QST

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amateur radio

May 1961
50 Cents
55c in Canada

PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

Everywhere you turn, there's something

NEW

from **hallicrafters**

HA-2 & HA-6
TRANSVERTERS

Now—go single sideband on VHF!

New transverter converts your present 50-meter station to VHF: AM, CW, SSB, RTTY, FM capability.

Complete, effective, easy to install—Hallicrafter's new HA-2 or HA-6 transverters offer a new approach to Single Sideband on VHF.

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Input up to 180 watts (as in the SSB final can be obtained by cooling having a capability of 120 to 300 watts.

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Furnished less power supply. Requirements: 750 volts @ 100 MA, 350 volts @ 70 MA, Minus 80 volts @ 10 MA.

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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 communication

Presenting—a new standard of performance for AM, CW, SSB reception

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- **Linear CTO, direct reading in kc.**

SX-11
RECEIVE

The experienced amateur will immediately recognize in the SX-115 a first rate engineering triumph that creates an *entirely new class* of deluxe receiver.

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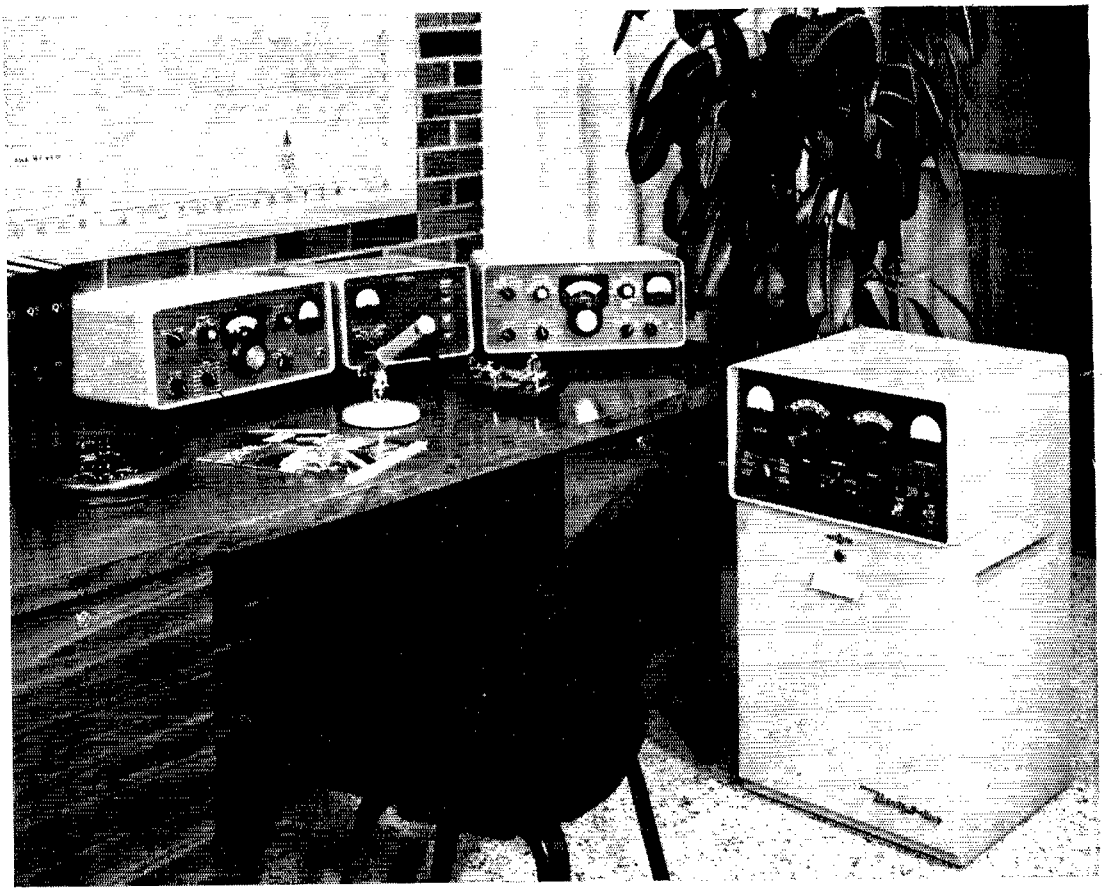

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COLLINS

QST

MAY 1961

VOLUME XLV • NUMBER 5

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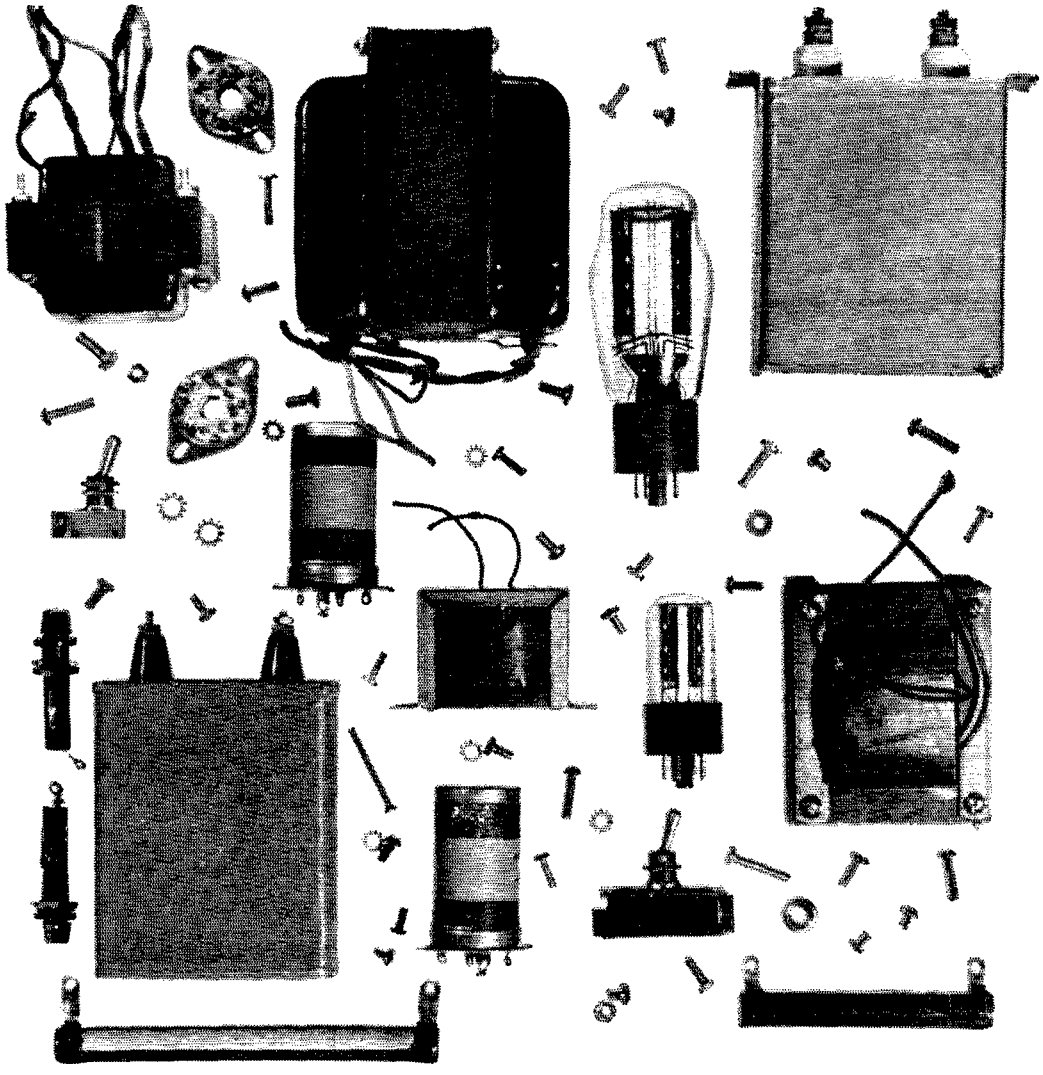

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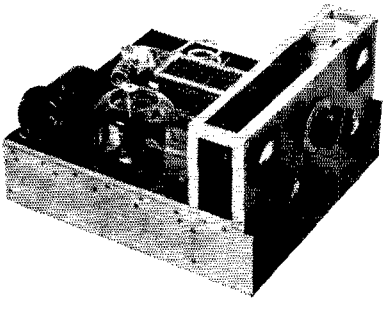

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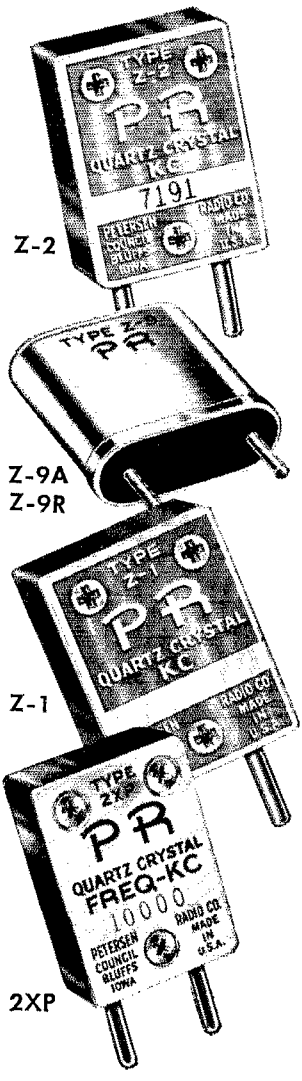

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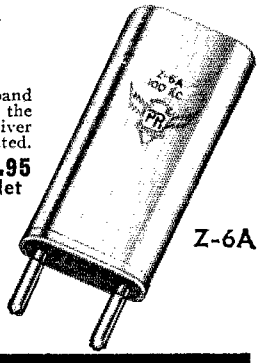

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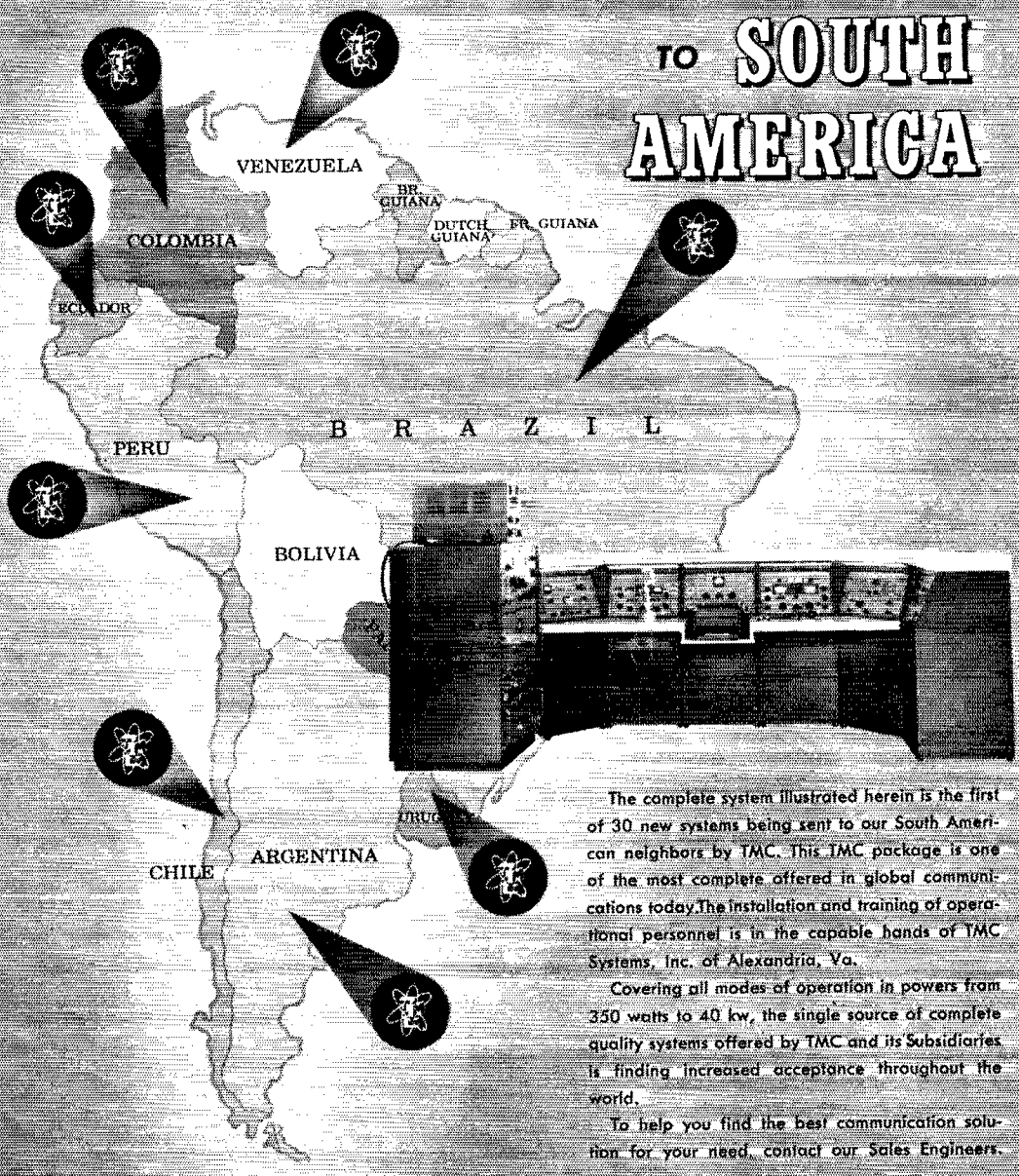

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors.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

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

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

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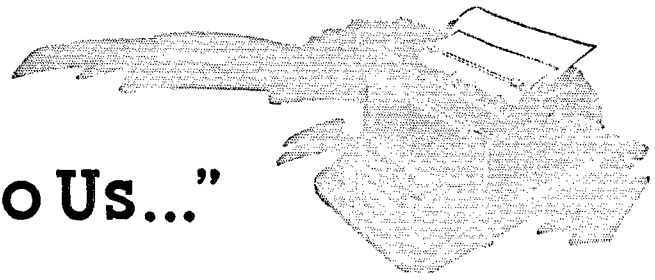


"It Seems to Us..."

