# REPLACEMENT TYPE TRANSFORMERS & REACTORS

## CHANNEL FRAME FILAMENT/TRANSISTOR TRANSFS.

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<th>Type No.</th>
<th>Secondary</th>
<th>W</th>
<th>D</th>
<th>H</th>
<th>M</th>
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Taps on pri. of FT-13 & FT-14 to modify sec. nominal V, 
-8% +8% +12%

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<th>Secondary</th>
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<th>H</th>
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## DOUBLE SHELL POWER TRANSFORMERS

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<th>H</th>
<th>M</th>
<th>N</th>
<th>Wt. Lbs.</th>
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<td>2.7A</td>
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<th>D</th>
<th>H</th>
<th>M</th>
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## CHANNEL FRAME FILTER REACTORS

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Inductance shown is at Rated DC ma—Test Volts RMS: 1500

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can be rendered to mankind
than communication of
the greatest of all ideas
...the hopeful message
of Christmas
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DECEMBER 1962
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for dependable, high quality power tubes

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<th>D.C. PLATE VOLTAGE</th>
<th>D.C. PLATE CURRENT (AMPERES)</th>
<th>D.C. SCREEN VOLTAGE</th>
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<th>APPROX. MAX. DRIVE POWER (WATTS)</th>
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<th>APPROX. D.C. GRID CURRENT (AMPERES)</th>
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(1) Ratings also apply to 4X250B.
(2) Ratings apply to 4-250A within plate dissipation limitation.
(3) Zero signal and maximum signal dc current.
(4) Grid and screen grounded, cathode driven.

Above you see popular Eimac tube types suitable for ham transmitters. Remember this chart when you need a tube. And remember the name Eimac. It means power. Quality. Dependability. For Eimac has more know-how, more experience with power tubes than any other manufacturer. Your local Eimac distributor can supply you with any of these tubes listed and Eimac sockets to match. Or for complete data, write Amateur Services Department, Eitel-McCullough, Inc., San Carlos, California. Subsidiaries: Eimac, S. A., Geneva, Switzerland; National Electronics, Geneva, Illinois.
ALL PR CRYSTALS are Continuously Monitored for Frequency During the Lapping Process

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**FUNDAMENTAL, PR TYPE Z-2—Frequency Ranges in Kcs.**
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- 7,000 to 7,425 (40-M)
- 8,000 to 8,222 (2-M)
- 8,334 to 9,000 (6-M) ± 500 Cycles...

All Z-2 Crystals calibrated with a load capacity of 32 mmfd.

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- PR Type Z-9A, 24,000 to 24,666 Kcs. $3.95 Net
- 25,000 to 27,000 Kcs, ± 3 Kcs...

6 Meters, Fifth Overtone, PR Type Z-9A, 50 to 54 Mc., ± 15 Kcs...

Citizens Band, PR Type Z-9R
- 0.005%...

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Precision at every stage of manufacture is responsible for the outstanding excellence of PR CRYSTALS. Here is a view of the Lapping Room, where blanks for PRs, previously cut and edged, are ground smooth to specified frequency, ready for etching to insure absolute stability during the life of the crystal. During the lapping, the crystals are continuously monitored for frequency with Collins 51J receivers.

PRs are in the rigs of thousands of proud Amateurs. They are famous for accuracy, dependability, high activity and low drift. Every PR CRYSTAL is UNCONDITIONALLY GUARANTEED. Get yours today from your jobber.
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<table>
<thead>
<tr>
<th>State</th>
<th>Call Signs</th>
<th>Name</th>
</tr>
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<tbody>
<tr>
<td>Delaware</td>
<td>WJZJ</td>
<td>Alan R. Strickler</td>
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<td>New Jersey</td>
<td>WJZJ</td>
<td>Andrew H. Abraham</td>
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<td>Pennsylvania</td>
<td>WJZJ</td>
<td>M. F. Nelson</td>
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### Central Division

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<td>WIND</td>
<td>Donald L. Davis</td>
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<tr>
<td>Wisconsin</td>
<td>KBOO</td>
<td>Kenneth A. Emeter</td>
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### Dakota Division

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<td>KDKA</td>
<td>Wendell H. Winkel</td>
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<td>South Dakota</td>
<td>KGND</td>
<td>J. W. Sloss</td>
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<td>Minnesota</td>
<td>WOBX</td>
<td>Mrs. Lynda S. Johnson</td>
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### Great Lakes Division

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<tr>
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<td>WJRQ</td>
<td>James L. Ferguson</td>
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<td>WJDU</td>
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### Hudson Division

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<td>W2FPU</td>
<td>George W. Tracy</td>
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<td>W2DHY</td>
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### Midwest Division

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<td>WGST</td>
<td>Dennis Burke</td>
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<td>Kansas</td>
<td>Wailo</td>
<td>C. Leland Chappell</td>
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<td>Missouri</td>
<td>WBBH</td>
<td>C. O. Goshe</td>
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### New England Division

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<td>WLCW</td>
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<td>W1YH</td>
<td>Percy C. Noble</td>
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<td>Vermont</td>
<td>W1EEB</td>
<td>Albert P. Haworth</td>
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<td>W1XJ</td>
<td>John H. Johnson</td>
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### Northwestern Division

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<td>Kenneth F. Koester</td>
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<td>Idaho</td>
<td>WTJN</td>
<td>Mrs. Helen M. Millard</td>
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<td>Oregon</td>
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<td>Washington</td>
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<td>WQOY</td>
<td>George R. Hudson</td>
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<td>Wyoming</td>
<td>W8TAU</td>
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<td>Georgia</td>
<td>W8LJ</td>
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<td>WJG2J</td>
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<td>Utah</td>
<td>W822J</td>
<td>Donn White</td>
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<tr>
<td>Oklahoma</td>
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<td>V47S</td>
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<td>H. E. Savage</td>
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<td>V47L</td>
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### Section Communications Managers of the ARRL Communications Department

- **Reports Invited**: All amateurs, especially League members, are invited to report station activities on the first of each month (or proceeding month) to the SCM, the administrative ARRL official elected by members in each Section. The ARRL club reports are also being solicited by SCM for inclusion in QST. ARRL Field Organization amateur stations are available in areas shown qualified League members holding Canadian or FCC amateur license, General or Conditional Class or above. Those include O/E, O. S. O., O. P. S. and O. S. B. S. O. M. desire applications for SEC, ECC, R. A. M. and FCC. As to which, unless O.S. O. M., finds appointment, is available to Technicians and Novices, as well as to full-privilege amateur licensees.

---

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

* *Effective Dec. 10, 1962.*
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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.

"Off, 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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160 Magnolia Place, Natchez, Miss.

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1570 Observatory Ave., Cincinnati 6, Ohio
Vice-Director: Robert H. Combs, W8AQA

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Vice-Director: Sumner H. Foster, W neglected.
2513 Linden Dr., S.E., Cedar Rapids, Iowa

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Vice-Director: John H. Smith, W1EAE
216 Old Bridge St., East 10, Mass.

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347 Park Hill Drive, Hillings, Mont.
Vice-Director: Robert H. Whited, W7PPQ
7700 31st Ave., N.E., Seattle 15, Wash.

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HARRY M. BRIDGWORTH.................................. W7WDA
170 Chapman, San Jose 26, Calif.
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“It Seems to Us...”

HONESTY IN REPORTS

As we’ve said several times recently on this and other pages of QST, a major problem facing the amateur service today is congestion in our bands. While the amateur body continues its steady growth, band limits remain finite. Individual station bandwidths, at least in proper operation, have been whittled down pretty much to the minimum the state of the art permits. The real solution, we believe, is sincere amateur attention to the League’s program to alleviate congestion through a more intelligent use of our frequency privileges — proper choice of bands for the distance covered, use of minimum power, and a better understanding of the technical capabilities and limitations of equipment.¹

Our operating techniques can stand some close scrutiny, as well. And one key to improvement of our situation is the giving of honest reports.

Here’s what too often happens: WAIABC gets on the air with a new sideband rig, a manufactured job. He’s so eager to get it going he hasn’t read the instruction manual except cursorily. After all, he’s held an FCC license a couple of years and ought to know how to run the thing. From what he’s heard about linear, he expects the input meter needle to react substantially when he speaks, and he adjusts the mike gain accordingly. Of course, he “flat-tops.” He makes a contact — and here is where our system fails down: the guy at the other end says, “you sound swell, OM, 5 by 9 plus 30 db., excellent quality.” He works a couple more with the same results. Suddenly a more conscientious or better-equipped station reports his splatter. ABC naturally concludes the guy is a jerk, or a trouble-maker, since everyone else has rated the signal as tops. So he goes merrily on his way, continuing to produce a considerable amount of splatter and resultant interference to others on adjacent frequencies.

The offender is no more to blame than the contacts who give him erroneous reports of excellence. The inaccurate report may be due to sheer ignorance of what the signal should sound like, or a failure to check for spurious away from the “carrier.” It may be the reporting operator hears the garbage but, since the transmitter has been identified as the latest manufactured unit, it is obviously a fault in his receiver. And although we hate to admit it, it may be because of a milquetoast attitude, a fear to start any argument with a fellow ham you want to call your friend.

We need more “arguments” about our signals these days — we mean, of course, gentlemanly discussions and a searching analysis of emission quality. Each signal, especially from a new or modified rig, should undergo careful examination of its characteristics. Even a two-letter call with a rig in use for some months is not exempt from possible misadjustment. The transmitting operator should receive honest views of how the signal sounds — better yet, how it looks on the scope. If it leaves something to be desired, tell him so. We can’t afford space today for energy which isn’t doing a communications job.

We’ve picked s.s.b. for the initial point of discussion, and indeed improperly operated sideband signals are major offenders in our crowded voice bands. But the principle applies to a.m. as well, and to c.w. “Up 579 hr in...” is too often a standard habit, regardless of actual readability, strength or tone. If he has clicks, chirp, contact bounce, or whatever, tell him so!

We can live in our congested bands, but only with full cooperation of all active amateurs in a better understanding of the technical limitations of our equipment. And 100%, honest reports are an absolute necessity, so that discrepancies may be cleared up immediately rather than permitted to take up priceless band space we need for communication.

A SALUTE TO I.R.E.

In mid-1912 a group of professional wireless engineers met in New York City to form, as an outgrowth of the Society of Wireless Telegraph Engineers and The Wireless Institute, a new organization which they named the Institute of Radio Engineers. The first roster contained names synonymous with the early development of wireless, both professional and amateur: deForest, Hogan, Pickard, Collison, Parnsworth, Goldsmith, Hober, Vanderpoel, Clark, Kolster, Hammond, Pacent, Sarnoff.

(Continued on next page)
Eastham, Spangenberg, Alexanderson, Apgar, to mention a few.

IRE commenced operation with 46 members; today it has grown to 100,000. Initially, all organizational work was on a volunteer basis; today a staff of more than 200 services the Institute’s needs. Part of this growth, assuredly, has come from the vast expansion of the electronics industry. But much of it has come about because the organization has had a real purpose, and its guiding directorships and operating staff have carried the Institute steadily forward toward such objectives.

A hearty salute, then, to our “big sister” society on its Golden Anniversary!

New York — The Westchester Amateur Radio Association will hold its Christmas dinner at 8:30 p.m., Dec. 20, at the Cabin Restaurant, 1172 Knollwood Road, White Plains, N. Y. The guest speaker will be Morton B. Kahn, W2KR, Hudson Division Director. Tickets are $5.00 per person, and may be obtained at the door or in advance from Stan Rothman, WA2NRV, 217 No. Regent St., Port Chester, N. Y.

FEEDBACK

We have just learned that W6TKA was the photographer who took the picture of the W6ULS transmitter used on the November cover. Our apologies to W6TKA, because taking a photo of such an intricate set-up is no easy matter!

COMING A.R.R.L. CONVENTIONS

October 4–6, 1963 — ARRL National, Cleveland, Ohio.
October 11–13, 1963 — Southwestern Division, San Diego, Calif.

Strays

W3HIC thinks he has the shack with the lowest ceiling — 4-ft. 8-inch headroom.

Some Heathkit Model HX-10 Marauder s.a.b. transmitters have exhibited a spurious signal at 13,990 kc. when operating c.w. at the very low end of the 20-meter band. A modification kit to attenuate this spurious signal is available free upon request from the Heath Co., Benton Harbor, Mich.

WV2WOA Dean A. Roork, 326 State St., Elmer, N. J., is interested in auditory system response to radio frequency signals, and would like to hear from others who have info or interest.

LX1 JW and W3GG/HB91A were among the engineers and administrators attending the general assembly of the Federation des Ingenieurs des Telecommunications de la Communauté Europeéne (FITCE) held in the City of Luxembourg September 3–9, 1962. W3GG is Secretary-General of the International Telecommunications Union; LX1 JW is president of FITCE and Chief Engineer of the Grand Duchy of Luxembourg.
This is the first of a series of articles describing the various sections of a transistor communications receiver. The construction is broken down into several discrete physical units which may be used either individually, or finally combined in a framework chassis to form the complete receiver, as the reader chooses. The sections include a tunable i.f. in the 2- to 4-Mc. range (described in this article), a series of crystal-controlled converters for the higher frequencies, a selective 455-kc. i.f. strip, a detector/agec/noise-limiter unit, including both diode and product detectors, and an audio section with squelch control. A suitable a.c. power supply and control system complete the receiver.

A Tunable I.F. Amplifier Using Transistors

2- to 4-Mc. Unit with 455-Kc. Output

BY B. E. HARRIS,* W6ANU/4

FOREWORD

As many other writers have said, the current advances in the solid-state or semiconductor electronics field are destined to revolutionize communications. Although it is more than a full-time job to stay abreast of all developments in this field, it nevertheless behooves the technically inclined amateur to maintain some contact, or he will find himself left at the post in future years. The current wide availability of a large variety of semiconductor devices at constantly decreasing prices makes it possible for the amateur to maintain contact and, at the same time, build equipment which will perform most of the old tasks at least as well as vacuum-tube equipment and, in several cases (notably in portable equipment), do them better.

It was primarily with the idea of maintaining contact with the field that the writer began the experimental work which resulted in, among other devices, the various units to be described which are eventually combined to form a complete communications receiver. Most of the work is not new. There is, however, no stimulus to study and thought quite like the desire to complete a functioning and useful piece of equipment.

The word "transistor" has come to imply "miniature." While it is true that transistors permit considerable reduction in the size and weight of a complete receiver, as compared to an equivalent employing tubes, other components (principally the tuning dial) are limiting factors. The cabinet size of 8 by 8 by 10 inches, which houses the complete receiver shown in the photo, is small, but it can hardly be classed as "miniature." However, it is in the area of power consumption that a transistorized receiver is really differ-

*Chief Engineer, Polaris Project Office, Patrick AFB, Fla.

Here is the complete receiver for which the tunable i.f. described in this article was designed. It takes up only 540 cubic inches of space and weighs 1.5 lbs. complete with long-life battery supply for portable operation.
Fig. 1—Tuner circuit. Heavy lines outline subassemblies mounted on copper-coated phenolic boards. Resistors are 1/4 watt. Fixed capacitors of decimal value are disk ceramic or mylar; others are silver mica or NPO ceramic. All unidentified plugs and jacks indicated are single-circuit miniature (CTC 2379-1 and 2378-2). Other components not listed below are identified for text-reference purposes.

C₁—Triple-gang variable, approx. 200 pf. per section (see text).
C₂—4-30-pf. NPO ceramic trimmer.
C₅, C₆, C₇, C₈, C₉—Air trimmer (see text).
J₁—J₄, inc.—Banana jack (see text).
L₁—4 turns over ground end of L₅.
L₂—70 turns.
L₃—8 turns at ground end of L₂.
L₄—Same as L₃.
L₅—5 turns wound over ground end of L₁.
L₆—1.5 turns at low-potential end of L₇.
L₇—58 turns, tapped at 3 turns from low-potential end.
Above coils are close-wound with No. 32 enameled wire on 3/8-inch ceramic iron-slug forms (CTC PL55-2C4L/B).
P₁—P₉, inc.—Banana plug (see text).
T₁—Miniature transistor 455-kc. interstage i.f. transformer (Lafayette MS268A).
The complete receiver requires less than one-half watt at 12 volts with the dial lights turned off. (The two 6.3-volt lamps consume about five times as much power as the rest of the receiver!) This is more than two orders of magnitude less than the power required by the average communications receiver using tubes. The reduction is most evident in the absence of heating. Compact vacuum-tube devices are usually "hot boxes" indeed. The low-power requirement allows truly portable operation. There is space inside the cabinet for 8 penlight cells which will power the receiver for many hours. A 12-volt lantern battery (the recommended battery supply) will give practically shelf life under average use.

The mechanical design of the receiver is somewhat unusual in that, with the exception of the i.f. tuner described in this article, all units are assembled on bases of \( \frac{1}{16} \) inch copper-coated phenolic sheet of uniform dimensions \( 4 \times \frac{1}{2} \) inches. This makes it possible to interchange the positions of units in a framework chassis which has corresponding uniform mounting openings. The interchange of units is facilitated by a system of miniature plugs and jacks for connections, which is simplified by the fact that no heater wiring is needed.

The 2- to 4-Mc. Tuner

The tunable circuits are really the heart of any communications receiver, especially one with sufficient stability for single-sideband use. It is here that good components and careful design, both electrical and mechanical, are most needed. The problem is much simpler if the tuning range can be made small compared to the frequency of operation. This tuner was initially built with the idea of receiving ship-to-shore s.s.b. communications associated with the guided-missile project on which the author is employed. The 2-Mc. tuning range is a compromise between a sufficiently slow tuning rate and a desire for maximum frequency coverage. The Eddystone dial mechanism selected for the job is smooth enough so that the tuning of s.s.b. signals is not difficult with the 2-Mc. tuning range. However, for a strictly amateur-band receiver, a range of one megacycle would probably be more desirable from a tuning-rate viewpoint. This would, of course, require two steps in covering the 10-meter band and several steps for higher-frequency bands. On the other hand, it would ease the problem of achieving a flat passband characteristic in lower-frequency converter sections preceding the tuner. A reasonably flat 2-Mc. low-noise passband is not difficult to obtain at 20 Mc. and above, but it is a little tricky at the lower frequencies.

The circuit of the tuner is shown in Fig. 1. The unit is designed to feed a 455-ke. i.f. amplifier having low-impedance input. Covering the range of 2 to 4 Mc. requires the use of a tuning capacitor with a fairly high ratio of minimum to maximum capacitance. A three-gang capacitor originally used in the 3- to 6-Mc. ARC-5 Command receiver was finally selected from the junk box because nothing better was readily available. This capacitor has three identical sections of about 200 pf. each. The front section \( (C_{1a}) \) is used for the oscillator, the center section \( (C_{1b}) \) for the mixer, and the rear section \( (C_{1c}) \) for the r.f. stage. Four air trimmers of about 15 pf. each \( (C_3 \) through \( C_6) \) are built into the frame of the tuning capacitor and connected, two in parallel, across the oscillator and mixer sections. A 4-30-pf. NPO ceramic trimmer \( (C_2) \) is mounted on the frame with 2-56 machine screws and connected in parallel with \( C_{1a} \) to provide a means of trimming the r.f. stage.

The r.f. stage is neutralized because there was a slight tendency for it to oscillate when shock-excited by a strong static burst at the high end of the tuning range. The reversed-phase voltage is available from \( I_9 \), and neutralization is readily accomplished by adding a 10-pF. capacitor from this coil back to the base of \( Q_1 \). The capacitive input-coupling connection was provided in the event that it is desired to receive in the 2- to 4-Mc. range with a whip antenna.

A.g.c. voltage to the r.f. stage is delayed by diode \( CR_1 \) and the 27K and 22K resistors in the bias network. \( CR_1 \) is back-biased and does not conduct until the a.g.c. voltage exceeds the voltage at the junction of the two resistors. A germanium diode, rather than a silicon unit, is used because the forward drop across a germanium diode at low current levels is less than the relatively fixed drop across a silicon diode. More a.g.c. voltage is therefore available under saturated conditions.\(^1\)

Regulation of the mixer supply voltage is essential, not because of the effect on the mixer itself, but because of the pulling effect which the mixer has on the oscillator when the supply voltage is varied.

Temperature Compensation

Frequency stability in the tunable oscillator is, of course, a first requirement in a communications receiver and an absolute necessity in a single-sideband receiver. Unfortunately, the interelement capacitances of transistors are not as stable as they are in vacuum tubes, and good frequency stability is therefore more difficult to achieve. Transistor interelement capacitances are primarily functions of the area and width of the

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\(^1\) The term "saturated," as applied to transistors, refers to the condition where both the emitter-base and collector-base junctions are forward-biased. It occurs when sufficient current is fed to the base to drop the collector voltage to a value less than the emitter-base voltage. Since the base is normally forward-biased, and the collector normally reverse-biased, this condition results in a forward bias on both junctions. All but one or two hundred millivolts of the collector supply voltage appears across the circuit impedances external to the transistor. — Author.
p-n junctions within the transistors and these, in turn, are affected directly by temperature and, more importantly, by voltage and current values. Although the applied voltage can be regulated by zener diodes, the portion of the applied voltage appearing across the various elements is a function of the bias condition and this again is a function of temperature. In the usual transistor-oscillator design, the largest contributor to frequency drift with temperature is the variation in junction width and, consequently, the variation in interelement capacitance.

The interelement capacitance most often specified in transistor characteristic sheets is that between the collector and base. In r.f. transistors of the type used in this tuner, this capacitance has a typical value of from 1.5 to 6 pf. The capacitance which is in shunt with the oscillator tuning inductance, however, is that existing between the collector and emitter, and this has a value several times the collector-base capacitance. The base-emitter capacitance is larger still, but this is in shunt with a low impedance and has a smaller effect. Oscillator designs which cause the collector-emitter capacitance to be in shunt with a much larger fixed capacitance (notably the Clapp circuit) minimize the effect of variations in the interelement capacitance. Unfortunately, these designs are not adaptable to tuning ranges which are significant fractions of the nominal frequency of operation. For this reason they could not be used in this tuner, and compensation for frequency shift with temperature was necessary.

Fortunately, the same effect which causes the trouble in the first place — the variation in junction width with current and voltage — offers means of temperature compensation. If the bias voltage is varied with temperature in a manner which is the inverse of the variation which would cause the transistor oscillator to exhibit the temperature/frequency characteristic which it does, then compensation is achieved. Voltage variation required to accomplish this is not a linear function of temperature, but linear compensation will usually suffice over a reasonable temperature range.

In this receiver the temperature-sensitive bias network consists of two 1N2326 diodes (C12 and C13) in series. These diodes have a forward-voltage-drop vs. temperature characteristic such that for two in series there is a decrease of about four millivolts for each degree C. increase in temperature. This results in the necessary positive-going base bias voltage. After proper adjustment (discussed later) and an initial warm-up period of about fifteen minutes, during which a differential temperature between the transistor and diodes is established, the frequency shift is less than 100 cycles for ambient temperature variations of fifteen degrees Centigrade.

Construction

Throughout this series of articles, reference will be made to copper-coated phenolic board (printed-circuit board) which is used as a mounting base for subassemblies. It is easily cut and worked with a fine-tooth saw and files. The copper coating in this instance is not used for the actual wiring as would be the case in printed-circuit construction. Instead, all ground connections are made by soldering to the copper coating. The copper coating is cut away in the areas around ungrounded tie-point terminals or jacks.

Although the construction is not truly miniaturized by modern standards, the components are quite close together, and detailed drawings or sketches made in advance are advisable to be sure that all of the parts will fit. The use of "transistor-type" miniature capacitors and 1/4-watt resistors is essential. The layout of the chassis is best accomplished by marking the required holes and cutout areas with light scribeline on the copper coating. A jeweler's loupe (magnifying eyepiece) is helpful here and is probably a necessity for those over forty. Tolerances to better than .001 inch should be maintained.
Most of the wiring can be done using the leads of the components alone. For the small amount of additional wiring required in the subassemblies, No. 21 solid-conductor bare or plastic-covered wire was used.

As used in the receiver, the tuning capacitor is mounted on a plate of 1/16-inch aluminum which has a cutout for the dial flywheel. The dial drives the capacitor shaft directly. The original worm-drive mechanism was removed, and the dial coupled to the shaft with a flexible coupling. It is important to select a coupling which has high torsional stiffness. The one used by the author is a surplus item that looks as though it might have been made by Hammarlund.

With the worm drive removed, the capacitor increases capacitance with clockwise rotation of the shaft. Since the dial mechanism does not reverse the rotational direction, frequency decreases with clockwise rotation rather than increasing in the conventional manner. This takes a little getting used to. However, the oscillators in both the tuner and the converters used with it for the higher frequencies are on the high-frequency side of the signal. This causes a reversal of tuning direction so that the tuning direction is conventional on all higher-frequency bands. The dial is provided with two scales which are identical except that the 2- to 4-Mc. calibrations run in opposite directions. A small chart mounted on the panel shows the integral number of megacycles to be added to the dial reading when the converters are in use.

The capacitor plate shape is such that the tuning approaches straight-line-frequency when the oscillator pad is added. The scales are slightly compressed at the center and spread out at the ends of the range. The tuning rate is about 4.5 kc. per vernier division at the center and 3.5 kc. at the ends.

The coils are mounted in the shield can which originally housed the r.f. mixer and oscillator coils of the ARC-5 receiver. The thin aluminum channel which originally held the three shields together is removed, and the shields are secured at the plug-in end to a dural plate (as shown in the detail photo) which is fastened by machine screws and spacers to the underside of the plate on which the tuning capacitor gang is mounted. Small banana plugs (removed from the original chassis-mounted coil connectors) are soldered to the leads from the tuning-capacitor sections and these are plugged into the appropriate coil connector through holes in the plate on which the capacitor is mounted.

The r.f. amplifier and mixer transistors and the resistors, capacitors and output transformer associated with them are mounted on two small bases made of 1/16-inch copper-coated phenolic printed-circuit board. These bases are mounted with 2-50 machine screws on spacer bushings (CTC No. 2188-B-3/4") which are riveted to the plate on which the coil shields are mounted. A.g.e., power, and input and output connections are made to these subassemblies with miniature plugs and jacks. This, together with the banana-plug connections from the tuning capacitor, allows the plate carrying the r.f., mixer and oscillator coils, transistors and other components to be removed from the receiver as a subassembly.

As can be seen in the photo of this unit, the oscillator construction is somewhat unconventional in that the transistor, temperature-compensating diodes and other components are mounted inside the shield containing the oscillator coil. A small square of 1/16-inch perforated insulating board is cut so it will just fit inside the coil shield. The center of this piece of board is cut out to clear the coil, and the various oscillator components are mounted on CTC No. 1558-BB turret lugs riveted to the remaining piece of board. The transistor socket is mounted in a hole cut in the board. The board is fastened to four small spacer bushings with 2-50 screws. The screws which secure the coil shield to the dural plate come up through the shield base and enter the ends of these bushings. The coil is initially supported by the leads to it. When the shield cover is in place, the coil is secured to it with a nut. There is a flat on the threaded area of the CTC coil forms used and a D-shaped hole in the shield cover prevents the coil form from tuning when the nut is tightened.

Adjusting Temperature Compensation

The amount of compensation required can best be determined experimentally. The oscillator should be built in essentially the finished form and the bias and emitter-resistor values adjusted for best operation. The inductance values and the trimmer and padler capacitances should be adjusted to give approximately the desired frequency coverage. A thermometer is then clamped to the oscillator coil shield and the temperature varied while recording the frequency shift. Temperature can be varied over a fair range by the simple expedient of aiming an incandescent desk lamp at the oscillator at close range. Frequency shift can be determined conveniently by using a stable fixed-frequency oscillator (100-kc. calibrator or similar) and measuring the beat note with another receiver, an audio oscillator and an oscilloscope. A calibrated trimmer capacitor could also be used to return the beat note to zero after each increment of temperature change. The important thing is to obtain the relationship between temperature and frequency (or tuning capacitance). This relationship should turn out to be reasonably linear over a range of 15 to 20 degrees C. The bias-food resistor (R1) is then disconnected from the regulated supply and a smaller value substituted. A source of voltage which is variable over a range of 200 or 300 millivolts is connected between the bias food and the positive supply. The nominal value of this voltage should be adjusted so that the base bias voltage is the same as it was with the original value of bias-food resistance. Under these conditions the oscillator frequency should be the same as in the earlier step. With the temperature reasonably constant, the base-bias voltage is then adjusted in small increments (5 mv.

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or so) to swing the frequency through the same range as was obtained in the temperature run. It will be found that, for this oscillator configuration, a positive shift with respect to ground in base-bias voltage causes an increase in frequency. An increase in temperature causes a decrease in frequency. With the information obtained from the above tests, a temperature-sensitive bias network can be designed which will compensate for oscillator-frequency shifts as a result of temperature. Because of variations in load impedance and feedback level with frequency, the above tests should be run at two or three points through the tuning range. Although the change in frequency will be different at different places within the tuning range because of the difference in tuning capacitance shunting the transistor the effective change in transistor interelement capacitance should be somewhere near the same. If it is not, a compromise point must be selected for design of the temperature-sensitive bias network or the oscillator component values must be adjusted until the change is relatively uniform across the tuning range.

The above sounds like a fairly complex operation and, if exact compensation is desired, it can be very complex indeed. However, if a transistor is used which has fairly low interelement capacitances to start with, adequate compensation can be achieved with a simple voltage-divider-type bias network, one element of which is temperature sensitive. The tests themselves can be simplified if it is not desired to separate out nonlinearities. This can be done by combining the two tests and using the variable bias-voltage source to return the oscillator frequency to the nominal value after an incremental change in temperature.

**Tuner Alignment**

The oscillator is first set for the proper frequency coverage (2.455 to 4.455 Mc.). The low-frequency point is set by setting the tuning capacitor to maximum and adjusting $I_C$ for the low-frequency end of the range. The high-frequency end is set by turning the tuning capacitor to minimum capacitance and adjusting the oscillator trimmer capacitance ($C_S$ and $C_E$). Some juggling of these settings will be required, of course, to achieve the correct range.

With the tuner feeding an i.f. amplifier and detector system equipped with an S meter, a signal source, variable from 2 to 4 Mc., is fed in at the antenna connector while the r.f. and mixer circuits are aligned. The procedure for adjusting coil inductances and trimmer capacitances is similar to that described for the oscillator. The S meter can be used as an indicator for alignment purposes. A frequency meter is desirable for setting the oscillator and calibrating the dial, but a 100-kc. crystal calibrator can also be used. Tracking can be checked by tuning accurately on a steady signal from a signal generator at various points within the tuning range. The r.f. and mixer trimmers are rocked back and forth at each point and, if the tracking is satisfactory, they should peak at the same place for all points. The Q of these circuits is high enough to show a reasonable peak throughout the band. It should be possible to get the circuits to track within a few kilocycles at all points within the tuning range.

**Mixer Adjustment**

The most critical point in the mixer adjustment is the coupling to the oscillator. Coupling too tightly will result in oscillator pulling, and too much oscillator injection will cause excessive mixer noise. The correct level is in the vicinity of 100 to 150 mv., as measured at the mixer emitter.

Image rejection has not been measured quantitatively, but no image signals have been heard in many hours of listening on the 2- to 4-Mc. range. A signal from a test oscillator which is more than sufficient to saturate the a.g.c. gives no noticeable response when tuned to the image frequency.

QST for
Superstitions still persist about lightning—Don’t play the piano because sound “draws” lightning; never stand in an open door or near an open window because lightning follows a draft; lightning won’t go around corners; lightning always follows the shortest path; lightning never strikes twice in the same place; and so on. This article gives some of the known facts about lightning and how to protect against it.

How To Protect Your Station From Lightning

Answering A Frequently Asked Question

BY LEWIS G. McCOY,* WI1CP

Of all the various questions asked of the League’s technical staff, the one that far exceeds all others is “How can I protect my equipment and property from lightning?” This article will discuss the lightning problem and describe how to provide the maximum protection for you and your equipment.

Before discussing protection, let’s take a look at the problems involved and how lightning is generated. Lightning is simply a gigantic spark that occurs between an electrically charged cloud and earth or between two clouds. These electrically charged clouds commonly are found in two types of thunderstorms, local “convectional” thunderstorms or “frontal” storms. A convectional storm results from heated surface air in the summer rising into the colder air above, while a frontal storm comes from a mass of cold air riding in over warm, moist air. In either case an unstable condition is set up, with the warm air rising rapidly into the colder air, causing condensation of moisture and the formation of a thundercloud. While it is not clearly understood exactly how it happens, both negative and positive charges of electrical energy accumulate. Usually the negative charge collects along the bottom of a thundercloud and the positive charge along the upper portions, resulting in a tremendous difference of electrical potential between the two portions of the cloud and between the cloud and earth.

When the charge in the cloud builds to sufficient intensity, a “pilot leader stroke” leaves the cloud toward the earth, traveling at about 100


The Lightning Protection Institute, 33 West Jackson Blvd., Chicago 4, Illinois, has available a free booklet entitled Lightning Facts and Figures, which has additional information on the subject. Single copies can be obtained by writing to the above address.

The Empire State Building in New York City has been hit as many as 48 times in one year, and during one lightning storm the building was hit eight times! This photograph shows the awesomeness of one of the strokes. (Photos courtesy of the Lightning Protection Institute.)

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miles per second. This leader stroke only carries a few amperes but it is quickly followed by "stepped leaders" of increasing intensity. Many of us think of a lightning stroke being a single unit, but actually it consists of many strokes all following the same path. As soon as these leader strokes reach the earth the current at the ground end of the path increases enormously and the main stroke then propagates upward into the cloud along the path set up by the leaders. This main stroke can develop a current as high as 200,000 amperes! The main stroke is many times followed by a "dart stroke" which is presumed to drain additional charges from the cloud. In many cases as many as 40 strokes make up what appears to be a single stroke. However, most flashes have only three or four strokes.

_How Often — And where — Does Lightning Strike?

The map of the United States shown in Fig. 1 shows the approximate number of thunderstorms per year for any given area in the country. For example, if you live in Northern Illinois you can expect about 45 storms per year. The highest number for this country is in the Tampa, Florida, region with about 90 storms per year. It becomes apparent from looking at the map that the place to live is on the Pacific Coast, which shows an almost complete lack of thunderstorm activity. (However, they tell us that earthquakes are a problem there.)

The map doesn't tell the whole story. It has been estimated that 44,000 lightning storms occur every day over the world with about 9,000,000 lightning strokes per day over land and sea. In the United States as a whole, the average is 40 storms per year for any given locality. What is important is the likelihood of lightning striking any particular area. In general, the number of storms per square mile per year can be expected to average 1 to 2 times the number of thunderstorm days per year. Some areas, probably due to terrain and soil conductivity, have more strokes than others. In Pittsfield, Mass., where the General Electric Company has made many tests, it has been observed that there is an average of 45 strokes per square mile per year with the number per year as low as 19 and as high as 65.

The higher an object is above the surrounding terrain, the greater the attraction of lightning to that object. For example, on a flat terrain having an average of 30 storms per year, a 50-foot metal tower can expect to be hit once in four years and a 100-foot tower every two and a half years. These figures are of particular interest to the ham who wants to put his beam up on a tower. However, don't be alarmed, because actually the tower can serve as a measure of protection. More about that later.

_The Paths of Lightning Strokes_

What is of primary concern to an amateur is the path of a lightning stroke. Whether or not his antenna system presents an attraction to lightning is the main question. And if it does, how does one protect against it?

As the tip of the pilot streamer approaches the
This exposure shows the multiplicity of strokes around a typical suburban community. Note the number striking the earth.

earth, streamers of opposite polarity develop in the earth and approach the pilot. These develop from projecting metal points such as metal church steeples, lightning rods, and, of course, antenna towers (metal). Such streamers grow in strength until they meet the pilot streamer which initiates the main lightning stroke. This, in turn, fixes the location of the later strokes, if there are more than two. Because of the large voltages involved it is impossible to insulate an object from the paths of the strokes. The term “lightning arrester” doesn’t actually describe a preventive, because such a device doesn’t actually “arrest” the lightning; it merely provides a favorable path for the lightning to follow.

Until quite recently it was believed that installing lightning rods actually prevented lightning from striking an object that was rodded. The theory was that the rodded object kept a strong electrical field from building up by continually draining off the charge. Numerous tests and experiments have proven that this is not the case. Lightning will strike the rodded object, but because of the lightning protection the bolt is harmlessly drained off to ground. (We hope!)

**Induced Effects**

The radio amateur usually thinks in terms of direct hits by lightning, but there is another factor of considerable importance. Whenever there is a storm in your general area it has several effects that are of concern to an amateur radio operator. First, and of course the most obvious, is ordinary QRN. Even when a storm is as much as 50 miles away, the static can be quite bad. When the storm moves closer, more serious things can happen. The electrical field surrounding a storm can be quite strong and can create real hazards,

Here is a particularly impressive photo of a lightning stroke near the power lines of the Iowa Light, Heat and Power Co. Credit for this photo goes to C. H. Utter, who was awarded first prize at a Chicago Art Institute exhibit.
experiments have shown that lightning would strike a tower first, rather than nearby objects, if the tower is higher than the other objects. These tests have shown that anything within a distance of twice the tower height would be fairly safe from any hits. In other words, if you had a tower 60 feet high, then anything within a 120-foot radius would be safe. Actually, the tests have shown that the safe range is much more than not even greater than twice the tower height. If you have had a hard time selling the YXL on the aesthetic value of an antenna tower, you might point this out to her.

The best time to put in a ground system is when the tower is installed. The National Electrical Code provides that the grounding electrode can be a noncorrosive metal plate at least two feet square, or if rod electrodes are used they should be at least ½-inch in diameter and a minimum of eight feet long. Electrodes, wherever practicable, should be imbedded below the permanent moisture level. Grounding conductors should be at least a No. 6 wire or equivalent. Flexible copper tubing, ½ inch in diameter, would also make a suitable grounding conductor.

When the tower base excavation is made, the metal plate or an automobile wheel (which also has sufficient area) can be placed in the bottom of the hole. The grounding lead can be attached to the plate and brought up the hole to be attached to the tower. All connections should be solid and it would be a good idea to coat the connections with creosote or some similar material where the connections are below ground. The concrete for the tower base can then be poured.

If your tower is already installed and doesn’t have a good grounding system, one should be installed. In this case a good grounding system would be to install two or more 8- to 10-foot-long ground rods around the base of the tower. The Electrical Code calls for the rods to be spaced no closer than 6 feet from each other. Grounding leads of the recommended size should be used to connect the electrodes to the tower base.

Beam antennas fall into two categories, the “Plumber’s Delight” variety with all elements grounded to the boom, and the type using insulated elements. As far as performance goes, there is no evidence that one type is better than the other. As far as lightning protection is concerned, the grounded-element type would be preferred. This type of installation would put the antenna at ground as far as lightning is concerned. However, this doesn’t mean that you are not able to provide adequate lightning protection for a beam with insulated elements. How you provide protection depends on the type of feed line used. Let’s discuss coax line first, as it is probably the most popular.

For coaxial feed no arrester is required for the outer conductor. If the coax is fed down inside the tower, adequate protection would probably result. However, to be safe, it would be a simple

Here is what happened to an antenna on top of a 91-foot tower in Lewiston, Idaho. The tower itself is apparently undamaged but the antenna, which was used for cable television service, was completely demolished. The newspaper account had some rather humorous quotes: "One office worker cried, 'We're hit,' and ducked under his desk." Another employee was quoted, "Never in all my years in electronics—and I've been in it all my life—have I ever heard of lightning striking a two-way radio tower." (Maybe it only is supposed to hit one-way jobs!)

even though there are no direct hits from lightning.

Measurements made in the vicinity of storms have produced some startling figures. For example, a wire clothesline, mounted six feet high on wooden posts, has been known to have an induced charge of 1600 volts per foot of wire when the lightning bolts were striking three miles away! The energy stored in such a charge may not be enough to be lethal, but it certainly could scare you.

Any antennas or feed lines that are ungrounded or don’t have a means of draining off this "static" can have some fairly high charges built up. These could cause damage to equipment, let alone the shock possibilities.

How To Protect Against Lightning

The average ham is of course concerned about protecting his equipment first (1) and house last. His wife feels just the opposite. At any rate, all joking aside, it is a problem because any type of metal, be it antenna, feed line or tower, does present an attraction to lightning.

Let’s discuss towers first. As stated earlier, a tower will provide a certain measure of protection to nearby objects. A well-grounded tower installation provides what is known as a “zone of protection,” particularly if the tower is the highest object in the area. Numerous tests and ex-

matter to remove a portion of the outer insulating material from the coax to expose the outer conductor braid. The braid can then be taped or clamped directly to the metal tower, preferably at the point where the coax line leaves the tower toward the shack. The connection should be weatherproofed to prevent moisture from getting inside the coax. The Electrical Code specifies that burying coaxial cable provides adequate protection, but it would seem safer actually to bond the cable to the tower to insure only one ground path.

This, of course, takes care of the outer conductor, but we are just as concerned about the inner conductor. The problem is to protect the station receiver and transmitter from the induced charges which can build up on the inner conductor when a storm is nearby. This can be taken care of quite simply by installing a "needle gap" across the chassis coax connector on the receiver and transmitter. Mount a ground lug under one of the screws that holds the chassis connector. Next, solder a short length, about one inch, of No. 14 or 16 solid wire to the ground lug. The free end of the wire can then be positioned so that it is about \( \frac{1}{2} \) of an inch from the inner conductor terminal on the chassis connector. Do this on both the transmitter and receiver and, of course, make sure that both units are grounded to a good ground connection. If you find that on transmitting the needle gap arcs over, increase the spacing of the needle gap to the point where the rig doesn't. There are also commercially made lightning arresters for coax, one of which is called a "Blitz Bug," listed in nearly all parts distributors' catalogues.

A look through any distributor catalogue will show that there are several different types of arresters available for different types of lines. If Twin-Lead is used to feed a beam, an arrester should be installed, mounting it on the tower where the line leaves. Also, there are commercially produced arresters for the four-conductor cable used on beam indicators. These can be installed on the tower the same as other types of arresters. All lines leaving the tower for the shack should have lightning arresters installed at the tower in order to prevent any charges from being carried into the house.

Arresters for open-wire feeders can easily be built (we don't know of any commercially made units). Fig. 2 shows the construction details for an arrester for open-wire lines. The arrester consists of three pieces of \( \frac{1}{2} \times \frac{1}{2} \) -inch flat brass plate, the pieces being mounted on stand-off insulators. The center plate should be connected to the tower with a length of No. 4 wire. The gaps between the plates should be no more than \( \frac{3}{4} \) inch apart. An induced charge or bolt should jump the gap and be drained off to ground.

Wire antennas strung between masts or trees will, of course, be as subject to lightning hits as any other objects, and even more so if the antenna is the highest thing in the vicinity. If the supporting masts are made from metal, they should be adequately grounded by means of ground rods. The antenna can be taken care of by using lightning arresters on the feeders where they enter the building or shack. A ground lead made from No. 6 wire should be run from the arrester to a grounded water pipe or a ground rod. Some amateurs use a large knife switch to connect the feeders directly to ground when the station is not in use. Large knife switches are occasionally advertised by surplus houses.

In apartment buildings it may be impossible to install a grounding system, but with steel construction the building itself is adequately grounded. An amateur residing in such a building should use lightning arresters on his equipment to prevent damage, using the nearest ground connection, which may be a water pipe or radiator. Incidentally, the Electrical Code states that a ground connection either outside or inside a building is suitable as long as the ground is a good one, such as a water pipe.

In conclusion, lightning storms can be very frightening and the lightning itself can cause tremendous damage. And it should be emphasized that there is no positive method of predicting exactly what a lightning stroke will do, even with adequate grounds. Lightning is erratic in its behavior, and won't always follow the path you might expect it to take. But while we don't want you to leave you with the impression that any method is guaranteed to provide 100 per cent protection, you can be reasonably sure that your radio equipment won't suffer damage from lightning strokes if the steps outlined in this article are followed.
1962 Field Day Results

Record 15,000 Report Activity

BY ELLEN WHITE,* WIYYM

Thirty years ago QST announced and reported a brand new kind of operating activity called the Field Day. Since its inception, this annual trek to the field has grown fantastically from a 1933 report (based on 50 logs) to this year, when over 3461 transmitters were reported used, indicating participation by a record 1450 logs! Over all, in 1962, 1018 separate entries were received from Class A stations with groups 3A, 2A and 1A (in that order) proving most popular. If the number of individuals participating is any gauge of the willingness and ability of amateur radio to serve in an emergency, then amateurs in the League's field organization are doing one whale of a job!

Weatherwise, it drizzled, it rained, it poured (and then some)! In fact, if it didn't rain where you were, where were you? When the mop-up brigades finished their work what did we have? We had the best Field Day ever! Hands turned out to climb mountains, cut brush, tote gear, raise antennas, kill rattlers and make enormous numbers of contacts to prove again and again that there's absolutely nothing to compare with the ARRL Field Day.

How your group and others fared is best summarized and accounted for in the following tabulations, photos and club comments. To all who helped their clubs, to the fine fallies submitted by club secretaries and activity managers, to the XYLs, to the cooks and bottle washers, to the patient families, to one and all — brava!

PUBLIC RELATIONS received a double boost thanks to the efforts of K5SFE/5, the AR Caravan Club and AEC/ RACES Groups of New Mexico. The OM of K5WZA took this photo showing the set up of the display at the Winrock Shopping Center. Public response was reported excellent.

QST for
ANTENNA aspects include (reading down) getting that line up over the tree, & is David and Goliath, done in a forthright fashion by the boys at the Miami Valley AR Contest Society, W8CEA/B (2A); raising the beam with cooperation from all hands at the 2nd high Canadian entry VE3WE/3 (the Scarborough ARC) and the Alexander Hamilton H. S. AR Alumni Association (2A) K6BEP/6 demonstrating a novel arrangement of a quad suspended upside down, rotor and all.

SOAPBOX
Class A

"We checked everything ahead of time except the site. Next year we'll check out the site first and make sure it's not in a hole." — W8DLQ/G, "A new temperature gauge next year for our overheating generator whose downtime cost us the 11-K mark." — Livemore AR Club, W6UODP/1, 2.

"Custom FJ rig for the 30-watt class plus a 1200' Rodhime moped east helped us to bring our points up this year." — Twain Valley ARC, W7O7TV/7.

"Despite mosquitoes, sunburn and a few wild moments when W8YCR dropped cigarette ashes on the logs, W8RA/9 recorded a new high score. Our success, still surprising to the battle-beaten veterans who bravely fire, fumes, carburetor insects and near electrocution prove the old axiom that more operating and less zooting brings results." — W8RA/B.

"Our field day site was right on the beach of the blue Pacific and all 12 club members were workers, no loafers. One of our best outings demonstrating teamwork and fellowship." — Honolulu Mobile ARC, K6HDD/K6H.

"We had little trouble pitching our vertical, we just used a nearby snow bank." — K7QXZ/7.

"Field Day was a bit strange after cranking the generator all night both we and 80 were dead by morning, but we'll be grinding away next year." — K6PVU/W.

"The storage room atop the stadium where we were began to fill with water when the storm came up. Things were frantic for a while until someone plugged the proper drainpipes and allowed the water to flow over the sides of the roof. Even so, we had 14" of water until the broom brigade finished sweeping it out." — ARC of Ohio State University, W6LBT/6.

"The 1200 Yee did a job. After a slow start we bettered any previous year by 50%." — Royal Order of Lightning Dodgers, W8T102.

"We heard 42 states on 6 meters using an 8' antenna wire strung around the tent, this on Mt. Somerset, Washington, Lake Washington ARC, W8BB/7, i.e., "Need any hot dogs or hamburgers? We have about 100, left of each. Oh yes, the mosquitoes made more contacts than we did in spite of bug dope." — Ofenbush ARC, W8PBN/2.

"A local thunderstorm almost tore down our 70' crankup tower. Another ham and I were the only ones present at the time and we stood in the rain for close to a half hour holding up the tower by pulling on the guys." — Van Wart ARC, W8PY/6.

"It was hot and the bugs almost carried us away." — ARC, W8PJC/B.

"In spite of all elaborate preparations for a winning score this year we fell on our faces by not checking out the new beam before FD. The thing went assembled wrong and as a result our score on 15 and 20 suffered greatly." — S7AX/KC, Rcn, group, W8GCG/8.

"For the first time we set up in a shopping center parking lot to advertise amateur radio to the public, attracting approximately 100 visitors." — Delta RC, W8BYT/7.

"A 20' rafter caved through a hole in the floor and we almost had someone with a pistol; 10 ratters. The guy sleeping by him wasn't sleepy anymore. P.S., we lost 20 minutes of operating." — Klamath Basin AR Assn, K7CBP/7.

"We have four field days a year, January-April and October, during S7T exercises." — Miami Valley ARC, W6LSL/5.

"There was one period during the night when QSOs were so hard to come by that everytime someone made a contact it was announced over a p.a. system, much to the dismay of some fellows trying to get some shut eye." — Milledgeville ARC, W8GCP/4.

"In our gasoline generator we used 15 gallons of oil and 5 gallons of gas!" — Waverlyton West H. S. RC, K6KGA/B.

"We suggest that Field Day be held on the first sunny day in June." — Washington RC, W8AV/3.

"Our first job was to get a
Operators, top to bottom, include KP4AL, operating 20 s.s.b. with KP4BDG for the El Morro ARC (KP4ASK/KP4-4A), center the boys at KS5BF/S, the Electronic Technician and Amateur Club (2A) and bottom WNS4QY logging for KS5AV for the Lost Pines ARC (W5KPI/5), the top 1A score for 1962.

16-element 2-meter collinear up 85° and believe me that’s a chore. It was done under the masterful direction of V2ZFR and a cheer went up when the last guy was hoisted in place.” ~ Amateur VHF Institute of N. Y., W21F/R

“... ‘Electrical storms ruined 80, couldn’t load transmitter on 40, no antenna for 20, generator noise on 15, no antenna for 10 — check’ ~ KS5MT/T.

‘Congratulations for the superlative effort put forth by the fine men at W4RA/8. They are, by far, the best operators to be found in Minnesota.’ ~ Wimauna ARC, WOLUX/6, ... ‘We had Murphy whipped, but oh those Sunday afternoon conditions.’ ~ KA of Eri County, KS5LJ/A. ... ‘How do you think 75 worked FR for 200 contacts on 6.’ ~ Burlington AR Assn., W1CB/1, ... ‘A tree-trimming company let us use two snorkels which raised our 80-meter center-fed Hertz to 45° in minutes. We had a 0-meter beam on top of one of the snorkels but the tribander we were going to use on the other snorkel didn’t arrive till the Monday after Field Day.’ ~ Sec. of R Operators, W5NGI/8, ... ‘Field Day was a signal success for our group. Despite nearly 2 hours of lost time due to a thunderstorm, we showed a 41° increase in number of contacts over last year.’ ~ O.B.P. 41, W5MGX/0, ... ‘We feel many points were lost by assuming too be dead or by not listening on the band.’ ~ Raytown AR, K6EQV/6, ... ‘Did you say unusual experiences? We started up Keesler Mt. with $100 worth of equipment but never reached the top. A quarter of the way up the wagon on which the equipment had been packed was lost. We eventually tracked it down and started rumbling downhill. Fortunately it didn’t turn sideways and tumbled over. Four very depressed hams played pick-up-sticks for 4 hours with the gear.’ ~ Dallas ARC, K6OHS/3, ... ‘Four sides of the barn as well as the roof looked. Over 2″ of rain in about an hour.’ ~ Lesseu ARC, K5TBN/8, ... ‘We used the observation tower at the Horicon Marsh headquarters to support our antenna. It is 75° high and its base is about 100′ above the surrounding area. Signal reports received were tremendous.’ ~ Rock River RC, W6T/0.

‘Spaced level just before the exercise was precarious but let up as time went on. We have now gone 3 years with all gear working perfectly. In all, a wonderful weekend of many experiences for all concerned.’ ~ Pinos AR Assn., W5TVA/2.

‘We wonder if having W4BAI/4 also active from Alabama cost us any QSOs?’ ~ K4BAI/4, ... ‘The first 2 hours the 50-Mc. rig handled traffic for 4 volunteer fire departments working to save a large dairy barn. We handled traffic regarding a doctor for 2 sick victims, need for more water, etc. The fire departments were very appreciative of the assistance rendered by amateur radio.’ ~ Miami County RC, K5LFE/9, ... ‘We operated 3 stations and

CLASS A LEADERS

1A W5KPI/5 Lost Pines ARC, 1B 2251 2A W2SSC/7 Niagara Frontier DX Assn, 1,331 3A W6HST/6 Citrus Belt ARC, 1,052 4A W2ZHY/2 Morris RC, 1,254 5A W7HZ/7 Valley RC, 22,318 6A K5AVE/0 Illinois Valley Assn, 10,101 7A K2AA/2 South Jersey Assn, 1,031 8A W9ZQF/3 Montgomery County ARPC, 13,333 9A W2PM/0/8 Associated RA of Long Beach, 14,267 10A W7NCJ/7 Lower Columbia AR Assn, 10,614 11A ZWT/2 Tri-County AR Assn, 23,357 12A W7DK/7 RC of Tacoma, 25,137 13A W40DP/9 Livermore AR Assn, 9,949 15A W7FBA/6 The Corona Gang, 9,818
had 2 generators furnishing power. A public information booth was manned with civil defense material and a plotted orbit of Oscar 2 with a tape of HFI taken by K7KSE and W7JYF."—Richland ARC, W7VPA/7. "Located on a hill with dirt road access. Then it rained 15° in one hour. Anybody for 4-wheeled toogobragi?"—Washington University RC, W7QGY/8. "We were pleased this year to joint forces with the National Bureau of Standards Radio Club, K8UK, and we used one of the NBS field sites as our location, complete with 100' tower and many telephone poles. Our 20-meter c.w. beam was on top of this tower and it helped immensely. During the past year we initiated a traveling trophy to go to the Colorado station with the highest score. We hope to win it back from the Montrose-Delta ARC."—Boulder and National Bureau of Standards RC, W7GDK/0. "We tried a new (for us) wrinkle, having 4 teams working 5 bands competing with each other. We believe this competition kept the transmitters going steadily better than any other method."—Boulder Valley ARC, W7AV/4. "Real fine Field Day. The quad worked like a bomb and everyone had fun. Fine weather (21) and a good location help."—K7JCS/8. "Our second try with 100's, lunedrew, transmitter and receiver. Next year we hope to have a homebrew generator too. If next year is anything like this one though it'll need a sniffer."—W7NJN/8. "Everyone had a fine time and next year we expect to eek a lot before PD and really rack up a score."—ARC-5 RC of Rapid, Min., K7VYY/5. "We encountered extremely bad conditions during the first portion of the test. However, everyone had a good time and it did give us a good test of the portable generator loaned through C. D."—Pine Ridge ARC, K8QHE/8. "Our setup this year consisted of 4 separate operating positions, each with its own antenna system, thereby allowing instantaneous band changing. Each position included an operating indicator, consisting of 4 panel lights, one representing each post. This enabled each operator to know which transmitters were on the air and when he could transmit. Each transmitter's control circuit was tied into a central control box which allows operation of only 2 transmitters simultaneously by shutting down all transmitters if a third is turned on. The 10 participating operators represent a total of over 2000 confirmed DXCC countries and this in itself indicates the caliber of operation involved and the ability to use the equipment to its utmost capability."—Niagara Frontier DX Assn., W8MUG/2. "Although our transmitters were only 10° apart, the antennas were cased fed at right angles to each other. We were able to work 3.5 c, w, and 3.9 s.s.b. without the slightest interference between the two."—W8AHR/2. "This year we decided to hold our field day as one of the local city parks and invite the public. We attempted diversified operations including emergency-powered teletype and a complete 2- & 6-meter station. While we were not too pleased with our total score, we feel that much was accomplished in the field of public relations."—Midland ARC, W8KAA/8. "Our site was on top of Bowman's hill tower which stands on the top of a 300' hill. The "snake" was an enclosed area just below the observation platform. Lugging all that gear up 120 steps was a bit tiring but well worth the effort. The only trouble we almost had occurred when we learned that another group was going to operate near the tower with a kw, on all bands. Saturday morning looked like the Oklahoma land rush! The other group joined us under our call and we shared equipment. This is what I would call the true spirit of Field Day."—K6KJ/5. "Once again we chose a site adjacent to the rifle range in St. Bruno, P.Q., through the kind permission of the Canadian Army Command. Our emergency power was a 2.5 kw gasoline-driven generator courtesy of the RCAP which gave uninterupted power. Messing was taken care of by a local group of River Scouts ... an admirable job."—South Shore ARC, W9READ/4. "Our mountain top location did not pay off because of inability to get low-band antennas in the clear. We plan to use a more open location next year, perhaps at the sacrifice of the view of the city of New York."—W6GB/8, the Emporia ARC, class 2A.

