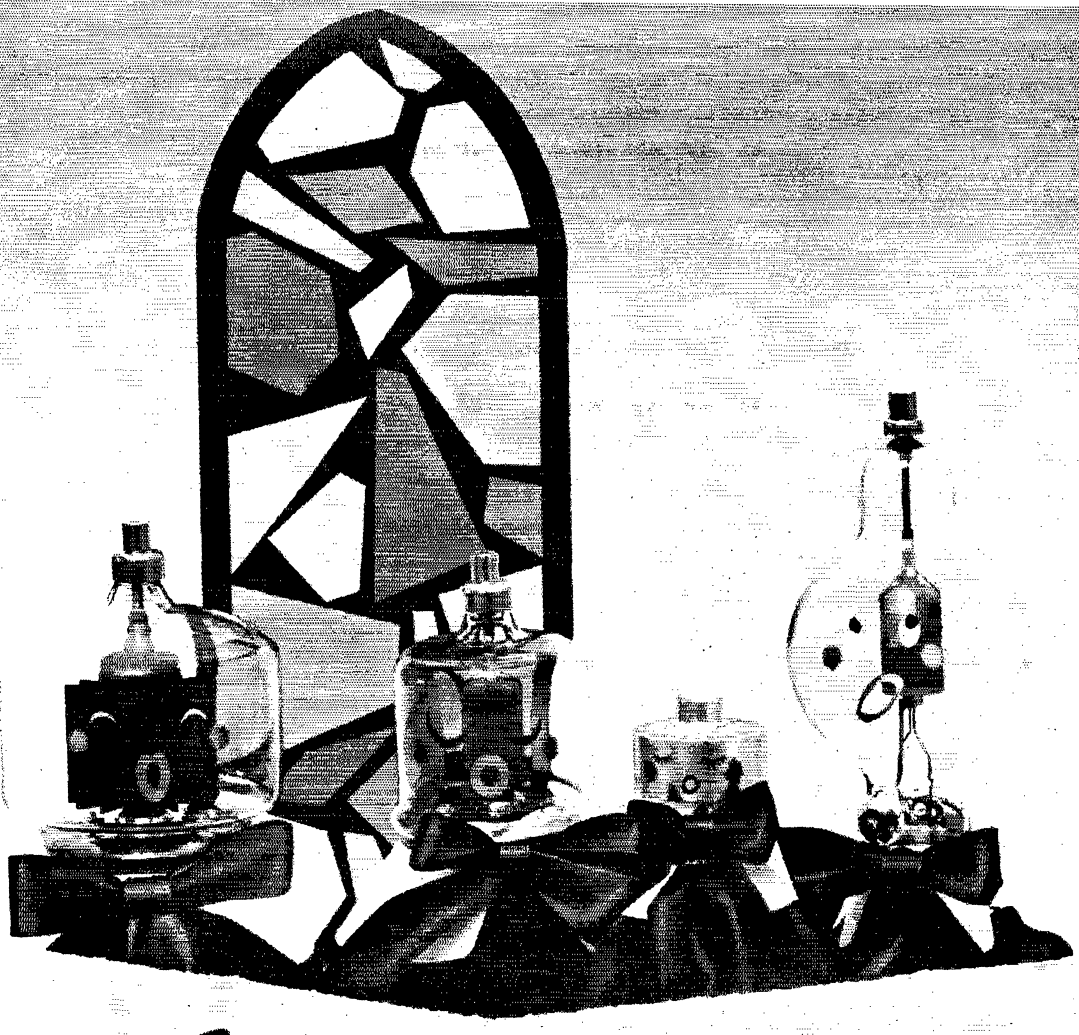
HUDSON DIVISION

EASTERN NEW YORK — SCM, George W. Tracy, W2EFU — SEC: KGC. RM: BXP. PAMs: GDD, IJG and NOC. Section Nets: NYS meets on 3615 kc. at 1900 hours, NYSPTEN on 3925 kc. at 1600 hours, SRPN on 3980 kc. at 1100 hours, IPN on 3970 kc. at 1600 hours, MHT on 3716 kc. Sat. at 1300 hours. We extend our congratulations to EFU, NIV, NOC, ZIS, K2BSD, JEQ and PPB on earning ARRL Public Service Awards for activity during the 1955 hurricanes. The dozen or so amateurs in Cohoes are considering the possibility of organizing a club. WHX is now using 32 elements on 2 meters. KN2TLS, recently discharged from the Air Force, is heard on 80, 40 and 15 meters. The Schenectady Association held its annual auction on Oct. 1st. The NYSPTEN is sorry to lose K2EKE, who has moved to California. K2HEF is attending Dartmouth College. We add to our family teams K2QIT and his mother, KN2UNL. Happy operating to both. K2IWT is now modulating a 500-watt rig. KN2OLV reports he passed the Technician Class exam. The Harmonic Hill Club had a "YL Nite" on Sept. 7th. After a long time QRT, BRS is back on 80 and 20 meters. Evening classes at Columbia U. prevent PHX from taking NCS of the EAN on Tue. nights. K2EKS, attending Clarkson College, keeps skeds with home through Schenectady stations. K2GNO, now in D. C., says he is on assignment for Federal Electric and hopes for a permanent berth. APQ is working 10-meter s.s.b. with his 5100 rig and 51SB adapter. A cubical quad is expected to go up soon. NGO states he is building a new linear amplifier to be driven by his s.s.b. exciter. His many friends will miss KUJ, designer of s.s.b. gear, who leaves G.E. for a new job with Hulett Packard in California. Traffic: W2EFU 177, PHX 169, NOC 110 K2PPB 90, HPQ 87, JEQ 72, MBF 42, QIX 39, LKI 27, W2ATA 24, K2EHI 15, HNW 8, CXO 5, GCH 4, HJX 3, HON 3.

NEW YORK CITY AND LONG ISLAND — SCM, Harry J. Dannals, W2TUK — SEC: ADO. PAM: OBW. RM: WFL. Section Nets: NLI, 3630 kc. nightly at 1930 EST and Sat. at 1915 EST; NYC-LIPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EST. WFL reports an NLI traffic total of 204 with activity picking up. OBW and the NYC-LIPN are rolling along in fine shape with a traffic total of 194. KEB, KFV and JGV made BPL, the latter on originations plus deliveries. JGV will be operating mobile from Connecticut. K2AMP's traffic total is climbing. K2HKH is putting the finishing touches on a pair of 807s. WMG and K2KLN made WAS. K2PHF has a new ARC-5 on 80 meters and has been bitten by the traffic bug. IAG reports that the Queens 10-meter AREC mobiles cooperated with the Jamaica auxiliary police on a RACES drill. K2JZR is looking for an on-the-air chess match. AOD is replacing his tripler on 420 Mc. with an AX-9903 final. BQM has moved to Harbour Green. JCA became a QCWA member. With DIU as his father, K2KBQ as his mother and K2BNW the delivering doctor, how can the fourth harmonic fail to become a ham? K2KRC finished his 500-watt rig for 6 meters. K2UOY worked 18 states in his first two weeks on the air. New calls on 6 meters in Nassau County are K2s JVS and OCE. K2s TLG and USL expect to be on 50 Mc. soon. IYYO/2 now signs K2UUP. IOI and his XYL, LZJ, moved to a new QTH at Springs, L. I., and have a fine signal on the NYC-LIPN. Congratulations to OBU, who has been returned to office as our Hudson Division Director for another two years. K2ITZ finds his new 10-meter ground plane fine for DX. K2s AED and JTW visited the RCA radio facilities at Rocky Point. IVS is now building a mobile rig to put in his Morrow converter-equipped Imperial. K2KTT is building for 6 meters. The Frog Hollow RC is sponsoring a 220-Mc. club building project. Ex-AQV now signs K4GQX from Florida and ex-FIT signs K4KOB on 20-meter s.s.b. from the same state. Twenty-three states answered KN2STF in his first twelve days on the air. Two hundred people enjoyed the first FLIRC outing and dinner at Lindenhurst. New officers of the Central Queens RC are K2DEV, pres.; K2LWK, vice-pres.; K2ODB, secy., and K2OUD, act. mgr. K2PWH plans to key his 6-meter Communicator for c.w. KN2TIM and his DX-35 and AR-3 worked 10 states and Canada in a month's operation. K2QOV is the proud owner of a Viking Valiant. K2IOT has joined the mobile gang on 10 meters. K2LUR is soon to have a beam on 14 Mc., courtesy of the OM, K2HZC. YBT reports that the Bonac ARC is growing. CLG has been building modified ARC-5 s.s.b. rigs similar to EWL's *QST* article and Lew offers to help interested amateurs with their modification problems. All stations are reminded that their monthly reports are due in my hands by the 5th of each month. Your SCM would like to visit as many clubs as possible during the coming year. All club secretaries are urged to report club activities and arrange for possible meeting dates. Hope to see many of you in '57. Traffic: W2KEB 2809, KFV 1380, JGV 264, K2DEM 220, AMP 157, KLN 125, GHS 88, LWK 71, W2TUK 57, HAC 55, K2PIIF 33, W2IAG 31, WFL 29, K2JZR 28, W2UGF 26, K2RJO/2 23, W2OME 20, K2EOR 16, EQH 16, W2IVS 16, K2KSP 16, W2OBW 16, GP 14, K2CMV 13, W2AEE 12, EC 12, FTV 12, K2CRK 9, W2OBU 8, YBT 7, GXC 6, PF 6, DUS 5, K2ITZ 5, W2JBQ 5, K2ADL 2, JTW 2, W2MUM 2. (Aug.) W2AEE 48, IVS 5, K2KTT 4, EQH 2, W2MDM 2.

NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — SEC: HN. PAM: CCS. RMs: MLW, CGG and NKD. My sincere thanks to all of the gang who so faithfully supported me in the recent balloting. I will continue to serve you in the best interests of amateur radio. CVW soon will be on the air with a new Viking Valiant. The Raritan Bay Radio Amateur Club is building automatic Conelrad monitors for use by club members at their stations. TTM now is well known by his local police department. It seems his 6-meter activity and their radio system is not quite compatible. K2RJD is General Class and is awaiting the arrival of a new DX-100. K2BZX has been blessed by the arrival of a new YL in the family. K2DDM is experimenting with a new 10-meter mobile rig. LOY, of Clegg Laboratories, was a recent speaker at the RBRA Club. Hosts for the evening were K2FQD and POH. Don't forget that NJN meets at 1900 local time on 3695 kc. Mon. through Sat. MLW has issued the second in a series of NJN bulletins. The bulletin contains a complete net directory as well as a "Who's Who" column which provides interesting

(Continued on page 118)



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W6RWI
W6RXW
W6SC
W6SCZ
KN6TNK
W6TVS
W6TXT
W6UF
W6UFU
W6UMX
W6UOV
W6VBJ
W6VW
W6VYH
W6WC
W6WSL
W6YSX
W6ZGV
W6ZIU
W6ZLB
W6ZNP
W6ZPH
W6ZVV
W1KKP
W2CN
W2QA
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bits of information about net members. This is a time-consuming operation, and it is all done by one member alone, MLW, a fine net manager. The Irvington Radio Amateur Club has started code and theory classes to extend throughout the year. NJFN meets at 1800 local time on 3900 kc., Mon. through Sat., and Sun. at 0900 same frequency. VDE has been appointed assistant net mgr. for this net. ZVW has just completed a new mobile rig, 60 watts on all bands 75 through 15 meters. K2GAS is working good DX with his little 10-watter. K2DOX is back at the U. of Detroit. HXU spent his vacation with VE1EX. K2EQP visited 4IR on his recent vacation. K2JOM has a new 75A-3 receiver and is working 29-meter c.w. New officers of the Tri-County Radio Assn. are BRC, pres.; YJC, vice-pres.; K2TOU, secy.; K2HTR, treas. There is a net operating in Monmouth and Ocean Counties on 6 meters. This net is open for local traffic as taken from other long-haul nets. K2SBG is the motivating force behind the new net. IQD has been reappointed to MARS. The IRAC held a successful transmitter hunt and picnic on Sun., Oct. 2nd. The NJ Phone Net held its annual outing at the home of ZQ, West Trenton, on Sun., Oct. 14th. The NJN held its annual get-together at the New Brunswick YMCA on Nov. 3rd. GVU has just received his third DXCC certificate. K2IBF waited thirteen months for the DX card from Italy. K2IKZ is a new Extra Class licensee in the section. Karl is just 15 years old, and we believe he is the youngest to hold Extra Class license in these parts. If anyone can beat this record let's hear from you. VMX reports that the new XYL now is KN2UXJ. K2PCO has worked 63 new countries with his new 15-meter beam. SUG is hard at work building the RACES organization in Hunterdon County. He has just erected a 100-ft. tower at his County Control Center in Flemington. JT has erected a new tower at the Passaic County RACES Control. NIE has forsaken the ham rig for the bow and arrow. WSN is working skeds with KC4USA at Little America. K2BWQ has made WAC. NJN traffic report for September: Sessions 25, attendance 348, traffic 270; NJN morning, sessions 21, attendance 70, traffic 42. Traffic: (Sept.) W2MLW 314, K2FQP 168, W2VDE 150, K2BHQ 108, W2BRC 75, ZVW 34, K2BWQ 16, W2SUG 14, KFR 12, VMX 12, DRV 10, K2GAS 10, SKK7, W2CFB 3, CJX 2, NIY 2, ZEP 1. (Aug.) K2SKK 3.

MIDWEST DIVISION

IOWA — SCM, Russell B. Marquis, WØBDR — The Newton and Des Moines Clubs furnished communications for the National Plowing Field Days near Newton with 3 fixed stations and 20 mobile units. WQQ has gone s.s.b. with his mobile. LGG and BLH renewed ORS, AEH OES and NWX EC appointments. LCX, GXQ, RQW and ZPM received TLCN Section Net certificates. Section Net certificates were issued to 113 members of the 75-Meter Phone Net. New officers of the Central High School Radio Club of Sioux City are WDK, pres.; YSE, vice-pres.; KØDPI, secy.; UJF, treas.; and UJD, chief op. The Sioux City clubs are going to hold emergency drills the 1st and 3rd Sun. of each month on 3940 kc. ZUV has a new SX-99 and DX-35. New Novices are KNØHBL, HJF, GXE, HXL, GTF, GOC, HFR and HFW. General Class tickets went to KØBSK, DPH, DPG, DON, TLX, CZQ and WØAHJ. USQ is putting in an RTTY rig on 2 and 6 meters. KØAAH is a new member of the TLCN. LJW visited several amateurs around the State. A club station is being built at the Hamburg High School. 6WLY/Ø, at Volga, has worked 132 countries during this stay in Iowa. He plans to return to California in the near future. Traffic: (Sept.) WØBDR 1562, SCA 1504, LCX 1362, PZO 800, LGG 590, BJP 421, CZ 126, KØHEA 111, WØUTD 77, QVA 64, WYW 59, SQE 54, KVJ 48, KØBEC 36, WØNGS 35, BLH 31, LJW 19, GXQ 18, VWF 18, KØEXN/Ø 11, WØYUA 10, FMZ 7, HNE 7, RQW 7, KØCLS 5, WØBRE 4, KØDBW 4, WØDIT 4, EEG 4, UJC 2, FDM 1. (Aug.) WØSQE 49.

KANSAS — SCM, Earl N. Johnston, WØICV — SEC: PAH. PAM: FNS. RM: QGG. The Kansas Nebraska Radio Club has elected new officers for next year with OFG, pres.; ZNP, vice-pres.; KØAOQ secy.; and GYK, treas. The club held its Field Day Sent. 30th instead of at the regular time last June because of harvesting, and had a very successful outing. Power supplies and rigs were OK but much was learned about antennas. We wish to salute an old-timer who is starting on his 25th year of ham radio, OAQ, of Leavenworth. Bud stays on 40-meter c.w., handles traffic when he can and loves DX, having worked 142 countries with 128 confirmed. The JARC Hamfest had 250 registered with a fine program and prizes. NIY, winner of the big prize, a 60-ft. crank-up tower, gave it back to the club to add to its station equipment. This was really a very noble and generous gesture. VZG, of Leavenworth, has a new Mosley 7-Me. beam that works everything. KØDBK passed his radiotelephone 1st-class exam. WWR reports there are 5 s.s.b. stations in Barton County. LOU has a kw. final on s.s.b. TOL, of Manhattan, has a new high-powered linear. Traffic: WØBLI 622, NIY 234, FNS 221, YVM 106, QGG 100, SAF 91, TOL 90, IHN 54, ABJ 51, KØEWS 25, WØFDJ 19, ONF 19, WWR 19, QGB 13, TNA 12, QQG 11, KØAHW 10, WØTSR 10, VZM 10, DEL 9, ICV 9, ECD 8, KØBIX 7, WØLIX 6, LOW 6, AER 3, ASY 3, KØAOQ 2, WØUAT 1.

MISSOURI — SCM, James W. Hoover, WØGEP — PAM: BVL. RMs: OUD and QXO. OUD has a new SX-100. VPQ has a new Gonset receiver mounted in a new car and is working on the dynamotor and transmitter installation. YER is back on the air with a new DX-35 and NC-98. ETW has returned to Washington University for another year. IJS has his new 813 rig on the air. SUV has been off the air since the wind toppled two 55-ft. towers. PAIE has from four to six traffic schedules each day. KØCHE had a two-week vacation in the West. Two hundred were in attendance at the hamfest and picnic of the Southwest Missouri Amateur Radio Club in Springfield. MFB, who recently left the State, is in Lake Hiawatha, N. J., but is not on the air yet. The Missouri Valley Amateur Radio Club has a station at the Slater Airport. Meetings are held the 1st and 3rd Sat. of each month. The Missouri School of Mines Radio Club has 30 members with 16 licensed. The club has started a message service for students of the school. The SCM visited ARRL Headquarters on Sept. 24th. The majority of time was spent with 1BDI, Communications Manager, and 1ICP, ex-0ICP, of the Technical Staff. Anyone interested in starting a state-wide traffic net on 6 meters should contact the SCM. Traffic: (Sept.) WØCPI 702, GAR 415, KIK 132, KØDEX 113, WØOUD 103, MHS 91, OMM 74, BUI 41, VPQ 39, CKQ 34, YKC 25, RTW 22, BVL 17, IIR 14, WFF 14, EEE 10, EBE 9, ECE 3, WAP 2, GEP 1, JHY 1. (Aug.) WØVPQ 112, IJS 43, CKQ 36. (July) WØIJS 22.

NEBRASKA — SCM, Floyd B. Campbell, WØCBH — SEC: JDJ. PAM: MAO. ZIN and the boys are about ready for a test run on the 300-watt transmitter for installation in that trailer. FQB has a station in operation at the Fire Alarm Headquarters with the noise level being very difficult. A quarter-wave vertical has been constructed and works FB. Art has a T2FD antenna under construction for all bands. Art would like liaison with net members on 40-meter phone for traffic QSP, as the high noise level prevents Art's activity on nets. AIN, ZAA and PZII have a new design cubical quad for 20, 15 and 10 meters. The Western Nebraska Net had 339 QNIs averaging 13.5 and 35 QTC for September. The SCM had a very pleasant meeting in Scottsbluff with Alliance, Chadron, Sidney, Gering and Scottsbluff being represented. The 75-meter Emergency Phone Net report: Morning Net — QNIs 489, average 16.3, QTC 81, average 2.7, time in minutes 729, average 24.3. Noon Net — QNIs 573, average 19.1, QTC 64, average 2.1, time in minutes 758, average 25.3. UJL/2 is on 10 meters from New Jersey. The 160-meter Net is back in full swing on 1995 kc. at 7:30 P.M. daily. NSS is in operation with a nice turnout. On Sept. 23rd about 30 members of the phone and c.w. nets and the Lincoln Amateur Radio Club. XYLs and jr. operators swooped down on MAO for a surprise birthday party. Traffic: WØZJF 243, SPK 77, DDT 56, EGQ 51, MAO 46, KØFBD 43, WØFTQ 40, PUT 36, NIK 30, ZOU 28, UJK 27, VGH 27, KØBDF 20, WØORW 15, DQN 10, KØELQ 10, WØQKR 9, KØDFO 8, WØPNY 6, KØBSG 4, BYK 4, WØIAY 4, PDJ 4, BOQ 3, KLB 3, LZL 3, AIN 2, PQP 2.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Milton E. Chaffee, W1EFW — SEC: EOR. RM: KYQ. PAM: YBH. Traffic Nets: MCN meets Mon.-Fri. at 0645 on 3640 kc.; CN meets Mon.-Sat. at 1845 on 3640 kc.; CPN meets Mon.-Sat. at 1800 and Sun. at 1000 on 3680 kc. Our new SEC is working hard to bring the section back to its proper place in the AREC picture. ECs are urged to help him by filing a report on activities in your area as well as suggesting possible appointees in towns not already on the EC list. Net reports: CN met 25 times and handles 211 averaging 8.4 per session, and KYQ notes that KYQ (19), RFJ and RGB (18) and LV, AW, EFW and IUC (14) were there most regularly. After four years of Friday NCS on CN, KV has relinquished the spot to look after his health. YBH reports that CPN met 29 times, handling 332 for an average of 11.5 per session, with QNI honors to VIY and YBH (29), FKE (28), DHP and EKJ (27) for a fine record. Early birds bring fewer in number, MCN met 21 times, handled 53, and recorded QNI by RGB and IBE (19), RFJ (18) and EFW (15). CLD and CKA are having fun with 2-meter walkie-talkies. With beams all over at BDI, Ed hopes for no winds. Swing-shift working hours keep TD from being active. VIY is busy as EC, Deputy RO and TECA president in Trumbull. DHP is trying his hand at DX on 10 meters. WHL says new interest sparks the Hamden Club. Novices LXD, MBY and MBX are newly active in Torrington. *QTC* is the name of the excellent new bulletin of the Waterbury ARC. The lone OES report comes as usual from FVV. OO GIX has been busy checking harmonics in the 7.6-7.8-Mc. range. FDJ is ready for anything with a Ranger and an NC-98 available fixed or mobile. Appointments: DHP is a new OBS, IYI and JEQ are new ECs. CGD and NEK renewed OPS, CGD renewed OBS; CGD, NFG, BVB and DEK renewed EC; CGD and BVB renewed OO and NJM and ORP renewed ORS appointments. How about yours? Time to renew? Many thanks for kind words by message and mail on my "election" as Director. I'll do my best to merit your confidence. Traffic: W1YBH 368, EFW 253,

(Continued on page 120)

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MAINE — SCM, Allan D. Huntley, VYA/BPI — SEC: TVB. PAM: FNT. RM: EFR. The Barn Yard Net meets Mon. through Sat. at 0800-0930 on 3960 kc; the Sea Gull Net Mon. through Sat. at 1700-1800 on 3940 kc; the Pine Tree Net Mon. through Sat. at 1900-1930 on 3596 kc.; the Horse Traders Net Sun. at 1700-1800 on 3940 kc; and the State C.D. Net Sun. at 1100-1200 on 3993 kc. All Maine nets now are operating on EST. The State C.D. Net meets Wed. at 2000 hours on 80, 75, 6 and 2 meters. Why not give the boys at Augusta a little business on any of the above frequencies? JVU and QCC are operating s.s.b. on 2 meters. Look for them on the low end of the band. TVB now is working with NXX at G.E. TGW has a new tower and beam on 15 meters. You 15-meter boys can now get a pretty certificate for 15 on 15 by contacting TGW. Let's all pitch in and give FNT a hand on the Number Plate Bill coming up soon in the House of Representatives. Every little helps. Let's not let the Horse Traders Net die. A good net control station would help. PTL and VV have new Viking in Bingham. VED, a summer resident in the Pine Tree State, sports a new call — NTV. ZME has made BPL two consecutive months. IZS has dropped the "N" and now is on 75 meters with a new Windom antenna. FIG has a new SX-100. Is CBU only running 25 watts? With TVB working steady in Portland, YTE will be heard from more often. VXU is getting a slicer to copy VYA on s.s.b. WTG's mobile now is 100 per cent Elmac. The Pine Tree Net needs c.w. operators in "The County." Traffic: W1ZME 163, LKP 144, CEV 91, FNT 74, BCD 32, UDD 28, EFR 26, BX 25, FZK 20, VLU 18, FLV 10, TGW 7.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — ETH is a new OPS. Appointments endorsed: EGZ Harwich, LPM Natick, MBQ Vineyard Haven, OLP Walpole, WK Quincy, HSN Comm. Officer for Sector 1-B, MEG Framingham, BB Winthrop, WCI Newburyport, ZBD Hudson and YYZ Randolph as ECs; USA and MEG as OPSs; USA and MEG as OBSs; MEG and HWE as ORSs; USA, BB and THO as OOs. Sorry to have to report the death of QJK/SMC and SIT. GOU worked Little America. Heard on 2 meters: TVF, AQO, BDF, WNP, FCX, MNU, OAI, JRG, IWK, EZV, BIR, LXR and K2HBL/1. NSY is ex-K6HEC. EOI, Weston, has a Gonset on 6 meters and is at Fort Devens. Ex-HVI is now in Cleveland. ZBD is Radio Officer for Sector 3-D. THO, our PAM for 6 meters, reports lots of activity by CTV, EQA, EQS, ETZ, GHF, GJZ, GKE, HHJ, HUB, NRY, WEJ, YOP, YTO, ERP, HM, NRW, CHS, DFS, DOF, EGB, EOI, EUJ, EVS, FOY, GCK, HTJ, KWV, LDD, MFM, MLK, PMX, QFE, VBC, VGZ, WIW, LRX and KKB. K8AIR/AM was over the Boston Area with a Gonset 6. EMY has P.A. on his Gonset and an NC-300 with converters. CEI will have a 500-watt job. PX has a good high location and antenna. K2MSU/1, mobile, is a teacher at M.I.T. ZTO has his General Class license. The Nit-Wit Network is on from 11:30 P.M. on. A new mobile antenna "HALO" is being used by AQR, UZZ, UVB, RMF and VYS. EPE is NCS for 1RN on Tue. and 1RN representative on EAN on Fri. EMG is representative from EAN to CAN on Mon. and from CAN to EAN Thurs. and Fri. WSN made BPL. We hear that more stations are checking into our Eastern Mass. Net at 1900 on 3660 kc. TY has a Viking Adventurer. WU's XYL has been in the hospital. BY is busy at work. AOG has the rig on 2 meters. BB is putting up a 160-meter DX antenna on a farm in Maine. EEB made WAS. NF has a Gonset. JNE/4 is on 40-20-meter c.w. FFA will be on from ET3-Land. AGA has a Telrex super-mini beam. LQQ has a three-element on 10-20 meters. Radio Amateur Open House held its first meeting at Cambridge YMCA. ORV is treas.; EPL secy. The South Shore Club meets the 1st and 3rd Wed. nights at 7:30 at the Quincy Health Center, 1120 Hancock St., Quincy. The club plans for this season include interesting guests and speakers as well as special activity nights and auctions. MEG is building a 6-meter c.c.c. New officers of the Hingham Radio Club are BIY, pres.; IGH, ex-1HH, vice-pres.; ONV, secy. ECS, ex-9FWA, now in Hingham, will be on 2 meters. GDJ says he will be on more now. The T-9 Radio Club held a meeting at KON's QTH. RCA is back again. New officers of the Middlesex Radio Club in Waltham are SAD, pres.; FMW, vice-pres.; DDN, secy.; KSJ, treas.; CNW, act. mgr.; DWH, chief engineer. The Braintree Radio Club, ZST secy, held a meeting and is planning a "Ladies Night." HIX is R.O. for Stow, AHE is his alternate R.O. Meetings are held Monday nights at the Hudson Town Hall. MDD is mobile on 2 meters. Many of the gang were on during the V.H.F. Contest and several were up on the hills in Maine and New Hampshire. SNR is on 2 meters. SMO is handling some traffic for USA at R. H. Whites. CHA/MRQ has been on some from home and from Maine on 2 meters. SRG spent 3 weeks in the hospital. CFJ is a new ham in Winthrop. The Winthrop drill had BDU, CMW, DJ, OIR, DPN, HFJ, DGY, IRV, ORV, MQB, JJI, IOO, NMX, FIB, BB and YLs on. BB is getting ready for 160-meter DX tests. JNO is on 160 meters. This month we had 19 out of 34 ORSs reporting in. Area 1 Radio Comm. held a meeting with TQP, KTG, DFS and

(*Continued on page 122*)

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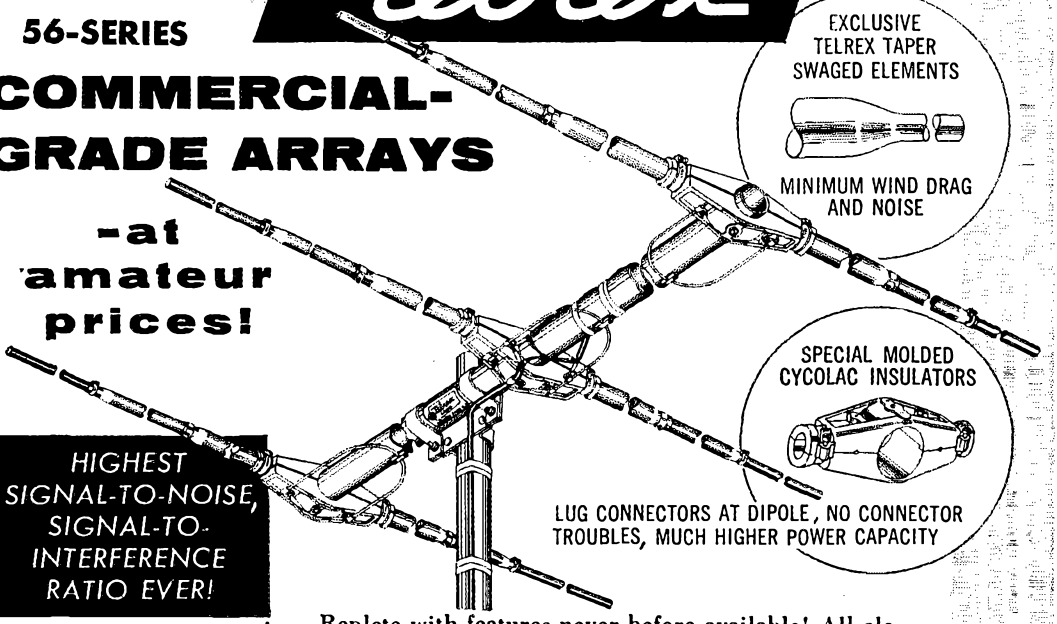

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DWY present. Traffic: (Sept.) W1EPE 195, EMG 185, AUQ 67, GNX 60, EAE 50, AVY 48, TY 32, WU 14, UKO 13, AOG 11, BY 11, AQE 8, BB 6, EEB 5, CAM 2, CZW 2, LM 2, NF 2, SMO 2. (Aug.) W1WSN 170, QLT 10, SMO 4.

WESTERN MASSACHUSETTS — SCM, Osborne R. McKeraghan, W1HRV — SEC: RRX. RM: BVR. PAM: QWJ. The WMCW Net meets on 3560 kc. Mon. through Sat. at 1900 EST. DZV, DGL and KGJ have been doing a swell job representing Fitchburg on WMN. Endorsements go to the following appointees. EC to RO, EC and OES to VNH, OPS to UKR and ORS to WEF and MVF. WN1GNJ is now General Class. JYH has been working some rare DX on 15-meter c.w. DLS is looking for DX on 20 meters. DGL has a new Heath Q multiplier. BYH is in Boston for some time and operates at home in Fitchburg only on week ends. LDE sends in an FB traffic report this month and is due for a BPL card. CMS is away at college. VNH has 700 watts on 6, 600 watts on 2, 100 watts on 220, and 50 watts on 432 Mc. He still needs two states for WAS on 6 meters. WEF has acquired an HRO-5TA1 and is very happy with it. MVF is selling out his ham gear in preparation for moving to the West Coast. BKG has a new minibeam up and is working out FB. MJD has gone s.s.b. with a Collins and an SX-99. AZW boosted his countries total with FG7XD and VP4KL. IJZ has a new HRO. QWJ demonstrated his new homebrew receiver to HCRA in Agawam at the October meeting. Dick sure did a fine job of design and construction and has a receiver to be proud of. Club members were very much interested and it may result in more receiver construction projects. C.D. Area 4 had its communications equipment set up in the Massachusetts Building at the Eastern States Exposition. The display and demonstration of area communications was seen by many visitors. Many of the local boys manned the equipment, including KUE, KUL, UVI, QFB and others who put in many hours. Traffic: W1LDE 649, BVR 137, TAY 68, DYO 56, DLS 31, DVW 26, DZV 22, KGJ 16, DGL 12, EKO 12, HRV 8, AGM 5, JYH 2.

NEW HAMPSHIRE — SCM, Harold J. Preble, W1HS — SEC: BXU. RMs: CRW and COC. PAM: CDX. The Granite State Phone Net meets Mon. through Fri. at 1800 on 3842 kc. and Sun. at 0900.; the New Hampshire C.W. Net Mon. through Fri. at 1900 on 3685 kc. The Concord Brasspounders Convention Committee is to be congratulated for the fine job it did on the ARRL New Hampshire State Convention. There were nearly 800 present and we believe everyone had a good time. JWU passed his Gen. Class exam at the hamfest. HOU gave our traffic count a nice boost in September. PVF is operating mobile with an Elmac PMR-7 and H-W T-90 at Plattsburg AFB. DYE has been reappointed OO. FZ is handling phone patch from KC4USA (Little America) to the XYLs in New Hampshire. BYS visited K6ELR while on vacation. BYS has a weekly sked with F7AR on 29.1-Mc. mobile. Congratulations to FTJ on receiving No. 28 WAM certificate. Hams this year at the U. of New Hampshire are ARR, AUK, CCE, DEN, DUK, MDZ, YZB and ZIZ. Welcome to Novices MEL, MOI, MKA, LYM and MBP. AIJ took over as your SCM in October. Thanks to all for your cooperation during my two-year term as SCM. Traffic: (Sept.) W1HOU 161, ARR 44, FUA 23, WBM 18, FZ 9, VZS 9, DYE 4. (Aug.) W1EVN 8, BYS 3.

VERMONT — SCM, Mrs. Ann L. Chandler, W1OAK — SEC: SIO. RM: BNV. PAM: SEO. Traffic nets: VTN — Mon.-Sat. at 6:30 P.M. on 3520 kc.; VTPN — Sun. 9 A.M. on 3860 kc.; GMN — Mon.-Sat. at 12 noon on 3860 kc. VTN has had a nice turnout since the starting of a full schedule Sept. 15th. Our old top QNI member, IT, has been ill with the grippe. SEO reported 51 different stations reported into VTPN during 5 Sunday sessions in September. The BARC held its annual meeting at the home of DAP and VSA on Sept. 30th, with the following officers being elected: NLO, pres.; VSA vice-pres.; CKO, secy.; and DAP, treas. A new operator in Winooski is OJO. Twelve-year-old Novice Lois Hebert, WN1LZF, asks, "Why is it that when a girl contacts a man he sometimes drops the conversation?" Lois's pop is WYG. FTF/1 and KRV finally "got thru" on 6 meters, both receiving "loud and clear"! UNF is heard on 75-meter phone mornings. VEB has returned from Labrador and soon will be heard from Tucson, Ariz. WOA and DFU attended a scout conference in Connecticut and visited TJX in Putnam. SEO now sports a new 15-meter beam. MMV still is going great guns on 15-meter phone with 169 worked and 152 confirmed. The latest worked are VK1IJ, UC2KAB and ZK1BL. TAN has moved to South Lancaster, Mass. The new alternate RO in Rutland is WOA. EIB is enjoying increased contacts on 75-meter phone. UCW is overjoyed over his WAC. Recent DX worked was UA3DA, UB5UB, HI8FR, ON4BQ/LX, EL2S, VR4AA and HP1EH. EXZ worked MMN, his first contact on 2 meters, using low power. CBW is the first station in Caledonia County to go s.s.b. BNV contacted the two stations at the South Pole on s.s.b. running about 100 watts. Active again is TFB, operating from a brand-new remodeled shack. AOX is a grad student at U.N.H. OAK has taken to gunning for partridges. Sorry to report the passing away of WUN. Traffic: (Sept.) W1VZE 85, OAK 47, BNV 20, ZNM 17, KRV 11. (Aug.) W1KJG 11, UGW 2.

(*Continued on page 124*)

NORTHWESTERN DIVISION

MONTANA — SCM, Vernon L. Phillips, W7NPV/WXI — SEC: KUH, TPE, TNJ and SEW provided communications for the American Power Boat Association Races near Malta. AYG, LUT, SVE, TPE, OYP, OOY and NPV attended the ARRL Dakota Division Convention at Watertown, South Dakota. The RACES plan for the Billings Area has been submitted for final approval. Billings is the first city in Montana to get its RACES program moving. The City of Butte gave one of its old prowl cars to the Butte Club. Butte amateurs are in the process of fixing the car up for an Emergency Mobile Unit. ED reports that there are 800 hams in Montana. LBK is alternate net control on Montana Army MARS Net. TTC has a new harmonic. NAW's XYL passed away. 5GWX moved from Great Falls to Roundup. ZUJ and ZUK have a new SX-99. QYA and VMB have a new Pacemaker and HT-31. New officers of the Harlo Radio Club are YHC, pres.; CTM, vice-pres.; BJV, secy.-treas.; and YHB, act. mgr. Traffic: (Sept.) W7YHS 20, LBK 11, W7MQI 1. (Aug.) W7YHS 8. (July) W7MQI 8. (June) W7MQI 4.