THE AMATEUR APPROACH

As amateur radio takes its initial steps toward space communication, it is appropriate on this page to comment once again on the vast potential which our hobby offers scientific experimentation, even in a field as complex as that we now propose to tackle. Yet our own views are perhaps suspect in the minds of pure scientific researchers; after all, we *are* slightly prejudiced! It is a most happy coincidence, therefore, that two eminent publications in other fields have recently discussed the place of the non-professional in scientific endeavor. They so beautifully put the case for the amateur approach to science that we asked for and received permission to quote excerpts.

Hallowell Bowser, General Editor of *Saturday Review*, said in his February 25th issue:

"Last year two teen-aged American radio hams astounded the scientific community when they transmitted signals to each other by bouncing radio waves off an earth satellite passing overhead. This pioneering feat, noteworthy in itself, is doubly meaningful because it gives us still another proof that the unsubsidized, independent amateur is capable of making a solid contribution to modern scientific research . . .

"The advent of nuclear fission and space rocketry seems to have opened up a new era of friendly interchange between the professional and the amateur scientist . . .

"Predictably, many researchers will blanch at the suggestion that they allow ham-handed, unreliable amateurs to invade their labs and studies. But organized amateur astronomy provides an analogy and model that should dispel such fears. The movement, which has an estimated 25,000 members in America, gives its participants complex, exacting assignments that are executed with professional competence; the ham-handed and the unreliable are quickly weeded out. In such organizations as the American Association of Variable Star Observers, world-famous astronomers work in close and respectful interdependence with amateurs; indeed, a great many of America's leading astronomers are former members of these groups.

"Similarly, America's 225,000 amateur radio operators meet a high standard of professional excellence, and often are the only dependable means of communication in times of disaster. The development of short-wave radio and of many important electronic devices was made possible by active cooperation between professional scientists and amateur radio operators.

"The dedicated and gifted amateur, working alone in his tool-shed lab, has always been something of an American folk figure. If we can find a place for him and his colleagues on our various research teams, the sciences will not only gain an enthusiastic new public, but will also gain something else every good team ought to have — strength on the bench."

The December 31 issue of *The New Yorker* magazine reported an interview with Mr. C. L. Stong, conductor of a column in *Scientific American* entitled "The Amateur Scientist." He said, in part:

"Over the years, I've collected as many figures as I could — attendance records of conventions of amateur astronomers, of holders of ham radio licenses, and so on — in order to make a calculation of the total number of amateur scientists in this country. I've reached the conclusion that there are more than a million of us. About forty per cent of the amateurs I hear from are professional scientists who qualify because they tinker in their spare time with supposedly useless projects outside their own fields. Take Vannevar Bush, whose proper subjects are physics and electrical engineering. For the past ten years, in association with John Early Jackson, director of the Defense Department's Office of Atomic, Biological and Chemical Warfare, Bush has spent a lot of odd moments tinkering with an old-fashioned pendulum, hoping to make it tell time as accurately as a quartz-crystal oscillator does. The great thing about amateur projects is that one can never tell whether they're useless or not. Long ago, we had such distinguished amateurs as Robert Boyle, who formulated the law to the effect that the volume of a gas varies inversely with the pressure upon it; Henry Cavendish, who weighed the earth; and William Gilbert, who discovered terrestrial magnetism. It was an amateur who discovered the planet Pluto. An amateur scientist usually wants to know why more than how. A child asking his father why a pebble is smooth is laying the groundwork for a scientific project. There are thousands of interesting questions that we amateurs can try to answer — questions the professionals would get around to if they weren't so busy elsewhere." QST

COMING A.R.R.L. CONVENTIONS

June 16–18 — Rocky Mountain Division, Ogden, Utah.
August 26–27 — Central Division, Springfield, Ill.
September 15–17 — New York State, Niagara Falls.
September 29–30 — Ontario Province, Windsor, Ontario, Canada.
October 7–8 — Midwest Division, Omaha, Nebraska.
October 13–14 — Great Lakes Division, Cleveland, Ohio.
October 13–15 — West Gulf Division, Kerrville, Texas.
October 28 — Kentucky State, Lexington, Kentucky.

NOTICE: CONELRAD DRILL

A Conelrad test will be conducted for 30 minutes commencing at 2100 GMT (3 P.M. CST) April 28, 1961. See p. 64 this issue. The amateur service has been requested to participate in this drill voluntarily; purely as a matter of pride in continuing amateur radio's record of self-policing, we urge all amateurs to comply fully. This means that all amateur bands should be absolutely silent during the half-hour drill. Hang a notice on your rig concerning the date and time, and check out your Conelrad monitor to ensure full compliance, especially if you might be in the shack that afternoon.

SOUTHWESTERN DIVISION CONVENTION

Phoenix, Arizona — May 26–29, 1961

All roads lead to the Westward Ho Hotel in Phoenix for the Southwestern Division Convention on May 26-29, judging from a list of tentative speakers and guests expected for the affair. Speakers include U. S. Senator Barry M. Goldwater, ex-6BPI, Bill Orr, W6SAI, Leo Earshaw, ZL2AX, Don Stoner, W6TNS, Wes Schum, W9DYV, Andy Andross, WØLTE, and Merrill Swan, W6AEE.

There's an impressive expected guest list too! Among them will be Lt. General Francis H. Griswold, USAF, Vice-Commander In Chief of SAC, WØDWC; Robert E. Lee, FCC Commissioner; Herbert Hoover, jr., W6ZH, Bill Grenfell, W4GF, Chief, Amateur and Disaster Service, FCC; Southwestern ARRL Director Ray E. Meyers, W6MLZ; and Pacific Division Director Harry Engwicht, W6HC.

Special sessions are being organized for v.h.f., DX, s.s.b., c.w., RTTY, QCWA and SWOOP.

The latest ham gear, shown the preceding week at the Chicago Parts Show, will be flown to Phoenix. On display will be a new MARS communications van and the new SB-1, Controlled Radio Drone, from the U. S. Army's Electronics Proving Ground at Ft. Huachuca. XYLs are to be provided with tours of the West's "Most Western Town" and special luncheons. An Initiation for the Royal Order of the Wouff Hong is also planned with Kenneth Pond, W7MAE in charge of the ceremonies.

The Southwestern Division Convention Committee warns visitors not to forget to bring along your informal and western wear. There will be a plunge party, shopping tours and plenty of sightseeing. Convention General Chairman is H. E. Blaksley, K7ASK. Convention pre-registration is $8.50 (or $10.00 at the door) and includes a dinner in the Thunderbird Room of the Hotel and a breakfast of your choice. Convention registrations should be sent to George Mezey, K7NIY, P. O. Box 814, Sun City, Arizona. Hotel reservations should be sent directly to Arthur Famularo, Resident & Reservation Manager, Hotel Westward Ho, Phoenix, Arizona. Other convention correspondence should be sent to E. A. Marshall, Jr., K7AWI, P. O. Box 7155, Phoenix, Arizona.

OREGON STATE CONVENTION

Coos Bay, Oregon — May 5–7

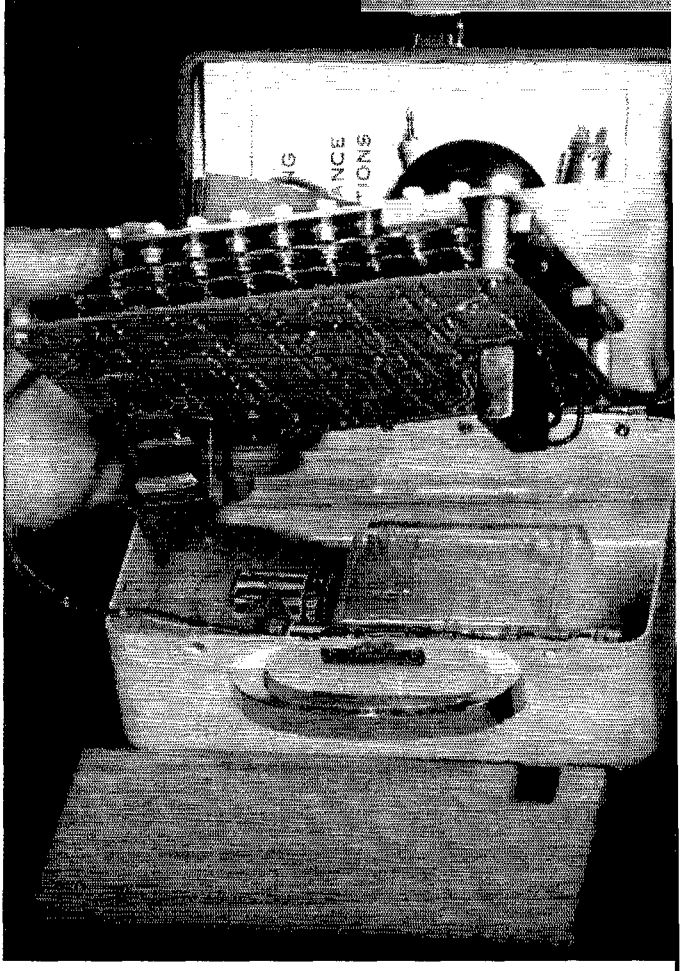
The Oregon Amateur Radio Association and the Coos County Radio Club are sponsoring the Oregon State Convention at the Hotel Courtel in Coos Bay, May 5–7. Robert H. Cline, W7IRG, is the convention chairman and is being assisted by Carolyn M. Cline, secretary, Irwin Doty, treasurer and Nathan Olsen. Convention registration is $8.00 each for amateurs and $4.00 for non-hams. Registrations may be sent to W7IRG, Box 8, Myrtle Point, Oregon.

(See pages 77 and 164)

OUR COVER

Here is the history of modern civilization. First we walked, and then we rode, and now we fly at hundreds of miles per hour. First we had the straight key, which required the operator to form every dot and every dash and the spaces in between. Then came the bug, with its vibrating lever which formed the dots and relieved the operator of some of the chore of sending. The next step was the electronic bug, which in its most polished form makes dots and dashes and spaces of proper lengths and which foils the operator when he violates the prescribed pattern of timing. Finally we have the Codamite, which generates each complete character at the touch of a button. When we walked the cost was small, and when we fly the cost is high. So it is with code senders. One dollar will buy a straight key — Codamite comes in at about Mach 2.

Codamite



The compactness of the Codamite is evident in this view of the "chassis" removed from the case. The upper of the two boards is the typewriter-like keyboard. Circuit wiring is etched on the lower board.

Typewriter-Like Keyboard Forms Code Characters Automatically

BY R. W. JOHNSON,* W6MUR

Push a button marked with the letter or number you want and out comes perfectly-formed Morse. Lives there a code man who hasn't dreamed of such a device? Over the years some have actually been built, but none so compact as this pocket-sized semiconductor-and-memory-core model.