POWER considerations, left to right, finds K4YYN cranking up W4TW/W for 1A operation at the Pine Haven Shopping Center in Charleston, S. C., center the boys at K9HLV/9, 3A, in front of their home-brew generator. The neat job was constructed from a burned out 2-horse motor with an engine from an air compressor, trailer a reworked Plymouth frame. The unit is equipped with an electrical starter, automatic voltage and frequency regulation and completely interlocked to provide fool-proof operation. Right, sprucing up come Sunday morning is K8CKP, one of 7 fastidious operators at W9FTH/8, the Emporia ARC, class 2A.

December 1962
of v.h.f. operation." — Piedmont ARC, KAMHS/4 . . .

"We had our own contest between the phone and c.w. of same as last year and the phone won." — Windsor AR Society, W0G3X/3 . . . "Poor preparation and the least amount of equipment in the history of the Philadelphia area cut our operations significantly, but everyone present enjoyed the entire affair." — South Jersey R Asso., K111/L . . . "Since our gang is small we have never managed to take a first place in FD. This year, being our 10th FD anniversary, we decided to go all out and win two hopes by placing ourselves in the exclusive 15-transmitter group. The problems involved were many: (1) transportation of equipment and operators up a steep narrow fire road for 12 miles to the site (2) handling a 3500 lb. generator on the same road, with a jeep about half the size of said generator (3) the inevitable amount of intra-station interference with all wires not simultaneously (4) the embarrassment when we discovered that our site was in a different county and ARLR section than we had been announcing for the prior 5 years!" — The Crown Gang, K0FLA/6 . . . "Our location was at an elevation of 5000' in the Los Padres National Forest, south of Carmel Valley. Being in an area of extreme fire hazard we had extinguishers all over the place. For good fellowship within a small group you just can't beat the IA Class." — Monterey Bay Band Jammers, K0D1X/6 . . . "Our second year out and the QRN was very bad, no breakdowns though and thank goodness for the tests." — Brown Creek Wireless Asso., K81MN/8 . . . "Except for our Apache, SX101A and HQ180 going on the blink (75%), of our two rigs, FD was great from our 10/1200 RPTT." — K0D1X/6 . . . "Shortly after the contest began a tornado passed within about 3 blocks of our site. Interestingly enough, last year our mast was struck by lightning (same location). No telling what will happen next year!" — K9AM/8/9 . . . "Inverted vees were held up by the 50' boom of a Bay City crane with pulleys attached to the boom for easy lowering to change bands." — Saratoga ARC, K9MCJ/4 . . . "Very few portables were heard operating properly on phone. No other than identification of geographic location will satisfy BCC. FD is fine but it shouldn't be an occasion for such widespread violation of the regulations." — Electronic Technician and Amateur Club, K9KHF/B . . . "Everyone at camp kept wide awake by the pack of dogs forested to be wild. We contacted the state police and were told to slow if necessary. In addition, the mosquitoes here carry wing tanks for extra capacity!" — A Up ARC of Burlington, W7A2TPY/8 . . . "The San Diego Council of Amateur Radio Clubs has offered a F. D. trophy as an incentive to local activity." — North Shores ARC, K9HA1/G . . . "Effective line filters and antenna pre-selection plus lotsa' pre-plans made things run smoothly even when we had to fire up the standby generator." — Schoenstatt AR Assn., K9MEB/8 . . . "Expanding suburban developments forced the club to a new site this year after many years at the old location." — Waterbury Valley RC, W2W/H/8 . . . "Approximately half of our operators/loggers were on their first FD so although they learned much for next year, it reflected in a lower score this year." — Searborough ARC, W3ZW/G/8.

DX left is K9M0B/K9M6, Midway Island, class 2A. Note in the foreground a good shot of an honest to goodness "Gooney Bird." Right, Class B entry K56AM/K56, American Samoa, with Operators K56AM/W1BYH and K5KOR. A number of FD portables were pleasantly surprised to raise DX stations like these.
"Our location was nearly perfect, overlooking the great south bay and Atlantic waters. This year's contest was the result of many months of planning and practice."

"Our Heath inverter proved to be the perfect answer to Class B battery-powered operation. It supplied our entire station with power to spare, with a fully charged 12 volt battery lasting about 3 hours before change over. However, F.S. is never without problems. We had 2 antennas on 40, a vertical and a dipole, both loaded beautifully and exhibited an SWR below 1.5:1, but making QSOs on either of them was like pulling teeth.

"W5QNY: "Our location was Cape San Blas, Lincoln County, New Mexico." W5QNY: "We used a Wimo 1.5 KW generator that performed like nothing I've ever used before and have operated in the field as W5QPLT, W5QNY and now as W5QNY - never have seen a generator like this." W5QNY: "Never have slept so little, laughed so much, got so bored, ate quite so skittishly or wasted so many cigarettes." W5QNY: "We had a great time operating from Cape San Blas, about a mile off the Florida coast near Panama. During Saturday night we were forced to QRT for several hours because of trouble resulting from high winds and driving rain. Our return by sailboat was delayed also because of rough seas and poor weather." W5QNY: "We had a beautiful setup, the best in Texas I think. But trouble! Our rig wouldn't load, our load up, was caught in bed with the uncertain and the generator wouldn't put out power."

"W5QNY: "I forgot it was K 11 until the night before about 3 A.M." W5QNY: "I hereby wish to claim the high score for the under 5 watt division." W5QNY: "Next year we will have 1100 watts at 1000 watts for the phone and 20 watts, separating the stations a bit (5) bring along a couple of spare operators, plus extra receiver and transmitter (6) get further away from people (7) be out for blood in 2A." W5QNY: "We were at 1000 watts down from a local radio, better advanced planning would have helped!"

W5QNY: "Even ZL1AH called us to say hello! Best FD yer." W5QNY: "Even ZL1AH called us to say hello! Best FD yer.

---

**SCORES**

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

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<tr>
<th>Transmitter</th>
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<td>A-6</td>
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<td>144</td>
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*December 1962*
FOOD and FAMILY weren't neglected by W2AMK/1 (left), the Westchester AR Assn. amassing 5002 points between snacks and (right) the 14-Mc phone station of W9KYO/9 showing the crack Jr. ops. of K9TAG and W9KYO of the Nabage RC who combined FD operations with a family camp out.
"Now according to the book that's an exchange," W4AWM seems to say to operator K4SAN as the gang at W4AWM/4 (3A) sum up 3281 points.

<table>
<thead>
<tr>
<th>Call Sign</th>
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<th>QTH</th>
<th>Notes</th>
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<tr>
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<td>W3/0</td>
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<td>W8KE/8</td>
<td>W. Kellogg</td>
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<td>W8WE/6</td>
<td>W. White</td>
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<td>K8LWAF/KL7</td>
<td>L. Wilson</td>
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<td>W. McRae</td>
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<td>W6KVK/9</td>
<td>W. K. Miller</td>
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<td>W. Wright</td>
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*Four Transmitters Operated Simultaneously*

- **W20YH/2**: Morris RC...
- **W20YH/2**: Morris RC...
- **W20YH/2**: Morris RC...
- **W20YH/2**: Morris RC...

*Notes:*
- **804A**: 16-16 1835
- **804A**: 16-16 1835
- **804A**: 16-16 1835
- **804A**: 16-16 1835

*QST for 32*
1963 FIELD DAY
JUNE 22-23

CLASS D

<table>
<thead>
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<td>W6PVW</td>
<td>4830 KHz</td>
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<tr>
<td>K6V KO</td>
<td>2510 KHz</td>
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<tr>
<td>K6LW I</td>
<td>3110 KHz</td>
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<tr>
<td>KSOCO</td>
<td>2900 KHz</td>
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<tr>
<td>KV7 I</td>
<td>2180 KHz</td>
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<tr>
<td>W6N7K</td>
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<tr>
<td>K6DV J</td>
<td>3600 KHz</td>
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<td>W6GH P</td>
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<tr>
<td>K6NCW</td>
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<td>W6MDH K</td>
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<td>W6ZV J</td>
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CLASS E

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<td>W6KX H</td>
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CLASS F

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<td>K6W P</td>
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<td>6370 KHz</td>
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The first phase of "Murphy's Law" is dealt with by W6Z and ZR keeping W6ZJ/F on the air for the Santa Clara County RACES group, well up in the 1A's.
It is unlikely that you will find a 416B or equivalent for sale in your corner radio store, but because these hot tubes are widely used in commercial u.h.f. applications (where they are replaced regularly as a routine maintenance matter) they are readily available to most amateurs. Even though used for their normal life expectancy, they are likely to be better for u.h.f. amplifier service than miniature triodes of conventional design. A grounded-grid amplifier of the type described here will provide lower noise figure than anything but a parametric amplifier. Used ahead of an average good 432-Mc converter, it will make a marked improvement in weak-signal reception.

A Low-Noise Preamplifier for 432 Mc.

Improving U.H.F. Reception with the 416B

BY LEO H. SCHMALENBACH, W4TVP

On one of my luckier days I was handed a couple of 416B tubes and asked if I could use them. Although not experienced with this tube, I was well aware of its capabilities as a low-noise v.h.f. and u.h.f. amplifier, so I eagerly accepted. It was decided that the best use I could make of the 416B would be as a preamplifier ahead of existing 432-Mc converters at this station. Results with the amplifier to be described have been very gratifying, and very much worth the effort of building it.

Circuit Description

The amplifier uses a grounded-grid configuration, with a quarter-wave coaxial plate circuit.

The grid is grounded directly, and bias is obtained through a cathode resistor. Only a small amount of bias is needed, as the tube operates at 25 ma., with a supply voltage of 250. The cathode input circuit is also a quarter wavelength, and it provides a good impedance match to 50- or 75-ohm antenna systems.

The coaxial plate circuit has an outer-to-inner conductor ratio of 8 to 1, providing an impedance of 135 ohms. The output coupling loop is suitable for coupling into converters with low-impedance coaxial input circuitry. The amplifier is very stable, and has a gain of approximately 10 db. The plate circuit covers a frequency range of 400 to 500 Mc. The cathode circuit is broadly resonant at approximately 432 Mc. Best noise figure was obtained by capacitively tapping the antenna directly to the cathode shell of the tube. The 416B must be forced-air-cooled, so as not to exceed the manufacturer's temperature rating on the glass-to-metal seals.

![Schematic diagram of the 416B preamplifier.](image)

B1—Small surplus blower, with 6- or 12-volt motor.

C1—Power lead bypass; see text.

C2—5-muf. miniature variable made from Johnson 20M11 (160–110) cut down to three rotor and two stator plates. Leave stator bars intact; see text and photograph.

C3, C4, C5—1000-muf. button mica.

C6—50-muf. silver mica.

C7—100-muf. ceramic.

J1, J2—BNC chassis receptacle.

L1—Copper strap cathode inductance; see Fig. 2 and text.

L2—Inner conductor, plate circuit; see Fig. 3 and text.

L3—No. 16 wire formed into 1/2-inch loop, spaced 1/4 inch from L2.

RFC1-RFC4—1/2 inches No. 20 enam, close-wound 1/8-inch diameter.

R1—100-ohm potentiometer.

R2—12-ohm 1/2-watt resistor.

36 QST for
Construction

All metal work was done with hand tools normally found in the well-equipped ham shack. Details are given in Figs. 2 and 3. The amplifier itself is built on a 1/4-inch brass plate, drilled as shown in Fig. 2. The amplifier assembly is mounted on a 5 × 7-inch aluminum plate, containing the blower, variable cathode resistor, power receptacle and current-metering jacks. This plate then covers a 5 × 7 × 2-inch chassis, so that air from the blower will be forced up through holes around the tube, and out through holes in the top of the coaxial plate-circuit assembly.

The plate-circuit outer conductor is made from 2-inch copper tubing, obtainable from plumbing contractors. Principal dimensions and assembly details are given in Fig. 3. The first step in making the "hat" is to solder the top in place. This is done by first marking a 2 1/2-inch circle on a sheet of copper a little larger than the tubing. The center of the circle should be centered-punched for future drilling. The 2 1/2-inch length of copper tubing is then centered in this circle and soldered in place, using plenty of heat and soldering paste. A propane torch was used, but a heavy soldering iron may also suffice.

The excess copper sheet is then trimmed off with tin snips, and finally dressed smooth with a file. Next, the center hole should be drilled, along with the air exhaust holes around the edge of the top plate. The bottom flange (the brim of the hat) should then be soldered in place, being careful not to overheat the top of the cavity. A damp cloth placed on the top, while soldering the flange, will help in this. Next, the holes for the output connector and the tuning capacitor may be drilled, and finally, the assembly should be given a good cleaning with alcohol or soap and water, to remove the soldering paste, etc. A coat of paint may be applied to the outside of the hat, to prevent tarnishing of the copper and to add to the appearance of the assembly. Alternatively, the copper surfaces can be polished with steel wool, and then sprayed with clear lacquer. Silver plating, inside and out, would be the best possible treatment, but this was not done here.

The inner conductor is made from 1/4-inch copper tubing, 2 1/2 inches long, slotted at one end to accept the 416B plate connection. Four slots are sawed to a depth of about 1/2 inch, and the end formed on a suitably sized drill shank. The other end must be made to accept a 6-32 screw. This may be done by first inserting about 1/4 inch of a brass 10-32 screw, or a piece of brass rod that will make a tight fit, and soldering either in place. The excess length is then cut off and trimmed smooth with a file. The end is centered-punched and drilled and tapped for 6-32 thread.

The 416B preamplifier described by W4TVP is shown here connected to his 432-Mc. converter. The ventilated tank-circuit assembly is at the lower left, with the blower in the upper right corner of the base plate. Metering jacks and the cathode potentiometer are at the lower right.
The disk is made of flashing copper, 1\(\frac{3}{4}\) inch in diameter. The insulation between it and the cavity top may be any low-loss material capable of withstanding 250 volts, and it should be 0.005 to 0.01 inch thick. Since heat is not a problem here, plastic material taken from a small radio-parts bag should be suitable. The insulating disk should be only slightly larger than the capacitor plate, so that it will not block the flow of air through the holes in the top of the hat.

The inner conductor with its capacitor plate and insulating wafer may now be fastened in place by a 6-32 screw inserted from the outside. A soldering lug and an insulating washer are placed under the screw head. A washer with a \(\frac{3}{4}\)-inch diameter shoulder is desirable here, but it is not absolutely necessary if care is used in lining up the screw in the center of the \(\frac{3}{4}\)-inch hole. The plate-decoupling button-mica capacitor is installed on the top of the assembly.

Now put in the coaxial receptacle and its output coupling loop. For a really neat job, the mounting flange of the coaxial connector should be bent slightly to match the curvature of the outer conductor. Finally, to complete construction of the cavity assembly, the tuning capacitor \(C_2\) is installed. A Johnson miniature 5M11 may be used, or a 20M11 may be cut down to three rotor and two stator plates, leaving the stator bars full length. This was done here, as may be seen from Fig. 3 and the third photograph. The stator bars of the 20M11 fit nicely either side of the inner conductor, and may be soldered in place easily.

The 416B chassis plate is shown in Fig. 2. The tube is held in place by a \(\frac{1}{4}\)-inch nut, no more than \(\frac{1}{4}\)-inch thick. The nut should be soldered to the brass plate after positioning the tube properly. It may be well to stress here that the plate assembly should be removed or loosened before screwing the 416B in or out of the nut. The author had the sad experience of breaking a tube when neglecting this precautionary measure!

The cathode inductance is shown in its flat form, at the left, and after bending, at the right. It is made of flashing copper, so experimentation with its length, to resonate the input circuit at the desired center frequency, is not difficult. The end with the two holes is fastened to the antenna receptacle, and the other to a \(\frac{1}{2}\)-inch standoff insulator next to the 416B. From this insulator to the shell of the 416B is a piece of finger stock \(\frac{3}{4}\) inch wide, bent so as to provide spring contact to the r.f. cathode. The author was lucky enough to find some finger stock made for the 416B tube, but the above method should prove satisfactory. The input capacitor, \(C_6\), is soldered to this spring contact. Remaining construction details should be self-explanatory from examination of the drawings and photographs.

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Fig. 3—The amplifier plate tank circuit is shown in cutaway form, A. The flange, B, is soldered to the open end of the assembly. The top, C, is made by soldering a slightly over-sized copper plate in place, and then trimming off the excess material.

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\[^2\]A nut sometimes pressed into service for use with the grid thread on the 416B is the type used in BX cable and box work by electricians.
Testing and Use

Putting the amplifier into operation is very simple, and few adjustments are necessary. The blower motor should be wired to come on with the heater voltage, and plate voltage application should be delayed approximately one minute thereafter. Plate current should be monitored, and adjusted to 25 ma, by means of the variable cathode resistor. With the amplifier connected to the 432-Mc. converter through a short piece of 50- or 75-ohm coax, an increase in noise should be noticed as the plate tuning capacitor is adjusted for resonance. Plate current should remain steady after it is adjusted to the proper value.

A diode noise generator with either a 52- or 75-ohm terminating resistor should now be connected to the antenna input and the input capacitor tap moved along the cathode inductance for optimum noise figure. If 75-ohm termination is used, the tap should be very close to the r.f. cathode shell of the tube as this is near the input impedance of the amplifier. If 52-ohm termination is used, the tap may be lower on the cathode inductance. Once the optimum position is found, the antenna may be connected and the preamplifier put to work. It is possible that stations never heard before may be encountered, if the converter normally used for this band is of average quality. The author's converter following this preamplifier has a 417A grounded-grid stage ahead of a 417A grounded-grid mixer. An improvement of approximately 4 db. in noise figure was obtained when the preamp was added.

The output coupling loop may be adjusted for maximum gain, but this was not too critical in the author's model. The loop should be run parallel with the inner conductor as shown, and spaced about ½ inch from it. It may be well to recheck the noise figure and cathode inductance tap if this coupling loop is adjusted.

The author wishes to thank T. H. Strothman, W4UBY, for his encouragement and suggestions in making this article possible and also for on-the-air checks in testing and evaluating the preamplifier.

Strays

Despite the immensity of the monitoring task FCC is still keeping a watchful eye on the Citizens Radio Service. In one day's mail recently, Hq. received information copies of five license revocation orders. Violations were non-substantive communications (i.e., ragchewing), transmitting in excess of five minutes without observing the two-minute silence, failure to identify the station, transmissions not directed to a specific station, excessive deviation from frequency, allowing others to use the station, transferring the station to a location not specified in the license without notifying the Commission, failure to respond to notices of violation, and failure to keep the Commission informed as to correct mail address.

The Arecie ARC will hold its annual Winter Field Day on Dec. 29 and 30 in Fairbanks, Alaska. Club members will work all bands on c.w., a.m., and sideband. QSLs for all QSOs. For further info, contact Herb Loree, KL7EEH, Secretary, AARC, Box 389, College, Alaska.

Feedback

In Hints & Kinks, page 58, November QST, WSDEB's miniature 6-meter transmitter should have a ground at pin 1 of L1.
A Two-Kilowatt P.E.P. Amplifier
Using the 3-1000Z

BY
ROBERT I. SUTHERLAND, W6UOV*
AND
HAROLD C. BARBER, W6QK**

Until very recently, the amateur wishing to run high power on s.s.b. utilizing a zero-bias triode grounded-grid amplifier had to resort to the scheme of using many small tubes in parallel. This approach, while not too difficult at the 1-kilowatt p.e.p. input level, becomes extremely cumbersome at the 2-kilowatt p.e.p. level. During 1961, the problem was simplified by the announcement of a new family of zero-bias triodes. Two members of this family are of immediate interest to the amateur who enjoys building his own equipment. These tubes are the 3-400Z and the 3-1000Z. A linear amplifier using the 3-400Z was described in the September, 1961, issue of QST. In addition, at least one piece of commercial gear available to the amateur has been put on the market using the 3-400Z.

For maximum power input, the 3-1000Z tube may be used in similar circuits. This article is intended to present a design approach for the 3-1000Z which others may wish to duplicate or to modify to fit their individual design specifications.

The 3-1000Z Zero-Bias Triode

The new Eimac 3-1000Z tube is a high-
alpha zero-bias triode having a plate dissipation rating of 1000 watts. It is rated to 2 kilowatts peak-envelope power input for single-sideband linear-amplifier service, as shown in the table of typical operating conditions. The 3-1000Z has no need for a bias supply for plate voltages up to 3500 volts. Used in a well-constructed, grounded-grid circuit, no neutralization is required.

The seated height of the 3-1000Z is only 6¼ inches from the base to the top of the plate cap, making it possible to build a complete amplifier behind a standard 10½-inch high relay-rack panel or within a desk-top cabinet of the same height. Forced air cooling is required for controlling temperature of the stem and plate seals. The air requirements are modest, and when the 3-1000Z is used with the SK-510 socket and SK-
### General Characteristics, 3-1000Z

Filament: 7.5 volts at 21.3 amperes
Inter-electrode capacitances:
- Grid-Filament: 17.0 μf
- Grid-Plate: 6.9 μf
- Plate-Filament: 0.12 μf

<table>
<thead>
<tr>
<th>TYPICAL OPERATING CONDITIONS</th>
<th>GROUNDED-GRID AMPLIFIER</th>
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<tbody>
<tr>
<td>2500 v., s.s.b.</td>
<td>3000 v., s.s.b.</td>
</tr>
<tr>
<td>Zero-signal plate current</td>
<td>162 ma</td>
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<tr>
<td>Single-tone d.c. plate current</td>
<td>240 ma</td>
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<tr>
<td>Single-tone d.c. grid current</td>
<td>800 ma</td>
</tr>
<tr>
<td>Two-tone d.c. plate current</td>
<td>254 ma</td>
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<tr>
<td>Two-tone d.c. grid current</td>
<td>530 ma</td>
</tr>
<tr>
<td>P.e.p. input</td>
<td>147 ma</td>
</tr>
<tr>
<td>P.e.p. output</td>
<td>2000 watts</td>
</tr>
<tr>
<td>Resonant load impedance</td>
<td>1050 watts</td>
</tr>
<tr>
<td>Driving power (approx.)</td>
<td>1700 ohms</td>
</tr>
<tr>
<td></td>
<td>92 watts</td>
</tr>
</tbody>
</table>

### The Amplifier Circuit

The 3-1000Z grounded-grid amplifier shown in the photographs is designed for 2 kilowatts p.e.p. input for single-sideband service on amateur bands between 3.5 and 29.7 Mc. The plate circuit is a pi-L tank presenting a tube load impedance of 2650 ohms, at a plate potential of 3000 volts, and capable of matching an antennas load impedance of 50-75 ohms. The pi part of the network has a Q of 20 and the L section has a Q of 10. With 2500 volts and a plate current of 800 milliamperes, the plate load impedance is 1700 ohms. The pi part of the tank circuit will then have a Q of about 12. When the amplifier is tuned for the maximum legal conditions for 1 kilowatt c.w. the network Q is somewhat higher, but this presents no problems.

A plate potential of about 2500 volts will provide a signal with somewhat less intermodulation distortion than is generated at 3000 volts, but any voltage from 2500 to 3000 will provide efficient operation.

The pi-L design was chosen for use in this amplifier because of two inherent advantages. First, the pi-L network provides an improvement in harmonic suppression of about 15 decibels over the simple pi configuration. Second, the loading capacitance can be chosen to allow the use of inexpensive variable air capacitors, without the usual selector switch for adding fixed capacitors in parallel for operation at the lower frequencies. In this amplifier it was decided that loading capacitor C5 (see Fig. 1) would be a single 2000-

516 chimney the back pressure is quite low, allowing the use of a small inexpensive blower.

The 3-1000Z is designed to present a load of approximately 50 ohms to the driver, and has a drive power requirement compatible with the power output from a modern exciter using a pair of 6146s or similar type tubes.

volts, 1000-μf, variable unit, or two 500-μf, units in parallel. In the design, the r.f. voltage across capacitor C1 was arbitrarily limited to 1000 volts. The calculations indicated that a loading capacitance of 891 μf would be required for 3.5 megacycles. Two E. F. Johnson 500-μf, 2000-volt air capacitors were then chosen to be driven in parallel by a set of 2½-inch diameter surplus gears.

A simple semiconductor voltmeter is incorporated in the output portion of the tank circuit to indicate relative power output. The sensitivity is adjusted by means of a rheostat.

The only disadvantage of the pi-L network (if it can be considered a disadvantage) is the requirement for two sets of coils and two band-change switch decks for the plate tank. In addition, the operator may be surprised at the fast change in loading when the loading capacitor is placed across a relatively high-impedance part of the circuit. This effect could be eliminated by using a reduction gear arrangement between the loading capacitor and the dial.

The tuned input circuit is a conventional high-C tank, with a Q of about 2, shunted across the filament circuit. The filament is above r.f. ground by virtue of a homemade bifilar choke wound on a ferrite core. The tuned cathode circuit aids in matching the exciter to the final and reduces the magnitude of the intermodulation distortion products. As the input impedance of the 3-1000Z is close to 50 ohms, it is not necessary to provide driving-point taps on the input coil for each band. The input tuned circuit is switched simultaneously with the plate tank by ganging the plate and input band switches with a sprocket and chain-drive scheme.

Meters are provided for measuring plate and grid currents. These currents are independently monitored by inserting the meters in the grid and plate return leads to the filament center tap. This

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Fig. 1—The amplifier circuit diagram. Capacitors are 600-volt disk ceramic except as indicated. Resistances are in ohms. $R_1$ and $R_2$ are ganged as described in text.

B1—Blower, 20 cu. ft./min. at socket (Dayton IC-180).  
C1—3-section variable, 365 μf. per section, broadcast-replacement type (Miller 2113).  
C2—800 μf. mica (500 μf. and 300 μf. in parallel).  
(C-D type 4 or 9, 1200 volts d.c. test)  
C3—0.004-μf. ceramic (four 0.001-μf. In parallel).  
(Centralab 858-3).  
C4—350-μf. 3000-volt variable (Johnson 350E30, catalog No. 154-10).  
C5—0.001-μf. variable, 2000 volts (two Johnson 500E20, catalog No. 154-3, in parallel).  
C6, C7—0.1-μf. feed-through (Sprague Hystat 80U3).  
Z1—9 turns No. 10 enameled, diameter 1 inch, length 1½ inches. Tapped as follows, measured from “hot” end: 7 Mks: 4½ turns; 14 Mks: 2½ turns; 21 Mks: 1½ turns; 28 Mks: ½ turn plus 2-inch lead.  
L1, L2—See Fig. 2.  
M1—0-300 d.c. milliammeter.  
M2—0-1000 d.c. milliammeter.  
M3—0-1 d.c. milliammeter.  
R1—25,000-ohm control, linear taper.  
RFC1—90 μh., 500 ma. (B & W 800).  
RFC2—7-μh., 1000 ma. (Ohmite Z-50).  
RFC3—Four windings, 50 turns each, No. 10 enameled, on ½-inch diameter ferrite rod (Lafayette MS-333), winding length 4 inches. Bifilar wound in two layers, with two windings parallel in each leg. (B & W type FC-30 may be substituted.)  
S1—1-section, 1-pole, 5-position ceramic rotary (Centralab 2501).  
S2—2-section, 2-pole, 5-position ceramic rotary (Radio Switch Corp. Model 86; two type H wafers, 60-degree detent).  
T1—Filament transformer, 7.5 volts, 21 amp. (Stancor P-6457).  
Z1—½-inch copper strip formed into U, 2 inches long, 1 inch wide, paralleled by three 100-ohm, 2-watt composition resistors.

Shielded Enclosure and Chassis

This compact table-top amplifier is packaged in a homemade aluminum cabinet measuring 10½ inches high, 17 inches wide, and 14 inches deep. The small chassis at the back of the cabinet was fabricated after a layout satisfying the electrical requirements was determined. This chassis measures 2½ inches high, 17 inches wide, and 6½ inches deep, and is made of 0.003-inch sheet aluminum. It shields the input circuit and provides the mounting deck for the filament transformer, blower and tube socket. The front panel is made of two pieces of aluminum sandwiched against one another. The "rear" panel, of 0.003-inch aluminum, is used for mounting all of the parts attached to the front panel as seen in the photographs. Flat-head machine screws in countersunk holes support the various
components and provide a smooth surface for the “outer” front panel to seat against. The “outer” front panel is made of 1/8-inch Dural and is painted and labeled to provide a neat looking appearance with no screw heads visible. The cabinet enclosing the amplifier is formed from two pieces of 0.063-inch aluminum sheet. The bottom is formed in the shape of a U from a solid piece of aluminum. The top piece was perforated (this work was done by the California Perforating Screen Company, 345 Folsom Street, San Francisco) to aid in cooling the tube and components. An edge of solid aluminum was left around the top piece for esthetic reasons. Both the top and bottom covers extend 3/8 inch beyond the edge of the front panel.

All three meters are isolated from the r.f. field by the use of aluminum meter shields. The meter leads are brought through the shields in small ceramic feed-through capacitors. Panel bearings and shaft assemblies are used for front panel controls and on shafts from the input compartment to the plate compartment. The “C” retaining washers on both sides of the bearing serve as good wiping contacts to ground and prevent the shaft from acting as an “antenna”, coupling power from one compartment to the other, as can happen with simple panel bushings. A control shaft “hot” with r.f. can lead to circuit instability or TVI problems.

Component Layout and Assembly

General component placement may be seen in the photographs. The three meters are arranged across the front panel with the grid meter at the far left, the plate meter in the center and the r.f. voltmeter at the far right.

The plate tank and cathode tuned circuit band switches are ganged together by means of a chain and sprocket drive system. Both band switches have 60-degree indexing so the sprockets can be of equal size. A brass sprocket with 10 teeth was used on both band switches. The drive chain is Boston No. 1 brass chain. It is imperative that brass chain be used as the chain is in a fairly strong r.f. field. Iron has such high r.f. resistance

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6 Perfection Gear Co. (American Stock Gear Division), 132nd Street and Vineyards Avenue, Harvey, Ill.; Sprocket K-10, 1.125 inch diameter.
6 Boston Gear Works, Quincy 71, Mass.
that serious heating of the chain will prohibit
its use even if the chain is copper plated.

The plate band switch must be insulated from
the front panel by ceramic or bakelite mounting
spacers and a ceramic shaft coupler. If this
precaution is not followed, there will be serious
closed-loop heating on the 80- and 40-meter bands
because of the loop formed by the panel, chassis,
switch and chain coupled to the plate tank coil.

A standard heat-radiator cap (Fimac HR-8)
was modified to provide sufficient clearance be-
tween the radiator and the cabinet. The two top
radiating fins were removed; this can be done in a
lathe or by hacksaw and file. Ordinarily this is not
a recommended procedure. However, after the
modifications were made, the plate seal temper-
ure was measured by a thermocouple and was
found to be well within the manufacturer's rates.
The chimney and modified heat-radiator cap were in place and cooling air was supplied by
the fan described in the parts list.

The SK-510 socket was modified to allow a
shallower chassis to be used. The SK-510 has a
short plastic cylindrical protrusion on the bottom
to couple to an air hose for cooling purposes. This
cylinder is not used when the chassis is pressur-
ized as in this amplifier. The plastic cylinder can
be cut off with a hacksaw and file after the con-
tact pins have been removed. The pins are
snapped back into the socket after the modifica-
tion.

The semiconductor r.f. voltmeter is mounted
in a small aluminum box bolted to the chassis
just below the blower motor. A length of hook-up
wire is attached between the voltmeter and the
pi-L output to sample the r.f. voltage. The sensi-
tivity control is mounted on the front panel and is
connected to the voltmeter by means of a shielded
wire. The indicating milliammeter is attached to
the detector unit by means of a shielded wire.

Amplifier Wiring

Shielded wire is used on all low-voltage leads
in the plate compartment except the blower
power leads and r.f. sampling wire. Small ceramic
feed-through capacitors pass all leads from one
compartment to another. Coaxial capacitors are
employed as 115-volt a.c. terminals on the rear
apron of the chassis.

Silver-plated ½-inch copper strap is used for all
taps on the pi section of the plate tank and for the plate leads connecting the tuned circuit to the 3–1000Ω plate cap. No. 11 tinned copper wire is used to connect the taps on the L part of the plate tank to the band switch.

Large transmitting-type mica capacitors must be used as the coupling capacitors in the cathode tuned circuit, as all the drive power flows through these capacitors. The capacitor shunting the input circuit on 80 meters will carry part of the circulating current in this tuned circuit and therefore must be a good transmitting type. All of the mica capacitors used for the cathode tuned circuit are widely available on the surplus market.

**Testing and Tuning the Amplifier**

The amplifier is entirely free of regeneration or parasitics. The amplifier will operate with no plate load connected, a full 3000 volts applied to the plate, no grid drive applied, and with the band switch and tuning capacitors in any position — with no sign of oscillation.

Preliminary tuning adjustments should be

(Continued on page 180)
Looking at Phone Signals

The Receiver as an Analyzer

BY GEORGE GRAMMER,* W1DF

Any receiver that will bring in c.w. signals satisfactorily can be used for checking phone signals. Although the check is purely qualitative, more than that isn’t to be expected from a receiver. Qualitative measurements, whether on incoming signals or your own, take a great deal of auxiliary apparatus. However, a qualitative check will go a long way toward the goal of keeping signals clean.

Furthermore, you don’t have to know much about your receiver’s technical characteristics in order to make a fair assessment of the quality of a phone signal. It’s largely a matter of knowing how to set the controls and knowing what to look for. The “how” is easy; the “what” takes some practice — critical observation and comparison of the various kinds of signals you run across on the air. While there isn’t anything complicated about it, the technique differs from that used in ordinary reception.

First, about the receiver’s controls. Turn off the a.g.c. This is vital. Any variation in receiver gain while you’re examining a signal makes it practically impossible to interpret what you hear. Set the audio gain well up and turn the r.f. gain down to the point where the average signal is of moderate strength. Turn on the b.f.o.

Beware of Overloading

Before doing any phone checking you have to find out something about the receiver’s ability to handle signals. An easy way is to tune across a c.w. band. When you come to a strong signal, vary the r.f. gain control. If the audio output keeps coming up as you increase the gain, the control is operating in the right region. If the output starts to level off at some point on the gain control, the receiver is beginning to overload.

There is a change in the character of the beat note at that point; the tone begins to sound a bit thin or mushy. Also, signals and noise in the background will “bounce” in intensity with the keying of the signal. These effects will readily be recognized after you’ve heard them a few times. Pick out the strongest signal and set the r.f. gain well below the point where overloading starts. You should still be able to get all the output you need by increasing the audio gain.

Unless the controls are set in this way the receiver can’t handle the stronger incoming signals without overloading. Overloading has to be avoided at all costs if your observations are to be useful.

Adjusting the B.F.O.

Next, set the receiver’s selectivity to maximum and turn off the b.f.o.1 Tune in a c.w. signal by adjusting the tuning control so the response to the background noise is maximum when the sender’s key is down. An unmodulated steady carrier can also be used, if such a signal happens to be available.

When the gain controls are adjusted as described, the background noise increases when a signal is present, just as it does when the b.f.o. is turned on. This is opposite to what happens when the a.g.c. is used and the mutual r.f. gain is at maximum; in that case the background noise decreases when a signal is tuned in.

Finally, turn on the b.f.o. and adjust it to give a beat tone of about 500 cycles on the signal so tuned in. Either side of zero beat can be used.

Checking a Phone Signal

At this point you’re ready to take a look at a phone signal. The a.m. broadcast band is a good place to start, if your receiver happens to be one that covers it. Broadcast modulation is likely to be held under proper control, and your object is to find out what the sidebands of a properly modulated signal are like.

First, tune in a carrier, adjusting the tuning for the selected beat tone. For the moment, ignore the modulation, which will sound like a miscellaneous collection of beat tones. Concentrate on the carrier beat. Two characteristics will stand out: (1) the pitch of the tone is constant; that is, the frequency of the carrier is not in the least affected by the presence or absence of modulation, and (2) the carrier amplitude also is constant. There will be no changes in carrier amplitude that occur simultaneously with modulation.

1 — It may not always be easy to do this, since the b.f.o. and a.g.c. cannot be controlled independently in some receivers (although it is usually practical to pull out the b.f.o. tube temporarily). Also, receivers with product detectors do not lend themselves to this method of setting the b.f.o. frequency since the detector does not (or should not) function when the b.f.o. is not operating. In such cases the b.f.o. has to be set to give approximately the desired tone on background noise. This is good enough if the selectivity is high.

*Technical Editor, QST.
Fig. 1 — A properly modulated a.m. signal may have, instantaneously, side frequencies, distributed something like the pattern in this drawing. The frequency pattern from instant to instant with voice modulation.

If you are tuned to a distant station and there is fading, the fading will cause variations in carrier strength, but careful listening will show that these variations are quite independent of the actual modulation.

Now tune off about a kilocycle to the side which makes the carrier beat tone rise in frequency. You'll now be in one of the two sidebands, and if the receiver selectivity is high the carrier beat either will be much weaker or will have practically disappeared. Listen carefully to the beat tones that rise and fall with the modulation. Unless the station is in the middle of a commercial (where the rules are sometimes conveniently overlooked) the sideband beat tones will have a clean, smooth sound — a little hard to describe accurately but easily recognizable after a short listening session. Continue moving the tuning away from the carrier frequency and there will be no change in the character of these beats, except that as the tuning is moved farther from the carrier their intensity usually will decrease. These smooth-sounding beats are ‘‘legitimate’’ sidebands.

**Bandwidth**

If the receiver tuning dial is calibrated closely enough it is possible to get a fairly accurate idea of the transmitted bandwidth by this beat method. Concentrate on those beats which have the same tone for which you set the b.f.o. at the start. Find the frequency setting, farthest from the carrier, at which you get that tone from a sideband component. Then the difference between that dial reading and the dial reading for the carrier is equal to half the signal bandwidth — half, rather than total, because you've looked at only one of the two sidebands.

Estimating bandwidth by this method requires the ability to concentrate on the right beat tone. Obviously, it is easier to recognize the beats when the receiver has high selectivity, because then the strongest beats will always be around the right tone regardless of the tuning-dial setting.

One other thing will have been noticeable about the properly modulated signal you've been examining: the sideband components are always relatively weak-sounding compared with the carrier. This has to be so, because with voice or program modulation the average power in one sideband is only about one-eighth the carrier power. Furthermore, this power is divided up among the various component frequencies of the sideband, so any single component will have even less power. Occasionally, if you happen to be listening to music, a single tone will stand out, but even in this case its amplitude usually will be 6 db. or more below the carrier amplitude.

**Analyzing the Process**

If you aren't wholly familiar with receiver operation a diagram of this process may help. Fig. 1 is typical of the frequency-vs-amplitude distribution that might exist in a good a.m. phone signal at some instant. Each sideband consists of a series of frequency components associated with a voice sound. These components usually have harmonic relationship, to a close degree, for any given sound; in Fig. 1, all the side frequencies shown are produced by audio tones that are harmonics of 200 cycles. More important, however, is the fact that each sideband consists of a group of distinct frequencies. It is not just a continuous mess. Each separate frequency gives a separate, and reasonably stable, beat tone with the receiver's b.f.o.

If the receiver can handle a group of these frequencies without doing injustice to any of them — i.e., without overloading — the individual beat components will stand out just as any one of a similar group of closely spaced c.w. signals will retain its individuality. Sideband components of this sort are generated in a properly modulated transmitter, and sound “clean” with the receiver's b.f.o. on.

By using as much selectivity as the receiver offers, the number of sideband components heard at any one time is narrowed down. In Fig. 2 a curve typical of “500-cycle” selectivity is shown superimposed on the lettered group of sideband components from Fig. 1. The response range shown is 60 db. If the receiver is tuned to the frequency of side component D, the response to that component will be as shown by the vertical line. This response is relative to the carrier-only response; the scale here differs from that of Fig. 1 because the former was plotted to an intensity (voltage or current) scale while Fig. 2 is in decibels. The sideband components labeled B, C, E and F would have the decibel response shown,

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as a result of the effect of the selectivity on their original amplitudes. Note that A and G are so far down (more than -60 db.) that they do not even show on the graph. This is also true of all components higher in frequency than G and lower in frequency than A, including the carrier.

If the receiver's b.f.o. is offset from the selectivity curve by 500 cycles as shown (this was the object of the method of setting the b.f.o. frequency detailed earlier) each sideband component will give a beat tone as shown in the upper scale. The selectivity restricts these tones to a relatively narrow range centering around 500 cycles. This also will be true when the receiver is tuned to other parts of the signal. When this point is appreciated the beat-tone method of checking bandwidth becomes clear.

Practically speaking, any sharply peaked selectivity curve -- such as the kind a Q multiplier or the old-type crystal filter gives -- is best for this type of checking. While your mind can be trained to exclude those tones which differ appreciably from the one for which you originally set the b.f.o., it is easier with a highly peaked selectivity curve because then only a frequency component right on the peak — that is, one that gives the selected beat tone — really stands out.

**Splatter**

Splatter frequencies arising from overmodulation tend to have a different character than legitimate sidebands. There is a harshness associated with them that again is hard to describe but not hard to recognize. Listen for this sort of thing during commercials, particularly, and with the

tuning set toward the edge of the band you found to be occupied during normal program transmissions.

The harshness associated with splatter is the result of a different type of sideband-frequency distribution. The onset of splatter is usually abrupt, giving an effect something like key clicks. Also, the side frequencies it generates are often much more closely spaced than the sideband components of proper voice modulation, so that distinct tones are less easily recognizable.

**Checking Amateur Signals**

An hour or so spent in listening this way will give a much better idea of what a phone transmitter is really doing than months of listening to what actually is being said. Furthermore, what is learned is as useful in appraising an s.s.b. signal as it is for judging a.m.

Really horrible examples of overmodulation may have been missing in this preliminary training of listening to a well-modulated broadcast station. They are much less rare in the communication services — including, sad to say, amateur. However, it is well to start off by learning what a good signal is like. If yours is a hams-only receiver, you will have to identify the right kind through pre-knowledge of how it should sound. The difference between good and bad is clear enough, after you’ve heard both kinds.

With this background in checking modulation you’re in a position to take a look at amateur signals and find out a few things about them. However, before condemning any signal you hear as not being up to par, ask yourself two questions: First, is there any possibility that the receiver is being overloaded, either by the signal in question or by one that may be far enough removed in frequency so that you aren’t aware of its presence? That r.f. gain control setting is important. Second, if there are harsh “burps” indicating splatter from overmodulation or s.s.b. flattening, do they belong to the signal you’re blaming? In a crowded band identification of bits and pieces of splatter is sometimes pretty difficult.

In other words, make sure that the signal being checked is the one you’re actually hearing, and that no spurious receiver effects are being introduced. An overloaded receiver is worthless as a checking device. Most receivers have so much gain that even a weak signal can be amplified up to the overload point unless care is used in holding down the amplification. The lower you can run your r.f.-i.f. gain, the better.

**A.M. Phone**

With these precautions well in mind, you’ll have no difficulty in spotting overmodulation on a.m. signals. “Overmodulation” here means any nonlinearity that results in splatter outside the proper channel. Very often it isn’t overmodulation in the commonly accepted sense of the word, but is “spurious” generated by attempting to make a modulator do more than it is capable of doing. The actual modulation percentage may be
well below 100. The effect is much the same in either case.

You can find out still more by this method. Tune in the carrier and listen to the beat carefully while the transmitter is being modulated. A good many v.f.o.s can't "take it" when a succeeding stage is modulated. A change in the carrier beat frequency during modulation shows this up; it is most easily detected if the beat tone is made as low as possible. The change is often at a syllabic rate, giving an effect something like frequency-shift keying; the principal cause of this is a change in power-supply voltage when the modulation throws on an extra load.

If the v.f.o. frequency is modulated at an audio rate, the carrier will take on a mushy character during modulation. Audio f.m. leads to some undesirable effects; the combination of f.m. and a.m. causes distortion, increases bandwidth, and makes the sidebands unsymmetrical. If you run across such a signal, change to normal phone bandwidth, and with the gain controls still the same and the b.f.o. still on, try to tune the receiver to zero beat with the carrier. If there is appreciable audio f.m. it won't be possible to make the voice sound right. The same test on a stable signal will give no special difficulty, although it may not be possible to hold the exact zero-beat adjustment for any length of time because of minute frequency drifts in the transmitter's or receiver's oscillators.

The beat-note checking method also will show up changes in the carrier amplitude. As there are many controlled-carrier a.m. phone signals, an increase in carrier amplitude while modulating is often to be expected. However, if the carrier amplitude decreases, something is wrong with that signal. It may be poor power-supply regulation, but is just as likely to be something that results in the generation of spurious modulation components. A check of the sidebands will show which.

S.S.B.

Examined in this way, s.s.b. signals differ from a.m. only in the absence of the carrier and one sideband. Properly generated and amplified, the sideband components will have the same clean sound to them that properly modulated a.m. sidebands do. Overdriving a linear amplifier will result in "burps," especially noticeable outside the desired-sideband channel and particularly in the undesired-sideband region, just as a.m. overmodulation does.

Since there is supposed to be no carrier with s.s.b., the receiver's b.f.o. must be set up on a c.w. signal or unmodulated carrier as described earlier. This is obviously not the same setting that would be optimum for s.s.b. reception; the b.f.o. frequency is offset by 500 cycles or so from the s.s.b. setting. With this offset, you can easily determine whether any carrier is being transmitted; a continuous carrier will give a steady tone, usually weak compared with the sideband, but nevertheless present. You can also detect a carrier that rises with modulation. It is "keyed" along with the voice, sounding something like slow c.w. with a very soft make and break. This is caused by incomplete carrier balance, which may be a dynamic effect—that is, the carrier may be quite well balanced out when there is no modulation, but becomes unbalanced when it is being driven by audio.

With high selectivity it is possible to check the bandwidth of an s.s.b. signal by the beat method, and particularly to see whether there is appreciable output in the undesired sideband region. As shown by Fig. 2, the beat tone that your b.f.o. is adjusted for will predominate only when a sideband component is on the frequency to which the receiver is set. If your mind is trained to exclude any other tones you may hear, you may be sure that you aren't being deceived by instrument errors. The selectivity has to be high enough so that the audio image of the b.f.o. tone is negligible; in other words, you have to have true single-signal c.w. reception.

**Transmitter Checking**

Of course, all this is only preliminary to the real object—checking your own transmitter. Practice on incoming signals of all types will give you the insight needed for analyzing your own signal. Having found out how to spot defects in others, you're well prepared to find out what, if anything, is wrong with your own.

Some suggested setups for checking your own transmitter will be discussed in a subsequent article. In the meantime, give a try at being your own sideband analyst. The only equipment you need is a receiver.

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**Strays**

Any blind would-be amateurs who would like some study material on tape are urged to contact last year's Edison award winner, Bill Wolah, WA6VTI, 2300 West Clark Avenue, Burbank, Calif. No charge except for postage.

At midnight Saturday (0000 EST, Sunday) WNCN (104.3 Mc., f.m., NYC) broadcasts an hour-long program called Hi-Fi Workbench, and devotes part of the hour to ham radio news. K2IBY and K2YQH do the show. Hams in the metropolitan New York city area and suburbs should take a listen.

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**IMPORTANT NOTICE**

**Changes of Address**

Important postal changes in handling second-class mail matter are now in effect. Please advise us direct of any change of address. Four weeks notice is required to effect change of address. When notifying, please give old as well as new address. Your promptness will help you, the postal service and us. Thanks.
The VB5AA DXpedition

BY JOHN G. TROSTER W6ISQ

All ready go now, B'wana."

"Good work, Number One. Now call the porters. I want to say a few words. You translate."

The leader climbed a sand dune and faced his panting porters. "Now, boys, we are about to start our DXpedition into this unknown ARRL-forsaken island. Just think, never before has anyone set foot upon this dot of land! The jungles are thick, the slopes steep. But, my friends, the rewards are great. You are standing in a new country! A radio society in Connecticut, U.S.A., said so. And we've come here to set up the first radio station. Can you poor fellows grasp the tremendous significance of that? Can you understand... can you appreciate... oh, well. All of you who survive will be awarded a medal."

"Haablab, haablab."

"What do they say, Number One?"

"They say, 'peachy, peachy'."

"Boys, this award is a pin. And you can pin it proudly to your... ahh, you can pin... err, wear... make a string and wear it around your neck."

"Ollong goo?"

"What do they say, Number One?"

"They say, 'what kind of medal?'

"In American this medal is called a Booster Pin. And you will receive this citation for duty above and beyond the call of DX. Now, my brave fellows, let us point our beams toward the mountain. We are going to slash our way through this jungle and drag ourselves to that unscaped peak. Then we'll send messages all over the world."

"Pfud gruz -- blah goofoey."

"Blast it, Number One, what do they say?"

"B'wana, they say, 'we do same with bongos, but no have to climb to mountain.'"

"B'wana, porters say wish B'wana not put big long whirly-gig aluminumium on pickey before walkum through jungles."

I suppose you're right, Number One. I should have waited to assemble that dratted thing until we got to the top. But tell the machette-boys to cut a little wider. Two medals to those stout fellows!"

"Haablab, haablab."

"No sleep tonite, boys, we must be ready to call our first CQ by dawn. It's onward... onward and upward into the swirling mountain mists."

At last the steep slopes give way to level ground. "We're here, boys. Now quickly each to his own task. Hurry now, only an hour till dawn. Drat this fog."

Tent-boys heave canvas, fix tables, chairs and lanterns. Beam-boys straighten aluminum elements and swing the pieces aloft with a hearty dar-di-dar-dar-di-dar-di-dar. The generator-hads gas up and spun old faithful. Radio-boys unbox and carry radios into the tent. All is ready with minutes to spare.

The leader steps from the tent into the heavy mists. "Number One boy," he shouted, "fetch our official flag. You know, the sheet with the numbers on it. Ah, there it is... now nail it to that spare mast and we'll hoist it over our camp. On your feet, boys. Right haanda, salute!"

"See that, Number One? That's the radio call of this new country we just climbed. V-B-5-A-A. Yes, Number One, the Governor personally filled out the proper papers and gave me that call. Then he presented me with this magnificent radio call flag. 'Good luck,' says he, 'you'll make radio history in that new country.' And so we shall, Number One. Just a few more minutes and we'll..."

"B'wana, B'wana. Fizt zwink coco bongo."

"Blast it, Number One, what's he so excited about?"

"Boy say, 'sounds like some fella knock coconuts together out in middle of clouds.'Listen."

"He's right, Number One. There is something over there. Got me that flag pole -- we'll advance our standard and investigate. Careful now, Number One, there maybe be some unfriendly natives on this island we don't know about."

"I can hear the voices now, B'wana."

"What do they say?"

"Don't know, B'wana, but I see sompin white. Think maybe tent."

"Let's move up behind that rock. Now -- what do you see?"

"I see fella come out of tent. Maybe he make bed. He wave big sheet in air. No -- he nail sheet to stick. Up she go. See picture on sheet."

"Blast it, Number One, what's the picture? What's the picture?"

"Very hard see through mists, B'wana. Go closer."

"All right, Number One. The Governor himself told me... well anyway, here's the license in my pocket and the flag from the Gov..."

(Continued on page 184)
A Monitored Electronic Key and Keyer

Transistor Circuit for Both Cathode and Blocked-Grid Systems

BY JAMES C. MACFARLANE,* W3OPO

The solid-aluminum U-shaped chassis is approximately 11 inches long with ends measuring approximately 2 1/2 by 5 inches. The perforated cover is cut to fit. Rear panel [left] has the keyer jacks at the top, mark/space control at the center, lever and straight-key jacks and power cord at the bottom. Front panel [right] carries the three-position switch S1 at the top, speed control at the center, and monitor volume control at the bottom.

While Harry Beecher, W2ILE, described his original electronic key in a QST article (April, 1946), it seems improbable indeed that he could have anticipated how thought-provoking the basic idea was destined to be. Over the ensuing 22 years and more, an almost steady stream of designs has appeared, some simple, some highly complicated, but each representing the designer’s choice after weighing features, complexity, reliability and cost. All have had their followings of advocates. Is this the one for you?