OREGON — SCM, Edward F. Conyngham, W7ESJ — YUY is building a new house so all efforts are spent on building and painting, with a few check-ins on OSN and RN7. VBF shows a big traffic let-down now that school has started. SQR spends lots of time helping would-be hams and on MARS circuits. PRA is clearing the decks for the fall activity. WJF says activity is slack because of school and teen-age activities, with just a few nets and rag chews. VIL has just finished a new 2-meter receiver and is now working on the transmitter, in addition to being active on MARS. OMO says the Doc has him taking nitroglycerin now so he has to watch his transmitting. Hi. TSII's school work is forcing a reduction in ham work. JCJ is recovering from pneumonia and getting equipment ready for some DX work. UJL has been working a little DX and a lot of traffic, the DX on 15 meters and the traffic on OSN, PAN and RN7. RGS reports very little DX, but gave v.h.f. a big work-out during the contest. BVH is QRL with MARS work. Traffic: (Sept.) W7UJL 109, WJF 56, PRA 40, OMO 39, HDN 31, HJU 20, BVH 11, GUR 5, VIL 5. (Aug.) W7GUR 46, OMO 40.

WASHINGTON — SCM, Victor S. Gish, W7FIX — The West Seattle Amateur Radio Club is planning code, theory and building instruction classes for would-be amateurs. Official Observer reports from WLK and YFJ show a great number of Novices in the 7.4- to 7.5-Mc. portion of the spectrum. PGY is planning on a new final now that he is in the new shack. The McChord AFB Radio Club meets the 2nd and 4th Mon. at 7:30 P.M. KHL is in Marine Hospital, Seattle, with 20 watts and a haywire antenna. WAH is finding that school interferes with traffic. FZB is looking for a new QTH. AIB is moving to Port Angeles. BEC dropped the "N." BDK is ready to go on 6 meters. FWD and FWR are going great on MARS cipher work. UZB is back home from school in San Francisco. HDT is QRL working on the house and reports PKR has a fine vertical antenna. YBV is off the air working on the modulator. PGY, BA, K7FAE and FEA make BPL this month. OE is acting manager of WSN and is looking for a permanent manager and net controls. QHI and EVW now are NCSing MARS nets. The WARTS Net shifted time to 1800 PST on 3970 kc. EHM reports his bum knee has been fixed up by operation and he expects to go hunting again. BA says s.s.b. is very good for traffic-handling through poor conditions. PGY finally got Delaware for WAS. WN7FNL is building a Novice transmitter. A very Merry Christmas and Happy New Year to all. Traffic: (Sept.) W7PGY 1487, K7FAE 1402, W7BA 1309, K7FEA 538, W7WAH 163, K7WAT 110, W7APS 49, USO 38, AMC 22, JEY 21, EHH 17, LVB 11, RXH 9, KHL 8, EVW 4, AIB 2, BMK 2, FZB 1. (Aug.) W7TH 52, AMC 11.

PACIFIC DIVISION

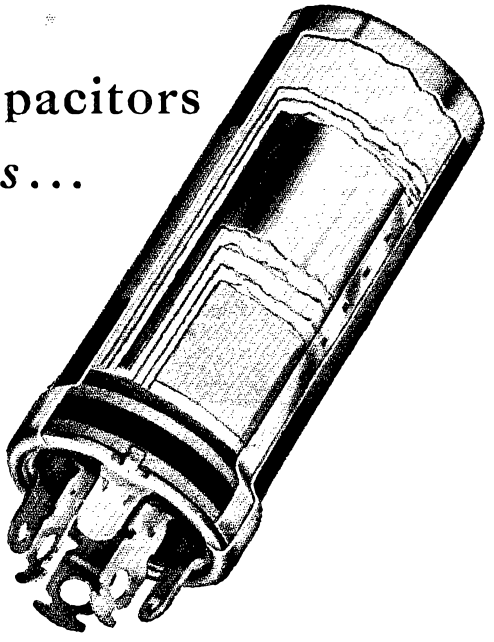
HAWAII — SCM, Samuel H. Lewbel, KH6AED — Zane, ex-KH6AWJ, now is operating in Japan under KA5ZS. Kauai reports: BCD is attending Oregon State. AXW is restoring an ancient Packard. BTS works part time at KTOH saving up for a new transmitter. BVH has a new DX-100. EU just built a "Quad-Yagi" for 2 meters. ARL is a new OO appointee and turned in an FB report. KS, also an OO, continues to help the KH6s with cooperative reports. BFT reports from Kona, announcing a total of 8 AREC members. The Kona Club now has a complete emergency set installed at the club headquarters. The main units are a Viking II CDC transmitter and HQ-140 receiver. Two-meter units are on the way. IJ is back chasing DX after a summer on the Mainland. The Honolulu Amateur Radio Club is sponsoring a class for Novices and General Class training with class work once a week and three a week on-the-air code lessons. Traffic: KH6QU 513, KP6AK 120.

SANTA CLARA VALLEY — SCM, R. Paul Tibbs, W6WGO — Asst. SCM: Roy E. Pinkham, 6BPT. SEC: NVO. It sure has been a lot of fun these last two years, gang. I would like to thank BPT and NVO and the other appointees, also all the amateurs in the Santa Clara Valley

(Continued on page 126)

MALLORY HAM BULLETIN

Why Mallory FP Capacitors ...with *etched cathodes*... won't develop "Middle Age Hum"



Ever notice how some electrolytic capacitors allow hum to develop after a few weeks of service? Even though they test out OK when installed, they let filter hum grow to an objectionable level in a relatively short time.

This is "middle age hum." It's caused not by capacitor leakage current, but by loss of capacitance. It's a common ailment of capacitors with plain foil cathodes. And it won't happen with Mallory FP capacitors, because they are made with *etched cathode* construction.

Here's the explanation. Maybe it's something you never realized goes on inside a capacitor. Actually there are *two* capacitors in series inside every electrolytic; one at the anode, and one at the cathode. The anode capacitor is the one that is formed electrically during manufacture. The cathode "parasitic" capacitor is due to the naturally formed oxide coating on the cathode foil. In a *new* capacitor, this cathode film is so thin, and capacitance thus so high, that the net microfarad value you measure at the capacitor terminals is hardly affected.

In a circuit having heavy ripple currents, the cathode can be driven positive with respect to the electrolyte during reverse peaks of the cycle. This action causes the oxide film to increase in thickness . . . *reducing* cathodic capacitance. The net series value goes down. And when the cathode capacitance gets comparable in size to the anode, the loss in filtering ability can be serious enough to cause considerable hum.

A capacitor with a plain cathode has no built-in "safety factor" to protect against capacitance loss, because its available cathode area is limited.

An etched cathode—as you'll find in Mallory FP's—eliminates this source of trouble. Because etching produces so much greater capacitance per unit area, the cathode capacitance is extremely high when the component is new. And build-up of the film during service doesn't reduce capacitance to a magnitude that will cause appreciable change.

Etched cathode is standard at *no extra cost* in Mallory FP capacitors and in popular Mallory metal and cardboard tubulars. It's another of the premium features that you're always sure of getting from Mallory, to assure the best in performance in your amateur rig or in repair jobs that you do in your shop.

See your Mallory distributor soon. He has Mallory capacitors with *etched cathodes* in the ratings you need.

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section for all the help I have had as SCM. I know you will continue to help your new SCM, YHM. UW was in the V.H.F. Contest on top of Mt. Hamilton with three operators. UF says the SCCARA, UW, won the CCRC plaque for the 1956 Field Day by default. Any amateur wishing to help in search and rescue work communication, call DA5-8605, Cmdr. Byers, of USCG auxiliary. With ham license plates on our cars, let us show the public we are courteous on the road as well as on the air. K6BBD cannot find much time between work and school to get his Viking II on the air. He received some nice answers on QO reports. K6BAM needs Africa for WAC and New Hampshire for WAS. K6DYZ is active in the MBRC 2-meter net. YHM has a BC-624 converted and working on 2 meters. Thanks to NTQ for an eight-element beam. After three years, ZRJ put an a.c. switch in his rig. To keep his OBS skeds, while getting the final power transformer back in, K6DHO was using JKJ's rig. LXA is moving to the east foothills of San Jose. QIE has a new QTH with lots of room for antennas. Don does more for amateur radio than anyone I have met. K6QCI now has a General Class license. WAI spoke on how to get more audio on a.m. Contact him for information on how it's done. Traffic: W6BPT 365, K6DYX 259, W6YHM 174, JRJ 142, HC 106, AIT 63, YBV 56.

EAST BAY — SCM, Roger L. Wixson, W6FDJ — Asst. SCMs: Harry T. Cameron, 6RVC; and Oliver A. Nelson, jr., 6MXQ. PAM: LL. RMs: EFD, JOH and IPW. Your SEC is CAN. Appointees as of Sept. 24th are as follows: RMs: IPW, EFD and JOH. PAM: LL. ORSs: HHX, JZ, YDI, DUB, HBF, TT, AHV, TI, EJA, EPC, VDR, K6FDG, K6WAY, EY, LMZ, OT, OJW, NGC, ITH, KEK, JOH, RRH and QDE. OESs: WGM, DDT, CAN, JZ, NDR, DOU, VSV, OHQ, MXQ, OJJ, SXK, NNS and UHM. OOs: ERR, JZ, HBF, CCQ, EPC, EY, FZC, OJW, CBF, NGC, ITH, BEZ, LTI. OPSs: BF, EJA, VDR, EY, AKB, LIL, OT, BPC, BHY, OJW, ITH and QDE. ECs: ERR, CAN, GK, FLT, ZZF and QDE. OBSs: WGM, VPC, DUB, ZX, TT, TI, BXE, FZC, OT, LGW, IGN/DMI, ITH and ASJ. If any of you wish to be deleted from the list, please drop me a card. If there are any of you who would like to get on the wagon let me know. I would like more reports from the clubs on activities in our section. Around the clubs in the East Bay section: The regular monthly meeting of the Skyriders Club was held Sept. 22nd at the residence of TM. New officers elected are ZOZ, pres.; PTJ, vice-pres.; TLM, secy.; TM, treas.; ANK, N.C., ELP, A.N.C. Thanks for the dope, K6PTJ. The Mt. Diablo Club had as a speaker K6BJ, whose topic was "How to Get the Fullest Use Out of Your Amateur Radio Equipment." The East Bay Radio Club had a demonstration and talk by K6AXN. Mike showed the equipment used by AXN and BAT in breaking the 1296-Mc. record recently. The SARO met at the Bow and Bell for dinner. The program originally planned was cancelled because of the sudden illness of the guest speaker and the program was changed to a "Do It Yourself" show. Each member gave a short story on any topic of general interest. Clyde Sunderland gave a bird's eye account of his trip back from Salt Lake City. US gave his impression of RTTY. Speakers at the Oakland Radio Club, Inc., were GIZ and PYH. Their topic was "DX Operating Techniques." They presented colored slides showing many well-known DX stations and also described DX awards available to the amateur. A short quiz was given on operating DX. K6AUD came out on top. Woody is a teenager but his good DX operating procedure has made him one of the leaders in his age group as a DX hound. I had the pleasure of visiting ARRL Headquarters recently and met many of the gang there. I was amazed at the magnitude of the 38 La Salle Rd. office. Those of us who haven't had the chance to visit Headquarters do not realize how much work and effort is put forward on our behalf. It was another thrill to sit at the controls of 1AW and work my own rig here in Oakland with UES at the key. I hope to get around to all the clubs in the near future and give you a first hand report on Headquarters. Traffic: K6GK 202, W6VPC 72, ASJ 19.

SAN FRANCISCO — SCM, Walter A. Buckley, W6GGC — K6HIW was kind enough to let the local ladies' club meeting be held at her QTH. With so many new members in the club some of the ladies cannot hold meetings in their QTH because of lack of room. The Cathay Club holds code and theory classes at its club room, 1524 Powell St., each Mon. and Wed. nights from 8 to 9 P.M. The 12th Naval District Office is releasing new movies for clubs to show at their meetings. Subjects of interest to all are included. ELW took some beautiful slides of the city and convention doings and was kind enough to bring them to this QTH for preview. He is sending the slides on to the East for showing. QMO has a new 3-bander beam and hopes to be on the air with it soon. SWP's XYL phoned to state that Pat seems much better and at times he can hold conversation with her. The Central California Radio Council treasurer, CTH, reports there is $169.63 in the treasury. An auction at the San Francisco Radio Club showed some very nice gear put up for auction. SIJ now is on the air with a new home-brew 140-watt all-band transmitter which includes 6 meters. K6EQW also is on 6 meters with a 70-watt handmade rig. ULR is heard regularly on 6 meters. K6GIJ now is in Sacramento and hopes to return to the air soon

(Continued on page 128)

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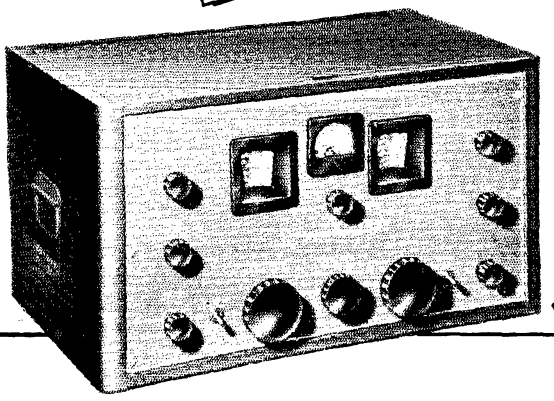
HQ-140-XA

New, smooth-as-silk tuning. Crystal filter for extreme selectivity. Electrical bandspread tuning. Extremely high signal-to-noise ratio. Positive noise limiter. Full 2-watt undistorted output. Continuously tunable from 540 KCS to 30 MCS with adequate selectivity to separate crowded signals.



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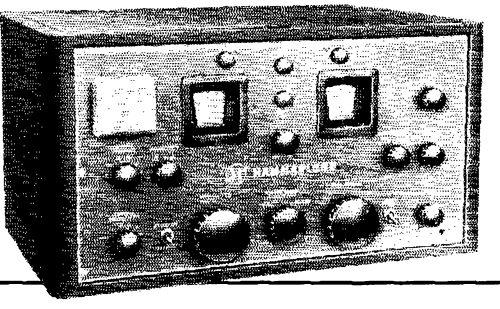
HQ-150

A really different receiver. Combines Q-multiplier with crystal filter to provide the widest range of tuning techniques. Extra fine superheterodyne circuit with full noise limiter. Full 2-watt output. New, improved S meter with illuminated scale. Built-in crystal calibrator.



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HAMMARLUND SETS THE PACE

and contact some of his old pals. Congratulations to BIP, a new member of the Northern California DX Club. BIP pulled a good one on the 29ers during the last transmitter hunt on 10 meters. The transmitter was well hidden amongst the bushes with a toy wagon to act as "mobile station." HVN, a new EC, is taking his job real seriously. FNC is a new regional director for the Civil Air Patrol, with jurisdiction over all the western states, Alaska and Hawaii. He has officers at the presidio in San Francisco and holds the rank of major. ATO and his XYL report a nice trip recently. BYB's new store is getting to be a regular meeting place for local hams. This SCM, his XYL and YL enjoyed a dandy dinner held at the Veneto Restaurant for NCN members and friends. K6GID was master of ceremonies and BMP made the dinner arrangements. GCV now has a three-element 20-meter beam erected on top of a 60-ft. power pole and reports fine DX. PCN held daily skeds with ØTAN to relay the results of the Olympic cycling finals to families and friends of contestants in St. Louis. WJF and FEA have a new QTH, No. 9 Traveler, San Anselmo, Calif. Traffic: W6FEA 210, GQA 14, PCN 8, GCV 4, GHI 4, WJF 2.

SACRAMENTO VALLEY — SCM, Harold L. Lucero, W6JDN — ØFIV is new in Redding, Calif., and works for KVIP-TV. The Tehama County Amateur Radio Club has elected TRR, pres.; KN6REW, vice-pres.; and SBH, secy.-treas. A nice time was had during the Chico pot-luck picnic in Bidwell Park. On 160 meters K6BDI can be heard trying to buck ITV. K6RSJ has TCS. K6GSK or TKE, that is the question, who will run the rig? MWR is back from a long vacation in Kansas City. K6CFF is a new OBS in Sacramento. I believe that the RAMS of Sacramento should be congratulated for showing appreciation of the XYLs by holding an "XYL Appreciation Nite." The OMs prepared the food and put the XYLs on the pedestal. I like the following, which was taken from the RAMS *News*. "Be careful of the words you use and keep them nice and sweet, you never know 'til comes the day which ones you'll have to eat." JDN and ZF were visitors at the Mt. Shasta Amateur Radio Club and enjoyed giving them a short talk on ARRL and other phases of radio. Looks like the traffic reports will be coming in again as the winter months arrive. Good to hear from you, K6EHT. Lots of luck to all the fellows and I do hope that we don't have to depend on amateur radio this winter. Should we have to, be sure to have the gear in top shape. Traffic: K6EHT 100.

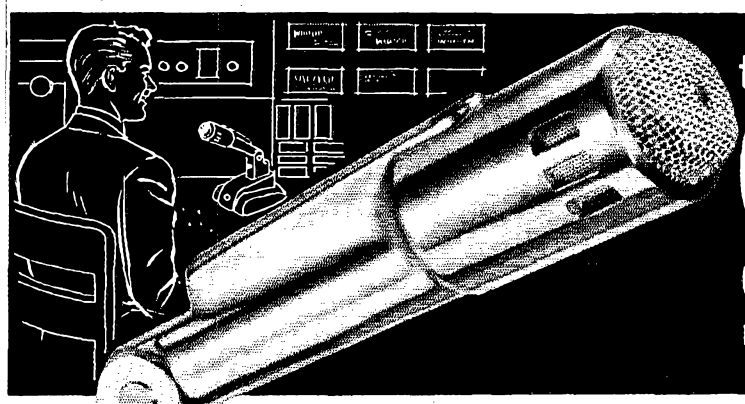
SAN JOAQUIN VALLEY — SCM, Ralph Saroyan, W6JPU — K6BGO has a new 75-4 receiver for his ham shack and a Peirson-Holt for his car. PCC is building a 6-meter rig with an 829B in the final. BFH has been transferred to Detroit. DUD manages to come in last in transmitter hunts. K6GTI is going on 10 meters. GCS is interested in teletype. MSU has gone hi fi on us. PGP is working on a printer for teletype. KOK moved to a new QTH and is back on the air. SUV has nine months to go for his new final. K6HII is holding weekly schedules on the Civil Defense Net, 3990 kc. every Sat. morning. K6RPM is president of the Roosevelt High School Radio Club. KN6RPN has a DX-35 transmitter on 80-meter c.w. HYR is sponsor of the Roosevelt High Radio Club, which boasts 19 members. It seems that HYR was my sponsor 23 years ago. SMS is working out real well with a new Valiant. UPS is shooting bugs on the 6146 Linear for 6 meters. TZJ left Fresno for Los Angeles and a job with Hughes. K6EDX has a kw. on 6 meters. DCE finally made his General Class. IMZ is setting aside model planes and is getting a station back on. JPS went deer-hunting and saw nothing. Your monthly reports are very important, fellows. No reports, no news. See you at the Fresno Radio Club meeting, 2nd Fri. each month in the power building. Traffic: W6ADB 138, EBL 16, GCS 2.

ROANOKE DIVISION

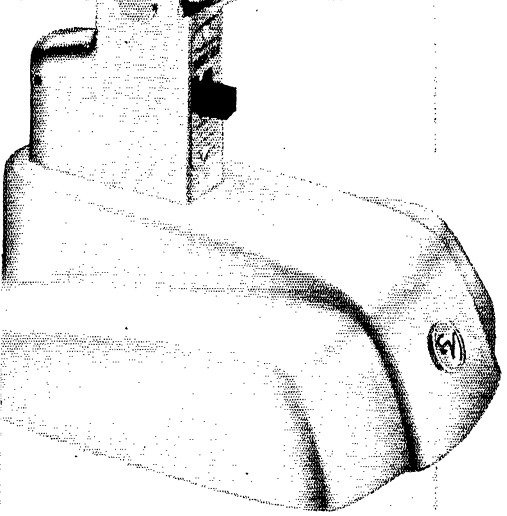
NORTH CAROLINA — SCM, B. Riley Fowler W4RRH — SEC: ZG. PAM: DRC. The space allotted North Carolina will be used for the next two issues to give the District EC's name and counties: District One: Gary Stanford, FDP, Cherokee, Clay, Macon, Jackson, Haywood, Swain and Graham Counties; District Two: Quimby Smith, GXR, Buncombe, Madison, Mitchell and Yancy; District Three: Ed Garrett, ACA, Henderson, Polk and Transylvania; District Four: G. Ernest Pilgrim, TMO, McDowell and Rutherford; District Five: Joe L. Lowdermilk, DSO, Avery, Burke, Caldwell and Watauga; District Six: Bobby E. Smith, DRC, Cleveland, Gaston and Lincoln; District Seven: John F. Frye, FUS, Alexander, Catawba and Iredell; District Eight: J. E. Switzer, AKR, Alleghany, Ashe, Surry, Wilkes and Yadkin; District Nine: Al Guin, ZQB, Anson, Mecklenburg and Union; District Ten: Furman James, YPZ, Cabarrus, Davie, Davidson, Stanley and Rowan; District Eleven: Roscoe Sieloff, TQU, Forsyth, Rockingham and Stokes; District Twelve: Weldon Fields, AJT, Guilford and Randolph; District Thirteen: Homer Apple, HER, Caswell Alamance, Orange and Person; District Fourteen: Jack McIver, NYN, Chatham, Durham & Lee; District Fifteen; James Diggs, EPI, Moore, Montgomery & Richmond; District Sixteen: Smith Woodson, DKO, Franklin, Granville, Vance and Wake. Register with these men on Form 7. We welcome 9QIU, now K4KXG, Hendersonville.

(*Continued on page 130*)

If you operate 'phone YOU WON'T BE SATISFIED UNTIL YOU OWN



the completely new 664 VARIABLE D* CARDIOID DYNAMIC MICROPHONE



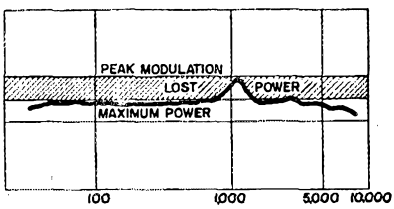
The 664 will equal a useful power increase of four times over commonly-used peaked microphones, and could well be the best investment, dollar-wise, in your shack

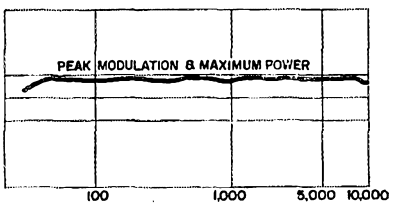
Here is a totally new concept in microphones for amateur phone communication.

The cardioid (high directivity at all frequencies) pickup pattern enables you to have a *real* "arm chair QSO." The forward gain of 5 db** allows you to speak at nearly twice the distance you have been working to a conventional microphone. Unwanted sounds in the shack are rejected nearly twice as effectively as by ordinarily-used non-directional microphones.

The response curve is tailored to put the highest degree of intelligibility on your carrier. Your 100% modulation is all speech . . . in full character . . . with bite and punch. This curve, compared to ordinary microphones, will give you up to 12 db more usable audio—without splatter or hash.

We invite you to prove to yourself that the 664 will outperform your present mike by a direct comparison. If it doesn't out-hurdle QRM, your distributor will refund the purchase price without qualification.





A peak in the response curve limits modulation to the peak value. A peak-free response brings the full power level to 100% modulation gaining an intelligibility increase equal to the peak in the average mike. The 664 is peak-free and gives the highest usable power of any microphone for AM, NFM and SSB.

New Variable D* Dynamic Microphone operates on the principle of multiple sound paths to the diaphragm. Spaced apertures to the rear of the diaphragm are phased to provide cancellation of rear sounds and give full response to sound from the front.

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

Model 664. Without Stand.....Net Price: **$49.50**
Model 419. Desk Stand.....Net: **6.00**

**Forward gain is that compared to a pressure mike; actual front-to-back hemisphere pick-up ratio is 20 db.

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SOUTH CAROLINA — SCM, Bryson L. McGraw, W4HMG — Congrats to CRF, our EC in Springfield, for the FB publicity on the work of the ECs. The Palmetto Club's new officers are EGI, pres.; IHL, vice-pres.; AVU, EC; VJI and DNR, directors. The new club house is located at Owens Field, advises HDR, secy.-treas. ETB (Betty) the Edisto Club secy., advises code and theory classes are under way with many takers. Congrats to DX, Kershaw County EC, on his c.d. appointment. New club officers of the Clemson College Radio Club are BMV, pres.; DTY, vice-pres.; JKJ, secy.-treas. Let's hear that kw. more often, fellows. AKC, our able RM, is busy with the C.W. Net members and is coaching them for ORS pasteboards. Our busy SEC, SOF, announced emergency tests for all South Carolina areas with much interest being shown by all ECs and AREC members. Guess I will have to get the 3-watter ready for the Columbia Area drills. Our PAM, FFH, is relieved at being able to take or give third-party Panama traffic since he has had many requests via 20 meters. The Aiken Club reports new quarters right in the city hall since its fine showing with emergency tests recently. Keep those fine reports coming, ZVY. The Shaw-Sumter Club meets Tues. at 8 P.M. and reports ever-increasing numbers of new members and much interest in the 10-meter nightly net on 29,626 kc. Congrats, ALM (Lucy), on those nice reports. Confirm 36 or more South Carolina counties to K4CRF and get a very nice certificate for your efforts. Any takers? Congrats, ZIZ, on making BPL for the second time with FB USO traffic. Traffic: W4ZIZ 193, AKC 65, PED 20.

VIRGINIA — SCM, John Carl Morgan, W4KX — VN and VSN have new net managers, IA takes over VN, with WYC as asst. mgr. and roll-keeper, succeeding TYC, who did a swell job on both for the last two years. LW now is piloting VSN, succeeding YZC, who also finds school work a full-time chore. Among the college-bound: CXQ, CPN and TFX. The latter is taking the rig back to GW to keep a sked with the OM, IA.The Blue Ridge ARC operated CA at the Roanoke County Fair. The Lynchburg Club has club station K4HEX perking. IA racked up 90 QSOs in all 9 VE/VO sections during the W/VE Contest. JUJ worked 55 in all 9. K4DKA is sporting a much fatter signal with a new DX-35 and antenna. CVO has a new 45-ft. tower and is planning to feed it as vertical. K4ASU has finished the new finals. K4BIJ is rebuilding, but finds time to do a bang-up OO job. KN4ERY is operating from Fork Union, awaiting General Class license. It is with regret we chronicle the passing of RJW. New officers of the PVRC are EIV, pres.; 4KXV, vice-pres ; ZM, secy.; and TKR, treas. The SCM enjoyed a nice visit with the PVRC and the swell hamfest of the National Capital Area clubs at Gaithersburg, Md. The Rappahannock Valley ARC had its first hidden transmitter hunt. ONV, with NO loop, won hands down. Another reminder: All Virginia nets are open to ALL, so make it a habit to report in whenever convenient. The Virginia Phone Net meets nightly at 1900 on 3835 kc. the VA C.W. Net meets Mon. through Fri. at 1900 on 3680 kc., preceded at 1830 by the Va. Slow Net, also on 3680 kc.; the Old Dominion Net meets weekdays at 1300 on 3845 kc. Traffic: W4IA 182, K4KNP 111, W4CA 59, K4DKA 55, W4CVO 36, KX 30, AAD 23, K4BYS 20, W4SZT 19, K4ASU 18, DBC 16, W4PVA 14, K4DWP 12, BUI 11, W4BZE 11, FKP 7, LW 7, K4EAS 5, JLO 5, W4ZM 4.

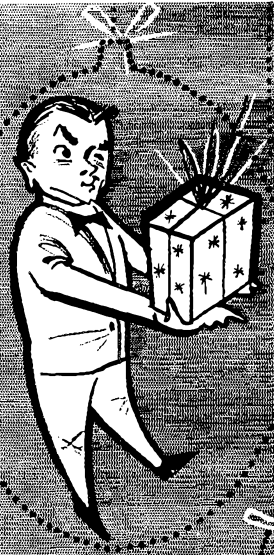
WEST VIRGINIA — SCM, Albert H. Hix, W8PQQ — SEC: GEP. PAM: FGL. RMs: DFC, GBF and HZA. A campaign is under way again for West Virginia hams to have call sign auto license plates. It is urgently requested that all West Virginia hams contribute to the expenses of the campaign for this project and that you all write your representatives urging them to sponsor the bill. Please send your contribution to Dr. Bill McClung, W8NBG, 16 Park Place, Richwood, W. Va. SSA is very active mobile and has an NC-330 and a 6-meter converter. He also has the call K8CPG in Beckley and is active from there as well. KDQ is in the Army in Arizona and would like the West Virginia gang to watch out for him as KDQ/7. QVP is on with high power and remodeled his shack. KBU has a new NC-300. EOJ built an extremely compact rig using a pair of 4X-250As. He does a fine job on s.s.b., as does RFD. HW has a new tower and 15-meter beam. GXO and GUL are two new members of the Morgantown Club. KN8BIT is doing a good DX job on 15 meters with his beam. AXU has a 2-meter rig going. TGF has a new vertical antenna. N1Y has an RTTY station almost complete. BNL operates RTTY on MARS with good results. Ex-4URF in Charleston is now K8CSG and will be on soon. ESH is busy with the 50-Mc. C.D. Net. Traffic: (Sept.) W8PBO 68, HZA 37, KXD 37, BWK 18, DFC 14. (Aug.) W8KXD 23.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, James B. Simpson, WØIIEM — SEC: NIT. RMs: KQD and MYX. PAM: IUF. Jim Simpson, still on the sick list, thanks all for their concern. UNM, on the staff of KUBC Montrose, and Jim Stowe, of KSLV Monte Vista, dropped in for an eyeball QSO with KQD. UIB says Montrose has organized a radio club of 15 members with KØDCC as secretary. Good luck to you, fellows,

(Continued on page 132)

Christmas scene



THE TIME: Christmas morning.

THE SCENE: Mrs. Mobile removes the blindfold from Mr. M revealing a lovely Christmas tree and dozens of beautifully wrapped gifts.

Mr. M's eyes dart back and forth as, from long experience, he mentally catalogues the many gifts. Shirts—neckties—

Hold it! A too-much-to-hope-for expression comes over his face as one particular package takes his eye. He hefts it. He holds it to his ear, shakes it. He wonders, can it possibly be? Nooo—probably not but let's just open it and make certain.

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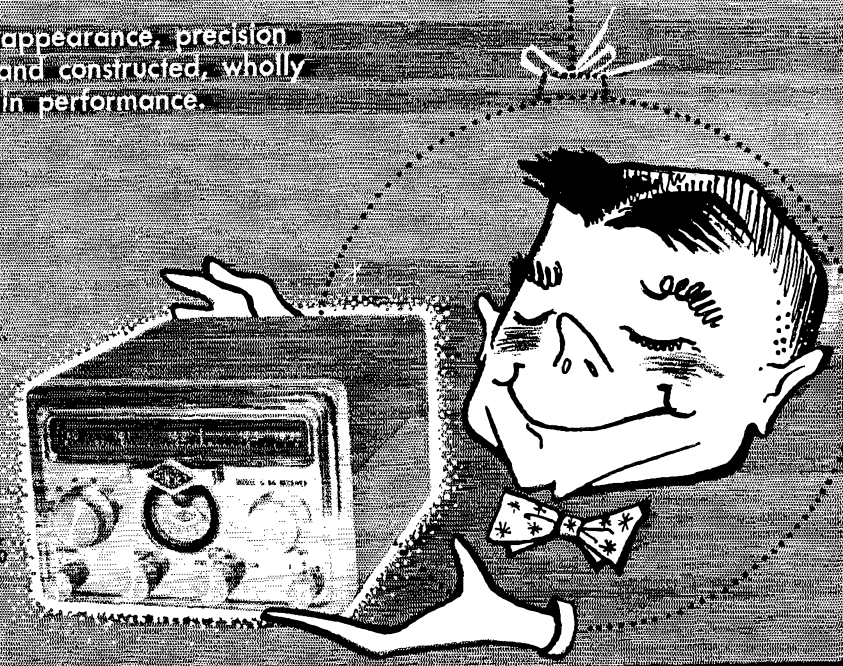

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and let us hear from you. KØDCS now is on s.s.b. DCP worked 57 countries with 36 confirmed, made WAC on 10 and 15 meters, and worked HR3HH/9 with a 30/9 report since he put up a Triple Globe Spanner three months ago. NVU likes the amplifier clipper built by KØEMP. EKQ hopes CSSN will liven up with more reporting in after the hunting and fishing season is over. SUP, IE, IVF, BQO, UQM, IKY, DKS, OVW, W7KFV, MHW, MWS, KUB and three XYLs enjoyed an s.s.b. dinner at the Town House in Denver. SGG got a new receiving antenna up with the help of SWS and KØHFM and can now work full break-in. TDG is off the air while changing QTH. KØDWZ is off the air while campaigning for election. We need reports from Observers, net officials, experimental stations and clubs. The Denver Radio Club is having some fine transmitter hunts. KNØEBV is giving old-timers a race and needs only Asia for WAC. He is running 50 watts to a 15-meter one-element beam. Traffic: WØKQD 488, NVU 105, KØEKQ 99, DXF 90, WØJHI 38, HOP 32, DGP 27, NIT 15, KØCEN 9, AYC 4.

UTAH — SCM, James L. Dixon, W7LQE — The MARS class conducted by LQE and OCX has five Novices working for their General Class licenses and building rigs. The WCEN 75-Meter Phone and 80-Meter C.W. Nets have been replaced by the 40-Meter C.W. Net. CWD had a new Heath VF-1. OBS and OO appointments for QWH have been renewed, with OBS skeds Mon., Wed. and Fri. at 2000 MST on 7250-kc. phone, Sat. and Sun. on 21,350-kc. phone when the band is open. He worked DL4 and HB9 DX on 15-meter phone recently. BBN has a GP-7 and ARC-5 rigs on 160 through 40 meters and BC-348 and ARC-5 receivers. YDW is building a new 6-meter exciter with a 6146 final. QAG is working 2 meters from the 9700-ft. Mt. Vision TV transmitter site. QDS has a new 40-meter vertical and skeds Japan weekly on 20-meter phone with power increase to 400 watts. ZSX is working all bands with a Globe Scout, a 65-ft. vertical and an SX-71 receiver and has GF-11 mobile. Traffic: W7BAJ 4, BBN 2, LQE 2, QDS 2.

SOUTHEASTERN DIVISION

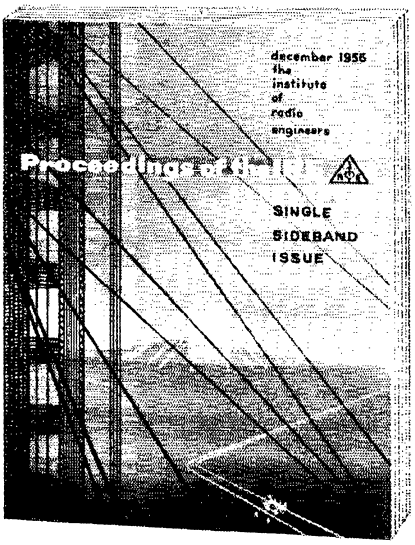
ALABAMA — SCM, Joe A. Shannon, W4MI — ATK has returned from the service and is on 75 meters with 60 watts in Birmingham. A welcome to OKQ, Birmingham, recently moved from Tennessee. Bob is active in AENB and RN5. Tuscaloosa has two Generals — K4GHN and K4HMQ. WAZ reports that he will publish the *Alabama Section Bulletin*. Write a blurb of news and send it to Kirk for the bulletin. WAZ also reports that the Tri-Cities Area now has 11 mobiles with 17 AREC members. ZUP has a new 4300 and YRO has traded for a 32V and an HRO. YFN, Huntsville EC, pulled a surprise drill with ten stations checking in. TLV, HHG and MI have gone to 6 meters. AZC has organized the first section 6-meter net meeting Mon., Wed. and Fri. at 8 P.M. on 50.1 Mc. GUV and GJW have received DXCC certificates and GJW now is working on WAZ. K4JPK is new in Sheffield and on with a Globe Scout. K4ANX and K4JOK have new DX-35s with JOK going whole hog with a Heath VFO, receiver and Q-5er. IKM has erected a 97-ft. tower and has a "high wire." WHW and the Mobile mobileers furnished communications during the New Orleans-Ft. Walton Ski Marathon. Traffic: (Sept.) W4KIX 150, RLG 144, K4BRS 126, AOZ 93, W4HON 84, K4ANB 83, W4YRO 37, CRY 25, TKL 24 WAZ 24, BFX 21, ZUP 21, DGH 19, EWB 18, TXO 17, TOI 15, K4AJG 11, W4WHW 10, CIU 8, NIQ 8, USM 8, HHG 7, RTQ 6, WOG 5, K4AAQ 4, CTC 3, KN4KJD 3, W4ZSH 3, RYY 2. (Aug.) K4GVW 25, W4ZUP 20, YFN 5.

EASTERN FLORIDA — SCM, Arthur H. Benzee, W4FE — Asst. SCM: John F. Porter, 4KGJ. SEC: IYT. Dade County: We are sorry to have to report RBQ among the Silent Keys. He was one of the top men of the State on DX. VTJ, from WPB, gave a talk on the 2-meter net at DRC. Dade County YLs and XYLs got a full-page story, with pictures in color, in the *Miami News*. GCQ/IYT vacationed in Kentucky. ZXL is mobile on 2 meters. All YLs and XYLs please note: A new Floridora Net is being formed on 7230 kc. Mon. at 8 A.M. Write or contact BIL or BWR for the dope. BWR is enjoying plenty of DX on 10 and 15 meters. ZJZ has an NC-300. The Gainesville Amateur Radio Society now has a membership of 35. JARS station DU was set up at the fair as usual. The CAP has asked JARS to assist with code classes for its members. Daytona Beach: New officers of the DBARA are MEL, pres.; K4DGB, vice-pres.; TNR, secy.; KN4KRI, treas.; HNV, act. mgr. TNR writes a ham news column once a month for a local paper. The annual Flamingo Net Bar-B-Q was a big success. GFQ is mobile with a Babcock and Super-six. VGT has a B&W sideband rig. ZPO has a new Elmac mobile rig to match a new buggy. K4COX has moved to Bartow. DVR has completed a kw. c.w. rig. Traffic: W4WS 168, DVR 113, EHW 107, ZIR 68, K4KDN 57, W4IYT 47, AZJ 33, BWR 27, K4IWT 22, AHW 20, W4ZJZ 8, SJZ 7, GGQ 6, WHK 6.