BETWEEN the electronic key and the full-fledged punched-tape system lies the real-time Morse code generator. Codamite [1] is such a device, and is of interest to amateurs not because its price and availability are within reach of the average amateur, but because the principles involved show what can be done with modern digital techniques, and some amateurs may wish to have a try at designing their own. To send the Morse code with Codamite, all that is necessary is to touch a tiny button on a keyboard arranged in typewriter format. The button need not be held down, as Codamite has full memory for what it was told to do. Each code character emerges as a relay closure and side tone, and is perfectly formed. Spacing between letters is what the operator makes it, in the unit to be described, although with slightly more complexity it is possible to electrically "lock out" the keyboard until a minimum space interval equal to three dots has occurred after any letter.

Codamite depends for its operation on recognition of a basic fact of life about the Morse code, this being that the code can be generated just as easily using the *spaces* as it can using the dots and dashes. In other words, if we can cause a

* Consulting Engineer, 9372 Hillview Road, Anaheim, Calif.

[1] Trade-mark registered, patent pending. The Model MG-100 Codamite is currently in production by Ling Electronics Division, Ling-Temco Electronics, Inc.

normally-closed relay to *open* each time a space is called for, we can generate code more simply with purely digital logic than we can if we try to cause a normally-open relay to close with each dot or dash. Spaces are always the same length, for any given code speed, and simply occur at different times. This basic principle has not been recognized in earlier real-time code equipment, in which circuits generated actual dots and dashes, with the result that numerous adjustments, complexity, and uneven code resulted.

While there are many ways in which the desired result can be obtained, the objective in designing Codamite was to select the smallest and least expensive way of having full memory for one letter, so that keys would not have to be held down until the letter was sent. It turns out that a 10-bit memory capacity is required if we are to handle the longer characters such as the zero and comma. We need to provide a means for parallel loading of a suitable memory, followed by automatic serial read-out of the memory. For Codamite, a magnetic-core shift register was selected as being the best choice, because its cost per bit is lowest, and it is small, relatively rugged and lends itself nicely to special circuit arrangements permitting the use of single-pole normally-open pushbuttons without large numbers of diodes as OR gates to isolate one bit from the next.

To explain the basic principle involved, consider the letter "F," as shown in Fig. 1. It will be noted that spaces begin at times 1, 3, 7, and 9, the latter being a permanent space. If we can

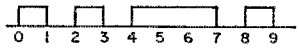


Fig. 1

generate space pulses at these odd-numbered times and cause them to open a relay which we have caused to become closed at time 0, the normally-open contacts of the relay will send the letter "F." It can be easily proved by making a simple chart of the Morse code that all characters can be generated if we can provide a system for generating spaces at any *odd-valued* time; no space is ever required at an even time, such as 2, 4, 6, or 8 in Fig. 1. This is because of the relationship between dash and dot length in the International Morse code, where each is of an odd-valued length and each must be followed by one space and (except at the end of a letter) by only one space.

In Codamite, the following sequence of events takes place each time a key is pressed:

1) The shift register charges in parallel to the proper bit pattern corresponding to the letter to be sent.

2) The relay is caused to close (being otherwise held off).

3) A multivibrator (clock) is started in the correct phase.

4) Pulses from the clock are used to cause the shift register to shift its pulse pattern out in serial form.

5) Each output pulse from the shift register, after suitable shaping and gating, causes the relay to open.

The electronic computer business has a language all its own, mostly unintelligible to the uninitiated. The glossary below, based principally on the IRE Standard (56 IRE 8.51) covering computer terms, should help the reader to whom the computer field is unfamiliar. — Editor.

AND-OR — Used in connection with gating. An "and" gate is one that operates only when all devices in the system are in a prescribed condition. An "or" gate operates when one or more devices are in a prescribed condition, regardless of the state of others in the system.

Advance — Successive steps in the operation of the shift register.

Bit — A single character in a system employing two types of characters (abbreviation for "binary digit").

Clear — To restore to the original state.

Digital Logic — A system designed to perform a specific function using digital (in contrast to continuously-varying) techniques.

Flip-Flop — A device having two stable states, either of which may be initiated by the application of an appropriate signal.

Memory — A device for storing information.

Parallel — Simultaneous transmission, storage, etc., of the several parts of a collection of information ("word") using separate facilities for each part.

Set — To place a device such as a core in a prescribed state.

Serial — A transmission in which operations occur in time sequence, using the same facilities for all.

Read — To acquire information from storage.

Real Time — Now, as contrasted to later. As used here, it applies to a keying device that produces the code character in usable form immediately — in the form of relay action — as contrasted with, for example, a tape system where the tape is first punched and then later converted to relay action.

6) The register clears itself as the pulses progress.

7) When two successive 0s appear in the register at the appropriate point, the end of the letter is recognized. (More than one space, successively, can only mean the end of a letter.)

8) The end-of-letter pulse permanently turns off the output relay, and the letter is complete.

Operation of a shift register may be likened to a row of marbles lined up on a table, with black marbles representing "1s" and white marbles representing "0s." In parallel loading, the marbles are lined up all at once. With serial read-out, the marbles are pushed at one end and fall off the table one by one in the proper sequence corresponding to the original load. When the register is cleared it has, so to speak, lost all of its marbles!

The circuit for the Ling Model MG-100 Codamite is shown in Fig. 2. S_2 through S_{44} are the s.p.s.t. normally-open pushbuttons of the keyboard. When any one of them is pressed, capacitor C_7 discharges into the multiple "set" windings of the magnetic-core shift register through diode D_8. The diode prevents reverse current flow due to e.m.f. generated in the set windings as the register shifts, in the event a pushbutton is held down too long. The set current flows through special series-connected coils around the major apertures of one or more of the shift-register cores, magnetizing the cores corresponding to the space pattern to be generated. The set current also flows through resistor R_{21}, the voltage across which is applied to the emitter of Q_7; the resulting amplified pulse from Q_7 is used to trigger flip-flops F_1 and F_2. The states of F_1 and F_2 when triggered are such that Q_{10} and Q_2 conduct. The relay therefore closes, remaining so until F_2 is reset as described later.

Triggering of F_1 causes Q_1 to cut off, and a negative voltage is delivered to the base of multivibrator gate MVG, Q_3, through Zener diode ZD_3 and isolating gate D_5–R_7. Q_3 conducts, connecting the emitter of Q_4 to ground so that the multivibrator MV starts. MV must start in the same phase each time, which it does because the emitter of Q_5 is permanently grounded. MV continues to run, at a speed determined by speed control R_{15}, until F_1 is reset. By returning R_{15} to −43 volts and making its resistance somewhat higher than that of base resistors R_{13} and R_{14} a 7:1 speed-control range is achieved. Speed is adjustable from about 6 to over 40 w.p.m.

Differentiated pulses from MV are applied to 4-layer diodes FD_1 and FD_2 in such a phase that the diodes fire alternately on each half cycle of the multivibrator output. When either of these diodes conducts, capacitor C_8 is discharged into the advance windings of the shift register through diode D_{26} or diode D_{27}, and through the common return through L_2, the primary of T_1, R_{20}, and R_{19} to ground. Provided that the register has been properly primed by the circuit to be described, this flow of advance current causes the

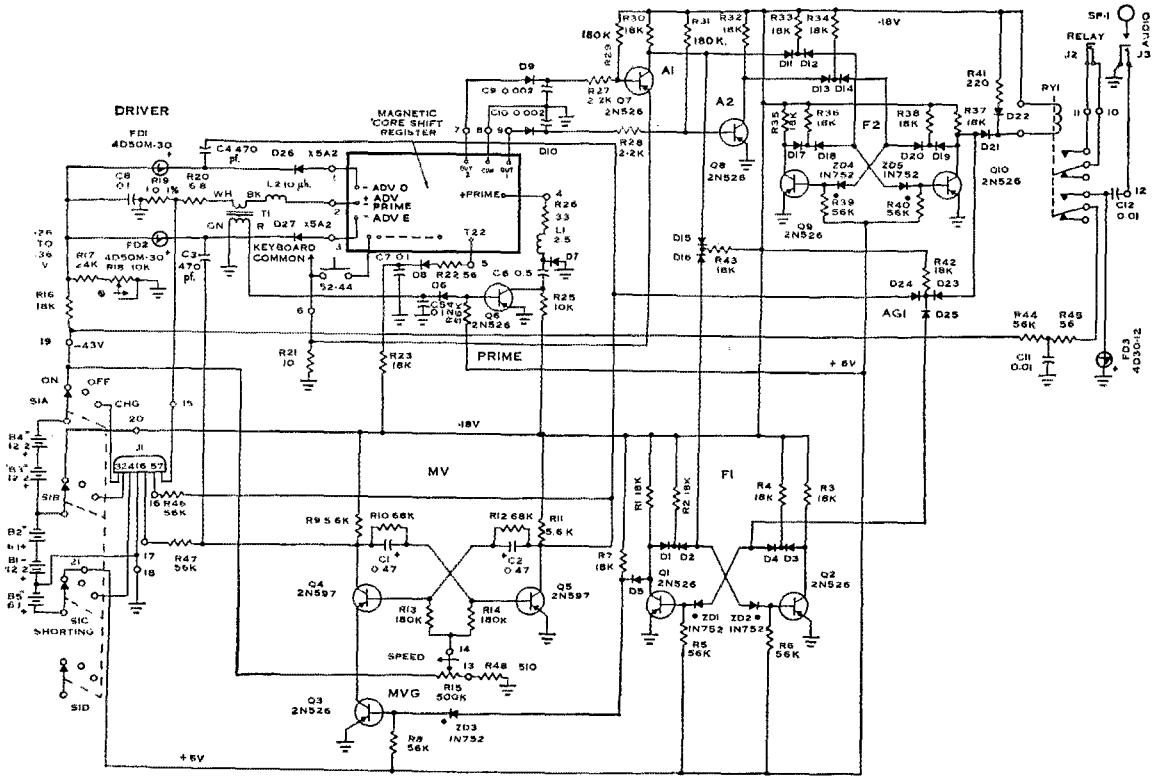
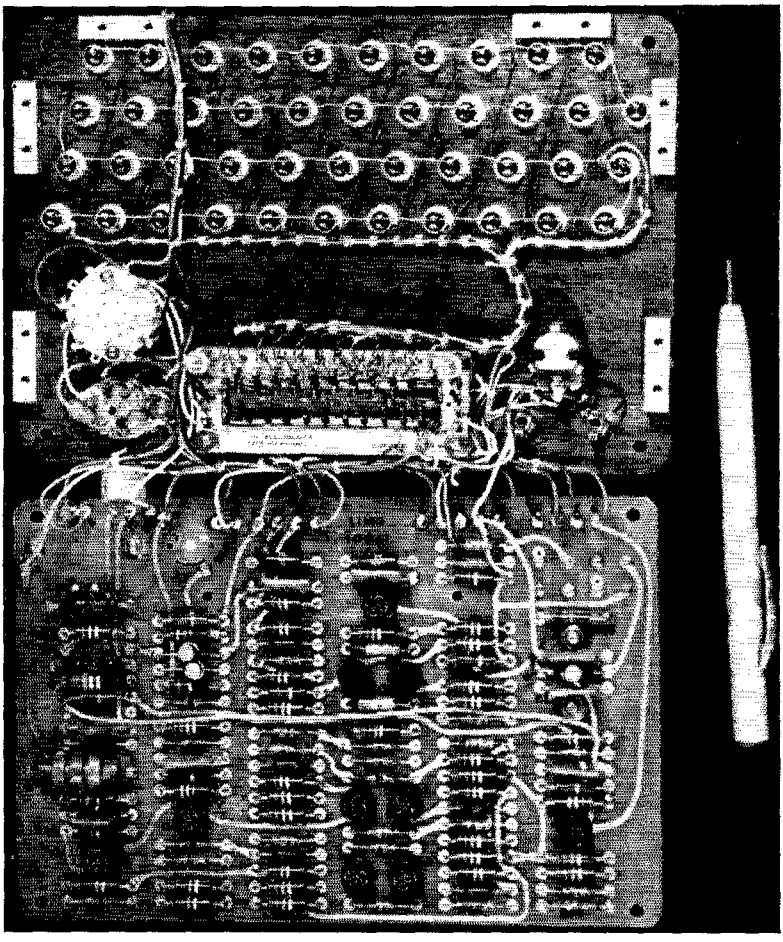


Fig. 2—Circuit diagram of the Ling MG-100 Codamite.



The inside surfaces of the two boards show the maze of wiring and miniature components. The magnetic-core shift register is the rectangular assembly at the lower center of the top board in this view. The four rows of push buttons at the top are operated by keys on the panel, reverse side.

register to advance one step for each full cycle (odd to even, even to odd), and the first output pulse is produced at the output (*OUT1*) terminals, provided a space is actually called for.