In these days, as s.s.b. becomes more and more popular, it is sometimes felt that c.w. is a forgotten art. But recently there have been several articles published on electronic keyers.1 Some of these units have been simple to build, but critical as to components or adjustments, and some have been complex and therefore unappealing. The keyer I’m about to describe is somewhere between these two extremes. I hope that this article continues to stir up interest in c.w., one of the finest modes of communication.

Here are a few of the features of this keyer:

1) Reliability through the use of positive and negative voltages and emitter followers to control the multivibrators in an “off” and “on” condition, which precludes unscheduled oscillations which, in turn, would key the transmitter.

2) No regulated voltages are required. Although the unit has been worked at from 14 to 24 volts, it is recommended that the voltages be between 18 and 22. Two 22!½-volt batteries, or one 45-volt battery with a 22!½-volt tap, may be used in place of the simple a.c. supply described, if desired.

3) Constant mark-to-space ratio (one set) from the fastest to the slowest speed. There is no interaction with the speed control. The speed for this unit is approximately 15 to well over 70 w.p.m. This speed range may be changed by using different timing capacitors in the free-running multivibrator.

4) No relays are used to key the transmitter, yet cathode and/or grid-block keying outputs are available.

5) The layout is not critical. Indeed, the first breadboard unit was spread out over three or four feet and worked just as well as the finished “cyclet” model. The most expensive items in the unit are the transistors themselves. C722s are available for considerably less than a dollar. This unit is particularly adaptable to printed-circuit-board construction.

6) Included are the usual provisions for speaker monitor output, optional hand key and/or bug. There are also provisions in the unit for holding a steady dash while tuning the transmitter.

Circuit

Referring to Fig. 1, the basic timing circuit is a free-running multivibrator including transistors

* 4917 Harvest Road, S.E., Washington 22, D. C.
Fig. 1—Circuit of the monitored electronic keyer. Resistances are in ohms and resistors are 1/2 watt. Capacitors of less than 0.001 μF should be mica or stable ceramic; 1-μF capacitors should be good-quality paper; other fixed capacitors may be disk ceramic or paper.

J₁, J₂, J₃—Open-circuit jack (J₁ must be insulated from chassis).

LS₁—3-inch speaker.

Q₄, Q₅—See text.

R₁—Linear control.

R₂—Dual 50,000-ohm linear control.
ing $Q_2$ and $Q_6$, respectively, in the off state.

To produce a series of dots, the paddle is pushed to the left. The base of $Q_2$ goes negative (off), which removes the positive clamping voltage from the base of $Q_2$, and the multivibrator starts to free-run. Since $Q_6$ is still clamping $Q_5$ off, the bistable multivibrator is not operating and the output of the free-running multivibrator ($Q_1$, $Q_2$) appears at the or gate ($CR_1$, $CR_2$ and associated resistors). The output of the or gate drives the current amplifier (emitter follower) $Q_7$ which, in turn, drives the keying transistors $Q_8$ and $Q_12$ and turns off $Q_{11}$, permitting the audio multivibrator $Q_9$ and $Q_{10}$ to oscillate. Referring to the waveform diagram (Fig. 2) you will note that the collector of $Q_2$ has a sharp rise and a slow fall time. The lengths of the dots and spaces are measured at the zero-voltage, or crossover point at the or gate output. Adjustment of the mark-space ratio will be described later.

To produce a series of dashes, the paddle is pushed to the right. The bases of $Q_3$ and $Q_6$ go negative, starting both multivibrators. Referring to the waveform patterns of Fig. 2B, it is noted that every time there is a positive-going pulse from the collector of $Q_5$, it triggers the bistable multivibrator (unless the bistable is clamped off, as it is during a series of dots). The first trigger pulse causes the collector of $Q_5$ to go positive (on) for the first two thirds of the dash. The next positive pulse from the collector of $Q_5$ causes the collector of $Q_5$ to go negative (off) for the last third of the dash plus a space interval. The next dash is started on the next trigger pulse. The resultant waveform at the output of the or gate shows the dash to be three times the length of a dot. The balance of the dash sequence continues as for the dots described above.

The resistors in the base circuits of $Q_2$ and $Q_6$ (to the collectors of $Q_1$ and $Q_4$) provide for biasing them negative until the timing interval (dot or dash) is completed. The capacitors in these feedback circuits provide the proper filtering and time constants.

**Adjustments**

There are no adjustments to be made if you are an operator who likes to work the weight or mark-space control to suit the situation. Many DX men like to make their dots a trifle heavy and slow down in speed when digging for the rare ones. However, if you are one who wants

![Waveforms](image_url)

Fig. 2—Waveforms at the collectors of $Q_2$ and $Q_6$ and at the output of the OR gate with (A) dots and (B) dashes.
essentially constant mark-to-space ratio, regardless of the setting of the speed control, here are some ways to do it.

If you have an oscilloscope which can duplicate the waveforms in Fig. 2, then it is a simple matter (after advancing the speed control to top speed) to adjust the weight control so that the dot and space are of equal length. Then return the speed control to the slowest speed. If the mark-space ratio varies by only a few per cent (undetectable to the human ear), you have now completed the adjustment. If it is off appreciably, that is, if the mark period is longer or shorter than the space interval, $R_3$ must be moved to the other potentiometer, $R_{2A}$. This resistor is required because the timing capacitors have a tolerance of plus or minus 10 to 20 per cent. If one capacitor had a minus value and the other a plus value, the timing intervals would be different for each half of the multivibrator, thereby destroying any chance of getting proper adjustment. If switching the resistor does not improve the adjustment, it would be advisable to find two capacitors whose actual values are more closely matched.

In lieu of a good oscilloscope, put a voltmeter across the output of the OR gate. Reset the voltmeter needle up scale away from zero, mechanically by the zero adjustment. Hold the key to the dot side. Adjust the mark-space control while swinging the speed control from the fastest to the slowest speed. When you have reduced the voltmeter swing to a minimum, your adjustments are completed. On my unit the swing was less than plus and minus 0.1 volt.

**The Keying Transistors**

It is not necessary to provide both $Q_x$ and $Q_{12}$, of course, unless you want to make provision for both cathode and grid-block keying. If only one system is needed, the keying transistor and accompanying base resistor of the other system may be omitted.

In selecting a suitable transistor for either $Q_x$ or $Q_{12}$, it is important to determine the voltage that prevails across the transmitter key jack when the key is open, and the current that flows in the key circuit when the key is closed. Both voltage and current must be within the rating of the transistor used as the keyer. Consideration must also be given to the dissipation rating, although it can be stretched a bit because of the low e.w. duty cycle.

Readings made by the ordinary voltmeter and milliammeter will be satisfactory, provided that no high-voltage transient takes place. However, in keying the cathode circuit of the Pierce crystal oscillator in my Viking I transmitter, a check made with an oscilloscope showed an instantanous voltage spike running as high as 60 volts coincident with opening of the circuit. The steady-state voltage as read on a voltmeter across the open key jack, was only about 15 volts. It is obvious that the most reliable check requires the use of a scope.

If transient spikes are detected, their cause should be investigated and corrective measures taken if possible. Otherwise, the voltage rating of the keying transistor will have to be sufficient to accommodate the peak value of the spike. It might be of interest to remark that the spike mentioned above occurred only when the keyed
The monitor speaker is mounted on the chassis by means of a bracket. It is on the transistor side of the component board. Power-supply components occupy the rear portion of the chassis.

stage was being operated as a crystal oscillator. When the stage was operated as a keyed buffer driven by a continuously-running external v.f.o., the spikes did not occur, and the open-circuit voltage was about 30.

In cathode-keyed systems, both the open-key voltage and the closed-key current will usually vary as the transmitter is shifted from band to band. Measurements should be made on all bands covered by the transmitter, and a transistor should be selected that will handle the highest values measured.

Most cathode-keyed transmitters these days are keyed in low-power stages where the voltages and currents are within the ratings of many of the low-cost ($1 to $3) n-p-n transistors. Where higher voltages are encountered, there are the 2N1310 (90 volts) and the 2N1311 (75 volts) at less than $5.

Among transmitters using blocked-grid keying, you may find a few, but not many, using blocking voltages of less than 50 volts. On the other hand, you will find several whose blocking voltages run up to 250 volts or more. The most suitable low-priced p-n-p transistor seems to be the 2N398A rated at 105 volts. For blocking voltages exceeding 100 volts, two or more of these units can be operated in series, as described by K5UIJ in an earlier QST article.  

**Operation**

Now that you have made your mark-space adjustments, have the proper transistor for keying your transmitter, and your transmitter is warmed up, turn on your keyer and get the feel of the key. If you have been disappointed with other keyers in recent years, I think you'll be happy with this one. If you've never used an electronic keyer before, it should not take you long to master it. As far as I'm concerned, the old saying, "You can't teach an old dog new tricks," does not hold true in this case. I used a semiautomatic key for over 20 years and I would never go back to it after the pleasurable hours I have had with this keyer.

If it were not for my friend, Mr. Thomas P. Sifferlen, who designed the basic circuit, this article would never have been written. My thanks also to Mr. Cheley H. Looney for encouraging me to write the article and for checking it for technical correctness and to Ron Woodman for the photographs.

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**Strays**

Governor Nelson A. Rockefeller of New York lent a note of official recognition to the ARRL Hudson Division Convention by cutting the ribbon at the start of the meeting, held in the Statler Hilton Hotel, New York City, on October 13. With the Governor are: K2SJN, convention vicechairman; K2SJJO, convention chairman; W2KR, Hudson Division Director; and W2TUK, Hudson Division Vice Director and president of the Hudson Amateur Radio Council, Inc. The Governor also proclaimed October 13 as Amateur Radio Day in New York.
16th V.H.F. Sweepstakes, Jan. 5-6

Attention V.H.F. operators! Here is the dope on the 1963 VHF Sweepstakes, which will be bigger and better than ever. It will start at 1400 your local standard time on Saturday, January 5, 1963, and end at midnight local time on Sunday, January 6. Remember, contacts count only when the contest is in progress at both ends of a QSO.

This year there is one rule change, the section status of Delaware. As usual, VESs will count as a separate multiplier. This will make possible a total multiplier of 74.

So join in the fun this year. Just call CQ Sweepstakes or answer such a call.

Remember that, unlike the V.H.F. QSO parties, in the SS sections count only once no matter what band they are worked on, although you may work the same station on a different band again for additional contact points. Example: WI1HDQ works W1FZJ on 50 and 144 Mc. for complete exchanges of 2 points on each band; 2 + 2 gives 4 points but only one section multiplier. So bandhopping will increase your score.

In scoring, the multiplier is the number of sections worked plus ten. Each complete exchange counts two points. Here is a scoring sample. Suppose W3HYV made 100 contacts in 17 different sections:

100 QSOs
× 2 (if all SS data exchanged in both directions)
200 (QSO points)
× 27 (17 sections plus 10)
5400 (claimed score)

You can get log forms as shown in December, 1961, QST, by writing to ARRL, 38 LaSalle Road, West Hartford 7, Conn. Let us know how many you need. Logs must be postmarked by February 2 to be eligible for score listing and awards.

Rules

1) Eligibility: Amateur operators in any ARRL section (see page 6) operating at home, or mobile or portable under one call on or above 30 Mc, are invited to take part. Yukon, N.W.T. (VES) counts as a separate multiplier.

2) Object: Participants will attempt to contact as many other stations in as many ARRL sections as possible.

3) Contest Period: The contest starts at 2:00 p.m. your local time, Saturday, Jan. 5, 1963, and ends at midnight, Sunday, Jan. 6, 1963. Contacts between stations in different time zones can be counted only when the contest period is in progress in both of the zones concerned.

4) Exchanges: Contest changes, including all data shown in the sample, must be transmitted and received for as a basis for each scored point.

5) Scoring: (a) Contacts count one point when the required exchange information has been received and acknowledged, a second point when exchange has been completed in both directions.

(b) Foreign entries: All contacts with foreign countries (such as Mexico and Cuba) count for score. All foreign countries are grouped together as one, and a section multiplier of no more than one (per band) may be claimed for contacts with all foreign stations contacted. Foreign stations may only work stations in ARRL sections for contest credit. Foreign stations will give their country name in the exchange.

(c) Final score is obtained by multiplying total contact points by the sum of different ARRL sections worked (the number in each of which at least one SS point has been credited) plus 10.

6) Conditions for Valid Contact Credit: (a) Repeat contacts on other bands confirmed by completed exchanges of up to two points per band may be counted for each different station worked. (Example: W1HDQ works W1FZJ on 50 and 144 Mc. for complete exchanges of 2 points on each band; 2 + 2 gives 4 points but only one section multiplier.)

(b) Cross-band work shall not count.

(c) Portable or mobile station operation under one call, from one location only, is permitted.

(d) A transmitter used to contact one or more stations may not be used subsequently under more than one other call during the contest period.

(e) Contacts with aircraft mobiles cannot be counted for section multipliers.

7) Awards: Entries will be classified as single- or multi-operator, a single-operator station being defined as one manned by an amateur who neither receives nor gives assistance to any person during the contest period. Certificates will be awarded in each ARRL section to the top-scoring amateur in the single-operator classification. In addition, a certificate will be awarded to the top Novice in each ARRL section where at least three such licenses submit valid contest logs. Multi-operator work will be grouped separately in the final results report in the QST.

When three or more individual club members compete and submit logs naming the club with which they are identified, an ARRL certificate will be issued to the leading club member. When more than three individual logs are received there will be no club award or club mention.

A gavel with an engraved sterling-silver band will be offered the club whose secretary submits the greatest aggregate score, provided such scores are confirmed by report at ARRL of the individual contest logs from each member. Only the score of a bona fide club member, operating a station in local club territory, may be included in club entries. Claims from federations, radio club councils, or other combinations of radio clubs, will not be accepted, nor can special memberships granted for contest purposes be recognized.

8) Conditions of Entry: Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Award Committee.

9) Reporting: Reports must be postmarked no later than Feb. 2, 1963, to be considered for awards.

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**EXPLANATION OF V.H.F. SS CONTEST EXCHANGES**

<table>
<thead>
<tr>
<th>Send Like a Standard</th>
<th>Call</th>
<th>OK</th>
<th>Place</th>
<th>Time</th>
<th>Date</th>
</tr>
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<tbody>
<tr>
<td><strong>EXCHANGES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Contest numbers 1, 2, 3, etc., a new NR for each station worked</td>
<td>Send your own call</td>
<td>CK (Readability and strength or BST of station worked)</td>
<td>Your ARRL section</td>
<td>Send time of transmitting this NR</td>
<td>Send date of QSO</td>
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<td>W1AW</td>
<td>Conn</td>
<td>1402</td>
<td>JAN 5</td>
</tr>
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QST for
It isn’t often that you see a home-built 100-watt 6-meter transmitter inside a 3 × 5 × 12-inch box, but K2IUV has done it here without undue crowding of components.

A Compact Six-Meter Transmitter

100 Watt Input at Moderate Cost

BY SAMUEL M. BASES,* K2IUV

Back in ’57 and ’58 when the sunspots favored 6-meter men, five watts would get you across the continent without much trouble. About the time the P2 openings started to become rare and these conditions faded away, several ideas began to congeal into a plan for more power in a compact six-meter rig. The outcome of these ideas is the 100-watt transmitter shown here. It has performed reliably for over two years.

My basic requirements included provision for either crystal or v.f.o. input, high suppression of unwanted crystal harmonics, easy and complete neutralization, and reasonable power output with inexpensive tubes. Consideration was given for making the rig small enough to squeeze in between the present equipment on the operating table. The transmitter was designed to permit the use of junk TV types of power supplies.

Circuit

A 5763 Tri-tet oscillator-tripler takes 8-Mc. crystals or the unbalanced output from a v.f.o., the shield of the cuax from the v.f.o. connecting to the ground side of the crystal socket. The oscillator plate circuit is tuned from the front panel, and is inductively coupled to the fixed-tuned grid circuit of the doubler.

Some considerable thought about doublers resulted in the choice of the Amperex 6360, a dual tetrode which lends itself to the push-pull configuration. Its convenient pin arrangement also provides good input and output separation. The push-pull doubler attenuates the third harmonic of the driving signal and is inductively coupled to the final with a double-tuned circuit, to provide high attenuation of unwanted frequencies.

The final uses a pulsed-power version of the old workhorse 829B, the 3E29. This tube apparently has been overlooked by hams to some extent, for its published ratings apply to pulse operation and are generally misinterpreted. Either the 3E29 or the 829B may be used, but the former is less expensive on the surplus market.

Metering only the final grid and plate currents proved sufficient and permits simple switching and a reduction in the number of leads from the tightly wired oscillator-multiplier assembly. The meter leads are bypassed and filtered and the meter is shielded to reduce harmonic radiation.

Cathode keying of the amplifier is employed, and the modulation transformer secondary is automatically shorted in c.w. work. The modulator should be turned off or the gain reduced when operating on c.w. to prevent sounds in the shack from overloading the modulator tubes and transformer. The modulator must be capable of delivering at least 50 watts of power for proper phone work.

A “hi-low” switch, S8, inserts additional resistance in the final screen circuit to prevent excessive screen dissipation during tuning adjustments, or when the loading is lightened for low-power operation.

Construction

Construction should start with the oscillator-multiplier subassembly for this may be tested as a complete working unit and is more easily worked on before mounting in the chassis. Incidentally,
C1, C2—30-μuf. miniature variable (Johnson 160-130 or 30MB).
C3—7-45-μuf. ceramic trimmer.
C4—150-μuf, screw-mount button mica.
C5—10-μuf. per-section butterfly (Johnson 167-21 or 10B15, or Hammond BFC-12).
C6—50-μuf. variable (Johnson 148-4 or 50S8).
C7—Neutralizing wires; see text.
J1—Keying jack with additional leaves (Mallory 705).
J2—Coaxial fitting, SO-239.
L1—14 turns No. 20, ½-inch diam., 16 t.p.i. (B & W 3003, Air-Dux 416).
L2—9 turns No. 20, ½-inch diam., 16 t.p.i.
L3—5 turns No. 20, ¾-inch diam., 16 t.p.i. (B & W 3007 or Air-Dux 516).

L1—3½ turns each side of center tap, ¾-inch diam., 16 t.p.i.; halves spaced to allow L3 between them.
L2—9 turns No. 10 enam., c.t., ¾-inch diam., each half ⅛ inch long.
L3—1½ turns insulated, ¾-inch diam.
RFC1—2.5-mh. r.f. choke (National R-50).
RFC2—1-mh. r.f. choke (National R-50).
RFC3—RFC2, incl. 7-mh. r.f. choke (Ohmite Z-50).
R1—Meter shunt, to give 0 to 1.5-ma. range. Wind R1 and R2 to suit meter used.
R3—Meter shunt, to give 0 to 250-ma. range.
S1—D.p.d.t. toggle switch.
S2—S.p.s.t. toggle switch.

In a mixture of several tablespoons of lye (sodium hydroxide) per quart of cold water until the surface has a matte finish, and then rinse in cold water or vinegar. The etched chassis will take primer and paint well, and will be free of oil and fingerprints. Never let lye or lye solution contact the skin or eyes, and always dissolve the lye in cold water.

**Electrical**

Testing the oscillator-multiplier subchassis as a separate unit permits access and inspection, which would be difficult in the compact transmitter after assembly. For initial testing make a load for the 6300, using one or two turns of insulated wire, ½ to ¾ inch in diameter, with a No. 44 or 47 bulb connected to the ends of the coil. The completed load is temporarily taped to the grounded end of the 6300 plate tank.

If a grid-dip meter is handy, adjust the oscillator plate circuit, L4C1, to resonate at three times the crystal frequency. If no grid-dip meter is available, the following tuneup steps should be carried out, with power on, doing this quickly to minimize the time off resonance.

Insert the crystal or connect the v.f.o. to the...
Looking into the bottom of the compact 50-Mc rig we see the oscillator-multiplier subassembly at the right, and the final amplifier at the left. Note that the meter is shielded to prevent harmonic radiation.

crystal socket, and connect the heater and d.c. leads to their respective supplies. Tune the oscillator capacitor, \( C_1 \), and the doubler capacitor, \( C_2 \), for maximum glow in the bulb lead. An absorption wavemeter or g.d.o. in the indicating position held near the coils is helpful in tuning up. Output indications should appear smoothly with capacitor rotations and there should be no output when the crystal or v.f.o. is temporarily removed. Any spurious or erratic outputs indicate instability. An inoperative 5763 stage when v.f.o. is used may be corrected by changing the value of the grid-cathode capacitor slightly to compensate for the length of grid lead and coax used. The lengths used here were 3\( \frac{3}{4} \) inches of RG-58A/U from the tube socket to the crystal socket, and 10 inches from the v.f.o. to the crystal socket.

**Final Assembly**

The final socket is mounted with two I, brackets so that pins 6 and 3 are towards the front and rear of the chassis, respectively. The screen bypass capacitor, \( C_3 \), a screw-mounted mica, must be mounted as close as possible to the screen pin and connected to it with a short length of heavy bare wire.

The final grid coil, \( L_4 \), is made up of two individual B\&W coils or a similar hand-wound coil, arranged so that the winding direction is the same for both halves. Ceramic trimmer \( C_5 \) is soldered directly across the heavy bare wires running from the final grid leads to the terminal strip which holds \( L_4 \), although mounting this capacitor on small ceramic standoffs would result in a neater and more solid installation.

An 8-pin plug on the rear of the chassis connects with a cable-mounted socket to bring in the power leads. All the leads to the plug are bypassed with .001-mf. capacitors with the exception of the ground lead. Although this bypassing reduces power lead radiation, a more effective arrangement would consist of a small box mounted onto the outside of the chassis at the connector location and enclosing line filters. The connector would then mount on the rear of this box.

All the power, filament and metering leads should be dressed down against the chassis away from the coils and components, and all bypass capacitors must be connected with the shortest possible leads. Note that the final tuning capacitor, \( C_6 \), requires an insulated flexible ceramic shaft coupler. A non-metallic shaft and regular coupler may also be used. The final tank circuit r.f. choke and capacitor are mounted on a tie lug.

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**Figure 2**—Detail drawing of the plate used for the oscillator-multiplier subassembly.
near the tank coil and coax socket, while a six-lug strip having two grounded lugs anchors the grid, screen and other circuit leads alongside the final tube socket.

**Neutralization and Alignment**

After the oscillator-multiplier assembly has been tested and installed and the final grid circuit, $L_4$, has been mounted, temporarily disconnect one end of $L_2$ or $C_2$ and set $C_3$ so that the grid circuit “dips” at 58 Mc. This is about $\frac{3}{4}$ open for $C_3$. This adjustment is made with heaters off. With power applied the final input capacitance brings the resonant point within the band. Now reconnect the doubler tank circuit.

The neutralization leads are made from two lengths of no. 14 solid wire which are covered with plastic spaghetti. Each capacitor wire connects to one grid pin, crosses the socket near the other grid pin and then is run along the side of the tube near the plate of the other tetrode section. Start with the wires extending about 2½ inches above the tube socket and following the tube envelope contours. With the oscillator-multiplier operating and applying drive to the final and the final tube heater on, but the plate and screen supply removed, tune the oscillator and doubler for maximum grid current as indicated on the meter. Place a grid-dip meter, in the diode position, near the final tank coil and pick up the six-meter output. Without disturbing the

(Continued on page 180)
Summary of Rules—1963 ARRL DX Contest

A/mateurs throughout the world are invited to participate in the 29th ARRL International DX Competition. A certificate will be issued to the top phone and c.w. scorer in each country. For those DX stations that do not receive complete DX Contest rules (next month in QST) in time for the contest, here is a summary of the rules for the 1963 ARRL DX Contest— they are unchanged from 1962.

1. DATES:
   This 1963 DX Contest will be held two week ends each for c.w. and phone:

   **PHONE:** February 9-11 and March 9-11
   **C.W.:** February 23-25 and March 23-25

   S.s.b. as well as a.m. stations are invited to participate in the phone contest.
   Phone and c.w. are separate contests.

2. TIMES:
   The starting time in each instance is 2400 GMT Friday and ends 2400 GMT Sunday.

3. OBJECT:
   DX stations try to QSO as many W-K-V-E-V-KWI-KL7 stations as possible during the contest in as many different call areas possible per band.

4. EXCHANGES:
   DX stations send RS or RST report followed by a three-digit number representing power input. For example, on c.w. you might send 570050, which means RST 570 and power input 50 watts. U. S. A.-Canada stations will send a number consisting of RS or RST report followed by the name of their state or province, whose abbreviations follow:

   | W1, K1 — CONN MAINE MABBS NH RI VT | W2, K2, W2A — IL LND WIS |
   | W3, K3 — DE OH PA DC | W4, K4, W4A — ALA FLA GA KY NC SC TENN VA |
   | W5, K5, W5A — ARK LA MISS NMEX OKLA | W6, K6, W6A — ALA |
   | TEXAS | W7, K7, W7A — CAL |
   | ARIZ IDAHO MONT NEV ORE UTAH | WASH WYO |
   | K17 — ALESKA | W3, K8, W3A — MICH OHIO WVA |
   | W9, K9, W9A — ILL IND WIS | W9, K9, W9A — COLO IOWA KANS MINN MO |
   | NEBR NDAK SDAK | VE2 — QUE |
   | V62 — QTA |
   | V63 — ONT |
   | V64 — MAN |
   | V65 — RAVK |
   | V66 — ALTA |
   | V67 — BC |
   | VE8 — NWT YUKON |
   | V70 — NFCL LAB |

5. SCORING:
   Repeat QSOs on additional bands are permitted. Your multiplier is the total call areas (not states) QSOed on each band (maximum of 21 per band). The 21 call areas are listed above. Each completed QSO counts three (3) points. For DX stations incomplete contacts count two (2) points. FINAL SCORE is the number of QSO-points times the multiplier.

6. ENTRY:
   Free log forms are available on request from ARRL. You don't have to use these forms. Logs should contain calls, dates, times, bands, exchanges, and points. Sign your name to the statement: "I have observed all competition rules and regulations for my country." Send your log with summary data to:

   **AMERICAN RADIO RELAY LEAGUE**
   **38 LA SALLE ROAD**
   **WEST HARTFORD 7, CONN., U. S. A.**

   Your entry must be postmarked by May 3, 1963, to be eligible.

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In case we forgot to tell you, our favorite author, Walker A. Tompkins, K6ATX, has written another thriller — *Dr. Brings Danger* (Macrae Smith Company, Philadelphia 2, Pa.; $2.95; 207 pages; cloth board covers, etc.). If you have a favorite nephew you've been trying to infect with the radio bug, this book, based on the adventures of a 18-year-old ham, just might turn the trick. And, we might point out, that nephew's favorite ham uncle also may find it a pleasant way to spend a couple of hours one of these winter nights when the band is dead. Oh, yes — there are two earlier adventure books built around ham radio by K6ATX: *SOS at Midnight* and *CQ Ghost Ship* (same publisher).
TRANSISTOR MODULATOR CONTROL CIRCUIT

When using a transistor modulator with a vacuum-tube mobile transmitter, the modulator should be turned on after the high voltage has been applied to the Class C load. If this sequence is not followed, and the modulator is turned on slightly before there is a proper load, the modulator transistors will most likely be destroyed. The circuit shown in Fig. 1 is one I use to protect the modulator transistors. The modulator relay, \( R_1 \), controls the 12 volts to the modulator and cannot be energized until the plate switch \( S_1 \) is closed, and the antenna relay \( K_2 \) is closed. The sequence is started when the push-to-talk switch \( S_2 \) on the microphone is closed. This energizes \( K_2 \), which transfers the antenna and closes \( K_1 \), which turns on the modulator. The 1N2070 diodes across the relay coils prevent damage to the transistors as a result of the inductive "kick" from the relay coils.

Fig. 1—Transistor modulator control circuit.

\( K_1, K_2 = 12\text{-volt relays.} \\
S_1 = \text{D.t.s.t. toggle switch.} \\
S_2 = \text{S.p.s.t. push-to-talk switch.} \)

The rectifier tester shown in Fig. 2 will check practically any type of semiconductor rectifier. The method consists of applying an a.c. voltage to the rectifier under test and reading the forward and reverse voltage drops on an oscilloscope. The oscilloscope presents a visual picture of the front-to-back resistance ratio of the diode, thus giving a relative indication of the merit of the rectifier.

The rectifier under test is connected as shown to terminals \( E_1 \) and \( E_2 \). When point \( A \) in the circuit is negative with respect to point \( B \), the electron flow is through the resistor \( R_1 \) and the rectifier. Since the forward resistance of a "good" rectifier is much lower than that of the 1000-ohm resistor, most of the voltage drop occurs across the resistor (and the \( X \) input to the scope). The result, as indicated on the scope, is a horizontal line along the \( X \) axis. During the next half cycle, when point \( A \) is positive with respect to point \( B \), the electron flow is reduced by the back resistance of the rectifier. If the rectifier is good, the back resistance is high, and the majority of the voltage drop is across the rectifier (and the \( Y \) input to the scope). This will give a vertical line along the \( Y \) axis of the scope. The time integrated pattern for a good diode will then be an "I" shape as shown at the bottom of Fig. 2.

If the rectifier is open, no current will flow through the rectifier at any time. The total voltage will be across the rectifier during all of the cycle, and only a line along the \( Y \) axis will be seen. If the rectifier is shorted, the total voltage will always be across the resistor, resulting in an \( X \) axis line only. A rectifier which does not possess perfect characteristics will present a distorted "I" shape, something like the one at the bottom right in Fig. 2. The extent of the distortion is an indication of the poor rectification properties of the rectifier.

Before using the tester, it is necessary to calibrate the scope. A resistor with the same value as \( R_1 \) is connected across \( E_1 \) and \( E_2 \) and the amplifiers in the scope are set so that a 45-degree angle line of any convenient length is produced. Remove the calibrated resistor and insert the rectifier to be tested. If a 2.5-volt secondary transformer is not available, a 6.3-volt unit will work just as well. Resistor \( R_1 \) and the calibrated resistor must be changed to 3000 ohms, however.

—Jim Watt, W8GHZ

Fig. 2—W8GHZ's rectifier checker. The sketches below the diagram show some typical scope patterns.

\( T_1 = 2.5\text{-volt filament transformer.} \)
KEYING MODIFICATION FOR THE 100V

The Hint & Kink in QST, June, 1962, concerning a keying modification to the 200V, triggered off a number of inquiries about modification of the 100V to reduce its switching transients and key clicks. The circuit shown in Fig. 3 shows the additions and changes to the original 100V circuit. Components marked with a star indicate that they are to be added. The 2-µF capacitor, shown in Fig. 3 as C36MA, is a replacement for the original 1-µF unit. Both 2-µF capacitors added in this modification should be mylar or paper types, not electrolytics. Keying characteristics of the 100V can be adjusted somewhat by changing the values of C1 and C36MA in Fig. 3. For softer “make” increase the value of C1; for a softer “break,” increase the value of C36MA.

— O. M. Carter, W9ADN

SPRINGS FROM OLD PRESSURE CANS

Springs from the cans of “Reddi-Whip” whipped cream are useful for battery retainers in portable equipment, and can also be used to replace corroded springs in commercial portable receivers and equipment. Be sure that the can is empty and not pressurized. Break off the plastic tip with a pair of pliers and the spring will slip off easily.

— R. W. Johnson, W6MUR

DIODE-SWITCHING MOBILE BATTERIES

The battery system shown in Fig. 4 is useful in mobile work when it is desired to keep the car’s electrical system isolated from the mobile equipment. In this plan, an extra battery is installed to power the mobile equipment. Although the car’s charging system keeps the accessory battery up to par, the mobile equipment draws only from the spare battery, leaving the car battery to perform its regular duties. All of this is done without any mechanical switching.

The system shown in Fig. 4 requires two silicon diodes, CR1, CR2, and the extra 6- or 12-volt battery. The two diodes are connected so that the car generator will supply both batteries with charging current (through the voltage regulator), but neither battery can feed current back to the voltage regulator or to the other battery. The forward voltage drop across the diodes is somewhere around 0.7 volt, so it may be necessary to advance the voltage regulator for an additional 1 volt. The diodes I used were not expensive: a 70-amp., 30-p.i.v. unit was obtained for about $3.50. Most diodes will operate at temperatures up to 150 degrees C., so they can be mounted right up in the engine compartment. Of course, they must be isolated from ground and mounted on an insulated heat sink. I used a 1/4 x 4 x 4-inch aluminum sink for each diode.

— Robert V. Grater, K6SUB/4

SIMPLE AUDIO OSCILLATOR

The circuit in Fig. 5 is a transistORIZED audio oscillator that can be used for code practice, as a test oscillator for linearity checks in s.s.b.

Fig. 5—W9CZZ’s audio generator. Transistor Q1 is a 2N255 or equivalent.
RULES VIOLATIONS

The amateur radio service has a generally excellent record of self-policing, obviating the need for extensive official monitoring attention. Our performance is far from perfect, however, and during the months of July, August and September one in every thousand amateurs received an FCC citation. The Field Engineering and Monitoring Bureau has furnished the following statistics, showing the number of violations, definition and section of the rules which was violated:

123 Frequencies and types of emission 12.111
34 Purity and stability of emissions 12.133
33 Sidebands confined within band 12.113
22 Transmission of call signs 12.82
15 Classes and privileges of license 12.33
9 Notice of portable/mobile operation 12.91
6 Power supply to transmitter 12.152
2 No remuneration for use of station 12.102
1 Special requirements for nonportable stations 12.93
1 One-way communications 12.106

248 Total violations noted by FCC

Minutes of Executive Committee Meeting
No. 289
September 29, 1962

Pursuant to due notice, the Executive Committee of The American Radio Relay League, Inc., met at the Headquarters office of the League in West Hartford, Connecticut, at 9:48 a.m., September 29, 1962. Present: President Herbert Hoover, Jr., in the chair; First Vice President W. M. Groves; Directors Robert W. Denniston, John G. Doyle and Morton B. Kala; General Manager John Huntsman; Vice President F. E. Handy; Treasurer David H. Broughton. Also present were General Counsel R. M. Booth, Jr., Assistant Secretary Perry F. Williams, and Director Alfred W. Chaffee. On motion of Mr. Groves, unanimously VOTED that the minutes of the September 1 meeting are approved.

The Committee proceeded to examine nominations in the director elections, with careful attention to the application of the eligibility rules concerning membership, license status and freedom from commercial radio connections. The Committee made findings and ordered actions as detailed below, all by unanimous action.

CENTRAL DIVISION

For Director:
John G. Doyle, W9QPI, and Kermit A. Slobb, W9YMZ, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full members of the division.

For Vice Director:
Phillip R. Haller, W9HPG, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Vice Director of the Central Division for the 1963-1964 term without membership balloting.

HUDSON DIVISION

For Director:
Morton B. Kala, W2KR, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Director of the Hudson Division for the 1963-1964 term without membership balloting.

For Vice Director:
Harry J. Dannals, W2TUK, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Vice Director of the Hudson Division for the 1963-1964 term without membership balloting.

NEW ENGLAND DIVISION

For Director:
Alfred W. Chaffee, W1EFW, and Robert York Chapman, W1QY, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full members of the division.

For Vice Director:
Bigelow Green, W1EAE, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Vice Director of the New England Division for the 1963-1964 term without membership balloting.

NORTHEASTERN DIVISION

For Director:
Harold Walter Johnston, W7PN; R. Rex Roberts, W7CPY, and Robert Blaine Thurston, W7PGY, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full members of the division.

For Vice Director:
William H. Bennett, W7PHO, and Stanley Loyce, K7BII, were found lawfully nominated but ineligible due to lack of the required membership continuity. Richard W. Ross, W7QMC, was found lawfully nominated but ineligible under Article 12 of the Articles of Association, being commercially engaged in the sale of communications apparatus. The Committee therefore declared no election for Vice Director of the Northeastern Division, and noted that under the provision of By-Law 6 the incumbent continues in office.

ROANOKE DIVISION

For Director:
P. Lamer Anderson Jr., W4MWH, was found lawfully

Our congratulations to Domingo Arbo, of Buenos Aires Argentina, who recently observed a double anniversary; fifty years as publisher of Revista Telegrafica Electronica and twenty-five years as publisher of The Radio Amateur's Handbook en Castellano, the only authorized translation of a League publication. The monthly radio magazine, which started life as Revista Telegrafica in September, 1912 (Electronica was added in 1947 to keep it up-to-date), carries electronics articles of a general nature by top Argentine writers and translations from other magazines, including QST. In the early days it sponsored amateur pioneering efforts, for example cooperating with ARRL and the Radio Club Argentina in the 1923 DX tests, and still devotes considerable space to amateur affairs.

64 QST for
nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Director of the Hennocke Division for the 1963-1964 term without membership balloting.

For Vice Director:
Joseph F. Abernethy, W1AKC, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Vice Director of the Hennocke Division for the 1963-1964 term without membership balloting.

Rocky Mountain Division

For Director:
Robert B. Miller, W7QPP, and Carl L. Smith, W6BWW, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full members of the division.

For Vice Director:
John H. Samson, Jr., W7OCX, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Vice Director of the Rocky Mountain Division for the 1963-1964 term without membership balloting.

Southwestern Division

For Director:
Raymond E. Meyers, W6DMZ, and Howard F. Shepherd, Jr., W6QJW, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full members of the division.

For Vice Director:
A petition was found for Howard F. Shepherd, Jr., W6QJW, but declared invalid under the provisions of By-Law 17, because of precedence of his nomination for director. Amadeus V. Hilde, WABGDW, was found lawfully nominated but ineligible due to lack of the required membership continuity. Lyle C. Farrell, W5KCC, and Virgil Talbott, W5TVE, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full members of the division.

West Gulf Division

For Director:
Roomer O. Best, W5QRF, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Director of the West Gulf Division for the 1963-1964 term without membership balloting.

For Vice Director:
Kay K. Byrson, W5UYQ, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Vice Director of the West Gulf Division for the 1963-1964 term without membership balloting.

On motion of Mr. Doyle, unanimously VOTED that Messrs. Groves, Dennison and Kahn, with Messrs. Handy and Hoisington as alternates, are appointed to serve as a Committee of Tellers to count the ballots in the current director elections, under the terms of the By-Laws.

At this point the General Manager reported briefly on the status of League business matters, and the General Counsel on the status of League petitions before the Federal Communications Commission.

Mr. Kahn, as Chairman, reported for the Building Fund Committee. On his motion, unanimously VOTED that the President is requested to write each director informing him of the progress of his division toward its quota and asking special effort so that the goal may be met. The Committee also indicated approval of direct solicitation plans as proposed by Mr. Kahn.

President Hoover reported on administrative problems encountered by the Project Oscar Association and outlined a tentative plan to relieve the workload of dissemination of information to participants and correlation of intercept reports on future Oscar flights.

The Committee examined and informally indicated approval of a Headquarters outline of a specific program to implement the Committee's directive concerning improvement in amateur technical and operating capabilities and understanding.

The Committee was recessed for luncheon at 12:30 P.M., reconvening at 1:45 P.M., with all present except President Hoover and Mr. Williams. First Vice President Groves assumed the chair.

On motion of Mr. Huntoon, unanimously VOTED that approval is granted for the building of a New England Division Convention at Swampscott, Mass., April 26-28, 1963, and a Southwestern Division Convention at San Diego, California on October 11-13, 1963.


Mr. Hoover reconvened the meeting at 1:55 p.m. and resumed as chairman.

After examination of a proposal by Mr. Doyle, as Chairman of the Public Relations Committee, for an informational booklet on amateur radio to be distributed at fairs, hobby shows, etc., the Headquarters was directed to furnish copies of the draft to directors and vice directors for their comments.

At this point, 2:45 P.M., Mr. Cluffhe excused himself from the meeting.

Concerning an informal inquiry as to whether the League would act as coordinator of a scholarship for young amateurs, with funds to be provided in an individual's will, on motion of Mr. Dennison, unanimously VOTED that the League is interested in such a project and the General Council is requested to explore the matter.

The Committee briefly discussed the possibility of regular W1AW bulletins with RTTY emission and requested a later report from Mr. Handy on its feasibility.

The Committee noted, with appreciation, receipt of an extensive analysis of amateur band occupancy habits prepared by Dana Griffin, W21OE, and indicated a desire for more time to study the material and its conclusions.

There being no further business, the Committee adjourned at 3:45 P.M.

Howard Maguire, W2AAO, a tireless worker for call-letter license plates in New York, happily reaps the benefits of the more-than-ten-year campaign in the Empire State. The plate was personally handed to Howy by Governor Rockefeller at the Hudson Division Convention on October 13, 1962. Only Kentucky, Massachusetts and New Jersey are holding out on CLIPs now.

December 1962

JOHN HUNTOON
Secretary
Each year the Rock Creek ARA, in Maryland, conducts a Beginners Home Built Equipment Contest, with savings bonds to the winners. Above, L to r., we have first-place winner KN3RAZ, club prexy W3RE, third-place winner KN3TIV, contest chairman W3PIH, and second-place winner KN3STB. KN3RAZ's project was a 2-meter converter, while KN3STB built a ham-band transmitter.

Above, Canadian Division Director VE3CJ (r.) presents a QST cover plaque award to VE3ABU, whose article was judged by ARRL's directors to be the best in the September issue.

The Delaware Council of Amateur Radio Operators operated K3UN in Gimbel's downtown Philadelphia store from October 22 through the 27th, in observance of United Nations week. Among those operating the station were W3SLF, K3CEE, W3WMO, W3DZI, and K3HIL. (Photo via K31MV)

During the National Electronics Conference in Chicago the Chicago Area Radio Club Council set an exhibit inside and a ham station on board a Navy sub chaser that was tied up outside the hall. Operating W9FCA (Ladies Amateur Radio Klub station) aboard the Navy ship were the following YLs: K9EMS, K9TRP, K9VVG, K9BWJ, K9IWR, W9EXX, and K9DOT. The photo above shows the inside exhibit, with Harry Houck, president of Measurements, Inc., and CARCC chairman W9QKE.

Here is 6DQ as he was set up in 1913. The QTH at that time was California, but now OM Holmes is VE1AJ. As you can see, there have been a few changes in the way gear is put together in the past 50 years!
Military Affiliate Radio System, Navy Style

BY LCDR C. R. WINNETTE,* USNR

During the past few years there has been a growing group which has advocated a Navy MARS as a tangible program for the large group of Navy trained communications personnel and Navy orientated hams. There was a need for a Navy-sponsored program by which the Regular and Retired personnel, as well as young amateurs, could maintain a close relationship with Naval Communications through their amateur licenses. The possibility for an auxiliary network that could provide an unparalleled capability for the survivability of a Naval Communication System during periods of local, national, or international emergencies, plus the chance to create a potential input of personnel into the Naval Communication System while providing a means for the hams with salt water in their system to maintain their Navy proficiencies, led the DNC, ONO, and SECNAV to the conclusion that the time was ripe for a Navy MARS. Therefore, on 17 August 1962 the Secretary of the Navy approved a UNO request for authority to establish a Navy MARS. This decision was announced by Rear Admiral Bernard F. Roeder, the Director, Naval Communications, during his speech before the Twelfth Annual National ARRL Convention in Portland, Oregon, on 3 September 1962.

The target date for the implementation of the MARS program is 1 January 1963. At that time the MARS headquarters station NAV/K4NAA will commence operating from the old NAA site. The Navy MARS will be an adjunct to the established Naval and Naval Reserve Communications Systems. Its operations and administration will be conducted on a parallel but separate basis from the existing Navy systems. No reduction in the present operational training of the Naval Reserve is anticipated. These two programs should augment each other and result in mutual benefits to each.

Participants in the Navy MARS will be amateurs first and may or may not choose to affiliate with one o the Naval Reserve programs. Membership in the Navy MARS program will be open to any amateur operator, club station, or military recreation station that holds a valid amateur radio license issued by an authorized agency of the United States Government and that can qualify under the eligibility rules as established by the Director of Naval Communications. Those ships operating as maritime mobile stations under specific authority issued by the Chief of Naval Operations may also apply for membership.

The eligibility rules are as follows:

a. Possess a technical and operating knowledge sufficient to warrant receiving the Navy's permission to operate one of its authorized circuits. The possession of a valid amateur radio license issued by an authorized agency of the U.S. Government has been established as the sole criterion for fulfilling this requirement.

b. Be 16 years of age or older.

c. Possess a radio station, in being, which is capable of operating on, or which can be modified to operate on two or more of the Navy MARS frequencies.

d. Demonstrate a vital interest in the objectives of the Navy MARS and agree to conform to the directives which control the management and operation of the Navy MARS.

e. Not be a member of another Military Affiliate Radio System as of 1 January 1963.

Application for Navy MARS membership may be submitted on the standard DD 530 form. Simply write Navy MARS in the appropriate block of the form. Applications and/or requests for additional information should be mailed to the Chief, Navy MARS, Room 6D564, Office of Naval Communications (Op-945N), the Pentagon, Washington 25 D.C.

There will be local, state, interstate, Naval District, National and international networks organized for all the modes of operation. These networks will be administered by volunteer Net Control Stations and their appointments will be made by the Chief, Navy MARS, on the recommendations of the area Directors.

The times and frequencies for the various networks will be determined as soon as possible. Every effort will be made to establish circuits that will accommodate the preference of the majority of the members.

Navy MARS call signs will be assigned from a special block of calls from N6RAA through N6ZZZ.

The Navy MARS manual is approaching its completion, and an attempt has been made to provide every semblance of MARS participation within the procedures and answerers which will permit an active program in each of the networks. The procedures in this manual are identical with procedures employed by the Regular Navy Communications and the use of these procedures will be mandatory. No lapses into other procedures or the use of local procedure will be permitted. This will be a training program and the initial lack of knowledge of Navy procedures should not deter anyone, but since member stations may be called upon to communicate with other Navy Communications activities, each MARS station must adhere to the standards.

We invite any licensed amateur to participate in a MARS program, any MARS, but if by reason of prior service, family influence, or personal preference you are orientated toward the Navy then we welcome your membership. The Navy MARS will work very closely with the Army and Air Force MARS, and MARS participation can be an effective demonstration of the use of your amateur license in the public interest.

* Chief, Navy MARS

December 1962
Fifty Years of Amateur Radio

An Address by ARRL President Herbert Hoover, jr., W6ZH

My Fellow Radio Amateurs and Our Honored Guests:

It is indeed a great privilege to be here this evening and to join in honoring those Old Timers as they celebrate the 50-year Golden Anniversary of Amateur Radio. Their licenses and call signs, issued to them in 1912 by the Department of Commerce, mark the official birth date of an activity that has had a proud history for more than half a century.

It is most interesting that all of the pioneers who are here this evening are still active amateurs. As many of us have long suspected, the “Wireless Bug” that bit them 50 years ago, and is still in their blood stream today, is one of the world’s most persistent microbes.

If my mail and telephone calls are any indication, I am sure there are thousands of additional amateurs who have counted back carefully through the years to see if they could be admitted to this elite group. I conclude there are probably more candidates to sympathize with, than to congratulate. But unfortunately for one reason or another, the amateurs did not appear in the 1913 Call Book and there was nothing your Committee could do for them at this late date. I am sure, however, they will be among the first to pay tribute to the pioneers we honor tonight, and their exchange of reminiscences will bring back many memories of the good old days to all of us.

I did a little counting back myself, but not too hopefully because I did not get started until several years after the magic date. Nevertheless I saw enough of the “old days” to come down with a bad case of nostalgia this evening.

The youngsters of today may get just as big a thrill out of their first contact on the air as we did years ago, but I doubt if it is now done under such dramatic circumstances. The painstaking process of manipulating a wire cut-whisker toward the most sensitive spot of a galena detector demanded absolute silence throughout the house. If a door slammed the whole process had to be repeated. Everyone whispered and walked on tip-toes as the budding genius strained to pick up a weak signal. Changing over to the “sender” involved throwing several big knife-switches — the larger the better.

The key was also a massive affair, and when pressed the spark flashed forth, the neighbor’s lights blinked, the silence was shattered, and the nearby inhabitants jumped a foot.

In those days, on two or three hundred meters, distant stations did not come in well until long after midnight. How our families managed to survive those ordeals, I cannot guess. But all seemed forgiven the next morning as we related our exploits, and everyone rolled their eyes at the wonders of Modern Science. To exchange messages through the ‘ether’ with someone 50 miles away, was almost beyond comprehension.

In looking back over those years, one of the truly great institutions were the old-time radio inspectors of the Department of Commerce. I know I speak for all of the early amateurs here this evening in paying tribute to this dedicated group of men in Government service. Many of them were enthusiastic amateurs in their own right and they have exerted a fine influence over the amateur fraternity right down to the present day.

Countless thousands of small boys have stood at the doors of inspectors’ offices while they screwed up their courage to go in and ask to try out for a ham license. The encouragement and understanding they received usually pulled them through, and their interest and imagination was fired higher than ever.

Many of the today’s leaders in electronics got their first friendly push forward by a reassuring smile and a pat on the back by an old-time radio inspector. I know, because I was scared to death as I
hesitated in front of Ben Linden's door in the old San Francisco Customs House more than forty years ago. I will always owe him a great debt of gratitude for helping me get started.

As the years rolled by after World War I, audions replaced the galena detector, tube transmitters displaced the spark, and cross-country contacts became a frequent reality. While signals were heard across the Atlantic on 200 meters in the tests of 1918, and finally 20 meters under the spark making contacts in 1923 on 100 meters between Reimartz and Schnell in the United States, and Delay in France, that international communication by amateurs came into its own.

In the year that follow contact was established with other amateurs on a world-wide basis as the wavelength was progressively reduced to 80, then 40, and finally 20 meters under the spark making contacts in 1923 on 100 meters between Reimartz and Schnell in the United States, and Delay in France, that international communication by amateurs came into its own.

By 1928, some of these contacts had evolved into a major scientific breakthrough, and Reimartz's articles in QST and elsewhere are still the foundation of short wave communication. Considering the later impact of shortwave broadcasting and commercial service on world affairs, I have never felt that John received the recognition he properly deserved.

In the best amateur tradition, Reimartz formulated a logical hypothesis of what might occur in this unknown part of the spectrum, built the equipment out of the meager materials then available, and enlisted the help of others who were also willing to give it a try. The scramble for high frequencies that has gone on ever since is a matter of history.

The desire to find out why things did or did not work, to improve on existing techniques, and to explore the unknown has been one of the great traditions of Amateur Radio. It is a far cry from the early work of 50 or more years ago, the age of satellites and space in which we now live. Yet amateur radio has played a far larger part in this electronic age than many people might suspect.

In the United States and Canada, it is estimated that more than a million individuals, directly or indirectly, have entered the amateur fraternity during the last 50 years. Many of them were youngsters of school or college age. Amateur Radio around their scientific curiosities for the first time, and the preponderance of them went on into careers in electronics, communications, or other branches of engineering and science. Their desire to "find out why, to improve and explore" is just as strong today as it was a half century ago.

If one could make a survey of the electronics and space industries, there is little doubt, a substantial part of its brains and leadership came up through the amateur ranks. The amateur privilege has created a priceless asset that few other nations possess. And much of the credit goes to the foundations that were begun by these pioneers so many years ago.

One of those foundations was our national society, the American Radio Relay League, which will mark its own 50th anniversary just two years from now. In 1914 a few pioneering amateurs led by the late Hurman Percy Maxim banded themselves together to form the organization and locate its headquarters in Hartford. They soon realized that if Amateur Radio

(Continued on page 182)
September V.H.F. Party Summary

No Records, but Country-Wide Fun

Where you sit has a lot to do with how you view a v.h.f. contest, ordinarily, but with few exceptions the opinion stands that the September V.H.F. Party of 1962 was one of the worst on record, as far as propagation goes. Still, it brought in more than 450 logs, which would have been a record a few years back. As may be seen from the comments quoted below, there was no lack of enthusiasm, but a thorough search of the logs and letters fails to reveal a single record high of any kind.

This was a contest that paid off on operating skill, persistence, equipment quality and locations, more than most. This is perhaps the fairest kind, and over the weekend of Sept. 15 and 16 the element of luck had as little to do with the results as in any contest we’ve seen. Still, we find mostly familiar calls in the upper-bracket scores. Those who have the combination of know-how and facilities win, come what may in the way of natural aid or obstacles.

K3IPM, Philadelphia, worked the most stations and posted the highest score of any single-operator station, in winning the Eastern Pennsylvania Section award, as he has done on several previous occasions. Only K2LNS and W1RJA, award winners in Northern New Jersey and Connecticut, respectively, were also able to run up more than 300 contacts. Section totals of 29 were amassed by K3IPM, W1RJA and K1DTR, setting the pace in this department for the country.

Among the staff-operated stations there are also few Johnny-come-lately winners. The W2ZB Club of Northern New Jersey, operating W2PEZ/2, ran up the country’s highest total. 748-44-31,458, using 50 through 1215 Mc. A certain well-known call is missing from this category, the operators devoting their efforts to one binge a year these days, but they had better look to their laurels, judging from the intensive efforts of several club groups in the September affair. Witness W1GB/1, with 570-42-25,116, tops in New England, and already working on next June, or W1BU, with 554-43-23,822.

W1OOP thinks that if Sam would get that 1200-Mc. dish to aim at earthy targets, as well as the moon, the RSVHFS gang would “have it made.” Not to be counted out is the Cleveland 50-Mc. DX Club, W8HRI/8, with 600 contacts and a score of 18,051. Our records indicate that the region centered on Ohio is a “sleeper,” just waiting for the right combination to put over a score that will leave the rest of the country gasping.

There were some surprises, mostly in the large numbers of stations worked without benefit of any favorable propagation, in areas where dead-band conditions used to rule out interesting work in a v.h.f. party. We find W0FFP/6, K0RRC/6 and W6DK/6, operating from high points in Colorado’s Front Range, all making more than 100 contacts, and the Boulder Radio Club, W6DK/6, working three Wyoming stations on 822 Mc. W4EWW, licensed for and operating from Clingman’s Peak, Mt. Mitchell, N.C., made 120 contacts on 50, 144 and 220, for 2000 points. W4AAJ won the Kentucky Section award on 30 Mc., with 161 contacts, on a “dead” band. K4BEI/4 found 85 stations to work from Alabama on 6. W4CDG won in North Texas with 111 essentially local 50-Mc. contacts. W0AKM won in Missouri with 106. W0EAO/5, operating from a 200-foot gravel pile in Northeastern Oklahoma, found 110 stations to work on 6, despite poor conditions. K3KIX worked 245 stations on 6 from Michigan.