WESTERN FLORIDA — SCM, Edward J. Collins, W4MS/RE — SEC: HIZ. EC: MFY. RMs: AXP and BVE. We are looking for RMs in other Western Florida counties. The Countermeasures School at Panama City has formed a club and TJQ and IFY are getting into the emergency

(*Continued on page 134*)

IRE reports on SINGLE SIDEBAND!



The December issue of **Proceedings of the IRE** presents a round-up of the most recent technical discoveries as presented by the Joint Technical Advisory Committee through its sub committee on single sideband techniques.

Because single sideband offers advantages over conventional AM systems for police radios, taxi radios, ship to shore radios, as well as in many other practical uses, the JTAC has launched a special study for the FCC on this new development in radio communication. Interest in single sideband systems is high because they:

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2. **Conserve the radio spectrum by not taking up as wide a band of frequencies as do AM signals.**
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The December issue of **Proceedings of the IRE** begins with a guest Editorial by the Honorable George C. McConnaughey, Chairman of the Federal Communications Commission and will take its place in the record of radio-electronics growth. IRE gave you the color TV issues of October, 1951, and January, 1954, the scatter propagation issue of October, 1955, the earth satellite issue of June, 1956, and now December's special single sideband issue—a reference work of the decade!

Get the December Proceedings of the IRE and get the facts about SINGLE SIDEBANDS

Partial list of contents:

"Factors Influencing Single Sideband Receiver Design" by L. W. Couillard, Collins Radio Co., Cedar Rapids, Iowa

"Frequency Control Techniques for Single Sideband" by R. L. Craiglow, E. I. Martin, Collins Radio Co., Cedar Rapids, Iowa

"A Suggestion for Spectrum Conservation" by R. T. Cox, E. W. Pappenfus, Collins Radio Co., Cedar Rapids, Iowa

"Power and Economics of Single Sideband Equipment" by E. W. Pappenfus, Collins Radio Co., Cedar Rapids, Iowa

"Automatic Tuning Techniques for Single Sideband Equipment" by V. R. DeLong, Collins Radio Co., Cedar Rapids, Iowa

"Linear Power Amplifier Design" by W. B. Bruene, Collins Radio Co., Cedar Rapids, Iowa

"Distortion Reducing Means for Single Sideband Transmitters" by W. B. Bruene, Collins Radio Co., Cedar Rapids, Iowa

"Linearity Testing Techniques for Sideband Equipment" by P. J. Icenbice, H. E. Fellhauer, Collins Radio Co., Cedar Rapids, Iowa

"Early History of Single Sideband Transmission" by A. A. Oswald, (retired) formerly Bell Telephone Labs., Inc., Murray Hill, N. J.

"Comparison of Linear Single Sideband Transmitters with Envelope Elimination and Restoration Single Sideband Transmitters" by L. R. Kahn, Kahn Research Labs., Freeport, L. I., N. Y.

"Application of Single Sideband Technique to Frequency Shift Telegraphy" by C. Buff, Mackay Radio & Telegraph Co., Inc., Brentwood, L. I., N. Y.

"A Third Method of Generation and Detection of Single Sideband Signals" by D. K. Weaver, Stanford Research Institute, Stanford, Calif.

"An Introduction to Single Sideband Communications" by J. F. Honey, Stanford Research Institute, Stanford, Calif.

"Synchronous Communications" by J. P. Costas, General Electric Co., Syracuse, N. Y.

"Synthesizer Stabilized Single Sideband System" by B. Fisk, C. I. Spencer, Naval Research Lab., Washington, D. C.

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group. Hurricane Flossy found the Pensacola Club ready in full force. UYZ received an FB write-up and picture in the Chemstrand paper for his emergency effort. AXP was all set up with emergency power throughout the storm. K4DKG/4 has increased power and is moving the traffic. PLE has moved to Jacksonville. HBK is hunting a tower. GMS had to return to Florida State and leave his new 40-ft. steel tower waiting. ZFL had a bad fall but is OK now. ZPN keeps 7 Mc. hot. K4EHI has his code speed up to 20-w.p.m. for his General Class. K4ECP is putting in 6-meter mobile. UUF holds forth with a high-power 2-meter rig. UCY is interested in 6 meters. CCY goes after the early morning DX. MS is wiring the Valiant for GMS. BGG lost the quad. K4ADY is getting set for 6 meters. K4AGM has 15 states on 6 meters. K4AFF is active again. MUX works 7-Mc. phone. UUY and ACB are setting up a real emergency unit in Tally. 6TOR/4 is building a bigger radio room. KN4IYQ is going after his Tech. Class license. Word comes that a Novice instruction class is in full swing over in Santa Rosa County. BGO is working s.s.b. over Quincy way. CDE meets emergency nets over Blountstown way. DAO/DEF keeps helping the beginners. QK meets the Hurricane Net. AXF likes the new dial on the 75A-4. JLW has been enjoying 10 meters, along with YES. PAA continues to hunt DX. NRX took the beam down for Hurricane Flossy. K4AH promises activity. JPD prefers 7-Mc. phone. NJB is building still better transmitters. I would appreciate more reports. Traffic: K4DKG/4 63, W4AXP 1.

GEORGIA — SCM, William F. Kennedy, W4CFJ — SEC: K4AUM. PAMs: LXE and ACH. RM: PIM. The GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs. and at 0800 EST Sun.; the ATLCW on 7150 kc. at 2100 EST Sun.; the GSN Mon. through Fri. at 1900 EST on 3595 kc. with PIM as NC; the 75-Meter Phone Mobile Net meets each Sun. at 1330 EST on 3995 kc. with UUH as NC; the 10-Meter Mobile Net each Sun. at 2200 EST on 29.6 Mc. with VHW as NC. We welcome the Flint Radio Club, of Cordele, which has 14 members and meets the last Mon. of each month. The Savannah High School Radio Club elected K4BWV, pres.; K4BBB, vice-pres.; K4IQL, secy.-treas. KN4HKK is a new ham in Sycamore. Another Baker, Nita, K4ETX, is now General Class. BXV is constructing a new 20A; also new antennas for 20-40 meters. BKK and K4AUM raided the ice box of BWD. The penalty, antennas to be erected for 75-20 meters. LNG is working on an exciter for 144 Mc. WKP is the proud owner of a 20A and is working good DX, PIM, NC for GSN, reports he needs Savannah and Columbus stations. How about it, fellows? Jack is doing a wonderful job with the GSN. PBK participated in the Hurricane Flossy alert on the Alabama Net. MIP's daughter now is attending West Ga. College. MIP is constructing a new s.s.b. K4ATM now has QRM from Peggy, K4KKR, and Cheryl, K4KKS. HYW has a Globe King working FB on all bands. ZD is the proud owner of a new mobile rig. What power does MV run on his mobile rig? AREC members, watch the expiration dates on your cards. Send them to your EC for renewal. Your SCM wishes you and your family a very Merry Christmas and a Prosperous New Year. Traffic: W4PIM 178, DDY 160, PBK 37, ZD 25, CFJ 21, K4BWV 17, W4BXV 6, YR 4.

WEST INDIES — SCM, William Werner, KP4DJ. SEC: HZ. My thanks to those who nominated and reelected me to the office of SCM. I would like to hear from all who may have suggestions for a better section or who may wish to qualify for an official ARRL appointment. Congratulations to SZ, who has become the reliable operator at NCS DC located at Police Hq. Plans are being drawn up for remodeling of the Police Dept. communications center by DC and BX. Hurricane Betsy blew down the long, high-receiving antenna of ID running from the YMCA to the Red Cross Building. AAA discarded the center-loaded short antenna and improved results using a 120-ft. antenna bent to fit his roof. He also made a one-element rotary beam for 20 meters that shows considerable directivity. CB has a new Valiant and PRO-310. HZ rebuilt the front end of the old HRO and installed a crystal calibrator. KD, with a month-old Viking II, has worked 69 countries so far, including three new ones — YJ1RF, VK1RW and VR3B. KD received a card from YV0AA, which brings his score to 217/207. ZW is QRL running lots of phone patches at Ramey AFB. WX has a new harmonic that makes BU a grandpa. RD has a new HQ-140X and has reinstalled the 20-meter beam on the crank-up tower for easy lowering during storms. TIN added a Q multiplier to an NC-173. AZ, feeding 20A s.s.b. into 4-125 linear, contacts FCDA regional director at Atlanta for c.d. director of P.R. on an almost daily basis. The medical officer at the Antarctic base, KC4USH, requests that KP4 stations look for them beginning February 1957 on 7235, 7250, 14,250 and 14,275 kc. as he would like to talk to his family here. WF returned to the U. of Miami. ABW traded a DX-100 to JZ for an Elmac 67 and a PMR-6 receiver. UH returned from a Stateside vacation and resumed as NCS of the Antilles Amateur Weather Net on 3815 kc. AEF spends all his time on 3925 kc. ABA moved to a new QTH on the same street as AZ! W6SIF/KP4 has a new SX-96 receiver. ES is on s.s.b. with a B&W 5100 and a BWL-1000. AAB, ABN and ACH hear many LU stations on 6 meters but can't make contact. ABN, using a TBS-50, worked several Cuban

(Continued on page 136)

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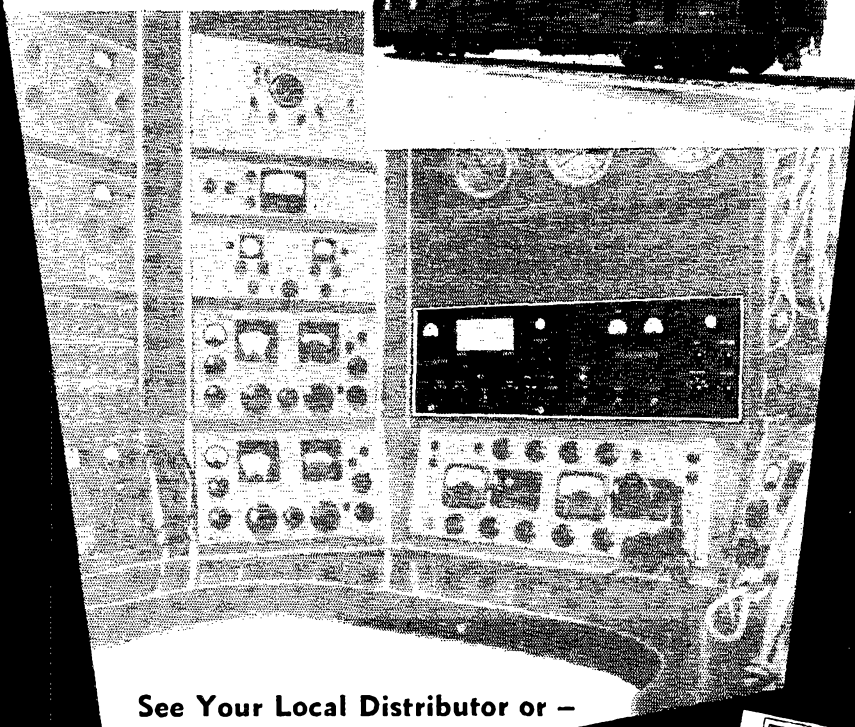

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stations on 6 meters. AAN has a KWS-1, an Eldico SSB-1000, a 75A-4 and a five element Telrex for 20 meters. Traffic: KP4WT 164, ZW 3.

CANAL ZONE — SCM, Roger M. Howe, KZ5RM — As of Oct. 1, 1956 the Canal Zone has a new SCM, WA, in a very close election, nosed RM out by a single vote. Congratulations, Alton, and the best of luck to you in your new office. While we are on the subject we want to thank the KZ5 gang for the fine cooperation during our term in office. The CZARA, as part of its last meeting, arranged for the members and their guests to be conducted through the studio and other facilities of CFN's TV and radio station. The trip was very well planned and everyone who went enjoyed it. The staff of the station were very hospitable and answered all questions and demonstrated the equipment to the visitors. BD and DW have departed these shores for Michigan, U. S. A., and soon will be heard as W8s. The CZARA president, CF, also has left on a State-side assignment. Here is a DX note: Several of the local DX gang have received their Russian cards. Traffic: KZ5VR 117, WA 113, DG 54, RM 28.

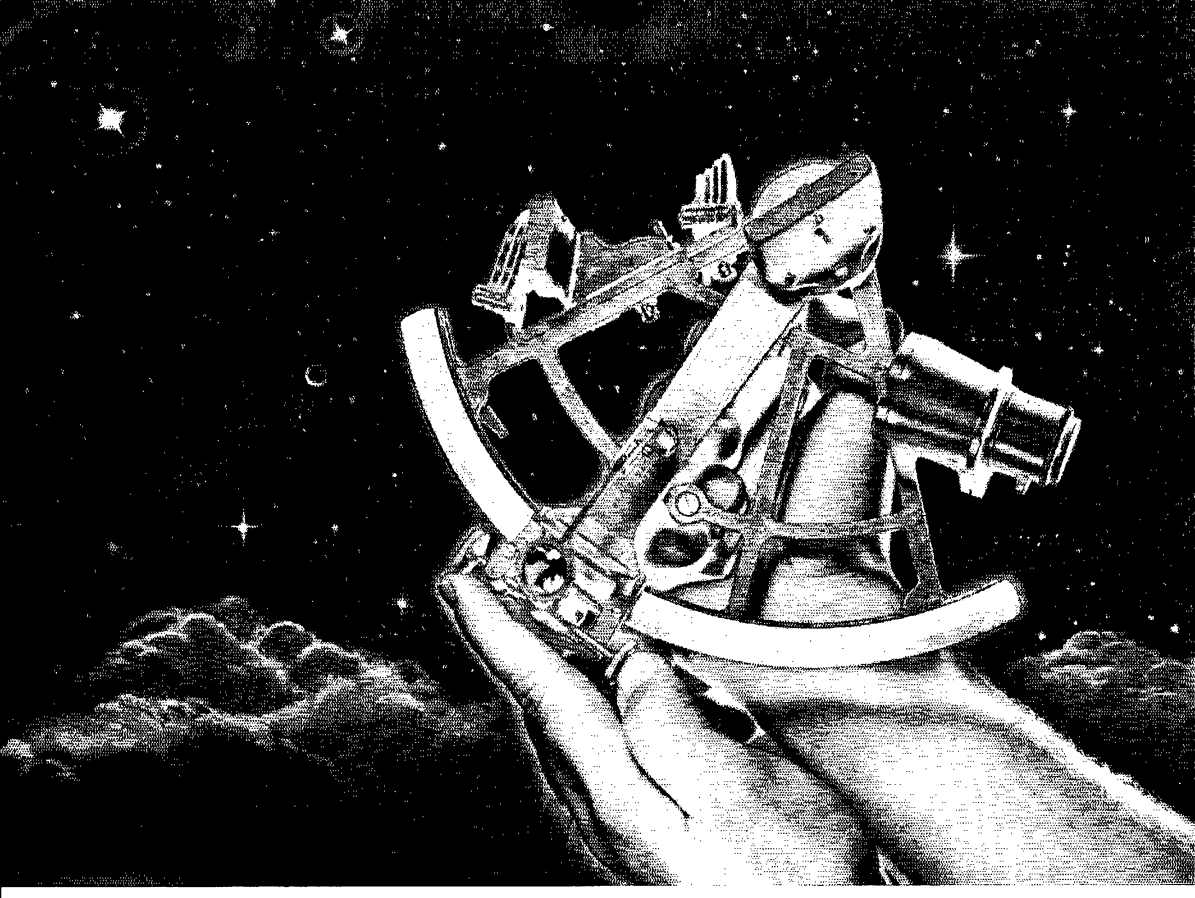
SOUTHWESTERN DIVISION

LOS ANGELES — SCM, William J. Schuch, W6CMN — Asst. SCM: Albert F. Hill, jr., 6JQB. SEC: LIP. PAMs: PIB and K6BWD. RMs: BHG, TDO and GJP. KN6QPG made General Class and is going c.w. RW is taking bows for making first in the DX Contest, multi-operator. K6EA has left for his yearly trip to WØ-Land and will check nets from there. HBE made WAC and WAS mobile in four months. RUC has gone mobile. UPL is very QRL with the Boy Scouts. The Bell Gardens Club's officers are VAC, pres.; CFC, vice-pres.; K6IOJ, secy.-treas. K6BFA is now General Class. UTY is busy with civil defense. K6DFP is building a receiver for 420 Mc. K6DGX is with the Navy now. The Ramona Radio Club's officers are MLZ, pres.; ORS, vice-pres.; PVD, secy.-treas. K6DDO is back after an extended trip in Europe and reports he had a swell time visiting all the DX that the rest of the gang works. K6KJN and K6CJE are visiting with the Army at Fort Chaffee. ORS is back from a trip through the East. GYH is relaying lots of MARS traffic to NTS nets. K6DQA is QRL overseas skeds. HJY is NCS of the Novice Net on 3771 kc. INH is ORS. SCN made an FB turnout at the recent traffic breakfast. K6SSM is dividing time between traffic and DX. K6COP is NCS of the MCAN7 Net. K6IQF is back on the air after a complete rebuild. K6MON is spending a great deal of time in the hospital. Get well, Bud. NJU is back on the air after a summer job. UED has 145 countries. The Whittier 50 Club president is WGL. MEP is building a 144-Mc. repeater station. K6BWD has a new cubical quad on 10 meters. K6ICS has worked OJ2BW, G4UX, UA0GF and VR3B to make 18 zones and 28 countries. He needs Maine for WAS and a QSL from Arizona to make 47 states confirmed. Merry Christmas and Happy New year. Traffic: (Sept.) W6GYH 801, KN6OZJ 383, W6LYG 204, BHG 157, K6DQA 142, W6HJY 123, INH 101, K6LVL 90, SSM 89, W6VSH 84, K6COP 60, PLW 48, W6GJP 34, K6MON 29, IQF 27, HQV 18, W6USY 16, CK 14, KTZ 12, K6BEQ 9, DDO 7, W6BUK 6, K6ICS 6, W6CMN 5, AM 4, K6ELX 4, LMW 3. (Aug.) K6MON 71, COP 47, W6ORS 29, K6EA 22, BEQ 1.

ARIZONA — SCM, Cameron A. Allen, W7OIF — Asst. SCM: Fred W. Wilgus, 7LJN. SEC: YWF. Howard Hampton, YWF, 2812 West Campbell Ave., Phoenix, is the new SEC and we will be hearing a lot more from him as he gets a new program under way for the AREC. The Arizona Amateur Radio Club elected new officers as follows: QZH, pres.; KOY, vice-pres.; UDI, treas.; YWF, KWB, and MWQ. The Maricopa County V.H.F. Club has changed its name to the Phoenix V.H.F. Radio Club. It now meets the 1st and 3rd Wed. of each month. Officers remain the same. NFL has moved to Sunnyslope. Traffic: W7OIF 14.

SAN DIEGO — SCM, Don Stansifer, W6LRU — The Ten-Meter AREC group under its EC, WYA, furnished the communications for the Air Race Meet in San Diego in October. Old-time DX-er BAM made it 202 countries, with 9S4AX and DL3AO/LX. UWL now is active on 40 through 10 meters, phone and c.w., from Japan with the call KA5ZS. He sends Season's Greetings to his many friends in this area. Official Observers in this area note the rise in off-frequency operation on the 21-Mc. phone band. K6ITA is the proud father of his third jr. operator. New members of the Helix Club are KSM and ZAS. New members of the Coronado Club are KN6TWN, K6JPO and SQC. KN6PGO has dropped the "N" from his call and is building an 813 all-band rig. K6AWZ is back in town after a tour in the Far East. New officers of the Rohr Club are K6HLO, pres.; K6LKY, vice-pres.; KN6OYO, secy.-treas. KN6UHI is a new Novice in Vista. Her son is 9HAT. Net certificates were awarded this month to K6LXL, W6EOT and LYF for their work handling traffic with the SCN. CHV is now up to 198 countries. This December the Helix Radio Club will celebrate 25 years as an organized club with a gala dinner for present members, past members, special guests and their XYLs. The Helix Club is 100 per cent members of both the ARRL and the AREC, and is the oldest continu-

(*Continued on page 138*)



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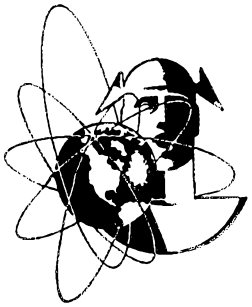

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ously active club in San Diego County. KL7MF, ex-local FCC engineer, ex-W6MI and W6SIG, is looking for San Diego contacts on 10, 15 and 20 meters, phone and c.w. He has a new tri-band beam and Elmac transmitter. Next month all persons holding valid appointments in this section again will be listed in this column. Merry Christmas to all and good hamming in 1957. Traffic: W6IAB 1918, EOT 192, SK 89, K6LXL 67, W6LYF 47, WNN 6.

SANTA BARBARA — SCM, William B. Farwell, W6QIW — Asst. SCM: Dorothy E. Wilson, W6REF. SEC: K6CVR. We welcome K6CVR as our new SEC but are sorry to lose K6KPU. New hams in Ventura are KN6UGW, KN6UGY and KN6UGD. Santa Barbara's new Novice is KN6TOD. DOR and his XYL, AET, are having lots of fun with their new KWS-1. K6ATX is back from an extensive trip through Washington State. K6KCI, Irma Weber, is a member of the YLRL and attends its meetings in Los Angeles. We hear K6LFQ checking into ALN lately. FYW has a new Skysweeper on 2 meters. BIY helped YCZ get his first buck before the deer season closed. The San Luis Obispo Radio Club will meet Tue. at 8 P.M. on 3655 kc. until a new club house is found. K6KPU has a new NC-300 receiver. The Ventura Radio Club has two new Communicators on 2 meters donated by the city and county for c.d. work. The Ventura Radio Club has changed its name to the Poinsetta Radio Club. K6GGQ is now authorized to operate MARS. Traffic: W6QIW 48, K6KCI 16, KPU 12, NBI 8, W6FYW 4, JPP 2.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, Ray A. Thacker, W5TFP — SEC: PYI. PAMs: YKT and IWQ. RM: KPB. It was with regret that we received the resignation of PCN as RM. This was an appointment of long standing, with a good job being done all along the way! YKT has accepted managership of the NT-O. New officers of the Caravan Club are GXX, caravan master; ZGY, asst.; BDB, secy.-treas.; IVE, prog. dir.; SBF, asst. prog. dir. IDU reports receipt of WAS and WAC on 40-meter c.w. DFB, BDF, KIS, KAS and SSD now have new AF calls. The Cen-Tex ARC, Waco, reports new officers are BOO, pres.; AYX, vice-pres.; CIO, secy.; TVA, treas.; IQY, act. It's good to hear CF back on NT-O as NCS. Your SCM had a most enjoyable evening in Breckenridge with SFA and KOR. That new Valiant at KOR's QTH is really a nice rig. The NETEN is now organizing a Storm Warning procedure. DARC is conducting another of its very successful Novice classes. We would like to hear from any other clubs in this section who are conducting classes. The population on 6 and 2 meters grows each day. We understand that there were 960 registrations at the Annual Amateur Radio Day festivities at the State Fair. That's terrific and it looks very much as if we'll reach the thousand mark next year! It sure was a real pleasure to see so many ham friends of old and to have the opportunity to make the acquaintance of so many new ones. I would appreciate receiving your activity reports. Please? Traffic: K5FFB 834, W5DTA/5 797, KPB 253, YKT 34, AHC 32, BKH 30, K5EMR 30, W5ASA 20, TFP 17, AYX 12, CF 11, DFB 2.

OKLAHOMA — SCM, Ewing Canaday, W5GIQ — Asst. SCM: James R. Booker, 5ADC. SEC: LXH. PAM: MFX. RM: JXM. It is with great regret that we accept the resignation of KY as SEC. However, LXH has taken over and we know he will be a good leader for Oklahoma AREC. JXM has been appointed Route Manager to succeed GVS, whose faithful key was silenced on Aug. 28th. EHC reports he will be in Washington on CAA business for several months. HCB also went to Washington. WEH is in New York on business for several months. KN5HQA, at Morris, reports 38 contacts and 19 states in 14 days on the air. YKB is going after DX with a new half-kw. c.w. rig. K5EJC made WAS in less than four months and is now going for DXCC with a new tri-band beam. K5DPJ recently dropped the "N" on a trip to Kansas City. N5DJZ was on the air in 1909 but dropped out to go to college. Members of the Oklahoma Phone Emergency Net have indicated great interest in a new daily traffic net. Such a net should be in operation by the time this hits *QST*. Let's all join in to make it a great success. A late schedule also has been suggested for OLZ. Traffic is picking up with cool weather and these net additions should help move it. Traffic: K5AOV 261, W5MRK 133, FEC 80, ADC 74, K5CAY 65, W5JXM 48, K5DUJ 29, W5MFX 27, GIQ 26, RST 25, K5CBA 24, W5EHC 24, PNG 23, YPI 22, QAC 9, SWJ 8, K5AUX 2, KN5HQA 1.

SOUTHERN TEXAS — Acting SCM, Roy K. Eggleston, W5QEM — QKF has a new Johnson Pace Maker. ORG and family visited in Austin. GQ has a new 75A-4. YYM now has a Helpmate. KN5COZ and KN5CPA now have their Technician Class licenses. CNF is on 6 meters. LOW is on 10 meters with a new three-element beam. QEM is on 10 meters with a new 4-250A and a three-element beam. The CCARC visited the telephone company's microwave system. SQW was awarded a citation from the State and US for being the most worthy handicapped. New board members of the HARC are AIR, EYM and ZPD. ZPD is the first woman ever to serve on this board. New officers

(*Continued on page 140*)

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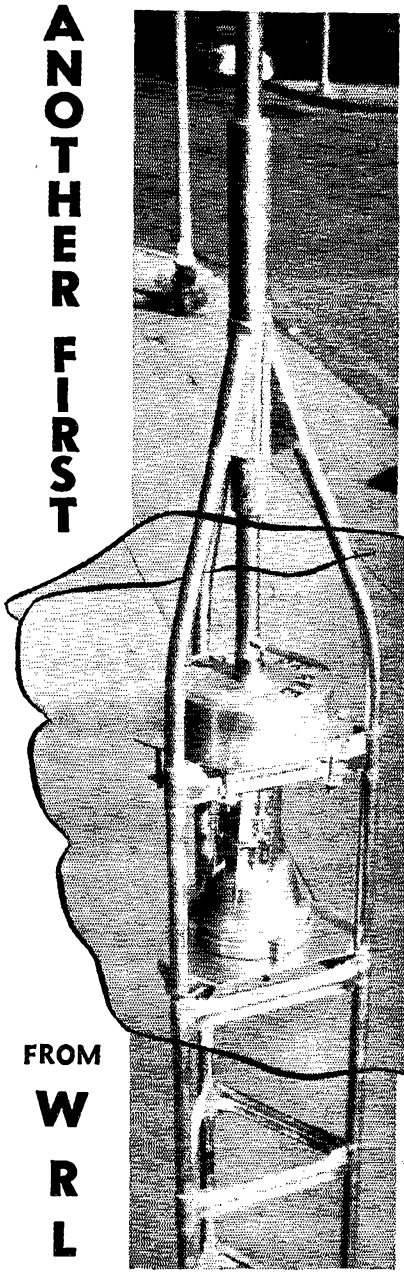
An Efficient Brake At An Unbelievably Low Cost!

ANOTHER FIRST FROM WRL



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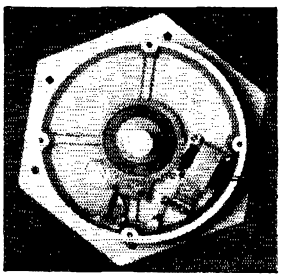
- ★ Will support 150 lbs. of antennas against 5000 inch.-lbs. of torque!
- ★ Brake is released automatically when rotator is energized.
- ★ Positive braking action prevents coasting and damage to rotator.

The RotoBrake is a spring-actuated, solenoid released braking unit, mounting between the rotator and antenna (in most cases without having to take antenna down). It performs two basic functions; — provides positive braking action and thrust and radial bearing surfaces to convert any TV or other type rotator to the finest ham antenna rotating assembly available.



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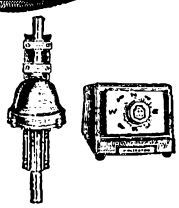

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of the San Antonio Radio Club are EDZ, pres.; DKK, vice-pres.; OZQ, secy.; FQA sgt. at arms. FZA has a new three-element beam. LMU and his XYL have been mobiling in New Mexico, Colorado, Utah, and Nevada. RPH is now crushing molars with the Air Force in Arkansas. FNT is now mobile, as is WPC. DSY now has his General Class license. FQQ visited in Corpus Christi. PM is working DX with a new 20-meter beam BRZ is mobile on 10 meters with a powerful 4-watter. LUU and his XYL vacationed in Louisiana. PPC is mobile again. K5HHW is on from Premont. FAH attended radio school at Dallas, and brought back word that Ford and Chevrolet are making a completely-shielded car. FNT is the NCS of the Corpus Christi Amateur Mobile Net.

NEW MEXICO — SCM, Einar H. Morterud, W5FPB — SEC: FHP. RM: RKS. PAM: DVA. The NMEPN meets on 3838 kc. Tue. and Thur. at 1800 MST, Sun. at 0730; the NM Breakfast Club meets on 3838 kc. daily except Sun. at 0730. RKS transmits Official Bulletins on 7100 kc. Mon., Wed. and Fri. at 1930 MST and will stand by after the Bulletins for any traffic. The operators at GEM have been busy getting set up in the new shack. We've missed the station on the nets. KWP has been busy on 6 meters. GRI spent a three-week vacation in W2-Land. NQG has been working WOX and BIH on 2 meters; he also worked LGW and SNX in Texas. CIN, SGC and WKW made another expedition to the Four Corners. The Carlsbad Club members have joined c.d. I am again asking club secretaries to send me items each month for this column. The only regular reporter is CIN. If you want the activities and accomplishments of your local amateurs brought to the attention of the rest of the section, send me the items the first of the month, as my report must be mailed not later than the seventh. Traffic: (Sept.) W5UAR 28, LEF 10, K5DAA 8, W5ZU 6, CIN 4, RKS 4, BIH 2, NQG 1. (Aug.) W5DVA 14, NQG 7.

CANADIAN DIVISION

MARITIME — SCM, D. E. Weeks, VE1WB — Asst. SCM: Aaron Solomon, 1OC. ADH, at 14, is the youngest member of the Halifax Club and operated club station FO during the W/VE Contest. HC attended a recent c.d. course at Arnprior. MZ has departed for the Far North. OC has a new 75A-4 receiver. MX has moved to Ontario. PF has built a new modulator for his QRP emergency transmitter. BN reports few frequency violators. FQ is using a pair of 813s after years of successful operation as NCS of the Maritime Phone Net with an 8-watt transmitter. EK holds code practice sessions at the HARC meetings. IL reports the formation of a radio club at St. Mary's University. WL has a new cubical quad. The Ladies' Dit and Dah Club of Halifax continues in strong operation, being in continuous existence for nearly ten years. New calls heard include KW and PM (ex-2CL and 2PY). Activity in the W/VE Contest was confined mainly to c.w. PQ has a two-element 20-meter beam and reports good results. ADM is working considerable DX on 10-meter phone. Copies of club bulletins would be appreciated. Traffic: VE1DW 174, FQ 96, FH 63, UT 60, AV 48, OC 32, ADH 10, DB 10, WR 10, BN 2, LY 2.

ONTARIO — SCM, Richard W. Roberts, VE3NG — The Metro Club elected the following officers for '56-'57: BUT, pres.; APN, vice-pres.; BBQ, secy.; DSM, treas.; DQX, act. mgr. PH was a visitor to Toronto. 6HI, ex-3EO, attended the c.d. course at Arnprior. We extend our sympathy to the SEC, KM, on the loss of his father. BXK has a flying license. New officers of the Nortown Radio Club are DAR, pres.; BVI, vice-pres.; BJI, rec. secy.; DAS, corr. secy. DNK was reelected treasurer. Thanksgiving week end saw GH, AJA, NG, W2DXZ and 3AFI all at Meaford for the trout fishing. DEX, BBH and his XYL attended the Montreal Hamfest. BSW, OO on 75 meters, has a new transmitter and antenna tower. BXF and HE were made Life Members of the Nortown Club. TV on Channel 6 is giving the 2-meter boys in the Toronto Area a headache. GI, of Ottawa, was a visitor at the I.R.E. Convention. The Muskeg Net is active on 75 meters. New officers of the Sky-Wide Radio Club are BCR, pres.; BHJ, vice-pres.; DXS, secy.; BJB, treas.; OR, act. mgr. BUD has a new QTH. CAB is very active on 2 meters. DVM will be at Bowmanville for the winter. ARF will commute. BQT won the Albert Yates Memorial Trophy for outstanding work as c.w. instructor in the Nortown Club. The Westside Radio Club, Toronto, won the ARRL Field Day Award in Canada. The call was JJ. Ontario was well represented on the recent S.E.T. AUU, BUR and VZ report lots of traffic on the c.w. nets. Phone operators are reminded that distant traffic can be readily passed on the OSN, ECN, TCC, EAN, UTL and H and B. AMB skeds DEW mornings. Traffic: (Sept.) VE3BUR 115, NO 102, NG 79, AUU 52, VZ 46, AML 45, EAM 38, DQX 37, DPO 36, AJA 30, KM 30, AJR 11, SG 5. (Aug.) VE3VZ 20.

QUEBEC — SCM, Gordon A. Lynn, VE2GL — The sympathy of the VE2 gang is extended to FG in the recent sudden death of his wife. WW and GQ are "single sideband" with excellent results. WW has a KW1. The W-VE Contest was enjoyed by a goodly number of VE2s.

(*Continued on page 142*)

RADIO SHACK CHRISTMAS SPECIALS!

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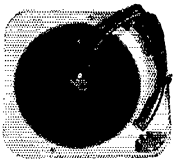

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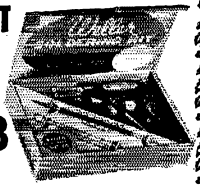

Ideal for shop, lab. or home craftsmen! Famous Weller Dual-Lite Soldering Gun *delivers over 100 watts of concentrated heat instantly!* Kit also contains Kester Solder, wire soldering brush and handy soldering aid to make tight contacts or loosen old solder joints.

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with BN making over 500 contacts, YA with only 20 watts nearly 400 and DR 470. YU visited ARRL Headquarters and W1AW during the summer, and had as his guests VE6HM and W3ZQ among others. His big project now is a three-band beam. PQN now meets at 7:15 P.M. Standard time on 3670 kc. AAE, VI and AOL are on nightly at 7 P.M. on 3740-kc. phone ready for traffic for the St. Maurice Valley District. ATQ, when at home, reports into PQN and when away makes every effort to report in from his mobile and is presently mobiling in the Maritimes. EC skeds AEM at 8:30 A.M. daily, KJ at 1300 daily and APP every Sun. on 3695 kc. Reports are requested from Quebec City Area, eastern townships, and the Hull Area. Traffic: VE2DR 77, EC 17.

ALBERTA — SCM, Sydney T. Jones, VE6MJ — SX reports the combining is all done for another year. The CARA'S president, Brian Smith, took the fatal step on Sept. 22nd and honeymooned south of the border in W-Land. Congrats to you both. HI is taking a civil defense course at Arnprior. WL says the Calgary gang is moving rapidly to 28 Mc. HM and his XYL, Hilda, have returned after a three-month trip to G-Land. AS is working the local gang on 144 Mc., along with KC and KM. FF reports LL is making tracks to get back on the active list. FF still is enjoying mobile operation as well as making many FB contacts on 28 Mc. from the home station. LY and his XYL have returned from a holiday trip to Western U. S. A. WO has completed an SWR meter. LZ has been enjoying a few c.w. contacts after months of inactivity. Your SCM appreciates your monthly reports, gang. They help so much in writing this report. Keep them coming. Traffic: VE6OD 14, MJ 5, TT 2.

SASKATCHEWAN — SCM, Harold R. Horn, VE5HR — JV sends in a nice bit of news this month, otherwise another *QST* would have gone by with no Saskatchewan news. If the readers of *QST* do not send in items of interest this column cannot be made up. JV worked XW8AB and VU2RM with an indoor folded dipole on 21 Mc. to boost his zones to 39. Allan needs Zone 23 and would appreciate one contact with this zone at least, before propagation conditions change. TK hits 100 countries worked with his new two-element 21-Mc. beam. KG has a new three-element beam on a 70-foot tower. KR is a civilian again and also has a two-element Mosley. SY now is retired after 44 years of railroading. Congratulations, Art. He will be working DX with his dual 10-20 Mosley. HR visited with 7JS at 7EH's QTH and also visited W7OVU, VE7RZ and VE7PNE. TH was kept busy with the new mobile rig and also was elected president of the Saskatoon Club. LM keeps skeds on 7, 14 and 3.5 Mc. daily with western districts.