The output pulse is stretched by diode D_{10} and capacitor C_{10} and applied to transistor Q_8 as a positive pulse cutting off Q_8, which is normally conducting. The negative output from the collector of Q_8 resets flip-flop F_2, so that Q_{10} cuts off and the relay is de-energized. One-half cycle later, however, another pulse is generated in the auxiliary (*OUT2*) winding *provided that there are still 1s in the register*. This pulse is stretched and applied to cut off Q_7; the output from Q_7 again triggers flip-flop F_2. F_1, of course, is already triggered and has not been reset. The relay again closes. This pattern continues through the entire register cycle: the *OUT1* winding causes the relay to open, and the *OUT2* winding causes the relay to close.

When the register is empty, the *OUT2* winding fails to produce an output pulse and so F_2 is not triggered and the relay remains open. At this point, we have a unique situation, in that for the first time Q_5 and Q_{10} are both cut off simultaneously. At all other times during a letter, either one or the other is cut off, but not both. Thus at this time, the AND gate AG_1 produces an output which resets F_1, turning off MV and the sequence is complete. The circuit is ready for the next letter.

The shift register used in Codamite requires *priming*. That is, either d.c. or a slowly rising, fairly broad pulse is required through a series of windings to establish the proper flux reversal around the minor apertures of the shift-register cores. The circuit associated with transistor Q_6 achieves this purpose. Advance current flows through the common terminal of the register and through the primary of T_1, as previously described. This current produces an oscillatory transient in the tuned secondary circuit of T_1, the second half cycle of which is applied to the base of Q_6. Q_6 then connects capacitor C_6 to ground so that it discharges into the prime windings of the register through L_1 and R_{26}. Priming takes place just *after* each advance pulse. Since the register must be primed *before* it can shift, the first advance pulse of each sequence does not cause shifting to take place; shifting starts with the second advance pulse, which is the correct time since all letters must

start with either a dot or dash, and hence a relay closure.

As may be seen from Fig. 2, Codamite has ten transistors, three 4-layer diodes, five Zener diodes, and 27 ordinary diodes, in addition to the special 10-bit magnetic-core shift register. Codamite is powered by nickel-cadmium rechargeable batteries, and is completely self-contained. Side tone is supplied by sawtooth oscillator FD_3, a 4-layer diode, feeding a high-impedance earphone. This oscillator is keyed by the second contact of the relay, insuring that if the tone is heard, the relay is actually closing. Codamite weighs 3 pounds 4 ounces, including batteries, and is about as big as a multimeter. With this degree of miniaturization and the expensive components, Codamite is not economically practicable for amateurs on limited budgets: it is intended for military and commercial applications where the small size, low weight, and battery-powered operation are necessary features. It might be remarked, however, that Codamite cost is substantially less than that of a new tape perforator and keyer.

Codamite has been used on the air from W6MUR with excellent results, and has been widely demonstrated to amateur groups and to military agencies.

The assistance of Mr. Melvin R. Hughes, W6DEM, and other consultants of the R. W. Johnson Company in developing Codamite is gratefully acknowledged. QST

10 Meters with the All-Metal Quad

Simple Modification for Two-Band Operation

BY EDWIN FEHRENBACH,* KZ5EG

THE 15-meter all-metal quad [1] worked out so well that it wasn't long before the author began to look into the possibility of adding 10-meter elements. While there were several possible constructions, the one shown in the sketch of Fig. 1 seemed the simplest. The diagonal distances work out to be just about right for the 10-meter elements plus insulators.

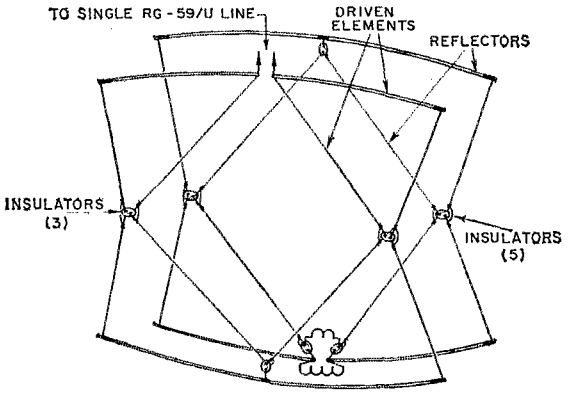


Fig. 1—Sketch showing the method of adding 10-meter elements to the 15-meter all-metal quad. Ten-meter elements (approximately 8 feet each side) and reflector tuning coils are made of aluminum TV ground wire. The 10-meter coil has 4 turns 3 inches in diameter and the 15-meter coil has 7 turns.

The elements were made of ⅛-inch aluminum ground wire, and the lengths were made approximately 8 feet on a side. Egg insulators are used at the centers of all sides of the 15-meter elements, except at the feed point where the two driven elements are connected in parallel to the coax line.

The original antenna had a tuning stub at the bottom center of the parasitic element. This was replaced with a coil of 7 turns of aluminum ground wire 3 inches in diameter, and a similar coil of 4 turns was used in the 10-meter parasitic element. Adjustment for minimum backward radiation was made on both bands by compressing or stretching the coils as required.

The combination has worked so well that I doubt that I'll ever be tempted to try another Yagi. QST

* Box 537, Curundu, Canal Zone.

[1] Fehrenbach, "All-Metal Quad for 15 Meters," *QST*, March, 1961.

Strays

Friends of K3NQC, who was formerly WA2-DIA, might like to send him cards of cheer. He is confined to Deborah Sanatorium, Brown Mills, N. J., with tuberculosis.

— • • • —

At a recent fire in Rhode Island the volunteer firemen from both Glendale and North Smithfield were on the job. As the smoke died down, the affair took on the air of a hamfest, for included in the two departments were W1EAS, W1WMW, K1EDX, K1EHL, K1HZF, and K1IPY!

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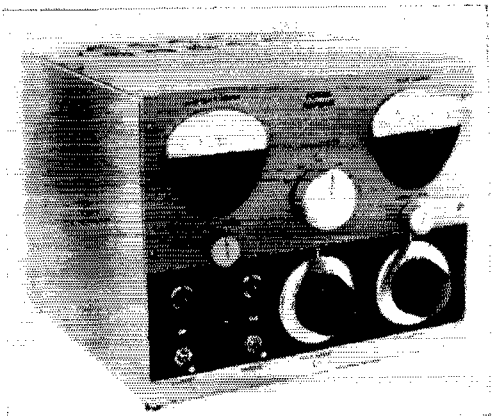
Here's one instance where TVI was a blessing in disguise. Last Hallowe'en the Framingham Radio Club had six mobiles on the road, with a police officer in each one, to combat vandalism. On one complaint, after investigating, the officer radioed to headquarters the name of the boy that the complainant said was responsible. Woops! Out charged an indignant mother from a near-by house. She had been watching channel 2, heard the vandalism report override the TV program, and it was *her* boy that was accused. Seems that he had been right there in the house with them all evening, watching TV. — *K1ADB*

UE572s in Grounded Grid



W6HHN's amplifier makes a neat 10 × 12 × 11-inch package. The grid current/output meter and switch (left) and plate meter and output-meter sensitivity control flank the band-switch knob. Below, from left to right, are the filament switch and pilot lamp, fuse holder, plate switch and pilot, and plate tuning and loading controls. The latter are equipped with vernier drives (National AM).

A Near Kilowatt with Some New Wrinkles

BY IRWIN R. WOLFE,* W6HHN

This handsome and easy-to-duplicate linear features a pair of zero-bias triodes which can be driven to a c.w. plate input close to the legal limit by a 50–100-watt exciter. The home-made cathode r.f. choke should be of interest to those contemplating any sort of grounded-grid p.a.

A FEW years ago, s.s.b. exciters were almost all of the low-output type, and power amplifiers were usually grid-excited using tuned input circuits. Present-day sideband exciters are generally capable of delivering 50 to 100 watts, so tuned input circuits are no longer necessary on power amplifiers, and this makes their construction much easier. The grounded-grid parallel UE572 amplifier described here was designed for use with a 50-watt sideband exciter. It is comparatively easy to build and uses some parts which have become available only recently.

New Components

The UE572 is a new high-μ triode [1] designed for Class AB r.f. amplifier use. It is similar to the 811A but will operate with zero bias at plate voltages up to 2000. The resting plate current at 2000 volts is only 40 ma. The rated plate dissipation of the UE572 is twice that of the 811A. The maximum-signal plate current is approximately 200 ma. per tube or 400 ma. for a pair in parallel. Multiply this by 2000 volts and add the driver input power (most of the driver output "feeds through") and you are close to the maximum legal input power.

If you already have a pair of 811As, the same amplifier design will work fine with them. Just use a lower plate voltage and supply a few volts of bias if the plate voltage is more than 1250.

The meters shown in the photos are also new items. They are front-of-panel mounting and require only two $\frac{3}{8}$-inch holes for installation. The panel itself acts as an r.f. shield. The meters are only about $\frac{1}{4}$ inch deep and do not occupy any more panel space than the usual flush-mounted types. This configuration is achieved by the use of printed-circuit coils and ceramic magnets. The meters are remarkably sturdy, electrically. Once an accidental short from filament to grid applied 3 volts a.c. across the grid milliammeter. I wondered where the buzzing noise was coming from, and then I looked at the meter! Nevertheless, no harm was done to the meter movement, and its accuracy was not affected.

Another innovation is the easy-to-make filament r.f. choke. Most homebrew grounded-grid amplifiers employ a manufactured part here. A homemade air-wound coil with sufficient inductance becomes cumbersome and usually has enough wire to drop the voltage at the tube socket. This presents a problem when a 6.3-volt transformer is used with a tube requiring 6.3 volts. The filament choke used in this amplifier was wound on a ferrite core removed from a defunct TV horizontal output transformer. These transformers are available at most TV repair shops without cost. The drop across this choke is only one tenth of a volt with a current of 8 amperes (both tubes). The choke operated as efficiently as either of two manufactured units tried and had the same inductance value.

Circuit Information

Fig. 1 shows how the driving signal is capacitance-coupled to the UE572 filaments, which are isolated from ground by RFC_1, the choke described above. The grids are paralleled and bypassed to ground, and the d.c. grid return is made to the filament transformer center tap via bias terminals and the grid metering circuit. With S_2 in the position shown, the 0–10-ma. meter is connected across shunt R_6 and gives an effective

* 3467 Rambow Drive, Palo Alto, Calif.

[1] Made by United Electronics Co., 42 Spring St., Newark, N. J.

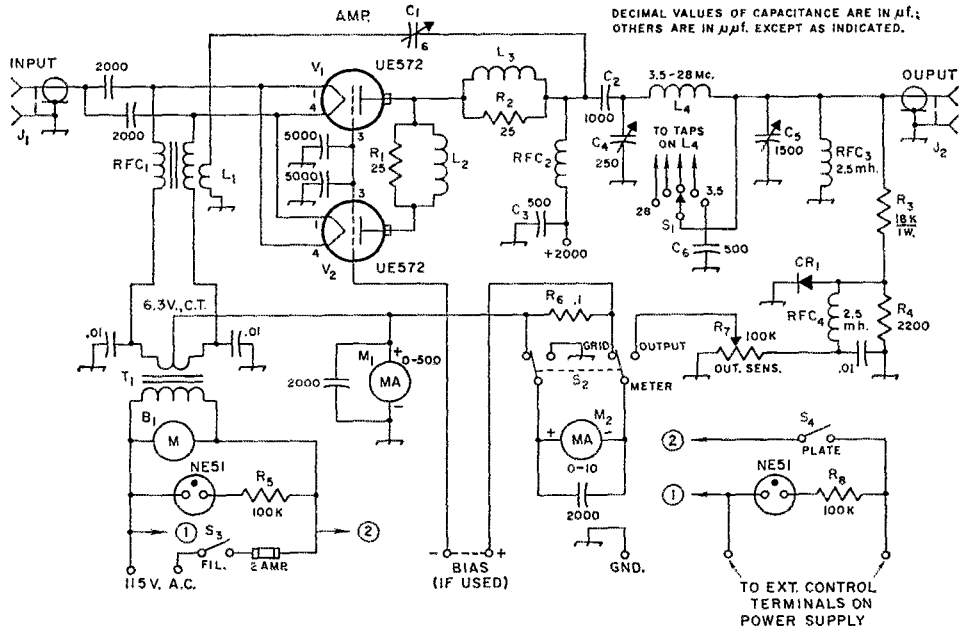


Fig. 1—Circuit diagram of the amplifier. Resistances are in ohms; resistors are ½ watt unless otherwise indicated. The 0.01-μf. capacitors are disk ceramic; others not specified are mica.