The mostly dead conditions boosted the worth

The Western Pennsylvania Section has always been tough for stations along the Eastern Seaboard, but this was remedied in the September Party by W2SDZ/J, atop Ravenhill Mtn. The most easterly high point in the section saw two towers, 60 and 70 feet high, erected for the occasion by K3SBQ, K3SHY and W3SDZ. A 7.5-kw. generator supplied power, and gear was housed in a converted school bus and a commercial radio mobile news cruiser. K3SHY at the mike.

More will be heard from this station in future contests.
of the 144-Mc. band, and some real digging produced fine scores for operators who work that band only. WA2MOY/2 ran up the country’s highest one-band score, 250-18-4500, on 144 Mc., the first time in the memory of the oldest inhabitant of the v.h.f. bands that this trick has been turned by a 2-meter operator. WA2LRX won the NYC-11 award with 220 contacts in 12 sections on 50 Mc., for the best total on that band. Favorable tropospheric propagation (more help on 2 than on 6) was a factor in the ability of several 2-meter men to work more sections this time than the best 6-meter operators. Note that W1PKQ/1 was able to collect 15 sections from Connecticut on 144 Mc. The predominance of 2-meter activity is reflected in several California totals, and in the total of VE3BGB and VE3EZC, with 169 and 164 stations, respectively, on 144 Mc. And note that one of the better Novece scores was that of WN9EYJ, who worked an even 100 2-meter stations.

The real flavor of the party comes through best from sampling the comments appended to logs. Here are a few:

K3IU — Wish more would use c.w. under weak-signal conditions. Sure makes a big difference. Increased activity noted on 220 and 430 this time.

K3HNP — Conditions like the worst of January. C.w. activity picking up, but slow operators should practice contest exchanges — and stick to the basic information.

W3ZSR — Conditions crummy, but never had so much fun!

W3HB — Really had to scratch for 61 contacts on 2!

K9ECEC — Activity very good for September. Most stations ever worked in September or January contest.

K0YNF — Not much like June, when I heard the whole country at once on 6!

W9CSF/9 — Transmitters, converters and antennas all home-built. Michigan City ARC is real building club.

W4ZZ/4 — Conditions very poor. First contest in which no Ohio or W. Va. stations have been worked from this high mountain location. (LeConte Lodge, Gatlinburg, Tenn.)

W8WZJ — Smart operating pays off. Noticed that operators who give their location, beam heading and tuning patterns frequently make the contacts fastest.

K8BHI — Well, now, that was a contest!

WN2AKA — My first; low score, but good experience!

W4HRJ — Never heard so much 2-meter activity!

W2EMA (94-13-1222, on 144 Mc.) — Most contacts made on c.w. VE3’s came through beautifully Saturday night in N J.

W2FV — Lots of people would do with more selective receivers, even when using low-power.

W0ROY/0 — Antenna 12-section super-turnstile, 570 feet above ground, courtesy of KOAM-TV, Pittsburgh, Kan.

W1PKQ/1 — Can’t stress enough the value of c.w. in digging up section multipliers!

Once again, K3PM, Philadelphia, won the E. Pa. Section award in the September V.h.f., and this time also posted the country’s highest single-operator score.
Inside the 2-meter tent of W2PEZ/2 we see WA2NAT logging, K2QKR receiving and K2URC operating. Such platooning helped the 6220 Club to post the top score by any group-operated station.

KITYZ — This was a contest for high power and mountain tops, but high local activity kept things interesting for everyone.

W1GB/1 — Better yet this time enabled us to beat our June score by 5000 points, despite poor conditions. Not many groups can say this. Wait til next June! 220 paid off with 21 contacts in 11 sections.

K1DIR — More people should try scatter skeds! W100P — Worked Maine on 1200 Mc., but couldn’t get my own section.

W1HLQ/1 — Worked from long-time favorite portable site, Sweetman Mt., Granville, Mass., first used by the writer on 5 meters nearly 30 years ago. Some different now!

K1GKT — Very quiet in Vermont his time, with few mountain-toppers.

K1HRJ/1, Vt. — Used 2-meter beam made of coaxhangers — but it worked!

W7GUI, Portland, Ore. — Best contest yet. Tropo excellent to Seattle, nearly 200 miles.

W7RT, Seattle — Scatter skeds paid off on 50 Mc. Got SJV and LA Sections in California, workable no other way this time.

W4GUYD — Real lack of activity in Bay Area.

W4GBQU — Best activity on 432 in a long time.

W4YQS — Our V.h.f. QSO Parties are wonderful; just wish more v.h.f. men would make an effort to participate in them.

W4GNF, Greensboro Radio Club — Over 4 inches of rain on Sartown Mt. over the weekend!

W4TLC — Lost 2 power transformers Saturday!

W4TBQ — We need more listening for e.w.!

K0RRC/0 — Highest station? Squaw Mt., 11,500 feet.

W0FQP/0 — Would be glad to hear from other groups crazy enough to work mountain-portable in winter, to swap ideas on location.

VE2APN — Most v.h.f. activity ever seen here!

VE3EZC — Many stations could have picked up another section by turning their beams our way. Conditions excellent entire weekend. Best contest ever!

**SCORES**

In the following tabulation, scores are listed by ARRL Sections and Sections. Unless otherwise noted, the top scorer in each section receives a certificate award. Columns indicate the final score, the number of contacts, the section multiplier, and the bands used. A represents 30 Mc.; B, 144 Mc.; C, 220 Mc.; D, 443 Mc.; and E, 1251 Mc. or higher. Multiplier-operator stations are shown at the end of each section tabulation.

**ATLANTIC DIVISION**

**Eastern Pennsylvania**

<table>
<thead>
<tr>
<th>Call</th>
<th>Score</th>
<th>Contacts</th>
<th>Bands</th>
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<tr>
<td>W3PNU</td>
<td>2821</td>
<td>6873</td>
<td>50 MC, 220 MC</td>
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<tr>
<td>W3HV</td>
<td>2758</td>
<td>6226</td>
<td>220 MC</td>
</tr>
<tr>
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<td>1950</td>
<td>1212</td>
<td>144 MC</td>
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<tr>
<td>W3EY</td>
<td>1062</td>
<td>814</td>
<td>443 MC</td>
</tr>
<tr>
<td>W3EB</td>
<td>391</td>
<td>103</td>
<td>1251 MC</td>
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<tr>
<td>W3HTQ</td>
<td>79</td>
<td>14</td>
<td>1251 MC</td>
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<tr>
<td>W3F</td>
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**Southern New Jersey**

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<td>W2XPF</td>
<td>2720</td>
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<td>W2HR</td>
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<td>1112</td>
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<td>71</td>
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**Western New York**

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<td>1816</td>
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<td>W2XG</td>
<td>1685</td>
<td>1200</td>
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<td>W2XGQ</td>
<td>1230</td>
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<td>W2XCA</td>
<td>1004</td>
<td>714</td>
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<td>W2XDF</td>
<td>940</td>
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<td>W2XGQ</td>
<td>306</td>
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<td>1251 MC</td>
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**Up they go!** The 5- and 2-meter beams of W2AOG/2 are hoisted to their position on a building of the Rutgers Experimental Farm.
OSCAR

The Oscar Association has in the past demonstrated its ability to design and construct a transmitter capable of orbiting the earth and performing in a predicted manner. The two successful Oscar transmitters were heard by amateurs the world over. You will be interested to know that the Oscar III repeater in breadboard form is now in operation. This transponder, or translator, is located on a 30-ft. tower at the shack of W6VMH. In its present form it listens to a 50-ke. slice at the low end of 144 Mc. and retransmits whatever it hears at about the center of the 144-Mc. band. The exact frequencies employed as well as the method of operation are still under consideration and I cannot at this time predict what the end result of the development program will be. The point is that the Oscar Association is continuing to work on their planned program and those interested should be preparing their equipment in order to take advantage of the Oscar III potentialities. As in the past, QST will carry complete details on the new venture as the information becomes available. Tentative plans are for a spring firing date.

Receivers — Parametric Amplifiers — Projects

In our efforts to spur the v.h.f. fraternity on to greater accomplishments, we quite often make reference to various projects which are undertaken at the Rhododendron Swamp VHF Society. Naturally, if we make an essentially overload-proof receiver we are interested in letting you know that it can be done. A result of this disclosure is, of course, a desire of many asking “How can it be done?” Unfortunately, while it is easy to point out that we solved the problem in our particular case, it is very difficult to solve someone else’s specific problem.

The solution of our problem was not easy. It required months of experimentation with various converters and receivers, and combinations of filters and tubes in order to result in a system which could have low noise capabilities as well as high overload capability. The solution does not lie only in a converter. Nor does it rest in the choice of an i.f. receiver. Rather it is a result of carefully designing your overall system, to provide the proper signal level translation from the antenna to the loudspeaker. Most of our efforts are directed towards improving our equipment and while the programs are in progress there is little or no time to document the results. The subject of receiver overload would require a several-part article, the writing of which would be a considerable undertaking. So also is the design and construction of a parametric amplifier or the design and installation of a moonbounce station.

We have, for instance, spent a considerable amount of time over the past two years in an attempt to document our moonbounce efforts. We still have some months to go before the first draft of the complete installation is ready for distribution. The same applies to our efforts at building parametric amplifiers for use in the v.h.f. range. The have recording of how to build a device leaves much to be desired when its operation requires information which is not readily available.

Some months ago we suggested that if enough people were interested in a 142-Mc. parametric amplifier we would attempt to prepare an article on the construction of one. I am happy to point out that there was certainly sufficient interest in such an article. In fact, we are still getting inquiries, some of them sincere, as to when we are going to prepare such an article. To be perfectly frank I would almost rather build you one than try to write an article telling you how to build it. The difficulty lies not in making one which works satisfactorily but in determining how to tell you how to make one which performs satisfactorily.

It isn’t enough to tell you that the parametric amplifier will give you considerable improvement in noise figure. We must also delve into the method used to determine when you do get an improvement in noise figure. While it is obvious to me and most other old timers who listen to weak signals that if an improvement in noise figure is obtained there will also be an improvement in signal-to-noise ratio, it is not easy to explain this to someone who believes that an 8-meter that reads 89 is better than an 8-meter that reads 85 when no signals are present.

How do you explain that it is not the actual reading of the meter but the difference between what it reads with no signal and what it reads with some signal which counts. I have received letters from all over the world concerning the operation of parametric amplifiers and with some exceptions they are almost all saying that they are not obtaining any improvement although the amplifiers are working. This, of course, is ridiculous. If the parametric amplifier is working there will be an improvement in signal-to-noise ratio. Unfortunately, a parametric amplifier can in fact show evidence of gain and not be working properly. It is obvious therefore that an article on the construction of a parametric amplifier must also include a sub-article on instrumentation or measurements.

It is easy to go into a well-equipped laboratory and tune up the parametric amplifier using several thousand dollars worth of test equipment. With information gained from this type of preliminary work it is then relatively easy to remove the same parametric amplifier to a working installation and make an improvement in signal to noise in on-the-air tests. However, if one must start blind and have only a normal amateur receiving set up as test equipment, the problem becomes considerably more difficult. And so it is with most of the problems of receiver overload, or problems encountered in a moonbounce installation, or a satellite-bounce installation.

"Die Unzertrennlichen," Swiss Style, moonbouncers. Right to lefth Dr. Hans Lauber, HB9RG; Kurt Eckert, DJ3LH; Hans Roetz, HB9F; Eddy Kienzle, DL9GU; and Pigmeiknecht Juergen Wannau, DJ4AU. This group heard their own 1296-Mc. signals between Switzerland and Germany via the moon on April 23 of this year.

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

December 1962 75
Parabolic dish in use by the Swiss moonbounce group. Diameter has been increased to 18 feet since their first experiments.

144 Mc. and Up

Two meters is still being good to those working the band, but it's beginning to look as though those boys are getting a bit used to it. Out in St. Louis, Illinois, Joe, KB6CD, says, "The two-meter band has not been good but had not either during the month of September. On 9/7 I worked W5RCI in Morse, Mass.; 9/11 W5PZ and W5JNY in Peoria, Ill.; 9/12-13 W5HAX at Oklahoma City and W5HQ at Lake Mills, Wisconsin; 9/21 W5ML, Vivian, Louisiana; W5HFP and W5DDX in Longview, Texas, and the only one, a new state on 144 Mc., W5BVW, Spruce Pine, North Carolina; 9/22-23 W5THJ that was W5PDQ in Kansas. Now if that isn't pretty good for two meters, maybe the rest of us had better change locations. Joe goes on to say that s.s.b. activity is picking up and is noticeable particularly during the openings when more and more is being heard. He will have his own sideband rig on the air by this time.

In Salisbury, North Carolina, K1YYJ reports no unusual conditions yet this season. A small opening was observed there on September 10 into Ohio and during the September contest Virginia, South Carolina, Georgia and Tennessee were worked. Jim has nightly skeds with W5CTZ, Milford, Ohio, and to date has been able to complete two out of ten skeds. Jim is very interested in an s.s.b. exchange and is sending his own logs on 20 Mc. K1YYJ worked 144.006 and W5GZW is on 114.260 Mc. K11MF sent that on September 12 144.006 was open from North Carolina north to Maine from 2000 EST to midnight. Roger worked K5JPW, W1JCJ, K5ABM, W1IFH, K1AII and W1JSM during the opening.

W1JS in Waltham, Massachusetts brings us up to date with his activities by telling us that on August 15 144 Mc. opened in the late evening to 8- and 10-land when he worked K9OUF in Indiana, W5FSF, K5GER, W5YIO, W5PHH in Ohio and Michigan. On the 31st (of August) he worked VE1TV, VE1QT, VE1OL, VE1MX, VE1IX and VE1QJ. Joe's new 260 rig is now complete and he is using a 10-element beam with it. Next on his list is a rig for 432 Mc. We hear from Doc, VE3BQN, that he has been sked in his "states worked" total to 20 when he worked Delaware during the June Contest. You might look for Doc nightly at 144.051 Mc., when he is calling "CQ-SCH", at 10:15-15:15 EST.

Ted, W5RUE, brings us to task for scrambling his listing in the 220 and 432 Mc. listings. Think we have it correct now, Ted, and while we're at it, we'll ask the rest of you to check your listings and if we're incorrect or have left you out, please advise. Depending on the call area in which you are located is the reason that some who have sent in listings have not been entered in the two-meter box. For instance, if you live in 1 or 2 lands you'll not be listed unless you have worked 15 or more states; but if you live in 6 or more states, we might get listed with as few as three or four States Worked. (Now see what you brought on, Ted.)

On August 30 W5RUE worked KNAXU for the first Pennsylvania to West Virginia contact on 432 Mc., and on September 10 W5RUE worked W5IFX for the first Pittsburgh, Pennsylvania, to Cincinnati, Ohio, contact on 432 Mc. These two meters is represented by 15 on our totals in Winnie, Manitoba, with more joining the ranks every week. Recently VE3TL worked the first "ground-wave DX" from Winnie on 144 Mc., when he kept successful skeds with W5PHH in Washington, Illinois; with W5IFH in Grand Perk, North Dakota, and with W5BYJ in Fargo, South Dakota. W5FPB, Albuquerque, New Mexico reports good attendance at net sessions during September with ten to twelve stations reporting in each week. Net is held on 149.182 Mc. each Tuesday night at 2000 EST, and has worked states so far. He says it's a fine job but doesn't compare with the 48-element colinear at 88-4, that he used in Ohio (K5JLA) in 1960-61.

Out St. Louis, Missouri, way W6DQY would like to let the gang know that it is possible to work above 145 Mc., set contacts and even DX. Glenn has worked twenty states so far running 150 watts into a 15 over 15 up 80-feet. He finds he can work about a 250-Mile radius under normal conditions and can talk to K2ZGG in Lebanon, Pa., who also has a two-meter opening into Illinois, Texas and North Carolina, when he heard lots of activity but was only able to work W9BNN, K2DD and K3611, all in Illinois. On Labor Day Jack out of a 17-element yagi at the 80-70 feet level and has worked states so far. He says it's doing a fine job but doesn't compare with the 48-element colinear at 88-4, that he used in Ohio (K5JLA) in 1960-61.

In Minneapolis, Tennessee, W5MVV is looking for two-meter skeds with anyone looking for Tennessee, cw or am on 146.747. Jack sees that to date his best DX is W4TRK in Lexington, Kentucky, whom he worked on September 11. He also heard Ohio signals that same date but had no luck in announcing a contact. On September 22 Jack had a good opening into Illinois, Texas and North Carolina, when he heard lots of activity but was only able to work W9BNN, K2DD and K3611, all in Illinois. On Labor Day Jack out of a 17-element yagi at the 80-70 feet level and has worked states so far. He says it's doing a fine job but doesn't compare with the 48-element colinear at 88-4, that he used in Ohio (K5JLA) in 1960-61.

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WYWWD writes that he's been active on 144 Mc. for two years and has decided it's time to be listed in the two-meter-stations; to date Charles has worked 10 states and is going strong. His station consists of a Johnson 6 & 2 Tube Super that is driven by a Communicator III. Antennas and tower are new and have been up about two months. Two 15-element beams stacked, with top one being 100 feet up, are being used. Charles has had occasion to phone contacts in stations at 250 to 300 miles and is looking for skeds; he usually operates between 144 and 145 Mc.

From VE63 land we received word from Bert, VE6EU, about his aeronautical-mobile jaunt. A few days before, VE5AATT on September 1 and 3 on 144 Mc. "To say the least we were gratified by the results — 17 contacts in 4/1 of an hour on 9/1 and 19 on September 3. Immediately after our first QSO we stood by for calls and found one giant heterodyne across the band. Our route took us from Butterfon Airport west and south to Hamilton, and then east to Oshawa at a height of about 5000 feet. Plans are presently under way to mount a two-meter halo permanently on the plane. We originally used a crystal mike and one set of hand phones, but now have a system where two sets of hand phones are operating simultaneously and two carbon microphones, which can be switched from one operator to the other." Must be great fun and we wish you more good luck during the winter for your future trips.

In Thomaston, Connecticut, K1PKQ says that 144 Mc. wasn't any good at all during September, but that October 2, 4, and 5 were very good with VE3BPR, VE3QKN and K6HPQ all coming in with very good signals. KS5B has been experimenting with receiving conditions on 220 Mc. and finds that "local" coverage is as good as two meters if not a little better, and that some stations at greater distances are even more consistent. Larry is presently working on a final amplifier for 220 Mc. and a navigater converter for 432 Mc., hopes to be on the air soon with both.

From South Carolina and W4TIC we learn that W4COPX is now on 144 Mc. s.s.b. Charlie, W4TLC, reports that the path to K4KLD in Georgia has been fair on Sunday mornings with good copy possibly 80% of the time (220 Mc.). There is usually rapid fading on the signals though. No other 220 Mc. stations have been worked from that QTH except K4TLZ in North Carolina who consistently has a good signal.

From Old Paul, W4HHK, we hear that: "Had a terrible tropo opening between Tennessee, Oklahoma and Texas on the night of October 8 when I worked WS6WV on 432 Mc. o.w. For the first time, Tennessee 432 contact and state 8. While trying to start 432 Mc. QSO with WS6WV, WS7HZ in Oklahoma called me on 432 Mc. so of course we had a contact there. Using only the recently completed 144 Mc. s.s.b. gear, I worked as far west as WSY5A in Amarillo, Texas, and also worked W5POT, W5HCX, W5KHT, W5JBE, W5UGO and W5WAX. Several of the two-meter contacts were s.s.b. both ways. The two-meter s.s.b. setup consists of phasing type 14-Ac, exciter and transmitting converter with 6360 linear output stage driving the Ermae 4C-X300A's, all "home built." Congratulations, Paul, on another new state on 432.

More good news, this time from Rex, W5RCI in Marks, Mississippi, who says: "Though I'd rather get my late news up to date. On September 6 we had a little opening to the northeast and I worked 8KAXU at his new QTH on 220 and 432 Mc., making state 12 on 432 Mc., distance about 110 miles. On October 9 had another opening, this time to the west, and worked the fellows around Oklahoma City, W5HIT, W5HCX, etc., on two meters." More congratulations extended.

K6AGY would like to let it be known that he will be on 224.5 nightly (except Mondays and Wednesdays) between 2130 and 2110 local time. He will call "CQ" to the north between 2030/2030; to the east between 2015/2035; to the south between 2000/2110; and will tune the entire band after each CQ. Anyone calling him should give at least a three-minute call. Out in Boulder, Colorado, probably the first 1225 Mc. contact from strictly home locations was made on Labor Day between W7MOX and W6YF. Both of the better APX-0's and the sixty watt converter were loud and clear; plans are being made to extend the range considerably with the same rigs.

Custom-mode sweaters identify Canadian delegates of Syracuse VHF Round-Up. Nonchalant wearmers can supply information on how hard it is to get these beautiful works of art.

opened the fall season at 2100 EDT on September 7 on 50.4 Mc. 24 stations reported into the net with Pennsylvania, Maryland, District of Columbia, Virginia and West Virginia being represented. On September 7, 27 stations reported into the net, 14 new Rebels were certified during the month of September, thus swelling the ranks to 283 certified members.

The latest project of the Midwest VHF Club, Inc., was the installation of a v.h.f. station at a Veterans Hospital, the Hines Memorial Hospital near Chicago. Next project of the club, which has over 50 members, is a mobile emergency net including another well known club, the Six Meter Club of Chicago, which has over 250 members.

Recently in this portion of the column we mentioned the newly formed "Burlington Amateur Radio Club and Net" and gave its location as Burlington, Wisconsin. Our apologies to the Club — location is Burlington, WASHINGTON. Anyone wishing to join this group can contact K7PFL, Larry, on 50.4 Mc. at 8:00 p.m. nightly, or drop him a note at his home QTH, 420 North Pine Street, Burlington, Washington.

50 Mc. — Argentina

Haven't heard very much from Mike, LUB1DC recently, but did receive a letter today and think you all will be interested in what he has to say. "I am busy building a sidestand exciter and heterodyne up and down converter (OFO) near Buenos Aires. The converter will be a band-pass type that will cover all bands in the 40 meter band. Already completed is a band-pass transvertor that will cover all bands in the 80 meter band. Plans call for it to be completed before Christmas and then we will be in business. We are all very enthusiastic about this project and we are looking forward to some good DX on 50 Mc."

Aurora lights the sky over VE6BY's antenna farm.

December 1962

The Confederate States Rebel Net, which operates under the numbers of the Confederate States Amateur Radio Club,
2-METER STANDINGS

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<thead>
<tr>
<th>Call</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>W1RLZ</td>
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<tr>
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<td>W1MZ</td>
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<td>W1FL</td>
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<td>W1WJ</td>
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220- and 420-Mc. STANDINGS

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<tbody>
<tr>
<td>W1AJR</td>
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<tr>
<td>W1IQ</td>
<td>11</td>
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<td>W1PK</td>
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<td>W1PA</td>
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420 Mc.

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<th>Call</th>
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<tr>
<td>W1LQ</td>
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<tr>
<td>W1PB</td>
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<td>W1RL</td>
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The figures after each call refer to states, call areas and mileage of best DX.

50 Mc.

We hear from Bill, W9TIL, that there are quite a number of "beats" in his area on six meters; in fact, there are between 40 to 50 stations on 50 Mc., in the Toronto area, mostly in the city of Winnipeg.

Anyone on 6 interested in experiments with tilted beams? K3AQR would like to hear from you. He wants to run tiling tests at medium distances, under various conditions. Candidates write Robert D. Balby, 326 Hoffmagne St., Phila. 11, Pa.

A very interesting letter has been received here from Alice, K16ECA, now '4 in Jacksonville, Florida; she drops KH6 calls around just as though they were common calls to hear on 50 Mc. "We certainly had some good openings over in Hawaii and am looking forward to some good DX here. I'm anxious to look up the 3 contacts I made in November, 1960, when California and Florida were in at the same time. Miss our friends in Hawaii and wonder if K08DBY and K18HME (only usable KI3 in the room) would have any openings; if KH6QF has has been up yet; if K16KTV has had time to work Oahu from Kauai; and how the stations which were new on 50 Mc., when we left are doing. In 1959 and 1960 it was almost a nightly routine to work K0K, K1 and VKZJ, and VK1ZRM during February to August. During the same period in the afternoons, K1U's were in and we worked PYS once, and Spanish speaking stations were heard (Mexico, I think) but not contacted. Then come the asthmatic of Wi kind of thing, working between 1600 and 1800, and the fun (of?) QSLing them. Also heard W7 land and one WV7. We had an extra bonus in having ZLs come through, only one night in three years, and JA's one night in two.

K99 and K95DT, reports that during a weak aurora on
August 18 KL7PLC was heard. Randy was in QSO with V8BSY at the time when KL7PLC was heard breaking in. The time was approximately 2131 CST, signal peaked a 2-19 with a beam heading of 390. Signals of both V8BSY and KL7PLC were heard over a short time.

The opening of September 17 held some interesting moments according to Jeff, WA2GEP, when a 4 in Miami "told off" practically everybody on the band; and a 2 in New Orleans told the "ship" he could only hear 4 from the town. Too bad — but these occasional free-for-all's on any band do help to perk up the conversation for a few days thereafter.) The evening of the 17th started off with good signals; a 4 and 3 in Londen were being heard while being carefully for a possible Virginia contact he heard WA4GDC in Sebring, Florida. Only four skip stations were heard: WA4GDC, W4VDE, WB4BAO and WA4Y1I, and these started fading out just thirty minutes later.

Later, New Hampshire and K1KRP report a half-hour opening into Indiana on September 7 with signals being far to good. Dick now has up a three-element beam, is running 15 watts c.w. and 18 watts a.m., using an 1HR-16 for receiving. Dick says there are 3 people who would turn their beams toward New Hampshire. K4L4L reports that on September 6 he heard KP4PC and on September 22 Texas was starting into Florida for about three and a half hours. KSH1Y mentions an opening into Leesport. Pennsylvania on the 10th when 4's and 6's were being heard. On September 13, Milt, WAGYT, observed the only opening of the month (for him) when he copied two Texas stations for approximately 15 minutes. No contacts. From Cincinnati, W4XQN reports "we heard QSO's very good on Sept. 7. We on Sept. 8 followed by a brief opening to the north when W4ZBFE heard a VE3. The 17th was marked by opening into an Indiana and the south.

He is reporting, one may mention stations during the September VHF Contest; K0C00G says that the band opened to Wisconsin during the contest and also to Indiana. W4R1X reports Mississippi being heard on the 15th and Florida on the 16th. W451BH heard stations on the 14th, 2 and 3 each, in Yulee, FL. 14 was calling, 15 and 16 but were weak and no contacts made. Emmett, W4R1X, also observed openings on September 6 (Illinois, Michigan), 7th (Illinois, Texas and Arkansas), 17th (Florida), and the 19th into Texas.

Steve, W3R0TH, at Petside, New York, reports that on September 2 several stations in Illinois were heard with good signals; and that ground wave was very good in the early mornings on September 3, 4, 5, 6, 7. One opening only was heard by K5KPA in Philadelphia, but the one he heard was to the south on the 22nd of the month; John also mentions that ground wave was very good during September with New York and Maryland stations putting in very fine signals. Six and two meter beams at K5KPA have just been raised and are being worked. The effort is being made in hearing and working farther and getting better reports.

Also from Pennsylvania, K3ARR and K3ADS come through with ground wave reports: Bill, K3ARR, noted good conditions on September 9, 2 and 3 each, York was tuned up for the Opening Contest and no stations were heard in the 1, 2, 3 and 4 call areas. Larry, K3ADS comments that ground wave was good to excellent on most days during the month. He also has a suggestion for those who have built the 6 meter converter (incap.) as in the article in the R.F.M. — install a 100- or 1200-turn resistor in the cathode of the 1st r.f. amp and bypass the cathode with a .001 fi. disk ceramic. This increases the bias on the first stage to allow it to handle signals that would normally overload it.

Others who mentioned good conditions for ground wave are K4YV1, K6VX1, K3JEE, WB4MOW, K6FPC, and W6CMI. Dan, W6CMI, says that he finally has his 40-ft. tower up and a six-element beam. Result — much better signal reports than ever before. Dan says that six-meter activity is really at a peak in St. Louis. On September 24 a roundtable was started at 1800 CST and four and a half hours later two stations were twelve stations participating.

K4RR in Aurora, Illinois, was contacted on September 26th. Dan worked W4C6KS in Burlington, Iowa on 2w for a new state. He then broke into a roundtable already in progress in the Peoria, Illinois area. On September 30 K4GG was opened to Miami, Florida.

December 1962

CANADA/CHILE THIRD PARTY

Just as press time we learn that the governments of Canada and Chile have entered into an agreement permitting the amateurs of the two countries to exchange messages on behalf of third parties, subject to the usual conditions that no political interest is involved and that the messages handled are of sufficient importance to justify use of commercial circuits. Canada has previously signed similar agreements with Costa Rica, Honduras, Mexico, the United States and Venezuela.
Dear Fellow Members:

As you know, the League has a new administrative office building under construction. Our present staff quarters have been occupied for 30 years, during which time ARRL membership -- and the resultant workload -- have increased severalfold. Now our League is to have long-needed facilities from which to work more completely and efficiently for you and every other amateur in the country.

In accordance with the desires of our membership, a Building Fund drive was initiated to help finance the new structure. I am fully confident of the eventual achievement of our goal, but currently the fund has lagged somewhat behind costs incurred in construction. In talking with amateurs at conventions and club meetings I find many who plan to participate but have been "putting it off." For that reason I am writing this reminder to all League members hoping that (if you have not already done so) you will see fit to add your name now to the list of supporters of the ARRL Building Fund.

Some amateurs have been able to give substantial amounts. Many have contributed an extra year's dues. Many others have sent $1 or more for each year of holding an amateur license. The average contribution so far is $12.

Whatever yardstick you use to measure your own participation, make your contribution payable to the ARRL Building Fund, and please mail it now.

Sincerely -- and 73,

[Signature]
President 4J6Z4
The SB-175 is a suppressed-carrier double-sideband band-switching transmitter that will operate on the 80- through 10-meter bands. Either crystal or external v.f.o. can be used for frequency control. The power supply isn’t furnished although one is available as an accessory from the manufacturer. Power input to the transmitter is rated at 175 watts c.w., 140 watts p.e.p. d.s.b., and 100 watts on a.m.

This transmitter could also be called a “power balanced-modulator,” since the r.f. amplifiers, two 6DQ6B TV sweep tubes, are connected in a balanced modulator circuit for d.s.b. operation. The remainder of the r.f. circuit, an oscillator/ buffer, and a driver/multiplier, are more or less conventional. A block diagram of the transmitter is shown in Fig. 1. The equipment is not limited to double sideband, but can also be operated on c.w. and a.m.

The cabinet has been removed and the chassis tipped over in this view of the SB-175. The final-amplifier tubes, shown at the top of the photograph, are mounted parallel to the chassis. The belt and pulley system adjacent to the final-amplifier section is part of the band-switch mechanism. Rear-apron components and connectors at the bottom left are mike and key jacks, crystal/v.f.o. switch, and power-supply connector.

A switch at the rear of the chassis changes a 6CL6 pentode, V1, from an oscillator/multiplier (with crystal control) to a buffer/multiplier with v.f.o. control. Crystals plug into a socket on the front panel; the v.f.o. must be connected to pins in a 11-pin accessory plug at the rear of the chassis. The v.f.o. output must be on 100 or 80 meters for 80-meter operation, on 80 or 40 for 40-meter operation, and on 40 meters for 20-, 15- or 10-meter output. With crystal control, 40-meter crystals are used on all bands except 80 where, of course, 80-meter crystals are used.

There are tuned circuits in the plate of the 6CL6 on 10, 15, and 20 meters. The proper one is selected by the panel band switch. On 40 and 80 meters, the plate load is resistive.

A 5763 driver/multiplier, V2, following the 6CL6 operates as a straight-through amplifier on 80 and 40, as a doubler on 20 and 10, and as a tripler on 15. The plate circuit uses an r.f. choke as a load. There is no r.f. switching in this stage when changing from band to band, but the screen voltage changes with the band-switch setting. To keep the drive more or less constant on all bands, the screen-dropping resistor is lowered in value as the frequency of operation is increased.

The unusual features of the amplifier circuit in the SB-175 are shown in Fig. 2. For d.s.b., the circuit operates as a balanced modulator, with the amplifier grids fed in push-pull and the plates connected in parallel. For c.w. and a.m., the amplifier grids are connected in parallel. When the function switch, S1, is in the d.s.b. position, S1B connects the grid of V4 to one side of the circuit while V5 is left on the other side. Switch section S1A is open in the d.s.b. position. Since the 6DQ6B plates are in parallel and the
Audio is fed to the 6DQ6B screen grids in parallel for a.m. Fig. 3 shows how the function switch, S1, changes the screen connections for d.s.b., c.w. and a.m. The modulation transformer has a center-tapped secondary so that either push-pull or single-ended output is possible. For d.s.b., the center tap is grounded and the modulator output is fed in push-pull to the screen grids. On c.w. the modulator high voltage is turned off, and d.e. screen voltage is fed to the r.f. amplifiers in parallel. In a.m. operation, audio is fed through a negative-peak clipper diode, C6, to the 6DQ6B screen grids.

The balanced modulator feeds into a pi-network designed for loads of 50 to 75 ohms. The load should have an s.w.r. of less than 1.5 to 1.

The speech amplifier has only one tube envelope, a Compatron, containing three triodes. This tube, along with several printed circuits, reduces the chassis area required for the speech stages. The speech amplifier is designed for use with high-impedance crystal or ceramic microphones. A three-way microphone jack is used in case push-to-talk operation is desired; the control circuit goes to an accessory socket at the chassis rear. A microphone gain control is located on the front panel.

Power for the SB-175 must be supplied from an external source. A power supply that will furnish all the necessary operating voltages is available from WRL as an accessory. An 11-pin connector at the rear of the chassis is used for power pickup.

For c.w., cathode keying is used with both the oscillator and the 6DQ6 cathodes keyed. The key jack is at the rear of the cabinet.

The SB-175 is housed in a gold and brown

**WRL SB-175 Transmitter**

- **Height:** 5 1/2 inches.
- **Width:** 11 1/4 inches.
- **Depth:** 8 1/2 inches.
- **Weight:** 10 pounds.
- **Power Requirements:** 6.3 volts a.c., 4.8 amperes, or 12.6 volts a.c., 2.1 amperes; 300 volts d.c., 125 ma., 600 volts d.c., 300 ma.
- **Price Class:** $100.00.
- **Manufacturer:** World Radio Laboratories, 3113 W. Broadway, Council Bluffs, Iowa.
perforated cabinet. The front panel has seven operating controls: the function and band switch, plate tone and plate load, grid, mic gain, and meter switch. The meter switch allows reading either plate current (actually cathode current) or grid current. The meter is calibrated with a relative scale which includes limit marks as aids in tuning up in the various modes. The crystal jack is also located on the front panel.

— E. L. O.

Trans-Pro C.W. Monitor

The term "Monitor" really doesn't do justice to the Trans-Pro TN-1. This device not only furnishes a side tone when the station transmitter is keyed, but also squelches the receiver output during key-down periods. The action is similar to that described by Warner in his transistorized "Little Oskey."

The TM-1 is completely transistorized and contains its own battery power supply. When using the monitor, headphones and key are plugged into the unit and connections are made from the monitor to the transmitter's key terminals and the receiver's audio output. With the key up, whatever comes out of the receiver will be heard in the headphones. When the key is closed, the receiver output is automatically disconnected from the headphones, and a side tone, generated in the monitor, will be heard instead. The volume and pitch of the side tone is adjustable (pitch: 700-1200 c.p.s.). A function switch permits bypassing the unit so that the key can be closed for "spotting" purposes without the receiver output being squelched or a side tone being generated. Of course, the monitor can be used as a code-practice oscillator simply by turning off the transmitter or by removing the transmitter key leads.

A block diagram of the Trans-Pro monitor is shown in Fig. 1. With the battery switch on and the key open, audio signals from the receiver are amplified in transistor Q₁, pass through the normally-closed series-gate diode switch, CR₁, through the transistor mixer, Q₂, and on to the headphones. When the key is closed, transistor Q₃ opens the diode switch, CR₁, and also shorts the output of Q₁ to ground through the shunt gate. Switch Q₃ also turns on the transistor tone oscillator, Q₄. Oscillator output goes through the mixer to the earphones.

The 2N530 diode is connected between the monitor and the transmitter to provide isolation. Without it, the transmitter could "key" through the monitor. The diode shown in Fig. 1 is connected for cathode-keyed transmitters, and will work in transmitters with up to 300 volts across the open key.

Models are available for either cathode-keyed (TM-1) or grid-block-keyed (TM-14) transmitters.

— E. L. O.

Most of the components are mounted on an etched circuit board which sits vertically in the center of the chassis. The board is supported by three metal posts attached to the rear wall of the chassis. The self-contained power supply is a 9-volt battery. Battery terminals are just visible behind the component board at the bottom right of the photograph. Front-panel controls and connectors are from left to right: VOLUME, function (SPOT, ON, OFF), PHONES, PITCH, and KEY. A rear apron terminal strip, just visible in the photograph, connects to the transmitter key jack and receiver audio output.

Trans-Pro C.W. Monitor

Height: 1 1/2 inches.
Width: 3 1/2 inches.
Depth: 1 1/2 inches.
Power Requirements: Self-contained 9-volt battery.
Price Class: $17.00.
Manufacturer: Trans-Pro Labs, 263 Bouchard Ave., Dracut, Mass.

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CONDUCTED BY ELEANOR WILSON,* W1QON

Between Us Girls

There bend with Jack La Lane, stretch with Debbie Drake, have their wigs set weekly, glamour for dreams "guaranteed" to erase wrinkles and sprinkle gold dust on their eyes. We could go on, but, girls, you know what we mean. In these days of "going modern" we're in the midst of it all. We're (summarily saying it's all bad either.) But to licensed YLs, we've got something that doesn't even come in a jar, but something exclusively ours that we turn to with the twist of a knob that can light up our faces better than any foundation, that can advertise us more deeply than any vibrating music can truly give us that magical "inner glow."

It comes not quite for free — but for the price of a ham ticket, plus a rig to operate. You say you realize this? Sure you do, but occasionally it is good to pause long enough to reflect on what we have at our fingertips. Of course, we don't get on the air deliberately to scintillate, to put a sparkle in our eyes. We didn't seek our licenses for that purpose. But the stimulation, the "I feel good all over feeling" comes anyway!

Girls, we're sitting pretty! We already have what countless women are looking for, or if we may say so, should be looking for. We have the opportunity to be part of something bigger in this life than our own little world within the confines of our own home. We have a unique opportunity to serve others, and if helping others is a large part of what life should be all about, we have an opportunity for service that is unique.

Milady, you have a few extra blessings to count!

Oregon Hams Honor WTGNJ Posthumously

Honorary chairmanship of the Oregon Amateur Radio Association was conferred posthumously upon Carl H. Austin, WTGNJ, at ceremonies during the ARRL National Convention in Portland, Labor Day weekend. Mr. Austin's widow, Bea, W7HHH, of Bend, Oregon, accepted a cup in recognition of her late husband's outstanding career as an amateur radio operator.

Selection of WTGNJ for the honor was made unanimously by the OARA nominating committee and confirmed by the Affiliated Council of Amateur Radio Clubs, Inc., of Portland. In recognition "of the respect and high esteem in which WTGNJ was held by his fellow amateurs". WTGNJ was the 25th amateur to have his name enshrined on the OARA cup. The award was instituted in 1932.

Mrs. Austin, W7HHH, who served as president of the YLRL in 1951, will hold the honorary chairmanship until the next OARA convention, to be held in Eugene in April 1963.

YL Club QSL

Last month we reported all of the new YLs who participated in the 1962 Field Day that we had received our thanks to Ellen White, W1YYM, of ARRL headquarters, for the following information on YL clubs that participated.

Scores show QSO total, power class, nr. operators and final score:

3-Transmitter Class:
W3AAU/3 Penn-Jersey YL RC
305-AB-7-2082 (scores sent by W3AAU)
K75ER/7 Portland Roses
306-AB-6-1104 (scores sent by W7MN)

3-Transmitter Class:
K5SKY/5 Gulf Area YL AR Klub (GAYLARK)
581-B-21-2408 (scores sent by K5BU)

Fourth International Convention of the YLRL

It's not until June 19-21, 1964, but the Fourth International Convention of the YLRL is already looming large in the thoughts of YLRLers everywhere. 1964 marks the 25th anniversary of the Young Ladies Radio League too, so the convention should be the highlight of your year's celebration. And when a group of YLs like the Buckeye Belles, sponsors of the convention, start working hard on plans two years in advance, it can be expected that the event will be tops-notch.

The convention site is Lincoln Lodge, two miles west of Columbus, Ohio. Shirley Rex, K8M7T (new YLRL Treasurer) is Chairman, with Ruth Rickett, W8JGT, Co-Chairman, Alice Gehl, W8OTX, is Business Manager, Marie Holinski, W8MH, is Publicity Chairman. Toni Chapman, K8PXX and Joy Ronald, K8GWY, are in charge of prizes. Favors and Decorations will be handled by Marge Farinet, K8TTF.

Reserve the big dates now — June 19, 20, and 21, 1964.

An OM Suggests

Carl C. Drummer, W5EHC, writes, "For some time there has been a need for a term to designate a mature

W7HHH reads the inscription on the award she accepted in posthumous honor for her OM, WTGNJ.
Bettie Mayer, K7BED; Ruth Donnelly, K7ADI; and Mary Govig, K7BIL (l. to r.) tend the Portland Roses booth at the National Convention. The hanging aprons were decorated by YL clubs around the country and were later awarded as prizes at the YLRL dinner. (Photo by W7HPT)

female amateur radio operator. 'YL' is okay, but sometimes it is a bit out of place when applied to a great-grandmother.

"The term assigned by international convention to the amateur radio service is AT. By logic, an amateur operator might be designated as an ATA. But, further reasoning in the same channel, a lady amateur operator could be a LATA.

"Perhaps something of this nature might get away from the insulting term XYL (no longer young, no longer a lady).

"We're still open to all suggestions in the YL-XYL designations debate! — IF1QON

YL Doings at the National Convention

From Beverly Walker, W7HPT, has come the following report of the YL part of activities at the 1962 ARRL National Convention in Portland, Oregon, Labor Day weekend. W7HPT is publicity chairman of the Portland Roses Club, and we are grateful to her for giving those of us not lucky enough to have been there a chance at what went on.

"The 1962 ARRL National Convention in Portland, Oregon was a complete success, as far as the Portland Roses are concerned. We met many YLs, exchanged ideas, and had a great deal of fun being official hostesses.

"One of the meeting points for the YLs was the Portland

ARRL President Herbert Hoover, jr., W6ZH, was one of the visitors who stopped by at the busy Portland Roses booth. Committee member Mary Govig, K7BIL, sports one of the distinctive Portland Roses bonnets. (Photo by W7HPT)

Roses booth, located in the Exhibit Hall of the Memorial Coliseum, the most colorful part of the exhibit was furnished by the YLs in the form of brightly colored aprons decorated by YL clubs around the country. The aprons were later awarded as prizes at the YLRL dinner.

"The booth also featured posters of YLRL certificates, photos of the Roses, and certificates offered by the club. On display were the YLRL Scrapbook and the scrapbook of the Third International Convention of the YLRL. A feature of the booth that proved popular with all visitors was the Oregon agates and polished beach pebbles that were free for the taking.

"Among the visitors we were pleased to welcome to the booth were ARRL President Herbert Hoover, Jr., W6ZH; Ethel Smith, K1AH, founder of the YLRL; and Helen Mailet, W7GGY, ARRL SCM for Idaho. The YLs and XYLs we welcomed would be too lengthy to list, but we enjoyed every eyelash QSO.

"Two of the featured events for ladies were the Saturday fashion show and shopping tour at Lloyd Center, the world's largest shopping center of its kind, and the Sunday

Ten-year-old Shirley Vainio, KN7TB, and her 14-year-old brother Ed, K7MWL, would be glad to sked anyone who wants a Washington QSO on either 20 or 40 meters Shirley and Ed live in the town of Edmonds in the Evergreen state.

Last month OM WA6HUW "exposed" the art of feigning housework while hamming employed by his good wife Ruth, WA6CRC. Here is Ruthie and her mischievous grin. (We can only assume that she stole a few moments from her arduous housecleaning chores for a quick QSO on 40 c.w.) But it's all in good fun, WA6HUW says, and he's really well-adjusted about the whole thing.
sightseeing tour in Portland’s West Hills, that included such spots as the International Rose Test Garden and Portland Zoo.

The only event exclusively for licensed YLs was the dinner Saturday night. It was presided over by Helen Maillet, W7GGV, who also served as chairman of the YLRL Forum. Letters were read by Ethel, K4LMB; Marty, K8EPE; Fran, K7MRX; Irene, K6KCI; Helen, W7GGV; and Dot, K681C. These letters were from YLRL officers who could not attend. Letters were also read from W5RZJ, Louise, YL Editor of CQ and from W1QON. Reports were given by Beth, W7NJS; Betty, K7BED; Bertina, K7CHA; and Ben, W7HII; on different phases of YL activity. Various YLRL projects were discussed. YLs were present from the 4th, 5th, 6th, 7th, 8th, 9th, 10th, and K7Z call areas, with a total of 37 in attendance.

"On Sunday 82 women attended an ‘herb breakfast.’"

The Hoosier Amateur Women’s Club (HAWK) celebrated its 5th anniversary in September with a party at the QTH of Mildred, K9ZLB, in Plymouth, Indiana.Shown operating at K9ZLB’s rig are Adah, W9RTH, club director (seated); Fran, K9ILK, outgoing president (center); and Butch, K9IXD, director (right). HAWK members number about one hundred.

DJ4XL, Lisa Doell, was the DX "adoptegee" of Grace Swenson, W1RLQ, in 1962. Lisa is one of West Germany’s most active YLs on 15 meters.

(Photovia W1RLQ.)

Alona Jacobson gave an interesting talk on the uses of herbs in the diet.

"Sunday afternoon 104 YLs and XYLs attended a luncheon, at which George Crockett, W7GGG, gave an illustrated talk on the wildflowers of the Northwest.

"The fun event for YLs and XYLs was the SWOOP (Suffering Wives of Operators Poteriorate) breakfast, with 118 attending. Portland Roses dressed as innoverisihed ham widows. Tales were spun by XYLs of the miseries they had "suffered" by being wves of hams. XYLs Mrs. Lois Richard- son and Mrs. Harriette Maxon were selected as SWOOP sweethearts, following their heartsearing stories of broken teeth and electrical shocks.

"Many prizes and favors were given at all meals, and Margaret Stewart, W7PVF, won the Afghan knitted by the Portland Roses especially for the event.

"The Portland Roses would like to thank all those who helped with the convention and everyone who attended for making it, they feel, one of the best conventions ever!"

**Clubs & Nets**

**YL Welcome Net** — All YLs are cordially welcomed to this net which meets Wed., at 1400 GMT on 3000 kc. W8ATB is NCS; K8LUF is alternate.

Three HAWKs from Texas drove all the way up to Indiana to enjoy the club’s anniversary party. Estelle, KSZMB; Mary, K5RWR; and Dall, W5DHC (l. to r.) put their mobile rig to good use during the long drive.
In Norway applicants for amateur licenses must be at least 16 years old, according to LA6ZH, Ruth Tollefsen, who was licensed herself in April 1961. Ruth's eldest son, LA5CH, is presently in California. Ruth's DXing hours are mainly in the morning. (Photo by W1RLQ)

Loaded Clothes Line Net — New officers are Asso. K5SCP; V.P. K5JEN; Secy. K5RLL; Trens. K3GCA; Pub. K3OPS
The LCL Net meets Monday at 1600 GMT on 7255 kc.
K5GAS is NCS.

Georgia Peachs — Winter frequency for the Georgia Peach Net which meets Thurs. at 1400 GMT is 7200 kc. K4ZNE is net manager. New officers are Pres. K4HIA; V.P., K41FF; Secy. K4HIU; Trens. K4HSC.

LARK — New officers installed in Sept. were Pres. W9JUN; V.P. K9JFR; Secy. K9BJJ; Trens. K9JYW; Pub. W9CJF.

Petitieon Operators of Sig — New officers are Pres. K3DJS; Secy. K3KTH; Trens. K3BRA; NCS K3CCP. The POOS meet Thurs. at 0200 GMT on 50.5 Mc.

Portland Rovers — New officers are Pres. W7ZMN; V.P. W7REH; Secy. K7AIL; Pub. W7NJS.
W1ONE — The club conducts three nets as follows: Yankee Lassies, Wed. at 1330 GMT, 3960 kc; Six Meter Net, Wed. 1900 GMT, 50.65 Mc.; C.W. Net Fri. 1330 GMT on 3960 kc. Informal luncheons are held on the first Saturday each month at the 1812 House, Rte. 9, Framingham, Mass.

H4VLARC — New officers are Pres. K4HAM; V.P. W3RXJ; Secy. W4JFT; Trens. K3SIX.

Coming Events

YL-QM Contest — The fourteenth annual, conducted by the YLRL. Phone section March 2–3; C.W. section March 16–17. Rules later.

Ladies Day — The second Monday of each month is reserved for just plain YL racecruising on all bands. Let the ladies go in favor of a fun day of YL QSOKing.

Are you a Phi Lambda Epsilon? If so, get in touch with Danny O'Connell, K0UWZ, 625 Highlands Drive, Springfield, Missouri.

The Wally Byam Caravan Club is a group of trailer fans who travel throughout the world and hold an international rally or convention once a year. On June 30 — July 5 of this year their rally was held at Auburn, Washington, and among the group were 18 hams. They have formed a club known as the Amateur Radio Club of the Wally Byam Caravan Club. Earl Johnston, W01CV, was elected president, and Robert M. Smith, W0LD, was elected secretary. On-the-air meetings are held the first Monday of each month on 14,260 kc., at 0200 GMT. For further info write to W01CV at 619 Buchannan St., Topeka, Kans.

W50DLT is Dr. John A. Hunter, president of Louisiana State University.

K6UMV was working on the electrical system of a Navy P2V antisubmarine plane which was being reconditioned and in the radio compartment came across a QSL from KG4AA to WA2MET. WA2MET is mighty lucky that a fellow ham found that scrap of paper, for otherwise it might have been given the heave-ho.

If you play the brass as well as pound it — that is, if you are a member of a drum or bugle corps — contact Joe Hoener, K9FYL, Great Bend, Kansas.

STOLEN HAM GEAR

A Conset G-76 (serial no. B-1195) and its power supply (serial no. 1094), together with a Shure 104 microphone, were recently stolen from Lemond Meadows, K2HPW, 2615 Clydesdale Ct., Oceansville, N.Y. If you have any info on this gear, write, or phone collect Rockville Centre RO 4-0598.
INTERNATIONAL HAMFEST — BRAZIL

The Association of Brazilian Radio Amateurs, LARBE, through its Sao Paulo section, will sponsor an "International Meeting and Symposium of Radio Amateurs" April 7 to 11, 1968. This will be part of an International Aeronautics and Space Fair being held in Sao Paulo at that time. A symposium of radio amateurs will be held to enable amateurs to express ideas, discuss matters and introduce themes which might be included in future International Telecommunications Congresses. Subjects for this symposium will range from TVI problems to international legislation.

In addition to the many interesting discussion groups, there will be an exhibit of amateur equipment produced in various countries, special visits available to the electronic and radio industries of Sao Paulo, and a program of entertainment.

More details will appear in a later issue of QST.

QSL BUREAUS OF THE WORLD

For delivery of your QSLs to foreign amateurs, simply mail cards directly to the bureau of the proper country as listed below. Cards for territories and possessions not listed separately can be mailed to the bureau in the parent country; e.g., cards for VPSs go to RsQG in England. W, K, VE and YO stations only may send foreign cards for which no bureau is listed to ARRL.

For service on incoming foreign cards, see list of domestic bureaus in most QSTs under "ARRL QSL Bureau." Bold face listings indicate corrections or additions.

Algeria: G. Deville, FABWR, Box 21, Maison-Carree, Alger
Angola: L.A.R.A., P.O. Box 494, Luanda
Argentina: R.C.A. Carlos Calvo 1421, Buenos Aires
Australia: P.O. Box 41, Box HILL, E. 11, Victoria
Austria: Oc, V.S.V. Vienna 1/9, Box 999
Bahamas: (V7P) D. R. Thompson, V7NS, Box 48, Nassau
Belgium: (All MP4), Ian Cable, MP4BBW, P.O. Box 425, Avall.
Bolivia: (All MP4), Ian Cable, MP4BBW, P.O. Box 425, Avall.
Bulgaria: R.P.O. Box 300, Sofia
Burma: B.A.R.T.S., P.O. Box 800, Rangoon
Canada: (All MP4), Ian Cable, MP4BBW, P.O. Box 425, Avall.
Cayman Islands: Phil Preece, Postmaster Canoe Island, UsPo 05-0000, Cayman Island, Phil Preece, Postmaster Canoe Island, USPO 05-0000, Cayman Island, Phoenix Group, South Pacific Via Honolulu, Hawaii
Chile: P.O. Box 907, Udonhno
Colombia: C.L.R.A., P.O. Box 594, Bogota
Congo: (CN32) Albert Noger, TNSBA, Box 12, Brazzaville
Congo: (VQ5) U.C.A.R. QSL Bureau, P.O. Box 3748, Elisabethville, Katanga
Costa Rica: Bill Scraborough, 99W, Radio Station Racotems
Costa Rica: Radio Club of Costa Rica, Box 2412, San Jose
Cuba: F.A.R.R.C., QSL Bureau, P.O. Box 650, Havana
Cyprus: Mrs. E. Barrett, P.O. Box 219, Limassol
Czechoslovakia: C.L.V., Box 69, Prague 1
Danmark: E.R.R., QSL Bureau, Instantrap
Dominica: VZ2DA, Box 61 Roseau, Dominica, Windward Islands
Dominican Republic: R.C.D., P.O. Box 187, Ciudad Trujillo
East Africa: (VQ1, VQ3-SIS, VQ4, VQ5-SX5) P.O. Box 2133, Kampala, Uganda
Ecuador: Guayaquil Radio Club, P.O. Box 579, Guayaquil
Ethiopia: Telecommunications Amateur Radio Club, P.O. Box 1547, Addis Ababa
Faroe Islands: S.H. Myhre, VR2AS Victorias Parade, Suva
Finland: SRAI, Box 306, Helsinki
France: Taiwan American Radio Club, Box 13, USARSCQT, APO 63, San Francisco, California
Germany (D.L.2 Only): G. E. Verrill, G3FEC, 10 Seebrown St., Gosport, Hants, England
Germany (D.L.1 & D.L.5 QSL Bureaus only): D.L.1 & D.L.5 QSL Bureau, 29 DLIAVJ Base MARS Station, APO 130, New York, N.Y.
Ghana: CW, Hans Sues, P.O. Box 1945, Kumasi
Great Britain (British Empire): R.S.G.B. QSL Bureau, G2MI, Bromley, Kent
Georgia: Georgia Zaralis, P.O. Box 564, Athens
Great Britain: (All MP4) Signal Officer, Hqtrs.
JUSMAGG APO 223, New York, N.Y.
Greenland (ONs only): Via Denmark
Greenland: (KGl only) All KG1s to MARS Director, 2004 Comm. Sqdn., APO 121, N.Y., All other KG1's to MARS Director, 1983 Comm. Sqdn., APO 23, N.Y., N.Y.
Grenada: VP2KG, St. Georges
Guatemala: M.A.R.C., Box 145, Aguac, Guan, Mariana Island
Guatemala: Brian E. Bottle, QSL Bureau, Box 15, St. John's, N.B., New York, N.Y.
Guatemala: C.R.A.C., P.O. Box 115, Guatemala City
Haiti: Radio Club d'Haiti, Box 933, Port-au-Prince
Honduras: (All MP4), Ian Cable, MP4BBW, P.O. Box 425, Avall.
Hong Kong: Hong Kong Amateur Radio Transmitting Society, P.O. Box 541, Hong Kong
Hungary: I.R.R.L., Postbox 185, Budapest 4
Iceland: Islanzirki Radio Amateur, Box 1088, Reykjavik
India: P.O. Box 581, Delhi 1
Iran: Joseph L. Martinling, EP2BN, American Embassy APO 205, New York, N.Y.
Ireland: I.R.T.S. QSL Bureau, 24 Wexford St., Dublin 2
Israel: I.A.R.R.C., P.O. Box 4099, Tel-Aviv
Italy: A.R.L. Via Pisto Venceto 12, Milan, Italy
Japan: Keiichi Sumida, VP5RS, Port Royal St., Kinquant
Japan (JA): J.A.R.L., Box 377, Tokyo
Kenya: See East Africa
Korea: Korea Amateur Radio League, Central Box 102, Seoul, Korea
Kuwait: W. N. Burgess, 492X2, % Kuwait Oil Co.
Libya: SA QSL Service, Box 173, Tripoli
(Must be renewed on page 178)
CONDUCTED BY ROD NEWKIRK, W9BRD

When?