Automatic Antenna Tuning

(Continued from page 17)

to the 52-ohm load in the tuner. The function switch is then set to phase tune, where the tuner phase capacitor drives to zero phase angle. I then place the function switch to PHASE AND RESISTANCE TUNE. After the tuner has finished tuning, I place the transmitter on high power (50 watts) where the tuner will make a slight readjustment. As the v.f.o. is varied, the tuner will follow, making corrections as necessary to keep the antenna tuned to the frequency. There are no limit switches on the coil or capacitor mechanism in this unit.

This automatic antenna tuner has performed satisfactorily with two other amateur transmitters. One of these was a Collins 32V-3. Mr. Paul Brown, WØZIS, has also built an automatic

(Continued on page 144)

MEMBERSHIP CHANGES OF ADDRESS

Four weeks' notice is required to effect change of address. When notifying, please give old as well as new address. Advise promptly so that you will receive every issue of *QST* without interruption.

(Continued from page 142)

antenna tuner consisting of a Johnson Match Box and a discriminator chassis with error-signal balanced amplifiers from this schematic. His tuner performs equally as well as my model. The tuner has worked well with an 18-ft. length of wire, a 40-ft. vertical, and a 100-ft. wire, all working against ground.

As it will probably be difficult to build an exact duplicate of this unit, here are some suggestions for component substitution.

1) Use 115-volt a.c. reversible motors or the 6-volt units mentioned under Fig. 1 in lieu of the 28-volt d.c. aircraft surplus fuel-valve motors.

2) Use an ARC-5 or B & W antenna loading coil in lieu of the surplus Signal Corps field-transmitter loading coil used in this model.

3) Use powdered-iron toroid coil forms (wedding-ring size) to wind phase-and-resistance-detector coils in lieu of the cup cores used here.

In conclusion, I wish to thank Mr. F. J. Blitz and Mr. Leon Sabine of Engineering Research for their technical assistance, and Mr. Don Rutledge for photographing the equipment.

4X150A Linear

(Continued from page 24)

equivalents are available either surplus or new.

Adjustment

When the amplifier is completed, attach a dummy load across the antenna terminals. Two 100-watt electric bulbs in parallel approximate 75 ohms. Select a band, and make the approximate settings of the plate-tuning and output-loading capacitors as follows:

Band	*Input*	*Output μμf.*	
Mc.	*μμf.*	*50 ohms*	*75 ohms*
3.5	240	1800	1300
4	220	1750	1250
7	150	850	600
14	90	400	300
21	50	250	200
28	35	200	150

Tubes in the 4X series always must be operated with a fully-loaded plate tank; that is, with relatively tight coupling to the antenna. Optimum loading stems from the proper *L/C* ratio on all bands, together with the ability to transform the tank impedance of 1000 to 4000 ohms to the feed-line impedance of 50, 70, 150 or 300 ohms.

Connect the exciter and turn on the plate voltage with some carrier insertion. Dip the plate current with the tank capacitor and adjust the loading. If everything is in order, increase the carrier insertion. Back off the carrier and null its output so that the standing plate current is down to about 20 ma. Speak into the microphone; voice peaks should produce the same intensity in the light bulb as with carrier insertion. A final check on the scope, and you have a mighty fistful of talk power.

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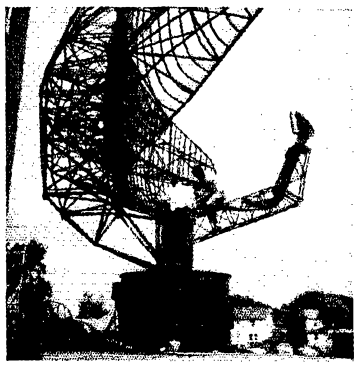

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W1GWD—O. L. Dewey, Mgr., Gov't. Service Dept.
W1EEE—E. K. Doherr, Asst. Mgr., Gov't. Service Dept.
W1CMU—G. E. Dodge, Supervisor, Field Engineering Section
W1PAW—W. R. Burrows, Supervisor, Technical Section

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2000 QSOs Later

(Continued from page 46)

did not give you a break, we are sorry. You probably were there but either too weak or too much down under.

A nice episode occurred during Monsieur Jean Wolff's, LX1JW, inspection visit. After finding all in law and order he tried a CQ under his own call. Promptly an SM station replied and asked in the course of this QSO, "Say, Jean, I can hear some DL's/LUX since a few days, are those genuine?"

On our homeward trip a short visit to the home of LX1JW revealed a beautiful ham shack and a powerful station. We also saw the boom for a nearly-completed three-band beam for 20, 15, and 10 metres and back in the garden a pretty rhombic stretches its legs. Jean is a real old timer and has his license since 1920. He likes fone, so you fone be patient till Jean turns up again. We also met LX1DA at Jean's place.

You whom we skedded on 10 must excuse us. We intended to be on 10 on Saturday afternoon. But Saturday afternoon saw us driving homeward, all because a telephone call told us that the borders were closed on Sundays for travellers carrying goods for which security was deposited. Since we had to be back home on Sunday night we had to pack abruptly on Saturday noon (August 18) instead of Sunday morning. The first DXpedition of German hams after the war had come to an end.

So we left without any celebrations our romantic chateau, to which we had become attached during those nights in which you our fellow hams and the howling, ever present wind had kept us strange and fascinating company.

Losses in Feed Lines

(Continued from page 19)

significant radiation of the r.f. traveling inside the line. (R.f. can be induced on the outside of it, from the antenna, and then re-radiated.) An open-wire line has no significant radiation, provided the currents are balanced and the line spacing is less than about 1/100 wave length (4 inches at 30 Mc.). Even when the currents are not balanced, as happens when the feed line is not symmetrical with respect to the antenna or ground, the radiation from an open-wire line is not serious in most cases. If you have a long transmission-line run, or if you must operate your feed line with a high s.w.r. (because you are using the same antenna for several bands and the antenna impedance is not the same on all bands), it is pretty hard to beat open-wire line, as Fig. 2 shows.

Strays

W3DMB belongs to the Indiana County Amateur Radio Club, whose club call is W3BMD.

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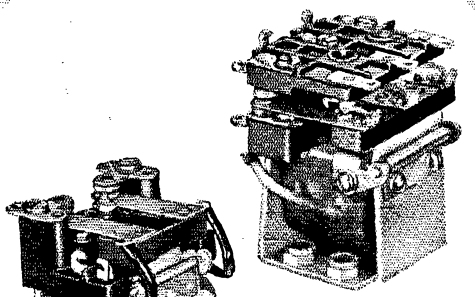
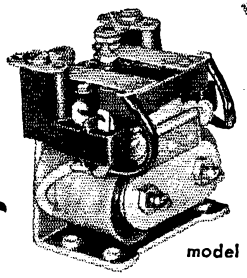


model DO relay



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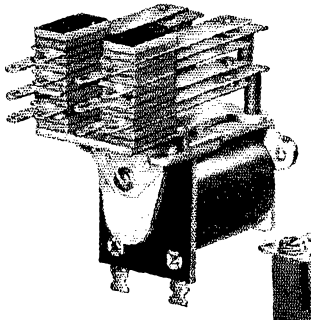
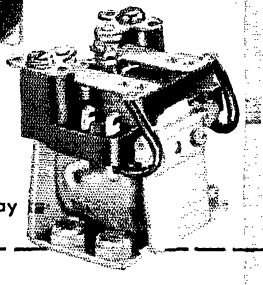


model CRU relay



model DOS relay

Also made-to-order models in a wide variety of coil voltages and contact combinations with current ratings up to 25 amps, AC or DC; also hermetically sealed or dust-protective enclosures.

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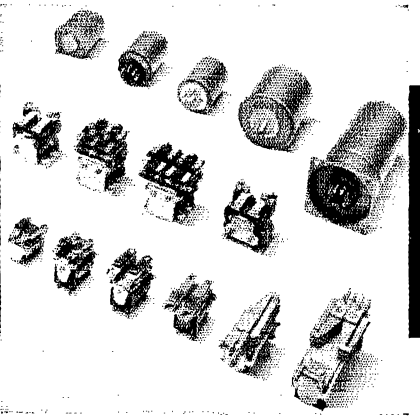
RUGGED, DEPENDABLE FOR LONG LIFE



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3636 Howard Street, Skokie, Illinois
(Suburb of Chicago)

YL News & Views

(*Continued from page 80*)

YLs each Tuesday at 10:00 A.M. around 14,080 kc. . . . W1TRE, Barbara, added MP4KAC on Kuwait Island in the Persian Gulf to her list of 100-plus countries worked. . . . W6UHA's new ones on twenty are FL8AB, ZC3AB, CR4AH, and ET3AF. . . . K6OWQ, Mary, worked FB-8ZZ on the island of New Amsterdam on 20 c.w. . . . Some Rhode Island YLs currently active on six meters are *W1s* GSD, NFA, VXC, WED, ZOK, and ZWM.

W1ZEJ, Mary, relates that W1IBA, Ruth, of Nantucket Island used 80 c.w. to relay early news of the Andrea Doria-Stockholm sea disaster to W1FYF/1 and his father, News Director for WTIC, Hartford, Conn., who were vacationing on Cape Cod. Ruth was able to supply the names of the survivors who had been flown in to the island by helicopter and also important news of other happenings that eventful day on Nantucket.

Miscellany:

The birth in August of Scott Wallenberg of Florence, Wisconsin, was another all-ham occasion. Baby Scott's Mom is K9DOT, Dad is W9PQI, Godfather is W9YUM, and the doctor who delivered him is W8DXS. . . . *KZ5s* AE, DW, and ML spent their summer vacations in the States. Sis, KZ5AE, bought a DX-100 with her winnings in the Strike-It-Rich TV show. . . . W1EXE, Hazel, formerly of New Hampshire, is now awaiting her W2 call at Amagansett, Long Island. . . . W3MSU's new QTH is 5505 Eighth Street So., Columbia Heights, Arlington, Va. (see photo on page 79). . . . Sister Charlotte, W7MUT, has been transferred to a new teaching position in Los Angeles. . . . W6UXF, Enid, is preparing for a three months visit to Austria in the Spring.

The Ninety-Nines, Inc. has announced that the Eleventh Annual All-Woman Transcontinental Air Race will start at the San Mateo County Airport, San Carlos, California, on July 6, 1957, and will terminate at the North Philadelphia Airport, Philadelphia, Pennsylvania, on July 10, 1957.

QST—Volume V

(*Continued from page 59*)

[For footnotes, see p. 152]

final list of American stations which they heard,[44] are as set forth below:

OVERSEAS SIGNALS HEARD AND IDENTIFIED BY:

W. R. Burne, of Springfield, Thorold Grove, Sale, Cheshire. (The first-prize-winning British receiving-station)

H. H. Whitfield, The Glen, Primrose Lane, Hall Green, Birmingham

W. E. F. Corsham, 104 Harlesden Gardens, Willesden, London, NW 10

R. D. Spence, Craighead House, Huntly, Aberdeenshire

A. E. Greenslade and E. W. Mc T. Reece, British School of Telegraphy, 179 Chapham Rd., London, SW 9

J. R. Forshaw, Westville, St. Helens Rd., Omskirk, near Liverpool

T. Cutler, 24 Floating Bridge Rd., Southampton

An Anonymous amateur, vouched for both by Godley (who met him), and by Coursey.

The first American signal heard by a British amateur was from 2FP (picked up at 2:30 A.M., GMT, on December 8, 1921).[45]

And, in summarized form, the results achieved at British receiving-stations were as follows:

Calls and Identifying Code-Groups Correctly Received From:

1AFV (Salem, Mass.)

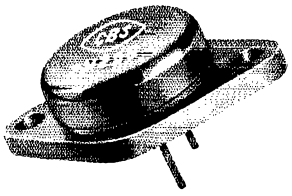
(*Continued on page 150*)

NOW ... LOW-COST POWER TRANSISTORS!

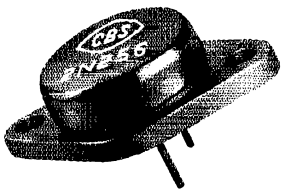
CBS, leading manufacturer of power transistors for automobile radios and industrial equipment, offers you new low-cost power transistors delivering up to 10 watts output in Class B! Now you can build a variety of economical transistorized amplifiers capable of real power output.

The 2N255 and 2N256 PNP alloy-junction germanium transistors are designed for six- and twelve-volt battery operation respectively . . . ideal for mobile use. They feature high power coupled with high current amplification and their construction permits high heat dissipation.

Check the typical operating data. Order the 2N255 and 2N256 from your CBS Tube distributor . . . they are available now!



2N255 . . . $2.95



2N256 . . . $3.45

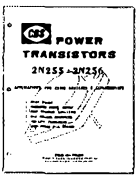
TYPICAL OPERATING DATA

	2N255	2N256	
Battery voltage	6	12	volts
Class B push-pull output	5	10	watts
Class A output	1	2	watts
Distortion at max. output	Less than 10		per cent
Power gain, Class A	24	27	db
Total max. dissipation*	6.25	6.25	watts
Alpha cutoff frequency	200	200	kc

*With chassis as heat radiator.

Free . . . "*CBS Power Transistor Applications*"

This easy-to-read booklet gives data and operating notes for the CBS 2N255 and 2N256 in addition to six simplified power transistor circuits: Regulated power supply . . . code practice oscillator . . . d-c voltage multiplier . . . relay control . . . portable phonograph . . . and mobile public address system. It's free . . . from your CBS Tube distributor. Or write direct. Ask for CBS Power Transistor Applications, PA-16.



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CBS semiconductors

CBS-HYTRON
Semiconductor Operations, Lowell, Mass.
A Division of
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1ZE (Marion, Mass. This result is characterized as being "probable," only. Why, I do not know, —S.B.Y.)
2BML (Riverhead, L. I.)
2FP (Brooklyn, N. Y.)
2ZL (Valley Stream, L. I., heard by 3 Britishers) [46]

Calls Heard in "Free" Periods (No Code-Identifications):

1UN (Manchester; state was either N. H or Mass.) [47]
1RU (West Hartford, Conn.)
1XM (Cambridge, Mass.)
1BCG (Greenwich, Conn. — heard by 5 Britishers)
2ZC (South Orange, N. J.)
2ZU (Location not given. Reception noted as being "probable," only.)

The Britishers heard no American or Canadian sparks. The stations which they heard were all using tube transmitters.[48]

Mr. Coursey's final report (23 to 27, May 1922) contains a number of passages of particular interest. On page 24, he emphasizes the fact that the British amateurs had been forced to use the small receiving-antennas specified by the G.P.O. Regulations.[49] At page 26, he adds that his analysis of Test results *disregards* "Godley's unverified reception of 1AAW on the 8th." And on page 25, he places station 1BCG in a special category:

". . . Reception of 1BCG during its special transmissions to Godley was on account of its more powerful nature not adjudged as of equal merit to the reception of an individual transmission with correct code word. . . ."

On December 11, 1921, Godley hoped that 1BCG would send messages to him; and his log shows that he listened steadily to 1BCG from a little after 1:00 A.M until 4:05 A.M., but began to hear other American amateurs, starting at 3:49 A.M. (See 25 to 26, February 1922). It is possible that if he had tuned around, instead of remaining on or near 230 meters, he might have heard some additional overseas amateur signals during that period of time, but nobody can prove such a proposition to be true.

In this connection, an earlier comment by Mr. Coursey, as to 1BCG, found at 20, March 1922, is of interest; because it expresses the view that the prolonged calls from 1BCG were *not* an unmixed blessing:

". . . While doubtless of considerable use to Mr. Godley, it is unfortunate that the signals from this station acted as a hindrance to some of the British amateurs, who picking them up, recognizing that they were of American origin and not knowing the special nature of the station [i.e., erected on Mr. Godley's recommendation, that he might have a known signal to tune to — *Ed.*],[50] copied the repeated calls and messages for hour after hour during the best nights of the tests, to the complete exclusion of possible signals from other American amateurs — signals which must have been there had they been tuned in if the exceptional transmission qualities of those particular nights are considerable. . . ."

I have found absolutely no evidence, either published in *QST* or elsewhere, to support the statement found in Mr. Warner's Article at 13,

(Continued on page 152)

the VOLUNTEER

15 TUBES!

Only **$99.00** Less Crystal

A New Professional Receiver for Fixed Frequency Services

The VOLUNTEER is a completely modern receiver utilizing the latest tubes, transistors and circuit design. It broadens the usefulness of 2-way FM communication systems by providing a low cost means of monitoring VHF circuits. Civil Defense organizations, volunteer fire and police departments, taxi and construction company operators, industrial plants, forestry services, broadcasting stations and other users of 2-way radio systems are now availing themselves of economical extra coverage.

There are 6 VOLUNTEER models—6 or 12 volt mobile or 117 VAC base stations for high or low band operation. The VOLUNTEER carries FCDA Designations UR-66 and UR-64 and qualifies for matching funds.

Write for complete details or visit your local 2-way radio service organization for a demonstration.

A product of the makers of the PAK-FONE— The Leading 2-Way Portable

- **Extremely Compact (4 x 6 x 8 inches)**
- **Models for Auto, Home and Office**
- **15 Tubes (AC Models)**
- **Dual Conversion Superhetrodyne**
- **Transistor Output (Mobile Models)**
- **No External Power Supply Required**
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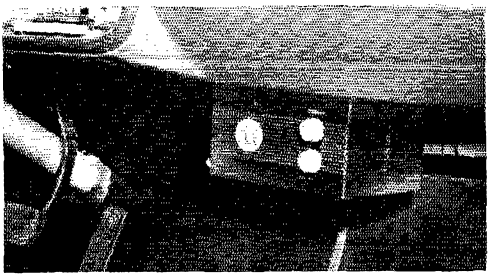

February 1922, indicating that some of the stations which were heard overseas in the Second Transatlantics, had transmitted on wave lengths down below 200 meters.[51]

In fact, the pages of *QST* contain many indications to the contrary.

First, examine Mr. Higgy's Tables (12, March 1922) which give various data on most of the successful stations. Not one single transmitter, either spark or c.w., is there credited with use of a wave length shorter than 200 meters. And of the stations operating under ordinary amateur licenses, nearly one-half are shown as having transmitted on wave lengths up above 200 meters.[52]

Furthermore, the official ARRL announcements concerning the Second Trans-Atlantics had emphasized that transmission on waves less than 200 meters long was undesirable.[53]

I find no direct statement by Godley (in *QST*) showing how far down below 200 meters he could tune at Ardrossan. However, there is fairly satisfactory evidence that he could reach down to 160 meters.[54]

Finally, I believe we may fairly assume that Godley knew where a 200-meter signal would come in on the dials of his receiving-apparatus;[55] and that if he had heard a signal at settings substantially below the 200-meter calibration-points, he would have realized the significance of the event; and would have reported the incident, in full.

A sidelight to the Second Trans-Atlantics remains to be noted: Secretary Warner collected on his bet with Burnham. There is a review of the wager, at 35 to 36, July 1922; and there you will find a photo of the "topper" itself, and a second picture which shows it perched on Mr. Warner's head.

[44] 25, May 1922 (Coursey's official report). Note that in the list at 20, March 1922, 1ZE was listed as *surely*, not probably, heard. Also note that the list at 25, May 1922, is just a repetition of a cablegram sent to Hartford, by Coursey, at some undisclosed date in January, 1922. Which list is correct? The *implication* is that the one at 25, May 1922, was the last word. But *was* it?

[45] 26, May 1922. This means that 2FP was heard in England *after* Godley had heard 1AAW, and *before* Godley had first heard 1BCG. 26, May 1922; 23, February 1922.

[46] 26, May 1922. This station was owned and operated by J. O. Smith, a pioneer in c.w. work. Locations of stations are taken from earlier lists, found at 11, February 1922, and at 20, March 1922. Although 3 British stations heard 2ZL, Godley never picked him up at Ardrossan. 26, May 1922.

[47] Reported as Mass., at 11, February 1922; and as N. H., at 20, March 1922. DeSoto says "Mass.," at p. 73 of his book. He also states, there: ". . . Eight British amateurs were reported by Philip R. Coursey, of the London *Radio Review*, to have heard eleven American stations: 1AFV, Salem, Mass.; 1BCG, Greenwich, Conn.; 2FP, Brooklyn, N. Y.; 2ZL, Valley Stream, L. I.; 2BML, Riverhead, L. I.; 1UN, Manchester, Mass.; 1RU, West Hartford, Conn.; 1XM, Cambridge, Mass.; 2ZC, South Orange, N. J.; and probably 1ZE, Marion, Mass., 1DA, Manchester, Mass., and 2ZU were heard as well. . . ."

Thus DeSoto lists *twelve* (not eleven) stations; and he adds to the eleven which I have listed, *station 1DA (in Manchester, Mass., as was 1UN, also)*; and he brands the reception of 1DA as being "probable," only.

He agrees that 1ZE and 2ZU must be listed in the "probable" class — which is some help, at least.

By now, it should be obvious that the records of the Second Trans-Atlantics are really in one sweet mess.

Look back at Footnote No. 30, also.

(Continued on page 154)

HARVEY ALWAYS HAS IT...IN STOCK For IMMEDIATE DELIVERY

New! HAMMARLUND HQ-100 COMMUNICATIONS RECEIVER

A brand-new concept in receiver design — offering amazing dollar-for-dollar performance, quality features and ruggedness, at a popular price. Continuously tunable from 540 kc to 30 Mc, with sensitivity and selectivity surpassing anything in its class. Electrical bandspread tuning with direct dial calibration for 80, 40, 20, 15 and 10-meter bands. Special Q-Multiplier circuit for continuously variable selectivity. Voltage-regulated and temperature-compensated oscillator for extra stability. Special Auto-Response circuit automatically adjusts audio response to fit receiving conditions. Automatic noise limiter minimizes static bursts and ignition interference. Newly designed S meter for maximum legibility and accuracy.

HQ-100 receiver only, in cabinet $169.00

Same, with Telechron automatic warm-up timer and clock 179.00

Matching 6" x 9" speaker in cabinet 14.95

Conversion kit for Telechron clock-timer 9.95

● THREE BANDS 10, 15 and 20 Meters
● ONE BEAM
● ONE FEED LINE

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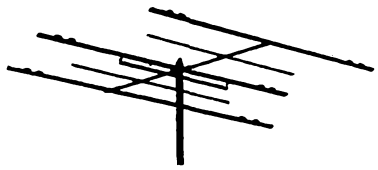
(exclusive in N.Y. area)



The original Three-Band W3DZZ Beam — Manufactured by the Frederick Tool and Engineering Corp.

No Stacking Required • Wide-Band Balancer — requires no adjustment. Maximum Gain—over 8 db gain on 20 and 15 meters; somewhat higher on 10 meters • High Front to Back Ratio — in most installations the front to back ratio exceeds 30 db on 10 and 20 meters and 25 db on 15 meters • Rugged Design — boom consists of two 12-foot lengths of 2¼" dia. tubing with .065" wall. Three-band elements are made of 1½" tubing with .058" wall. All tubing is of 6061-T6 heat-treated aluminum alloy for maximum weather resistance and strength.

Model FT-100 Beam Antenna—a Multi-Band Parasitic Array for 10, 15 & 20 Meters Light weight—only 55 lbs. • Total length of elements less than 28 ft. • Clean design with shortened elements gives low wind resistance • Uses RG8U as feed line • Trap capacitor insulation is of highest quality polystyrene.

Complete $195.00

Model FT-200 Set of Traps for 5-Band W3DZZ Wire Antenna

10, 15, 20, 40 and 75/80 Meters • 75 Ohm Twin-Lead or Coax Feed Line • Concentric Coil and Condenser Completely Potted in Polyester Resin • High-Voltage Polystyrene Insulation on Concentric Capacitor.

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ANTENNA KIT for FT-200 Traps

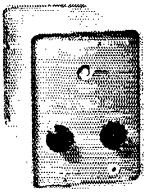
150' #12 Copper-Weld Wire • Special Center Insulator • 2 End Insulators • 2 additional Egg-Type Insulators $6.90

RG 11/U Coax ..... $0.13 per ft.

RG 59/U Coax ..... .07 per ft.

72 ohm kilowatt twin lead ..... .06 per ft.

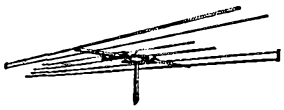
CENTRAL ELECTRONICS INC.



Model GC-1 GATED COMPRESSION AMPLIFIER

A complete audio system that really eliminates blasting. Unlike ordinary compression amplifiers, which are limited to a range of 10 to 20 db before severe distortion occurs, the patented Gated Compression Audio AVC circuit limits the increase in output to less than 3 db for increases in input level of 40 db above the Compression Gate value, adjustable by means of the Sensitivity control. A separate Output control adjusts the actual power output. The GC-1 goes between the secondary of the receiver's output transformer and the speaker voice coil, or else between the sideband slicer's volume control jack and the speaker voice coil.

GC-1, wired and tested $59.50



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Rotary Beam for 15 and 10 Meters

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103 W. 43rd St., New York 36, N.Y. • JUdson 2-1500
Established 1927

[48] 40, February 1922; 17, March 1922.

[49] ". . . . Of course Mr. Godley as a visitor was granted more privileges than are normally allowed to the British amateur, who except in special cases is restricted to an aerial with a *total* amount of wire including down leads of not more than 140 feet, or 100 feet if only a single wire is used. Hence a [comparison] of the ten or eleven stations heard by our amateurs on aerials of this size, with the twenty-three heard by Mr. Godley on his aerial of 850 feet is not so unfavorable, especially as only one Britisher used more than six valves all the time. . . ."

[50] In the "1BCG Commemorative Issue" above referred to, Mr. Godley makes a statement which implies that he made no formal request to anybody that station 1BCG be built so that he would have a strong signal available for adjustment purposes. He intimates that some casual remark of his, uttered at some time before he went overseas, may have been taken seriously, nevertheless: ". . . Only much later — back in the States — was I told that 1BCG had come into being because of a chance, almost facetious, request made (and at once forgotten) as I was about to sail away toward 'an unknown professional fate.' . . ." See page 31 of the "1BCG Commemorative Issue" (October, 1950) of the *Proceedings of The Radio Club of America, Inc.*

[51] This reads: ". . . To get over on wave lengths sometimes under 200 meters, with our aerials that are as grasshoppers to the commercial station! That too was done. . . ."

[52] 1ARY, 225; 1BCG, 230; 1BFG, 210; 1BKA, 225; 1RU, 204; 1RZ, 220; 3DH, 225; 8ACF, 225; 2BK, 203; 2ARY, 208.

The Special-License stations are thus listed: 1XM, 210; 1YK, 235; 1ZE, 375; 2ZL, 325; 8XV, 200.

Ordinary amateur stations using 200 meters, are listed as being: 1AFV, 1BDT, 2AJW, 2BML, 2EH, 2FD, 2FP, 8BU, 1ARY, 1BDT (spark), 2DN.

[53] For example, Schnell's original announcement (12, September 1921) had stated ". . . The only requirements are those of the U. S. Radio Communication Laws. The power must not exceed 1000 watts and the wave length, must be 200 meters. The laws permit transmission on waves below 200 meters but since the English stations will be tuned for reception on 200, we ask you to use that wave. . . ."

Later (at 30, October 1921) Schnell had issued a more flexible wave-length requirement. But he had still emphasized the desirability of adhering to 200 meters: ". . . As to wave length there is no stipulation — stay where you are if that is desirable, but bear in mind that if you want to increase your chances a hundredfold, get on 200 meters where the British will be listening. We don't know much about the equipment Mr. Godley will take over but we have it from him that it will be sufficiently flexible to cover the usual amateur tunes, including 'specials' from 150 to 425 meters. . . ."

[54] He had two receivers at Ardrossan: (1) A special regenerative, tuning from 160 to 500 meters; see photo and caption at 25, February 1922. (2) A superheterodyne, consisting of a tuner and amplifier. See photos and captions at 17 and 19, February 1922; and circuit diagram at 39, February 1922.

The caption under the picture of the superheterodyne set (17, February 1922) says, in part: ". . . As connected for use with Beverage antenna, the special regenerator shown on page 25 was inserted between this tuner and the antenna."

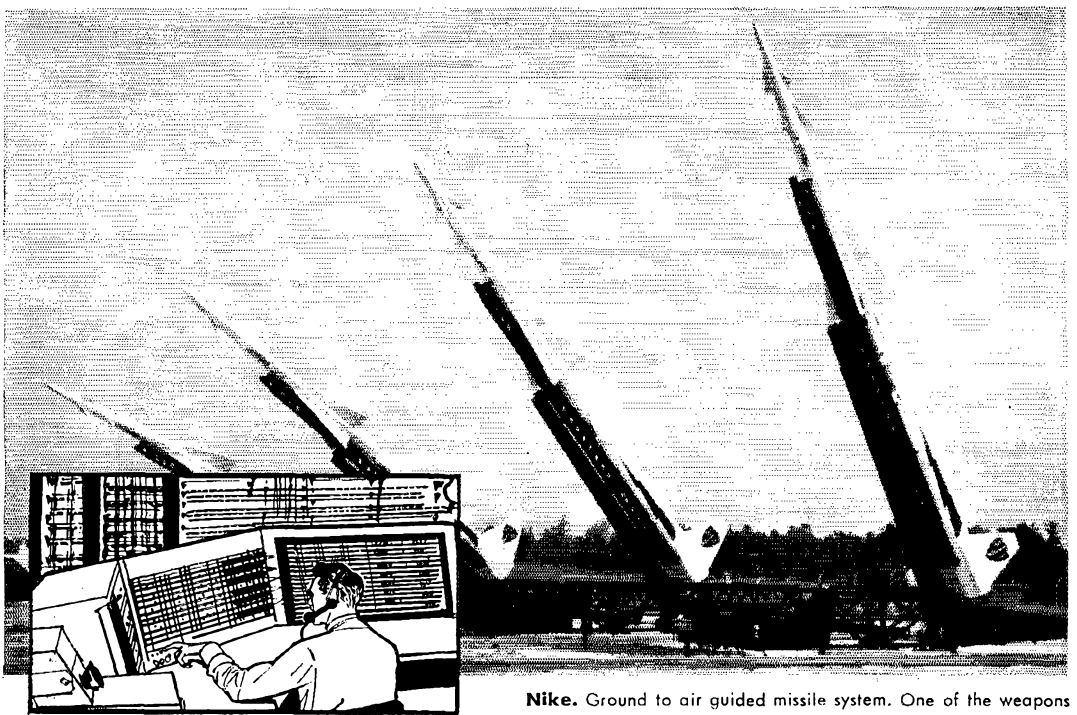
[55] That he had with him in the tent at Ardrossan a small General Radio Company precision wave meter is a certainty. He had even checked it against "an unusually fine standard owned by Mr. Frank Phillips, of Wembly Park, London"; and it had "checked to a hair on 200 meters." See 14, February 1922. He used it, at 1:59 A.M. (GMT), on December 10, 1921 — measuring 1BCG's wave length as being "somewhere between 230 and 235 meters." 24, February 1922. (The date December 9, 1921, at that page, is erroneous. As to date, see Footnotes 31 and 32, above).

Later on the same date (for some undisclosed reason or reasons), he wired Courscy that he had heard 1BCG on 230 meters. 25, February 1922.

Incidentally, 230 meters is the wave length given for 1BCG in the R.C.A. *Proceedings* of October, 1950, at page 14; and the figure is repeated in *QST* at 33, February 1922 (Burghard), and at 20, March 1922 (reception report from a Dutch Amateur at The Hague). Maybe Godley later remeasured 1BCG's wave length, on December 10, 1921.

Help test SAGE

— the new Air Defense System



Sage "Brain". Giant electronic computers store defense data . . . furnish correct picture to commanders at earliest possible moment.

Nike. Ground to air guided missile system. One of the weapons whose employment can be controlled by Sage (semi-automatic ground environment). The Nike guided missile system is one of the many defense projects for which Western Electric is prime contractor.

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Western Electric

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FD Results

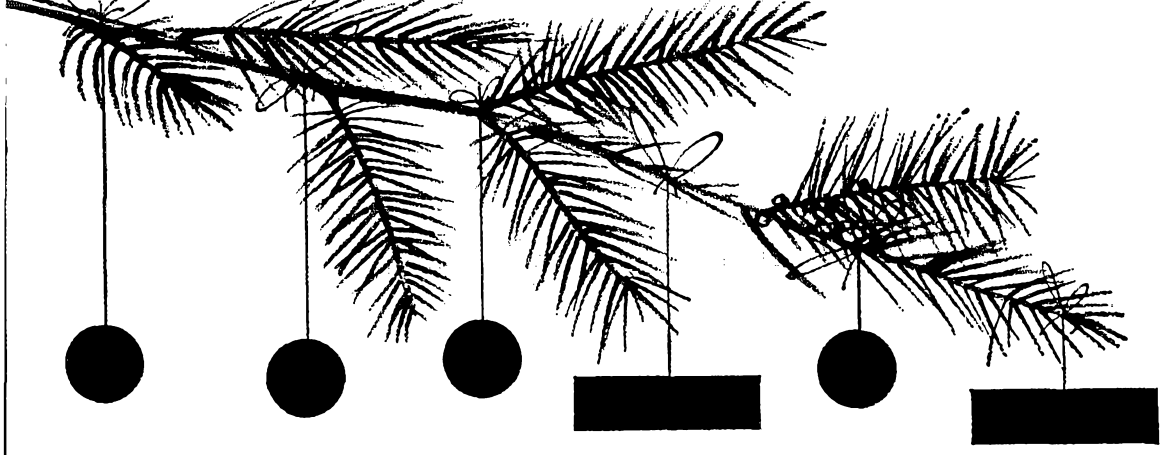
(Continued from page 66)

K5WAC/5	(nonclub group)	146-	AB-10-	1107
W4TBU/4	(nonclub group)	184-	B- 9-	1104
W0OUI/0	Denver RC	182-	B- 4-	1092
W3CUL/3	Spring-Mor RC	171-	AB- 5-	1056
W3QZF/3	Horseshoe RC	173-	B-28-	1038
W0QDN/0	Huron ARC	148-	B-11-	1038
W3CTG/3	Norristown H. S. ARC	142-	B-10-	1014
W0JFN/0	Lincoln ARC	148-	AB-12-	987
W9YLS/9	(nonclub group)	109-	A- 5-	981
K6MTS/6	Indian Wells Valley Radio Assn.	161-	B-10-	966
W8KEA/8	Midland ARC	154-	AB- 6-	936
KP4ID/KP4	Puerto Rico ARC	131-	B-12-	936
W0AQQ/0	Homesteader ARC	130-	B-14-	930
W7ANB/7	Yuma County RC	103-	A- 9-	927
K4EWW/4	(nonclub group)	133-	AB- 6-	921
W1HGV/1	Nashua Mike and Key Club	210-	BC-10-	920
W8NMD/8	(nonclub group)	153-	B- 6-	918
W0TXP/0	(nonclub group)	151-	B- 5-	906
W9LL/9	Lake County ARC	136-	AB-10-	888
W2KLF/2	(nonclub group)	265-	C- 8-	876
W3BOA/3	(nonclub group)	143-	B- 4-	858
K9BJU/9	New Castle AR Assn.	143-	B-29-	858
W8PIF/8	M. and M. RC	117-	B-20-	852
W9ZFW/9	Pontiac RC	142-	B-11-	852
W8OKV/8	Thumb ARC	141-	B-15-	846
VE3JH/3	Algoma ARC	109-	B- 8-	804
K4DXZ/4	Valley ARC	217-	AC-14-	801
K0ANO/0	QSO and QRM Society of Iowa	56-	A-10-	729
W0WWJ/0	(nonclub group)	54-	A- 9-	711
K0BDF/0	Crete ARC	54-	A- 5-	711
W2NOO/2	RAC of Belleville	177-	AB- 8-	708
W9BXR/9	Montgomery County AREC	118-	B-	708
W0SHZ/0	Lake Region RC	117-	B- 9-	702
W8GIY/8	Mount Clemens RC	227-	C-1	681
W3EEG/3	Short Skip RC of Philadelphia	112-	B-15-	672
W2MTA/2	Otsego ARC	74-	A- 8-	666
W8PHU/8	Mt. Pleasant ARC	174-	BC-13-	654
K4FFR/4	(nonclub group)	80-	BC- 6-	627
W4RKC/4	Shenandoah Valley ARC	79-	B- 9-	624
W5HPI/5	Terry County ARC	67-	A- 9-	603
W1USV/1	Trumbull Emergency Communications Assn.	37-	A- 4-	558
VE7VP/7	(nonclub group)	91-	B- 4-	546
W9RHU/9	Menomonie RC	84-	B- 5-	534
W7VAS/7	Rodeo City RC	147-	AC-14-	501
K4IGR/4	Clearwater ARS	147-	C- -	441
W3WBD/3	Southern Chester County ARC	57-	AB- 5-	435
W8TWJ/8	(nonclub group)	116-	BC- 6-	429
W9MAJ/9	DeWitt County ARC	63-	B- 5-	378
W5HTK/5	Enid ARC	37-	B-11-	372
W3CAR/3	Washington RC	27-	A- 5-	243
W2BMW/3	Tu-Boro RC	68-	AC- -	210
K2JVR/2	(nonclub group)	28-	AB- 6-	198
W3BMD/3	Indiana County ARC	32-	B- -	192
VO6H/6	Goose Bay ARC	21-	C-11-	138
W8AXE/8	(nonclub group)	9-	A- 4-	81
W1FTS/1	Hoosac Valley RC	4-	AB- 7-	27

Three Transmitters Operated Simultaneously

W3PKV/3	Northeast RC	918-	A- -	8262
W5ZDN/5	Central Texas ARC	879-	AB-30-	7872
W3VUZ/3	(nonclub group)	886-	AB-15-	6240
W9FGF/9	Gary ARC	714-	AB-15-	5841
W9AB/9	Michiana ARC	601-	A-50-	5634
W8ET/8	Westpark Radiops	814-	B-28-	5550
K6CLZ/6	Aerojet RAC	545-	A-21-	5130
W5DXD/5	Temple ARC	711-	AB-15-	5106
W2PE/2	Radio Assn. of Western New York	818-	B-35-	5064
W5MUZ/5	Ouachita Valley ARC	493-	A-15-	4662
W4YKY/4	Lake AR Assn.	497-	A-33-	4473
K4JVA/4	South Miami RC	691-	B-14-	4296
W3NEW/3	Capitol Suburban RC	461-	A- 8-	4149
W2FEB/2	Lockport AR Assn.	458-	AB-21-	4077
W8NCM/8	Springfield ARC	429-	AB-28-	4038
W2UBW/2	Mid-Island RC	422-	A-15-	4032
W1ICP/1	Laurel AR Assn.	466-	AB-15-	3996
W2WUX/2	Utica ARC	410-	A-14-	3915
VE7ARV/7	Vancouver ARC	454-	AB-14-	3813
W2DAY/2	Northern New Jersey Radio Assn.	394-	A-18-	3771
W2MO/2	Livingston ARC	513-	AB-25-	3738
W9TFA/9	Hamfesters RC	383-	A-11-	3672
W9FAU/9	(nonclub group)	418-	AB- 4-	3636
W1BYF/1	Newport County RC	497-	AB-26-	3630
K6EGR/6	(nonclub group)	371-	A- 3-	3582
W4SKH/4	Oak Ridge RAC	453-	AB-47-	3552
W1RTI/1	(nonclub group)	380-	A- 7-	3420
W9TJP/9	Hamfesters RC, Group 2	543-	B-13-	3408
W2KFR/2	Penn-Jersey RC	348-	A-12-	3357
W9FEX/9	Chicago Radio Traffic Assn.	346-	A-15-	3339
W9YYJ/9	Elgin ARS	371-	A-25-	3339
K6LLH/6	North Bay AR Assn.	488-	AB- -	3198
K4ALM/4	Shaw-Sumter ARC	531-	B-20-	3186
VE1FO/1	Halifax ARC	321-	A-15-	3132
W4FR/4	AR Transmitting Society	422-	AB-35-	3012
K6SSM/6	(nonclub group)	424-	AB- 5-	2997
K5NBD/5	Ruston ARC	485-	AB-12-	2898

(Continued on page 158)



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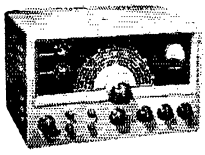
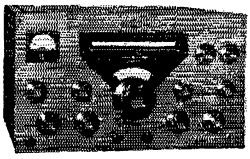
From the entire staff and

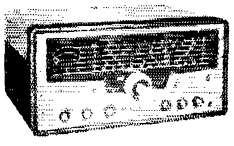
W6OYD W6YML K6BSB W6VCR K6PMU K6DPH W6LTY K6JJM
W6YPA K6CRD W6QJI W6KFS W6VBY K6GLH W6EBG KN6UAZ



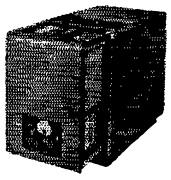
RME Electro-Voice
Model 4300 Receiver
Amateur net: **$194.00**
(wired)



Collins 75A-4
160 to 10 meter receiver
Amateur net: **$595.00** (wired)
With new fine tuning knob
$610.00



Hallicrafters New SX-101
AM-CW-SSB receiver
Amateur net: **$395.00**
(wired)



Johnson KW
Power amplifier
Amateur net: **$1595.00**
(wired)

Complete lines of transmitters and receivers, fixed and mobile—and all equipment, parts and accessories for ham station operation and maintenance. See Valley for the "final word" on trades and credit.