B_1—Blower (Allied Radio Cat. No. 72P715).
C_1—6-μμf. feed-through neutralizing (Bud NC-852).
C_2—5000-volt ceramic (Centralab 858S-1000).
C_3, C_6—20,000-volt ceramic (Centralab TV-207).
C_4—250-μμf. variable, 2000 volts (Johnson 250E20).
C_5—1500-μμf. variable (Cardwell PL8013).
CR_1—Germanium diode, 1N34A or similar.
J_1, J_2—Coax receptacle, chassis mounting.
L_1—8 turns No. 22 insulated hookup wire wound over RFC_1.
L_2, L_3—4 turns No. 14 tinned, ½-inch diam., 1 inch long.
L_4—16 turns No. 12 tinned, 2½-inch diam., 4 turns per inch (Air Dux 2004T), tapped 1, 2, 5 and 10 turns from C_2 end.
M_1, M_2—D.c. milliammeter, front-of-panel mounting type (Parker Instrument Co., 116 Kraft Ave., Bronxville, N. Y.).
R_1, R_2—25-ohm 5-watt noninductive (Sprague type 5NIT).
R_3, R_4—Composition.
R_5, R_8—Part of Johnson 147-1144 sockets used for NE51 neons.
R_6—About 0.1 ohm; adjust for 100 ma. full scale on M_2.
R_7—0.1-megohm control.
RFC_1—2 lengths No. 12 enamel wound bifilar 12 turns each on core removed from TV horizontal output transformer; see text.
RFC_2—Plate r.f. choke (Johnson 102-754).
RFC_3, RFC_4—2.5-mh. r.f. choke (National R-50 or similar).
S_1—Heavy-duty ceramic rotary, 1 pole, 5 positions, 1 section (Communications Products Co. type 86).
S_2—Ceramic rotary, 2 poles, 5 positions, 1 section, nonshorting, 2 positions used (Centralab PA-1003).
S_3, S_4—S.p.s.t. toggle.
T_1—Filament transformer, 6.3 volts c.t., 10 amp. (Stancor P6308).

range of 0–100 ma. grid current. The 0–500-ma. meter is connected between the transformer center tap and ground and indicates plate current.

The pi-network plate tank has 250- and 1500-μμf. input and output air variable capacitors. This combination is adequate for matching 50- or 70-ohm loads between 3.5 and 30 Mc. S_1 parallels a 500-μμf. fixed capacitor with the big output variable on 80 meters, but this is not really necessary. The taps on L_4 were adjusted for resonance with values of capacitance calculated to give a circuit Q of 12.

When meter switch S_2 is thrown to the output position, M_2 becomes part of an r.f. voltmeter. CR_1 rectifies the r.f. voltage across the lower part of divider R_3 R_4, and the setting of R_7 determines how much of the rectified output is applied to M_2.

Parasitics and Neutralization

It was with smug optimism that the design of a grounded-grid power amplifier was undertaken. No more tuned grid circuits to cause oscillation, no neutralization, nothing to worry about . . . I thought. To my amazement and dismay, the amplifier "took off" at the first sign of plate voltage. Grounding the grids directly and bypassing the r.f. input to ground and disconnecting the exciter had no effect on the spurious oscillation. The very chassis and panel set my neon lamp glowing! While I attempted to find the oscillation frequency, 2-watt parasitic suppressor resistors in each plate lead went up in smoke.

With patience, persistence, parasitic-suppressor rearrangement, and neutralization, the beast was finally tamed. One parasitic suppressor was used to parallel the two plates, and another

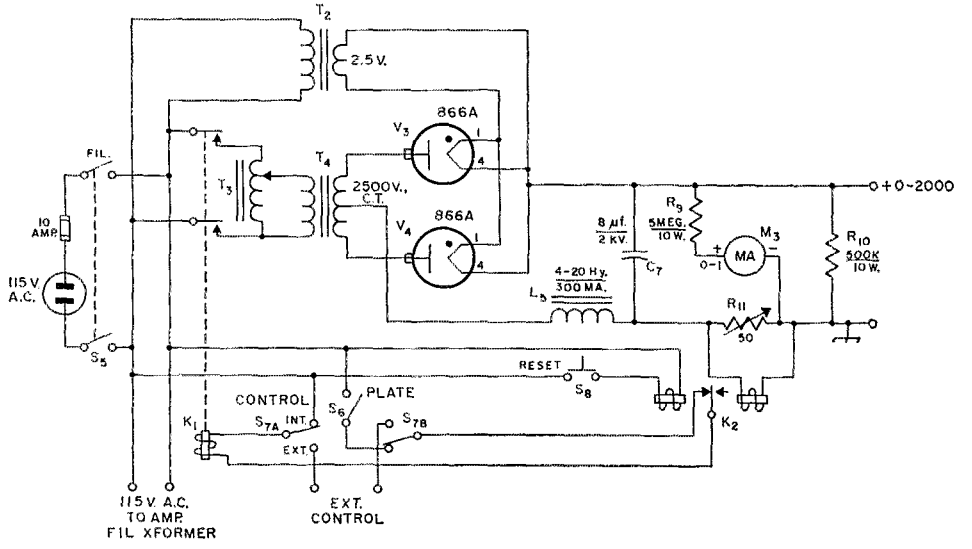


Fig. 2—Power supply circuit for the UE572 amplifier. Resistances are in ohms.

C_7—Oil-filled paper.
K_1—D.p.s.t. relay, 115 v. a.c. coil (Potter & Brumfield PR11AY).
K_2—Latching-type overload relay, adjustable 500–1000 ma. (Advance OF/2B).
L_5—4/20-hy. 300-ma. swinging filter choke (Stancor C-2307).
M_3—D.c. milliammeter (see text).
R_9—5 1-megohm 2-watt resistors in series.
R_{10}—5 0.1-megohm 2-watt resistors in series.
R_{11}—Part of K_2.
S_5—D.p.s.t. toggle, 10 amp.
S_6—S.p.s.t. toggle.
S_7—D.p.d.t. toggle.
S_8—S.p.s.t. push-button, normally open, momentary contact.
T_2—Filament transformer, 2.5 volts, 10 amp. (Stancor P6454).
T_3—Variable autotransformer, 0-140 volts, 7.5 amp. (Superior 116U).
T_4—Plate transformer, 5000 volts c.t., 300 ma. (UTC S-50 or similar).

was inserted in the h.v. lead from the r.f. choke to one of the plates. For neutralization, C_1 feeds back a bit of the output voltage to a winding, L_1, on the cathode r.f. choke.

Power Supply

Filament and plate switches and neon-type pilot lamps are provided on the front panel of the amplifier. The small cooling fan (not really required, but a contribution to longer tube life and a cool cabinet) is turned on by the filament switch. Plate switch S_4 is operative when the power-supply control switch, S_7 in Fig. 2, is set for external control. Normally, the plate voltage is left on during an entire QSO. This eliminates the clatter of the plate relay during VOX operation. When S_7 is in the internal control position, the supply can be turned on and off with built-in switch S_6.

The power-supply circuit is conventional except, perhaps, for having the filter choke and the trip coil of overload relay K_2 in the negative lead. R_{11} shunts the relay coil and is used to adjust for the desired trip current. When an overload occurs, K_2 opens the plate transformer primary and remains in that position until it is reset by pushing S_8 momentarily.

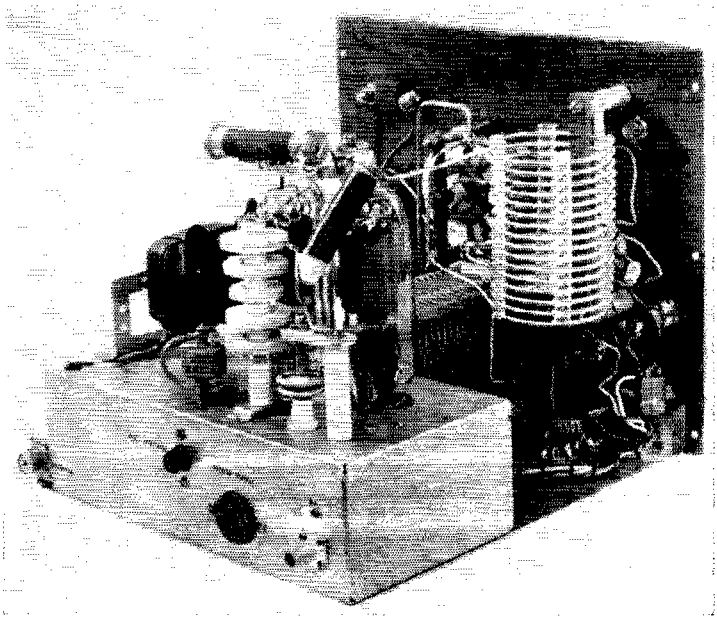
An 0–1-ma. meter and 5-megohm multiplier are connected across the plate supply to measure output voltage. The meter scale can be redrawn to read 0–5000 volts. Variable autotransformer T_3 is used to adjust the output voltage to the wanted value.

If Class C c.w. operation is contemplated, an external bias supply delivering about 100 volts will also be required.

Construction

Since I had access to a bending brake and shear, I could avoid the usual procedure of designing the amplifier to fit a commercially available panel and cabinet. The panel of my amplifier is a 10 × 12-inch piece of ⅛-inch aluminum, and the cabinet is 11 inches deep. The unit weighs about 20 pounds and is half the size of my GSB-100 exciter. No doubt a local sheet-metal shop could turn out a similar job for anyone lacking the necessary equipment.

The amplifier base is a sheet of 1/16-inch aluminum that measures 11 × 11 inches after a 1-inch lip for fastening to the panel is bent up at the front. All components not fastened to the panel are mounted on a 5 × 10 × 3-inch chassis as shown in the photos. The cabinet is a three-sided "wrap-around" with ⅛-inch lips which are held to the panel and top and bottom plates with self-tapping screws. The top and bottom plates are identical except that the top one has ten 1¼-inch holes cut in the area above the tubes. A strip of perforated "do-it-yourself" aluminum is fastened underneath these holes.

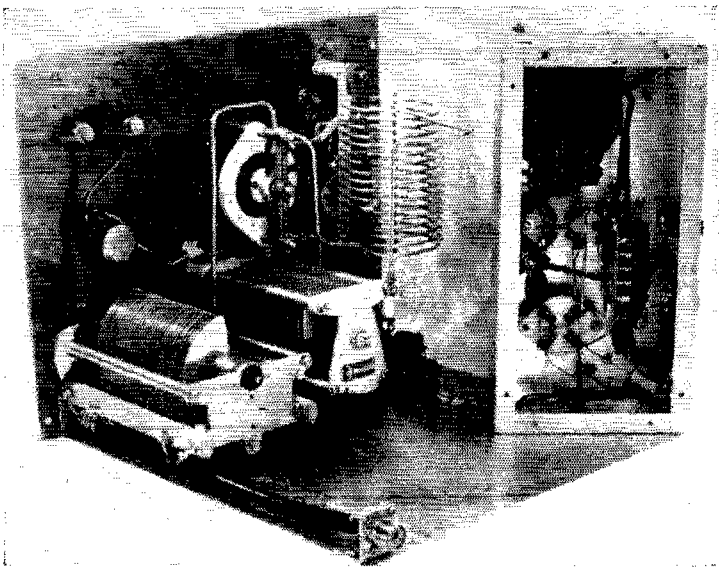


The amplifier removed from its cabinet. The plate-tank coil is held by phenolic clamping strips mounted off the panel on standoffs. The tube sockets are submounted so that the tops of the tube bases are flush with the top of the subchassis. In front of the tubes in this view are bypass C_3, the plate r.f. choke, and the neutralizing capacitor. The h.v. fitting, an octal power connector (which should be a male fitting for safety's sake) and the input coax receptacle are on the rear panel.