The subject of radar DX arose here last month during our continuing reflections on the remarkable Mr. Marconi. Lost you fall into the error of regarding Guglielmo as a mere tinkerer who happened to get lucky with a spark gap and coherer, here’s an excerpt from his prophetic speech at an IRE shindig in New York City on June 20, 1922:

As was first shown by Hertz, electric waves can be completely reflected by conducting bodies. In some of my tests I have noticed the effects of reflections and deflections of these waves by metallic objects miles away.

It seems to me that it should be possible to design apparatus by means of which a ship could radiate or project a divergent beam of these rays in any desired direction, which rays, if coming across a metallic object, such as another steamer or ship, would be reflected back to a receiver screened from the local transmitter on the sending ship, and thereby immediately reveal the presence and bearing of the other ship in fog or thick weather.

DX men being what they are, it was only a matter of time before they looked beyond Mama Earth for something far enough away to make pulse techniques more interesting. Hence such propagational propositions as moon-bouncing and Project Winkie. But passive spatial reflection, already old hat in terms of the art, is a fringy variety of communication. One soon wearyies of one’s own echo in the valley and years for a live response from someone on the other side. RCA’s Mr. Handelsman, at this year’s Western Electronics Show and Convention, delivered a provocative paper on possible celestial two-ways, reported by L. Tolopko of Electronics News:

He listed factors that enter into the calculation of the over-all probability of communicating with intelligence on another planetary system. Among them were the following: (1) Fraction of stars with planets. (2) Fraction of such stars with sufficiently long and stable existence for evolution of life on its planets. (3) Fraction of such planets with stable circular orbits. (4) Fraction of such planets with orbits within favorable zones for life. (5) Fraction of such planets with mass, atmosphere and biochemical environment favorable for life. (6) Fraction of such planets on which civilizations evolve technically capable of long-range communications. (7) Fraction of such civilizations with the requisite longevity or rebirth rate for coincidence of at least their signal’s arrival with our listening period. (8) Fraction of such civilizations who can and want to establish communications with us.

Mr. Handelsman cautioned that there are undoubtedly many more factors, some known but overlooked, and others unknown at present. To receive a signal from at least one civilization within 1000 light years, an examination of some $2 \times 10^5$ likely stars in a field of about $10^2$ stars is required, Mr. Handelsman estimated. This examination is based on optimistic assumptions—the civilizations have a longevity of 50,000 years, and no previous intercommunication. For much shorter longevities, an exchange of messages is not possible as the round-trip time exceeds the lifetime of the civilizations, Mr. Handelsman said.

He described a system to search $2 \times 10^5$ stars within a period of ten years, looking for a contact signal being broadcast from us far away as 1000 light years. It was assumed that one large antenna would be used twelve hours a day, and the search time would be ten minutes a star, allowing 3.3 minutes for slewing and positioning.

Mr. Handelsman assumed that a determined transmitting civilization is willing to expend a total of $200$ billion per year, which might represent a significantly less proportion of its resources than it would to us. It was also assumed that about 20 per cent of this goes to prime power generation and the remainder to conversion to microwaves so that the radiated power is about $10^{13}$ watts.

Okay, Mr. Handelsman, but we still want to see the color of those QSLs. Don’t sneer, though, OMs. Why, even as you read this some three-headed four-armed five-eared radio amateur a few light years away may be puzzling over that strange noise-increase he observes on 14
UB5UG combined a recent mountain-climbing trip with western-style DXpeditionary work as UB5UG/JU8. Yuri scored sideband QSOs from a glacier QTH at the 13,000-ft level with a 75-100-watt rig, ground-plane and long-wire.

Generator troubles, a shot 523 rectifier and poor propagation conditions beset the endeavor.

These photos come courtesy KB9HG, UB5UG/JU8 QSL aide.

Me. every so often when an ARRL DX Contest comes along.

**What:**

Getting back to earth again, W1BB reminds us it’s time for the Annual Transatlantic and World-wide 160-Meter DX Tests, a long DX tradition of long standing. From 0000 to 0300 GMT on December 2nd and 16th, January 6th and 20th, February 3rd and 17th, there will be concentrated 160-Mc. intercontinental efforts. New suggests that, as in the past, W1KQ’s call QG DX TEST is the first five minutes of each hour, every minute, again for five minutes, etc., till the QSO bell is ringing. Non-W1KQ’s should call during even 8-minute periods, listening for our side during the odds. After two-way test poppin’, of course, it’s each man for himself... Led off by KB9MBF, our east coast gang began working V6’s XRQ and IG on 160 back in September, and W3QOF apparently scored the first transatlantic crossing of the new season with QSOs on September 14th. Westarines have already worked ZL8A and VP8CQ and began operating Statesiders in midsummer. JAGAK tells W9XXM he hears our States are doing well on short band. Check the most recent edition of “Band-Available” in QST or your Handbook to ascertain what 160-meter frequencies, if any, are available in your area. Hope you can join the fun.

Jeaves & Co. gratefully acknowledges activity reports from the following stations on these respective bands:

**20 C.W.:**


**20 Phone:**

WA6DNS 7G6Y 9G6Y, KS1F 2HJ2A, 2HJ2A, 2QZ 2RUB 9G6X 9G6R and 3NYJ 7Z2F.

**15 C.W.:**

WA1CQ 21L, 7Z2F, 7Z2F Y1AQ, KS1F 2V1G, 3NYJ 7G6Z, 8V4Y 9G6Y, W3ML 2HJ2A, 2PJ, 2QZ 2RUB 9G6X 9G6R and 9G6Y.

**15 Phone:**


**15 Novice:**


**10 Phone:**

W9WZ 9G6X 9G6X, 9G6X 9G6R and 9G6X 9G6R.

**40 C.W.:**

WA1CQ 21L, 7Z2F, 7Z2F Y1AQ, KS1F 2V1G, 3NYJ 7G6Z, 8V4Y 9G6Y, 9G6Y, W3ML 2HJ2A, 2PJ, 2QZ 2RUB and 9G6X.

**40 Phone:**

W9WZ 9G6X 9G6X.

**80 C.W.:**

WA1CQ 21L, 7Z2F, 7Z2F Y1AQ, KS1F 2V1G, 3NYJ 7G6Z, 8V4Y 9G6Y, W3ML 2HJ2A, 2PJ, 2QZ 2RUB and 9G6X.

Next month we intend to present the usual cross-section of DX activity on all bands to the new DX year off to a running start. Good luck, guys!

**Where:**

Asia — ARRL Assistant Secretary WIECH has word from 8P4BBW that Jim will handle all inbound Bahamian, Dua, Mueset, Oman, Qatar and Trucial Oman QSLs through his Caliborn QTH... WIECH relayed an apology from W2AYN (HLX5, ex-KGOX-KQ2AT etc.) for tardy response to correspondence. Now working with the Ministry of Communications and National PBI, as of South Korea, W2AYN is adding to the fifteen-year overseas tour that has taken him from Thule through Ammonium jumbles to both ends of Asia. — Recording UB5UG/JU8 confirmations, QSL side KB9HG states that replies are sent direct to W1KQ’s address, either self-addressed and stamped envelopes, otherwise via bureau...— "Have closed operation at K72AB..." writes W3JCF/DX, "I still have a good supply of cards if any replies have some urgency, all address in the list to follow will be good for the next nine months."—- When V80APH and friends make it to the Kuria Maria, C82BN will handle QSL matters, according to VR70ON’s DX press...— W9XDC’s DX Bulletin indicates that G5JMH may be of assistance in confirming certain V80MB Mailadies QSOs. — The DXer of NCDXC has it that 9G6VAD invites inquiries on late cards.

**Africa** — Informative WIECH advises that WB8BF can handle QSLs bound for any Secondaire amateur, as our REC of France. Furthermore, TN8BA writes Gary that he relays cards for TLT TN80 T85 and T87 areas, while Z18RM volunteers the same for all Nyaasalanders...— X7T2U tells WIECH his current Caliborn address should be good till June of this year when he returns to Switzerland for further studies. Meanwhile, QSL from West Africa operation may go via HB90Z...— W1WPO of the ARRL DXCC Desk and WIECH call attention to prex changes for Sierra Leone and Uganda. — In Europe, H7Q, H70, 9G6X 9G6X...— "It is my policy to QSL 100 percent on receipt of QSLs from stations worked," assures Z813JA, a new a-b-c DXer, who requests QSLs to be sent with W2AW’s mint foreign stamp enclosures when other means failed. W7 further advises that 9G6JBB helps out with 9G6QSL when the latter is away in Belgium. "A few words in highschool French help considerably in obtaining cards from former French and Belgian colonies," writes W816X. — 9B2AIC may give prompt response to a-MBB-hearing W7K requests for 5N2RSB QSLs but non-W7K’s should apply to Jim’s Nigerian address. — A self-addressed 3-Mc, CT8AV complicated W2AVY’s QSL Labors in behalf of that Madeira station, according to NCDXC. CT8AV rarely into 40. The DXer also requests permission to G7JIF if you’re still short ORSA’s QSLs...— Oceania — KW6QJ writes WIECH that he prefers incoming Wake cards be addressed to P.O. Box 446 rather than old Box 417. "The only one was my business address, and QSL activity has reached such a degree that it would be better to use my new personal box number..."—- NCDXC requests CT8AV reconsider KO1A’s request for the collector’s item for the truly discerning DXer...— "I’ve completed my tour at Wake Island and have been transferred, bag and baggage, to Hawaii where I expect to become a new KH8 shortly," writes W6VTN/KW6. "All QSLs will be answered as soon as possible, I’m running short of cards at the moment, so those who include a stamp, will receive priority." Verne has a new batch on route from the printer, and his KH8 address appears in the list to follow...— W8171B and W5C1M indicate that K60DZ advise: "The membership of KARC recently voted to resume the duties of QSL bureau for incoming K6 QSLs. It is felt that the activity level in the Marshall
Islands will be sufficient to justify having a local bureau for the next several years. The address of the club in KX5R, Box 444, Navy 821, 1PO, San Francisco, Calif. Realizing that it will take some time for this changeover to take place, the club will continue to handle cards which are received via the KG6 bureau for as long as they come through. QSLs for recently donated KX5s AB AL AN AP AQ AR AS AU DG DJ DX can still be forwarded by KARC. — W5HTM writes that as of September 11th, "I have QSL'd every entry in my own V6/RG logbook direct to those who asked to be remembered, via bureau for others. S.w.l. reports also have been confirmed. W5BRT, still on his way home at this writing, will send out cards as soon as possible. All requests for V6/RG QSLs should go to him or to me and we will see that they are forwarded to the operator involved. ZCC authorized the use of 4/KP for Christmas Island in July this year. ZC1C and ZC1M, the last known ZCs, have QSL'd all log entries and s.w.l. reports for W5HTM/KP6 of this date."

W5DCX informs us that K5ADQ will assist in QSLing next month's Heart Island operation by V6Y2K. Then Steve will swing to Wilkes base, Antarctica, where QSLs will be handled by his YL through the V6Y2K address. The Heart logs will go by boat to Australia, then probably fly Stateside. A card will be made out for each QSO and snail mail via bureau. W5DCX also indicates that V6KOA of Konoe-Koelting will QSL 100 per cent via bureau, direct if possible.

Europe — "As for Spitzbergen QSLs from LA6/IID/2 and RG7/G, I have talked with LA6AD who plans to take care of this service," says LA6FCT of Tromelinia. — W5KX lauds, "I mark F7 stations as the poorest QSOs listed. Not a single card from dozen worked in the last five years. Only a few YLs have French food, women and songs." Walt has named some strong QSO-colonial distractions.

South America — Timely and topical observation by W1F, the QTH of the year when surface mail destined for the Caribbean and South America regions will not reach its destination until March. Christmas looms, you know, and we have a few Minorcans and Frenchmen who can give us more interesting, more stimulating shipping space will find many letters and packages held over for the next trip. Better send those QSLs airmail. — ARRl staffers W2PL, W2B, KL1M, K4AAR, W4JP, K4AAR and others urge that those on Christmas stations in the K4/HSA-KC/HUS block go to KINAP. Amateur Radio Station, USN CBC, Daviaville, East Greenbush, N. Y. W1MN, the present QH there, says, "One point that might help the fellows sending QSLs to be forwarded to the 'ice': KINAP only collects and forwards from Rhode Island. The individual stations must make out their own cards so that they will have the Antartic postmark." Also, W1W5N himself will be going to KC/HUS shortly. Curly adds that K4DZK is a good station, too, and K4ZL has QCQs for the Antarctic stations in the K4/HSA-KC/HUS block. QSLs from November 15, 1967, to November 15, 1968, may go to K3YXJ who also has QCQs for the K4/QAA operation. OM Bares expects the last station to reactivate next month for a "full year's QSOs."

F4YAP awaits overdue QSLs from QG2UB, QG2BD, U8BKE, UI8KAD, U8RAA, UI8RC, UI8ZAD, VP8Z, VP8V and other stations. The individual stations must make out their own cards so that they will have the Antartic postmark. Also, W1W5N himself will be going to KC/HUS shortly. Curly adds that K4DZK is a good station, too, and K4ZL has QCQs for the Antarctic stations in the K4/HSA-KC/HUS block. QSLs from November 15, 1967, to November 15, 1968, may go to K3YXJ who also has QCQs for the K4/QAA operation. OM Bares expects the last station to reactivate next month for a "full year's QSOs."

Around the world — Quite a few specific suggestions this month, as we had to start:

- ex-APACR (to 062ACR)
- CE3AXA, NASA, c/o U.S. Embassy, Santiago, Chile
- CE9AV, c/o M. Valenzuela, Base Naval Arturo Prat, Corso Naval, Punta Arenas, Chiloé
- CE0ZI/MM, USS Elinor, c/o FPO, New York, N. Y.
- CO2BG, M. Ortiz, P. O. Box 6096, Havana, Cuba
- ex-GR5AR (to CT11L)
- CX2AX, M. Bialo, Box 37, Montevideo, Uruguay
- DJ6HJ, A. Brodgen (K3KMO), Fuerstenberg Str. 147, Frankfurt a/M, Germany
- ex-DL4HCA, J. Hallowell, 52606 Missouri Av., Plattsburg, New York
- DL4HU, J. Barrows, c/o Bitburg ARC, 35th CIV, Eng., APO 132, New York, N. Y.
- DK4KW (via KG5L)
- EL2PF (via W1MZ)
- ex-EP5X-KO2AT (to H5X)
- EL8LL, c/o G. S. Embassy, Addis Ababa, Ethiopia
- FA2VW (via RE5)
- FA2VX, W. Porter (K1YDP), c/o State Dept., Mail Rm., Washington, D. C.
- FFS8S (to ZK8J)
- HHC8JU (to HHC1JU)
- H8NE, Box 10129, Quito, Ecuador
- H9KQG, c/o S9-KV (via W9HJ)
- HI1P1M, I. W. E. Stuiver, c/o W9SUS
- H1RMD, P. O. Box 45, Tegucigalpa, Honduras
- HJ2W (via KC3QW)
LX1TJ is a delicious 14-Mc. single-sideband morsel also sometimes available on 10 and 15 meters. Jules sports 150 watts, a double-con superhet and a triband quad. (Photo via W3ICQ)

KØRAX/KL7, C. Holher, c/o RCA, Nikolski, Alaska ex-KAZAB, V. J. Smith, W4CJD/5, 335 Baker st., Biloxi, Miss. K6SAAK, AE USB (see preceding text) KG1AI (via W3UR) KG4AN, Navy 118, Box 32, FPO, New York, N. Y. KG4BCL (via W9AQW) KG4AX (via K1AAZ) KG6DU, D. Lodwick, c/o PARI, Box 188, Wake Island LA4III/p 9RG/p (via LA5AD) LJC4IP (via WA5AIO) MP4MAO, c/o Southeastern DX Club, Box 749, Atlanta, Ga. OAI5P (via RCP) OAI5BA, Las Palmas AFB, Lima, Peru OH22BT/OH8 (to Q12BT) OX3KR (via W2CTN) P12CU, P.O. Box 383, Willemstad, Curacao, N.W.I. PY1BCR (via LABRE, or to P.O. Box 58, Rio de Janeiro, Brazil) PZ3CP, P.O. Box 221, Paramaribo, Surinam SV9WZ (to W7FDU) TF2WGR (to K1QIM) TTSAM, T. Savelli, Noumura, Tchad USBGUK/J8 (W/K via K8CHG) VE3FFW/SU, WO/2 AL, Transat, 5th Canadian Sig. Sdn., CAPO 4510, Montreal, P. Q., Canada VE3MO (via V67ALA) VE9N6K, R. Knight, Box 31, Alice Springs, N.T., Australia VK6UK (Heard Island via K6ADQ; Wilkes base via VK3KE) VP3KZ, J. Joseph, Jr., Box 321, St. Kitts, B.W.I. VP2ML (via K4LBRA) VP3SY (via K3RIR) VP3XL, Box 15, Tortola, B.V.I., W.I. VP4TM (via K1JAA) VP5BG, Box 208, Kingston, Jamaica VP6XQ (via W10PA) VP6SG (via KB2QX) VP6UG (via KB2UG) VO16GW (via R3G1Q) VQ2EW (via W2CTN)

VO2WM (via W2CTN) VOS1V, Box 335, Kamuela, Uganda VR3L/VR1 (via W6EMA2) WS1O/CW (via V02UA) W5YNI/K5E (to W5YNI) W6CBE/K6E (via W6AZW) W6POP/K6E (via KH6GQ) ex-W6WUN/K6V, V. Baughman, 300 Karsten Dr., Washiana, Hawaii W2YVY/V02, C. Lange, 886th Med. Gr., Box 2008, APO 072, New York, N. Y. XE1EW, H. Wallace, Box 31634, Mexico, D.F., Mexico XW8AT, OICG, c/o U. S. Embassy, Vientiane, Laos XZ2D, U. T. Miyata, 40, 82nd St., Rangoon, Burma ZB1A (via VE7ZMI) ZB1B (via W2CTN) ZC8FF (to Q3KQJ) ZD6CA, G. Armstrong, P.O. Box 41, Zomba, Nyasaland ZK1AJ (via W6ZEN) ZL30, M. Johnston, 107 Beverley Rd., Timaru, N. Z. ZPS6N (via KH6GQ) ZS1T, J. Lamb, Box 207, Walvis Bay, SouthWest Africa ZS8BB/ZS9/9, B. Aviden, P.O. Box 9399, Johannesburg, S. Afr. ZS6PC/ZS9/9 (via ZS6PC) ex-ZS7H, now ZS1BIH, P.O. Box 1, Cape Town, S. Afr. ZV9CA (via W4YW) 4S8BR, B. Rampla, Box 355, Comolobo, Ceylon 8H1BJ (via W7FPUO) 8N2RBB (via K3MNNJ) 8SRAG, Box 173, Diego Suarez, Madagascar 8TS5J, Box 358, Nouakchott, Mauritania 601WF, W. Franklin, U. S. Embassy, Box 6, Mogadiscio, Somalia 601WU, U. S. Embassy, Mogadiscio, Somalia 9G1ER, P.O. Box 251, Tema, Ghana 9L1HP, Box 7, Freestown, Sierra Leone ex-WN1GW (to KH7CP) 9OS5Q (via W2HJH) 9U8AS (via OH1IK) 9U8S BH ZZ (via W4ECD)

H9KRI (W4WNY) enjoys a visit by HM1AP between pile-up sessions at Seoul. This photo was snapped by H9KKN operator W3MVK who has since returned to our side. HM1AP is probably the most widely worked of Korea's nationals gang.
HC4CD and family enjoy wireless hobblding with the North American gang via this layout at Manta. Danny has favored 10 and 15 meters but changing conditions may force his Viking II and HQ-160 toward lower frequencies in the sunspot-deficient years ahead.

A sweeping bow to our QTH donors for the preceding, namely WA1IECH, IGDQ 2II, 6ZY, 71ZF, T7AQ, 8KX, S4G6R, KA1BTU, Z2DIF, 2U3G, 3UCS B3JN, JIWIS, 67ZK, TC0G, 97ZK, 8AxT, 8M4, WA1HLL, CMU2, RUB, 6HRS, DL0LH, KH6EV, and LA6VC, plus such live-wire DX clubs and groups as DARC DX-Club, DLSB DX Club, and the East Auxiliary Radio League News (KA2EB), Florida DX Club DX Report (WlC6KB), Japan DX Radio Club Bulletin (JAIJD), Kamassia (W, VA) Radio Club Bulletin (KNHT), Long Island DX Association DX Bulletin (W22E), passing New York DX Club Bulletin (LY, Wailea, 89 Hamilton St., Balston Spa, N. Y.), North Eastern DX Association DX Bulletin (W22D), Northern California DX Club DX Bulletin (X0QCM), VERON DX Press (PADS FX LOU VD0 WWV) and West Gulf DX Club DX Bulletin (K3ADQ). Fine work, indeed.

Whence:

Asia - More on UBSUG/US's mountaineering s.s.b. DX exploits from KQ8GQ: "UBSUG flew from Kirov to Moscow, then to Tashkent, then to Osk. They loaded everything on board autos, including equipment shipped by rail to that point. For 50 km, roughly 30 miles they had to travel by foot, packing all gear on their backs through wild country. Camp was set up on Olkhotsky Glacier at 13,000 feet. The shack was built of wood and muscovite which they carried with them. The gasoline generator would not work, so Yuri had to dismantle, find the trouble, and put it together again. He erected a ground-plane, and later a north-south long-wire. The 62Z tube in his transmitter was n.s. because of portaging vibration, but he improvised a circuit with one generator motor and diodes, raised a VHF on QRP e.w. and asked them to relay a request to Osk for a new 52Z. It arrived several days later by caravan. Propagation conditions were very bad, so only a handful of W7s were worked. UBSUG/US heard many loud stations who were dead to his calls. In addition to his radio work, Yuri took part in several trips with loads to set up intermediate camps on the way to Lenin peak (7134 meters). His top eliitch was 6000 meters..."

According to W0Z6Y, 1IL5X (W2AYN) soon will have a KW-2 on 1X bands..."W6PKM credits JASQ and W6PJ with consistent Asian signals on 1X Mc. despite trying conditions. The latter is on almost daily, 1300-1600 GMT..."

Whence:

Europe - ZDG5A, back in the slots after an eight-month pause, remarks, "As the only ZDB single-sideband station I would have thought that W5/KQ5Os would be quite easy. However, they just don't seem to know I exist. There is a new s.s.b. country for anyone who cares to tune around on 20, 15 or 10, whichever band is open, between 1400 and 1600 GMT. I ran 880 watts p.e.p. to a 4-element Mosley, and I trust these comments will get a few beams turning my way..."

Africa - ZW4HH tells me he is QRV with a full-size 80-meter ground-plane, 4800-4900 GMT, on 3510-3515 ke. e.w. or on sideband just below 3800 ke.

Radio Club of Cuba in Exile, P.O. Box 1688, Miami 1, Fla., includes among its 150 members, front (left to right), CO2s FK OA ZT UA HR; standing, CO2s DD UP ZG AN, an s.w.l., CO2s RB HC GU and CO5TM. (Photo via CO2ZQ)

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He looks for W/K just above 3800 kc, other North Americans on his own frequency." This from W6IBK who is working a good share of lower-frequency DX this time. --- Sheepekin classics world wide now can shoot for Northern Rhodesia Amateur Radio Society's WNR certificate. For W/NWRs, confirmed QSOs with 10 VQs in six different towns since 1945 should do the trick. But don't forget back with NRARS award manager VQAT for details. --- Notes from Africa via the trusty club organs previously mentioned: 'Rwanda's active includes 996C, 91L, PC and PE, while 926C CR DAI DS KU and XX hold forth from Burundi. W8BPQ did well from both areas as 916C HI and BB, respectively. The return leg of W8BPQ's vast 1Xpe's activity should include 1A63 stops at 546, 988 islands, FR7, VG9 and again, 1A63 SN 5DI ADF, CR8 Timor, VK8 Cocos and Christmas, other curious VK outputs and ZA9. 6981/11/mm shoek us up in claiming Madagascan 1Xpe as QTH. L907H is said to be available on Bouvet island, 1A6300. 2A3T4/3 is a 14-kc. sidetone bandpass. L9051/SU is the call of raving HB9M on Caen Strip, a.m. and sidetone. 1A63CBC/965 lucks with a.s. on 14,290 kc, about 1500 GMT. 1A63CR is back at 1473RS for a spell of s.s.b. and possibly c.w. 6996/3CF heads for retirement in New Zealand, 7A6/BB and PC mix, as you read this, kindly sidestreet on 7025, 11,415, 21,415 and 20,000 kc.

4X4DK, Asia's No. 1 DX man, entertained W5LDH on his recent visit to Jerusalem. Phil was officially licensed as 4X4DK's second op during this visit. 4X4DK has a 2A receiver, a 250-watt homebrew linear, vertical and folded-dipole radiators.

Oceania -- From K5QR/K8 via R632L: "I'm on 'rounds, 1000-1400 GMT, usually working Pacific stations on s.s.b. but calling breakers. Also, depending on my schedule, I look for Asians, Europeans and the U. S. east coast from 1100-1200 and 1430-1530 kc on single-sideband, 14,030 c.w., and I'll have a new K8 call shortly." K5PZK adds that K5QR/K8 is very interested in AMS bands, especially 14,415 kc and 15570 kc. K5QRK visited the west coast, VE7s B9H and ZL6 and CX6RQ all with 4X4DKS, fresh from a look-in on Kwajalein, observes, "I've never heard of QQ3, that is the place." However, the fellows get along with the other DXers and it's far too bad nobody has shut down anybody's beam. K5XEBV carries the main load of phone traffic on sidetone, K5S6 DB or PC running a second call, K5XARV has a new home now. --- W6ZDF/KM8 reconnoiters highlights of his ham career to W5KD and back becomes W6ZDF in 1946, then signed JAI2KX for a spell when he decided to be a strong yen for traffic work. Daily deals with W6GAM went off like clockswork, he became JAI2KX in 1960, enjoying QTG doings in the ARRL nets, then a jangling tour in the Philippines. Okinawa next, where he built his DX-100 for future use. Back to Japan, then, a stint in Maryland with very little hamming, and finally a trip to Midway where W6ZDF/KM8 is extremely popular on DX with phones at 80 meters at this time. "I'm 24 still quite single, so nobody interferes with my operating." That old ham spirit! Pacific nomenclature via the clubs: VK9LCA's Centennial station should be ready for another year with new HT-37 on tap. VK9RIS is there, too, but terribly inactive. 6972 1/b, mm, fresh from Manihiki triumphs, currently stops at home, Niue, Niue Island, and in the year. Danny's c.w. hoots are 7001, 14,050 and 21,405 kc. --- sideband spoils 14,195 and 21,445 kc. --- After his one-week Heard Island effort beginning in October, W6ZDF will winter at Wilkes base. Steve will use a DX-10 with a built-in s.s.b. converter, an NC-100 and multiband dipole for c.w. on 80 meters. See him at his home spot. --- Rare novelty entry W6GALS may show up about 1100 GMT, from Rota. --- VK is CB on phone, CU newly arrived on phone, and CV, mostly c.w. on 80 meters. The Solomons. VK4CV is away on leave and may not return till 3590 and 3550 kc. --- V6ZDF, W6ZDF, VK4CV and Frank are taking up a potential two-week Willis Island venture as VK4WE come available. VK5AB also has Timor and Christmas (VK9) credentials.

Europe -- LAM's spare KWM-1 should make LAM1/P and R656/P DXtryme available on Spitsbergen. Finn comments, "A wireless radio, both here and on the rig arrived safely and they will be on the air as soon as they have their antennas rigged. Activity will be s.s.b. and c.w. mainly in the 14,100-14,300 and 14,250-14,500 kc ranges. The transmitter will stay there until June of next year, so everyone should have a chance of operating well here." --- Don't forget that LAM6/M is going to be at a 14-Mc. Telephony Contest due on the 1st and 2nd of this month as detailed on page 10 of November QST. --- K5XCO now active as 1XPEZ with a Navigator superior radio for various antennas. Al is interested in possible DXpeditionary work at rare continental spots, so be alert. Neighbor KB6LGL is about to be on air in Germany too, using 20 and 40 c.w. Horst rates Cuthenate a superior radio position, and his results seem to bear him out. --- A rarish Finnish call is available through QVSJG's 5D-watcher and U. S. A., oriented quad on 14,000-ke. W6Y7M also mentions the far-north activity of OH12AD/OHD at Pylkkäneva. --- Now Europeanaddens via club sources: ESEA and U. S. QY7ML has permission to run 10 watts of c.w. on 80 meters till April. --- SW6V's John SW6A WO and WT on QO-164, 14,250 kc, sidetone at 14,000 GMT. --- That roving single-sideband rig of UA3CR & Co. aired up 20,000 phone and 0300 contacts in 1961 while wandering in rarer U.S.S.R. reaches later this year.

South America -- W9GAMS qualified for the first 7/21K7 certification awarded to a Yankee by Santander Radio Club. HRZ7T welcomes inquiries on this one, pointing out a lot of W9s are active on c.w. and phone nowadays. --- "Very erratic and unreliable," was the final summation of 2X- and 24-Mc. conditions in Ecuador lately. --- PY4AP mentions the World Belo Horizonte DX party to his fellows, walladips available on W9s and to those who work five B. H. PYs since 1958. Only three such QSOs are reported to date from Asia and Oceania applicants, check with PY4AA for details on W2BJ. --- HC139J intends to make use (Continued on page 176)
Correspondence From Members

NOVICE ACCENT

Recently I obtained my Novice ticket. I have found amateur radio to be a very interesting and educational hobby. But, I was shocked to see the way Novices are criticized. Sure, I'll admit I've heard some Novices who act like they got their licenses out of a cereal box, but I have heard just as many Generals and upper licensees who make just as many mistakes. Some Generals think they can come busting in on any frequency, any time they want to, even if somebody is already engaging in a nice QSO. That isn't the same thing Novices are told when studying for their licenses! I'm sure many agree with me. — Michael E. Shoalcy, W9CWK, New Hampton, Iowa.

THOUGH I've been a Novice for only a few months, I wish to respectfully submit the following message for the "QRM of the Month Award." . . . QTH (13), is (6), BT (13), Austin (18), BT (13), Texas (16), BT (15), name (17), BT (14), addr (19), BT (10), 5499 (12), BT (2), Chesterfield (11), BT (2), so hw epyou? . . . . . . . . . . . . . . . . . . . de WN . . .

As you may have guessed, but find hard to believe, the numbers in the parentheses are the approximate number of times the word was repeated. So far as I could tell his handle is BT, since after sending his handle 17 times he forgot to send his name. I don't know what the unfortunate Novice on the other end answered, but had it been me . . . . . . (for ten minutes). — Alfred L. Moyer, jr., W556BT, Los Alamos, New Mexico.

WHY NO V.L.F.?

The amateur radio spectrum extends from 1.8 Mc. to infinity. The FCC has always been pushing us up in frequency. Why not open a band well below those in use today? Who uses the frequencies below 20 kc? I'm sure there is many a ham who would like to string up an antenna 2.2 miles long (a quarter-wave at 20 kc) and have the benefits of continental ground wave. — Dennis McCormack, K1PLX19, Chicago 41, Ill.

TNX

I would like to thank you for the excellent article on the HBR-16 by Ted Crosby and all the modification articles the past two years. I built the original in October 1959 QST and now have rebuilt it with the Eddysonal dial and new 6BY4 product detector. Ted Crosby has been very helpful and prompt on all inquiries to him, and the same for Alex Stewart on the Eddysonal dial. Believe me, these men are a real asset to the great fraternity which is amateur radio, of which I have been a member the past 30 years or so. — Howard J. Klinger, W8PZQ, Rossville, Michigan.

The following Resolution was passed at the American Radio Relay League Convention in Corpus Christi, Texas, August 5, 1962.

We members of the West Gulf Division of the American Radio Relay League, in convention assem-

bled at Corpus Christi, Texas, 5 August 1962, do hereby commend the League Headquarters Staff, and the West Gulf Division Director, Dr. R. O. Pest, for outstanding leadership in the promulgation and implementation of programs designed to enhance the status and prestige of amateur radio and the American Radio Relay League. — Holland Henderson, W5QOK, General Chairman.

THANK you for that plain and understandable article on a beginner's antenna (page 17, October QST). Most of the time the older hams don't want to fool around with the beginner. The dimensions for the elements and match were especially helpful. — Steve Sprague, W8HGE, Riverville, W. Virginia.

I just thought I'd take this opportunity to tell you that I think QST is the best magazine of all those devoted to ham radio. Although I have been a ham, member of the ARRL, and a reader of QST for only four months, these things have given me a hundred-fold that figure in knowledge, enjoyment and hours of pleasure.

In reading QST I have particularly enjoyed your novice and v.l.f. columns. I hope you keep up the good work. — Mike Kendall, W59CRA, Jasper, Indiana.

COMPLETE ADDRESS, PLEASE

I would like to back up WA2FQG's remarks in June QST. I also live in an apartment block, flats we call them in G-hand. Very often W/K stations omit my flat number; hence, the postman has difficulty in finding me. Luckily this block is not very big and I am the only amateur in it. Usually the QSLs reach me without trouble, but they are often delayed.

Another pet peeve of mine is the stateidek method of dating, i.e. 6.8.62, being the 8th of June, whereas we in Europe read it as 6th of August. Also, why use local time? It means nothing to the European station. Who wants EST, CST, MST, PST, etc? Why not GMT? It would make it so much easier to the QSLs up to QSOs. — Don Walmsby, G5HZL, Islington, Middlesex, England.

WHAT BAND, HEY?

A ham antenna on a car immediately catches the attention of every amateur; and the question immediately "pops into mind": "I wonder what band he works?" Why couldn't that ham antenna tell us what band it is tuned for all in the same glance? It would be a simple matter to fly a colored streamer from the end of the antenna, indicating the band being used. Suppose a color-scheme something like the following were published and adopted by hamdom:

<table>
<thead>
<tr>
<th>Band</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
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<td>50-Mc.</td>
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December 1962
To make the scheme complete, one could fly double streamers if working c.w.
I believe there would be far more ear-to-ear contacts on the highways if we could know at a glance what band is being worked. — F. J. Mehetre, W5JO, Schudelnberg, Texas

HELPING HAND?

In defense of the amateurs who do not acknowledge SWL cards, may I suggest that SWL Edward O. Page (September Correspondence) consider that he is not the only SWL (or the only ham, either) who may listen to a given QSO, and that it is not only he who is asking for a QSL acknowledgement. From experience at my station, the number of SWL cards received varies directly with the amount of traffic in phone operation. Few such cards are received for s.s.b., and almost none for c.w. contacts. The conclusion is inescapable that very few SWLs are embryo hams. Their interest seems to extend only as far as turning on a switch, spinning a dial, and collecting cards. This may make an interesting pastime, but is not remotely a part of amateur radio, and its participants have no claim on legitimate amateurs. It is difficult to see how a meaningless card can help a beginner toward his license, or how the lack of it can be construed as refusal to extend a helping hand. — W. Willard Bridgeham, W1W, Pittsfield, Mass.

BE A SPORT

I have never heard such badinage on the amateur bands lately.
I have monitored the 75-meter phone band every day for the past eight months, and for the past few days on 40-meter phone. What discourtesy I have heard!
Although I know the regulations do not specify that c.w. cannot operate in our phone bands, it is becoming more commonplace to jeopardize good phone quality by incessant "chop-chop" and voice operators to give up in disgust if they cannot QSY. I have observed this unsporting attitude among the newly licensed to c.w. on the phone bands mentioned above, thus making communications impossible.
The unwritten code used to be, each to his own section. Has that passed? If it has, then I propose an FCC Docket initiated by ARRL to make it mandatory for c.w. to stay out of our amateur phone bands. It is just as easy for a fixed station or mobile to work c.w. on the proper frequencies.
Everybody knows the rules, but not everybody knows the sport; let’s make the sport the rule. — Eugene Cape, WAlDUF, Pasadena, California

PRIVATE SHORT-CUTS?

Being very active on the c.w. bands, I have noticed in the past few years a great number of amateurs who have made up their own private set of abbreviations for use by themselves. This has become somewhat of a trouble when trying to copy c.w. between 16 and 20 w.p.m. either in your head or with pen and paper. Using either method to copy, you do not have time to stop and wonder what the sender may have meant or whether you have copied what he sent correctly. I do not profess to be either an expert or a high speed c.w. operator but it does seem to me that if everyone used the standard international Morse code and abbreviations, maybe we could decrease the number of mistakes made in copying c.w. — Paul H. Valentino, K5PPF, Mt. Pleasant, South Carolina

OSCAR

The OSCAR III "breadboard" translator is on the air, operating into a single 4-wave whip used for simultaneous transmission and reception.
The translator picks up a 50-kilocycle band at 144.1 Mc. and retransmits it at 145.9 Mc. with a peak transmitter power of about one watt.
On October 8, 1962, at 9:15 p.m. PDT W6DKI and W6HEK had a two-way QSO via the repeater, which was located at the QTH of W6VMH. Later, W6VMH joined for a 3-way QSO, also using the repeater. Distances involved were of the order of 5 miles, and all signals were s.m.
This is a historic "first" for amateur radio using a frequency translation that span 2 meters which can accommodate more than one QSO. Tests of the OSCAR III repeater are now underway to determine its translation capability when a number of signals are within the passband of the equipment.
A "well done!" to W6VMH and W6VKP who built this miniature "Poor man's Telestar"! The first important step towards a radio amateur translator satellite has been successfully taken! — William J. Orr, W6SAI, Project Gears, Inc., Menlo Park, California.

BPL REVISED

Has ARRL ever considered reapproaching and perhaps revising requirements for Brass Pounds League? I assume this award is intended to honor outstanding performances in handling reasonably significant messages contributing to the public good. However, it seems that in pursuit of BPL a few monopolists glut nets with trivia.
Batches of "nice working you X hope we do it again soon", dispatched overnight, drive away many conscientious and capable operators who do not wish to be identified with a childish distortion of the public service that the FCC expects of us.
I realize that practice messages cannot always (perhaps for the beginner should not) be vitally important but I deplore the practice of "earning" a several-hundred-point BPL score with such items as: "sent you QSL today X hope you copy me down". That sort of thing weakens and cheapens amateur radio. — Eleanor D. Hope, W4JLI, Loxahatchee, Florida.

INFORMATION NEEDED

As national historian for the Associated Public-Safety Communication Officers, Inc. it has been necessary for me to do considerable research into the early days of police mobile radio systems.
It was most interesting to discover that police radio and mobile radio, in general, owe so much to the amateurs for the valuable assistance given by many hams throughout the country in the pioneering days of public-safety mobile radio.
For the sake of amateur radio as well as police radio, a record of this early work prior to 1932 would make a valuable part of the mobile history.
I would appreciate it very much if any hams who have contributed in any way to this pioneer, public-safety radio work, or know of someone who did, will send me the information along to me so that the amateurs can be given credit for their work in the development of mobile radio communications which have saved countless lives and made our country a safer place to live.
An informal note containing the facts and infor-

(Continued on page 184)
Operating News

F. E. HANDY, W1GDI, Communications Mgr.
GEORGE HART, WINJ, Natl. Emerg. Coordinator
ELLEN WHITE, W1WYM, Ass't. Comm. Mgr., Phone

ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide.
FRANK GILMORE, KSJF/1, Ass't. Comm. Mgr., G.W.

K2YFM Wins at 60 w.p.m. Last month we
gave you the results of the National Convention
Code Contest. This month it is our pleasure to
report on the Code Contest held at the Hudson
Division Convention, Oct. 13th. This was ably
conducted by W2CVW, assisted by K2IWC.
There were successive elimination runs; clear
text tapes were run at increasing speeds. Lots of
interest! Edward J. Sheehy, K2YFM, Allendale,
N. J. was announced as the code contest winner.
He made accurate typewritten copy at 60 w.p.m.
competing with a group of other operators.
PY7VE was the runner-up.

Using Amateur Radio To Send Holiday
Greetings. It's that time of year again, and no
better time, to demonstrate Amateur Radio.
Your message handling capability can readily be
used to exchange Christmas or New Year's greetings.
Receiving a radiogram can be a pleasant
surprise.

We suggest getting off your messages into ap-
propriate networks early to allow time for their
relaying to destination ahead of the peak traffic
days. Make the addresses complete and correct
to facilitate delivery.

To insure reasonable speed and accuracy put
your message in the hands of amateurs who spe-
cialize in traffic handling. Such operators are
best equipped in know-how and the techniques
of seeing the message through. If you are not
on the air, you still can file your amateur radi-
ogram with any active local ORS or OPS who re-
ports into h.f. nets, or with OBS supporting v.h.f.
ets and having relay connections into the
National Traffic System.

On Message Originations; International
Limitations. This personal pleasure and chal-
lenge in sending messages from your own ama-
teur station. Consult the booklet Operating an
Amateur Radio Station for message form and to
find out all sorts of details about message han-
dling, message count etc. For each message you
get off by radio, starting this at your own station
your own call can rightfully go in the station-of-
origin part of the message. International com-
munications for third parties are prohibited (see
Chap. 8, International Regs, License Manual)
with certain exceptions. Happenings, June '62
QST, lists the 16 countries having agreements
with the U.S.A. permitting specified amateur
work. Canada has similar special agreements
with the U.S.A., Venezuela, Costa Rica, Mexico,
Chile, and Honduras. But we amateurs within the
U.S.A. can freely handle traffic with each other,

barring any compensation, direct or indirect. See
FCC's Sec. 12.102 as pertinent.

If you enjoy casual operating and have lots of
time you can make a project out of finding an
amateur at or near the destination for your
traffic, combing the bands for a dependable sta-
tion to handle your message direct. But you are
perhaps taking more of a gamble to locate such
a station unless you can find in Station Activities
that your man is engaged regularly in traffic
handling. A "directional QO" also can be used to
try to find stations at the point where a mes-
sage is directed. This is less practical than using
the organized amateur nets or traffic facilities,
especially when you have more than one message.
Working with a net avoids the disappointment of
running into an amateur who has his interests
only in other directions. So we suggest using
organized amateur radio means, the useful c.w.
and voice networks.

Your Section Net, whose frequency and time
of operation is given in the ARRL Net Direc-
tory (sent on request) or in Station Activities,
can most often solve any problem of a reliable
spot for placing your traffic. Some time before
the hour for net operation you tune up quietly
on the net frequency. At net time when the NCS
calls for stations to report in you call in. You state
to the NCS that you have traffic, indicating the
number and destinations of messages. Name the
city if this is in your own state; otherwise for
distant points (beyond Section boundaries)
merely say that you have "thru" traffic. The
NCS will advise you to stand by or designate
which station to give your traffic to. After you

On the right, West Virginia SEC WB5SA, General Chair-
man for the 1962 West Virginia State Convention, wishes
luck to W8JM, SCM of W. Va., the chairman-to-be
for the '63 ARRL affair.
KC4’s in Antarctica. We remind amateurs of the calls and locations of the stations presently assigned in Antarctica and also give their frequencies where known.

**KC4USV, McMurdo Sound.** 14.265 kc.,
14.250 kc., and
14.350 kc. for
Pac. and Eu.
work.

**KC4USN, South Pole.** 14.270 and
14.250 kc.

**KC4USH, Cape Hallet.** 14.250 and
14.300 kc.

**KC4USR, USS Arneb.** When south
of 60° south
latitude.

**KC4USB, Byrd Station.** 7 and 14 Mc.

Inactive: KC4USK at Elizabeth; KC4USM,
auroral near Byrd; KC4USX, AIRDEV
RON near McMurdo; KC4USC, Field
 Traverse project. Also: KC4USP USS Dur
ant; KC4USE USSCGC Eastwind; KC4UST,
USS Edisto; KC4USG USS Glacier; KC4
USS USS Staten Isl.; KC4USD USS Tom
bighcer; KC4AAA USNS Ellanin, National
Science Foundation.

Clear with this station and it receipts for or
QSLs a message, it is successfully on the way.
Enter its call and handling data right on the
ARRL message blank or other form for a record
of the handling. In receipting for a message an
operator accepts the moral responsibility to see
it on its way to the best of his ability. (You can
be part of this traffic group all year round just by
brief participation in the net whenever you can
report in. Otherwise work into the system and
nets for starting your traffic on special holidays
or as desired.)

**ARL-Texts.** Individually worded radiograms
are most popular ordinarily. For emergencies as
well as holiday situations which develop traffic
in volume, ARL-check numbered-text messages
can be used to cut circuit time. This device helps
the fraternity do a bigger public service job.
Each ARRL Log Book has the list of such texts.
A radiogram to ARRL will bring an extra copy
of this list (CD Form 8) to any amateur.

Precautions: When a text is represented by a
number, ARL should be sent both in the check and in
the text ahead of the spelt out number. If one
gets an ARL-text for his city, it is his responsibility
as receiving operator to expand this fully for
delivery. (Numbers merely identify a particular
text to amateurs and are meaningless to the
addressree.)

**General Holiday Communication.** If you
specialize in voice work the holiday season is a
good time to invite persons besides licensed ama-
teurs to talk to their friends and convey greetings
back and forth across the U.S.A. Remember, of
course, to log the names of “third parties” as re-
quired by FCC’s 12.136 (b). Best luck with
holiday traffic!

--- F.E.H.
The fullest enjoyment of traffic handling can only be derived from the ultimate in both operating ability and station equipment. Now somebody is going to say that we said you can’t enjoy traffic handling unless you’re a hot shot operator and have a lot of power; but this isn’t what the above statement means. There can be a lot of fun regardless of your circumstances; but it is more fun the better your operating ability and the better your station equipment.

Perhaps your traffic work would be more enjoyable if you considered some of these aspects, instead of just struggling along in the same old rut, thinking of what a wonderful public service you are doing.

First, how about your operating ability? Do you handle all your traffic on phone? If so, you’re missing something. Briefly, is your procedure proper, clean, snappy, business-like? If you’re one of these casual traffic-handlers who thinks it doesn’t really matter whether the filling time comes before the date or afterward, or whether recommended procedure is used as long as the message gets handled, you’re cheating yourself out of one of the greatest satisfactions in amateur radio — that of doing a job properly and efficiently and thereby gaining the respect and admiration of your fellow workers.

How is your station set up? Can you work break-in c.w.? Fast push-to-talk on phone? Do you pack as good a signal as your power will allow? Is it a clean signal, devoid of key clicks or distorted modulation? Is your receiver good enough to separate signals for best possible reception?

All these things add up. The best operator with the best station makes the best traffic handling combination. Anything less than the best you can muster is an injustice to yourself. Yet, one hears all kinds of excuses for inferior performance. How often have we heard amateurs say that they just can’t seem to master the code.” How many can operate on 80 meters because they don’t have enough room for an antenna? How many abhor the thought of “making a hole out of a hobby”? The list of excuses is endless, but they all add up to one thing: “I’m too lazy.” We admire much more the amateur who frankly admits that he just goes on being a slob because he is too lazy to do otherwise, and then the one who connects all kinds of excuses, consciously or subconsciously, for his various shortcomings.

There is a difference between reasons and excuses. There is no excuse for being a low-grade traffic handler. If all you have are excuses, then let’s get with it and start doing it right. It’s a lot harder, perhaps, but a great deal more fun — W1NJM.

At the Lake Huron Amateur Radio Club picnic in August, SEC W8L0X presented the club with its League-affiliation charter. The snapshot above shows KBEFG (L) and KBGSW, secretary and president respectively, proudly displaying it.

Section NTS Nets are urged to report each month on form CD-125, either via your SCM or direct to headquarters, so your data can be included in the monthly summary. If you do not use the standard card report form, send us the information on a separate sheet so it will not be delayed in reaching us; many section net reports which are stuck on SCM monthly activity reports do not reach us until after our copy deadline. Be sure your report indicates the identity of the section net you net liaisons with, whether this is done direct or through another section net.

In a recent exchange of correspondence with old-timer W4BAZ, who was operating at high c.w. speeds about the time most people who now consider themselves old timers were in knee pants (or even three-screwed allow), he asks “Isn’t it necessary to have an in-Gnome home? What do you mean by the effect that c.w. is more difficult to master (and therefore a greater challenge), is more effective in handling formal messages, is faster and more accurate, will get the traffic through under rough conditions where voice fails, performs better under emergency conditions because it uses less power and simpler equipment and gives you infinitely more mileage per watt, and that it is an honor to be able to handle c.w. in an efficient manner and that such an operator is much more desirable than one who cannot do so?”

**BRASS POUNDERS LEAGUE**

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**More Than One-Operator Stations**

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*Correction from October issue.*
National Traffic System. Although so far the devastating long Skips has not been as devastating as expected, we think it fitting to mention the device customarily used by Central Area Net to combat such conditions. CAN Manager W9DYG tries to line up another station at some distance from the NCS (often in another area) to QNB or QNG, depending on how long the skip actually is. When skip is only 300 miles or so, another station in the same area can often do the job; but when the skip extends to 900 or a thousand miles, it is good to have an alternate NCS in another area to QNG, for he can hear all near net stations and is in a good position to control the net. In such cases, judicious use of QNG and QNY is required, for very often net stations cannot hear each other and QNB becomes necessary. W9DYG is now busyly working in lining up EAN stations to assist CAN operations at the same time he is offering CAN stations to assist in the operation of EAN. This is a type of inter-net cooperation not envisaged in the original CD-24, nor indeed in the present one, but it definitely has its place. It requires much net "savvy," close acquaintance with the QN signals, and ability to improve; and it isn’t always the solution to the problem, but it helps.

A.R.R.L. ACTIVITIES CALENDAR
(Dates shown are per G.M.T.)

Dec. 6: CP Qualifying Run — W60WP
Dec. 18: CP Qualifying Run — W1AW
Jan. 1: CP Qualifying Run — W60WP
Jan. 5-6: V.H.F. Sweepstakes
Jan. 12-11: CD Party (e.w.)
Jan. 16: CP Qualifying Run — W1AW
Jan. 19-21: CD Party (phone)
Feb. 9-11: DX Competition (phone)
Feb. 2-17: Novice Roundup
Feb. 7: CP Qualifying Run — W60WP
Feb. 15 — Frequency Measuring Test
Feb. 23-25: DX Competition (e.w.)
Feb. 21: CP Qualifying Run — W1AW
Mar. 9-11: DX Competition (phone)
Mar. 23-25: DX Competition (e.w.)
June 8-9: V.H.F. QSO Party
June 22-23: Field Day

OTHER ACTIVITIES
The following lists date, name, sponsor, and pane reference of QST issue in which more details appear.
Transcontinental Corp., All TCC directors report the same trouble—getting enough stations with the needed combination of operating ability and power. As far as TCC is concerned, this is our greatest need at the moment. Presently, stations are using 50 meters for most TCC schedules this winter. TCC Central stations have been awarded to WMOJZ, K2UQY and K9YQV.

September reports:

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The TCC roster: Eastern Area (W1MSU, Dir.) — W1AG NJM SMU, W2ZEB, WA20IPG, W3EML, W4DLA, W6s CHT UPH, V63s FAS FES, Central Area (K1AKP, Dir.) — JOZ, DXY GY, YAF FSP, ZRK, JOX NY, JHN UGY, W6s SCA LOG, Pacific Area (W7DZX, Dir.) — W7s RTO HIC, KI6s KCB DXY G1D, W7DZX, K7s NHI NWP, W6s WHE /7 KQD.

With the AREC

Nearly every subject has a history of past discussion, and the National Calling and Emergency Frequencies is certainly no exception. Going back through past issues of QST, we find it cropping up again and again. It must have been a good idea to merit all that consideration, but no one has ever come up with a good, workable system that was acceptable to everyone.

The NCEFIs were based on an original idea for a National Emergency Net promulgated by this headquarters in about 1948. Two continents of amateurs were signaled up, one for phone and another for CW. Such an amateur or group was expected to appear on one of the NEN frequencies, ready for emergency action when alerted by headquarters. Being selected as one of the NEN stations carried with it a certain amount of prestige, but the idea didn’t work because the NEN stations were hard to alert and not particularly sensitive to emergencies not in their own areas. The plan was modified to give more action and less prestige and eventually withered as stations were dropped for inactivity until only a handful was left. The calling frequencies were adopted, however, and expanded to other bands under pressure with a new arrangement (see box, page 104).