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FREE Novice Classes at Both Stores • W6LTY & W6QJI Instructors • 335 Novices Licensed Through Our Classes to Date

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W9NEV/9	Blackhawk ARC.....	320-	A-14-	2880
W8IRN/8	Kanawha RC.....	453-	B-20-	2868
W4GNF/4	Greensboro RC.....	438-	B-35-	2778
W7IO/7	Arizona ARC.....	355-	AB-15-	2778
W9NZ/9	Swan ARC.....	306-	A-16-	2754
W7YN/7	Nevada AR Assn.....	410-	AB-11-	2691
W4NVU/4	Dade RC.....	269-	A-10-	2646
W4PLB/4	Orlando ARC.....	284-	A-18-	2556
K2ERQ/2	IBM AR Assn.....	422-	B-12-	2532
W1AQ/1	Associated RA of Southern New England.....	252-	A- 6-	2493
VE6NQ/6	Calgary AR Assn.....	333-	AB-20-	2490
K6IDV/6	(nonclub group).....	250-	A- 5-	2475
W1KKS/1	Manchester RC.....	273-	A-13-	2457
W4NEK/4	Navair ARC.....	382-	B- 7-	2442
W5IJO/5	(nonclub group).....	368-	B- 8-	2358
W5TAK/5	Jackson ARC.....	368-	B-14-	2358
K4JLA/4	Spartanburg ARC....	335-	AB-15-	2349
W4FWU/4	(nonclub group).....	376-	AB- -	2331
K6HGA/6	Chula Vista ARC....	302-	AB- 7-	2217
W3VV/3	McKean County RC..	358-	B- -	2148
W2CWW/2	Staten Island AR Assn.	352-	ABC-22-	2142
W1DDD/1	Blackstone Valley ARC	349-	B-35-	2094
KØGPV/Ø	Southwest Iowa AR Assn.....	319-	B-25-	2064
W8AM/8	Coffee Dunkers.....	204-	A- 9-	2061
W4AB/4	Broward ARC.....	301-	AB-15-	2001
W7TZ/7	Grays Harbor ARC..	286-	AB-18-	1998
VE1LC/1	Loyalist City ARC...	277-	AB-15-	1998
WØYWS/Ø	Southwest Missouri ARC.....	305-	B-30-	1980
W9AWE/9	Western Illinois RC..	194-	A-16-	1971
W2AVZ/2	Hamilton Township Radio Assn.....	193-	A-15-	1962
W6AEX/6	Society of AR Operators.....	326-	B- -	1956
W6MLI/6	Coronado RC.....	296-	B- 8-	1932
K4FDT/4	(nonclub group).....	317-	B- 8-	1902
W5NZH/5	Magic Valley RA....	348-	BC-12-	1881
W5IGC/5	Alamogordo ARC....	306-	AB-16-	1848
W1YFA/1	Walpole ARC.....	239-	AB-13-	1824
WØLGO/Ø	Council Bluffs Radio Operators Club....	276-	B-10-	1806
W4NGO/4	Tri-County RC.....	271-	B-15-	1776
W7UZ 7	Tacoma ARS.....	208-	AB-12-	1761
W9QK/9	Y-Rad RC.....	265-	B-17-	1740
W2GSW/2	Smithtown Civil Defense AR Assn.....	289-	B-12-	1734
W1BRF/1	Quinnebaug Valley RC	478-	BC-10-	1731
W9BOM/9	Kenosha Radio Communications Society	191-	A-13-	1719
W7MXH/7	Cascade RC.....	261-	B-15-	1716
WØEQU/Ø	Ak-Sar-Ben RC.....	360-	BC-26-	1695
VE3YJ/3	London ARC.....	240-	AB- -	1641
W8TPY/8	Belmont County ARC	242-	B- 6-	1602
W1HEB/1	Middlesex ARC.....	261-	B-15-	1566
K5AXA/5	San Angelo ARC....	220-	AB-25-	1539
W1NPP/1	Androscoggin AR Assn.	201-	AB-20-	1524
W3SAY/3	Nittany ARC.....	196-	AB-20-	1488
WØOJY/Ø	Prairie Dog ARC....	224-	AB-24-	1455
W4EFR/4	Petersburg ARC.....	209-	B-16-	1404
WØBGR/Ø	Coffeyville ARS.....	234-	B-13-	1404
W1NBN/1	Merrimac Valley ARC	151-	AB-17-	1395
W2SEX/2	AR Assn. of the Tonawandas.....	152-	A-10-	1368
W9ILS/9	Chicagoland Mobile RC.....	168-	AB-22-	1326
W2GBN/2	Schoharie County ARC	156-	AB-10-	1296
W3VPR/3	Anne Arundel RC....	210-	B-15-	1260
W4VM/4	Coastal Plain ARC...	210-	B-20-	1260
VE7ANW/7	Royal City AR Assn..	175-	B- 6-	1218
W2AFU/2	Ocean County AR Assn.....	160-	AB-17-	1203
VE7ES/7	Totem ARC.....	152-	AB- 9-	1176
W1ISK/1	Twin State RC.....	195-	B- 8-	1170
W6BLW/6	Feather River ARC..	207-	ABC-10-	1170
KØEXJ/Ø	Kil-A-Wat ARC.....	137-	AB-22-	1167
K2ESM/2	(nonclub group).....	194-	B- 3-	1164
W4LEN/4	Decatur ARC.....	194-	B-13-	1164
VE7ASM/7	Fraser Valley ARC...	102-	A- 6-	1143
WØILO/Ø	Red River RA.....	126-	A-10-	1134
W3MDO/3	Pocono ARC.....	129-	AB- 9-	1041
W3CYU/3	Warren County Emergency Radio Assn..	173-	B- 9-	1038
K2KED/2	Burlington County RC	224-	ABC-25-	1002
W8HLD/8	Catalpa ARS.....	134-	AB-21-	975
W7PXR/7	Yellowstone RC.....	162-	B- 6-	972
K7FCB/7	Ocean View ARC....	81-	A- 3-	954
W9CBR/9	Wabash Valley AR Assn.....	166-	BC-25-	885
KØWAQ/Ø	Wichita ARC.....	137-	B-11-	822
W5UNB/5	Santa Fe RC.....	138-	ABC- 4-	816
W9JEP/9	Green Bay Mike and Key Club.....	108-	AB-20-	816
W2LUX/2	Queens RA.....	120-	AB- 8-	804
K2BFW/2	Boys' Life Magazine Radio Club.....	243-	A- 5-	804
WØLUI/Ø	Flint Hills ARC.....	126-	B-14-	756
W9EHE/9	Duneland AR Assn....	124-	B-14-	744
K9CJO/9	RA Megacycle Society	114-	AB- -	744
W5SVB/5	Gulf Coast Emergency Radio Net.....	57-	A- 4-	738
WØCDA/Ø	St. Louis ARC.....	113-	AB-15-	732
W9CDO/9	(nonclub group).....	115-	ABC-12-	705
K6DWH/6	Alpine ARC.....	130-	AC- 4-	651
W7YXG/7	Great Falls RC.....	154-	BC-10-	645
KØCEA/Ø	Southeast Missouri ARC.....	70-	A-20-	630
KØAZV/Ø	(nonclub group).....	66-	A- 6-	594
WØOLE/Ø	(nonclub group).....	95-	B- -	570
W8SEB/8	Southeastern Michigan AR Assn.....	83-	AB-20-	558
W1TKA/2	Stamford ARC.....	91-	B- 7-	546
K2GJU/2	(nonclub group).....	177-	AB- 7-	506
K2QDB/2	Brooklyn Civic Center RC.....	63-	AB-12-	471

(Continued on page 160)

And, for that lasting Smile of Satisfaction... get it from HAM HEADQUARTERS, USA!

BECAUSE:

1—Harrison will "fire-up" your KWS-1 for you, and stay with you until you handle it on-the-air as smoothly as an expert!

2—Harrison's big, **BIG**, allowance for your present rig will usually more than cover the down payment—you **PAY NO MONEY NOW!**

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So, why go a day longer denying yourself the fun of joining the gang. You can be right up there on top, with the new Collins Full-Power KWS-1 Transmitter for SSB, CW, *and* AM! And, with the companion 75A-4 Receiver, the World is yours!

REMEMBER,
It actually costs you less per year to own the best, because you'll receive a lot more for it when you go to sell or trade! It is a sound investment, one which will give you extra dividends in outstanding QSO performance, greater operating pleasure, and pride of ownership.

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to get your new rig! At Harrison's you are sure that what you purchase is the newest, the latest, and the best for your purpose. Only at Harrison can you obtain that extra measure of interested, competent service that brings you complete and lasting satisfaction at truly lowest cost.

Let's get together, now, OM!
Come on in, or phone or write me.
It's easier than you think to own the best!
Merry Christmas, Gang!
73. Bil Harrison, W2AVA

New production 75A-4	$ 595.00
Vernier Tuning Knob, extra	15.00
Extra Mechanical Filters: 500 cycle (for CW), 6 Kc (for AM). EACH	35.00
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W8FAU/8	Quaker Radio Assn...	125-	BC-10-	414
VO1NR/2	Newfoundland RC...	42-	B-10-	402
W8HCF/8	Detroit Metropolitan RC.....	50-	AB-10-	354
K2MMQ/2	Central Queens RC...	102-	AB-11-	323
W3ZOZ/3	Hasleton ARC.....	34-	AB- 6-	264
W9UL/9	Knox-Warren AR Assn.....	72-	BC- 9-	252
KL7RN/KL7	Polar AR Klub.....	88-	B- 6-	226

Four Transmitters Operated Simultaneously

W6PD/6	Foothill Mobile Net..	1253-	A-15-11,277
W9PCB/9	York RC.....	1133-	A-19-10,422
W6VUP/6	(nonclub group).....	1040-	A-14- 9360
W1SKT/1	Narragansett Assn. of AR Operators.....	890-	A-20- 8235
W8MGJ/6	Helix ARC.....	855-	A-12- 7920
W2OR/2	Pompton Valley RC..	1000-	AB-35- 7249
W8KP/8	Amateur MARS Communicators Club...	845-	AB-30- 6990
W8MRM/8	Motor City RC.....	861-	AB-25- 6834
K6AAZ/6	Pasadena RC.....	714-	A-18- 6660
W9SWQ/9	Four Lakes ARC.....	755-	AB-30- 6597
K2BC/2	Windblowers V.H.F. Society.....	687-	A-18- 6426
K6CXI/6	Hamilton H. S. ARC.	712-	A-15- 6408
W5PDO/5	Los Alamos ARC....	875-	AB-20- 6402
KP4ZA/KP4	Ramey ARC.....	677-	A-10- 6318
W6JU/6	Crescenta Valley RC.	943-	AB-15- 6054
K6PVN/6	Rio Hondo RC.....	645-	A-25- 6048
W9OFR/9	Joliet ARS.....	613-	A-23- 5517
W1OMI/1	El-Ray ARC.....	607-	AB-15- 5328
W6MWO/6	Young Ladies' RC of Los Angeles.....	779-	AB- 9- 5328
W2QYV/2	Niagara RC.....	540-	A-15- 5103
W3AFM/3	Chesapeake ARC....	622-	AB- - 5067
W2ZQ/2	Delaware Valley Radio Assn.....	583-	AB-25- 5031
W6HAL/6	Citrus Belt ARC....	553-	A-16- 4977
W6MHM/6	Bell Gardens AR Assn.	518-	A-15- 4887
W4JP/4	Blue Grass ARC.....	514-	A-20- 4851
W4PAY/4	ARC of Falls Church.	572-	AB- - 4827
W3OK/3	Delaware-Lehigh ARC	508-	A-18- 4797
W7NTO/7	Lewis County ARC..	461-	A-20- 4374
W3NKF/3	Naval Research Laboratory ARC.....	451-	A-14- 4284
W1SS/1	Bedford RC.....	660-	B-14- 4110
W2KKE/1	Westchester AR Assn.	517-	AB-20- 3786
KØEMH/Ø	Tri-State RC.....	602-	B- - 3612
VE3BSD/3	Quinte ARC.....	557-	AB-28- 3591
W7RGL/7	North Kitsap ARC..	394-	AB-11- 3531
W8DC/8	Grand Rapids AR Assn.....	584-	B-30- 3504
W1WFB/1	Milford ARC.....	547-	AB-17- 3465
W5NF/5	Channel Communication Club.....	481-	AB- - 3405
W4DU/4	Jacksonville ARS....	520-	AB-22- 3405
W9JP/9	Indianapolis RC....	414-	AB-23- 3339
K9AVO/9	Western Electric ARC	527-	B-15- 3312
K6SIR/6	Ramona RC.....	503-	AB-19- 3306
W4TRC/4	Kingsport ARC.....	534-	B-25- 3204
W5UIV/5	Hobbs ARC.....	527-	B- - 3162
VE3AIS/3	Oakville ARC.....	342-	AB-16- 3024
WØCET/Ø	Kaw Valley RC.....	456-	B-12- 2982
WØQLW/Ø	Kansas City Mobile Unit.....	486-	B-12- 2916
K5CQF/5	Panhandle ARC.....	481-	B- - 2886
W2ZB/2	(nonclub group).....	328-	AB- 7- 2814
W2DPQ/2	Huntington RC.....	364-	AB-15- 2739
K4HEX/4	Lynchburg ARC.....	399-	AB- - 2673
VE3DC/3	Hamilton ARC.....	257-	A-36- 2664
W6MFL/6	Cathay ARC.....	361-	AB- 8- 2610
VE7APL/7	North and West Vancouver ARC.....	329-	AB-10- 2601
W2GLO/2	Levittown ARC.....	405-	AB-14- 2574
W1MHL/1	Waltham AR Assn....	282-	AB- - 2520
W4KH/4	Nashville ARC.....	379-	AB-40- 2511
W8AKA/8	(nonclub group).....	269-	A-10- 2421
W3KWH/3	Steel City ARC.....	397-	B-22- 2382
W2NRY/2	Mid-Hudson RC.....	318-	AB- 8- 2367
K2TAZ/2	Northern Nassau ARC	344-	AB-24- 2286
K2AAN/2	Babylon RC.....	320-	AB-10- 2196
W4CA/4	Blue Ridge ARS.....	333-	AB-25- 2154
W4NEP/4	Paducah ARC.....	358-	B-10- 2148
K6KHE/6	Yuba-Sutter RC.....	350-	B-12- 2100
K2HEM/2	East Meadow RC....	251-	AB-15- 2019
W3PGA/3	Aero ARC.....	310-	AB-12- 2010
W3GUR/3	Pottstown AR Assn...	319-	ABC- 9- 1998
W1JJL/1	CQ RC.....	302-	AB-18- 1962
W2EFU/2	Schenectady AR Assn.	438-	ABC-40- 1893
W9CLI/9	Midway RC.....	240-	AB- 8- 1875
W4AM/4	RAC of Knoxville....	271-	AB- - 1650
W3RQM/3	Burroughs ARC.....	257-	AB-16- 1647
VE7EZ/7	Victoria Shortwave Club.....	248-	B-12- 1638
W8WNK/8	(nonclub group).....	263-	B-10- 1578
K2BR/2	Southern Counties AR Assn.....	232-	B-16- 1542
VE1RC/1	Moncton ARC.....	224-	AB-10- 1530
WØERH/Ø	Johnson County RAC	246-	ABC-35- 1527
W1TRZ/1	Tri-County ARC.....	191-	AB-12- 1479
W9HGC/9	CAA ARC.....	212-	B- 7- 1428
VE3BNK/3	Robiin ARC.....	186-	AB-11- 1347
W8LTZ/8	Gratiot County AR Assn.....	147-	A-15- 1323
W1MB/1	Satuit ARC.....	193-	B-15- 1320
W1ECV/1	Southington AR Assn.	140-	A-12- 1260
KØBVX/Ø	Whent Belt RC.....	206-	B-19- 1236
WØWME/Ø	Montrose County ARC	136-	A-15- 1224
VE3CY/3	Kitchener-Waterloo ARC.....	176-	AB- 8- 1140
K5FIB/5	Harlingen ARC.....	350-	BC- - 1116
W8NVN/8	(nonclub group).....	183-	ABC- 8- 1095
W4NPT/4	FAETULANT ARC.	118-	A-12- 1062
W2US/2	Suffolk County RC...	200-	BC- - 957
W3FZC/3	MIC ARC.....	127-	AB-23- 957

(Continued on page 162)

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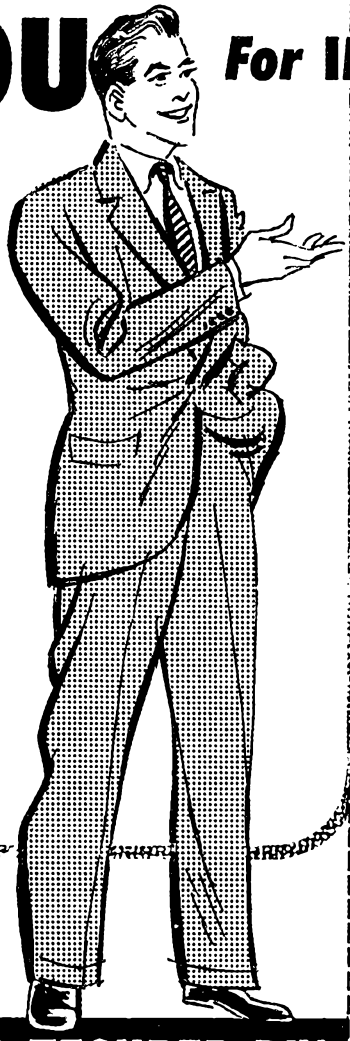

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NAME _____

ADDRESS _____

CITY _____

FIELD OF INTEREST _____

WØVQN/Ø	Tri-City RAC	132-	B-15-		942
K2LFU/2	Black River Valley ARC	277-	AC-10-		921
W8ERK/8	Bay County RA	146-	ABC-14-		884
W3TQU/3	South Philadelphia ARC	124-	AB-20-		867
K3WCO/3	69th Signal Battalion ARC	167-	BC- 7-		825
W3GH/3	Wyoming Valley ARC	150-	ABC-10-		789
W2MVS/2	Trylon RC	235-	AB-17-		753
WØEIJ/Ø	Grand Island ARS	143-	BC-10-		747
W8FGY/8	Van Wert ARC	158-	ABC-16-		636
WØPMW/Ø	Boot Hill ARC	62-	B-12-		522
W2DYM/2	Amateur UHF Club of Jamaica	143-	AB-14-		435
W4CBM/4	Danville RAC	171-	ABC-15-		208

Five Transmitters Operated Simultaneously

W2YKQ/2	Lake Success RC	780-	A-23-		7308
W2IN/2	Fordham RC	927-	AB-37-		7263
W6AVJ/6	Four H Minus One RC	876-	AB-25-		6864
W2KOJ/2	Watchung Valley RC	701-	A-25-		6534
W2GLQ/2	Nutley ARS	649-	A- -		5841
W1WKN/1	Old Colony Radio Assn.	610-	A-15-		5490
W7YYE/7	Oregonian ARS	850-	B-42-		5262
W5CT/5	Austin ARC	774-	AB-26-		5049
W5CF/5	Ft. Worth Kilocycle Club	830-	B-54-		4980
W1O8A/1	Pittsfield RC	569-	AB-31-		4221
W1ECO/1	Sub. Signal ARC	485-	AB-36-		4059
W6OYJ/6	Corona Gang	479-	AB- 6-		4035
W9IAW/9	Twin City RC	612-	B-25-		3822
W1GES/1	North Shore Radio Assn.	491-	AB-24-		3438
W4MOE/4	Asheville ARC	539-	B-21-		3408
W8KGG/8	Huron Valley AR Assn.	492-	B-23-		2952
K6CSU/6	Band Spanners ARC	401-	AB-12-		2769
W7BHT/7	Mid Columbia ARC	425-	B-18-		2550
W9DUK/9	Delaware AR Assn.	414-	ABC-15-		2473
W8WCE/8	Saginaw Valley AR Assn.	364-	B-45-		2334
VE2ADX/2	South Shore ARC	289-	AB-19-		2286
W3RDM/3	York Road RC	357-	B-11-		2142
W5CXU/5	Pioneer RA of Kay County	392-	BC-12-		2076
W8WIT/8	Toledo Mobile Radio Assn.	299-	AB-15-		2073
W3UCR/3	Harford County AR Assn.	300-	AB-24-		2049
VE3BAC/3	Mohawk ARC	185-	A-14-		1890
K6AM/6	Upper Ten RC	291-	ABC-12-		1794
W3QHF/3	Windsor ARC	267-	AB-15-		1698
W6K8T/6	Mojave Desert ARC	260-	AB-13-		1617
W5NRJ/5	Garland ARC	324-	BC-15-		1557
KØBPR/Ø	Fairfield H. S. ARC	266-	ABC-15-		1194
W2SB/2	Northern Chautauqua ARC	149-	ABC-20-		1143
W1LAS/1	Waterbury ARC	265-	ABC-30-		1098
W4VTF/4	Catawba Valley ARC	262-	ABC-25-		990
W3CTC/3	Delaware Valley ARC	99-	AB-10-		211

Six Transmitters Operated Simultaneously

K2AA/2	South Jersey Radio Assn.	1250-	A-30-		11,475
W2VDJ/2	Lakeland AR Assn.	1166-	A-25-		10,737
W9SW/9	Chicago Suburban Radio Assn.	837-	A-40-		7758
W6PMI/6	United RAC	980-	AB-18-		7680
K9AVE/9	Illinois Valley Radio Assn.	837-	A-16-		7533
K6GOB/6	Collins RC	827-	AB-13-		5532
W8ACW/8	Genesee County RC	707-	AB-60-		4689
W3VRZ/3	Beaver Valley AR Assn.	576-	ABC-10-		4537
W2BVL/2	Nassau RC	711-	AB-30-		4464
W7NZA/7	AR Assn. of Bremerton	638-	AB-15-		3864
W9BA/9	St. Clair ARC	603-	AB-22-		3858
W2GM/2	Albany AR Assn.	541-	AB-23-		3549
W4DW/4	Wake County RC	584-	B-15-		3504
W1KVZ/1	Yankee RC	433-	AB-20-		3456
W7NBR/7	Spokane RA	492-	AB-19-		3087
W6LIE/6	Kern County RC	481-	B-22-		3036
VE3AVU/3	North Shore RC	285-	AB- 9-		2724
W5US/5	Wichita Falls ARC	397-	B-25-		2532
W9UVI/9	Peoria-Area ARC	357-	ABC-12-		2208
K6CUK/6	El Segundo CD Radio Group	319-	AB- -		2001
W6PMK/6	North Peninsula Electronics Club	213-	A-14-		1917
W8ID/8	Seneca RC	198-	AB-30-		1275
W9EKR/9	Anderson ARC	259-	ABC-25-		1146
W9NET/9	Cenois ARC	238-	ABC-26-		1101
W4THM/4	Bristol ARC	442-	AB-20-		892

Seven Transmitters Operated Simultaneously

W7HZ/7	Valley ARC	1275-	A-56-		11,700
W6NWG/6	Palomar RC	1528-	AB-20-		10,353
W7DK/7	RC of Tacoma	995-	A-31-		9198
W6LS/6	Lockheed ARC	904-	AB-19-		7020
W6OZ/6	Palisades ARC	1216-	ABC-13-		6435
W6OT/6	Oakland RC	969-	AB-25-		6075
K6FD/6	Sylvania ARC	637-	AB-30-		5553
W1GLA/1	Framingham RC	529-	A-24-		4986
K6QZJ/6	Riverside County AR Assn.	712-	AB-21-		4650
W8RNF/8	Lake-Geauga ARC	759-	B-22-		4554
VE3ZM/3	Guelph ARC	518-	AB-18-		4320
W4VTA/4	Confederate Signal Corps	616-	AB-14-		3885
W5ABD/5	Westside ARC	595-	B-16-		3720
W6SD/6	San Fernando Valley RC	435-	AB-25-		3528

(Continued on page 164)

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VE3BXT/3	Scarboro ARC	376-	A-20-	3384
W7KYC/7	Portland ARC	374-	AB-18-	2445
W5WIH/5	South Plains ARC	453-	BC-30-	2043
K4JIY/4	Aiken ARC	226-	AB-10-	1923
W3GV/3	Radio Assn. of Erie	222-	ABC-30-	1350

Eight Transmitters Operated Simultaneously

W5SC/5	San Antonio RC	1464-	AB-	10,689
W6UW/6	Santa Clara County AR Assn.	1523-	B-40-	9288
W6PW/6	San Francisco RC	1122-	AB-23-	7494
W8OUD/8	Fort Hamilton AR Assn.	636-	A-17-	5049
W0CKF/0	Minneapolis RC	873-	AB-60-	5910
VE3JJ/3	West side RC	618-	A-25-	5787
W6CX/6	Mt. Diablo ARC	573-	A-29-	5373
W9AP/9	North Suburban RC	567-	A-25-	5328
W3BTN/3	North Penn ARC	781-	AB-45-	4878
W8FO/8	Toledo RC	626-	B-45-	3756

Nine Transmitters Operated Simultaneously

W8EV/8	Ohio Valley AR Assn.	1725-	A-40-	15,750
W1OC/1	Concord Brasspounders	1525-	A-28-	13,950
K6EBN/6	Westchester AR Assn.	1220-	A-32-	10,980
VE3BRR/3	Nortown ARC	606-	A-40-	5697
W7NCW/7	Lower Columbia AR Assn.	537-	ABC-27-	4491

Ten Transmitters Operated Simultaneously

K6BAG/6	Pacifico RC	3069-	ABC-30-	17,139
W6TOI/6	Downey ARC	1291-	AB-	9363
W3RCN/3	Rock Creek AR Assn.	942-	A-65-	8703
W6LUC/6	Santa Barbara ARC	1162-	AB-19-	8831

Eleven Transmitters Operated Simultaneously

W2LI/2	Tri-County Radio Assn.	2252-	A-30-	20,493
W2GSA/2	Garden State AR Assn.	2000-	A-40-	18,225
K6DTA/6	West Valley RC	1355-	A-45-	12,420

Twelve Transmitters Operated Simultaneously

W9RK/9	Northwest ARC	1497-	A-46-	13,698

Thirteen Transmitters Operated Simultaneously

W6UF/6	Elmac Gang RC	2285-	A-61-	20,790

Fourteen Transmitters Operated Simultaneously

K6RXC/6	West Valley ARC	723-	AB-33-	5679

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 assisting operator is given below that of the amateur whose call was used. Figures following the call listings indicate number of contacts, power and final score.

One Transmitter

W3EIS/4				
W4KFC	462-	A-	6575	
W2JBQ/2				
W2FBA	340-	A-	4928	
K6BKT/6				
K6ASK	471-	B-	3000	
W9ESQ/9				
W9IU	274-	A-	2466	
WØAJA/Ø				
WØRJX	156-	A-	2444	
WØBBM/Ø				
WØRCZ	225-	A-	2354	
W9DSP/9				
W9EDW	204-	A-	2061	
W7WOQ/7				
WN7CHE	201-	A-	2034	
K6HKE/6				
K6HJZ	129-	A-	2009	
W8MZA/8				
W8MNZ	123-	A-	1998	
W7CJZ/7	107-	A-	1782	
W6OPY/6				
W6GTG	267-	B-	1752	
WN3EBG/3				
W3BES	164-	A-	1701	
W8OEQ/8				
W8HXB	153-	A-	1602	
K2GMF/2	114-	A-	1539	
W7ZLG/7	162-	A-	1458	
W3RZG/3				
W3PWK	185-	A-	1422	
W7PKA/7				
W7GHT	202-	B-	1362	
W8UVZ/8				
W8CNL	188-	B-	1278	
W7JKB/7				
W7FOR	200-	B-	1200	
W9OMT/9				
W9GYA	133-	A-	1197	
K2AFQ/2				
K2CLL	54-	A-	1067	
W6TUZ/6				
KN6ALH	113-	A-	1017	
W4BXE/4				
K4AWV	144-	B-	1014	
K6ORT/6				
K6EDE	143-	B-	1008	
W9OEY/9				
W9OHU	48-	A-	999	
W5YKE/5				
W5STI	144-	BC-	984	
W3FYS/3				
W6HOH	306-	A-	918	
KØAAN/Ø				
WØVYK	120-	B-	870	
K6KYH/6	61-	A-	824	
K6OHV/6	28-	A-	770	
W3ZFY/3				
W3ZHH	122-	B-	742	
WINXX/1				
WN1FKJ	57-	B-	738	
W3ZEM/4				
W3BYP	121-	B-	726	
W7GUS/7				
W7JHX	55-	A-	720	
WØYOR/Ø	120-	B-	720	
VE7AC/7	28-	A-	716	
W4ZMR/4				
W4CPK	116-	B-	696	
W6PMU/6	26-	A-	689	
W9DIK/9				
KN9CUA	111-	B-	666	
W2DMJ/2	45-	A-	630	
K6LVL/6				
K6MKG	40-	A-	585	
WØVJD/Ø				
WØPWJ	92-	B-	552	
K6CJA/6				
K6DFK	57-	A-	513	
W9JCF/9	32-	A-	513	
W7VRO/7	81-	B-	486	
W9KZM/9				
W9JJT	55-	B-	480	
WØQDZ/Ø				
WØZMU	51-	A-	459	
W7MLT/7	76-	B-	456	
W6PFE/6	33-	A-	446	
WØYVY/Ø[1]	145-	C-	435	
K2KDW/2	217-	B-	434	
W4BGV/4				
K4BKG	217-	B-	434	
W4FOX/4				
K4CEF	47-	AB-	372	

(*Continued on page 166*)

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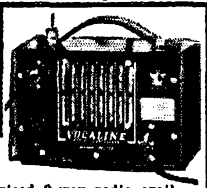

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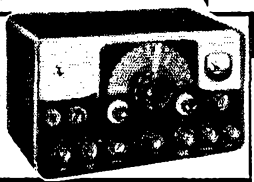

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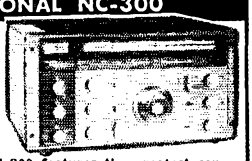

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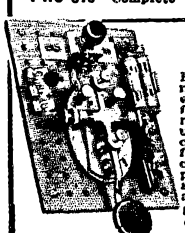

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For those interested in mastering the international code, an audio tone oscillator is essential. The circuit of this transistorized feedback oscillator has the simplicity of the neon glow, the signal strength of the vacuum tube, and requires only two penlite cells for weeks of service. It may be used for solo practice, or two may send and receive with the same unit. Kit comes complete with Transistor, Telegraph Key, Resistors, Condensers, Masonite Board, etc., and Schematic Diagram.

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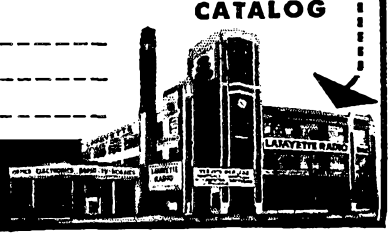

KNØCVD/Ø, KNØCBZ	16-	A-	369
W7NXZ/7	34-	B-	354
W6GJP/6, W6CMN	170-	B-	340
K4CHE/4	54-	B-	324
W4AJJ/4, K4ALB	53-	B-	318
W6JQX/6, W6NYA	99-	C-	297
W7MRW/7	49-	B-	294
W9DOW/9	30-	A-	270
W7YJW/7	27-	A-	261
W3CJV/3, W3BGL	25-	A-	225
K6KUQ/6	109-	B-	218
W8MNV/8, W8KWC	36-	B-	216
W5DAX/5, W5DBO	65-	A-	195
KØAQO/Ø, WØVXT	29-	B-	174
W8TBF/4	27-	B-	162
W7FZB/7	54-	B-	158
W2TYC/2	78-	B-	156
W2ZAL/2	11-	A-	149
W5NSV/5Ø7[2]	23-	B-	138
WN1IWK/1	43-	A-	129
W7WPR/7	119-	C-	119
W1YCW/1	13-	A-	117
WN3GOA/3	39-	A-	117
W2HF/2	12-	A-	108
W4WHF/4	34-	C-	102
K6HYX/7	7-	A-	95
W6FYG/6	15-	B-	90
K6HOA/6, KN6OLB	14-	B-	84
W5C1N/5Ø7[2]	11-	B-	66
W5SGC/5Ø7[2]	11-	B-	64
KN8BAH/8	9-	B-	56
KN4JJS/4	8-	B-	48
KNØCNT/Ø	15-	A-	45
K2G8M/2	6-	B-	36
W1BB/1	5-	B-	30
W9CMT/4	10-	B-	20

Two Transmitters

W6KLZ/6, W6PKK	290-	A-	2853
W9EWC/9, W9HTY	354-	AB-	2739
W1SFW/1, W1PWK	219-	AB-	1455
W6QHQ/6, W6QPG	193-	AB-	1314
W7BTF/7, W7QEV	34-	A-	797
W1YOR/1, W1QCL	145-	AC-	641

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.