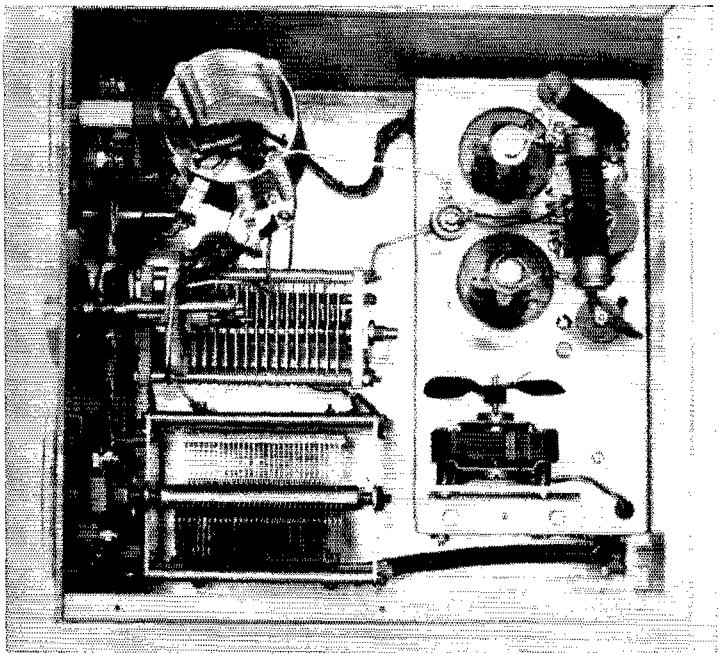
After all the drilling was completed, the outside surfaces were sanded and given a silver hammertone finish with an aerosol-type spray can. The two-tone effect on the panel was achieved with masking tape and a black enamel spray can.

The power supply was built into a cabinet 8 × 16 × 13 inches deep. Components are mounted on a chassis 15 × 12¾ × 1½ inch, which is bracketed to the front panel.

The only component requiring special mention is the cathode r.f. choke. As mentioned earlier, its core is obtained from a discarded horizontal output transformer. After the windings are removed, pull the core apart and remove the two L sections with a grinder. This will give a straight piece of core about 9/16 inch square and 2½ inches long to accommodate the winding. Wrap a layer of masking tape over the core. Cut two 30-inch lengths of No. 12 enamel wire and fasten one end of each in a vise. Keeping the wires parallel and at a little tension, wind the choke by rotating the core. The 8-turn neutralizing coil, L_1, is wound over the choke with the turns going the same direction as the bifilar winding. The end closest to the cathode end of the choke is grounded, while the other end is connected to C_1. The finished choke can be mounted on a phenolic board with terminals.



Here the subchassis has been unscrewed from the base plate and tipped up to show the filament choke, transformer and other wiring underneath. Over on the panel, loading capacitor C_5 is to the left underneath the output-meter potentiometer, R_7. Band switch S_1 and tuning capacitor C_4 are in the middle, and tank coil L_4 is at the right. The coax output fitting in the foreground is mounted on a small right-angle bracket.



Looking down into the amplifier with the top cover removed. Most of the plate-tank components and meter wiring are on the panel at the left. Other components, including the UE572s, are on the subchassis to the right. The cylinders connected to the tube plate caps are noninductive resistors—part of the parasitic suppressors. Blocking capacitor C_2, to the left of the tubes, is mounted off the chassis on a standoff insulator. For more efficient cooling, the blower motor might be turned around 180 degrees and the fan reversed on the shaft so as to suck in air through a shielded hole which could be cut in the lower side of the cabinet, but the arrangement shown has been found to be adequate in this case.

Dummy Load

A dummy load for testing the amplifier was improvised as follows: Eight porcelain light-bulb sockets were mounted on a 6-inch-square wood panel, four on either side. The sockets on either side were paralleled, and the two groups of sockets were wired in series. With eight 100-watt lamps in the sockets, the resistance is about 70 ohms. This makes a reasonably good load and has the advantage that maximum output can be observed visually.

Adjustment

Preliminary testing should be done with a plate voltage of about 1000, half the normal value. Tune up the exciter for 10-meter c.w. output and set the amplifier plate band switch for that band. Set output capacitor C_5 at maximum and adjust the plate spacing of neutralizing capacitor C_1 to about $\frac{5}{16}$ inch. Connect the dummy load, and apply drive and plate voltage. Adjust the exciter output until the plate current rises from its 80-ma. resting value to 200 ma., and tune C_4 for maximum indication on the output meter. The plate current should dip to about 100 ma. Now decrease the capacitance of C_5 in small steps, retuning C_4 after each change, until the plate current is 200 ma. If the amplifier is properly neutralized, maximum output will occur at the same setting of C_4 that gives minimum plate current. Increase or decrease the capacitance of C_1 until this is the case.

Proceed to the lower-frequency bands and check that the amplifier can be tuned and loaded to 200 ma. on each. Keep a record of the settings of C_4 and C_5. If all is well, increase the plate voltage to 2000 and readjust the exciter output until the plate current is 400 ma. The grid current at this point should be about 50 or 60 ma. By now, the eight lamps in the dummy load should be lit up brightly.

Next, connect the amplifier output to the antenna. Some readjustment of C_5 may be necessary to obtain proper loading. Keep adjusting C_5 for maximum indication on the output meter. The best setting is just beyond the point where decreasing the capacitance of C_5 does not result in an increase in output. During these adjustments maintain a constant plate current of 400 ma. by regulating the exciter output.

At this point there is no substitute for a two-tone generator and oscilloscope to see that there is no waveform distortion or peak flattening at a plate current of 400 ma. See the s.s.b. chapter of the *Handbook* for complete information. QST

Strays

Fellows in the Boston area who want to work for their ham tickets are welcome to attend the free week-end classes sponsored by the Hawk club. Contact Father John Murphy at 11 Elm St., Charlestown, Mass. This Hawk club is a non-sectarian group comprised of boys between 11 and 21 years of age.

In the sophomore class at Needham (Mass.) high school there are five General Class hams (K1OPQ, K1OQQ, K1NUD, K1OPA, K1OQF), one Novice (KN1PUF), one ex-Novice (KN1-NOM), and three fellows studying for their Novice tickets.

The Appearance of the Moon at Radio Frequencies

Why Lunar Echoes Sound the Way They Do

BY ROLF B. DYCE,* K6DSJ, ex-W2TTU

THE moon, illuminated in visible light, appears as a round disk about 0.5 degree in diameter.[1] To the naked eye, the moon looks rough, as if someone had given it a treatment with coarse sandpaper. We also see conspicuous gray areas which have been dubbed "seas," but which, as far as we earthlings can tell, might really consist of boulder-strewn fields. A look through a telescope, however, reveals the mountainous nature of the moon (some of its peaks are higher than Everest), caused presumably by the tremendous impact of ancient meteorites. Streaks radiate for hundreds of miles from some of the larger craters, possibly caused by debris flying outward from the explosion-like impact, unslowed by any atmospheric drag.

At radio frequencies, radar probing of the moon has shown that the moon behaves as a partially polished sphere, giving a bright spot in the center. This characteristic was found by transmitting a short, powerful r.f. pulse toward the moon and noting the shape of the returned echo. Since the moon has a radius of about 1000 miles, there is a possible delay of 11.6 milliseconds from the first returned energy to the last. If the moon were a smooth copper sphere, the energy would be reflected only from the front point of its surface oriented at right angles to the observer on the earth. On the other hand, if the moon were uniformly rough (like frosted glass at optical frequencies), the echo would diminish linearly from its strong leading edge to a distance (range) equal to a lunar radius (the first slice has the largest exposed area, etc.). This behavior is diagrammed in Fig. 1. Between these two extremes is sketched the actual behavior of the moon, a strong initial echo followed by a weaker tail.

An example of a radar echo is shown in Fig. 2, together with a sketch to scale, of the moon's curvature. Note the strong echo from the front edge of the moon followed by a gradual decrease of echo strength until the shadow behind the moon is reached. Since the moon has no atmosphere [2] or ionosphere,[3] the radio waves are not bent around the curvature of the moon's surface. The picture shown in Fig. 2 was made with a 142-

* Division of Engineering Research, Stanford Research Institute, Menlo Park, Calif.

[1] Russell, *et al.*, *Astronomy, Part I, The Solar System*, Ginn and Co., Boston, 1945.

[2] Dollfus, "Nouvelle Recherches d'une Atmosphere au Voisinage de la Lune," *Compted Rendus 234*, pp. 2046–2049, 1952.

[3] Elsmore, "Radio Observations of the Lunar Atmosphere," *Paris Symposium on Radio Astronomy*, Bracewell, ed., Stanford University Press, 1959.

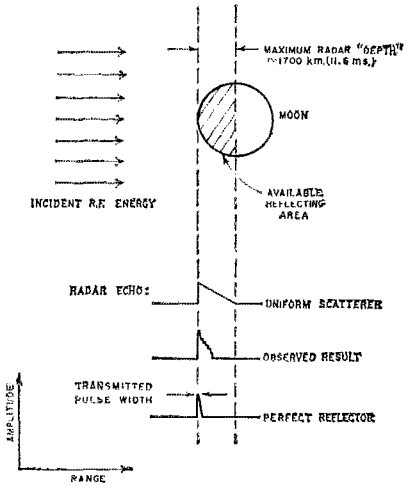


Fig. 1—Sketch showing the effect of surface scattering behavior on a radar pulse.

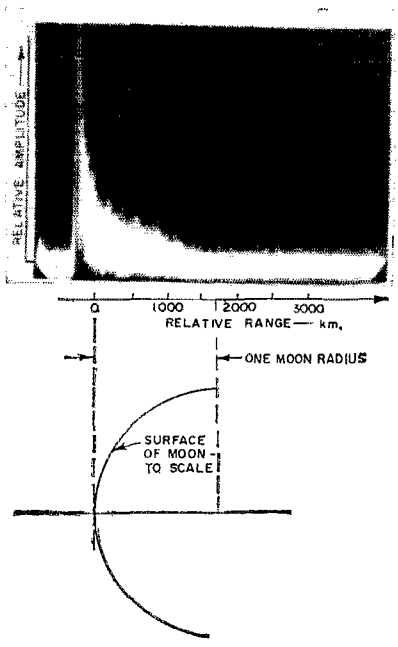


Fig. 2—Time exposure of radar echo showing strong echo originating from front face of the moon, followed by weaker returns.

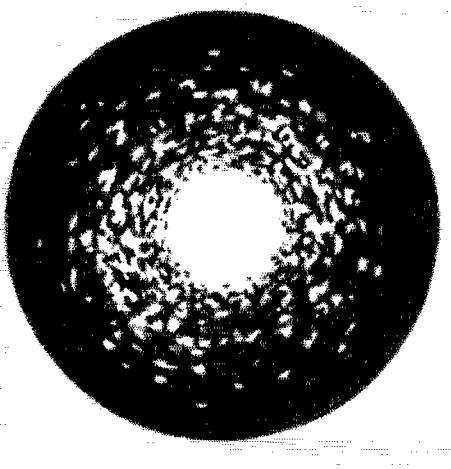


Fig. 3—Artist's conception of the moon's appearance at radio frequencies, showing a bright spot in the center.

foot diameter parabolic dish using 170 kw. peak power at 101 Mc. and 300 μsec. pulse width.[4] The strong leading echo gives more than half of the total echo power obtained with c.w. and is all that is detectable with lower-powered pulse radars.[5,6] The strong leading echo must be associated with a "bright spot" near the moon's center, making the moon appear at r.f. as in Fig. 3.

The echo from the moon has an irregular fade at approximately a few cycles per second at u.h.f., which occurs because the moon very slowly "rocks" or "wobbles" with respect to the observer on the earth, allowing individual echoes from various portions of the moon's surface to alternately reinforce or cancel each other by phase addition. Experiments show that two stations only a mile apart experience peaks and dips at different times. This slow "libration," as the astronomers call it, allows us to peek around the edge of the moon. Earth-bound observers have actually seen 59 per cent of the total lunar surface. The apparent libration is chiefly due to three factors: (1) the observer's motion while attached to a point on the spinning earth, (2) a tilt of the moon's axis of 6½ degrees that gives about this amount of lunar latitude variation once each month, akin to the earth's seasons, and (3) an 0.05 eccentricity of the moon's orbit, despite its uniform slow spin rate, that gives about 8 degrees of lunar longitude variation during the course of an orbit around the earth. The first libration component is largest so that fading is generally most rapid when the moon crosses the observer's meridian. These components add in complicated ways, sometimes causing the rocking to approach an apparent standstill for a given observer on the earth. On these rare occasions, the fading becomes so slow that only a few cycles per minute are noted. The effect on the radar echoes is demonstrated in Fig. 4. The more distant returns fluctuate more rapidly because they come from portions of the moon having greater line-of-sight velocities. These small velocities are slight compared to the average Doppler shift due to the observer's motion with respect to the center of the moon.