Theoretically, there is nothing wrong with the present setup for the National Calling and Emergency Frequencies. Practically, it doesn’t work because we don’t make it work. Nearly everybody thinks it is a good idea, but only a few ubiquitous reliable are willing or able to devote the time and effort required for implementation. Down through the years, our NCEFIs have been subjected to periodic discussion involving criticism, alternatives, different frequencies and the usual denunciations of ARRL policy. Regarding the latter, the principal allegation has been that the League has not pushed hard enough.

Well, maybe not. For many years we have carried the list of NCE frequencies in almost every issue of QST, along with information concerning their use, and occasionally have entered into discussions to encourage utilization. Once in a while a campaign to popularize them has been conducted by interested amateurs and has been given encouragement and publicity in QST and in bulletins. Again, amateurs have come forward with well-thought-out proposals for changes. Five FCC and local conferences brought use of NCEs on a regulatory basis, only to be booted down by the amateur irateness in general — proving that amateurs are not interested enough in emergency work to set aside a part of our bands for that exclusive purpose.

And still the subject keeps coming up, sometimes from amateurs who seem not even aware that we already have calling frequencies, quite often the appeal is for leadership and direction from headquarters, but usually this appeal is qualified by a list of objections or non-observations if the discussion doesn’t favor their ideas.

Whatever plan is finally decided on as official, one thing is sure: observance will be voluntary. This means that if a majority don’t favor it, there is no use setting it. How do you go about getting majority approval of a plan, when a dozen minorities will have nothing to do with their own plan.

We have, for some months, had in mind a set of rules for effective utilization of the NCEFs, but we are in no hurry to stick our necks out until or unless the demand for such rules and the willingness to abide by them is apparent from the attitude of the fraternity. — W4NJA.

Kansas SEC K8HBF sends along a report for the month of May, 1962, on the Kansas Storm Warning Net submitted by K8BMB that definitely merits summarizing. This is really a group of dedicated amateurs, active almost every night. The highlights of the month’s activity are as follows:

May 1: Net operated by K8HGI handling emergency weather traffic from severe weather conditions in Missouri and Iowa.

May 2-10: Regular sessions, reports of hot, dry windy weather.

May 17: Severe weather alerts, tornado, high winds, rain and hail in the west. Twenty-five stations participated.

May 18: Tornadoes, 80-m.p.h. winds in central part of state. Thirty-nine stations took part.

May 20: Bad weather cells and both confirmed and unconfirmed tornadoes reported and watched along with high surface winds and electrical disturbances. Twenty-nine stations.

May 21: Severe weather threatened but did not materialize. Thirty-one stations.

May 24: This was the date of the most severe storm for several years, and makes an emergency communications story in itself. The net was opened at 2200 GMT by K9FPU operating Newton Amateur Radio Club station W0BZN, to institute watch on six confirmed and numerous unconfirmed funnel clouds in the central part of the state. Information was also channeled into the net from a weather observer being maintained on 2 meters. Hutchinson was first hit by a tornado and hail up to 8 inches in diameter (w.m.)! then tornadoes made several passes at Newton and wrought great destruction, disrupting power and communications. K8RMB was forced to leave the air, and Club station W0BZN went on emergency power, K6FIF also carried on during the height of the storm on 2 meters.

May 26: The net held its regular session, closed, then was reactivated for severe weather again. Five tornadoes were reported and tracked throughout the state. Net control was shifted from W0BZN to K6HIF and K8HIGI, with more than 30 stations participating before being secured.

May 27: Again extra hours were spent in sessions as tornadic activity continued. Seventeen stations took part in extremely heavy QRN.

May 28: Once again warnings were out. High winds, hail and one unconfirmed funnel were tracked. Net was closed with contact was lost with all stations at 0430 GMT.

May 31: The net opened at 0000 GMT with four areas of severe weather reported throughout the state. However, the build up was unnecessary, as no damage was wrought despite the appearance of two full-blended tornadoes. The net was closed at 0630 GMT after 41 stations had reported in with information.

This is the Kansas Weather Net on 3810 kc. — right on the job when needed.

— — — —

At 1725 GMT on Sept. 15, VETARB, on the British Columbia AREC Net, reported a 7-year-old girl seriously ill at an Indian reservation on Vancouver Island, VETBIV telephoned long distance to a doctor in Vancouver as well as consulting his own doctor, and both agreed on a diagnosis of pneumonia. VETOFO arranged for air evacuation of the child to a hospital. From start to finish, the operation lasted one hour, at the end of which time the child was safely hospitalized. — VETBP, SCM B.C.

— — — —

On Sept. 3, early in the evening, Bryan, Texas, K5JQJ, received a call asking for assistance in the search for a little girl missing from her home. K5KAZ was set up as base station while mobiles K5s JOT XNL KNE EPF WIC and DNB joined the searchers. Other amateurs assisting were K5s MLT WJ3 GIC and W5BU. Shortly after 2200 local, K5GIC found the little girl unharmed in a ravine near her home.

December 1962
During the SET week end (Oct. 6 & 7), Maine was being lashed by severa storms. KIDYG, EC for Hancock County, decided to forego the planned SET drill in the prospect of a real emergency, and concentrated on monitoring on 75 and 2 meters, with occasional net meetings to swap weather information and other news. Contact was also maintained with other states. Approximately fifty amateurs were involved in this alert. — KIDYG, EC Hancock County, Maine.

An explosion and fire at a paint factory in San Leandro, Calif., on Sept. 12 gave the Southern Alameda County Emergency Net their baptism of fire under actual disaster conditions. Operating on six meters, mohles W7RYN, W7FCS and K6S were at the scene of disaster in constant contact with base control station WA6BZA. later WA6IRO. K6DQO relayed traffic from the American Red Cross chapter house to the fire chief at the scene. Some of the communications problems encountered included getting evences together with people offering their homes for shelter, procurement of lumber to board up blown out windows, calls for supply vehicles of various kinds, procurement of coffee, fresh water and other necessities. Other amateurs who assisted included K6S QKD RMD, W7RQ AWI NEL K6A YLR. — WA6BZA.

On Aug. 22 a gasoline truck crashed into a telephone pole and burned, cutting off telephone communication between Oak Ridge and Knoxville, Tenn. K4OUK, who first heard about the trouble, alerted Anderson County EC K4VOP. From 1900 until shortly after midnight channels were maintained among Oak Ridge, Norris, Rockwood, Ozone and Knoxville on 50.7 Mc., even though most telephone communication was restored late in the evening. Communication was conducted on behalf of hospitals, three UCNC plants and the Red Cross. Stations participating included K4Q QOP ONU WOE WKB PUM VZI YVE EAK IUF KXYL, W7A SG YNG YPN HPN DNF NCV GMA, W4AS FPZ GDY COT ADM AUX K4VOP, BC Anderson County, Tenn.

The Sarasota-St. Petersburg area experienced heavy flooding during Sept. 20-21, necessitating action by the AREC of both Florida sections. Shortly after QFN had completed its regular session, WA4JH broke in to report that Sarasota had lost electricity and telephones. This was relayed to the press in Tallahassee by W4MLE, Via W4T, the Miami Weather Bureau, requested weather observations from Sarasota. Contact was established between WA4JH and K4QXF in Sarasota, and K4UBB, Western Fla. RM, joined the net. For some time thereafter informal traffic flowed over this route, eventually culminating in Sarasota being declared a disaster area. W4MLE contacted the state c.d. director in Jacksonville and arranged for him to keep contact with Sarasota via QFN on 3450. Later, at the urging of state c.d., Communications Officer W4UHY, several of the stations were moved to 3910 kc. sidewand. QFN continued operation informally as a net, and handled formal traffic for Egin Air Force Base regarding USAF installations in the Sarasota area. Approximate operating time was from 0130 to 0820 GMT. Three traffic operators who stayed right with the job to the end were K4UBB, W45SA and, especially, WA4JH. The entire operation was a great credit to the AREC. — W4MLE, SEC Western Florida.

When fire razed the telephone exchange room of the Pacific Power & Light Building in Whiting, Mont., the evening of Aug. 25th, the town was left with a shortage of communication. The Flathead Valley 6 Meter Net was activated and remained on standby until two days later when normal service was resumed. — WT7KJH, SEC Mont.

August reports were received from thirty-four SECs representing 15,473 AREC members. This is five more reports than ever received for August before, and roughly almost 3,000 more AREC members than the previous August record. What's more, the number of AREC members shown is the second-highest on record for any month previously. But if you think this is good, wait you'll see the Sept. report!


RACES News

RACES amateurs in Texas' District 31 were activated on Sept. 4 to assist in the search for a missing child at Garner State Park in Uvalde County, Texas. The account received is not too clear, but here it is just the way we received it. K5IUS called W5BRC on 7200 kc. at 2241 GMT saying he needed some information from San Antonio on the lost child, which he had to report to c.d. headquarters at the airport in Uvalde. Their c.d. frequency was crystal controlled at 3905 kc. At 2133 GMT, K5VFC in San Antonio broke in on 7230 kc., and with wonderful cooperation from him, W5BRC talked to W5DRO on combined radio and landline link. The latter agreed to go to 3905 kc. At 2202 GMT, W5BRC joined K5IUS, K5IQI, and K5TSZ on 3905 kc. At 2217 they were joined by W5DRO, and W5BRC acted as relay between K5IUS and W5DRO. Due to conditions and the emergency situation W5DRO then called the District 31 RACES Net into emergency session at 2255 GMT on 3905 kc. The following day the net again met on 3905 kc., with W5BRC doing the net controlling. Those in the above, were W5TSP/mobile for supplying a much needed San Antonio contact until W5DRO was available; K5MQR, who took his mobile to the park; W5VB, who supplied liaison between the 80 and 40 meter nets; W5VYC, who remained on frequency the second day to provide continuing contact with San Antonio; W5BDR, who established another San Antonio contact on 75 meters; W5CIT, who gave unpublished records of his time and effort and as relay on 75 meters; and W5IHR, who effectuated close cooperation between c.d. units in Bexar and Uvalde Counties and helped organize ground-air communication.

The story has a sad ending: the girl was found drowned. But without the aid of the RACES net, the search would have been much more poorly organized.

This interior shot shows how members of the Kankakee Area Radio Society outfitted a bus as a c.d. communications control center. That's W9VQC, c.d., communications director, demonstrating one of the units. Note the control panel for the 3-kw., gasoline-driven generator at the left rear. Besides being equipped to operate all amateur bands, the unit also contains a galletry. KARS members and local business establishments of Kankakee, Ill., donated labor and materials.
ELECTION NOTICE

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. Nomination 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.

Nominating 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 reasons of expiring memberships, individual signers uncertain or ignorant of their membership status etc.

The following nominating form is suggested. (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRl. 
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the above-mentioned Section, 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. B. Handy, Communications Manager

Section Closing Date SCM Present Term Ends


Island Feb. 11, 1963 Mrs. Helen M. Maille Apr. 10, 1963

Alberta Feb. 11, 1963 Harry Harold Apr. 10, 1963


Cleveland Area Council Amateur Radio Clubs, Gertrude E. Maxim, W80HS, Soc'y., 2346 Waudville Drive, Brook Park 42, Ohio.


The Ohio Council of Amateur Radio Clubs, Ernest E. D'Angelo, KB7UM, 3134 Ontario St., Columbus 24, Ohio,

December 1962

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NATIONAL CALLING AND EMERGENCY FREQUENCIES (KC.)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Call Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>3550</td>
<td>3875</td>
</tr>
<tr>
<td>14050</td>
<td>14,225</td>
</tr>
<tr>
<td>28,100</td>
<td>29,640</td>
</tr>
</tbody>
</table>

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 reverted immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: e.w. — 3545, 7050, 14,060; phone — 3765, 14,100, 28,230 kc.

SUGGESTED RTTY OPERATING FREQUENCIES

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Call Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>3620</td>
<td>7040</td>
</tr>
<tr>
<td>14,000</td>
<td>21,090</td>
</tr>
</tbody>
</table>

GTM CONVERSION

To convert to local times subtract the following hours:

- ADST — 3
- AST — 4
- EDST — 4
- EST — 3
- CDT — 4
- CST — 4
- MST — 7
- MST — 7
- SST — 8
- Hawaiian — 10
- Central Alaska — 10

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made Dec. 18 at 0230 GMT. Identical tests will be sent simultaneously by transmitters on 1805, 3555, 7080, 14,100, 21,075, 28,080, 59,900 and 145,800 kc. The next qualifying run from W6GDP only will be transmitted Dec. 6 at 0000 Greenwich Mean Time on 3590 and 7120 kc. CAUTION: Note that since the data are given per Greenwich Mean Time, Code Proficiency Qualifying Runs in the United States and Canada actually fall on the evening previous to the date given: Example: In converting, 0230 GMT Dec. 18 becomes 2130 EST Dec. 17.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

W1AW conducts code practice daily at 0230 GMT on all frequencies listed above with speeds of 15, 20, 35, 50, and 35 w.p.m. on Tuesday, Thursday, and Saturday, and at 5, 7, 14, and 13 w.p.m. other days. Approximately 10 minutes practice is given at each speed. To check your copy, the tests used on several transmissions are listed below. The order of words in each line of QRT is sometimes reversed. To improve your list, try to send in step with W1AW.

Date: Subject of Practice Test from Oct. QST
Dec. 3: "It Seems To Us . . ." p. 9
Dec. 6: "The Ultimate Easter . . ." p. 11
Dec. 15: "Some Thoughts on Power Supplies . . ." p. 28
Dec. 17: "The Towing Problem . . ." p. 33
Dec. 21: "2-Meter Moonbounce . . ." p. 52

W1AW SCHEDULES

(December 1962)

Operating Visiting Hours

Monday through Friday: 3 P.M.—5 A.M. EST.
Saturday: 7 P.M.—3 A.M. EST.
Sunday: 3 P.M.—10:30 P.M. EST.

The ARRL Maxim Memorial Station welcomes visitors. The station address is 225 Main St., Newton, Conn., about 5 miles south of West Hartford. A map showing local street detail will be sent on request. The station will be closed Dec. 25, Christmas Day, and Jan. 1, 1963, New Year’s Day.

Operating Frequencies

C.W.: 1805, 3555, 7080, 14,100, 21,075, 28,080, 59,900, 145,800
Voice: 1820, 3845, 7255, 14,280 (a.a.b), 21,330, 29,000, 50,700, 145,800

Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibrating purposes.

Official Bulletins

Bulletins containing latest information on matters of general amateur interest are transmitted on the above frequencies according to the following schedule in Greenwich Mean Time:

G.W.: Monday through Saturday, 0100; Tuesday through Sunday, 0500.
Voice: Monday through Saturday, 0230; Tuesday through Sunday, 0130.

Caution: Note that in the U. S. and Canada, because times are GMT, bulletins hours actually fall on the evening of the previous day.

WIAW CONTACT SCHEDULE

Would you like to work W1AW? W1AW welcomes calls from any amateur station in accordance with the following schedule:

<table>
<thead>
<tr>
<th>Time</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0300-0400</td>
<td>7255*</td>
</tr>
<tr>
<td>0415-0500</td>
<td>3555^</td>
</tr>
<tr>
<td>0515-0600</td>
<td>7255*</td>
</tr>
<tr>
<td>0600-0700</td>
<td>14,280</td>
</tr>
<tr>
<td>0700-0800</td>
<td>7225</td>
</tr>
<tr>
<td>0800-0900</td>
<td>14,280</td>
</tr>
<tr>
<td>0900-1100</td>
<td>21,280</td>
</tr>
<tr>
<td>1100-1300</td>
<td>14,100</td>
</tr>
</tbody>
</table>

* General-contact period on stated frequency begins immediately following transmission of Official Bulletin which begins at 0300 and 0430 on phone and at 0100 and 0500 on e.w. Starting time is approximate.

** W1AW will first listen for Novices before checking the rest of the band for other contacts.

^ Following period will be conducted on either 21,075, 21,330, 28,080 or 29,000 kc.

* Operation may be on a.b. as announced at the beginning of the period.

104 QST
DX Century Club  The following list contains the call letters and country totals of holders of the DX Century Club Award who have submitted confirmations to ARRL for the period from October 1, 1960 thru September 30, 1962. New members in DXCC for the period from September 1 thru September 30, 1962, also appear in this list. DXCC members qualifying for the Honor Roll appear in the Honor Roll list below. Since the necessary space to run the complete DXCC roster is not available, the total number of DXCC certificates issued as of September 30, 1962, being 8755, this list contains only the calls and totals of those who have shown an active interest in their DXCC rating over the indicated 21-month period.

### Honor Roll

The DXCC Honor Roll consists of the top ten numerical totals in the DCCC. Position in the Honor Roll is determined by the first number shown. The first number represents the part of the country's total country that has any credits given for deleted countries. The second number shown represents the total DXCC credits given, including deleted countries. Positions in cases of ties are determined by date of receipt. All calls shown represent submissions received from September 1 thru September 30, 1962.

### Radiotelephone

<table>
<thead>
<tr>
<th>Call Letters</th>
<th>Total Calls</th>
<th>Total DXCC Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3BIS</td>
<td>332</td>
<td>294</td>
</tr>
<tr>
<td>W3BFX</td>
<td>332</td>
<td>294</td>
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<td>W3RVI</td>
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<tr>
<td>W4AMU</td>
<td>332</td>
<td>294</td>
</tr>
<tr>
<td>W4AU</td>
<td>332</td>
<td>294</td>
</tr>
</tbody>
</table>

(Continued on page 182)
**Station Activities**

**EASTERN DIVISION**

- **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 SCM's for inclusion in these columns. The addresses of all SCM's will be found on page 6.

- **Station Activities**
  - **ABSORBING PENNSYLVANIA**—SCM, Allen B. Breiniger, W32RQ—SEC; W32UD, PAM; K38HU, RM; W38ME, VAP; W38FQ, FAM; W38Q. A new section appeared in the SCM and he has been helped by a member of the club, K38AIV, who is active on 2 meters. He is operating under the call K32BU and is active on 2 meters.
  - **SCM, John B. Brenner, W32IR.**

**SOUTH-BEHIND THE BARRICADE**

- **SOUTHERN NEW JERSEY**—SCM, Herbert C. Brooks. K2BIQ—SEC; K2ARY. PAM; W21M. RM; W22WV, W22Y and W20YM. Volunteer. Also SCM, Hal E. Smith, W22BY, who is active in New Jersey and is working with the New Jersey Military Radio Association. He is helping with the public service activities of the club.

**MARYLAND—DELAWARE, DISTRICT OF COLUMBIA**—SCM, Andrew H. Abraham. W32YJ—ATSC. Has kept the SCM informed of all new equipment, both new and old, and has kept the SCM informed of the progress of the transmitting equipment. He is active on 2 meters and has been heard on W32RAI.

- **SCM, John H. Miller, K32IB.**

**WESTERN NEW YORK**—SCM, Charles T. Hansen, K32HUK—SEC; W32LEX, RM; W22UF, W22ZB and W22YF. Volunteer. Also SCM, Hal E. Smith, W32BY, who is active in New York City and is working with the New York City Military Radio Association. He is helping with the public service activities of the club.

- **SCM, John H. Miller, K32IB.**
HALLICRAFTERS MANAGEMENT:

"Can we build a quality receiver, capable of all important coverage from 85 kc through 30 mc, with at least 3-step variable selectivity, including a transmitter-type V.F.O. that can be locked on frequency, with sensitivity under 1 µv on the high frequency range, a high order of mechanical and electrical stability, that weighs under 20 lb., is extremely compact... and will sell for about $400?"

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Exceptionally versatile and compact triple-conversion, super-heterodyne communication-type receiver. V.F.O. can be used as crystal locked oscillator; Selectivity: Variable in 3 steps, 0.5—2.5—5.0 kc. Crystal-controlled 1st and 3rd oscillators. Selectable sidebands, constant tuning rate. Sensitivity: less than 1 µv on AM, less than ½ µv on SSB/CW. T-notch for up to 50 db. attenuation to unwanted heterodyne in I. F. pass band. I. F. type noise limiter. Audio inverse feedback. Crystals provided for 3.5—4.0, 7.0—7.5, 14.0—14.5, 21.0—21.5, 28.5—29 mc. Four add'l. crystal pos. for 500 kc. segments between 85 kc. and 30 mc. 100 kc. crystal calibrator included. Size: 15" x 7¾" x 13". Net wt. 18 lb. Amateur net price: $379.95.

HA-10 Low freq. tuner adapts SX-117 for 85 kc.—3 mc. $24.95

Additional searching questions and exciting answers will be coming your way from Hallicrafters soon.

**new SX-117** Triple-conversion communication receiver by **hallicrafters**

5th & Kostner Aves., Chicago 24, Ill.

Outstanding performance on SSB, AM and CW with absolutely no compromise on any mode!

"SSB ADAPTER"—Here's the filter-type SSB generator amateur operators everywhere have been asking for! Bandswitching 80 through 10 meters... more than 30 db sideband suppression... more than 45 db carrier suppression! When used with the Viking "Valiant" or "Valiant II" it places 275 watts P.E.P. at your command—gives you the punch and penetration necessary for solid communications on today's crowded bands!

Two compact units and interconnecting cables... RF unit is only 8" wide—may be placed on your operating desk—power supply unit may be placed in any convenient location. Unique design features built-in multiplier requires VFO input only—band-pass interstage couplers require no tuning—design and front panel layout make operation practically "foolproof"! Superb audio fidelity and balanced audio response; excellent sideband, spurious and carrier suppression. Other features: positive VOX and anti-trip circuits with built-in anti-trip matching transformer and adjustable VOX time delay.

Cat. No. 240-305-2—Wired and tested with remote power supply, tubes crystal filter, less microphone. $36950

"VALIANT II"—Newly restyled, the "Valiant II" gives you outstanding flexibility and performance in a compact desk-top rig! Bandswitching 160 through 10 meters—delivers a full 275 watts input CW or SSB (with auxiliary SSB exciter or the new Viking SSB Adapter) and 200 watts AM! Low level audio clipping prevents overmodulation and increases modulation level and intelligibility—differentially temperature compensated VFO provides the extreme stability necessary for peak SSB operation! High efficiency pi-network tank circuit—final tank coil is silver-plated. Other features: complete TVI suppression; timed sequence (grid block) keying; high gain push-to-talk audio system built-in low pass audio filter; self-contained power supply; and single control mode switching.

AS AN EXCITER—Drives any of the popular kilowatt level tubes, and provides a high quality speech driver system for high power modulators.

SSB OPERATION—Provision for plug-in SSB operation with no internal modification necessary. Rear panel fittings provided for VFO output and SSB input, connections for remote control of final amplifier bias and VFO keying through the VOX control of the SSB adapter.

Cat. No. 240-105-1—Kit with tubes, less crystals. $37500
Cat. No. 240-105-2—Wired and tested with tubes, less crystals. Amateur Net $495.00

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WASECA, MINNESOTA, U.S.A.

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Park-Armature Co., 1218 Columbus Ave., Boston 20, Mass.
Heights Electronics, Inc. 1145 Halsted Street, Chicago Heights, Ill.
B and S Electronics, Inc. 6326 W. Roosevelt Rd., Oak Park, Ill.
Radio Comm. and Engr. Pineshurst Place
E. F. JOHNSON COMPANY
Charlotte 9, N. C.
Pick your power and features from these popular Viking Transmitters!

"INVADER"—More exclusive features than any other Transmitter/Exciter on the market! Specially developed high frequency, symmetrical, multi-section band-pass crystal filter for more than 60 db. sideband suppression, more than 55 db carrier suppression! Instant bandswitching 80 thru 10 meters—no extra crystals to buy—no realigning necessary. Delivers solid 200 watts CW and P.E.P. SSB input; 90 watts AM (25 to 30 watts output-upper sideband and carrier). Built-in VFO—exclusive RF-controlled audio AGC and AI.C (limiter type) provide greater average speech power. Wide range pi-network output smooth VOX and anti-trip circuits. Fully TVI suppressed. Self-contained heavy-duty power supply. Wired and tested, with tubes and crystals.
Cat. No. 240-302-2 Amateur Net .................. $619.50

"INVADER 2000"—All the features of the "Invader", plus the added power and flexibility of an integral linear amplifier and remote controlled power supply. Rated 2000 watts P.E.P. (twice average DC) input on SSB; 1000 watts CW; and 800 watts AM (250 to 300 watts output-upper sideband and carrier). Wide range output circuit 40 to 600 ohms (adjustable). Final amplifier provides exceptionally uniform "Q". Exclusive "push-pull" cooling system. Heavy-duty multi-section power supply. Wired and tested, with power supply, tubes and crystals.
Cat. No. 240-304-2 Amateur Net .................. $1229.50

"HIGH POWER CONVERSION"—Take the features and performance of your "Invader" ... add the power and flexibility of this unique Hi-Power Conversion and you’re "on the air" with the "Invader 2000". Completely wired and tested, includes everything you need—complete the entire conversion in one evening.
Cat. No. 240-303-2 Amateur Net .................. $619.50

"ADVENTURER"—Completely self contained single knob bandswitching 80 thru 10 meters ... effective TVI suppressed ... and puts 50 watts of power into a rugged 607 transmitting tube. Operates by crystal or external VFO control. Front panel meter switching permits monitoring of the final grid of plate currents ... keying is clean and crisp. Wide range pi-network output with tubes, less crystals.
Cat. No. 240-181-1 Kit ................................ $69.95

10 METER "PERSONAL MESSENGER"—Two models: 100 milliwatts for short range; 1 watt for extended range—11 transistors and 4 diodes-super-heterodyne receiver with tuned RF amplifier gives excellent sensitivity two stage transmitter punches signal home, "Quiet" control silences receiver on standby. With battery compartment for penlight cells (less cells) Rechargeable battery and other accessories available.
Cat. No. 242-103 100 milliwatts .................. $109.50
242-104 1 watt ................................... $129.50

RANGER II—Now a new version of the popular 75 watt CW or 65 watt AM "Ranger". The Ranger II transmitter also serves as an RF/audio exciter for high power equipment. Completely self-contained instant bandswitching 160 thru 6 meters! Operates by built-in VFO or crystal keying, TVI suppressed. Pi-network load matching from 50 to 500 ohms. With tubes, less crystals.
Cat. No. 240-162-1 Kit .................. $249.50
240-162-2 Wired, tested .................. $389.50

FIVE HUNDRED—Full 600 watts CW—500 watts phone and SSB (P.E.P. with auxiliary SSB exciter). Compact RF unit designed for desktop operation. All exciter stages ganged to VFO tuning—may also be operated by crystal control. Instant bandswitching 80 thru 10 meters—TVI suppressed—high gain push-to-talk audio system. Wide range pi-network output. With tubes, less crystals.
Cat. No. 240-500-2 Wired, tested .................. $1050.00
Wise Amateur Radio operators know that they can depend upon Heath for quality, dependability and performance at lowest cost! Savings realized through easy, do-it-yourself kit construction, make it possible for the radio amateur to equip his station with complete facilities at savings of up to 50%! You also enjoy latest engineering design and features for top performance and convenient operation. Whatever your need, whatever your interest... "Mobile", "Fixed", AM, CW or SSB... there's a Heathkit product to fill it!
The handy accessories shown above are only a few of the many money-saving Heathkits available to make better contacts, more conveniently, and with added fun.

1. MONITOR SCOPE: Specially designed for Amateur use! Displays envelope, AF and RF trapezoid patterns. Ideal for checking "flat-topping" and non-linearity in SSB linear amplifiers, observing modulation characteristics of AM & SSB transmitters plus quality of received signals. Use on amateur bands 160 through 6 meters. Built-in two tone test generator. 10 lbs.
   Kit HO-10...no money down, $5 mo. ........$59.95

2. REFLECTED POWER METER: Checks efficiency of antenna system by measuring forward and reflected power or standing wave ratio. Handles a peak power of well over 1 kilowatt and may be left in the antenna system feed line at all times. Matches 50 or 75 ohm lines. Covers 160 through 6 meters. 2 lbs.
   Kit HM-11...........................................$15.95

3. 100 Kc CRYSTAL CALIBRATOR: Perfect for checking VFO's, receivers and other communications gear! Provides precise output every 100 kc from 100 kc to 54 mc. Circuit is transistorized and battery powered for complete portability. .005% crystal included. 1 lb.
   Kit HD-20.............................................$14.95

4. RF POWER METER: Samples RF radiation near antenna to give continuous indication of relative power output of transmitter. Sensitive 200 ua meter. Requires no external source of power for operation. Covers 100 kc to 250 mc range. 2 lbs.
   Kit PM-2.............................................$12.95
Easy to Build Heathkits

5. "CANTENNA" TRANSMITTER DUMMY LOAD: Permits testing or servicing transmitting equipment "off-the-air"... no TVI, QRM, or FCC violations to worry about! Handles up to 1 kilowatt I.C.A.S. with less than 1.5 V. S. W. R. up to 300 megacycles. Features oil-cooled resistor (oil not included). 2 lbs.
Kit HN-31......................................................$9.95

6. "TUNNEL DIPPER": Exclusive with Heath!... a solid-state grid dip oscillator. Covers 3 to 260 mc. Improved circuit extends ambient operating temperature (0° to 120°F). Color-matched coils and dial scales. Battery powered, use it anywhere! Complete with rugged, epoxy coated coils, protective cover. 3 lbs.
Kit HM-10A.... no money down, $5 mo...........$34.95

7. VARIABLE FREQUENCY OSCILLATOR: Provides complete coverage of amateur bands, 80 through 2 meters. Rugged, reliable and loaded with special features for top performance and stability. Use with most transmitters designed for grid-block or cathode keying. All connecting cables furnished. 12 lbs.
Kit HG-10.... no money down, $5 mo..............$34.95

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ANTENNA SYSTEM

WITH 56 foot Spaulding Tower

WORTH OVER $500.00
or one of 24 other valuable prizes

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SECOND ANNUAL

CONTEST

Contest open to any Licensed Amateur on Planet Earth. • All entries must be postmarked no later than 23:30 GMT, 31 December 1962.

NOTHING TO BUY...
Here's all you have to do— Simply pick up an Official Skyhook II Entry Blank from your favorite Hy-Gain distributor and, in twenty-five words or less, complete the following statement: “If I were the New Product Manager of Hy-Gain, I'd ask my engineering department to develop an antenna design that would...” Send your entry to Hy-Gain Antenna Products, NE Highway 6 and Stevens Creek, Lincoln, Nebraska. All entries will be judged on the contribution the suggestion offered will make toward universally improving reception or transmission and will remain the property of Hy-Gain Antenna Products, Inc.

FIRST PRIZE... 3.5—500 MC including RBX-1 Rotator and Directional Indicator, DS-1 Disccone with range of 50 thru 500 mc., TH-4 Tribander, 402-B 40 Meter Monobander, 2BDP Multiband Doubled and 56’ Spaulding Tower.

2nd PRIZE—DB-24 Duobander, 20-40 meters

3rd PRIZE—18HT All Band Vertical

4th PRIZE—TH-4 Thunderbird Tribander

5th PRIZE—TH-3 Thunderbird Tribander

“Sorry, we must exclude entries from Cities, States or Countries where contests are prohibited by law.

BE A WINNER! Pick up an Official Entry Blank TODAY and submit your suggestion NOW to:

ANTENNA PRODUCTS
8403 NE Highway 6 and Stevens Creek
LINCOLN, NEBRASKA
Good news travels fast. And if you've been listening to local or DX bands you know that Gonset has come out with a new single side band transceiver that's everything you've been waiting for!

Of course you want the facts on the new Gonset GC-102, so here's the scoop. Whether you want to operate it barefoot or with shoes, the GC-102 is the best SSB transceiver you can buy!

Because the Gonset GC-102 receiver uses transistors and "hybrid" tubes, it operates from 12 volt DC with a minimum power drain!

Coupled with the Gonset GSB-201 Linear Amplifier, the GC-102 gives 1500 watts P.E.P. input.

**ONLY THE GONSET GC-102 SSB TRANSCEIVER GIVES YOU ALL THESE DELUXE FEATURES!**

- Mechanical filter used to generate side band.
- All bands, 80 through 10 meters, in basic 500 KC segments.
- 2-speed concentric dial drive with "coarse" tuning ratio of 20:1 (50 KC/revolution) and "vernier" tuning ratio of 100:1 (10 KC/revolution).
- Power input to final: 180 watts P.E.P.
- Receiver features dual conversion.
- Semi-digital dial presentation with 10 KC major divisions, 2 KC minor divisions.
- Highly stabilized VFO.
- Designed for mobile and fixed station operation.
- Separate AC and 12 volt DC power supplies.
- AC P/S forms pedestal for transmitter to match appearance of GSB-201 Linear Amplifier.
- "Edge-lighted" dial and illuminated "S" meter.
- 100 KC Crystal calibrator built in.
- Transceiver tunes WWV (15 Mcs) for calibration purposes.
- High voltage power supply is used only in "transmit" mode.
- VOX and speech amplifier sections are completely transistorized.

For the Gonset distributor in your community consult list on the next page.
GOTHAM VERTICALS DELIVER THE CONTACTS

THE ULTIMATE PROOF OF THE FINE PERFORMANCE OF THE GOTHAM VERTICAL ANTENNAS IS IN THE ACTUAL FIELD RESULTS, BY HAMS ALL OVER THE WORLD.

PROVEN! PROVEN! BY THESE EXCERPTS FROM UNSOLICITED TESTIMONIALS:

CASE HISTORY #71
"I am very delighted with the first V80 and want another for a different location." A. C., California.

CASE HISTORY #159
"I ordered a Gotham V40 Vertical Antenna and found it so successful that several others are wanting them, too. Will you please send me four more." W. A., Alaska.

CASE HISTORY #248
"I just wanted to let you know how pleased I am with my Gotham V80 antenna. I have worked a W.A.S. of 46/43, a WAC of 3/3, and DXCC of 14/12 in about 12 months." G. W., Maryland.

CASE HISTORY #111
"The Y160 did a beautiful job on a VE1 for me. Also, I forgot to take it down during the hurricane of last week. It is just as straight as it was when bought it." D. S., New Jersey.

CASE HISTORY #250
"I have one of your vertical antennas and have been having fine results on 10, 15, and 20 meters." N. P., Missouri.

CASE HISTORY #613
"I have never been happier with any antenna than I have been with the V80. I have worked all bands with it and have had tremendous success — i.e., DL4s, ZS3, etc., all solid copy." R. D. S., Penna.

CASE HISTORY #483
"My V80 is working wonders. I am able to maintain a 1:1 SWR all across the 40 meter band. After many years on 10, 15, and 20, the XYL and I are getting great kicks out of some of the lower bands." J. A., New Mexico.

CASE HISTORY #123
"I am full of praise for your vertical. In the recent field day, we went up to the mountains near here and QSO'd a KA2, K75, and on XE at 2100 P.D.T. on 15 meters. We got a 59 plus from the KA and KZ and 58 from the XE." D. P., Nevada.

CASE HISTORY #398
"Some months ago I purchased one of your V80 vertical antennas. I have had wonderful results with this antenna, and I think it was of far greater value than the small amount I paid for it." R. C., Utah.

CASE HISTORY #766
"The Gotham vertical takes almost no room. I don't see how I could have used any other type very well. Sure do appreciate the fine record this antenna has made so far." H. C., Haiti.

CASE HISTORY #146
"I have had very good luck with mine (my V80) feeding it with a Johnson Adventurer; works fine on all bands." B. L., Nebraska.

CASE HISTORY #555
"Being an owner of your V80 vertical I would like to let you know of the excellent results I am getting with it, both working the DX and the local stations on the lower bands. It certainly is an excellent antenna system." F. H. Jr., New York.

CASE HISTORY #84
"A few months ago I purchased your V40 vertical and have achieved outstanding results on the air." K. G. B., North Carolina.

CASE HISTORY #407
"I recently purchased a Gotham V80 vertical antenna and I am very pleased with the results. Up until now my home brew antenna has had a very high SWR, but with the V80 the SWR is 1:1." J. D. R., Virginia.

CASE HISTORY #414
"Just a quick note to tell you how pleased I am with my 2 day old V80. My old SX-28 just seems to be re-born. An excellent receiving antenna as well as a fine transmitting antenna." D. J., Utah.

FREE
Catalog of all Gotham antennas, including 47 different beams covering 2 meters through 20 meters, free on postcard request.

ANNOUNCEMENT!
GOTHAM proudly announces our appointment as an AUTHORIZED FRANCHISED DEALER for ALL LEADING MANUFACTURERS OF TRANSMITTERS AND RECEIVERS.

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WHY

THE GOTHAM VERTICAL ANTENNA IS THE BEST ALL-BAND ANTENNA

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• Radials not required.
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• Special B & W loading coil furnished.
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• No relays, traps, or gadgets used.
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• Many thousands in use the world over.
• Simple assembly, quick installation.
• Non-corrosive aluminum used exclusively.
• Multi-band, V80 works 80, 40, 20, 15, 10, 6.
• Ideal for novices, but will handle a Kw.
• Will work with any receiver and transmitter.
• Overall height 23 feet.
• Uses one 52 ohm coax line.
• An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price.

DO YOU KNOW

1. You will have no difficulty installing your Gotham Vertical Antenna in just a few moments, regardless of your particular problem, so order with confidence even if you have restricted space or a difficult situation.

2. Loading coil not required on 6, 10, 15 and 20 meters. For 40, 80, and 160 meters, loading coil taps are changed manually except if a wide-range Pi-network output or an antenna tuner is used; in this case band changing can be done from the shack.

3. Every Gotham Antenna is sold on a ten day trial basis. If you are not fully satisfied, you may return the antenna prepaid for full refund of the purchase price. This is your guarantee of full satisfaction.

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Enclosed find check or money order for:

☐ V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS.............. $14.95

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HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

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Now...TWO GREAT LINES BECOME

the FINEST in AMATEUR GEAR

RME (Radio Manufacturing Engineers) long reputed as builders of the finest Amateur Communication Gear and

GLOBE: pioneers in unique Transmitters and accessories now join together under GC ELECTRONICS COMPANY, DIVISION OF TECTRON ELECTRONICS, INC to bring you the finest line of Amateur Gear available anywhere

6900 RECEIVER INCOMPARABLE AT ANY PRICE

Optimum performance of every circuit is assured by meticulous attention to all details.
- Advanced circuitry and engineering techniques
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- Separate BFO injection control
- 4 ohm/800 ohm Audio Output.
- Modern push pull switch provides unified control of five individual functions, simultaneously, automatically

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To complement the appearance of Model 6900 and other quality receivers. Neat, modern design finished in gray and charcoal. 10" Speaker 4 ohms impedance

No. 65-450 RME Receiver
Amateur Net 369.00
No. 65-451 RME Receiver Speaker
Amateur Net 19.50

HG 303
AMATEUR TRANSMITTER SIMPLE TO TUNE. 3 X'AL POSITIONS. COMPACT RUGGED. FUNCTIONAL. FIRST QUALITY.

- Input Power—75 Watts (Nominal)
- Provision for Matching V.F.O
- Grid Block Keying
- Wide Range Pi-Net Coupling to Antenna
- Low Voltage Switching
- Provision for "Plug-In" Modulator
- Addition
- Recessed Crystal Socket on Front Panel

No. 65-430 Amateur Transmitter
Amateur Net 99.95

VARIABLE FREQUENCY OSCILLATOR. COVERS 6 THRU 160 METER BANDS.

- Easily read Dial Scales
- Self contained, well filtered power supply
- Voltage regulated and temperature compensated for utmost stability
- Operating frequency divided into 4 Bands

No. 65-401 VFO-wire-tested
Amateur Net 89.95

SCREEN MODULATOR KIT

For Globe Chief or similar CW transmitter. Permits radio-telephone operation at unheard of low cost.

HG 303 MODULATOR
Companion modulator for the HG303 or any 6I46 rig

No. 65-421 Screen Modulator Kit
Amateur Net 11.95
No. 65-431 HG-303 Modulator
Write for prices

CHIEF DELUXE TRANSMITTER KIT SELF-CONTAINED 90-WATT TRANSMITTER FOR CW; BANDSWITCHING 10-80 METERS.

- Lives up to its name! Improved circuitry and new components provide outstanding performance for either the advanced amateur or the novice

No. 65-406 Globe Chief Kit with EZ Assembly 3 color diagram
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GC ELECTRONICS COMPANY
Western Plant: Los Angeles 18, Calif. Main Plant: Rockford, III., U.S.A.
ONE TO BRING YOU
available anywhere

4 BAND GLOBE-CEVER SHORT WAVE AND STANDARD
AM BROADCAST

Hear exciting events throughout the world as they happen. AM broadcasts police calls, aircraft, civil defense, ocean liners and many others. Whip Antenna included.

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PRESELECTION FIRST CHOICE OF EXPERIENCED HAMS

Preselector gain plus automatic
match between receiver and an-
tenna for optimum performance. One setting
continuous tuning not necessary. Improves the performance of any receiver! 26 db gain.

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MODEL HG-602 V.H.F. TRANSMITTER, CUSTOM TAILORED FOR PEAK PERFORMANCE POWER ON 50 MC AND 144 MC.

High styling and Engineering combined with rugged Military Type construction makes the New Globe HG-602 VHF Transmitter the feature attraction in the amateur’s “Shack”

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VHF 126 VERY HIGH FREQUENCY CONVERTER

Designed to extend the range of any communications receiver through the 6, 2 and 1½ meter amateur bands. Excellent Signal to Noise Radio, ultra-sensitive, performance equals astronomy receivers.

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RME
COMMUNICATIONS
EQUIPMENT
TO MY FRIENDS AND FORMER CUSTOMERS
IN AMATEUR RADIO AND COMMUNICATIONS FIELDS

I am pleased to announce formation of SBE, Sideband Engineers, Inc., a new communications manufacturing company headed by myself and a fine group of former amateur radio associates. As many of you know, I retired from active electronic manufacturing several years ago and since then have been asked continually when I would return to the field. After careful study of potential new items that would meet my requirements of high value and performance, I have formed this group to bring you a new series of dynamic products. All will have outstanding “break-through” features.

Our first product is a new single-sideband transceiver which is described on the adjoining page. It is my personal feeling that this exceptional unit will soon lead the field. It is physically small, outstanding in circuitry, provides 4-band operation with selectable upper and lower sidebands, has built-in power supply. These are truly dynamic new features. There are several other new products in our laboratories that will soon go into production. These will be announced in the near future.

SBE

Faust Gonsett, W6VR, Pres.
Sideband Engineers, Inc. Rancho Sante Fe, California
Entirely New! Outstanding! Dynamic!

SB-33 transceiver... dynamic product of solid-state electronics and advanced electro-mechanical design! Exceptionally small—less than one-half cubic foot including built-in AC supply and weighing only 15 pounds! Powerful... 135 watts P.E.P. input. Four-bands, 80-40-20-15 meters. Upper or lower sideband selectable by panel switch and without carrier or dial shift! Collins mechanical filter. Very low frequency drift. Check the specs... compare prices. This has to be one of the biggest values ever! Available at your SBE distributor during February 1963. Write today for complete specifications.

SIZE: 5¼"H. 11½"W. 10¾"D. Weight 15# (approx.)
FREQUENCY RANGE: Band 1: 3.8-4.0 mc;
Band 2: 7.15-7.35 mc; Band 3: 14.2-14.4 mc;

TRANSMITTER
POWER INPUT: 135 watts P.E.P. max. (Speech waveform.)
DISTORTION PRODUCTS: Down at least 25 db.
CARRIER SUPPRESSION: —50 db.
SIDEWAND SELECTION: Upper or lower sideband selectable
by panel switch.
UNWANTED SIDEWAND: —40 db.
OUTPUT IMPEDANCE: 40-100 ohms unbalanced.

RECEIVER
SENSITIVITY: Better than 1 uV for 10 db signal/noise ratio.
SELECTIVITY: 2.1 kc @ 6 db. 5.3 kc @ 60 db.
SPURIOUS RESPONSE: Images and I-F response down at
least 40 db.
STABILITY: Less than 100 cips drift in any 30 minute period
in any normal ambient temp. condition.
AUDIO OUTPUT: 2.0 watts @ 10% distortion.
TUNING RATE: 30 kc per revolution.
POWER SUPPLY: 117VAC POWER SUPPLY IS BUILT IN.
POWER CONSUMPTION: AC operation. Receive 35 watts.
Transmit: 165 watts (single tone).
DC operation through vibrator or transistorized inverter.
TUBE AND SEMI-CONDUCTOR COMPLEMENT:
2-PL-500-beam power tetrodes, PA. 1—12DQ7 driver,
19—transistors, 13—diodes. 1—zener diode.
OPTIONS: Several options are separately available including
V.OX and Calibrator unit with provisions for mounting on rear
of transceiver. Internal power supply provides operating power.
Rear connections are brought out for linear amplifier.

389 50
SUGGESTED RESALE PRICE

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Sideband Engineers, Inc.
Rancho Santa Fe, California.
Santa's Choice!

Merry Christmas!

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MANUFACTURING COMPANY
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And Factory, Mars Hill, North Carolina.
Communication Antennas

Streamlined grace combined with the look of rugged strength to make MOSLEY Trap Master Antennas pleasing to the eye and completely acceptable to your neighbors. Trap Master Antennas perform, too... thousands of Amateurs in the U.S.A. and almost every corner of the globe are glad they bought a MOSLEY Trap Master! Illustrated, is the world-famous TA-33. Rated to maximum legal power, this 3 element beam performs wonderfully on 10, 15 and 20 meter bands. Factory pre-tuned for quick, easy assembly without tedious measuring.

AMATEUR NET, $99.75 at your favorite amateur equipment dealer.

Communication Towers

TEN BIG REASONS WHY "TOWERMASTER" BY MOSLEY GIVES THE HAM MORE FOR HIS AMATEUR DOLLAR.

OUTSTANDING ENGINEERING ESPECIALLY DESIGNED WITH THE HAM IN MIND, TO FILL EVERY INSTALLATION REQUIREMENT.

WEATHER RESISTANT WITH YOUR CHOICE OF EPOXY RESIN OR GALVANIZED FINISHES.

ENGINEERING CALCULATIONS AVAILABLE FOR BUILDING AND ERECTION PERMITS WITH PURCHASE OF TOWERS.

RIGID TEN AND TWENTY FOOT SECTIONS, WELDED BY CERTIFIED PERSONNEL.

MANUFACTURED FOR LIGHT WEIGHT OR HEAVY DUTY REQUIREMENTS.

ALL TUBING CONFORMS TO FORMED STEEL INSTITUTE AND CHANNEL BRACING A.S.T.M. STANDARDS.

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THE GUYED TOWER HAS SAFETY CLIPS, LOW FRICTION GUIDES, METAL BALL BEARING PULLEYS & GEARED RAISING WICHES.

EXTRAS INCLUDE, SWING-OVER BASES, MOTORIZED CONTROLS AND MANY OTHERS.

REMEMBER THE NAME "TOWERMASTER" FOR A TOWERING SUCCESS

Communication Receivers

HERE IS A GIFT IDEA for any amateur radio enthusiast. Mosley's CM-1 Communication Receiver. Outstanding performance in a compact design formerly only available in much higher priced receivers. Priced at only $182.70. For detailed information contact your nearest amateur equipment dealer, or write... Mosley Electronics, Inc. ... 4610 North Lindbergh Blvd., Bridgeton, Missouri.

Matching Speaker,

Model CMS-1
Net Price

$16.95

Mosley Electronics Inc. 4610 N. LINDBERGH BLVD., BRIDGETON, MISSOURI
WA6FPW says that you can buy obsolete house meters from the power company for about $1.00 each. You can count the number of r.p.m. for a 100-watt light bulb load, and use this calibration to determine the approximate number of watts being consumed by your gear.

K5RAB reports that he has finished compiling the list of optometrists who are also hams, and that a copy may be obtained by sending a stamped, self-addressed envelope to Dr. Dan Monaghan, K5RAB, Box 609, Garland, Texas.
Go Single Sideband on VHF Today!

... with hallicrafters' field proven 2 and 6 meter transverters

New transverter converts your present 10-meter station to VHF... AM, CW, SSB, RTTY, FM capability.

Complete, effective, easy to install—Hallicrafters’ new HA-2 or HA-6 transverters offer a new approach to Single Sideband on VHF.

All modes of transmission and reception available on your present equipment are usable with these units.

Inputs up to 120 watts to the 5894 final can be obtained by exciters having a capability of 10 to 100 watts.

A nuvisor front end in the receiver section provides excellent sensitivity and noise figures.

Furnished less power supply. Requirements:

750 volts @ 160 ma.; 250 volts @ 70 ma.; minus 60 volts @ 10 ma.

HALLICRAFTERS' MODEL P-26 POWER SUPPLY

Unit (not illustrated) supplies all voltages; only one supply necessary for operation of either HA-2 or HA-6 when used in stations set up for 2 and 6 meter operations.

The new ideas in communications are born at... hallicrafters

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YOUR GERTSCH FM-3 FREQUENCY METER CONVERTED TO MEET FCC REQUIREMENTS

— factory conversion provides direct reading of all allocated channels in the 150-170 mc band

All Gertsch Model FM-3 frequency meters can now be factory-converted to measure and generate all assigned channels in both 150-170 mc, and 450-510 mc bands....with ±0.00025%(2.5ppm) accuracy. Instrument features a single 1-mc crystal which is easily standardized against WWV.

Converted units can also be operated as standard FM-3 instruments through 20 to 1,000 mc, at .001% accuracy.

Conversion includes: an all transistorized converter module, a new front panel and carrying case, and a built-in amplifier (with speaker). Also, a front-panel jack allows input of external audio signals, such as those from a Gertsch Model DM-3 deviation meter. Space for a DM-3 is provided in the case.

Compact size — only 13½" W x 11½" D x 13¾" high.

New Gertsch frequency meters are also available in both battery operated and AC power supply units. New meters incorporate same features as converted instruments.

Send for literature on FM-3A series.

GERTSCH PRODUCTS, Inc.
3211 South La Cienega Boulevard, Los Angeles 16, California/Upton 0-2761 - VErmont 9-2201
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Send complete specifications on SX-117

(Continued from page 108)

confusing. WZ2AC is looking for 1296-Mc contacts. W2EUF and K2QUG are building a 2-meter repeater for Erie County. We will keep you informed as we get more information. This column would like to publish a list of all frequencies which are monitored on any regular basis by various groups in our area. Information to K2HUK. See page 6 this issue for address. WAZWEE has a new Valiant and an HQ-106. The Riverport Club elected WAGAN president of the board; WSNPL, vice-pres.; WAGJS, secy.; W2LMK, treas.; W9IEZL and W9TBY are working on ham TV. W9IEZL gave a talk on ham TV demonstration on ham TV to the RAWNY. WAZVOK has a Polycom 828 and a DB-62 beam. K2QUG reports that he was on the air new that he got his license from the Navy, a college degree and a new wife. WA2KUW has a new AC-501. W9URF, Clara, has another pro-
test. He's W9DDYQ. Clara worked with him while he was hospitalized for a serious operation until he got his license and then introduced him to the Lockport Club members, who will see to it that he gets theirs. W9-
RUF and W9EBO are giving him further code instruc-
tion and rounding-up equipment. Traffic: W9ZOE 357, W9URF 319, W9EBO 187, W9EBO 108, W9QBO 54, W9DSS 40, K2QFY 41, W9QOG 28, W9ANL 22, K2-
KJ 22, W9AC 12, K2CJQ 12, K2BDO 12, W2AU-
GIA 10, W9PYT 7, K2HUK 3, K2QQ 3.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mravec, W2UHN—SEC; W3LIV, R.M.; W9KUN and W9QIP. The WPA Trade Show was held at 2200 GMT on 5953 kc. The Keystone Slow Speed Net (KSSN) meets at 2230 GMT on 5953 kc. Mon, through Fri. We regret to record the death of W9IFP, of Petersburg. W9IFH is working toward his WAS. K3EDO has a new KWM-I. New officers of the POOS are K3DIN, pres.; K3QVY, secy.; K3BARK, treas.; K3DIN and K3QVY are moving to Arizona. Anyone wishing a list of TV manufacturers supplying filters can obtain same through the Greater Pittsburgh V.H.F. Society. K3DIN is attending

St. Mary's Prep school in Michigan and operating on 6 meters. W3Y1L is using an inverted-F antenna. The Cum-
lumbia Valley ARC reports on Valley G.M.R. The club will again participate with the Cerebral Palsy Drive: Field Day was a huge success. W3KZ, W3EYV, W3-
ZQW, W3CIN, K3MUR, K3MUL and W3CIN operate from the club in the V.H.F. Contest. W3MIV is installing an 80-
meter vertical. K3BQW moved to W6-Land, K3CTN is mobbing on 14 meters. K3CNJ is at Ohio Christian College. The Steel City ARC reports through Killington Hamograms: The club station, W9KWH, won the V.H.F. Contest for the section. W3DQZ, of W3NYP, reports that K3NFJ is attending school at Penn State. Indiana County ARC (W3BMD) reports that the whole chapter under the able supervision of W3Y1L netted six new Novices—K1NM, V9IC, V9DF, V9DE, V9EF and V9F. Up Erie way: W9ENQJ is conducting code classes under the aegis of the Patomac netted six new Novices—K1NM, V9IC, V9DF, V9DE, V9EF and V9F. Up Erie way: W9ENQJ is conducting code classes for the AAE: K3KIN has a new tower for 6 and 2 meters. W9UXK is home from the hospital. W9RTK is working mobile with a new K4915 and a new call sign. K3KMO is now in Germany using the call D2O-
HZ. The Bedford County ARC had a QSL Display Project in Bedford and Raymont. W9HAV has an HQ-704XQA. The Firma. RC reports via Oscillator: W3MUC is active on 100 meters. K3QZQ has a Maraud-
ner. K3AMQX has a Windsor and W6-104. W3TIE is busy working DX. Traffic: (Sept.) W3JFB 210, K30OH 32, W3KUN 82, W9QIG 43, K3EDO 34, K3-
KJ 28, W9ANL 27, W9QOG 41, W9QOG 28, W2A-

CENTRAL DIVISION

ILLINOIS—SCM, Edward A. Metzger, W9PRN—Asst.; SCM, Grace V. Ryder, W9GNE, SEC; W9RYU, RM; W9DRE, P.M.; W9WYJ, EC of Cook County; W9-
HFG, Section net; K6N, 3515 kc. Mon, through Sat., at 1000 C.S.T. This column's sympathy is extended to our Asst. SCM, W9GME, on the recent death of her husband, K6LM. Also to the family and friends of W9FJL, president. W9MKR, W9PRN 10, K6YUL 9, W9NSCI 5, K5OU and also passed away suddenly. Joe will be greatly missed by the gang at the Allied Ham Shack where he was employed for several years. From reports at this early date, the SET was very successful and many Illinois amateurs were very active. W9N0C and W9CCT are new calls on 137. K9JEJ is sporting a new s.s.b. transmitter. W9FIEE is now mobile. WHDA reports that some of the power units men are confused in the listing of trees and those who are interested in the procedure and eager to drop me a line. I'll forward complete details immediately. W9R2K has a new antenna tower. K3DCC also reports a new 30-ft. tower. K5FFS is now in O-Land awaiting his new call. K9DCE is on 6 meters with a new Linode transceiver. K9YUU, the McClean County RACES and c.d. program, has 9 stations and 6-meter calls. K9QAF and K9YUU are operating portable from St. Mary's and Seneca. The K9VMX has a new Clear transceiver and 4 meters and reports that it is getting out well. K9QSC and W9HIC manned

(Continued on page 112)
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There is an old saying that curiosity killed the cat. But curiosity was instrumental in getting a signal to the moon and back, so this trait is not without benefit.