W8QAV/8	203-	A-	4239
W8ERA/8	151-	A-	3537
W8GHO/8	116-	A-	3065
W8PM/8	110-	A-	2985
W8INO/8	109-	A-	2970
W8AEU/8	107-	A-	2943
W8QXG/8	106-	A-	2930
W8LEX/8	99-	A-	2835
W8FKB/8	81-	A-	2592
W8QXW/8	81-	A-	2592
W8GMK/8	79-	A-	2565
K5EXZ/5	164-	A-	2552
W8OHA/8	78-	A-	2552
W8CQX/8	76-	A-	2525
W8ZXL/8	76-	A-	2525
W8HFE/8	75-	A-	2511
W8BDZ/8	70-	A-	2444
W8CDB/8	70-	A-	2444
W8CZM/8	70-	A-	2444
W8GHT/8	70-	A-	2444
W8IWP/8	70-	A-	2444
W8MAE/8	70-	A-	2444
W8MWE/8	70-	A-	2444
W8NGY/8	70-	A-	2444
W8NLJ/8	70-	A-	2444
W8NLX/8	70-	A-	2444
W8NOX/8	70-	A-	2444
W8NYX/8	70-	A-	2444
W8PVA/8	70-	A-	2444
W8RDF/8	70-	A-	2444
W8SDV/8	70-	A-	2444
W8SZV/8	70-	A-	2444
W8VUI/8	70-	A-	2444
W8WAG/8	70-	A-	2444
W8ZJQ/8	70-	A-	2444
W8LHJ/8	36-	A-	1985
W8LPZ/8	36-	A-	1985
K2KUC/2[3]	119-	A-	1944
W6NFH/6	178-	B-	1827
W5LPF/5	67-	A-	1809
K4BCN/4	175-	B-	1800
W1WAL/5	62	A-	1688
K4GTZ/4	162-	B-	1683
W5ELK/5[4]	95-	A-	1634
W9NJB/6	95-	A-	1620
W6OLY/6	94-	A-	1607
W5GGJ/5	49-	A-	1512
W9YWF/9	81-	A-	1431
W5FVY/5	42-	A-	1418
K5GBU/5	38-	A-	1364
W6AML/6	76-	A-	1364
W5ZSL/5	39-	A-	1350
W6ZVD/6	75-	A-	1350
W9EZS/9	75-	A-	1350
K6CTH/6	70-	A-	1337
W9C8V/9	73-	A-	1323
W9TWA/9	98-	A-	1323
W5UWA/5	32-	A-	1283
K5DHZ/5	31-	A-	1269
K6IPV/6	115-	B-	1260
W5BYG/5	28-	A-	1229
W5GWJ/5	30-	A-	1229
W5CZT/5	24-	A-	1212
W4EXC/6	109-	A-	1206
W5WBG/5	25-	A-	1188
W3DOU/3	62-	A-	1175
W5UCW/5	23-	A-	1161
W7OYO/7	57-	A-	1107
W5UCX/5	18-	A-	1094
W6FA/6	55-	A-	1080
W5UOZ/5	16-	A-	1067
W3SAA/3	51-	A-	1026
W3PXY/3	50-	A-	1013
W5YDE/5	12-	A-	1013
W3SRU/3	46-	A-	959
K5CQH/5	8-	A-	959
W6TQB/6	71-	A-	959
W3NIP/3	60-	B-	936
WØOWY/2	41-	A-	918
K5DJU/5	4-	A-	905
W1SMO/1	65-	A-	878
W9NIO/9	40-	A-	878
VE1PF/1[5]	38-	A-	851
W3DSG/3	35-	A-	810
W3TOZ/3	34-	A-	797
W5FHP/5	37-	A-	783
W5TTF/5	87-	B-	783
W3QZO/3	31-	A-	770
W6UHC/6	31-	A-	756
W9MYI/9	56-	A-	756
W3FWZ/3	53-	A-	716
W3CNO/3	26-	A-	702
W3VVS/3	27-	A-	702
W3SAE/3	26-	A-	689
W6IIZ/6	26-	A-	689
W3FDJ/3	25-	A-	675
W3QZP/3	25-	A-	675
W3SAI/3	23-	A-	648
W6WI8/6	21-	A-	648
W1YBT/1	21-	A-	621
W6UTZ/6	20-	A-	621
K6CQX/5	19-	A-	621
W3UQM/3	43-	B-	612
W3BBB/3	20-	A-	608
W3LNQ/3	18-	A-	581
W3IVD/3	39-	A-	527
W3PWG/3	14-	A-	527
W5OAI/5	14-	A-	527
W3QQH/3	9-	A-	459
K6HJM/6	8-	A-	446
W3CDY/3	6-	A-	419
W5UAF/5	4-	A-	419
W2LID/2	30-	A-	405
W6GME/6	4-	A-	392
W6ZGA/6	28-	A-	378
K6GXK/6	28-	A-	378
W8AGA/8	2-	A-	365
W8AJH/8	2-	A-	365
W8AJW/8	2-	A-	365
W8BUQ/8	2-	A-	365
W8FGB/8[6]	2-	A-	365
W8ZEU/8	2-	A-	365
W6EJU/6	1-	A-	361
K6JDG/6	1-	A-	361
K6OGL/6	1-	A-	361
W8LVM/8	1-	A-	351
W2MZB/2[7]	38-	A-	342
W3HFD/3	38-	B-	342
W1BDI/1	5-	B-	270
W1QFO/1	25-	B-	234
W1FGF/1	17-	A-	230
K6BAY/6	16-	A-	216
K6CBN/6	15-	A-	216
K2CCX/2	15-	A-	203
W4CFJ/4	13-	A-	176
W3AJO/3	18-	B-	162
W4TJ8/4	12-	A-	162
W1CLF/1	31-	C-	140
W3ARD/3	15-	B-	135
KØBZK/Ø	15-	C-	135
W3WNC/3	8-	A-	108
K5BUV/5	8-	A-	108
WØDEL/Ø	8-	A-	108
W3FXG/3	7-	A-	95
W3UMK/3	10-	B-	90
W2PSH/2	5-	A-	68
W5GBV/5	5-	A-	68
W6AOI/6	5-	A-	68
W8MPZ/8	5-	A-	68
W2ZAS/3	4-	A-	54
W3TWQ/3	4-	A-	54
W6UOC/6	6-	B-	54
K2AOE/2	8-	B-	48
K4IKF/4	5-	B-	45

(Continued on page 168)

A QUALITY XMTTR.
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The Globe Champion 300

Competely Bandswitching, 160-10M
350 W. CW, 275 W. Fone, 300 W. SSB (P.E.P.)*

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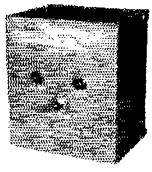

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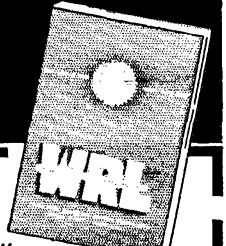

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K4CFN/4	2-A-	27	KØBY8/Ø	2-A-	27
K4CFO/4	2-A-	27	WØNLV/Ø	2-B-	18
K4IWN/4	2-A-	27	W9VER/8	1-A-	14
W8CBM/8	2-A-	27	KØBRF/Ø	1-A-	14

CLASS D

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

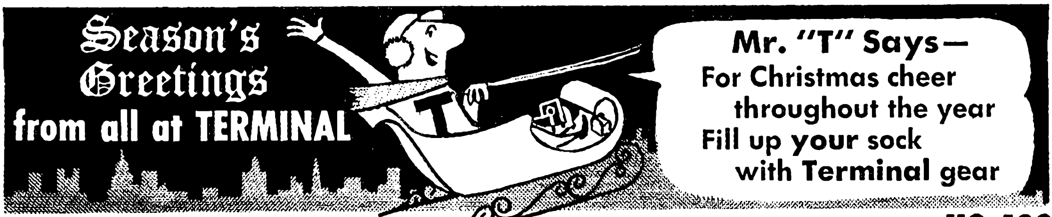
K2OFQ [8]	435	W4RWM	47
K4CDA	250	W2ZAL	12
W7WLG	117		

CLASS E

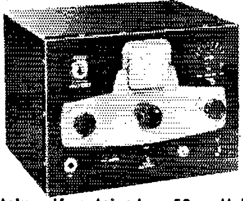
Grouped in this tabulation are the scores of home stations operated from commercial power sources.

W3M8R	381	W8JDN	31
W9BHR [9]	350	W8AYS	30
W4WKQ	321	W9EBY	29
W8NCF [10]	320	K4HAV	24
W4YI [11]	296	W2SJV	23
W4FGH [12]	295	W3WHK	23
W9EXL	236	K4JLO	23
W2DSC [13]	150	K2ITG	21
W4RUE	144	KN2ROH [18]	21
K2MFW [14]	131	W4HBO	21
W1ZIO	126	W6R8U/6	21
K2OPJ	114	W8WRO	21
W4HKJ	114	W2TUK	20
W5KRI [15]	114	K2PIM	20
K6EA	110	W6EHZ	19
W3UMU	104	W3GKP	17
WØYCA	103	WN7COK	17
W6MJP	97	W8IDM	17
W7PQE	97	K2AMP	16
K2GZD	96	K5BVM	16
W7YAQ	93	W3RHT	15
W1EOR	91	WN7BEC	15
K6LNB	82	K2RDP [19]	13
K4CQA	80	KN2TGU	13
K5DSX	77	K4DRO	13
K6COP	76	W9MCK	12
W1AW [16]	75	W9RKE	12
W4BUW	73	W7CWN	11
K6LKG	73	W7OVJ	11
W2CPA	72	KN4IPB	10
W4SGH [17]	70	W6QIW	10
W7VRG	70	W3IMW	9
W8UPH	70	W5GRI	9
W6AM	66	W1FVV	8
W3TN	64	K2CHS	8
W8MXO	64	W3UJP	8
K9AUB	63	W7HVM	8
W5EUQ	60	W9QGA	8
K2CTK	57	WØWTJ	8
VE5DZ	53	W9HWN	7
K6LSG	52	W9UMF	7
W1IQD	51	W2MYN	5
WN7CNL	51	W3BZR	5
WØHAW	48	W9TAL	5
K4BES	44	VE5JK	5
K6CKA	43	W7EYR	4
K2MYS	42	W7PSS	4
W3HTK	42	KNØDON	4
VE3NG	42	K2LDN	3
VE7XK	41	W3ZAO	3
W2PVE	38	W4FLX/4	3
K6PLW	37	K6PBX	3
K2MMM/2	35	W2LID	2
W6QOZ/6	34	W3WAF	2
W9YAC	34	K5DET	2
K2JYS	32	VE7BG	1
W7DLR	32		

[1] KØs ASE CHC, oprs. [2] Only point in the U. S. A. common to 4 states, Arizona, Utah, Colorado and New Mexico. [3] W2s KXR MIU OZU WZX, K2s CVR IDH KUC, oprs. [4] W5UUA, second opr. [5] VE1ABT, second opr. [6] 2 oprs. [7] W2s MZB PIA UVM, oprs. [8] Frog Hollow ARC. [9] Kekionga ARC. [10] Tusco RC. [11] W4TFP, W8s HOM SYD, oprs. [12] W4BXV, second opr. [13] N. Y. Univ. RC. [14] 9 oprs. [15] K5DET, second opr. [16] W1WPR, opr. [17] W4FXQ, opr. [18] KN2RLI, second opr. [19] KN2PXO, second opr.



JOHNSON'S VIKING "ADVENTURER" CW Transmitter Kit



Completely self-contained • 50 watt Power Input • TVI suppression • Pi-network output tuning • no antenna tuning needed • single knob bandswitching for 80, 40, 20, 15, 11, and 10 meters • Compact! Only 7⅜" x 10⅜" x 8⅛".

No. 240-181-1 VIKING ADVENTURER KIT Complete with tubes, instructions, less crystals and key. **$54.95**

VIKING "6N2" VHF Transmitter

for Real Power and Punch on 6 and 2 Meters!

Bandswitching • TVI Suppressed • Built-in XTL control • External VFO jack • 5894 PP output stage • 150 watts CW or 100 watts AM input. Adapted to use a wide variety of modulators and power supplies or use with your Viking "Ranger," Viking I or II or similar xmtrs.

VIKING 6N2 KIT with tubes and instructions, less key, mike, Xtl, Mod. and Pwr. supply........ **$99.50**

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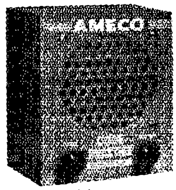
Communication Receiver — features AC powered performance at only little more than AC-DC price!

Broadcast 540-1630 kc plus four S/W bands covering 2.5-31 and 48-54.5 Mc. Overseas dial—headphones jack—separate electrical bandspread. Seven tubes plus one rectifier—105/125V. 50/60 cycle AC. Satin black steel cabinet, silver trim, piano hinge top. 12⅞" x 7" x 7¾".

No. S-53A Hallicrafters **$89.95**

AMECO CODE PRACTICE OSCILLATOR



A real top quality unit that produces a pure, steady tone without clicks or chirps. Can handle a large number of headphones or keys. Includes 4" built-in speaker, variable tone control and volume control. 115 VAC-DC. Unit readily converts to an excellent CW monitor

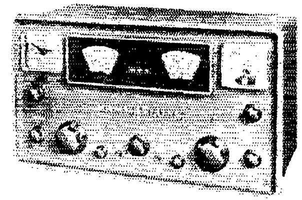
CPS-KL IN KIT FORM with complete instructions for assembly, less tubes. **$11.75**

CPS-WL Wired and tested, less tubes. **$12.95**

Set of two tubes (35W4 & 50C5). **$ 1.50**

HAMMARLUND'S New HQ-100

A True Communications Receiver At Moderate Cost!

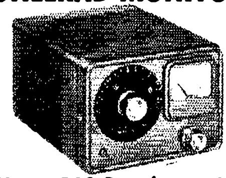


Continuous tuning from 540 kcs to 30 mcs • Customized Q multiplier • Electrical bandspread • Direct Dial Calibration • Noise Limiter • Individually Shielded RF and Oscillator coils • Voltage Regulated and Temperature-compensated H.F. Oscillator • Rock-like Stability • Rugged die-cast Aluminum Front Panel • Heavy Gauge Chassis and Cabinet • Compact! Only 16¼"x 9-7/16"x 9⅛"

HQ-100 less clock **$169.00**

With timer clock **$179.00**

MORROW CM-1 CONELRAD MONITOR



Meets FCC Requirements

5-tube tunable broadcast receiver with built-in speaker. Conelrad frequencies plainly marked. Meter permits visual monitoring, rear jack allows for relay connection to other signal devices. 115 VAC. **$39.50**

PASS FCC EXAMS WITH AMECO HOME CODE COURSES!

Let these 78 rpm recordings prepare you for all exams. Fast, easy method! You learn by **listening!**

NOVICE CODE COURSE—From alphabet through 8 wpm on 10 recordings. Typical FCC code exams. Instruction book **plus** charts to check your receiving accuracy. Complete **$7.95**

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SENIOR CODE COURSE—Combines materials and 22 recordings contained in the Novice and Advanced courses with a **savings** to you Complete **$12.95**

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New AMECO TRANSMITTER KIT

A high quality, reliable unit that's perfect for the beginner Heavy duty transformer-choke power supply. Pi-section output circuit permits random length antenna. **No antenna tuner necessary!** Includes TVI suppression features, 6V6 oscillator and 6X5 rectifier. 15 watts input crystal controlled. Designed for 40 and 80 meters CW. Simple, educational instructions included.

AMECO AC-1 KIT less tubes crystal **$16.95**

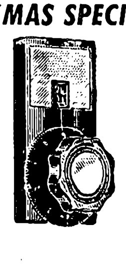
Extra coil kit CK-1........**$ .50**

Set of tubes for AC-1 (6V6 & 6X5) ....**$ 2.13**

Transmitter key ....**$ 1.95**

XMAS SPECIAL! All 4 items shipped postpaid. Remittance must accompany order! **$19.95**

Groth TURN COUNT DIALS



Registers fractions to 99.9 turns. For roller inductances, Inductuners, fine tuning gear reducers, vacuum and other multi-turn variable condensers. One hole mounting, handy logging space. Case: 2" x 4".

TC-2 (2⅛" Dial) **$4.20** **TC-3** (3" Dial) **$4.75**

Either with Spinner Handle, add 75c to price.

Send remittance, we ship postpaid.

DISTRIBUTORS OF ELECTRONIC EQUIPMENT

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Signal Slicer

(*Continued from page 35*)

the Slicer. Of course, if you own or can borrow a signal generator for the frequencies involved, the process of alignment will be that much easier and more precise.

Placement of parts is not critical and may be varied to suit individual requirements. The usual wiring and shielding precautions should be observed. The power requirements are 6.3 volts at 0.9 ampere and 18 ma. at 230 volts. The performance of this gadget in c.w. reception is a revelation. No longer do strong signals block the receiver, and it's amazing how well the weaker ones filter through. By judicious use of the b.f.o. capacitor true single-signal reception becomes the rule rather than the exception. Oh yes, the thing works on s.s.b. also!

Two Rare Countries

(*Continued from page 49*)

will not bother to pick them to sell.

The varieties of local fish are too numerous to list. Jon went fishing several times in a small boat. With just a handline he could bring in the fish as fast as he could land them. After a few hours fishing Jon had so many fish on board it became a problem to get the boat back to shore.

The tallest mountain on the island is called Paradise Peak and some parts of the slopes are very steep. In spite of this bananas flourish near the top slopes. On nearby estates we saw big, handsome avocados growing profusely along with breadfruit trees. The wild oranges are much sweeter than the usual domestic ones.

There isn't a DX-minded amateur that does not secretly dream of someday being rare DX himself. And to do so is an experience that one will never forget. The most difficult matter for an American amateur is to get a license to operate in a foreign country. The present reciprocal licensing agreement between America and Canada is the only one of its kind. (I hope there can be a movement started to permit temporary operation on the amateur bands between licensed amateurs of friendly countries in each other's country.) Getting permission at the present time depends solely upon the initiative and patience of the individual amateur. With determined effort and unending persistence, a great deal can be accomplished.

The splendid cooperation of VERONA, the amateur society of the Netherlands Antilles and particularly the sympathetic understanding of Mr. Van Haaren, who journeyed clear across the Caribbean to give me the Sint Maarten license examinations and to approve the installation at PJ2MC, was deeply appreciated.

During this June–July trip 3515 stations were contacted from PJ2MC, over 2000 on phone (nearly all with s.s.b.) and the balance on c.w. 138 countries were worked as well as all states without difficulty. An additional 1520 stations were worked from FS7RT.

(*Continued on page 172*)

Henry gives YOU A WHALE of A BARGAIN

and HENRY HAS ALL THE NEW EQUIPMENT First

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EASY TERMS

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A-1 RECONDITIONED APPARATUS

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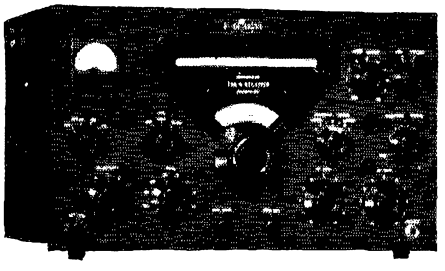

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An SSB Receiver that doesn't sacrifice top efficiency on AM, CW and RTTY . . . top features proved in earlier 75A models are retained.

20 monthly payments **$29.45**

$59.50 down

Cash Price **$595.00**

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Collins KWS1	$1995.00
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National NC 300	399.00
National NC 98	159.95
Hammarlund HQ 150	295.00
Hammarlund HQ 100	169.50
Hammarlund HQ 140XA	249.50
TMC GPR-90	495.00
Gonset G66	189.50
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Morrow MB-560	214.50
B & W 5100B	475.00

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"World's Largest Distributors of Short Wave Receivers."

Louise again painted a scene in oils for the QSL card. The card, in full color, shows the ruins of historic Fort Amsterdam as viewed from the operating position at PJ2MC in the royal suite at Little Bay. This seventeenth century fort, with its grim ramparts and weathered guns, is on the extreme end of the peninsula which divides Great Bay and Little Bay. Located on a steep cliff, its cannon protected the entry to Sint Maarten in the times of the pirates. As we wandered among the ruins of the fort, subconsciously we imagined ourselves to live in the time that the approach of a distant fleet could mean the beginning of a ferocious battle between the frigates and the coastal batteries.

Now, each ship is a welcome visitor; and instead of being pirates, we were modern envoys of good will.

Satellite Tracking

(Continued from page 43)

shown. L_2 is a self-resonant choke at the signal frequency which serves to connect the heater to the 6.3-volt supply with practically no shunting effect or added loss conductance (G_1).

Interstage Coupling

The output circuit of V_1 requires proper care if the optimum noise figure is to be obtained. This circuit must transform the output impedance of the GL-6299 to the optimum (noisewise) impedance of the 6AN4. It also transforms the input impedance of the 6AN4, roughly 200 ohms, back as the damping resistance for the L_4C_6 tuned circuit. There are many configurations that may be used to provide the required impedance transformations at the input and output of each stage. For our purposes the single-tuned autotransformer is quite satisfactory.

For noise-figure considerations the optimum turns ratio of this transformer is about 8:1. The resulting 6AN4 input impedance reflected back through this turns ratio transforms a resistance across L_4C_6 which broadens the band width of the first stage output to about 4.5 megacycles.

For some applications this band width is too narrow. However, the small second-stage contribution to the noise figure allows some control of the band width by means of the turns ratio, which, within limits, has practically no effect on the noise figure. Actually, band widths up to 20 megacycles have been obtained at this frequency without serious noise-figure deterioration.

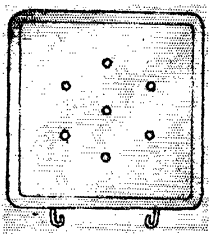
It is generally desirable to utilize as high an L/C ratio as possible in the plate circuits in order to obtain maximum band widths. The addition of resistive loading for this purpose is to be avoided, because a value of resistance capable of supplying appreciable damping would increase the noise figure materially.

Mixer Circuit

The load on the output circuit of the 6AN4 is

(Continued on page 174)

FOR THAT PERFECT CHRISTMAS GIFT... CHECK WITH ARROW'S HAM DEPT.!



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American made miniature crystal microphone.
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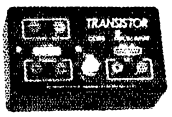


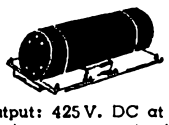
Jackson Transistor Code Oscillator

For code practice CW transmitter monitoring. A single "D" size flashlight cell provides all the required power. Pitch control provides tone adjustment. Shipping weight 2 lbs.
Net Price **$7.95**

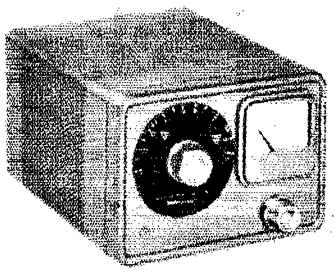
RELAY SPECIAL!

DPDT ceramic insulated relay with extra SPST contact. 12V. DC coil. Ideal for antenna relay, or parallel all contacts and use as generator relay.
Special Price **$1.75**

6 Volt Dynamotor



Rated output: 425 V. DC at 375 ma. High efficiency, compact. 4" diam., 7½" long. Shpg. wt. 13 lbs. Worth 2 to 3 times this low price..... **$12.95**



MORROW CM-1
Conelrad Monitor

A 5-tube tunable broadcast receiver, AC powered, built-in speaker. Meets all FCC requirements. Conelrad frequencies plainly marked. Meter for visual monitoring, also rear jack (for relay connection to other signal devices). **Amateur net..... $39.50**

Ameco AC-1 Transmitter Kit

Pi-network output circuit. Includes heavy-duty AC power supply. 6V6 Oscillator & 6X5 Rectifier. 15 watts input. For 40 & 80 meters CW. Crystal controlled. Ideal unit for the beginner or novice who requires a reliable transmitter. Works into any random length of antenna wire. NO ANTENNA TUNER IS NECESSARY. Keying is clean and chirp-free. TVI suppression features have been included. Complete with punched chassis, hardware and instructions.
Model AC-1 Kit for any 1 band, less tubes & crystal... **$16.95**
Extra coil kit CK-1..... **.50**
Set of tubes for AC-1 kit above (6V6GT & 6X5GT) **$1.97**
J38 Key (as shown above)
Special Price..... **97¢**

Hammarlund
HQ-100 Receiver

Dollar-for-dollar the most amazing communications receiver ever produced. Continuously tunable from 540 kcs to 30 mcs with sensitivity and selectivity surpassing anything in its class. Electrical bandspread tuning with unequalled direct dial calibration. Q-multiplier. Voltage-regulated and temperature-compensated high-frequency oscillator for extra stability. 10-tube superheterodyne circuit. Warm-up Timer automatically turns on receiver any pre-determined time*.
*Optional feature.
HQ-100 (less clock) **$169.00**
HQ-100 (with clock-timer).... **$179.00**
Matching 6" x 9" Speaker. Extended range. 8-watt capacity. Housed in attractive metal cabinet. Dimensions: 9⅝" W. x 9¼" H. x 7" D.
Amateur Net **$14.95**

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a balanced mixer, consisting of L_{12}, L_{13}, L_{14}, L_{15}, C_{14}, C_{15}, C_{16} and crystals CR_1 and CR_2.

Several beneficial results are obtained by using the balanced mixer for the heterodyne frequency conversion: 1. The signal and local oscillator are combined with low insertion loss. 2. A high degree of isolation is obtainable between the signal and local input, a desirable feature for cross-talk reduction between receivers employing a common local oscillator. 3. Noise from the local-oscillator line is balanced out.

The hybrid form of balanced mixer is the lumped-constant counterpart of the coaxial-line junction familiar to microwave engineers (commonly called the "rat race") or the "magic T" formed from a three-dimensional wave-guide junction. It is composed of four reactive matching networks having the required image resistances, three of which have positive 90-degree phase shift, and one having negative 90-degree phase shift. The networks are connected in the form of a ring, the input impedance of one serving to satisfy the image-impedance requirements of its neighbor. The relationship between the image resistances and reactances is

$$\frac{1}{\omega C} = \omega L = \sqrt{2 R_1 R_2}$$

where R_1 and R_2 are the image impedances of each network. When the individual networks are connected, the parallel reactances at the junctions combine to form a single equivalent component or, in many cases, disappear entirely due to an antiresonant condition.

Although most applications call for the image resistances being equal, hybrids can be made using transforming sections — *i.e.*, $R_1 \pm R_2$ — in which case the impedances at the terminals of the hybrid are not equal. The hybrid used in this front end has three 300-ohm terminals and one 50-ohm terminal, the latter properly loading the local-oscillator line. The crystals, which at this frequency have an impedance of approximately 300 ohms, terminate two of the 300-ohm terminals, while the remaining 300-ohm terminal provides the load on the second stage output through the turns ratio of the autotransformer, L_{10}.

This hybrid combines the received signal and local-oscillator signal, (119.3 megacycles), providing an intermediate frequency of 11.3 megacycles. The 11.3 megacycle i.f. signal is further amplified in a receiver which may be a commercial communications outfit or one specifically designed for the job.

General Considerations

In brief, although the rigorous analysis of the low-noise amplifier problem requires involved mathematical manipulations the actual circuit design can be relatively elementary. For optimum noise-figure design using the grounded-grid configuration it is primarily a question of transforming the source impedance to a value easily determined by the simplified expression for that quantity, both for the first and second stages.

(*Continued on page 176*)

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HALLICRAFTERS SX-101 . . .

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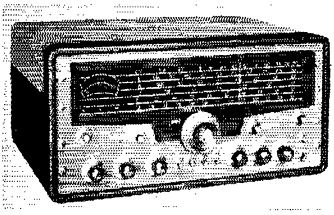

- Complete coverage of seven ham bands—160, 80, 40, 20, 11-10 meters.
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The power gain of the stages indicates the freedom the designer has in deviating from these computed values for band width and gain considerations, without detriment to the noise figure.

There is no substitute for practical experience in this field, a great clarification and understanding usually occuring after the work has begun.

Conelette

(Continued from page 41)

close, oscillation should occur; back it off from this point. (If oscillation does not occur, reverse the leads of L_2.)

Try to locate one of the louder broadcast stations that operates on a 24-hour schedule for continuous Conelrad service. C_1 provides a coarse adjustment of frequency, while the Loopstick screw may be varied for fine tuning across several hundred kilocycles. As stations are tuned in and out, the neon bulb will fire and extinguish. Improper setting of R_1 will prevent this action.

The bandwidth measured at the visual indicator is 10 kc. to 40 kc., depending upon the setting of R_1. Higher values of bias will decrease the bandwidth and also decrease the sensitivity. Therefore, be careful not to monitor stations too close to 640 and 1240 kc. During the July nationwide Conelrad alert, a satisfactory alarm was given with Conelette tuned to a station at 1210 kc.

Higher-power ham stations, depending on frequency band, antenna system, proximity, etc., may cause Conelette to block when the transmitter is on. If this occurs and phone operation is being employed, it will be necessary to cut the carrier for an instant and observe Conelette if the transmission is longer than 10 minutes. Operation on c.w. does not present a problem, since Conelette will operate between dits and dahs.

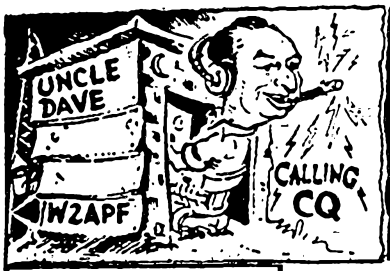
The rule for operation is simple. If the neon bulb is on, it is safe to transmit; if the neon bulb is out do not transmit.

Conelette should be checked approximately once each month for adequate operating margin. This can be most conveniently accomplished by touching a finger to the antenna terminal or detuning the Loopstick. The neon bulb should completely extinguish.

Although it has not been tried for mobile service, there is every reason to believe that Conelette should turn in an adequate performance when used with the broadcast car whip. It would be very desirable, however, to make C_1 a readily-adjustable capacitor to allow for quick retuning while en route between cities.

A considerable increase in sensitivity can be obtained for either mobile or home-station service by substituting a 1-ma. meter for the neon bulb, R_2 and R_3. The neon bulb, being essentially a digital device, can indicate only on-off operation, whereas the meter can indicate all levels of signal strength. Set R_1 so that the meter reads close to zero in the absence

(Continued on page 178)



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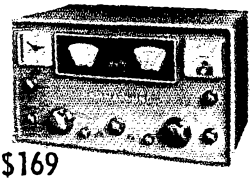
HAMMARLUND HQ 100 RCVR-

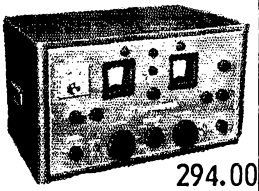


$169

With clock . . . 179.00

Speaker. 14.95

HAMMARLUND HQ 150 RCVR



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1 Barker & Williamson 5100 all band transmitter—modulator—VFO	310.00
1 Central Electronics VFO (Like New) — For above	54.95
1 Hallicrafters 100 Watt HT-19	179.00
1 Heath AT-1	25.00
2 Johnson Viking Adventurer 35 Watt (Like New) CW - all bands	50.00
1 Johnson Viking II w/VFO	275.00
1 Sonar SRT-120P 120 Watt (New - All band - No VFO)	175.00

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1 Central Electronics "SS" W "Q" Mult. (L.N.)	75.00
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1 240D (w/spkr—a real hot rcvr)	175.00
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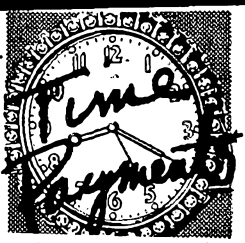

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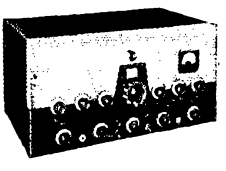

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of signal. With signal, the meter will read up-scale.

Conclette is simple, inexpensive, and reliable and will adequately perform the monitoring service prescribed by the regulations effective January, 1957.

Happenings

(Continued from page 67)

the procedure now proposed was provided for in the amateur rules. Thus the League is requesting a reestablishment of the former procedure.

2. Prior to the present §12.44, the locations of FCC district offices and quarterly examining points combined with the 125-mile radius to set off almost all of the area of the United States east of a line from North Dakota to Texas as well within the distance where personal appearance was required; major population centers on the west coast were similarly covered. The effect, then, was to make the amateur examination available by mail almost exclusively only in areas of comparatively sparse population. This is, the League believes, the more desirable arrangement. The mail-examination procedure is, of course, a necessary one in amateur radio; without it, in remote sections of the country, distances over which an applicant would be required to travel could total many hundreds of miles. However, this mail procedure should be afforded only to those applicants where travel would otherwise represent a hardship.

3. The reduction of the limit, in 1954, from 125 miles to 75 miles, opened additional sections of the more heavily populated eastern portion of the country, and western population centers as well, to mail examinations. For the most part, the standards of mail-examination procedures are good. The League does not have documentary evidence of abuse of the present relaxed mail-examination procedure; otherwise, we should have filed it with the Commission for disciplinary action. Yet, our correspondence, and particularly personal contacts at amateur radio club meetings, "hamfests," and conventions, shows an undercurrent of lessening respect for the amateur license because of the feeling of relaxation of examination standards, brought about by its widespread mail availability.

4. Even though amateur examinations under the mail procedure are conducted by volunteer examiners of integrity and disinterest in the applicant, so that in fact the standards are precisely the same as those observed by Commission engineers, there is a considerable point of prestige to the amateur license obtained through examination conducted by a representative of the Federal Government. This is not wholly an intangible point; it has its practical aspect as well. An amateur who has obtained his license on the basis of personal appearance before a Commission examiner is more impressed with the seriousness of the endeavor and his general responsibility in adhering strictly to the amateur rules and regulations. The personal exposure to authority inevitably has such a result.

5. Section 12.46 of the amateur rules provides that, when an amateur licensee appears before a Commission examiner for a higher class of license, he will be given credit for the elements required for the currently-held license only if the earlier examination were conducted by a Commission representative. Thus the Commission itself is unwilling to grant the holder of a license obtained on the basis of a mail examination the same stature as one obtained in an examination conducted by the Commission. The former procedure, where holders of "mail" licenses were limited to sparsely-populated portions of the country, was based on an understandable policy. However, as the present rule operates, with thousands of Conditional Class amateurs, for example, intermingled in the eastern half of the country with similar numbers of General Class amateurs, all possessing the same privileges but having different examination procedures dependent wholly on the chance of residence within a certain area, the policy becomes incongruous.

6. The League is aware that the 1954 action of the Commission in Docket 10712 was occasioned by budgetary considerations, and we have every sympathy with the Commission's problems in this respect. The League, therefore, requests that, should the Commission find itself unable to accede to our present petition *in toto*, there be separate

(Continued on page 180)

If Santa filled his sack at Elmar...

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ELMAC
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ELECTRO-VOICE
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there'd be a lot of very happy people on Christmas morning . . .

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Elmar's huge stocks could fill his biggest sack to overflowing—over and over again . . .

besides . . .

with over 200 different nationally advertised lines in plentiful stock, who could possibly be disappointed??

Santas who personally take care of filling the family stockings, (and their own of course) find that Elmar's eeeeasy payment plan on all transmitters and receivers, gives a big assist toward a most happy (electronic) Christmas!

Serving the entire Western Region . . . Alaska . . . and the Pacific Area . . .

* * * We have in stock, a few Collins 32V3's in factory sealed cartons.

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consideration of the several classes of license involved. For example, because the Novice Class license grants only restricted privileges for an unrenewable term of one year, there perhaps could be consideration of examination procedures for this class of license separate from procedures for the Technician and General classes. Since the total of Novice Class license examinations far exceeds the total of all other classes, the Commission's work load would still be far less than prior to 1954 if the 125-mile limit were restored only for classes of license other than Novice. The League urges the Commission to go at least this far in amending §12.44.

AMERICAN RADIO RELAY LEAGUE, INC.
By Paul M. Segal
Its General Counsel

A. L. Budlong
Its General Manager
September 27, 1956

How's DX?

(*Continued from page 86*)

with his No. 22 magnet-wire antenna that a beam will have to wait. Among several newly acquired DX certifications Ev has a WFRC (Frankford Radio Club) sheepskin for contacts with 65 members. Israel's 4X4=16, WAE-III and OHA. A card from XW8AB will clinch KP4KD's DUF-4 diploma . . . . . We regret the passing of W4RBQ, a well-known 14-Mc. DX stalwart of the 200-country school . . . . . ARRL staffer W1YYM, burning the midnight DX oil, verges on becoming Hq.'s first YL DXCC member . . . . . K2GMF met LU4AC (LUØAC) when the latter docked at New York aboard passenger liner *Rio Jachal* on the Rio run . . . . . It's not too early to set your sights for the 8th Annual Joint DX Conference of the Northern and Southern California DX Clubs to be held January 19th–20th at Fresno's Hotel Californian. Consult Chairman W6TI, P. O. Box 75, Oakland, for details . . . . . Better-Late-Than-Never QSL of the Month: W4AUL's VP8AI confirmation, five years en route . . . . . *Hmmm.* "I got TI9AA card and he says 'Don't QSL' on it," pens W7QNI. That's for the recent 7-Mc. TI9AA. Again, *hmmm* . . . . . According to WGDXC, New Years Day will see W4EMF/KS4 back on the mainland . . . . . And then there's the one going around about the DXpedition of W7s to DXCC's super-rare Wrangel Island. They got there, all right, but didn't dare get on the air because they forgot to bring 10,000-volt receiver-tuning gloves.

Ten Years Ago In "How's DX" — Spotty 14-Mc. conditions remind the gang that there *are* other DX bands. December, 1946, sees transatlantic QSOs back in style on 80 meters; 40 featuring LX1AX, TA1DB, UG6AB, W6SAE/J9, XAEY, YR5C; 10 phone displaying ARLC of Syria, Man's G6IA, KA1ABA, LX1BO, SU1HF, VS9s AB AP, VU2s in number, YR5V, W1LTQ/TF, W3GKJ/KJ6; 10 c.w. good for HE1CE, LX1SI, SP5Y, VU2BC, W2QVJ/KP6, ZB2A, ZC6FP; and even newcomer 11 meters earns mention . . . . . But 20 is DX king once more, make no mistake. On c.w. CR9AN, EK1AA, ES5K, ET1JJ, FI8CC, HI8X, HZ1A, K6HOT/KC6, KA1SS, OX1AA, PKs 5LK 6HA 6TC, TA1N, UA9s BP CB CR DP, UAØKAA, UD6s AB KBA, VQs 6GH 8AB, VS9AX, W5LJJ/Manus, W6VKV/I6, XABU in the Dodecanese, YA5AX, YS8UJ and ZD8A are workable; on phone there are Cs 1SU 8YR, ET1Y, FG3GP of Dakar, PKs 4DA 6AW, PK5AR/CR1Ø, SU1SX, UA9CB, W5IBE/J5, XU1s YO YY and ZB1AB . . . . . Redistricting of U. S. call areas makes W7s less rare and popularizes that curiously new prefix, WØ . . . . . January 1, 1947, is the deadline for claiming prewar QSLs . . . . . In Orangeburg, S. C., strange lights in the night sky turned out to be W4BPD's antenna shorting high on the pole.