A sophisticated radar is capable of simultaneously measuring distance and frequency shift. A measurement of distance from the earth cuts the moon as shown by the circles in Fig. 5. Lines of constant frequency shift, on the other hand, lie parallel to the instantaneous axis around which the wobble is occurring. Thus, even with a broad beam antenna, the moon can be mapped with only an ambiguity caused by the Southern Hemisphere being folded on top of the Northern Hemisphere. In principle, this could also be applied to echoes from distant planets, regardless of their distance or subtended angle. Preliminary maps of this sort have been made with the Millstone Hill radar, although, to date, no lunar echo has been identified with any particular lunar feature.

Accurate measurements have shown that the moon is about 7 per cent effective as a reflector compared to the theoretical "equivalent target cross section" of πr^2 expected whether the moon reflects as a perfect shiny sphere or perfectly

[4] Leadabrand, *et al.*, "Radio Frequency Scattering from the Surface of the Moon," a letter to the editor of *Proc. IRE*, Vol. 48, No. 5, p. 932, May, 1960.

[5] Trexler, "Lunar Radio Echoes," *Proc. IRE*, Vol. 46, No. 1, pp. 286–292, January, 1958.

[6] Yaplee, *et al.*, "Radar Echoes from the Moon at a Wavelength of 10 cm.," *Proc. IRE*, Vol. 46, No. 1, pp. 293–297, January, 1958.

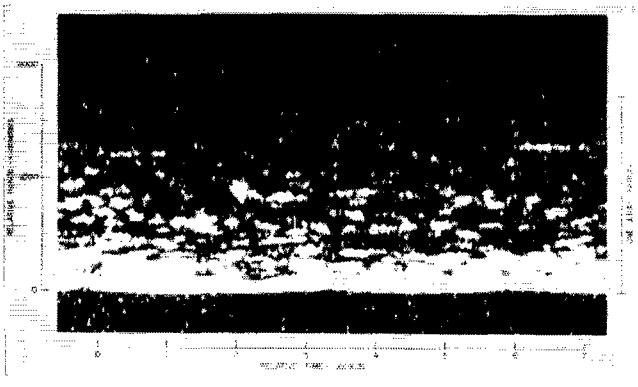


Fig. 4—Distance vs. time presentation of moon echoes, intensity being proportional to echo strength. Strong echo at the leading edge has been severely clipped in order to show the weaker delayed echoes.

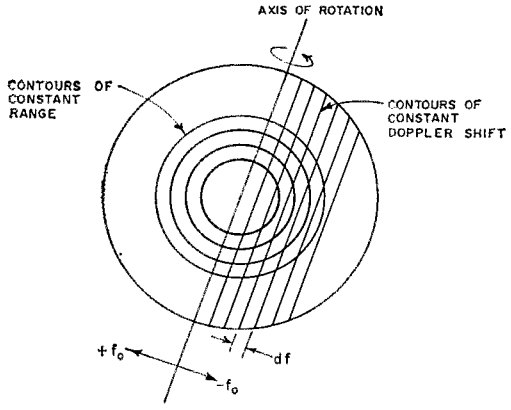


Fig. 5—Sketch indicating how the moon can be mapped at radio frequencies by simultaneously measuring time delay (range) and frequency (Doppler shift). The axis of apparent rotation is determined by the instantaneous libration when the observation is made.

diffuse sphere. The moon has an apparent temperature of about 200 degrees at microwave frequencies, with a delayed variation with solar heating that leads to the conclusion that the moon is covered with a layer of fine dust.[7] Radar evidence has been used to guess at the probable rocklike materials making up the lunar surface. So far, these measurements are disputable, although all agree that the moon is not made of green cheese.

Transmissions to and from the moon suffer rotation of the plane of polarization so that a vertically polarized transmission could appear as a horizontally polarized echo back at the receiver, this twist being added during each passage through the *F*-region of the ionosphere. This is due to the presence of the earth's magnetic field and is called the Faraday effect. At 400 Mc., about one rotation each way is experienced at noon for observers at the latitude of the United States. The amount of rotation is inversely proportional to the square of the operating frequency and so amounts to 90 degrees or less at 1296 Mc. The Faraday effect has been used to demonstrate that there are about twice as many electrons above the maximum density level of the ionosphere as below this level. To avoid embarrassing loss of signal, the transmitting station should use circular polarization, and the receiver use the opposite circular polarization.

The next best extraterrestrial object for echo purposes is Venus — five minutes round-trip time and roughly a million times more difficult to detect than the moon. However, this has already been done with great difficulty by computer-processing of the receiver noise by American,[8] British, and possibly Russian research groups. The ionized gases surrounding the sun have also given a feeble radar echo at 25 Mc.[9] Although the sun has a round-trip time of 15 minutes, it is a larger object and so is only about 100,000 times more difficult to detect than the moon. Present data indicates that Venus may have a bright central echoing region like the moon. There is reason to believe, on the other hand, that the sun may look jagged to radio waves and may be several times its optical size.

In conclusion, the optical appearance of the moon, sun, or planets is no clue to their reflecting properties at radio wavelengths. Radio-reflection experiments, therefore, promise to reveal new information about these distant bodies. QST

[7] Gibson, "Lunar Thermal Radiation at 35 Kmc.," *Proc. IRE*, Vol. 46, No. 1, pp. 280–286, January, 1958.
[8] Price, *et al.*, "Radar Echoes from Venus," *Science 129*, 751, 1959.
[9] Eshleman, *et al.*, "Radar Echoes from the Sun," *Science 131*, 3397, pp. 329–332, Feb. 5, 1960.

• *New Apparatus*

Hyp-Oiler

THE object shown in the photograph is not a modern Wouff Hong but is, in reality, a precision oiling tool used for applying precise amounts of lubricant to delicate instruments. Except for a steel needle tip, which is only dimly seen in the photograph because it is covered by a plastic needle guard, the Hyp-Oiler is made entirely of plastic. After the tool is filled with your favorite oil, it should be bled (all of the air removed) and can then be used or stored without any danger of oil leakage. When using the Oiler, remove the needle guard and apply a slight thumb pressure to the plunger for precision one-drop or fractional-drop oiling. The Hyp-Oiler is manufactured by Sparx Industries, Grand Rapids, Minnesota. — *E. L. C.*

Twins on Twenty

Grounded Quarter-Wave Elements in a Bidirectional Array

BY WALTER D. STEAD,* VE3DZL

Many amateurs who do not have space for anything more pretentious, or who are confined by other restrictions, are getting worthwhile results with a simple grounded quarter-wave vertical. This article shows how a second element may be added to improve gain and directivity.

THERE are many amateurs, myself included, who are constantly looking for something better in the way of antennas but who at the same time are severely restricted by lack of space, or money, or merely by aesthetic standards. Let's face it — there are some hams and many XYLs who do not like to see a small house on a small lot dwarfed by a full-size 20-meter beam. Now, no matter how small a house or lot you have, there is always lots of space — upward, and for this reason many of us have turned to vertical antennas. However, there are many kinds of verticals and this is just one of them (or should I say two), and for 20 meters only.

Like many new amateurs, I was inquisitive and eager to experiment, which resulted in an odd assortment of wooden supports, guyed by bits and pieces of string and rope. The results were both discouraging and encouraging, with enough of the latter to hold my interest. But, as in so many technical facets of amateur radio, the realization came slowly that all of this had surely been done before, and that time might be better spent in trying to understand as much as possible of that already written in, for instance, the ARRL *Antenna Book*. So I read and studied and subsequently one fine day out of it came a solid piece of apparently workable apparatus that served for many seasons until this one.

The original basic vertical served to work over 60 countries on 20-meter phone with a 60-watt home-brew transmitter, homemade reflected-power meter and a cookie-tin tuner (which is another story). As time went on, however, there grew a gnawing desire to obtain just a little more directivity and, therefore, a little more gain in one direction, or possibly two — say, Europe and New Zealand. So back to the ARRL *Antenna Book*. This time it wasn't so easy, but the end result is another piece of apparently workable apparatus which seems to justify all of the trouble involved, although I am sure many professional and amateur antenna experts will doubt it. At any rate, what follows is the "Twin" vertical on twenty.

Construction

Physically, the basic vertical is two pieces of ½-inch conduit joined together and supported on two standoff insulators set on a 4 × 4-inch cedar post, as shown in the sketch of Fig. 2, set about 2 ft. in the ground. Eight buried radials of copper wire are clamped to another 3-foot piece of conduit driven into the ground. It might have been better to use four quarter-wave radials but, because of the location of the antenna, it seemed preferable to use eight shorter ones and stay out of my neighbor's yard. A height of 19 feet 8 inches was chosen to give a length of 102 degrees at a frequency of 14.15 Mc., resulting in a theoretical base impedance of 52 ohms to match 52-ohm coax. To resonate the long antenna back to 14.15 Mc., it was necessary to put a capacitor in series. Some experimentation seemed to justify the theoretical value of 120 $\mu\mu$f., and a mica capacitor of this size was used.

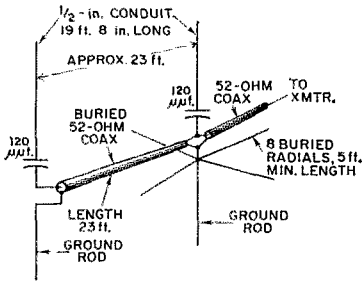


Fig. 1—Sketch showing the dimensions and arrangement of the 20-meter "Twins."

Adding the Second Element

The desire for directivity and gain resulted in a second almost duplicate antenna (see Fig. 1). I say "almost duplicate" because the radials were not used — only the ground pipe, since this unit is only semipermanent and may be relocated or removed later on. After all, it is stuck right in the middle of the back yard between two flower beds (remember the aesthetic approach). The distance of 23 feet between elements is a compromise based on data found in the ARRL *Antenna Book*. An end-fire array consisting of two half-wave horizontal elements fed 180 degrees out of phase shows a gain of from approximately two to four db., depending on the spacing. At 23 feet (approximately 0.3 wavelength at 14.15 Mc.), the theoretical gain is nearly 3.5 db. A 23-foot length of 52-ohm coax, which has a velocity factor of 0.66, is an electrical half wavelength, so the elements will be fed 180 degrees out of phase

* 291 Gardenview Drive, Burlington, Ontario, Canada.

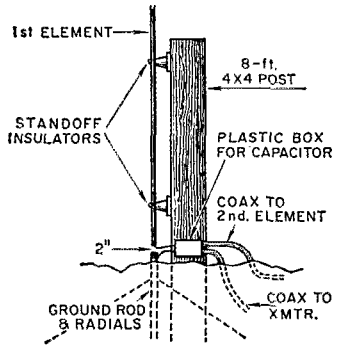


Fig. 2—Method of mounting the "Twin" elements, and the feed-line connections.

when they are connected together with this length of line.

This produces a bidirectional figure-eight radiation pattern with the directivity along a line drawn from one element through the other.