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The story begins a while back when we began to wonder if there was a way to improve the type 6146 for mobile work. Trouble was that power output dropped off with a decrease in heater voltage. So, knowing of no way to maintain a constant car battery voltage, we went to work on the heater and cathode structures of the tube.

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So, you might say that the Sylvania Type 6146A is a souped-up 6146.

Subsequently, we were highly pleased to learn that Collins had become interested in testing our 6146A for both the KWM-2 Transceiver and the 32S-3 Exciter.

To us, this all sounded very logical for a mobile job...at least for the KWM-2 mobile job. But our curiosity got the better of us when we learned that Collins had standardized on our 6146A for the new 32S-3 fixed-station rig. So we asked the Collins boys why...and we're glad we did.

Since the 6146 and the 6146A are directly interchangeable in any final, and cost the same, it could have been a case of easy bookkeeping. But there was a more forceful reason. After extensive life tests at 110 nominal watts at 30mc, Collins engineers found the Sylvania 6146A maintained consistently high power output...well beyond their expectations.

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73, Bob Lynch
K2RNM

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Companion to the Model 14 AVS...for 10-20 Meters. Completely self-supporting and factory pretuned with SWR 2:1 or less. Height: 13.5 ft. Wt.: 9 lbs.

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WISCONSIN QSO PARTY

December 9, 1962

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 within the section.

Rules: 1) The party will begin at 1600 GMT and end at 2259 GMT Sunday, December 9 to facilitate log checking, the use of GMT is requested of all contestants. 2) The general call will be "CQ WIS". 3) Exchange will consist of a QSO number starting with WIS, RS, or RST report, county and operators name. 4) Logs should show time of contact, station worked, signal reports, sent and received, band, type of emission, power input, QSO numbers sent and received, and name of operator and name of county worked. Sheets from the ARRL log book may be used with the additional information required being entered in the data column. 5) You may operate on either CW or Phone, but not both. CW to phone contacts will be permitted but cross-band contacts are not allowed. To encourage the use of bands other than 10, 20, 40, and 80, 6) Scoring: Each message sent and acknowledged will count one point and each message received will count one point, for a maximum of two points per contact. Each Wisconsin county worked counts as a multiplier and to obtain your final score, multiply your total contact points by the total number of bands you worked out of the 6 bands or QSOs with other WIs, hams count, and the log entries must be complete. Any violation of the contest rules of F. C. C. regulations may result in disqualification. 7) Send logs, postmarked not later than January 7, 1963, Russell Bosc, W9RKP, 6285 S. Baas Dr, New Berlin, WIs. The decision of the Contest Committee will be final in judging of logs received. Suitable awards will be given to the 1st, 2nd, and 3rd place winners for CW only, mobile, and Novice entries. Mark your calendar now for December 9. Get on the air during the contest period and see how many Wisconsin stations you can work. Meet the gang and have fun with "CQ WIS"

DAKOTA DIVISION

NORTH DAKOTA—SCM: Harold A. Wengel, W0HVA—SEC: W0CAQ, P.A.M: K0TYY, H.AM: K0QWY. The North Dakota 75-Meter Phone Net reports: For Aug.—19 sessions, 229 check-ins, 20 pieces of formal traffic and 33 informal with 6 relays. For Sept.—10 sessions, 335 check-ins, 23 pieces of formal traffic handled and 42 informal with 7 relays. W0CAQ has a new 1TP-32 and an SX-101A on the air and got a new stick for his beam antenna. The Minot Amateur Radio Assn. has its own QSL cards. The first of a series of sessions to attempt the would-be ham with radio was held in September by the MARA. Ten people registered for the course. K0QWY, left Bismarck Sept. 17 to attend school in Seattle. W9QDAR has completed a 2-meter tranceiver, KOJNB now makes his home in Pelican Rapids, Minn., and K0QWY has his job as the manager of the local club. A new call in Bismark is W9ODWA. Traffic: (Sept.) K0TYY 35, K0FRP 21, W0YCY 17, W0PFB 11. W9QDAR, W0CAQ 1, W0HSC 2, K0MPH 2. (Aug.) K0FRP 41, K0TP 31, W9QWYL 14, K0NGB 11, K0QYD 14, W0YCL 8, W0RM 6, W0MQA 2, W0YPY 1.

SOUTH DAKOTA—SCM: J. W. Siroki, WWNO—SEC: W0WCR, K0JMA, K0WEM and W0HAF have received the first three South Dakota certificates, sponsored by the SFRAC. W0HAF has installed a 60-ft tower at his new 40TH. KOJMA has moved to a new home. W0WCR and K0JMA are working for KNWC, Sioux Falls. K0YCD, Huron, is reported attending Harvard University. K0YSC moved from Aberdeen to Watertown, W0AJ has been issued the call W0HAT for operation from Jamestown. N. D., where he is teaching. K0YCD is operating portable from college at Springfield. K0RM returns renewed 301 and IC appointments. Traffic: W0SCT 306, K0BMB 113, W0DVB 78, K0...
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Lower noise figure
Over 20 db gain.
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MINNESOTA—SCM, Mrs. Lydia S. Johnson, WOKIZ Amt. SCM. Charles Marsh, WOALW, SEC. KORKO, SEC. KJOFP, WOOCR, WOHL, WOKIZ (sub.) Nists: 10/MMP, noon 3930 ke. at 134022: MISPW Evening, 3930 ke. at 2100Z. The phone nets evacuate and meet soon, and holidays some frequency on 1500Z, MISSB Noon, meets on 3930 ke. at 1700Z, and Evening at 2100 ke. at 0045Z. C.w. nets: SCM on 3930 ke. at 0000Z and MJN (our slow-speed, training net for Novices and Novices) on 3930 ke. at 0100Z. Novices, please take note and send your call, name, QTH and crystal frequency for 50 meters. If you wish to be placed on the MJN Roll-Call to your SCM, WOKIZ (address page 8 QST). Here are our present section appointees. If you are not among them, please check the appointment expiration date found on your certificate. A new item is accepted in lieu of a report. Failure to report can lead to cancellation.

QSS: WOQ, HWQ, KQI, KORJ, WSFT, WQTHY, RHQ, KQ6 OTHL, AKM, UKU, VFG, IZD, ORK, WPK, OPS: WQ5 RUQ, FQG, ALW, BLY, WMX, WQX, FQX, HEN, GCR, WQ2, KKK, ICG, SBR, OOS: WQ5 ESJ, WAI, KLG, KOORK, OES WSQTPS, KOS VLD, AKC, KOC, OSB, OQY, OQZ, OES appointment, WQ5 WQ, WQ2 KOS, and his XYL will be in the area two years as instructors with the Dunwoody Institute. The U.S. Government program. Operator Hero's Bill of WOBLT, will be congratulated on the excellent trouble-handling they do for the V.A. Hospital patients during their long illnesses. We wish you luck to all of the Minnesota operators, who so willingly accept the responsibility of delivering these messages.

Lousiana—SCM, Thomas J. Morgavi, WQFM. Our new SCM. WQFM has been appointed Assistant to the Louisiana-Pineville and surrounding area, KSQKG, who does lots of 6-meter work, applied for and received his OES appointment, WQFM was his RM and OES appointments renewed and is back handling traffic after a trip to New York to see his harmonicas. The Jefferson AMC members are hard at work, and many of them have put up antennas and installed some equipment. The latest speaker, A.S.C to New York, is a recent transmitter hunt, WQFM almost wound up in the river. It was a night-time hunt; he thought the river was a road and it took two hours to get him on the road, K3UYL. received his 35-w.p.m. code certificate. Congrats to W5KC on his DX test triumph. K34G received his E.E. at UCLA, and is back home, on a trip to Europe. He will be here at Michigan State Amateur Christmas, K5QKG, who has been operating in Florida under the call W5KQC, is back in New Orleans with his oldcall, OES WSQGV has his teletype going again this FAX and on all bands 80 through 5 meters. W6HBR, Westside ARC EC, had his appointment renewed. Your SEC, WSMQ, and your SCM are looking forward to lots of activity and reports from here, holders of ARRL appointments and others interested in making the Louisiana section tops. Traffic: (Sent.) K3KQX 320, WICHE 25, WSMQX 69, WZBE 60, W6EA 4, K5JYV 7 (Amq.) WSMQX 47.

MISSISSIPPI—SCM, Floyd C. Teedson, WSMQ—SEC: KSQG, WNCYR is now on from Dorsey, K5- TMYF. WQFM reports that WSMQG is now on in Ridgley, K5- MDX reports that he has worked over 200 countries this year. I think this is quite a feat. It is with much regret that we must report the passing of the K6M of WSMQG. She was nearly as much a ham as he, K6WSS requests that he plans his work's ARDF program so as to help the Red Cross in his town. A new appointment K5QFQ for Keebler Air Force Base. This is my last report as your SCM. The duties of Director require much time. Therefore, with regret I must resign as SCM. The SCM, WSMQG, of Meridian, has been elected as the new SCM. I join with WAFWE in extending congratulations to Jack. Let us each get into there and put the time to good work. Traffic: K5WSY 16, K3MDX 3, K5YPF 2. (Continued on page 135)
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137
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The American Radio Relay League
West Hartford, Connecticut

3RD EDITION

GREAT LAKES DIVISION

KENTUCKY—SCM: Elmer G. Leachman, W4BEW—SEC; W4TFK, PAM (a.m.); W4ZBH, PAM (v.h.f.); KILOA, RM; W4CDX. A very successful State Convention was held in Lexington under the auspices of the Blue Grass Amateur Radio Club. If you didn’t attend, come next year, Sept. 11, 1968. Welcome is extended to our new Section, Emergency Coordinator, W4XTC, accompanied by his staff. The first big test of the outfit was at Frankfort, one of the best known and best liked ham deals in the business. Johnny succeeds W4BAZ, whose term has expired, Thanks, J.B., for your job. All ECs will be contacted and plans made for increased activity and readiness. Traffic is picking up again with renewed network activity. We need more active operators in the KYN. Contact W4CDX for a net manual. Please report in at 5 P.M., 7 P.M. EST on 3960 kc. MP4N had an busy month with 31 check-ins. 386 calls on 102 messages, 30 stations 100 percent, 16 stations 50 percent. W4AKB4, aboard the c.e. battalioned at the Kentucky State Fair, handled 84 messages. All districts were active. See you on DL3s and the Submarine Cutlass (submerged). Thanks are extended to the 31 operators who participated. The bus is equipped with two complete 9-kW sets, running 818 in g.e., on all bands, u.m., c.w., a.s.b., and waco WAC in 4 hours. But please remember to send news to Kentucky Either Channels, Traffic, K4BFR, W4ABK/4, K4BFO, W4BAZ 48, W4XRP 39, W4CDA 28, W4BRE 26, K4ZQH 18, KILOA 20, K4VDO 13, K4ZQH 11, W4BEW 10, W4YTI 10, K4FO 8, K4KI7, W4QCG 5, W4U44 4, K4HSB 3.

MICHIGAN—SCM, Ralph P. Theufte, W8FX—SEC: W8LQX, KI5S; W8EGI, W8XJ, W8QVW, K8KQX, PAMs; W8QJA, W8GCU, PAM V.F.H.; W8PPT, appointments: W8PWW and OES/RSV as ECs: W8JU1 as OES; W8XJ1 as RM. We regret to hear that W8QXJ’s XYL died suddenly. New officers: Genesee County EC—W8PWT, pres.; W8SBH, secy.; W8GPH, treas.; K4JEH, tech. dir.; K4RBQ- program dir; Cadillac ARS—K4JSQ, pres.; W8ZS2, vice-pres.; K4KCN, tech.; W8TQ, corr. secy.; W8GJX and W8VQH recently were married. The best to you. W8FFB joined Silent Keys. The Suburban Teen Age Club K4HUB has started up in Oak Park. K8EXI and W8ESEY made General. K4 decomposition County: W8MSH has a new 40-41. W8SVDV and W8DVE have a hole on a 20-40. W8CEF has a hole and a Silver in the VV: W8CNO is in AA-MARS, W8OFM and W8ZSF are operators in the W6SAS. W8SD1 think of quitting, K8SIX transferred to Wisconsin, W8UPV/VO2 from Flint, now is in Goose Bay, Labrador, and runs a 7544 from 1424-4 kc. All AF man’s contacts, Old Timers’ Nite will be held Sat, May 4, 1963. The guest speaker will be Herriot Hoover, Jr., ARRL president. K8CVP now is Act. chief engineer at W4MIM. W8OND moved to Arizona for his health. K8EGU and K8KEN made General. W8WVP moved to
QSL PACKET
FRAMES 20 CARDS

OHIO—SCM. Wilson E. Weckel, W8AI—Asst. SCM. J. C. Erickson, W8DAE, SEC; W8HNO, RMs; W8BEX, W8DAE, W8WYF and K8ONQ, PAMs; W8VY, K8KKN and K8UBK. Appointments: D. September wards K8KRY and W8KAEY as OEs, W8QVY and W8WPF joined the Silent Keys. W8GQY, K8KKN and K8UBK, accompanied by W8YK and W8YTT and members of the Detroit Metro Club received parting shots at the club's picnic and the club elected K8KZK, pres.; K8KLZ, vice-pres.; K8KIR, sec.; W8VYF and K8KRM, directors. The ARC of the Ohio State University's W8LFT, tells of a club's efforts to find a building for the club. W8LFT received support and suggestions from the alumni would be most welcome, and the St. John's K8ENB, a baby boy. Toledo's Ham Shack Group names K8CCZ as its Ham of the Month. W8BZ, a veteran officer is in the hospital. Oregon RC elected K8LCW, pres.; K8KL, vice-pres.; K8SCH, secretary, and the St. Lawrence County (2) Meter Net held a meeting. The American Radio Relay League's CARA's Q-S3 class states that W8BAK and K8KRR worked each other 18 miles away on 1396 Mc. and W8HRX received W8CDA 195, W8NTC-1, W8QVY and W8TV stock. Queen City Emergency Net's The Listener's Forum showed pictures taken at a transmitter hunt. The South East ARC's Ham-Fest informs us that K8TUF was in the hospital and W8BHZ is in Connecticut with the U.S. Coast Guard. Springfield ARC's The Q-S3 tells us that W8PPD discussed their activities in Electrons Tubes, W8CHM and W8UHI visited the city and the club gave its 1962 officers. The Inter-City RC's IRC News Bulletin says that the club's 1963 officers are K8LZB, pres.; K8LZK, vice-pres.; K8QYQ, treas.; Ralph Stahl, sec., W8BEX is in the hospital, and following an operation, K8QYQ is teaching radio and TV in the high school. K8LZB and W8PPD are on s.o.b., W8QVY and W8LHR have started their ham. The New London KARA's Q-Match tells us the club operated its ham-fest in the black and K8ZNK received his General Class license. Dayton KARA's B-F Carrier informs us that the HCE again portrayed Dr. Moskowitz, E.T. and its second meeting W8PPD spoke on Philosophy of Repair. Six-Meter Nomads! The Amateur Extra says the new K8JVB is a new baby girl. The Greater Cincinnati KARA's Thye Mike and Key stated the club held a meeting of 1963 officers and the rest of the bulletin was devoted to news on the club's hamfest, which your Great Lakes Director Dana Cartwright, W8UPH, and your SCM attended. There were 1075 amateurs on the air and, with ideal weather, 2 big meals, refreshments, model airplane flying show, etc. K8JGA took home a Clegg Zephyr V.H.F. transmitter and W8QVY, a Drake 2-B receiver. W8QVY received Toledo Radio Club's second annual award for outstanding amateur radio work. W8DAE, W8FY, W8UPH and K8LBU marked the K8L in September. W8CIN received his Amateur Extra Class license. DXCC, WAC pieces and CWC Awards, W8QVY is back at Cine Inst. W8UPH is back home among touring Europe. So far this year we've had five hamfests in Ohio that drew between 1000 and 2500 amateurs. Toledo's (Sept.) W8UPH 707, K8LBU 501, W8DAR 388, W8BEX 183, K8QBK 185, W8FY 183, K8KCL 85, K8ONQ 62, K8LBU 21, W8SIN 17, W8LQ 16, W8RX 14, W8JZM 12, K8DKJ 12, W8BFX 8, W8LZD 7, K8LJ 6, K8QRF 6, K8QNS 5, K8KYU 5, W8SIP 4, K8DQ 4, W8CYS 4, W8QVY 4, K8ZS 3, K8QRF 2, K8QNS 2, K8KYU 1, W8SIP 1. K8BUX 66, W8PAI 60, K8QRF 2.

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(Continued on page 143)
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The best!!! and don't forget the D.C. supply is built-in for mobile.

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NLI 3030 kHz at 0010Z nightly; NYCLIPX 3908 kHz at
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0100Z at Fri, and Fri-Sat-Mon. 14:38, 14:39 kHz

Mike Farland, on 7238 kHz at 1700Z; All Service Net:
1400Z Sun. on 7270 kHz; QN Net on 3053 kHz at 2100Z daily.

Traffic, QSL cards for traffic handlers, Training for
W2QTH, W2GFT, W2FNE and W2SW.

The new manager for the QN Net is W2BOU. W2ONTM
has been added to the ranks of A-1 Operators, for
having received the coveted certificate. W2K2Z had 120
conversations accepted by the League for DXYC. The
new cadet must be working BB, W2H1Q earned certificates
for WNYC-T, and BTH. W2VOL put up a record hornet TH2QD
and a grid A222. The announcer’s brother became W2KHO.

Traffic is being handled on W2QTH from JFK in
industry and television, and W2GEB received a nice reply
from a friend in answer to her amateur telegram announce-
ing the station set up in the Brooklyn VA Hospital. New
operators of the American Association, W2BOU, W2GEB, W2-
K2ZQ, W2A2ZI, W2H1Q, W2VOL, and W2GFT. The Western
Division Circuit, also the W2GEB crew, have installed a
two-meter loop antenna in the machine shop and
operator W2H1Q would like to hear from stations across the
country using n.f.m. n.m.m. f.m. M. These stations and
operators are boys and young men, and their experiences and
records of QSOs. W2ONTM has been installed as president of the
ARC of New York U., W2GFT and his new XVI
have located in Carle Place, W2QTH urges anyone
interested in joining the 10-meter ARCEC and RACES group
on 29.3 MHz Mon. at 0002Z and requests cards to him
for ARCEC applications. W2GYC’s 220-Mhz station is
being used in the QSL cards and at least unlabeled
YMM’s new antenna mounted on a rotator and the
APX-6 transmitter is ready for use with any antennas.

Coast and island stations are using the 10-meter
section and information can be had for the asking via
the SCMI. W2WFL, KM for the NLI 320 C.W.
Traffic Net is seeking additional stations for the section
for coverage of traffic distribution. With the holiday rea-
son for approaching all of the section cards can use many
operators. Why not assist in this effort by reporting
into the net of your choice? All of our appointees
will be glad to help you in this effort and a League appoint-
ment awaits your results. PICOM means public service,
so let’s help it along by joining in an organized activity.

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(Continued on page 145)
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Cat. No. 200-509 Stationmaster Collinear Gain Antenna is designed to meet the ever increasing need for high antenna gain in minimum space and at lowest cost. This antenna, consisting of a number of collinear radiating elements fed inphase and encapsulated in a continuous weatherproof fiberglass housing, meets the above requirements. Low overall weight eliminates the need for extensive erection equipment required by previous antennas offering equal power gain. The input fitting on these antennas is a standard Type N male connector mounted at the end of an 18" flexible terminal extension. Designed for maximum strength with minimum cross-section, Cat. No. 200-509 is capable of withstanding winds in excess of 100 MPH.

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Vertical field strength pattern of Cat. No. 200-509 Stationmaster Antenna. A dipole pattern is shown for reference.

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The times, names, and frequencies of the NJ NTS nets: The N.J. 2300Z, Mon.-Sat., every half-hour, The N.J.P.N. 2130Z, Mon.-Sat., and 0130Z, Sun. The NJ 620Z, 0300Z Thurs. and Sun. on 51.15 Mc., 2200Z Fri. and Sat. on 146.7 Mc. Net reports (leaves, attendance, and traffic free not available). 279, NJP.N.-38-509-95. NJ 620Z-10-110-55. Four new appointments were made in September: WA2JVB and WA3QGZ as OEs, WA2ITB and K2QJJ as OEs. Renewals: WA2QGZ, WA2GQZ, WA2NAE, K24VL, K28SLG, K2QJJ and K2QEP as OEs. Only one new KFL in September, K2QJJ whose call was that of a darn good ham radio. Looks like WA2BVE is working out of Philadelphia now. K2KUQ has been given a standing invitation for a five-hour cruise on the Coast Guard Cutter East Wind for her work handling traffic during Operation Deep Freeze. That’s the kind of publicity we like. W2PFO is moving up. Ogdensboro, sorry to report that W2NITU’s XYL still is in the hospital. The SCM’s XYL was in the hospital too, that makes four girls and a boy. W2CCF has three stations running simultaneously. Hope that W2CWF gets that rig of his fixed before he takes off for Salt Lake City. WA2BPB worked 34 states with twenty watts on 6 meters. W2AOVH has held up the traffic work despite school. WA2LHL was on the air on the 28th. WA3NFL, the new RM WAQN9, is complaining about the lack of work. Can’t say that I blame him. WA2BL says that although traffic is pretty scarce, the August report from WA3JTZ is taking care of skins for K2BSB while the latter is getting set up after moving. The Parsippany High School Radio Club elected WA3SKY, pres.; K2BBB, vice-pres.; WA2UQM has received his General Class ticket and is going after that DX, W2NPD, a new Novice, would like to know where the whereabouts of a local club. His QTH in Orange, N.J., can anyone help him out? W2COT has been very busy running all over New England. I hope you all have a good time and good DX on the convention. Traffic: K2UCY 254, WA3CCF 191, K2BNL 138, WA3RFK 112, WA3JKU 112, WA2BJZ 22, WA2BNB 56, WA2GQZ 56, WA2BZ 54, WA2IJD 54, K2TBW 49, WA3BP 48, W2TOM 48, K2QJJ 48, K2QEP 15, W2BVE 18, K2QCD 18, K2AIG 6, W2XL 6, WA3QGZ 4, W2BEWZ 3, WA3KU 3, WA3FRY 3, WA3PUL 2, WA3QGZ 2.

MIDWEST DIVISION

IOWA—SCM, Dennis Burke, WONT-SE; KOEXN, P.A.M.; WOPZP, R.M.; WDBAA, WOLAG, The Tube and Shutter Club at Creston reports its officers are W2KXS, pres.; KOCG, sec.; W2OEH, treas. Good luck to you fine folks in Northeast Iowa. K0KVTK reports another successful year at the Old Time Threshers Reunion at Mt. Pleasant, Iowa, KOEXN calling the shots from North Iowa. The Clay County Fair at Spencer, with K0QCG, K0BHH and KOEXN running it up for the customers was very successful. KOHGG reports the annual V.H.F. and U.H.F. Picnic at Jester park was most enjoyable and featured a transmitter hunt on 6 meters. The Redfield Picnic had to be canceled due to everybody’s sorrow, KOPOI is a grandma now and (continued on page 15).

Here is Crank-Up Tower convenience at the flick of a finger!

"Moto-Winch" by E-Z WAY

When ordered with Tower.

$279.50

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Pull-down & Crank-up action

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Write for details
Here's the rig you've been waiting for — Clegg's new THOR VI Transceiver for 6 Meters.
Astonishing performance...Priced right!

Fixed station or mobile, this little power package reflects all the advanced engineering and design features that have made CLEGG the "most wanted" gear in the VHF field.
Talk about performance... listen to this: Fifty solid watts on both AM and CW; high level modulation with full speech clipping to give you famous CLEGG "Talk Power"; true transceiver operation with tunable oscillator in the receiver serving as the VFO in the transmitter; provision for keying the transmitter.
A low noise double conversion super-heterodyne receiver complete with BFO and ANL provides maximum selectivity and sensitivity with stability equal to the exacting requirements of SSB and CW; separate power supply modulator for 115V AC operation. A fully transistorized power supply modulator for 12V DC available soon.
And best of all, this rig is priced at a level that every ham can afford. Place your order with your distributor today. Deliveries start late in November.

And here's one for you VHF sidebanders!
It's the new CLEGG VENUS six meter transceiver for SSB, AM or CW! Once you've used or heard this rig you'll appreciate the engineering and design "Know-how" that made it possible.
Here's what you can expect: A superbly engineered crystal lattice filter, SSB transmitter of greater than 120 watts PEP input; amazing frequency stability, VFO controlled by the receivers tunable oscillator; full power input on CW and a substantial signal on AM phone. There is also output provision to drive a KW linear final.

In the receiver section a double conversion, low noise super-het of extreme sensitivity and selectivity, with crystal lattice filter and product detector provides flawlessness reception of sideband, AM phone or CW. A 115V AC power supply of adequate capacity is a separately mounted unit which can be installed at any convenient distance from the transmitter.
This rig, too, is priced within reach of every ham. Watch for it at your distributors late in January. Place your order now to be sure of early delivery.

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The 99'er offers operating features unequalled in far more costly gear. The double conversion super-het receiver provides extreme selectivity, sensitivity and freedom from images and cross modulation. The transmitter section employs an ultra-stable crystal oscillator which may also be controlled by an external VFO. An efficient high level modulated 8 watt final works into a flexible PI network tank circuit. A large 5 meter also serves for transmitter tune-up procedure.

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NEW YORK, Dec. 16

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celebrated by going high power. Congratulations. There
is lots of activity on the West Coast of Iowa WQVQ
is back in business. Our pleasure, OMI. WOLQG has done
a splendid job with the Tallman Net sure she took it over. There are 26 names on the latest roll call and the
list sounds like Who's Who in the Iowa section. My
sincere thanks and congratulations. Have a Happy New Year. Vine Davis, Bob Evans and Jack Lautis for a splendid
time at Moline Parks. Traffic: Sept. 1 WOLQG 1500,
WOSA 1540, KOJHC 40, KOAFV 20, KOBQG 60,
KOEXX 46, KOAUJ 42, WOTTF 27, KOJVA 17,
WOHI 16, KQFD 12, WOHV 11, WODMP 10, WOYWP 10, KOIEQ 9, WQDA 8, KOYTH 8, KOYLA 7,
WCTTJ 6, KOJAM 5, WOFM 4, WOSA 3. (Am.)
WOSA 1938, WQDA 1938.

KANSAS—Acting SCM and SEC, Robert M. Summers, KOHXC—Act., SEC, MBFPL, WOIAH, PAT,
16 sessions reported QRS high 45, low 13, total 59. 
average 21.2; QTC high 17, low 1, total 79, average
2.9. NCS: WQGLB, KCOOK, KOEFL, KOPHI,
WHFV, HOKTA. Top QNts for Sept.: KOYTA, and
KOJTG; QKS, Daily 3610 kc. 0000Z-2100Z, 30 sessions; QN
291, high 11, low 4, average 9.7 per cent; QTC 121 high
17, low 0, average 23 per cent. Emergency sessions: KOGL; WQG, WOSAF, KOYTA, WOHY, KOSN
One QM at a time, Sept. 18, 7 stations taking part. The
Ham-Butteflies Net is now back in full swing after a brief battle with QRM. QSB and QRM, Net Mgr,
KOHL reports for Sept.: Stations 13, traffic 102, QN,
118, NCS: KOYWT, KOBI, WOHN; NCS: KOHL.
HBN meets Mon, through Fri. 2035 z 2230Z, for
the new EC for Z one 9, including Chautanaug, Mont;
The new EC Zone 10, Sedgwick County, WQYB. An NVARc Flint Hills certificate is available to all
hams in Kansas certifying five Emergency contacts
feud lor data to WQZG 420 Neosho, Emporia, Kan.
All out-of-state hams need only three Emporia QSOs.
We believe the record establishment at WOFL.
WQDA 1 938, WQDA 1938.

MISSOURI—SCM, C. C. Gosch, WOFH—SEC,
KOUNZ, R.M.: WOUD, KOONK. PAMS: WOBYL,
WOTPF, WOLF E (v.h.f.). Net reports: PON (Mo.)
3000 kc. 2100 GMT, M-F 1 session; QN 200; NCS:
51; NCS: WOYHI 10, Mo. S.B.B.: (3003 kc. 2100 GMT,
1-Tu.) 1 session; QN 150; QTC 15: NCS: WOPX
2, WOEC 2, WOOG 4, WOLB 4, WOLF 4 (v.
F-1) 12 sessions; QN 228; QTC 107: NCS: KOYK
4, KOEPH 4, WOTPF 4, NON (3560 kc. 0100 GMT,
Fri.-Sat.) 25 sessions; QN 195; QTC 102; NCS:
2, KOJPC 5, WOFL 4, WOOG 4, QN 3000 kc. 0200 GMT, Sat. 3 sessions; QN 251; QTC 55; NCS:
4, WOUD 3, KOPFJ 2. No report was received from
MSN (3817 kc. 2200 GMT, M-F: Appointment: WOSAF (Mo) (III, III, IV). Endorsed: KOEFL, KOEFL
as EC, KOOLW as EC, WQOJ in SEC. Report: Hours of
activity are gratefully acknowledged from OQO KOPHY
and WOYHY and from WOOG and WOAIW. Because
of a change in employment demanding that he be out of town and away from the home
squadron extensively, from now on, sufficient personnel
is available for the SCM to continue with a detailed column. A request has been made to release the SCM
column: we regret we have to present an abstract column. Traffic: WOTPF 256, WOYAY 229, KOYHY
152, KOPFF 119, WOFL 94, WOUD 93, KOPFI 8,
WOMM 28, WOFL 26, WOOG 26, WOOG 26, KOFL,
Wacz, WOBZ 8, WOBY 6, KOPFC 2. (Continued on page 148)

NEBRASKA—SCM, Charles E. McNeil, W0EXP—
SECB: KOTSF. The recent trip to Moline, Ill., sponsored by W0ERW and WQDA, was a
great success with about 50 in attendance. Your SCM
has left for a vacation in New York and will not be
available until he has finished this report. K0JXN reports 27 sessions. QN 303. Nebraska Storm Net. The Western Nebraska Net
K0JXN reports QNI 103. QTC 74; NCS: WOOG,
WQDA 3, KOAIG, W0VYE, W0NIK, W0FPP; WOOG
checked 52. The Nebraska Slow-Speed Net operated
Sept. 5-30M. Through Fri. at 2300 kc. 2300, QNI 24.

(Continued on page 148)
ANTENNA
WITH A
PEDIGREE ....
(AND PAPERS TO PROVE IT!)

Every Band-spanner mobile antenna is a winner, an antenna with a pedigree...and papers to prove it in the form of an unconditional five year guarantee certificate.

Outwardly, the inherent quality and streamlined beauty of the Band-spanner is self-evident. For your complete assurance, the manufacturer guarantees that this finely crafted product is perfect in all respects—will last—and last—and last.

There’s convincing proof:

Ken Kesel, W6BVI, proud owner of the second Band-spanner ever produced is pictured in the act of receiving a shiny new antenna in exchange for it. Now Old Number Two can go into well-deserved retirement, battle-scarred but still performing after ten years of service.

Every Band-spanner is a winner. You can make no wiser choice.

Webster band-spanner.

317 Roebling Road,
South San Francisco, Calif.

147
"We have found the Rider Sound-n-Sight Code Course to be a successful training method. We are currently employing this method with modifications to fit our training requirements. We have found that this method of teaching code saves an appreciable amount of time in our training program."

The NAVY TIMES gives details of the successful Coast Guard test that led to the adoption, at the Coast Guard Groton, Conn. Training Station. "The Army at Ft. Monmouth, New Jersey, adopted the radio course. The Coast Guard was impressed with the Army results and gave the method a try."

According to the Coast Guard trial runs, the men taught by the new method take a lead immediately in building speed and remain ahead by nearly 100% throughout. "After 30 hours for example, the first experimental group averaged 19 words per minute, the second averaged 16.9 and the third 18.5. Men in the first class under the old method were clocked at 9 words per minute at that time and those in the second had no comparison in the third class, since all were on the new method."
NEW Sonar—MONO-BANDER

SSB transceiver for any one Amateur Band 80 to 10

- 180 watts P.E.P., 160 watts C.W.
- Collins 2.1 kc mechanical filter
- Driver stages employ electronic tuning
- 400 KC Coverage
- 50 db unwanted sideband suppression; and 60 db carrier suppression
- Receiver has 1 microvolt sensitivity for a 10 db s/n ratio
- Receiver employs full time AVC
- "A.M.C." (automatic modulation control).
- Vox/anti-vox/push-to-talk
- Four way meter function
  1. "S" meter
  2. Transmitter P.A. Grid
  3. Transmitter P.A. Plate
  4. Transmitter "A.M.C."
- Upper/lower sideband
- Separate models for 10-15-20-40 or 80 meter band (Commercial frequencies available within this range)

"With 1 crystal for 200 kc coverage. Less power supply and less noise. (Crystal available to cover additional 200 kc segment.)"

$395.00

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Please send me complete information on Sonar "Mono-Bander."

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149
has a new tower and beam for 2 meters. WICRO is now a Chief in the Coast Guard, KNIVXB, Weymouth, is now the 33d. The T-9 Club met at WN15 on the 9th. The QRA has a new meeting place—Woodville School, Farm St., Wakefield, WIIFH spoke at the meeting. The Wakefieldsmoof A1A met in the A1A restaurant. All are welcome, WIDBY and K1HGP are getting beams up, W1OLP spoke at the Wellesley ARS on "Radio Con-}
GOOD MOBILES GO...

NEW-TRONICS
MOBILE ANTENNA

Now, Get Fixed Station Reports with the “HUSTLER”
Buy only the mast and resonators for the bands you operate. No need for matching devices, no feed line length problems. Use any length of 52 ohm cable. This is a new, efficient concept of center loading. Each of the five resonators has a coil specially designed for maximum radiation for a particular band. Center frequency tuning is by means of an adjustable stainless steel rod in the resonator.
The 54-inch fold-over, heat treated, 1/2-inch aluminum mast permits instantaneous interchange of resonators. Mast folds over for garage storage. When opened to full height, the two sections of the permanently hinged mast are held rigidly in position by a shake proof sleeve arrangement. Mast has 1/4-24 base stud to fit all standard mobile mounts. Power rating is 75 watts do input A.M. — 250 watts PEP input for SSB.

ANTENNA ASSEMBLY CONSISTS OF 1 MAST and 1 RESONATOR

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Total Height of Antenna</th>
<th>Amateur Net</th>
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<tbody>
<tr>
<td>MO-1</td>
<td>54&quot; Mast folds at 15&quot; from base</td>
<td>(For Rear Deck or Fender Mount)</td>
<td>$ 7.95</td>
</tr>
<tr>
<td>MO-2</td>
<td>54&quot; Mast folds at 27&quot; from base</td>
<td>(For Bumper Mount)</td>
<td>7.95</td>
</tr>
<tr>
<td>RM-10</td>
<td>10 Meter Resonator</td>
<td>Maximum 80° — Minimum 75°</td>
<td>5.95</td>
</tr>
<tr>
<td>RM-15</td>
<td>15 Meter Resonator</td>
<td>Maximum 81° — Minimum 76°</td>
<td>6.95</td>
</tr>
<tr>
<td>RM-20</td>
<td>20 Meter Resonator</td>
<td>Maximum 83° — Minimum 78°</td>
<td>7.95</td>
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<tr>
<td>RM-40</td>
<td>40 Meter Resonator</td>
<td>Maximum 92° — Minimum 87°</td>
<td>9.95</td>
</tr>
<tr>
<td>RM-75</td>
<td>75 Meter Resonator</td>
<td>Maximum 97° — Minimum 91°</td>
<td>11.95</td>
</tr>
</tbody>
</table>

ANY MAST OR RESONATOR MAY BE PURCHASED SEPARATELY

FIT MORE CARS THAN ANY OTHER BUMPER MOUNT!

MODEL BM-1 Flat alloy steel strap fits tightly against any shape bumper yet is inconspicuous. Length of strap permits its attachment to both large and small bumpers.
Assembly is held in place by two “J" bolts at the top of the bumper and strap clamp at the bottom. “J" bolts may be inserted between top of bumper and car body where clearance is as low as 1/4”.
Whip receptacle assembly consists of a heavily chrome plated 1 1/2" die cast Zamak ball with 1/8-24 thread. Adjustable so as to maintain whip in true vertical position. Black phenolic base. All metal parts of the bumper mount are heavy cadmium plated. .......................................................................................$6.95

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Memo...

To: XYLs and YLs only
Subject: A "neat" Xmas Suggestion

Do you find his 1962 QSTs scattered about the shack and other rooms of an otherwise neatly arranged home? There's a simple solution to this problem: have a bright, new QST Binder under the tree for him on Christmas morning. He'll love you for it! And, he can file those valuable copies neatly for future reference. While you're at it, better get two Binders so he can open off the New Year right with a file for those interesting issues coming up in 1963.

ATTRACTIVELY finished in dark red varnished cloth and hard board covers, each Binder holds twelve issues of QST, opens to any page and lies flat. His copies will be protected and always available for ready reference. Mail your order soon to insure delivery before Christmas.

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WHJB as OQ, K1KCS as OPS and OHS and W1YH as OHS and OPS. We congratulate K1KCS on his appointment as RM. We feel sure that Press will inject new life into the DXM, The Plumbhub group, at the invitation of OQ, WB1ST, held its Annual Fish Fry Sept 9 with some 300 members and their XYLs in attendance. The ferry service to the island was being supplied by WCHK and WB1ST. The fish fry put on by K1YXZ and W1QZ and is reported to have been quite a success. W1KRD attended "in absentia", too, much photography being practiced in his behalf. All who attended are looking forward to another get-together next year. We are sorry to lose K1QZQ as SEC. Howard feels that business prevents his wholehearted participation. Thank you, Howard, for your help during the term.

Traffic: WITA 62, K1KCS 34, K1QK 28, W1NC 12, W1WX 12.

RHODE ISLAND—SCM, John E. Johnson, KIAV— W1YNE, P.A.M.; W1XTL, R.M.; W1NHU. New appointments: K1OZK, EC for West Warwick; K1Z5J, EC for Coventry; K1DPR, EC for Lincoln; W1POP, EC for Johnston. Endorsements: W1VPS, EC for Westport; K1AHH, EC for Cranston. KINEF as RS, all the EC's have been working with the SEC's to get their sections organized for the ARRC Program. K1PZ7Y, in the Smithfield section, and K1TPK, in the Pro-Portsmouth section, are to be commended for their fine work. All amateurs interested in the ARRC Program, contact your EC, SEC or SCM for applications. The results of our first month's ARRC Program shows 34 members, 17 mobile units and 10 emergency units. RISPN reports 33 sessions, 655 QNI, 110 traffic. KINEF reports that the HIN meets on 3540 ke at 1900 EDST Mon., Wed., Fri. Sat. and Sun. He said 10-50 this week though they do not have traffic experience. The WIAQ Club of Rumford voted that $25.00 be given to the ARRC Building Fund. K10ZT is elected to membership. In his first year of operation K1TPK completed 1074 QSOs with 1074 different stations on 6 meters. Traffic: WITA 62, K1KCS 34, K1J 27, W1YNE 37, K1PZ7Y, K1YXZ 27, K1NH 10, K1OZK 9, K1QK 8, K1NCW 8, K1MNZ 7.

VERMONT—SCM, Miss Harriet Proctor, W1EB— W1QY, W1RI, W1K, K10ZQ, W1RH, W1WQ, W1SG, W1KQ of Rutland, ex-W1FW, is again active. Welcome back, Dick. The CVWGB has a new masthead on its Newsletter for listing the club call, K1QY, W1QJ, W1RI, W1RH, and his XYL visited hams in the Moravian Area.

K1MNOU has tried out mobile operations on two occasions. W1QK had an informal evening around his camp. W1QJL has a teletype setup. The WIND Flower Club attendance was good. The Bank of America officers include K1CFE, pres., W1PZY, sec., W1RGR, treas. Other trustees are K1PFP, K1RH and W1GLJ. K1QXO has worked all but three countries in South America. K1MNP is getting a new QTH, moving W1QK and K1HPN have new jr. operators. Traffic: (Sept.) W1KJG 29, K1YD 11, (July) W1Z17H 1712, K1XV 159, K1DBQ 159.

NORTHEASTERN DIVISION

ALASKA—SCM, Kenneth E. Koester, K17BO—OOO K17BJW, KL7AQU, KL7FIE, KL7DLA had a very bad fall and hurt her back but is recovering fine. KL7QG/KL7I has left Alaska to be with his sick father, KL7BLI, and KL7AUQ are getting ready to hold open house in their new home. KL7FIE left Alaska Oct. 17 for a new assignment down south. K17BJW is trustee, KL7RWR and his XYL visited hams in the Morrisania Area.

KL7JUQ has tried out mobile operations on two occasions. W1QK had an informal evening around his camp. W1QJL has a teletype setup. The WIND Flower Club attendance was good. The Bank of America officers include K1CFE, pres., W1PWY, sec., W1RGR, treas. Other trustees are K1PFP, K1RH and W1GLJ. K1QXO has worked all but three countries in South America. K1MNP is getting a new QTH, moving W1QK and K1HPN have new jr. operators. Traffic: (Sept.) W1KJG 29, K1YD 11, (July) W1Z17H 1712, K1XV 159, K1DBQ 159.

NORTHWESTERN DIVISION

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGY—The FARM Net meets at 0200Z on 3865 ke. The Gem State Net meets at 0300Z on 3580 ke. The Twin State Net meets at 1300Z on 3580 ke. The Mountain Weather Net meets at 1340-1400Z on 3970 ke. The Twin State Emergency Net (Allagasi, Mountain) meets at 1600Z on 3970 ke. Son, with 35 on roll, W7QD, in Cow- bow, became a Silent Key. K7SJN is the new EC for Capt. County, W7MMS. A "toasted" CD was set for K76VQ, W7MTH and W76 AVY, DPD, DUP, GGV, OA and RKL on 88 meters, K7CLK has a new son, W7CT5, a new daughter. Those operating particular while attending the ARRC are K7CBV, Lozan, K7QGE, Helen, and K7KUN, Pocatello. K7KRO was hospitalized for a pinched nerve. W7TTH is becoming an expert hunter with the bow and (Continued on page 144)
AEROCOM'S Linear Amplifier used with conventional low power SSB transceivers for excitation, provides power output of 1000 watts PEP (continuous service). The SSB exciter should have at least an output of 65 watts PEP to obtain maximum output of the amplifier.

The Model 10LA amplifier is housed in a cabinet (22" W x 14¾" D x 36½" H) which can serve as a base for conventional SSB exciter, or amplifier may be placed a short distance away from the associated exciter, if necessary for convenience.

Frequency range of 10LA is from 2 to 22mc, covered in 6 bands. Up to 4 independent non-simultaneous channels are provided. These four channels are selected externally by exciter channel control. One tuning unit is provided for each frequency specified up to maximum of four.

The 10LA amplifier is designed to work into a 50 ohm coaxial feed line. One output coaxial receptacle, common to all four channels, or 4 output coaxial receptacles (one for each channel) are available; each channel normally requiring its own antenna. For multi-channel operation with 1 antenna it is recommended that Aerocom Model ATU-410 antenna coupler be used.

A built-in directional coupler provides monitoring of output power and SWR. Grid current, plate current, filament voltage and high voltage are metered.

Harmonic output attenuation: second harmonic is at least 55 db down and higher harmonics are at least 70 db down. Noise level is 40 db below 1000 watts PEP output. Distortion products, in two-tone test, are at least 35 db down, depending on characteristics of exciter.

This linear amplifier, like all Aerocom equipment, is ruggedly constructed to give long trouble-free service. Additional information and technical data on request.

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*FCC permits 1KW DC input for amateur service. PEP input is twice average DC input.
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UNCONDITIONALLY GUARANTEED FAST SERVICE

American specializes in two-way communications, frequency correlation data, for G.E., Motorola, R.C.A., Collins, Globe, Johnson, Lear, Narco, Hallicrafters, Link, Gonset, Heath, Bendix, Aerontron, U.S. Gov't. and many other companies. Include postage with order.

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<th>FREQUENCY RANGE</th>
<th>CALIBRATION TOLERANCE</th>
<th>PRICE</th>
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<tbody>
<tr>
<td>3000 KC to 9999 KC</td>
<td>0.002%</td>
<td>$3.50</td>
</tr>
<tr>
<td>15 MC to 30 MC TM</td>
<td>0.0025%</td>
<td>$3.50</td>
</tr>
<tr>
<td>30 MC to 50 MC</td>
<td>0.0025%</td>
<td>$4.00</td>
</tr>
<tr>
<td>10 MC to 17 MC Fund</td>
<td>0.002%</td>
<td>$4.00</td>
</tr>
<tr>
<td>2001 KC to 2999 KC</td>
<td>0.0025%</td>
<td>$5.00</td>
</tr>
<tr>
<td>50 MC to 69 MC</td>
<td>0.0025%</td>
<td>$5.00</td>
</tr>
<tr>
<td>1000 KC to 2000 KC</td>
<td>0.002%</td>
<td>$7.50</td>
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Use Christmas Seals

Fight TB and Other Respiratory Diseases

(Continued on page 132)
Federal Electric Corporation, a subsidiary of ITT, is moving ahead from a capability-base of more than a decade’s success over virtually the entire spectrum of electronic field service operations. Today we can offer field engineers and electronics technicians more than 200 new opportunities with assignments virtually around the globe.

Check the areas listed below. Contact our representative. We’ll match your qualifications and interests against current nation- and world-wide openings. The chances are excellent that we’ll be able to offer you the optimum combination of interesting work, long-term opportunity and geographical preference you’ve been seeking.

Immediate assignments for field engineers and field technicians with the necessary technical training and at least 3 years’ applicable experience in any of the areas below:

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To contribute to installation design, installation, site equipment maintenance, and establishment of a check-out procedure for 465-L installations. Qualifications include experience in pre-wired programs, peripheral equipment, and other computer related electromechanical devices. Background in large-scale digital computer or EDP systems highly desirable. (U.S.)

**REAL-TIME SYSTEMS MAINTENANCE**
RADAR...COMMUNICATIONS...DATA PROCESSING...
Involves operation, test and maintenance (inspection, repair, modification, adjustment and calibration) of complex electronics equipment such as search and height finding radars, (including ancillary equipment such as PPI display and SIF decoder units), data processing and control equipment, inside plant communications systems, ground-to-air radio equipment. Will also establish training programs and/or conduct instruction of military personnel in the understanding and performance of the equipment. Engineering level openings require an EE degree or at least 8 years electronics field experience. A minimum of 3 years' experience on engineering assignments is mandatory. Technicians should have 4 years' experience in electronics maintenance, some of which involved equipment indicated above. (U.S.)

**COMMUNICATIONS**
Positions call for 4-6 years' experience in installation, maintenance or test of one or more of the following systems: Microwave, Tropospheric Scatter, Carrier or Multiplex. Work involves installation, test and operational check-out of the individual equipment and subsystems for a major Tropospheric Scatter Communications complex. (European and Far Eastern Assignments)

**NAVIGATIONAL AIDS**
Requires thorough training and experience in VHF-UHF ground-to-air microwave communication systems as used in air traffic control systems. Must be familiar (in the context of these systems) with the design and layout of radio receiver and transmitter sites, and have extensive knowledge of large control consoles. Experience can include approach surveillance and GCA precision radar. (U.S.)

**INSIDE PLANT TELEPHONE ENGINEERING**
To design in minute detail all phases of inside plant telephone systems such as layout, circuits, equipments, etc. Must be capable of designing telephone central offices consisting of manual or machine equipment handling up to 10,000 lines. Applicants should be thoroughly familiar with step by step and XY automatic switching, and be capable of conducting, computing and using traffic studies in recommending the quantity of lines of equipment to be installed. (U.S., Europe and Alaska)

**RADIO COMMUNICATIONS**
Positions call for 6 to 10 years' experience in one of the following: High frequency radio direction finders or ECM; high frequency radio transmitters; high frequency radio antenna design; microwave equipment (Pulse Time Modulation). Responsibilities include handling all phases of large projects, including equipment selection and procurement, site specification, installation contracting and field inspection follow-up, EE degree desirable, but more than 10 years of related experience in industry or the Military will be considered the equivalent. (U.S.)

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Special ferrule fitting on GAM springs gives you positive grip. Stainless steel constructed, this rust-proof spring adapts itself to all existing GAM mobile VHF antennas and is rigid enough to resist wind but flexible enough to bend for low clearances. SB1 and SB2 differ from S1 and S2 only in that the ball joint allows mounting on angular surfaces.

LIST PRICES

| S1 (3/8" hole), S2 (1/2" hole) | $7.50 |
| SB1 (3/8" hole), SB2 (1/2" hole) | $10.00 |

See your distributor or write GAM direct. Prices available for different combinations of Springs and Antennas.

S1 and S2
SB1 and SB2

WTZCR, secy-treas.: K7S LTV, MNZ, RHY and W7s HRR and HJK, directors. Net time is 0330 GMT and frequency is 3000 kc. The WSN had 66 sessions, 229 QSOs and 59 DX8s during September. WTRG, now one of his new kw, WTHHD has ordered a new s.h.d. station, The Kittson County ARRL meets at 1845. The on 3000 kc. K7USL is a new call in the area. The Vema A. Richland Amateur Radio Club now has a station located in the Red Cross Building. WTOBR received his number 18TH. First ticket. The group the WLR amateurs in the Tri-Cities areas is planning to establish a 1Y club. KJ1RE is active on WSN and 240s R7N. WTPX was at the National Convention in Portland on LWB vacationed in WO-Land. The SCM and SEC attended the Walla Walla Hamfest along with 228 others. There were 27 licensed W7 and W7LX. K7FAV and KJ1HA came out in a dead head in the c.w. code contest. W7QYF and K7AAT received certificates in the Hamlin- catterers Net. W7ITC is being installed on a vhf transceiver, and W7HE is running a new HX-50. The World’s Fair station, K7USK, and KL70A/7 closed down a month early because of loss of donated space. WTPV is planning a new 20-meter beam. W7RA has 327 counties covered. W7NC was a visiting visitor from Portland. W7FHE is in a new QTH in Ohio. W7HRC and his XYL went to Klamath Falls, Ore. and Vancouver, B.C., on their vacation. W7EPE is being heard on WSN again after four n/a’s. W7AIC is “testing” with a space phone hook-up for the shack. K7THA spent five days in traction at the hospital. W7TVE is aligning his new all-band vertical. W7KXX has a new K1T-ZT. R7N is planning to go to 160 meters for the winter months on the second sessions. K7TAO is sending ISRC’s call for club house work at VARS. W7HQQ and W7WY attend the Richland and Grays Harbor meetings. W7UWT made his 29th consecutive report to the SCM. Traffic: W7DZK 320, W7RA 734, W7PYO 503, K7JHA 421, W7ORB 205, W7APS 179, W7GIP 136, W7AB 56, W7GYV 54, W7TRB 20, K7JRE 17, W7AB 14, W7IC 12, W7WZV 10, W7FHE 9.

PACIFIC DIVISION

HAWAII—Acting SCM, Mike Fern. KE6ARL—SEC: KE6QV, R.M.; KE6VU, P.A.M.; KE6M, KE6ML, and KE6HTS have broadcast the 5th State Net (7305 kc., 2000 HST, Mon. through Sat.) as a rallying point. Please come to K6DWD to KC6 for his firm during October. KE6BPG helped set up special communication circuits for the Nebbia pickup truck for the K6DG店铺 up the Kauai C.D. Group. K6DG is ready for 160 this winter. KE6BSZ has a new QTH. W6ZDP/K1MC moved ORS and worked applied W6TQG. KE6SOG had an OBS appointment. W6SOG and W6EKK are on from January, which has a bumper crop of ORS Novices. KE6GK brought K6DUDY’s gear when Milton left for Oregon State. KE6KRS, KE6ARL and KE6DUDY held down the end of K6CQV/K6Q’s phone operation for the South Pacific Conference. KE6QV/K6Q left for the South Pacific Conference. KE6QV/K6Q left for the Pacific War College, and came home with a custom-fitted ground bus in his hup. The Kauai C.D. V.H.F. Net meets on Wed. at 2130 KST nightly. If you’re there, send it in. Traffic: W6ZDP/K1MC 117, KE6DV 53, KE6KD 72, KE6GK 39, KE6TQ 26, KE6GK 18, KE6KRS 16, KE6QV 15.

NEVADA—SCM, C. A. Rhines, W7TVU—W7THH is moving to Reno. W7MAH and his XYL visited the Reno gang. Reno homes are expecting trouble with a proposed zoning ordinance. The Nevada is enjoying good turnouts at its meetings, and is planning classes in rod, theory and regulations. K7QJY passed his General Class exam. W7FZK is back in Reno. K7KBK made the BPL for the second straight month with hails of traffic from Antarctica. This will be his last time of reporting for the section as you have elected him W7BPV as your new SCM. It has been a real pleasure working with all of you and meeting some of your personally and representing you at conventions called by your Director. Give your support to W7BPV and I’ll be looking for you on the air. 73 and DX Traffic: K7KBK 1150.