Strays

Have fun in the SS? Don't forget to have your logs postmarked by December 5th.

Pick a number from one to seventy!
Any way you win!

Year-end Clearance

of QUALITY reconditioned equipment

10% DOWN . . . LIBERAL TERMS

Yes, we have hundreds of standard brand pieces of equipment in our trade-in department. Just 10% down and that quality re-conditioned equipment can be yours. Write today for complete information.

TRANSMITTING EQUIPMENT

1.	B & W 5100 & 5100S	$289.00 to $319.00
2.	Central Electronics 10A	99.00 to 119.00
3.	Central Electronics 10B	129.00 to 144.00
4.	Collins 32V1	250.00 to 295.00
5.	Collins 32V2	329.00 to 389.00
6.	Collins 32V3	449.00 to 499.00
7.	Eldico SSB500 Linear	329.00
8.	Elmac A54H	69.00 to 89.00
9.	Elmac AF67	125.00 to 139.00
10.	Gonset 500 W Linear	239.00
11.	Hallicrafters HT-9	99.00 to 129.00
12.	Hallicrafters HT-17	29.00 to 39.00
13.	Harvey Wells TBS-50 Series	39.00 to 79.00
14.	Harvey Wells T-9 with supply	149.00
15.	Heath AT-1 Transmitter	24.00 to 29.00
16.	Heath VF-1 VFO	17.50
17.	Johnson Adventurers	39.00 to 45.00
18.	Johnson Rangers	179.00 to 209.00
19.	Johnson Viking I's	139.00 to 169.00
20.	Johnson Viking II's	199.00 to 229.00
21.	Johnson 122 VFO's	29.00 to 39.00
22.	Johnson 250-23 Match Box	39.00 to 44.00
23.	Johnson 250-30 KW Match Box	95.00 to 110.00
24.	Johnson 250-33 Audio Amplifier	79.00
25.	Lakeshore II SSB Exciters	269.00 to 299.00
26.	Lakeshore 400 GG Linear	219.00 to 239.00
27.	Lysco 600 Transciter	49.00 to 69.00
28.	Meissner Ex Signal Shifters	24.00 to 39.00
29.	Millen 90800 with supply	24.00
30.	Millen 90800 less supply	15.00
31.	Millen 90810 with tubes & coils	69.00 to 85.00
32.	Millen 90811 with tubes & coils	25.00
33.	Tecraft TR20/144	44.00 to 50.00
34.	WRL 400 Transmitter	239.00 to 269.00
35.	WRL 400B Transmitter	269.00 to 299.00

RECEIVING EQUIPMENT

36.	Central Electronics A Slicer	$ 39.00 to $ 49.00
37.	Central Electronics B Slicer	69.00 to 79.00
38.	Collins 75A1	199.00 to 239.00
39.	Collins 75A2	269.00 to 299.00
40.	Collins 75A3	349.00 to 399.00
41.	Elmac PMR6A with supply	79.00 to 109.00
42.	Gon. AC Tri 10/15/20 (not mob.)	39.00
43.	Gonset Super Six Convertors	35.00 to 42.00
44.	Gonset TriBand Convertors	24.00 to 29.00
45.	Gonset Marine Convertors	25.00 to 32.00
46.	Hallicrafters S38-A-B-C-D	15.00 to 35.00
47.	Hallicrafters SX28 & SX-28A	119.00 to 149.00
48.	Hallicrafters S53 & S53A	49.00 to 65.00
49.	Hallicrafters SX71	135.00 to 159.00
50.	Hallicrafters S76	109.00 to 129.00
51.	Hallicrafters S85	79.00 to 99.00
52.	Hallicrafters SX96	169.00 to 199.00
53.	Hallicrafters S102	39.00 to 45.00
54.	Hammarlund HQ129X	129.00 to 159.00
55.	Hammarlund HQ140X	179.00 to 199.00
56.	Heath AR2 & AR3	22.00 to 27.00
57.	Millen 92101 R9'er	15.00 to 19.00
58.	Morrow MBR5 Receivers	159.00 to 189.00
59.	National HRO50T	239.00 to 279.00
60.	National NC57 Series	59.00 to 79.00
61.	National NC88	79.00 to 89.00
62.	National NC98	109.00 to 129.00
63.	National NC183D	249.00 to 289.00
64.	National Selectojects	15.00
65.	RME DB22A	29.00 to 39.00
66.	RME DB23	39.00
67.	RME 45	79.00 to 89.00
68.	Tecraft CC5/144 Convertors	29.00 to 35.00
69.	WRL 6 Meter Convertors	19.00
70.	Match. Speak. avail. for above	7.00 to 10.00

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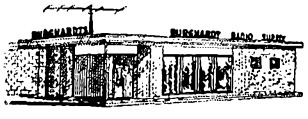


P. O. Box 746, Watertown, So. Dakota • Phone 5749

World Above 50Mc.

(Continued from page 76)

propagation even more marked. Have worked Kentucky and Virginia stations recently.

W4UCH, Sterling, Va. — Now running 250 watts peak input on 50 Mc. Rig is phasing job, straight through on 50 Mc. Carrier is 50 db. down; unwanted side band 40 db. down. Would like skeds with interested parties.

W6SOD, Torrance, Calif. — Worked 15 different stations on 220 Mc. during September. Signal levels on 220 drop around 2100 and then usually build up later. (Daily inversion pattern; sigs likely to be better still in early evening, around sundown. — EPT).

W7BDK, Seattle, Wash. — Have converted RAK-7 for solar-flare indicator.

W7PUA, Eatonville, Wash. — Good activity on 420 Mc. by W7s JHX LHL LRF MCU and SFO, mostly on 433.35 Mc. Also considerable interest in and work on 144-Mc. s.s.b.

W7QDJ, Clearfield, Utah — W6VDG reports reception of scatter sigs 16 days during September. This with one week off the air. W0CNM, Grand Junction, Colo., reports bursts heard regularly with his beam aimed at Bay area.

W8NOH, Grand Rapids, Mich. — Several stations working W8TXC airborne-mobile noted large increases in signal level when all antennas were aimed at the plane, flying at 15,000 feet. Improvement most marked on signals from 100 miles or more. Perhaps we could put the well-known airplane flutter to work for us, if we knew where to aim.

W0USQ, Davenport, Iowa — Installation of coaxial tuned circuits on both 50 and 144 Mc. has improved selectivity of receivers markedly. Expect to be on both bands with RTTY soon.

Apologies to K6BTJ and K6QLG. We put BTJ's call on QLG's work in OES Notes for October. And a request to all OES: Please put your city or town on the OES report form. It will help in processing the reports, and possibly prevent a mistake like the above. We'll provide space for this on future runs of the OES forms.

Hints & Kinks

(Continued from page 70)

first tune the desired signal for maximum deflection of the receiver's S meter with the BC-453 *out* of the circuit. The BC-453 is then switched into the circuit and is tuned back and forth through the receiver i.f. passband until maximum audio is heard. Then the b.f.o. frequency is adjusted until the received signal sounds natural. Now the receiver a.v.c. is turned off.

After the preceding adjustments have been made, signals using the same side band can be tuned in with the tuning control of the main receiver without the necessity of going through the above procedure.

Naturally, this setup will not compete with the upper-bracket gold-plated receivers on the market, but for the few dollars it costs, it gives surprisingly good results.

— *Charles McDowell, W4JJX*

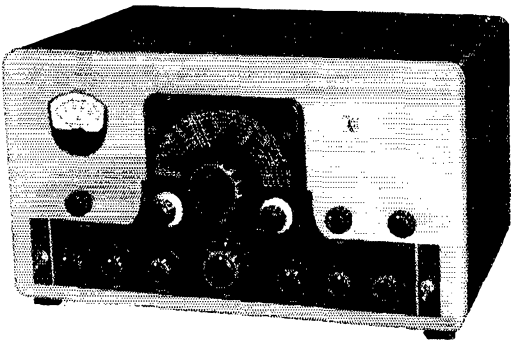
"DREAM COMBINATION"

(FIRST CHOICE
OF AMATEURS
EVERYWHERE)

The JOHNSON VIKING

VALIANT

275 Watts SSB P.E.P.* and CW
200 Watts Phone Input



FEATURES: ▶ Temperature compensated VFO

▶ Speech clipping and filtering ▶ "Push to talk" relay built in ▶ Effective TVI suppression

▶ High modulation index ▶ Pi-network output tuning ▶ Time sequence keying

Three 6146s in the final provide enough power to punch through QRM! Speech clipping and more-than-adequate audio power insure high modulation index. A new standard in effective phone signaling! Timed sequence keying is clean, free of clicks or chirps—a must for "break-in" operation. Flick the "mode" switch and turn on your SSB exciter for SSB operation.

Outstanding flexibility and performance. Fully TVI suppressed!

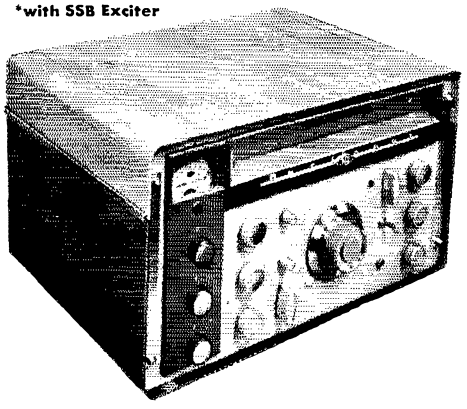
Single knob bandswitching for operation on 160, 80, 40, 20, 15, 11 and 10 meters. The "Valiant" may be operated by stable built-in temperature compensated VFO or crystal control. Metering of all essential stages! Pi-network tank circuit matches any antenna. Modulator output, filament and plate voltages brought out in the rear for powering a VHF transmitter. RF filtered key leads, antenna relay power and 'phone patch input are also available at rear chassis terminations.

The Viking Valiant is available completely wired and tested or as an easy-to-assemble kit. The ventilated 18 gauge steel cabinet is finished in attractive maroon and gray, with green nomenclature. Complete kit includes assembly instructions, photographs, diagrams and step-by-step wiring instructions. Wiring harness and all necessary hardware furnished. Dimensions 11⅝" x 21⅛" x 17⅜". Net weight: 73 lbs. Shipping weight: 83 lbs.

JOHNSON Cat. No. 240-104 Viking Valiant Kit with tubes—**$349.50** ham net.

JOHNSON Cat. No. 240-104-2 Viking Valiant wired and tested with tubes **$439.50** ham net.

*with SSB Exciter



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1st Choice Companion to "Valiant"
Solid, Basic reasons for the NC-300's gaining such an outstanding reputation in so short a time . . . **design plus performance!**

In the present state of the art, the National NC-300 has achieved the practical ultimate in sensitivity, selectivity, and frequency stability!

and **NO FUSSY RETUNING ON SSB OPERATION!**

All of these features plus the longest slide-rule dial ever. . . . Dial covers 160—1¼ meters with 10 dial scales (receiver includes provision for accessory converters for 6, 2 and 1¼ meters . . .).

$399.00 *ham net*

Try shopping around—talk it up! Then, write, wire or phone or drop in! We'll compete with **anyone on liberal trade-in allowances!** Extra consideration for clubs, novices and civilian defence groups.

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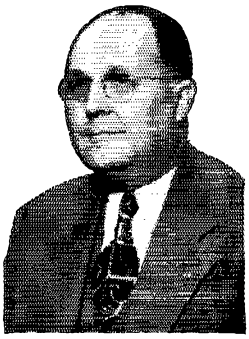

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There MUST Be a Reason

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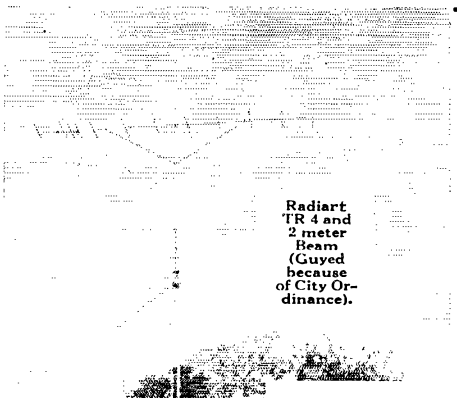
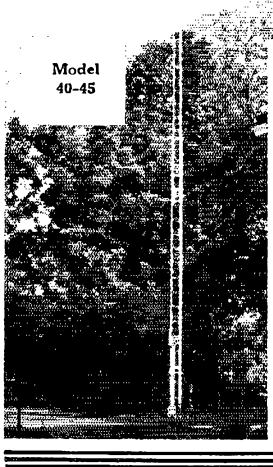


Radiart TR 4 and 2 meter Beam (Guyed because of City Ordinance).

Another Ham Picks E-Z Way Heavy Duty Tower Built Especially for Ham Beams

E-Z Way is not just another TV Tower. It is a real brute of a steel tower, yet a beauty to behold. Will support a 4 element 20-meter full beam at 50 feet in winds up to 70 MPH without guys. In case of high winds your E-Z Way Tower can be cranked down quickly for safety.



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- Cranks up and down — tilts over.
- 25 different types — 40′ to 60′.
- Free standing — no guy wires — no concrete.
- 80′–100′–120′ crank-up, tilt-over towers. (Must be guyed.)

Ground post 4½″ Dia. 10′ high.

Lower Section 10½″ cross section, 31′ high.

Top Section 8½″ cross section, 21′ high.

Mast 1.9 OD 10′ above tower.

Extended height of tower 48′.

Other size crank-up towers from 40′ to 120′, $100 up. 10 sizes of Guyed Towers from 6½″ to 30″ cross section. Tower shown owned by: Harry Densham, W2EH, Collingswood, N. J. Harry is another enthusiastic booster for E-Z Way Ham Towers.

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BUY RME Electro-Voice EQUIPMENT
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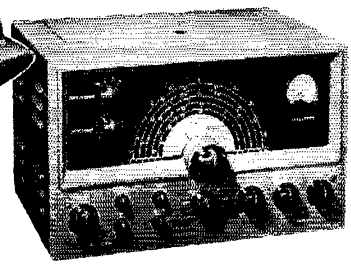

No. 664 VARIABLE D CARDIOID DYNAMIC MICROPHONE

The 664 will equal a useful power increase of four times over commonly-used peaked microphones.

New Variable D Dynamic Microphone operates on the principle of multiple sound paths to the diaphragm. Spaced apertures to the rear of the diaphragm are phased to provide cancellation of rear sounds and give full response to sound from the front.

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MODEL 664 Without Stand	$49.50
MODEL 419 Desk Stand .....Net:	6.00

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High quality, high performance communication receiver designed for optimum performance and maximum sensitivity. All usual controls PLUS adjustable BFO injection control — front panel oscillator Calibration control AND 2 speed tuning mechanism: — 1:1 for scanning — 75:1 ratio for fine tuning.

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All crystals tested and guaranteed to oscillate. Please include 20¢ postage and handling charge for every 10 crystals or less. Minimum order $2.50. No. C.O.D's.

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25 Assorted FT-243 45 Assorted FT-241A
15 Assorted FT-171B 15 Assorted CR-1A

100 Crystals Our Choice **$8.95**

Assorted.....Regular value $66.00

PACKAGE DEAL No. 2

FT-241A Crystals for Single Sideband
370 KC–538 KC

35 Crystals Our Choice **$3.49**

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HAM BAND CRYSTALS — FT-243

For operating on 80, 40, 20, 15, 10, 6 and 2 meters—on either fundamentals or harmonics.

25 Crystals Our Choice **$6.95**

Assorted.....Regular Value $20.00

FT-243 RANGE 3655 KC – 8733 KC

FT-241A RANGE 370 KC – 538 KC

FT-171B RANGE 2030 KC – 3995 KC

CR-1A RANGE 5910 KC – 7930 KC

INDIVIDUAL CRYSTALS • Indicate 2nd choice—Substitution May Be Necessary

Low Frequency — FT-241A for SSB, Lattice Filter etc., .093" Pins, .486" SPC, marked in Channel Nos. 0 to 79, 54th Harmonic and 270 to 389, 72nd Harmonic. Listed below by Fundamental Frequencies, fractions omitted.

49¢ each—10 for $4.00

370	393	415	487	509	533	
372	394	416	488	511	534	
374	395	418	490	512	536	
375	396	419	491	513	537	
376	397	420	492	514	538	
377	398	422	493	515	540	
379	401	424	494	516		
380	402	425	495	518		
381	403	426	496	519		
383	404	427	497	520		
384	405	431	498	522		
385	406	433	501	523		
386	407	435	502	525		
387	408	436	503	526		
388	409	481	504	527		
390	411	483	506	529		
391	412	484	507	530		
392	414	485	508	531		

79¢ each—10 for $6.50

400	462					
440	463					
441	464					
442	465					
444	466					
445	469					
446	470					
447	472					
448	473					
450	474					
451	475					
452	476					
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79¢ each—10 for only $6.50

CR-1A SCR 522-½ Pin, ½" SP		FT-171B—BC-610 Banana Plugs, ¾" SPC			
5910	7810	2030	2258	2435	3250
6370	7930	2045	2260	2442	3322
6450		2065	2282	2532	3955
6497		2105	2300	2545	3995
6610		2125	2305	2557	
7380		2145	2360	3202	
7480		2155	2390	3215	
7580		2220	2415	3237	

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4035	5740	6325	7475	7766
4080	5750	6340	7500	7773
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4190	5775	6373	7520	7800
4280	5780	6375	7525	7806
4340	5806	6400	7540	7825
4397	5840	6406	7550	7840
4490	5852	6425	7573	7841
4495	5873	6673	7575	7850
4840	5875	6675	7583	7873
4852	5880	6700	7600	7875
4930	5892	6706	7606	7900
4950	5906	6725	7625	7906
5030	5925	6750	7640	7925
5327	5940	6775	7641	7940
5360	5955	6800	7650	7950
5385	5973	6825	7660	7975
5397	6206	6850	7673	8250
5437	6225	6875	7675	8273
5485	6240	6900	7700	8300
5500	6250	6925	7706	8310
5660	6273	6950	7710	8316
5675	6275	6975	7725	8320
5700	6300	7450	7740	8630
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3735	6200	6640	8275	8625
3990	6450	6656	8280	8650
6025	6473	7000	8350	8690
6042	6475	7075	8375	8700
6073	6500	7125	8400	8733
6075	6506	7150	8425	
6100	6525	7306	8450	
6125	6550	7300	8475	
6140	6573	7425	8500	
6150	6575	7440	8525	
6173	6600	8173	8550	
6175	6606	8175	8575	
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SPECIAL—*200 KC in* FT241A Holder-$1.25 Without Holder 39¢ ea.-3 for $1.00

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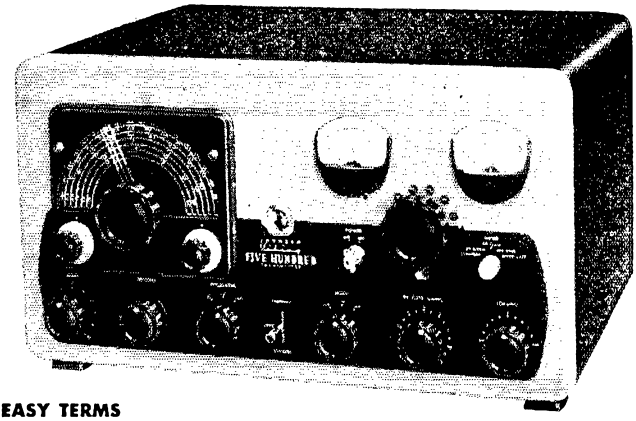

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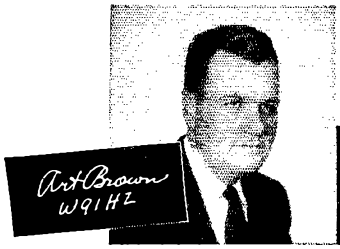

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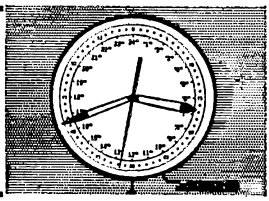

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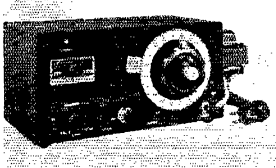

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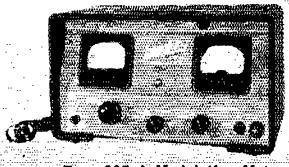

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QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTOROLA used FM communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

WANTED: Cash or trade, fixed frequency receivers 28/42 Mc. W9YIV, Troy, Ill.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0800 to 1730 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 605 Church St., Ann Arbor, Michigan. Tel. NOrmandy 8-8696, NOrmandy 8-8262.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

WANTED: All types aircraft & ground transmitters, receivers ART-13, RT18/ARC1, R5/ARN7, BC610E, ARN6, BC788C, ARC3, BC342. Highest prices possible paid. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

RECEIVERS repaired and aligned by competent engineers, using factory standard instruments. Hallicrafters, Hammarlund, National, Collins authorized service station. Our twentieth year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

ATTENTION Mobilcers! Leece-Neville 6 volt 100 amp. system alternator, regulator & rectifier, $45.00. Also Leece-Neville 12-volt 100 amp. system, alternator, regulator & rectifier, $85.00. Good condition. H. A. Zimmermann Jr., K2PAT, 570 Jamaica Ave., Brooklyn 8, N. Y. Ulster 2-3472.

CASH for your gear. We buy as well as sell. Write for cash offer or trade. We stock Elmac, Gonset, Hallicrafters, Hammarlund, Johnson, Lysco Master Mobile, Morrow, National and other ham gear. H & H Electronic Supply, Inc., 506 Kishwaukee St., Rockford, Ill.

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URGENTLY need AN/APR-4 items particularly tuning units for important defense contracts. New high prices. Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio.

HAM Guest Register Books, $2.00 in U. S. A. postpaid; $2.25 in Canada postpaid. Gratton George, W4PJU, Clewiston, Fla.

MEDICAL Ham! Swamp Burdick EK-2 for Globe King, 500-A C. R. Faulkner, M. D., K4AXE, 106 No. Main, Somerset, Ky.

OUTSTANDING ham list revised monthly. Our prices are realistic and attractive. Standout values in used Barker & Williamson, Collins, Central Electronics, Elmac, Gonset, Hallicrafters, Hammarlund, Harvey-Wells, Johnson, Morrow, and National units. We deal easy and offer time payments tailored for you. All leading brands of new equipment always in stock. Write immediately for this month's Bulletin and our new exclusively amateur catalog just out. Stan Burghardt, W0BJV, Burghardt Radio Supply, Inc., Box 746, Watertown, S. Dak.

PLASTIKASE rubber stamp, your call name and address. Economy with pad $1.00. Top quality with handle, $1.50, pad 35¢. El-Kay Stamps, Box 5-WT, Toledo 12, Ohio.

WANTED: Receiver R5/ARN-7, MN-62A transceivers, RT18/ARC-1, AN/ARC-3, BC-788C, I-152C, Collins, Bendix equipment, test sets, dynamotors, inverters. We pay highest prices. Advise quantity, condition, price in first letter. Aircraft Radio Industries, Inc., 15 East 40th St., New York City. Tel. LExington 2-6254.

STUDY at home for commercial radio licenses. Free sample lesson, very reasonable fee. Write Radio License Aids, 275 Dayless, Ft. Worth, Texas.

DX'ERS Notice! Save money? Save Time? Free info. DX QSL Coop, Box 5938, Kansas City 11, Mo.

WANTED: ARC-3, ARC-1, ART-13, BC-312, BC-342, BC-610, BC-788 and other surplus. Advise what you have and price. W4VHG, Box 5878, Bethesda, Md.

QSLS? SWLS? Finest and largest variety samples 25¢ (refunded) Callbooks (latest), $4.50. "Rus" Sakkers, W8DED, P.O. Box 218 Holland, Mich.

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QSLS-SWLS. Meade WØKXL, 1507 Central Avenue, Kansas City, Kans.

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QSLS. Nice designs. Samples, Beseparis, W3QCC, 207 S. Balliet St., Frackville, Pa.

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QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

QSLS-SWLS. Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

WOODY's QSLS. Box 164, Asher Sta., Little Rock, Ark.

QSLS. Western states only. Fast delivery. Samples 10¢. Dauphinee, K6JCN, Box 66009, Mar Vista 66, Calif.

QSLS, Taprint, Union, Miss.

QSLS, SWLS. High quality. Reasonable prices. Samples. Bob Teachout, W1FSV, 204 Adams St., Rutland, Vt.

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QSLS — All kinds and prices, samples 10¢ fast service. DX Card Co., Kulik St., Clifton, N. J. GR 3-4779.

QSLS-SWLS. Reasonable. Catalog, 25¢. Speedy delivery. Dick, K6GJM, 10558 E. Olive, Temple City, Calif.

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QSLS, Lapel pins, samples dime. Kephart, W2SPV, 4309 Willis, Merchantville, N. J.

QSLS of distinction. Three colors and up. 10¢ brings you samples of distinction. Uncle Fred, Box 86, Lynn, Penna.

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QSLS. Cartoons, colors. Something different. Samples 15¢. Chris, W9PIA, 365 Terra Cotta, Crystal Lake, Ill.

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QSLS-SWLS. 1¢ each, samples 10¢. Rusprint, Box 7507, North Kansas City 16, Missouri.

PANORAMIC Adapter AN/APA-10 Tech. Manuals $2.75 postpaid in U. S. A. Electronicraft, 27 Milburn St., Bronxville 8, N. Y.

FOR Sale: QST 1932 to 1947, 25¢ ea. Four or more, WØMCX, Art Jablonsky, 1022 N. Rockhill Rd., Rock Hill 19, Mo.

SELL or Trade: Radio magazines. Bob Farmer, Plainview, Texas.

MULTI-BAND Antenna. 80-40-20-15-10, $19.95. Patented. Send stamp for information. Lattin Radio Laboratories, Owensboro, Ky.

FOR Sale: One kilowatt xmitter, C.W. 80 thru 10. Pushpull 813's, Hunter doubling unit; outboard VFO, Six ft. cabinet, two antenna couplers. Prefer local sale: $600. W2JA.

SALE: 6 volt dynamotors, like new, 645 volts 155 Ma., $14.95; 600 volts 265 Ma., $16.95; 380 volts 340 Ma., $16.95; ICA Deluxe Signatone code practice oscillators, $7.95. Postage extra. Lectronic Research, 719 Arch Street, Phila. 6, Pa.

WANTED! U. S. and foreign coins or collection. Trade any radio equipment or parts. B. Bernbaum, 1109 Greenwood Ave., Wyncote, Pa.

FOR Sale: NC-183D w/spkr and s.s.b. slicer; Elmac A-54-H; both in excellent condition. Best offer. Ed Robinson, W5YTN, Box 1113, Emory University, Ga.

WANTED: BC-221, BC-348, BC-312, BC-342, BC-610-E, ARN-7, BC-788, ARN-6, APR-4, ARC-1, ARC-3, ART-13. All types surplus or amateur transmitters, receivers, test equipment taken in trade for New Johnson Viking Ranger, Pacemaker, Valiant, Hallicrafters, Hammarlund, National, B&W, Gonset, Elmac, Telrex, Fisher Hi-Fi, etc. Write Tom W1AFN, Alltronics, Box 19, Boston 1, Mass. Tel. Richmond 2-0048.

TELEPHONE Transmitter. Hand-set type. Suitable for interhouse phones, speakers or any communication purpose. Delivered two for $1.00. No C.O.D's! Sept. C-230, 1760 Lunt, Chicago 26, Ill.

SAN FRANCISCO and vicinity. Communication receivers repaired and realigned. Guaranteed work. Factory methods. Special problems invited any equipment. Associated Electronics, 167 So. Livermore, Livermore, Calif. W6JF, Skipper.

WANTED: 2-way FM equipment. Phillips, 1312 McGee St., Kansas City, Mo.

JOHNSON Matchbox; SCR522 (BC624-A) receiver, converted, power; SCR522 transmitter, receiver, unconverted; Sonar VF-120; Meissner Signal Shifter; Turner 8 -X, Astatic JT-40, T-17-B microphones; indicating selsyns; relay rack cabinets; SSB crystals; Hammarlund Four-11 modulator; filter condensers; relays; rectifiers; 160, 40 meter Command xmitters; AT-1 xmitter; RCA AVR-20-A-1 receiver, AVT-112-A BC-654; BC-645; PE-103-A; Millen GDO; indicating wavemeter; panel meters; Jackson 652 AF oscillator; BC-221-AA; GE YE-9 electronic switch; Heathkits; resistance Decade, 5" 'scope, impedance bridge, VtVM, signal generator; *manuals, QSRs, Radio News; request detailed listing, very low prices.* Howard O. Severeid, W9DPL, 2431 E. Riverside Dr., Indianapolis 23, Ind. Phone WAlnut 4-6384.

FOR Sale: 10-meter beam, 3E1OPD Hy-Lite, carton unopened, $15; new 24 hr. clock, unused, $10; used NC-SW54 revr, $25 .W2PDH, A. Clark, Lewis Lane, Syosset, L. I., N. Y.

FOR Sale: Beautiful custom-built Kilowatt! Completely TV suppressed, photos and price on request. May be driven by any 100 watt exciter. Four separate heavy duty power supplies — Class B modulation; splatter suppression and negative peak clipping; modern in every respect — seven ft. commercial rack — all circuits metered with eight meters! A DX man's dream rig — push-to-talk relay controlled and protected throughout! Class B linear operation. All components brand new — no surplus parts used. *32V3 available as* exciter. Will sell or consider trade on good late model airplane. Contact WØIOS, Cooper, 90 . 86th St., Omaha, Nebraska. This xmitter can be used for Amateur or Commercial duty!

SALE: AC Instructograph, 16 tapes, $30; ARC-5 transmitter 7-9.1 Mc., $8; 1500 volt power supply, $25; Mosley 40M loading coil, $5; 813 with filament transformer, $6. Will consider offers. W4UYH, SW 40th Ter., Miami, Fla.

FOR Sale: NRI Correspondence Course, $40 cash. John W. Collie, W5HQT, 6419 Aztec Rd., El Paso, Texas.

SELL: HRO-50T coils, 28 Mc. type 7AA and 21 Mc. type 7AC, $18 each. KH6IJ.

WANTED: HRO receiver with round I.F. cans. Any condition. W4GLV, P.O. Box 30, Leesburg, Va.

FOR Sale: Johnson Viking Ranger and D1004 mike, coaxial relay and other exct., also Hallicrafters SX-71 with R-46 speaker. Must sacrifice at low cost. Contact K21JZ, 65-26 Parsons Blvd., Flushing, L. I., N. Y.

FOR Sale: 10B sideband exciter $95; Viking Adventurer, $25; Viking VFO, $30; screen grid modulator, $3; Regency UHF TV converter, never used, $8. Dick Wilson, K6LRN, 1259-15th Ave., San Francisco 22, Calif.

ARC-5 Transmitters, 4-5.3 Mc., 5.3-7 Mc. Excellent condition, with tubes: $3.95 or two for $6.95. Peck's Radio TV, 1010 First Ave. So., Great Falls, Mont.

LABORATORY test equipment for sale. Tektronix 'scope; Hewlett-Packard VTVM; Measurements Corp.; Signal Generator & GDO; Ballentine VTVM; several misc. items by Dumont, Hickok, RCA, others. Write for list. Priced for quick sale! B. N. Gensler, W2LNI, 64 E. 9th St., NYC 3.

SELL complete station, like new. Viking Ranger (home wired); NC-300 with matching speaker, calibrator; Matchbox; new Vibroplex; new D-104 matching stand; 110V. Dow coax relay; SWR bridge; all gear in perfect order, now on the air. You pick up or pay shipment, $585. I ship for $650. W2EUQ, Gray, 3 James St., Corning N. Y. Telephone 2-5924.

WANTED: 15 meter bandspread coil for HRO5TAI. R. S. Ross, Henry, Ill.

BUY: Conversion for BC-433G, SCR-269G. Trade: 3-4 and 7-9 ARC-5 xmitters, new, for SCR-274N type. *Two 11H 500* Ma. H.V. chokes. Emil Kalar, So. International Falls, Minn.

SELL: 150W shielded bandswitching fone/c.w. amplifier, pwr. supply; Meissner EX signal shifter, TVI suppressed, both $100. Will not ship. W4RWA, 1502 No. 18th Ave., Lake Worth, Fla.

SELL: Hallicrafters S20R rcr, $35; RCA 4-band long wave revr, $10; UTC power xtrmr S-41, $5; W. Gieckel, 22-43 35th St., Astoria 5, L. I., N. Y.

WANTED: Electronic key, duomatic AKS-7. Must be in gud condx. Earl F. Brown, W7UVD, 2820 S. E. Ash, Portland 15, Oregon.

FOR Sale: 40 meter Premax antenna with insulator, $20; RME MB-3 code monitor, $15; Instructograph, $25; 2-Prop Pitch motors, $15 each; Selsyn indicator, $6; misc. transformers. R. Cocklin, 2202 St. Elmo, Canton, Ohio.

HIGH Power rotary inductors for kilowatt pi-networks. Worth 3 times price. Get flyer, details. Guaranteed. Paulson Electronics, 138 E. 6th St., Clifton, N. J.

AMATEURS! Interested in learning TV servicing. Cat necessary. Armor TV, 41-06 162nd St., Flushing, L. I., N. Y. Tel. Flushing 3-3785.

WANTED: Highest prices paid for ARC-3, ARC-1, BC788, BC610, BC348, ART13, BC312, BC342 and other military or aeronautical surplus. Name your price. We pay freight and c.o.d. James S. Spivey, Inc., 4908 Hampden Lane, Bethesda, Md.

FOR Sale: Motorola 30 watt mobile transmitter and mobile receiver *25 to 44 Mc., $35;* Motorola base station receiver AC operation, 1-25-44 Mc. 1-147-162 Mc $68 each; Bosch generator 6 volts @ 55 amps, $25; Leece-Neville 6 volt alternator with regulator and rectifier, $35. Ralph Villers, P.O. Box One, Steubenville, Ohio.

SSB For sale. Commercially constructed, finest components, 500 watt linear amplifier using 4X250B with self-contained power supply, forced air cooling, Central Electronics 20A exciter with VFO, TVI suppressed, used about 20 hours. Best offer over $450. Also Viking II like new in original carton, $200. WZGYL Ed Ruth, 56 Riverside Ave., Amityville, L. I., N. Y.

FOR Sale: Temco 75GA 150 W. xmitter, phone/c.w., built-in VFO, bandswitching, shielded, by-passed, low-pass filter, three meters, $125. Cash and carry, W20WL, Jerome 7-7874.

DX-35 and VF-1, $70. Both are factory inspected, calibrated and tuned. Prefer local sale. W1ZQT, 99 Hellstrom Rd., East Haven, Conn.

JOHNSON Viking Ranger with Astatic D-104 mike on push-to-talk stand, coaxial change-over relay, and 100 ft. RG-8U cable, like new condx, $220; Hammarlund HQ-129X with 10" spkr, perf. condx, $135. Will answer any reasonable offer. P. M. Desautels, 7 Hackfeld Rd., Worcester 9, Mass.

FOR Sale: NC-173 with speaker, $100; National MR150 tank, $14. W2JGF, 5 Oakbrook Rd., Ossining, N. Y. Tel. OSsining 2-5372.

TRADE: Retina III C camera. Want Communications receiver. W7AVS, 2910 Rickie Vista, Tucson, Ariz.

BC-610, complete with coupler, filter, mike, spare tubes; 750 watts, VFO 160 to 30 Mc. Answer all inquiries. W8SWF, 7711 W. Morrow Circle, Dearborn, Mich.

SCHEMATIC diagrams ARC-5 80-40 meter revrs and xmitters, 25¢ each or trade. S. Consalvo, 4905 Roanne Drive, Washington 21, D. C.

STOLEN! From auto, Lafayette, La., SmithCorona portable mill, Serial No. 5A453524; Elmac AF67, Serial No. 3878, Simpson 260 VOM, WØEIG, James W. Linthacum, Box 820, Lafayette, La.

WANTED: Preferably in Canada, 32V3 or KWS-1 transmitter. State condition and lowest price. Aaron D. Solomon, VE1OC, 8 Crichton Park Rd., Dartmouth, N. S., Can.

SELL: SX-42 recvr, gud condx, recently realigned. Best offer F.o.b. takes it. W9VIJ, 2933 Hobson Rd., Ft. Wayne, Ind.

SELL: Complete mobile rig. Fully metered bandswitching transmitter, 2E26 final, built-in 6V. Mallory heavy-duty Vibrapack, antenna changeover relay. Shure microphone, whip antenna. Mallard loading coils. Gonset Tri-Band converter. Like new condition. First $100. W2KUV, 54 Georgia St., Valley Stream, L. I., N. Y.

FOR Sale: BC342N, $50; Webster wire recorder 7A, $85; Gonset Tri-Band Deluxe, $25. W1SRB, 23 Young Ave. Thompsonville, Conn.

FOR Sale: Viking II, $215; B&W 5100 almost new, $400; RME 2 to 11 receiver with S meter, $100; HRO5 in Viking II cabinet, $125; BC348 in Viking II cabinet, $60; Millen 90810 xmittr, 100 watts with 6L6 mod. $150. All guaranteed. F.o.b. Bryan, Texas. Roy R. Bernhard, W5RAL, P.O. Box 673, Bryan, Texas.

FOR Sale: Telrex 20M 3E1 beam Mod. 503A, complete with broadband ends and balun. $80 f.o.b. Dr. M. F. Hash, 319 No. 26th St., Billings, Mont.

SELL: Central *20A SSB* transmitter. Looks and operates like new, $175. Pete Vander Meer, W8GWQ, 500 Elmdale St., N.E., Grand Rapids, Mich.

BC-221AK freq. meter, mod., original calibration book, in new condx: $75 or best offer. W2OTY, E. J. Pirrung, 40 Folger St., Buffalo 20, N. Y.

FOR Sale: Traded-in TV sets. Will ship anywhere. Dollar per inch (10" — $10), (12" — $12), (16", $16). Makes an extra set or scads of ham parts. Packing, $5 extra. F.o.b. Newport, Del. Box 3145, W3EEB, Newport, Del.

FOR Sale: Viking Ranger with sequential keying, JT30 mike and key, used very little, $182; Gonset Tri-Band, in fair shape, $15; Instructograph with built-in oscillator, 10 tapes, key and 'phones, $22.50; 829B's or 3E29's, $5 each; 814's, $4 pr; miscellaneous list. W9PBD, 2424 Washington Court, Ft. Wayne, Ind.

SELL: BC-224 receiver, same as BC348, clean and operating. Less power and speaker, $49. BC457 transmitter on 80 M, $10. N. W. Hearn, 185 Liberty, Rockland, Mass.

ENGRAVED Call plates for your rig and shack. Free literature. Ike Hagen, W8GVS, Northport, Michigan.

SELL: DX100 xmitter, in excellent condx, $200. Local sale is preferred. Bernhardt, W9JSM, 801 Mildred, Ft. Wayne, Ind.

NATIONAL SW3, excellent, with diagram, $25; new Eimac 4X150A tube, $25; 5D22-4-250A, $25; PE103, $25; Speedex Bug, $6.50; SCR522 2 meter transmitter and receiver, $25. M. D. Welch, 2637 49th S W, Seattle 16, Wn.

FOR Sale: 12 volt Gonset Communicator II with shore 101 mike, almost new, $195; KW linear final with 4-250A tube, less pwr supp, $75; Single Sideband exciter with VFO and pwr supp., $55. List of bargain meters and gear. 832 tubes, $3.50. W2PKI, 625 Pine St., Steelton, Pa.

FOR Sale: 20 and 15 meter interlaced beam. Custom made, $100.00 worth of aluminum in antenna. Pictures on request, $60. Will ship anywhere! Also 100# of RG-8/U with connectors, $8. K2JZT, RD #1, Sherburne, N. Y.

SELL 32V3 and NC-183D in excellent condition, both for $500 cash or 32V3 for $400 and NC-183D for $200 separately. No trades. Need funds for home. Will ship prepaid. Ltd. F. D. Wilson, K4AFV, Florida Group, Naval Station, Green Cove Springs, Fla.

300 Watt 813 final amplifier with 200 watt modulator fully metered, bandswitching, with 2500 volt 400 mil power supply, beautiful construction from 1956 ARRL Handbook, intended for use with Viking Ranger as exciter and speech. No reasonable offer will be refused. Also SP44 Panadaptor $50. W2ISS, H.H. Rogers, 118-36, 224th St., St. Albans 11, N. Y.

SELL or trade: Unused tubes: 829B, 832A, pair 811's, pair 807's. K4HDO, Rte. #1, Morehead City, N. C.

FOR Sale: Hallicrafters SX-88, in excellent condx, $425, or best reasonable offer. F.o.b. Arlington, Mass. W1WJW, Bob Hudson, 44 Varnum St.

NEED May 1916 QST, also 1926 and 1929 Radio Amateur's Handbook to complete file. Must be intact and good condx. Please advise prices. J. J. Simpson, 85-39 152nd St., Jamaica 32, L. I., N. Y.

VIKING Ranger, 1955 factory-wired; on air twice, perfect condx: $125. I. Daly, W2YBZ, 14 Ertman Drive, Whippany, N. J.

WANTED: KW Modulation transformer to match push-pull parallel TZ-40 Class B running 1500 volts 400 mills to RF load, 4000 to 5000 ohms at 400 mills. Will consider changing Class B tubes if they will work on 1500 volts at 400 to 500 mills. Ultra Modulation here we come! W1DIS, Rte 302, Raymond, Me.

WANTED: Modulation transformer for BC-610. State price and condition. J. D. Whitaker, 827 Church St., Marietta, Ga. W4UAT.

300 Watt diathermy machines, $20 each. Wanted: 500 watt modulation transformer. Will pay $30. Joe Tate, 2116 Rosebud, St. Louis 20, Mo.

VIKING Kilowatt and matching right desk. Entered service so must sell. Like new condx. $1250 F.o.b. Lone Tree, Iowa, takes it. Write Capt. Clifton Adams, 858 Greenwood Ave., Clarksville, Tenn.

FOR Sale: Hallicrafters S-38D, like new, $27.50 F.o.b. Bert Felsburg, W3VN, 675 Grant St., Hazelton, Pa.

SIGNAL Generators, perfect: Hickok 288X, $65; Heathkit $12; *Motorola mobile FM transmitter, $16.* W4BMC, 91 Karland Dr., N.W., Atlanta, Ga.

SALE: 4X150A/4X250B Eimac sockets shown in QST Oct., p. 40. Contract termination, never used: $5.00. K2CW, 69 Ashland Rd., Summit, N. J.

HQ-129X, A-1 condx, $140; Elmac A54H, $85; Gonset Super Six, $45; 6/400V dynamotor, $15; all three, A-1, $125. R. Tell, W2TZI, 240 Yarmouth Rd., Rochester, N. Y.

SELL: Collins V2, 75A2, like new condx, $575. Want: KWS-1, 75A4. Dr. Milton Gordon, 12 N. 27th St., Camden 2, N. J.

COLLINS 32V3, purchased March 1956, only 3 hours operating time. Like brand new, $525. W7WA.

FOR Sale: Viking II, VFO, Matchbox, low pass filter, Johnson SWR with 5" meter, factory wired, push-to-talk, all manuals, complete, hardly used. $325. N. Y. Area. W2ASI, Freedman, 117 E. 11th St., GR-2-7028.

FOR Sale: S & W mobil-ceiver (like Gonset Super-ceiver). Never used! Still in factory carton: $60; Simpson 303 VTVM: $45; Sonar 2-meter mobile transmitter and receiver: $40 each. Have other items. Fool! Send 3¢ stamp for full list. Gene Silvey, W6COZ, 636 N. Gordon St., Pomona, Calif.

25 Watt modulator with A.C. power supply, $20; A.C. power supply for Command set transmitters, $15; 10-meter xtal controlled mobile converter, $10; 8 watt ten meter 'phone xmitter with 5 xtals and A.C. power supply (detachable), $15. Write Miss Nancy Schein, K2ECD, Capen House, Tufts University, Medford 55, Mass.

BARGAINS. With new guarantee: SX-43 $109.00; S-38C $32.50; SX-28 rack $99.00; SX-62 $179.00; S-27 VHF $79.00; Lysco 600 $69.00; Lysco 381 VFO $17.50; Eldico TR-75 TV $35.00; HT-17 $24.50; Meissner EX VFO $25.00; Gonset Tri-Band $29.95; Gonset Super-Ceiver (6 v.) $69.00; SW-54 $30.00; NC-57 $65.00; NC-183D $265.00; HRO-50T $199.00; HRO-50T-1 $245.00; Millen 90800 $14.95; Johnson 122 VFO $24.95; Viking II $229.00; Viking Ranger $189.00; RME-84 $65.00; Globe King 500 $475.00; and many others. Free trial. Terms financed by Leo, W0GFQ. Write for catalog and best deals to World Radio Laboratories, 3514 West Broadway, Council Bluffs, Iowa.

WANTED: Used receivers and transmitters! Will pay cash or trade. 10% down with up to 24 months to pay. Have in stock: Collins 75A4, KWS1, new 75A3, Johnson, Barker & Williamson, National, Hallicrafters, Hammarlund, Gonset, Central Electronics, Hi-Gain, Gotham and Mosley beams. Write Ken, W0ZCN or Glen, WO/ZKD, Ken-El's Radio Supply Co., 501 1st Ave. North, Ft. Dodge, Iowa.

TRADE for NC-125 or equivalent, "D" Graflex with 2 lens and other equipment. Detroit area deal. Max E. Pierce, 5266 Maryland, Detroit 24, Michigan. Tel. TU 2-8809.

FOR Sale: One Meissner Signal Shifter with power supply. Partially built rig, cabinet complete with meters, knobs, frontal plates and all parts necessary for completion. Rig runs pair of 812As in final and is modulated with pair of 811s. Spare transformer for bigger final included. Any reasonable offer accepted. Sturgis Hiller, W1KPG, Foxboro, Mass. Tel. KIngswood 3-5736.

WANTED: Copy of "Two Hundred Meters & Down" by Clinton B. DeSoto, in gud condx. W2GVU, 34 Russel Ave., Ft. Monmouth, N. J.

NC-183D for sale. Only one year old, immaculate condx, used about fifty yours before interest in radio collapsed: $300. William D. Gardner, W61CH.

SELL: Excellent 3.8-5.8 Mc. receiver/transmitter combination for Field Day, emergency, mobile use, BC654A with spare tubes, speaker, mike, $50. Master Mobile antenna, Ward mount at half price. PE103A with cables available at $20 to power BC654A from 6 or 12 volts. W1HEZ, Springvale, Me.

SUPER-PRO 200X, complete with manual. Very clean. $95. K2ABY, McHugh, 73 Cherry Ave., Bethpage, L. I., N. Y. Tel. WE 5-0730.

WANTED: Wilcox CW3 receivers, Boehme keying head, sell RTTY tape transmitter WU-1A and double transmitting distributor. Millen exciter, Triplett 666H VOM. W. E. Britton, Box 1009, Sta. "A", St. Helens, Oregon.

FOR Sale: Collins 75A3, calibrator and speaker, latest factory run model, Serial #1620, perfect condition, $475; 500 watt Collins Class B modulation transformer with 4 new 810's, $40; new PE103 6, 12v. dynamotor, $20; RCA AVT112A and AVRO20A mobile transmitter and receiver, new, $35; BC645 2-meter transmitter-receiver with dynamotor, new, $25; 3 element 10-meter beam, small prop pitch motor, 2-110v. selsyns, 100 Ft. RG8U cable. $30. W0ATP, 6210 W. 76th Place, Prairie Village, Kans.

SELL: RME MC-55 five-band, 6-12 volt converter. Used little. Equal to new condition. $30. R. Hertzberg, W2DJJ, 241-16 Alameda Ave., Douglaston 62, L. I. N. Y.

WANT: NC240D, clean. Also DB-23, 100 Kc. GT-cut xtal; Wheatstone-Creed sending head and puller; and 85-Kc I.F. coils for BC-453. Paul Rockwell, 5800 Hillburne Way, Chevy Chase, Md.

SELL or swap 20A factory-tested with QT1 and all-band 458 VFO, $195; 2-837 linear with power supply in C.E. styled cabinet, $45; LA400 with 4-837 GG, $110; 522 xmitter, all tubes, new, unmodified $15; RK-34D32, new, in carton, $12; KW linear amp. 2-813 GG with Thordarson power supply, $100; 4-813 tubes, $5 each; 2-832 tubes, $3.00 each. All equipment new or in like new and in excellent operating condx. G. McKinley, 6149 Ozark, Chicago 31, Ill.

SELL: HRO-60 with speaker and 6 coils. Like new, $400. Pete Hansen, 751 Fairview, Kalamazoo, Mich.

TRADE good NC-183 for clean six meter Gonset Communicator. Sell pair brand new 4X150A's and SK-610 sockets, $50. George Ritter, W4UGX, Box 72, Winchester, Va.

COLLINS 32V-1 in gud condx, w/instrux book, spare set tubes, coax relay, SWR bridge. Best offer over $275 takes it. W2AII, c/o W2AEE.

NATIONAL NC-300 with plug-in crystal calibrator less crystal. Purchased May 1956. Perfect in every respect. $329. Inquiries welcome. Wilbur Wright, W8IUV, 2610 Andrew, Hamilton, Ohio.

FOR Sale: Pair 810's, $15; pair 6C21, $25; Thordarson T15R61 xfrmr 100 watts, 110 V. input, 5V, 3A; 150 to 275 v., 25 v. steps, each side center, $2.50; 10H 1A choke, cased, $12; heavy-duty xfrmr 110v. input or 110/220 v., 22v ct, 50A, specify. Make offer Kenyon S12851 fil. xfrmr 110 inp., 2 secondaries, each 7.5v., 15A., $4. All 60 cycle. Everything guaranteed. F.o.b. Louisville, Ky. Bob Goodman, W4EKI, 2131 Woodford Pl., Louisville, Ky.

SELL: SX-71, late model, in new condx; outboard units, $140. K2CJC, 6244 Cromwell Crescent, Rego Park, N. Y. IL 9-5571.

FOR Sale: DX-100 in exc. condx, used six months. Very neat careful wiring job by electronics engineer. Reason for sale: forsaking 10 thru 160 and moving to VHF, $190. Kingsbury, W1EME, Sachem's Head, Guilford, Conn.

LEARN Code quickly with your tape recorder, get your license. Same system, with improvements, as used for GI training during WW II. Uncle Sam did a thorough job quickly and you stand to benefit. Tapes start at $3.50. For full details write Tapecode, Box 31-E, Langhorne, Pa.

SELL or Trade: Hammarlund BC 779B receiver, in gud condx, $100; Hallicrafters HT-6 transmitter (25W) with 10-20-40 coils, ready to operate, $35; or will trade. Want commercial SSB exciter, mobile transmitter, or 2 meter transmitter. H. M. Russell, Lt. Col., Int., W9ULS, Quarters 8B, Ft. Sheridan, Ill.

KP-81, like new, factory aligned; parts list, manual, etc: $350; HT-20 and Viking VFO, perfect condx, like new, $350; 15 meter, 3-el. beam, $20. R9R, 10-15-20 coils, $15. R. Maxwell, W0QHU, 3933 Rose, Long Beach, Calif.

CENTRAL-ELECTRONICS "A" $49.95, "B" $74.95, 10B $139.95, 20A $199.95; Collins 32V2 $450.00, 32V3 $550.00; Elenco PA 400 (new) $199.95; Elmac A54 $99.95, A54H $110.00; Gonset 3016 $99.95, 3024 $64.95, 3025 $179.95; 3026 $159.95, 3030 $34.95, 3063 $129.95; Hallicrafters HT17 $34.95, S40A $69.95, S76 $139.95, SX62 $225.00, SX62A $250.00; Hammarlund HQ129X $139.95, SP400X $229.95; H-Wells TBS50D $79.95, TBS50JR $39.95; Johnson Adventurer $44.95, Vik-II $249.95, VFO $39.95, KW W/DESK $1,295.00; National NC57 $64.95, NC183 $194.95, NC183D $275.00, NC200 $129.95, NC240D $159.95, HRO50T1 $325.00, NC100 ASD $69.95; RME VHF152A $49.95. Many other used items available; write for latest list. Evans Radio, Box 312, Concord, N. H.

WANTED: KW1 or Johnson KW. Quote price and condition. All offers answered. P.O. Box 5032, Memphis 12, Tenn.

4-400A, one hour use, $50, or best offer. Dale Gorsuch, K5AKW, 3658 Race, Ft. Worth, Texas.

SELL: New 4D32 tube, $14; new 6-meter Gonset Communicator (6v/115v), $180; Want: Sonar MR-3 receiver; G-E Ham News (Bound, Vol. I). Roy Sawdey, 5255 Harper, Solon, Ohio.

WANTED: Surplus TV camera CRV59 or similar gear vicinity Long Island or New England. R. O. Noyer, K2QPH, 26 Sparks, Huntington Station, L. I., N. Y.

W1REP has spare G4ZU 3-band Mini-Beam (built by Panda Radio Co.) with auto-tune unit, $100. R. Gibbons, 15 Everett St., Canton, Mass.

FOR Sale: Transformers, less enclosures, 7200–7620 volts primary with center tap, 115/230 volt secondary. Excellent condx. $15 each. Power Electric Co., 1920 North Mill, Jackson 5, Mich.

FAMOUS VHF "Lunenburg" antennas, 6-meter, 5-el., $14.95; 2 meter 6-el., $6.95; 6 meter horizontally polarized mobile antenna. Wholesale Supply Co., Lunenburg, Mass.

SELL: ARR-7 rcvr, best thru 42 Mc., twelve tubes, xtal filter, airborne SX-28A, $60; Harvey-Wells T-90 xmitter, $145; R-9 rcvr, $130; both scarcely used. Several 2C40s, 2C43s, $5. No swaps. Updike, 1848 Winston, Charlottesville, Va.

SALE: Globe-Scout 65, $60; Knight VFO, $21; box of junk, $7. All ppd. 500 mil. Robert Weisman, W3ZQG, 516 Washington St., Cumberland, Md.

WANT Gonset Communicator or cash offer for my SX-28A, Sonar MR3, 522, VX101 xmitter, 100 watt mod., 150 watt final, Dumont 'scope, 2 M. conv., TR4 rotator. W. M. McDonald, St. Georges, Newport, R. I.

SWAP or sell, new RCA 832A, $4; 814, $1.50; 203A, $2; 872A, $1; 3½ KW auto transformer, input 220-output 115 volts, $25; plate transformer 2200–4400 c.t., 2200, primary 220, $25; BC-322 transmitter and receiver, range 52–65 Mc. $18; Aircraft AKN-8 receiver, $15; Kenyon S11459 choke 1.0 henry $5; new plate transformer, multi-tapped, primary 115 volt secondaries, 425 volt-250 mils and 185 volt 435 mils, $12; new Krecko 2 meter mobile transceiver and 6 volt Vibrator supply, $75. Bill Slep, W4FHV, Ellenton, Fla.

BARGAINS: Reconditioned with new guarantee. Shipped on approval. Hallicrafters S38 $29.00; S40 $59.00; S40B $79.00; S85 $89.00; SX43 $99.00; SX99 $119.00; S76 $109.00; SX96 $189.00; SX100 $229.00; SX71 $149.00; National NC57 $59.00; NC88 $79.00; NC98 $119.00; NC125 $129.00; NC183, NC240D, NC183D, HRO5TA1, HRO50T, HRO50T1, HRO60, NC300, Hammarlund HQ140X $179.00; HQ129X, HQ150, Super Pro, SP600JX, Viking Adventurer, $39.00; Ranger $179.00; Viking II $199.00; Collins 75A1, 75A2, 75A3, 75A4, 32V2, 32V3, mobile converters, receivers, transmitters, many other items. Easy terms. Write for list. Henry Radio, Butler, Mo.

WANTED: Patterson PR-15 communications receiver manual and schematic to copy. Will return. Offering $5.00. K0EXD, Carl Thorsell, 1195 E. 77th St., Kansas City, Mo.

SALE: Johnson Viking II, factory-wired, in excellent condition. Also Johnson VFO both for $250. C. Herring, 1306 West 8th St., Plainview, Texas.

HQ-120, $95 and DB22-A, $35. Prefer to sell together; as manufactured and with original instruction books. 250TH, $5; 450TH, $5, also "pole peg" 2400 CT at 1.5 amp cased, $10; Amertran 6200 CT at 750 Ma., $25. First money-order buys. Shipping charges collect, W6NXP, 407 South Mollison, El Cajon, Calif.

SACRIFICE SALE: 75A3, Speaker, 3 and 6 Kc. Filters, Calibrator, $350.00; BC-1004C, Power Supply, Speaker 540, 20.0 Mcs., $100.00; 150 Watt, Temco, 75 GA, 80 thru 10 meters, Final, 4–65 tube, complete, $125.00; RME, VHF152A, Converter, $35.00; LM-15 Freq. Meter, AC Supply, Cables, Original book, $100.00; Johnson, 20 M 3 EL, Beam, Boom, Balum, Unused, $65.00; Amphenol, Mims, Rotator, limit switches, Selsyn Indicator, Excellent Value, $150.00; Canadian, RCA, AR-6, Receiver, 140 Kc. thru 21.0 Mcs. with Dynamotor, $39.50; TR-4, Abbott, 2 meter Transceiver with tubes, less power supply $15.00; Write for long list tubes, parts and meters, all F.O.B. Oakdale, L. I., New York. Theodore Whildin, 288 Woodlawn Ave., Oakdale, N. Y.

SELL: DX-100, in perfect condx, $180. Want 4D32 tube. M. H. Klapp, 17 Kenosha St., Albany 9, N. Y.

COMMUNICATOR "S" Meters. Illuminated. Just plugs in to attach. Will make swell Xmas Gift. Also new and used Communicators, Linear Amplifiers, V.F.O.'s, G-66's, Commander transmitters, Super-Sixes, Eimac AF-67's, PMR-7 receivers, etc. Graham Co., R. T. Graham, W1KTJ, Stoneham, Mass. Tel. ST 6-1966.

CRYSTALS: Marine, CAP, MARS, CD, aircraft, amateur. Manufactured since 1933. Airmail delivery. C-W Crystals, Box 2065, El Monte, Calif.

SWAP New 416B. Need rec. 6 M. mobile converter. Make offer. W9TUV, K. Crittenden, 1312 Copeland, Beloit, Wis.

6M. International xtal converter, $9. Parts for 7 watt 6 M. rig, $8. K2GBH.

75A-4 Collins receiver, like new, used less than 3 months. In original box, shipped prepaid in U. S. First check or money-order for $500. K4IGW/3, 306 Princeton Rd., Lexington Park, Md.

NEW for all hams and SWL-ers. Great for the mobile rig, too. Ur call-letters in plastic that attaches to any smooth surface, car windshields, xmitter, receiver, etc. Only $1.00 postpaid. Frad Company, Dept. A1, Box 234, Coshocton, Ohio.

SELL: 1.3 Kv. power transformer and choke, Thordarson T19P67 and 19C38, 2500 VDC at 500 Ma., both $40; uncased but sealed transformer, 5200 VCT at 400 Ma., $15; Stancor SA403A clipper filter, $2.50; Johnson 50DD90 variable condenser, $3. D. L. Robinson, W3SWV, 1609 Westview Dr., New Kensington, Penna.

SELL: NC-98 and QF1. Best offer over $100, AT1 and VF1, $40. Dave Fraser, K2LAI, 8 Willow Bend, Poughkeepsie, N. Y.

PERFORATED aluminum sheet, .051, 5/64" OD holes, ½" centers, $1.20 sq. ft., cut to size. Send for listing on Beams, Aluminum Tubing, etc. Radcliff's, Fostoria, Ohio.

BEFORE you sell, call Rex! Wanted: Surplus military and commercial aircraft electronics: BC-788, I-152, ARN-7, ARC-1, ARC-3, BC-221, RTA1B, ART-13, DY-21, APN-9 transmitters, receivers, test equipment, etc. Electronic tubes, Broadcast, transmitting, receiving, Magnetrons, Klystrons, miniature, sub-miniature, ruggedized, etc.! Top prices paid! For fattest checks, sell to Rex. Write or phone description for immediate action. Bob E. Sanett, W6REX, 1524 S. Edris Drive, Los Angeles 35, Calif. Phones: REpublic 5-0215, CRestview 1-3856.

VIKING I and VFO for sale. TVI suppression kit installed, $160. Scott Smithson, W5CCB, 920 E. 7th St., Dumas, Texas.

SELL: NC-125 w/spkr, very clean, $125; DX-35, $60; new PE103, $25; D-104, Viking VFO, baluns, coax, etc. Getting out of the ham game. WØDMS, Box 23, Liberal, Kansas.

SELL: Collins 800-cycle mechanical filter for HRO-60 or SP-400, in perfect condition, $25; seven BC-454B in original cartons, $4 each. Radio Club, Central High, Sioux City, Iowa.

WANTED: 20A Pacemaker or other factory-wired exciter, VFO, final. Wilton M. Richards, W5JPR, Box 785, New Boston, Texas.

RUBBER Stamps: Call, name, QTH. Send for samples. C. W. Hamm, 542 No. 93rd St., Milwaukee, Wis.

WANT to get back on the air pronto! Finances very low; need receiver badly. Age, make, condx (repairable) not important. What's happened to all those old revrs? All letters will be answered. W9BOA, Schmidt, 1209 Alabama Ave., Sheboygan, Wis.

DX-35, Heath VF1-VFO, both wired and tested. Used only three months. Both for $65. Bill Lee, K5HDH, Box 2100, Harlingen, Texas.

JOHNSON Adventurer, in very gud condx, with two crystals, 7.073:333 and 7.175. Best offer above $30 gets it. KØDVJ, Jamaica, Iowa.

GONSET Communicator, 2-meter 6-volt model 1, with mobile and fixed cables. Portable chest-strap mike included. Gud condx. $110. L. G. McCoy, W1ICP, 38 LaSalle Rd., West Hartford 7, Conn.

B&W 51SB-B side band generator in factory sealed carton, $200; new RME-100 speech clipper, $25; RME DB-23 new condx, $35; Selsyns, 115 volt type SG, $10 pair; B&W 1TCL 75-watt turret, new, $5; LM-14 freq. mtr w/calibration book, $75; Eimac 6C21 new, $10; Eimac fixed vacuum condensers, 50 $\mu\mu$fd 32 Kv., $7; 25 $\mu\mu$fd, 32KV, $7; 12 $\mu\mu$fd 32 KV, $6, Jennings ditto, 250 $\mu\mu$fd 17 KV, $25 pair, 5 $\mu\mu$fd 17 KV peanut type, $5; Hammarlund crystal calibrator, $7, all F.o.b. John Huey, W9AMU, 390 Hill Avenue, Elmhurst, Ill.

WANTED: No. 15 teletype printer. E. J. Bungue, 473 11th St., Brooklyn, N. Y.

ELMAC PMR-6A, perfect condition, $70; B&W CX-95C, in original carton, $16.00; BC-221 frequency meter with extra 1000 Kc xtal, less calibration book, $25; Heath GDO-1A, $12. Bill Auvenshine, K6RXG, 8207 Kittyhawk Ave., Los Angeles 45, Calif.

SELL: Lakeshore Linear, P-400-GG 575 watts SSB 200 watts AM, $219. Central Electronics Model B slicer, $75; both items used less than one month. Guaranteed. Want: 6-meter Gonset converter trade. G. F. Guler, Palmetto Trailer Park, Box 203, Merritt Island, Fla.

SELL: 2-meter Communicator $175; 60 dynamotor 600V 250 Ma, $10; Motorola FM 30-50-Mc transmitter and receiver, $70. Other gear. Will consider trade. W8LRT.

GOING to college. Separate or closest offer. $700 takes all: Globe King 500A, $600; portable Underwood mill, $60; NC-57 revr, $70; Heathkit "Q" Multiplier, $12; Presentation goldplated bug with case, $20; low impedance dynamic mike with push-to-talk stand, silverplated, $70. All items in excellent condx. You pay freight. W. J. Fulmer, 426 E. Crane Ave., San Antonio, Texas.

MERRY XMAS and a Happy New Year from W0CVU. "Heard around the world." Collins KWS-1, 75A-4, Telrex 56 beams. On the air since 1913.

SWAP Model 70 Win. 220 cal. Swift with Weaver K-10. Want revr, HQ129X or better. KØDVW, RFD #3, Fremont, Nebr.

ASTATIC JT-40, stand, cord $10; T-17-B, $2; PE-103-A, $15; Sonar XE-10 $8.50; SCR-522, $22.50; Hammarlund Four-11 modulator $12.50; G-E VE-9 Electronic Switch, $35; BC-221-AA, power $60; Millen GDO, four LF coils, $42.50; Jackson 652 audio oscillator, $45; Meissner Signal Shifter $10; BC-624-A 2-meter revr, 115V supply, $25; Johnson Matchbox, $37.50; B&K CRT-350 TV tube rejuvenator, $30; BC-654-A, rack, PE-103-A, PE-104, $42.50; Heathkits: VTVM, $15; DR-1, $10; 5" 'scope, $22.50; IB-1, $37.50; GD-1A with LF coils, $17.50; everything brand new or like new, manuals, F.o.b. Indianapolis. Many other items. Howard Severeid, W9DPL, 2431 E. Riverside Dr., Indianapolis 23, Ind.

HAMMARLUND Super Pro 400SX revr with pwr pack, spkr, and manual; Harvey-Wells Bandmaster Senior xmitter with matching VFO. All units excellent, electrically and physically all for $275. Deliver within 60 miles. Leo Di Monopoli, 41 Suffolk St., Worcester 4, Mass.

FAMOUS Stancor ST-203A, 28 Mc mobile transmitter kits available, complete with manuals. Were $47.50 net. While they last: $19.95 F.o.b. 7808 W. Addison, Chicago 34, Ill. Ralph Curcio.

FOR Sale: Viking II and VFO in gud condx, $220; also Hallicrafters SX17 with speaker, $45 and S-52, $35. Need cash. Would prefer local sale. W1YVT, 48 Winchester St., Medford, Mass.

SELL: Collins 270G-1 speaker, $12; Collins 35C-2, 52 Ohm low-pass filter, $25; B&W balun coils mounted with co-ax fitting and switch for 75 or 300 ohms, 80 thru 10 meters $8; B&W HDVL 1000 watt coils for 80 thru 10, five coils jack base and swinging link, $20; B&W Butterfly condenser CX-49A, ideal for KW rig, $25; UTC type CVM5 600 watt audio modulation transformer, Varimatch $25. All parts used. Francis C. Kramer, WØDEI, St. Charles, Minn.

49-FT triangular Alprodco Pop-up tower, PM429A, new original crates $45; SST24 $22.50; Bl base, $1.00; MB1 base, 50¢; MK1 kit, $1.00; P1W kit, $1; 8 tt. ground rod, $1.00; 10 ft. 4W rotor cable, $2.50; new TV boosters factory cartoned with tubes for 110VAC; Regency DB520 $2.50; Anchor 101-75, $2.50; Standard B51, $2.40; Silman $2.50; Masco $2.50; Regency DB410, $2.50; Anchor 101-100, $3.50; Astatic AT1 $9.50; Astatic BT2, $4.95; Alliance AB3-5, $4.95; Tubes RK4D32, $13.95; RK715A $1.75; 725A, $1.75; 803 $3.75; new cartoned stock. Conelrad Monitor, Morrow CM-1, Christmas wrapped, immediate shipment, $39.50. Ladd Electronics, 111 North 41st St., Omaha, Nebraska

FOR Sale: P.P. 813 final, 2 ea. power supplies 1500V/1250 VAC at 325 Ma., CCS. 1000V/1250 VDC at 425 Ma. I.C.A.S. VR reg. bias supply, screen supply; 6AG7-6V6-807 exciter incl. but not connected. All metered. 7 ft. W.E. enclosed relay rack. Line filter. All rack mounted. Will not ship. $100. Kallaker Green House, RR #4 Massillon-Navarre Rd., Massillon, Ohio. Address all inquiries to: Terrill, 202 5th St., Brookings So. Dak.

HERE 'Tis: HRO5OT, 32V1, 32V2, 75A1, and 75A2. Cash acceptable only. Everett Norfleet, 2009 E. Broadway, West Memphis, Ark.

"COMMUNICATOR" 3057-B brand new, in original carton, $179; 4-el. dual boom 10-meter beam. Cost $55, never used: $25 (cannot ship); Millen 90881 500 watt amplifier/coils 10 thru 80, $59, Herbach & Rademan 35 watt ECO1 band-switching exciter. Cost $160; with cabinet: $45. W3BRS.

FOR Sale: National 173 receiver and speaker in excellent condition: $125. Robert Steinberg, 87 Evergreen Ave., Hartford, Conn.

FOR Sale: 75A3, $395; Matching speaker $15. 800N mechanical filter, $30; S01 rotator, continuous rotation either direction, complete with power supply and selsyns. Weight 150. . $100. Frank Fetzer, 16 Shelley Ave., Valhalla, N. Y.

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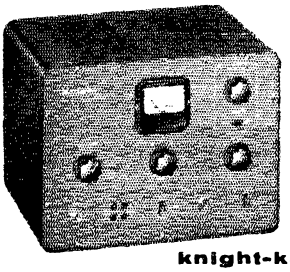

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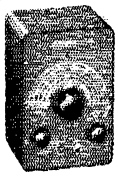

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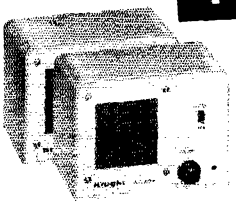

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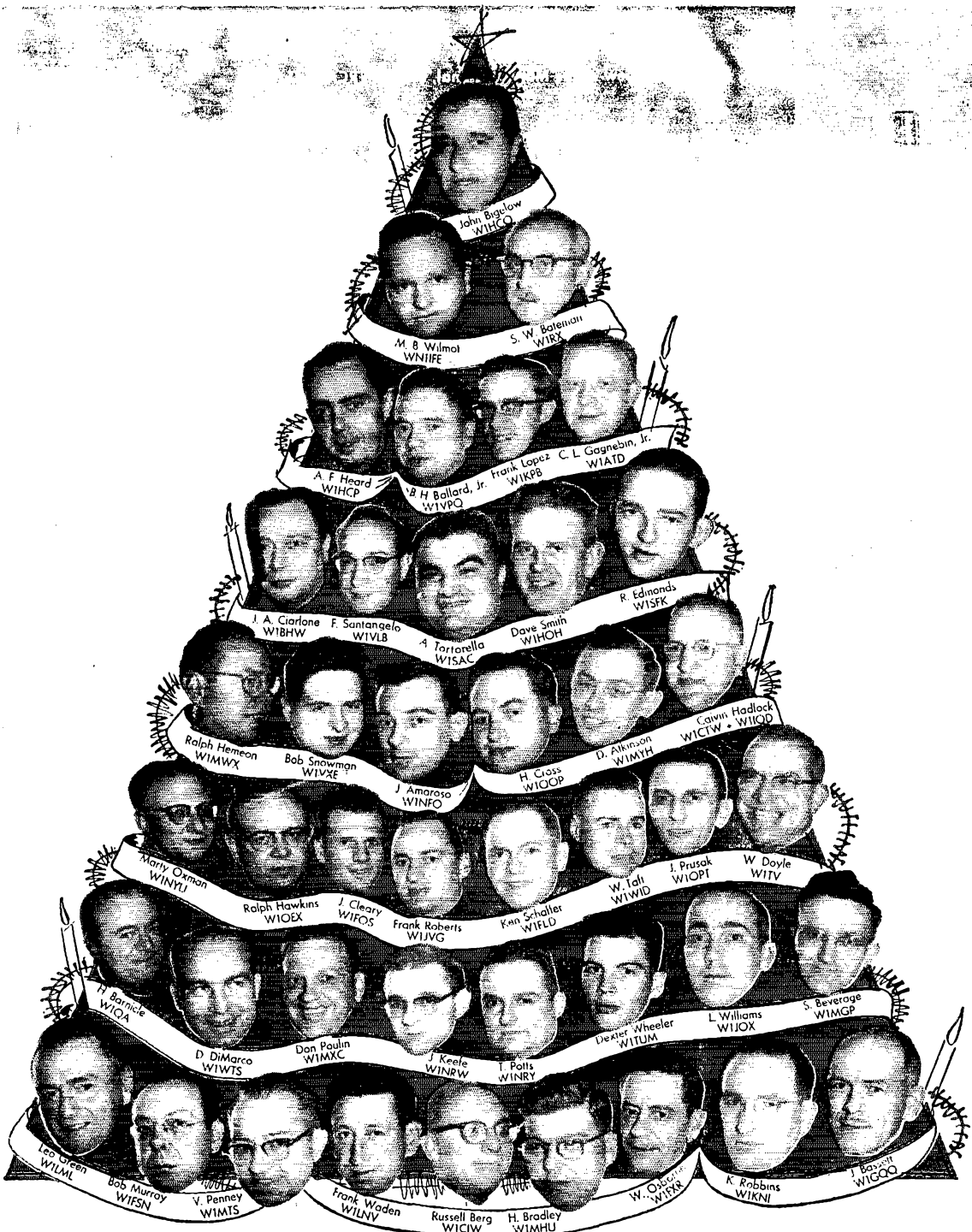

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Close-up view of the MB-560-A final, using an RCA-6146

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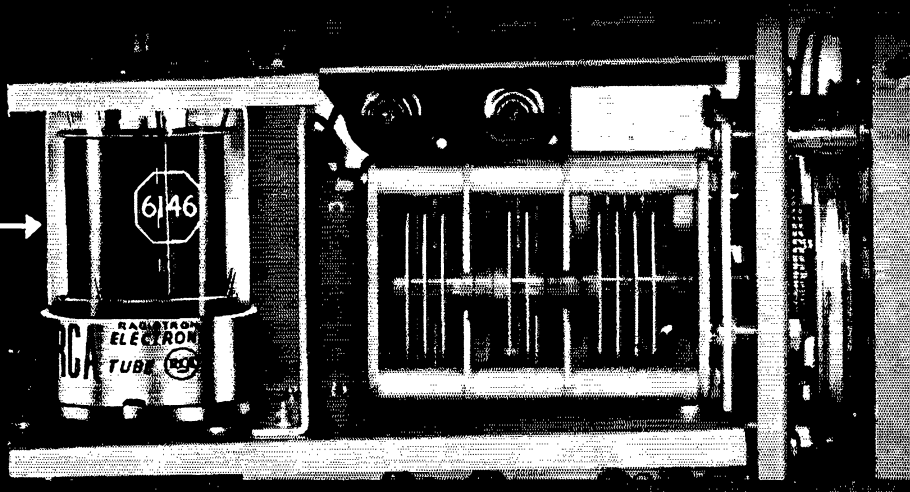

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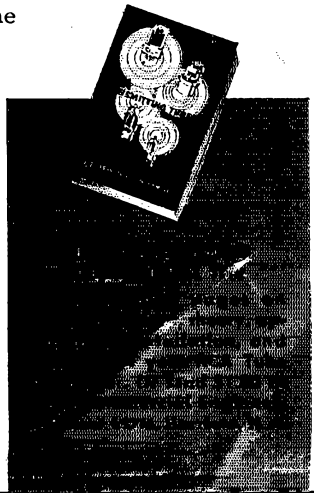

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