SANTA CLARA VALLEY—SCM, W. Conley Smith. K6DZV—The SCSCA reports the Old Timers Spa- ghetti Dinner, Sept. 7th, was a great success. Frank Oport and Dick Barrett showed pictures of houses built in 21 days complete with spark, are and tube. The oldest ama- teur present was Doug Perlman. "DP" before 1913. The club has started another code school and is operating with W6HYV in charge. W6MRS, ORS, is back from Kwajalein where he enjoyed operating K66BU and K6MRS. HH is moving to a new place, and presently is with the XYL for antenna installations. It’s good-bye to California for K6DRZ, at least for a while. His AAT or nurse. Claire will be stationed at Lackland AFB initially. WOYHM made the Portland Convention on the way back from KL-Land. Don R. is back with a new I.C. converter for the SARO. His other hobby is flying and he recently touched down at Monterey for a short chat with your SCM. KE6LH, RA6MP, W4GPD, WAGXXand

(Continued on page 158)
R F Communications' Model RF-101 Linear Power Amplifier provides a full kilowatt p.e.p. output over the frequency range of 1.6 to 16 Mc. Tuned to six fixed channels within this range, the RF-101 is normally driven by the widely used Model SB-6F, Base Station SSB Transceiver. The P A itself measures 25½" high, 18¼" wide and 19¼" deep. Together with its six channel exciter the complete kilowatt sideband station is less than 35" high. A companion kilowatt antenna coupler is also available.

WRITE FOR DETAILS ON THESE AND OTHER PRODUCTS IN THE WORLD'S MOST COMPLETE LINE OF FIXED CHANNEL SSB EQUIPMENT

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6 METER TRANSCEIVER
SOLAR SYSTEM

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Ham Net
- 12 Watts to 5763
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Better than 1/4 Microvolt Sens.
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BROOKLYN 7, NEW YORK

WITHD supplied radio communications with walkie-talkies and WAGYCZ, the 2-meter repeater for the Pulo Alto regatta. W8AUC maintains s.s.b. skeds nightly with Hawaii and Alaska. W8KDR is a new higher speed c.w. reception, by tape apparently since he is already qualified at 45 w.p.m. on the mill. This is no sort report after tour, but it is added to everyone for your support. I have enjoyed making so many new friends. See you on the low end, 73. Traffic: (supply)


SAN FRANCISCO—SBCM, Wilbur E. Bachman, W6BIP—San Francisco Club: New officers elected at the Oct. meeting were W6AXX, pres.; W6URA, vice-pres.; W6NLX, sec.; W6ABR, treas.; W6ABT, 1st vice; W6TJJ, 2nd vice. Teddy Marielli, one of club’s most popular members now is a Silent Key. Code practice is conducted on 3800 kc. Men thru Thurs. at 6:30 p.m. by W6USN, starting at 8 w.p.m. HAMS: Red Cross Clubs W6XNO and W6MLK were active in the alert drill of Oct. 8. They monitored 2700 and 2975 kc. also AM F.M. channels. W8MBSN is a new net, EC, Tamalpais Radio Club: Member W6MHW is now a Silent Key. K6HBA is a new resident in Novato. K6HBA helped move people out of the area during a recent critical fire in Lake County. Bay Area Clubs: W6BEH has to take things easy now so since his editing Splatter, Dot, W6LIZ, and Vern, W6FPK have taken over this task. The XYZ of K6EAP and after the XYZ of W6GBC met with some Portola Roses at the Portland Convention. Humboldt Radio Club: Portuna and Eureka amateurs exchanged their Oct. meeting night to hold a joint meeting of CCR Club. The Oct. meeting was held at the 8TH of W6CCH with good attendance. The First Greater Bay Area Hamfest held at Title seventh. About two hundred and fifty attended and all reports are that congratulations should go to the committee in charge for a job "well done", as they did. Planned and held this big affair within three months. Clubs already have keyed in to the next year with more clubs participating in plans. The San Mateo Radio Club, San Francisco Club, Northern Peninsula Electronics Club and Redwood Club took charge of the first get-together. I wish (Continued on page 169)
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to take this opportunity to thank all my appointees especially the OESs for their fine job of looking after the people who paid the bills. We had to reschedule our meetings several times due to weather and other events. I am grateful for their support and cooperation.

SAN JOAQUIN VALLEY—SCM. Ralph Sarean, W6JFU—W6JUK and K6ELX attended the S.B. Convention in Santa Barbara. K6JET attended the National Convention in Portland, W6UHY the Eastern Michigan Convention in Chicago, and W6TIZJ the K6BNL. K6BNL and W6RET are organizing a 6-meter RTTY MARS net. W6KQP is on 4.0 again. Drake X-21 has been purchased for the new Drake 2A receiver. K6BNL is building an RTTY converter. The following stations checked in on 3545 ke., for traffic and reports during the month: W6RES, K6JET, K6IZ, W6QEL, W6QAG, W6QGF, W6QHI, W6QSF, W6QVJ, W6QYU, W6QXN, W6QZB, and W6RED. K6OJ was a DX-Cover. K6OJ and W6QVJ are still working on 840 check-ins. W6QYU and K6OJ have been working on a new Drake 2A receiver, W6QVJ is working on a new Drake 2A receiver, and W6QYU is working on a new Drake 2A receiver.

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WRITE DEPT. HR-12
in his HT-37 but got a new one back in place, W4BP, again is back in the running, having changed his QTH. K4QSO got the bug out of his new hometown rig, spending time in the hospital, W4BC is struggling with a new Heath Marauder, and W4VFC is starting a project to rebuild the transceiver and get it back in position. K4AL says, "Having lots of fun with homemade projects. It’s a quiet 3-band in Richmond." W4M-
FLY has bugs in the new 150-watt amplifier, W4UFR is putting up a new TA-3340 with a new CDR Ham-M. W4UX misses them from 100-ft trees in Lynnhurst! K4PFX is putting a new Grace 201 Linear in the air. W4IP reports the Peninsula repeater is in working order but needs finishing touches. K4TZe had a buzz on his signal until he found a bad line cord. K4MB and K4TH-50 Awards were received by K4YDL. K0KPY is busy with various M3s on naval ships. W4UJUV is spending much time looking for new counting stations, K4OMC confirmed, including 42 in Virginia. Up Winchester way W4VOL reports the STARX landing at the Lewis Hotel with its Annual Banquet Sale. W4ZAX reports new officers of the PRVC are W4XWG, pres.; W4GQF, first vice-pres.; W5FRE, sec.; W4RFC, treas. K4JUY still is in the contest fighting. W4DLA says 80 and 40 have been the best for several months. Traffic: (Sent) W4PFC 1209, W4DLA 225, W4RHL 220, W4NTR 270, W4DFU 183, W4PFR 133, W4BDZ 127, W4SHL 128, W4FYJ 163, K4XHP 160, K4YNN 88, W4DA 76, K4TVE 64, W4LY 84, W4PTR 45, K4YAT 43, K4K4U 35, W4CTV 21, W4UTM 21, W4RFR 17, K4K4I 17, K4K4O 16, W4LBN 21, W4WOL 12, W4WCF 11, W4TVE 11, W4WJD 9, K4DCC 8, K4I- HP 8, W4BPG 7, K4V4B 7, W4K4J 4, W4C4B 3, K4BAV 3, K4K4O 5, K4K4I 5, K4K4O 5, W4WOL 3, CQ, W4PFC 117, W4GQF 29, K4JUY 13, K4TZe 8, W4KFC 7, K4K4O 5, K4TZe 5, K4R1Y 5, K4UVT 1, K4J2G 1.

WEST VIRGINIA—SCM, Donald B. Morris, W8JMN; SEC: WS8SA, RA; K8HHD, PM; K8CFT, WVN C W on nets at 3370 kc at 0000 GMT, 0200 GMT, 0400 GMT, 0600 GMT, 0800 GMT, 1000 GMT, 1200 GMT, 1400 GMT, 1600 GMT, and 1800 GMT. We welcome Kay, W8RLR, and her QM, W8WBY, formerly from Richmond, Va. To West Virginia AM K8CFT reports SWR at 17 net results, 59 stations, 27 messages, 23 sessions on c.w., 100 stations and 64 messages. New officers of the Blen- dale-Charleston Radio Club of Federal Communications Commission certify the following: K5GQY, pres.; K8BHT, vice-pres.; K8CFT, sec.; K5KUX, act. mgr.; Bob McKinley, pub. W8AGD received his General and 5-WANT license. The W8ATP and K8KAX are conducting code and theory classes for the Veterans Administration ARC at Shepherd College. The ARC has been named trustee for the National Radio Society. K8KMG will be chairman of the VLA for the 1963 West Virginia State Radio Convention. Are you ready for theCentennial Year with your new Centennial QSL card? Traffic: K5GQY 17, K5KUM 32, W8RLR 8/4, K5KEL 12, K8CFT 7, W8SHU 4, K5K6U 1.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald S. Middleton, W6TWT; SEC: W6SS, PM; K6PAM, AM; K6M3E, RM; K6WBF, and K6K7D, OBS; K6C4D; W6M4O reports that the BARC made several 432-Mc contacts with Wyoming during the ARRL Convention. The BARC has been invited to attend the American Convention of Junior Colleges at its Sept. meeting. Two new officers for Colorado are W6MRDF and W6DKA. The HNN signed a contract for 120 and a QSL TV card from K6C4D. Traffic: K6C4D 32, K7ZQ 27, W6WY 23, W6WY 21, W6ZQ 21.

UTAH—SCM, Thomas H. Miller, W7QW; Asst., SCM: John H. Simpson, W7QX, SEC: K7BLR, The UARC in Salt Lake had a good meeting recently. The main program was a contest for home-brew equipment. Contrary to popular belief, many hams still build their own equipment. The main prize was won by W7CYG with his kw linear amplifier. Band conditions on the 6-meter band were very good. K7TMQ, K7MQ, W7QW, and W7XY received BART awards on the 6. K7HIF needs control and alternate control sta-
tions. Station activity reports have reached an all-time high. Director Smith of the Rocky Mountain Division has the goal of doubling the membership in the division this year. Every member acts as a Recruiter. Help the Building Fund. Traffic: K7WNP 356, W7CBO 66, W7QW 6.

NEW MEXICO—SCM, Carl W. Franz, W7ZIN; SEC: KSQIN, V.H.F.; PM; W5WPG. It is with deep regret that we announce the passing of long-time owner of W4RC, on Sept. 12. He will be missed by his many friends. The NMBC net now meets at 7 AM on 3583 Mon. through Fri., NMBEPN, on 3583 kc, has dropped its time to 7:30 AM. Sun., John O. Kanole, K5UYF, has been appointed the new 900 Plaque which was presented to him, Oct. 15 by Lancer. President of the Albuquerque Chamber of Commerce. John is the 5th in the U.S. and the 16th in the world to be so honored. Our heartfelt con-
gratulations, John. I would like to hear from old ARCS with regard to the establishment of a state ARC (Continued on page 164).

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GEORGIA—SCM, J. W. Ora, W4JPL, 1110 W. Peachtree St., Atlanta, Ga.

LOUISIANA—SCM, C. S. Pritchard, W4JRE, 200 W. 7th St., Baton Rouge, La.

MOROCCO—SCM, J. W. Ora, W4JPL, 1110 W. Peachtree St., Atlanta, Ga.

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WESTERN FLORIDA—SCM, Frank M. Butler, Jr., W4K5R—SEC; W4MSE, PAT M; W4WBE, R.M.; K4RBER. The Florida SEC area has been hit by a number of tornadoes and 76ers W4MSE and K4RBER prepared a joint report which appeared in this issue. K4JRE, Tallahassee, handled traffic to and from state offices during the recent floods in the Sarasota area. W4BQH (ex-K4HAX) kept a continuous contact link between Panama City during the 5 meters. Quincy, K4QDN has a new TA-23 Jr., beam and is busy hunting DX. Hometown: with W4BR, K4NAP, W4CDL, W4QWJ, W4UH, W4QVQ, W4NLC, W4N1A, W4N3L in the mix. K4JRE has moved to Pensacola. W4ALQ has a new tri-band beam and has modified the DX-100 for high power operation. W4MLP is on the air from NTTY. W4MLP keeps slides with KLA, FL. W4FL, K4F1B: A recent EARS program included plans for SAG long-range e.s., communications meetings this week W4MLP has raised the 10-meter ground plane and is looking for ground wave DX. EARS W4NLH is sponsoring a new code and theory class taught by K4AAK. K4SOL worked FT, Walton on 2 meters with his tower and ground plant. The PARC holds frequent transmitters on 10m covering 800-9000 Kc. K4AAK, the station owner, suggested that the K4WJWP names "K4WJ" as his major call sign. K4WJG, with a license moratorium in mind, is maintaining weekly schedules with his OM, W3DQ on 40-meter phone. The prime site for the eldest ham present at the Home Hamfest was owned by W4JL. The Confederate Signal Corps is starting a Novice class in November. Contact W4PRR or drop a card to B.O. Box 293, West Point, GA. Yankees are welcome. The "Worked all Counties" Award is now sponsored by the Columbus Amateur Radio Club. W4NHQ doesn't look at all well. A hole he sounds: we pictured him as rotund and bald. Con gente to K4MN on making the highest e.s. score in the nation in the July CD Contest. EK6, K4LJ, K4KQ, KAOS, K4V, K4BYD and K4JRE also honored Georgia with excellent scores. W4UQ, W4UKR and W4HR are running a campaign covering 800-9000 Kc. In NOV appointments: W4JL as EC and K4FZP as OBS. Trapeze: W4DOW 163, W4PM 155, W4WY 121, W4FH 50, K4F1M 26, K4KFW 18, W4FL T.

WEST INDIES—SCM, W. J. Kerman, WP1DJ—C.D., Radio Office: KPAIJ, ARRL QSL Bureau. KPAIJ, Box 1001, San Juan 23, Puerto Rico. Headquarters: KPAIJ holds cards activating your BAAB. K4KFW is working the Island in 39 countries and 47 states, confirmed on 75-meter phone. K4KFW, St. John EC, has established the first island station on 28.740 mc., roll-call Thurs. 2200 GMT. K4KFW is presently K4QJR, W4COL, NCS of the Antilles Emergency Weather Net, constituted over K4KFW. K4FZ and K4JAI report on various stations for 463 mc., daily at 0115 and 0230 (GMT), as often as he can for traffic but he could use help from other K4 stations. WP2FW has returned to Accra and AEWN, K4PQOA, licensed as KP4A for a year, is close to XOCO-20, KPAI1, Staveley is very active with his gear made by radio amateurs. K4TGH and K4C5 are building a new station on St. Lucia Island. KPAWT, Staveley, is on 5 meters besides 20, 40 and 80. WP4BEL, at Central Coloso, is on 6 meters with his "antenna finder" and K4QF 12 is busy. K4QF 12 is K4QF 12's grandson, K4PBCW, is on 50.2 Mc. El Morro ARC Club meets the last 1st and 3rd Thurs. of each month at 2200 GMT. K4QF 12, on the air covering the 2nd and 4th Thurs. at 1300 GMT on 28.740 Kc. K4PQQA has a new KP4WM-2. K4PAKD started experimenting and is on 20-270 Kc., a.w., with a 20A and a kw. linear. K4PAZ is repairing his parallel 4-400 A linear. K4PAZ moved to a new station on GTL. 51 Perez St., Behavioral Science Building, uses KP4DJ, PJ, TVQG and QKQ. KP4CH now in charge of v.h.f. transmitters for the FAA at Int'l. Airport. KP4LI is in charge of the Washington, D.C. tower with KP4LI and KP4KI. KP4XN has an extra room on the tower for a radio shack. K4PAZX is striving to establish a new New York Traffic: K4PAZX 320, K4PAZX 105, K4PAZX 0, K4PAZX 0.

CANAL ZONE—SCM, Thomas R. DeMeen, KZ7DJ—
(Continued on page 188)
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**SOUTHWESTERN DIVISION**


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**OPERATION 52**

This year, as in past years, a group of Tucson, Ariz. amateurs will strive to put children hospitalized at the National Foundation for Aseismatic Children in touch with home on Christmas Day. Any ham who would like to aid in helping these children speak with their parents may get a list of towns needed and full details from K7HEP. Floyd Lake, Tucson, Arizona.

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**ARIZONA—SCM. Kenneth P. Cole, W7GZI—Asst. SCM: KITI. PA: W7IA: WMW. The Copper State Net meets on 3000 kc. at 0100 MIST through Fri. at 0000 MIST on 3000 kc.; the Grand Canyon Net Sun. at 0800 MIST on 3000 kc.; the Tucson ARRC Net Wed. at 0900 MIST on 3000 kc.; the Cochise County ARRC Net each Sun. at 1400 MIST on 2200 kc.; the Verona 2-Meter Net at 1000 MIST on 141.35 Mee.; the Arizona Interstate Net. CIR, Mon. through Fri. at 0900 MIST on 3355 kc. The Maricopa County ARRC Net will meet each Mon. at 0200 GMT on 432 kc. (CIR, ARRC Net) on 08.020 kc. (CIR, ARRC Net). The traffic net, K7CWB is on the line: K7CBW an Apache 8-10; KTLA a GS-500 and a 108-B 101 and KTCT a new KWA-2. All amateurs interested in the Santa Cruz Net should check in with KTCT. The Maricopa County Civil Defense Unit, in an effort to strengthen their organization, has requested that more amateurs enroll in the "COP 52" Paraguay. Regular meetings are held at 0130 the 3th Thurs. of each month at the Underwood Control Center. For further information, Maricopa County wireless may call W7GZI, telephone 273-1411, Ext. 48. W7LZL, Tucson, as con-

(Continued on page 12/1)

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ducting code and theory classes at the Elks Club every
Fri. at 10:00. Anyone interested should contact Jerry or
the Old Polk Radio Club. W7LIA is convalescing at
home after major surgery. His three 1140s are getting a
good workout. The Arizona Amateur Radio Club of
Phoenix elected: W7PSW, pres.; W7PPG, vice-pres.;
W7ZWI, W7UXX, W7YWR, K7CEC, and W7MAH, board
of directors. New-elected officers of the Old Polk Radio
Club are: K7CGO, pres.; W7USA, sec.-treas.; K7IPX,
vice-pres.; K7JPV, past vice-pres.; K7HEW, Treas.; K7CJI,
programs and publications. K7R91, ex-W4JKE, LXXSP, DLPAS,
is now engaged in promotional work for the Signal Corp. and Bell Aero-systems. You will find him on 20, 40, and 80 meters c.w., Traffic: WOWHE, DAB, BATAAM 183, K7CEC 188.

SAN DIEGO — SCM. — Don Stagner, W5LPU —
A meeting of "Old Timers" will be held Dec. 9 to form
a San Diego Chapter of the QCWA. If interested, and
you have been licensed for 25 years contact W5LPU
for more information. W5QXW and the AYL, vacationing
in Hawaii in October, W5AVQ became the first Orange
County ORS to earn a PRL and in some years. Con-
grats, Marv. W5WPK was elected vice-pres., of the An-
neheim Club to fill a vacancy. The club now has 30 full
members, W5RFO, who moved from the Los Angeles
section, becomes the second ORS in Orange County. He
is an active traffic man and presently manager of PANO.
W5MNV is control station for third and fourth
AREC nets in Orange County. W5VAA, Orange County
EC, reports 62 AREC members, of which 31 are pro-
filed, K5DRT is no longer SEC, but is still active in the
SECC affairs and the communications chairmen for the
Red Cross. My personal thanks to Wes for his work as
SEC. The other SEC is appointed, the SCM will be
hit and assume the duties of SEC, W4CDF sports a new
trio on his beam-top, K5EXX, in Encinco, K5QX, in
Upland, and K5QXN was appointed EC for the
La Mesa, Spring Valley area. SCM, K5KPL, is
chairman of the 1963 ARRL Division Convention to be
held Oct. 11-13, 1963, in San Diego. The committees
are being formed, and all local clubs are reminded to send
delegates to the Council meetings, the 4th Thursday
of each month at Red Cross Headquarters. Clubs request-
ing San Diego Council information should contact either
the SCM or W5RFO, chairman. My sincere Greetings and all the best for 1963 to all hams and
their families in the section. Traffic: (Sent.) K5R9T 1917.

SANTA BARBARA — SCM. — William G. Shelton, K6-
AAR — The section organization is shaping up and
we hope to announce all appointees in the next issue. The
WSSBA Annual Convention was held in Santa Barbara,
Sept. 28-30, and was an outstanding affair. W6OQJL is
operating portable at Dunn School with a new G-75.
K6OQJ is active as EC and reports 20 mem-
bers on the Onondara Net, K6OQJL, which meets Tues.
and Thurs., at 1500 UTC and 1600 UTC, on 6390 kc. W6OQJL
is performing a splendid job and reports regular
arrivals. The following have applied for AREC membership:
W6OPA, K6AXW, W6ZX, W6OQJ, and W6OQJL. The
Simi Radio Club is interested in forming an emergency
net and is headed by W6QWH. All clubs are re-
quired to forward the names of their officers and
members of their meetings to the SCM. Active nets should also
forward schedules to the SCM.

WEST GULF DIVISION

NORTHERN TEXAS — SCM. — L. L. Darby, W3BNG
— West SCM: E. C. Pool, WB3NO, SEC: K3AE, PAX:
W4AYX, FAX: W4LIR; Congratulations to the Irving ARC
and the Brownwood ARC on receiving approval of their
clubs for affiliation. This is proof that a group of ama-
teurs are really interested in promoting on the level and in
the realization of the assistance offered by the League.
W5QXW, West Gulf Division Director, visited the
Irving ARC and gave a fine talk on the program of the
ARRL and the future of amateur radio. Many hams from
the area were present and enjoyed the meeting. Con-
gratulations to Dee on being elected as West Gulf
Division Director for another term. W5QXW recently held a
meeting with Lubbock holding its 3rd, 20, Alhena Oct.
7 and Brownfield Nov. 11, Lubbock had a fine hamnet with
345 present and 251 preregistered. The Lubbock
ARC is to be congratulated on the editorial content
of the issue, I regret to inform you of the passing of a very active
ham and a spark plug for the Lubbock ARC. W5FEY, passed
away Sept. 31 just a week before the Lubbock hams in Oct.
W5KNA is the new EC for El Paso County. Chuck also
is president of the Permian Basin ARC and has been an
active ham for the past 21 years. ARC's officers are now
K5R9T, pres.; K5KPL, vice-pres.; K5QXN, treas. Traffic: W5MKR 188.

(Continued on page 172)
Clegg 99'er 6 Meter Transceiver

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OKLAHOMA—SCM, Adrian V. Rea, W6DRZ-K5K1W, our ECC, has been seriously ill in the hospital for some time. We understand that he will be out of it and home soon. We hope that he will be back on the bands in good voice.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QMA—SEC, W5AIR, the Corpus Christi Amateur Radio Club participated in The Victory over Police Drive from Dec. 1 to Oct. 7. On the first drive communications were made from the amateurs Department under Sheriff’s Department and CB. On the Oct. 7th drive amateurs worked all 52 locations in Corpus Christi and Nueces County. This proves again that you can’t stop the amateurs when it comes to dependable communications. Thanks to K5QFA, from Harlingen, and W6LMU, from Alice, for helping out. Amateurs in Corpus Christi and all along the coast participated in Hurricane Twist, a simulated hurricane. The Southmost Radio Club furnished communications for operations Club, Police Drive, with KFT as Net Control, and 20 other amateurs. The following is a quote from the newspaper The Valley Morning Star, for Dr. John Wetzel, Clarm. Club, Amateur Drive, “The second high point was the radio communications by the Southmost Amateur Radio Club, which kept the operating running efficiently and smoothly.”

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ONTARIO—SCM, Richard W. Roberts, VE2NG—VE2AYS visited Craigleith (for Rainbows), VE2SNG visited Woodstock, VE2AID was host. VE2AID was Observer to the SET in Woodstock. The Radio Society of Ontario, Inc., is sponsor of the AHRL Convention in Toronto and the plans are complete. From SEC VE6AI's report the recent SET was a success in Hawaii. The QSL Manager urges you to send him self-addressed

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Shape factor: 6 to 20db
1.15 to 1
Shape factor: 6 to 50db
1.44 to 1
Package Size: 2\(\frac{5}{8}\)" x 1\(\frac{3}{8}\)" x 1"
Price: $42.95 Each

The SILVER SENTINEL (32B1)

TECHNICAL DATA
Impedance: 560 Ohms in and out
Unwanted Side Band Rejection: Greater than 40db
Passband Ripple: ± .5db
Shape factor: 6 to 20db
1.21 to 1
Shape factor: 6 to 50db
1.56 to 1
Package Size: 1\(\frac{5}{8}\)" x 1\(\frac{5}{8}\)" x 1"
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stamped envelopes to pick up your QSL cards, VE36Q is the man. VE3CJR of Peterborough, is the recently-appointed net manager of the Outh-Que Net. VE3QG is now the net manager. VE3KJ, who used to work on the school bus, was just promoted to the new position. VE3KJ's calling was not new to the ham world, however. He used to be VE3KJ in the Windsor ARA movement. The operation was quite successful and VE3KJ was very active in it. Now he reports that he is no longer interested in the school bus business and has taken up a new one that interests him even more—VE3KJ in the ham world. VE3KJ has been a member of the Outh-Que Net since 1953, and he is now the net manager. VE3KJ was one of the original members of the Outh-Que Net and has been very active in it ever since. He has been a leader in the net for many years and has been very successful in his work. VE3KJ is a very active operator and has been very successful in his work. He has been a leader in the net for many years and has been very successful in his work. He has been a leader in the net for many years and has been very successful in his work. He has been a leader in the net for many years and has been very successful in his work. He has been a leader in the net for many years and has been very successful in his work.
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You can erect this tower yourself. Just dig four holes, set your posts in place, bolt the pieces together. It's that easy to make it work higher as your tower goes up. It's a bit of time to build your own tower - and saves you money, too!

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Width of Base Equal to 1/3 Height

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YOUR CALL- Name or option, deep engraved by any station on the back of a PSI, TPI, TIP, ORN, or PHE. - Colorful Phenolic Laminate - Quantity back type, number and type... Black, white, Green, Walnut or Mahogany. - White back. Satisfaction Guaranteed. - Pdp. $1.00 each. Quantity Purchase... - bluff of ideal equipment plates.

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516
Double your frequency coverage with COLLINS NEW 62S-1 VHF CONVERTER

Double your frequency coverage with COLLINS NEW 62S-1 VHF CONVERTER

Get full 6 and 2 meter operation simply by flicking a switch. And without changing cables. Collins 62S-1 is a self-contained (using exciter’s high voltage) unit and supplies 3 to 5 db noise figure on receive...160 watts PEP input on transmit.

The 62S-1 covers 49.6 to 54.2 mc and 143.6 to 148.8 mc (crystals for amateur bands provided). Crystal switching provides a choice of any one of twenty-three 200 kc bands in the 6 and 2 meter range.

Collins new VHF converter is system engineered for the S-Line/KWM-2 and needs no additional power supply when used with this equipment. Also, the 62S-1 can convert most equipment operating in the 14.0 to 14.2 mc range.

See the entire Collins S/Line...stop in soon.

62S-1 VHF CONVERTER $895.00

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IARU News

(Continued from page 88)

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Mexico: L.M.R.E., P.O. Box 1037, Mexico 1, D.F.
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Montserrat: VP2MY, Plymouth
Morocco: A.A.E.M., P.O. Box 296, Casablanca
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Netherlands Antilles (Curacao): Verona, Postbox 385, Willemstad, Curacao, NW 1
New Guinea: Rabaul Amateur Radio Club, P.O. Box 170, Rabaul, Territory of New Guinea
New Zealand: N.Z.A.R.T., P.O. Box 489, Wellington (C1)
Nicaragua: Club de Radio Experimentadores de Nicaragua, Apartado Postal 925, Managua
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★ A true ham station, ideal for both fixed station and mobile operation.
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★ Transmitter section has an ultra-stable crystal oscillator which may be controlled by external VFO.
★ Efficient, fully modulated 8 watt final works into flexible Pi network tank circuit. Large 5 meter serves for transmitter tune-up procedure.
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NEW 75S-3 RECEIVER

The latest addition to the famous S-Line! A versatile receiver for SSB, CW, RTTY and AM. Sharpest selectivity—SSB—2.1 kc, CW—200 cycles, Q multiplier, with 50 db rejection notch. Variable BFO, with calibration marks for RTTY use, and crystal BFO for upper and lower SSB, fast/slow AGC, spinner tuning knob.
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Powerful—1000 watt PEIP input! Portable—weighs only 38 lbs. Compact—same size as the KWM-21! (Including self-contained high efficiency silicon rectifier power supply.) Compatible—works with any 100 watt exciter. Features—AAF, RF inverse feedback, hi/Lo power switch, automatic antenna transfer, etc.
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New triple-conversion heterodyne receiver. Frequency coverage Nine 500-kc segments:
- 3.5—4.0 Mc.
- 7.0—7.5 Mc.
- 14.0—14.5 Mc. (4 segments)
WWV
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4 Elements on 10
3 Elements on 15
3 Elements on 20
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UNCLE DAVE'S RADIO SHACK
A SUBSIDIARY OF FORT ORANGE RADIO DISTRIBUTING CO.
Two-Kilowatt P.E.P. Amplifier

(Continued from page 45)

made at reduced plate voltage and with a minimum value of excitation. Excitation should never be applied without plate voltage. Once resonance is established, the tube should be loaded up to a plate current compatible with the mode of operation, as shown in the chart of operating conditions. If the grid current is excessive, the plate circuit loading is too light. Low grid current indicates that plate loading is too heavy. As a final check, the r.f. output (as observed on the output voltmeter) should increase in direct proportion to the excitation level. With an average voice, plate current should “klick” to about 300 or 400 milliamperes operating at a plate potential of 2500 volts. With 3000 volts on the plate, the voice current will read about 290 to 330 milliamperes. In either case, the grid-current reading will be approximately one-third the plate current reading.

The resting plate dissipation of the 3-1000Z runs between 400 watts and 720 watts, depending upon the plate voltage on the tube. It is possible to cut the quiescent plate current and accompanying plate dissipation to a negligible amount by inserting a 10,000-ohm, 10-watt wire-wound resistor in the filament center-tap return lead at point “X” in Fig. 1. The cathode bias developed by a small plate current flow through the resistor biases the tube to a few ma. of resting current. The resistor can be shorted out for proper amplifier operation by an extra set of relay contacts in the VOX circuit.

Finally, it should be noted that a pair of 3-400Z tubes connected in parallel may be substituted for one 3-1000Z with equivalent results. Additional air is required, in the amount of at least 30 cubic feet per minute at a back pressure of 0.4 inches of mercury. The blower shown in the parts list of Fig. 1 should therefore be replaced with one of larger capacity. The Ripley No. 5472 type 3 motor and blower assembly will do the job. Separate parasitic suppressors (Z1) should be used in each plate lead, of course.

There you have it—a complete 2-kw. p.e.p. input table-top amplifier capable of being placed on the operating desk, along with the exciter and the receiver. The amplifier emits an extremely clean signal. All distortion products, introduced by the amplifier, will be at least 35 decibels below the p.e.p. level when operating under the 2500-volt condition.

Six-Meter Transmitter

(Continued from page 60)

position of the g.d.o., carefully clip off equal lengths of the neutralizing capacitor wires until

(Continued on page 182)

FACTORY AUTHORIZED SERVICE
ON RECEIVERS AND TRANSMITTERS

(Continued from page 60)

position of the g.d.o., carefully clip off equal lengths of the neutralizing capacitor wires until

(Continued on page 182)

FACTORY AUTHORIZED SERVICE
ON RECEIVERS AND TRANSMITTERS

(Continued from page 60)

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(Continued on page 182)

FACTORY AUTHORIZED SERVICE
ON RECEIVERS AND TRANSMITTERS

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position of the g.d.o., carefully clip off equal lengths of the neutralizing capacitor wires until

(Continued on page 182)
LIKE-NEW HAM EQUIPMENT

AT MONEY-SAVING PRICES!

• Trade Your Present Gear On A Like-new Receiver or Transmitter
• Two-Week Trial
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If you insist on like-new equipment — in appearance and performance — at substantial savings, write, phone or visit Trigger Electronics. Receivers, transmitters, and other ham gear are completely realigned and calibrated by service technicians trained in rigid quality control methods. Tubes, capacitors, and other components that can contribute to unsatisfactory performance are replaced — insuring optimum, trouble-free performance. Inventory consists of one of the most complete stocks in America of brand-name Trigger reconditioned amateur equipment. Listed below are but a few of the hundreds of items currently available:

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<th>Model</th>
<th>Price</th>
<th>Manufacturer</th>
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<tbody>
<tr>
<td>HQ150</td>
<td>$169.75</td>
<td>Johnson</td>
</tr>
<tr>
<td>SB5</td>
<td>69.95</td>
<td>COURIER</td>
</tr>
<tr>
<td>SX71</td>
<td>137.75</td>
<td>NAVIGATOR F/W</td>
</tr>
<tr>
<td>XL16</td>
<td>119.50</td>
<td>GONSET G76</td>
</tr>
<tr>
<td>HT37</td>
<td>389.50</td>
<td>G76 DC SUPPLY.</td>
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<tr>
<td>HT41</td>
<td>319.50</td>
<td>SUPER 6 CONV.</td>
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<tr>
<td>HT33</td>
<td>289.50</td>
<td>COMM IV</td>
</tr>
<tr>
<td>NC125</td>
<td>99.50</td>
<td>6 METER</td>
</tr>
<tr>
<td>NC300</td>
<td>199.50</td>
<td>COMM IV</td>
</tr>
<tr>
<td>HEATH RX-1</td>
<td>199.50</td>
<td>2 METER</td>
</tr>
<tr>
<td>SB-10</td>
<td>69.95</td>
<td>RME 84</td>
</tr>
<tr>
<td>VENCA</td>
<td>179.50</td>
<td>RME 6900</td>
</tr>
<tr>
<td>DX40</td>
<td>44.50</td>
<td>KNIGHT R100 &amp; 5 METER</td>
</tr>
<tr>
<td>7SA2</td>
<td>389.50</td>
<td>GLOBE SCOUT</td>
</tr>
<tr>
<td>7SA4</td>
<td>595.00</td>
<td>GLOBE CHIEF</td>
</tr>
<tr>
<td>32V3</td>
<td>289.50</td>
<td>HARVEY-WELLS</td>
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the g.d.o. no longer indicates or is at a minimum. If the wires are about 1\(\frac{1}{8}\) inch away from the tube sides it is possible to go through the minimum and to return to it by varying the position of the wires with respect to the tube plates. When the final is neutralized, the wires project about 1\(\frac{1}{4}\) to 1\(\frac{1}{2}\) inches above the socket.

Connect the final power supply and connect a suitable load to \(S_3\). With the driver delivering a grid current of about 12 milliamperes, quickly dip the final plate circuit and adjust the loading so that the plate current is about 150 to 200 milliamperes. Readjust the final and repeat the tuning steps until the plate current is maintained at the proper level while delivering maximum output. Excessive grid current may be corrected by separating \(L_3\) and \(L_4\) slightly to reduce the coupling, or by increasing the value of the 6360 screen resistor. All controls should tune smoothly and the final grid current should drop to zero when the crystal or v.f.o. is momentarily removed. Tuning the final plate or loading controls with plate-screen voltage removed will not affect the grid current when the final is properly neutralized.

The low-power switch, \(S_6\), is used to limit the screen current during tune-up, or when the plate current is set below 125 ma., as in low-power operation.

Reasonable care and patience exercised during the construction of this little rig will pay off with both gratifying on-the-air comments and pride in owning a trouble-free, reliable piece of equipment. For those of us who are willing to think big in terms of six-meter mobile operation, it is possible to make a potent, yet compact mobile installation with this rig, using a transistorized power supply and modulator. The latter may be built into a package matching that of the transmitter.

---

Fifty Years of Amateur Radio

(Continued from page 69)

was to survive and grow it must dedicate its best efforts to the public welfare, without monetary return. If the League had not stood steadfast on this principle through the years, Amateur Radio would have perished long before now. The tradition of public service they pioneered has grown as the years have gone by, and today stands as the mark by which we are judged the world over. But we cannot stand on our past accomplishments if we are to move forward. The responsibility for public service is our greatest challenge for the future.

Our membership has grown from a few hundred in 1914 to over 100,000 in 1962. We have a most able and devoted staff at Hartford. They are men of long experience in amateur affairs and they do an excellent job of presenting our viewpoint on domestic and international matters. Above all, they are

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CQ de W2KUW

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Sent to us before Dec. 31, 1962

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Glistens with quality and performance all-over. Fea-
tures in addition to those listed above: 5 crystal
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for proper antenna match. Buy one now — we
Know you’ll be satisfied with it.

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NO MONEY DOWN

THE LAFAYETTE HE-30
Professional Quality Communications Receiver

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PLIER. TUBES: 6BA6—RF Amp, 6BE6 Miler, 6BE6 OSC,
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DELUXE 10-METER TRANSCEIVER

MADE IN U.S.A.

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- Illuminated Panel Meter for Plate Current and
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Similar to above except for 6 meter operation 114.95

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db at 10 kc, Image reflection is —40 db at 3 Mc. Tubes: 3-
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183
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- Meter Switching
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7 has 2.4” dial — 1.5” knob. TC 3 has 3” dial —
1.5” knob. Black bakelite.
TC 2 $35.99 — TC 3 $35.75 — Summer Handle 75c extra
4/14 for Parcel Post
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10009 Franklin Ave.
Franklin Park, Illinois

dedicated to the concept of public service by the
amateur fraternity.

As we look into the future there are many prob-
lems to be solved — over-crowding of our limited
frequency assignments in the more popular bands,
protection of our present international frequencies,
and the reciprocal licensing arrangements with
foreign countries— to mention only a few of the
more important.

Yet we have much to be proud of and a great deal
to be thankful for in the heritage that has been given
to us by the pioneers who are here tonight. If we
can meet the future with the same perseverance and
spirit of public service with which they did, I am
confident we will carry on successfully.

The VB5AA DXpedition
(Continued from page 86)

"Can see now, B'wana. Only letters on sheet.
That's all."

"What are the letters, boy, what are the let-
ters?"

"Think other fella see us, B'wana. He pick up
pole and come this way. Think I go now, B'wana.
Best read letters yourself. Gummbye, B'wana."

"Blast it, Number One, come back here. You
know I can't see through this mist. Blast this
mist anyway... blast the light... oops. I see
that other fella now... coming right at me.
Hope the natives here are friendly. Steady
now... raise your flag... let VB5AA wave
gloriously... remember the Govern... steady
man... go closer... closer. Just about read
those funny scribbles... another few steps
I can just... Z... R... 7... B
... B. ZR7BB??? What does that mean? But
I'm VB5... we're on the same... the Gov-
ernor told me... he gave me... what's go-
ing... must be some mistake... that fel-
low, he's on top of my new country... I can
see him now... why he's it... can't be
he's ZR7???... but I'm VB5... same
mount... we both... Gad Zooks... I'd
know him anywhere..."

"I say, Gus old man."
"Danny, my boy."

Correspondence from Members
(Continued from page 90)

RA? Thank you for your assistance. — C. E. Dongler, W1ZK, 15520
Highland Avenue, Rochester 18, N. Y.

THE NEW "CRUSADE"

"I" the article, "It Seems To Us," in September, 1962,
QST, is just what our wonderful hobby requires.
With the advent of many newcomers. (myself in-
cluded), we need a guiding hand to set us straight
on the many little tricks of the trade. Will be looking
forward to the new Crusade. — George Holden,
E7BBS, Victoria, B. C.

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band, all power to 1 kW.
SWR 1.2 to 1.
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- ACCOMMODATES ALL PROP PITCH AND OTHER ROTOR MOTORS INSIDE TOP SECTION
- HEAVY DUTY CRANK-UP EQUIPMENT

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>HEIGHT (ft.)</th>
<th>WEIGHT (lbs.)</th>
<th>NEW LOW PRICE</th>
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<tr>
<td>H-237</td>
<td>37</td>
<td>150</td>
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<td>54</td>
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<td>HS-6105</td>
<td>105</td>
<td>870</td>
<td>745.00</td>
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</tbody>
</table>

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JOHNSON 6N 2-meter converter. 144 mc. outfit, factory 
in stock. $35.00, complete. 38-3E. $38, K18T, Jericho Road, Middlebury, Conn.


GOING High power. Need tube: 304TL, 813A, 810, 455TH, 707T, etc. L. Huthner, 1890 East 5th St., Brooklyn 23, N. Y.


Waring Signs Bulletin. Building our 12 weather station in 
station in New York City. Call at 545-2598.晕


ESTATE Must sell station including KWS-1 and 754-A. Write for list. Hank Fray, 39 East 17th St., New York 3, N. Y.


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Dallas, Texas, Tel. R-1 1857.

THEY pay cash for your best prices paid. Write or phone. Lou-Tronics, Inc. 131 Lawson St., Brooklyn 1, N. Y. Tel. KN-2632.

FOR Those driving to Mexico will buy good mobile mike. Reutzer, Apartado 2807, Mexico City, D.F., 1.

WANTED: for personal collection: QSTs January through August, 1951. Please send condition. Epochs 1 and 5. WJCT. Jr., West Hartford, 7, Conn.


SELL: B&W L-1001-A linear amp, with matching power supply. 70-280 mc. $250. B-3222. $250.00. All in excellent condition or new. Combs, 1219 Yardley Rd., Morristown, N. J.


SOLD: Hammer Box 173, Cranford, N. J.

WANTED: Old wireless ear, tubes, magazines and catalogs before 1948. Will pays. Please complete information including prices. My purpose is to buy this equipment, put it in first-class shape and make it available either for serious or demonstration to all amateurs who didn’t live and operate during this era. W5WA. T. Frank Smith. P. O. Box 904, Corpus Christi, Texas.

ATTENTION Mobileers! Heavy-duty Leece-Neville 6 volt 100 amp. system, $55. 100 amp. alternator, $35. 12 volt 100 amp. system, $100. 12 volt 150 amp. alternator, $35. 12 volt 200 amp. alternator, $50. $125.00. for complete kit. J. J. Freeman, 1239 Coby Island Ave., Brooklyn 30, N. Y. Tel. JUNO 7-7388.

JOTL tubes wanted. Also other "K" and special purpose tubes. We will buy military or commercial transmitters and re ceivers, including 30 and 50 mc. Gh. On Ground Electronics Co., 64 Grand Pl., Kearny, N. J.

PROCEEDINGS Of the R.E.E. 1914 through 1925, 1926.

WANTED: Old coils and condensers for old coils or condensers. Price on entire lot. Mr. Miriam Knapp, W1ZMI, 19 Beechwood Ave., Jamaica 2, N. Y.

WANTED: All types of aircraft or around radio work. 17L, 618F or $5 886, 91. GRC, PRC, 513, RXA. Especially any item made by Collins Radio, ham or commercial. Also large type tubes and test equipment in general. For fast cash action contact Bob Hummel, 3853 Cook St., Arlington, N. Va.

HAM Discount House. Write us for lowest prices on ham equipment. Factory sealed containers. Specify equipment wanted! HAM DISCOUNT HOUSE, 3255 N. Maywood Ave., Dallas 1, Tex.

CASH promptly paid for your ham gear. Tissier, 3561 North River Forest, Ill. 8-8161.

TUNE-UP Service on mounting hardware. Unusual: like new. Information sheet included. $1 ea. $5 450. Vend, KCM, Hackett, 1527 R-St. Louis, Mo.

TELEVISION Camera Kit easy to build step-by-step instructions, suitable for Ham TV, Educational, Industrial, Medical uses. A-150. Televication, Inc. Labs. Inc. 60-30 54th Ave., Woodside, L. I., N. Y.

FOR SALE, complete instructions, including 28-p. booklet, 4-2 color pictures detailing the chassis. Also complete service manual and SHS. $2.50. Satisfaction guaranteed. Sam Appleton, KSMK, 5110 N. 12th Ave., Chicago 26, Ill.

NEW And used ham gear. Top trades. Norm, K9HRT at Danby Electronic Surplus. 14 Jasve St., Alamonox, Ill. Mail orders welcome.


DX-100 $275; A-1 NC TRS $115; AR-67 $390 complete mobile. $175. Includes many extras, send for list. Prefer local deal but will ship F.O.B. Seattle, W-42FZ, 1318 Ortol, Greensboro, N.C.

SELL: HQ-10X with xtal cal. and spkr. $150. PMR-8, used only $145. VHT-152 in one month. $350 NLI-152 in two mon. $254. Will deliver within 60 miles Phila. Rob Little. W-3ETB, MURRIS-12.

AT College: DX-100. w. DX-100 modifications, push to talk. $150. RME 4350A revs. $150 or best offer. All in extant condx. Includes extras. F.O.B., or will deliver between L.A. and S.F. Reu. W-3UQ. Ron Parks. W-5/6AUX. Box 1332, UCSB. University, Calif.

S. Cheyenne. Used as fixed station. perfect. $80 with mike. K-9577F, Pardeeville, Wis.


CRYSTALS Airlaid: SS-9, MARS, Commercial, CD, Novice. 8QI. Not. etc. Custom finished P.T.-243, .10% any kilocycle 2500 to 20000, $15.00 or more. PT-243, same frequency. 99c. 1700 to 20000 kilocycles $1.95. Over 1000 kilocycles, $2.50. Add $10 for BC-6/us hermetics. Airlaid 10 crystal, usual 5c. WRG-268a large crystal, usual 25c. Crystal from 1933. C-W Crystals. Box 1584-Q. El Monte, Calif.

SELL: Viking II. in extant shape. $125 or will trade for gud older revv. $150 F-84 tuner. $25. MEMY. $100 Sylvan. Rich- mond 25, Va.

XMAS Tube specials: 2014/6CL6/6H78C, 8 for $1.98. 432X2, $3.48. 872A & 829. $1.96. 8614 & 829. $1.29. Send stamp for complete ham tube listing. Lou. 113ST Lawrence St., Brockton, Mass.

JOHNSON 509. In daily use. $495.00. Will ship in original carton. W-3DLY, P.O. Box 88, Forest City, Iowa.


20-A. factory wired. KS-5YXX. Box 181, Hollis, Okla.


VIKING II. $185. B&W TR switch, Heath VFO. 75 meter BCA AVT124A recty and PSI. 75 meter SSB transmitter, Want Ad. 244, John. 20 Belmont St., Brimley, Mich.


SELOU. 3110 Central Electronics 600-L amplifier. $160. CDR Ham-Amp. New and new cond. $150 or $85. all in new condition. Must sell at any price to pay college expenses. K3ONF, 123 Chambers St., Vicksburg, Miss.

10B. QT-1, VFO and 200 watt homebrew linear. Sr clean. $155.00. Fern. K4WYM, 3088 Susanna Dr., Lou. 13, Ky.


WANTED: For my station in Chile, Collins 755-3 or 755-2. B&O 200 or 825-1. Will consider KTWM-2 instead of 755-3 and 325-3. Also 1000 power supply. 3000 power supply. 1140-2 power supply. James, 7GWR, Cecil, CE4PW, 1807 Poplar St., Pine Bluff, Ark. Phone Jeff 4-7135.


SELL: Eddystone 890 dial unused. original carton. $12.00 p.o. c. Nevel. 184 Mount Hwy. 39, N.Y.

GLOBE Scout Deluxe. $38.00. make offer, Heath VFO. $15. K4/MQ. Dukes. N.D.


HYGAIN Beams: three-element Tribander solid traps. extant cond. $50. three-element 15 meter Monobander coaxial rabbit $55.1; Cont. with 15 meter, $150. power supply, in beautiful goudy. $550.00. Cash. all Loz. Matlackwood. N.H. L. Carey. Sr. 33 Oakview Avenue.


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George Lucas, W1ZYS, is currently Raytheon's resident field engineer at Boeing, Wichita, Kansas. He has advised and instructed on new ACR alignment techniques at many major Air Force bases in the U.S.

Ray Churchill, W1VBI, specializes in high speed bombing radar aboard B-52's. He may be at Loring AFB, Maine one day, Edwards AFB, California the next.

Pops is the Field Project Supervisor of Air Force Programs for Raytheon's Electronic Services Operation. Pops served in a wide range of field engineering assignments prior to his promotion to Project Supervisor and is currently responsible for field programs requiring the services of a large group of field engineers. George Lucas and Ray Churchill are members of Pops' highly capable and fast moving field team.

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(Trade & Tech Help—
Mail or Phone)

W9QBB
Tasker Day
(Ham Shack)

K9LOK
John Chass
(Ham Shack)

W9HLA
Joe Glizzi
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K9WLB
Lou Green
(Ham Shack)

W9WHF
Jim Sommerville
(Ham Division
Manager)

K9KVO
Rodger Nordlund
(Ham Shack)

In Milwaukee
W9NGV
Lowell Warshawsky

In Milwaukee
W9VOB
Burt Fischel

In Milwaukee
WN9A WB
Neil “Bud” Cain

and from all the gang (over 60-strong) at Allied

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W9VQD J. Baird
K9AVU Marcell Bell
W9WOV George Bercos
K9KWSH Sherwin Berger
K9MDM Theodore Bleiman
W9BUD Larry Blostone
K9CJD Joel Bolker
W9THG Leo Borek
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WN9CNV Pauline Course
W9TTQ Gerald Dahl, Jr.
W9SFW Lou Dezettele
K9GSB Norman Eastman
K9GSA Norman Eastman, Jr.
K9OEP William Elland
W9DCB Milton Fojitik
W9FDI Marvin Garber
K9OAL Dave Gunzel
WA0EBO Brian Harris
K9GTK Thomas Ivas
K8ZRA Lee Jackson
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W9BHH R. E. Jankauskis
K9GHI William Johnson
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K9TTF Mike Levine
W9LCX Leon Lutz
K8YUK James Marker
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K9KWT Robert Oatley
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K9ZWK Emmett Paschke
W9ENK Robert Patejunas
W9UWM Cliff Ratliff
K8HAX Fred Redich
W9NPF Donald Rossi
W9KUV Seymour Sabitt
K9EIL Don Saxon
W9VES Phil Simmons
K9KBM Dave Sims
W9OCS Rich Stielbe
K9OKD Wayne Strahl
K9SRW David Thornburg
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W9YPC Charlie Vaughn
K9HOB Don Wisniewski
K9IOU Thomas Weismantel
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The American Radio Relay League, Inc.

Building Fund Subscription

________________________ 1962

ARRL Building Fund
38 LaSalle Road
West Hartford 7, Conn.

In consideration of the subscriptions of others to provide funds with which to secure and equip a new headquarters office building for The American Radio Relay League, Inc., I hereby subscribe and agree to pay to the ARRL Building Fund:

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December 1962
Members Are Saying...

Our club has only limited funds but it truly has been our desire to give a reasonable amount. We did it by conducting a raffle. Local radio supply dealers very graciously contributed items, surely in the feeling that without the efforts of the League there would be no amateur radio as we know it today. — West Seattle Amateur Radio Club, Inc.

The hobby has been good to me — gave me constructive interests, introduced me to fine friends and enabled me to turn a hobby into a rewarding vocation. ARRL through QST was the sparkplug that made much of my good fortune possible. It is a privilege to contribute to ARRL’s advancement. — W2SFLT.

I am a little alarmed that the funds are not increasing at a faster rate. In an organization such as ours all too often the membership is apt to take, like parasites, and not give in return. In my opinion many of our newer members do not fully realize what an utter state of bedlam would prevail without the League’s sense of direction. It behooves every member of the League, old timers and newer members alike, to take stock of the need of the League for a newer, more modern, larger building and contribute immediately as best they can. — K9BIV.

Guess you know the line about “the road to hell being paved with good intentions.” I had intentions to support the building fund way back in March, but I changed jobs, QTH (three times), and with the fishing season, fighting with the XYL, the drought, TV and other diversions, I just never got around to mailing off the check. However, it is now enclosed. — W2KJY/4.

I well remember the foundation of ARRL for I was in Hartford high school at the time and was a ham for several years previously. The vision of Hiram Percy Maxim and the energy and persistence of Clarence Tuska put the League into existence. From that time on ARRL has been a source of great interest and inspiration to me. I know of no hobby that has such a helpful organization behind it. I am happy therefore to enclose my contribution. — WIBT.

The maintenance of amateur privileges, the periodic reminders of the duties associated with those privileges, the publication of technical correspondence and training aids, and acting as a collective voice for nearly 300,000 individual amateurs comprise just a few of the things which ARRL has done for us, and from which we benefit. In appreciation, we wish to have a part in guiding the future through the enclosed building fund contribution. — Kay Co. Amateur Radio Club (Okla.).

Wish I could send a larger contribution, for no amount would be adequate to express my appreciation to ARRL for the enjoyment League membership adds to our great hobby. — K7QWR.

Our long-standing affiliation with ARRL and the resulting representation enjoyed by our members makes our contribution seem like a small service fee all out of proportion to the benefits received. As a club, we congratulate the building committee on their progress and look forward to periodic reports on construction via QST. — The Starved Rock Radio Club (Ill.).

The enclosed check isn’t a lot, but we do want to help with the new building which is much needed. Amateur radio has meant a lot to us over the years and had a fair influence in determining the OM’s life work. — W2OBB, KE2DGW.

We all feel indebted to ARRL for the many services extended to us as an affiliated club. There is no doubt in our minds that ARRL will continue in the future to meet and solve the complex problems that arise within the amateur fraternity as it has in the past. The added facilities will in fact strengthen the efforts of ARRL to coordinate the greatest hobby the world has ever known for increasing human understanding through personal contact. Enclosed is our check. — Northern California DX Club.

It gives me great pleasure to think I helped furnish a few bricks, a door knob, or perhaps a few floor tile. — W9NAJ.

We wish all amateurs were also millionaires and thus the building problem would be solved. Fortunately, however, you have the next best thing in loyal friends from amateur ranks. Enclosed is our check. Please hurry and finish the building; we want to inspect it before we make WAS on two. — Massachusetts VHF Society.

In ARRL I think the world of amateur radio has its strongest voice, and its most conscientious exponent. I think it stands firmest, and has a record of service to amateur radio without exception. In times to come the radio amateur will need even more strong protection of his rights — and a strong League is one of the best safeguards. My bank has already received instructions for my contribution. — G5JMO.

Made a couple of club talks here in Oklahoma and they had to pay me to shut up — hi! Enclosed are checks from the Electron Benders and the Tulsa Amateur Radio Club. And here’s mine — I had to send it in self defense! — K5KTW.