Results

I was a little dubious about my matching theory but was more than pleased to find that upon loading up the antenna at full transmitter power only a slight adjustment of the antenna tuner was required.[1] But theory is one thing and the proof of the pudding is in the eating, so they say. I was anxious for on-the-air results, and the next few days proved very interesting. I took with a grain of salt the statement from a ham in Kansas that I was the loudest VE3 he had ever heard, but a little later, a 5 and 9 + 20 from Italy excited me no end. Another fine report from England then came in and I felt that the effort was a success. Twenty is an odd band, especially these days, but I feel that the "Twins" will do a good job, and I hope that a few other curious amateurs will give the idea a trial and let me know how they make out. QST

[1] The theoretical feed-point impedance of an array of this type is approximately 35 ohms, assuming a perfect ground. In practice, with no special effort to secure a minimum-resistance ground connection, it is quite possible that the feed-point impedance may be high enough to provide a reasonably close match to 52-ohm coax. — *Ed.*

Silent Keys

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

W1CES, Earl M. Bradley, Searsport, Me.
K1COP, Ernest J. Houle, Malden, Mass.
W1QGJ, Freeman A. Bedley, Woburn, Mass.
W1SNK, Richard W. Perry, Wayland, Mass.
W1VVU, Edna M. Heim, Lovell, Me.
W2APS, William I. Petersen, Richmond Valley, N. Y.
K2CDY, David R. Smith, Elmira, N. Y.
W2IC, Donald C. McGiehan, White Plains, N. Y.
W2HCS, James B. Murphy, Albany, N. Y.
W2KCY, Arthur J. Perry, Hartsdale, N. Y.
K2KUU, William H. Beaulac, Albany, N. Y.
W2TNF, Edward S. Moore, jr., New York, N. Y.
W3CLA, Samuel M. Green, Langhorne, Penn.
W3FQR, Preston B. Longley, Silver Spring, Md.
W3LUA, Samuel J. Maiolo, Williamsport, Penn.
W3LXM, Joseph Hnat, Catasauqua, Penn.
W4DEY, Howard K. Peck, New Port Richey, Fla.
W4DIS, Dr. Bernard N. Walker, Charlotte, N. C.
K4EQW, Paul L. Snyder, Charlotte, N. C.
K4TLN, Glenn E. Murphy, Athens, Ala.
K5CEJ, Lt. Edward P. Shuller, McAlester, Okla.
K5EAN, William E. Barry, Houston, Texas
K5RAJ, Clarence D. Horn, West, Tex.
W5WPM, Billy A. Bright, Baton Rouge, La.
W6AMA, Dwight E. Querry, Culver City, Calif.
K6BS, Eugene W. Applebaum, Pasadena, Calif.
W6HHK, Roy L. Taunton, San Bernardino, Calif.
W6LRW, Louis H. Beinder, Auburn, Calif.
W6PIY, Ray F. Dibb, Los Gatos, Calif.
W6SZ, Stanley W. Johnson, San Francisco, Calif.
K6UGI, John H. Patterson, Compton, Calif.
W6YO, David C. Walker, Oakland, Calif.
W7HDN, Edwin C. Wiedmaier, Portland, Oreg.
W7KCO, Charles H. Woolsey, Bremerton, Wash.
W7SHH, Joseph J. Javinsky, Portland, Oreg.
W8AMJ, George L. Park, Akron, Ohio
W8PYZ, Charles E. Bobo, Tallmadge, Ohio
K8SCH, Sidney Isaac, Cincinnati, Ohio
W8WJB, Walter C. Kirsch, Canton, Ohio
W8ZXI, Dean R. Taylor, Detroit, Mich.
K9EQQ, Robert M. Taft, Wausau, Wisc.
W9HHR, Louis A. Russell, Madison, Wisc.
W9KZW, William Fiene, Momence, Ill.
W9OBZ, Chester D. Walters, Milwaukee, Wisc.
W9OXS, William M. Seaver, Hamilton, Ill.
W9PGF, Willis W. Pfister, Onalaska, Wisc.
K9RFT, Donald C. Brasel, Des Plaines, Ill.
W9ZTJ, Margaret Alongi, DuQuoin, Ill.
WØORQ, Ralph A. Steinborn, Abilene, Kan.
WØQXP, Jerome D. Stowell, St. Louis, Mo.
WØSQR, Ivan W. Smith, North Kansas City, Mo.
KL7BSX, Milton T. Griffin, Anchorage, Alaska
VE4AY, John M. Nelson, Morden, Man., Canada
XZ2GM, Maung Aye Maung, Rangoon, Burma

Strays

Air Force MARS Eastern Technical Net (Sundays 1400–1600 EST, 1900–2100 Z, 3295, 7540, 15,715 kc.) has the following scheduled for May.

May 7 — Modern concepts and applications of Telemetry
May 14 — Semiconductors
May 21 and 28 — Review of Basic Physics

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The Third Army MARS training program for May (Friday evenings on 5850 kc., 1900 local time, 0000Z) has W4FFH scheduled to talk about the care and repair of gasoline generators on May 5 and 12 and on improving receivers and receiving techniques on May 19 and 26.

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Boston area amateurs between 18 and 35 years of age who are interested in joining an active Naval Reserve communications group should contact Thomas McGillicuddy, 47 Barbara Road, Needham, Mass.

A roof-mounted mobile antenna has many advantages and need not detract from the appearance of the car more than other types.

Better Performance and Convenience in Multiband Operation

BY D. H. GIESKIENG,* K9CFE

A Roof-Top Mobile Antenna

Effectiveness and convenience are combined in this roof-mounted mobile antenna designed for multiband use on the lower frequencies. Bands are easily switched from the driver's seat.

THE design of the mobile antenna shown in the photographs was based on several objectives. The first of these, and one of long standing, was the hope for a more effective radiator founded on contentions such as, "A roof-top antenna radiates better in all directions than a rear-mounted whip does in its most-favored direction," "The signal from a top-mounted radiator is at least three times as strong as that from a bumper-mounted job," and other similar opinions frequently heard wherever mobile hams gather. After all, no one but a ham will believe that a transmitting antenna enhances the beauty of a car, no matter where it is mounted, so why not put it where it will work best?

A second objective, of more recent origin, looked toward convenience in multiband operating. In this respect, as well as in the considerations of mechanical and electrical simplicity and cost, the roof-mounted antenna has much in its favor.

An often overlooked advantage of this type of mounting is in regard to the factor of electrical stability while the car is in motion. All mobile operators are well aware of the drastic detuning that accompanies whip "lay back," especially on 80 meters, when the whip is mounted at the rear. A tuning adjustment made when the car is at a standstill will seldom hold when the car is traveling at 50 m.p.h. It is usually necessary to make some sort of allowance by guesswork for the change in capacitance as the whip lays back from the car body. With the symmetry of roof mounting, this problem is largely solved, because as the whip bends back closer to the rear portion of the roof, it moves away from the front portion, causing the capacitance to remain approximately constant.

Subsequent operation has proved the roof-mounted antenna on all counts. More often than not, contacts with fixed stations running power inputs up to as much as 250 watts result in exchanges of equivalent signal reports. The mobile rig is a Morrow MB-565 running 60 watts into a 6146, modulated by a pair of 6AU5s.

The antenna as shown has traveled over 10,000 miles and has had innumerable hard collisions with tree branches and bridges without damage to either the antenna or the car roof. The lack of a base spring seems to have little disadvantage and, conceivably, the springless mounting may be superior when the stresses involved are examined closely.

As for band-changing convenience, a photograph shows how the base-loading coil can be switched from band to band without moving from the driver's seat. The extension of the switch shaft goes through the dome-light fixture, but clears the light bulb, retaining its usefulness.

The antenna resonance characteristic is broad enough so that no retuning is necessary over any of the phone bands except 75 meters. Adjustment is more critical on the latter band, of course, and the tuning should be touched up for a change in frequency of 10 to 15 kc. or more. The loading-coil unit used in this installation is provided with a small variable capacitor for this purpose. Some consideration was given to the possibility of revamping the unit so that this trimmer could also be operated from inside the car. However, the difficulties involved were sufficient to encourage postponement of this operation as future project, but you may want to give this possibility some thought.

Tuning System

Direct feed with RG-8/U results in a good match on 10, 15 and 20 meters, and an acceptable match on 40 meters, but leaves something to be

* 8823 West Orchard, West Allis 14, Wis.

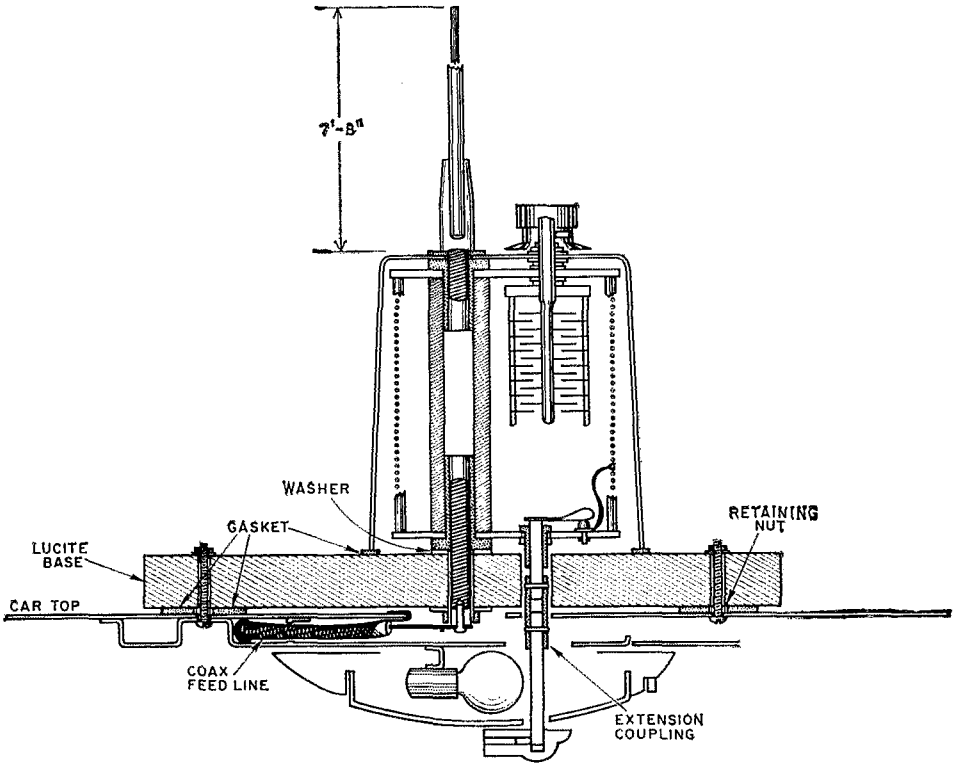


Fig. 1—Details of the roof-top mounting for a Whip Load 6 mobile antenna unit over the car's dome-light area.

desired on 75. Therefore, the future project mentioned will also probably include a switching system grounding the bottom of the coil on this band, and tapping the feed line up a few turns from ground.

The original plan was to use a variometer as the loading coil and crank from band to band. This would have solved the problem of remote trimming on 75, but would have involved the devising of a weatherproof enclosure and a foundation structure for the whip. Upon reviewing the market, it was found that the Johnson Whip Load 6 unit had most of the features required for an installation of this type. It provides a high-*Q* switching arrangement capable of simple modification to extend the switch shaft into the interior of the car. It has a weatherproof cover and a stout insulator to support the whip. It also provides positive detent band-switching action for which special provision would have to be made in the case of the variometer. Since the variometer envisioned was not available anyway, the Johnson antenna-loading unit was finally chosen.

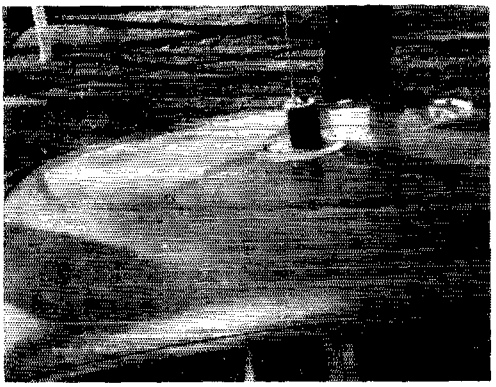
Mounting

Details of the mounting are shown in the drawing of Fig. 1. To use the Whip Load 6, it was desirable to provide a larger base to distribute the mechanical stress of the antenna over a wider area, since the steel of most car tops is rather thin. This was accomplished by making a 7 × 10½-inch elliptical piece of ⅞-inch Lucite and fastening it to the roof with eight 10-32 machine screws. There is no reason why a rectangular piece would not work equally well, but it would be less attractive, of course.

A gasket is used between the weatherproofing cover of the loading unit and the Lucite base. A rubber washer for this purpose may be cut from an old inner tube. This makes a seal against moisture and lends a little mechanical support to the main insulator. A washer between the bottom of this insulator and the Lucite base elevates the entire loading assembly to make room for the gasket.

Before the holes were drilled in the top of the car, a visit was made to a local car-wrecking yard. Here the cooperation of the proprietor was enlisted in making a detailed inspection of a similar-model car minus the upholstering. This examination revealed the normally hidden arrangement of stiffening braces, wire runways, and, most importantly, how the installation could most easily be made without marring the finish or damaging the upholstery.

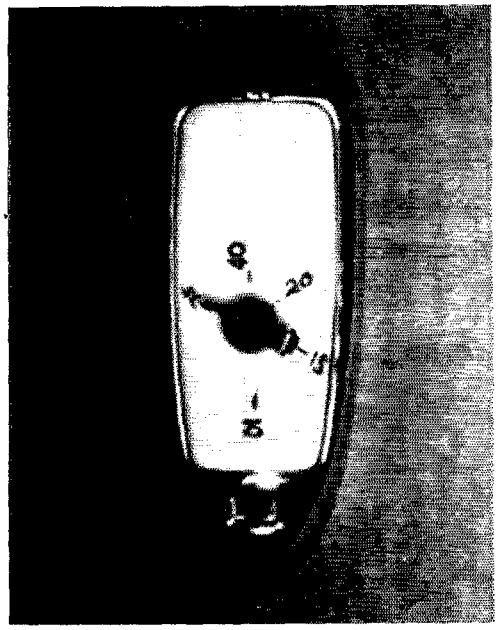
After working out a procedure, be sure to take the XYL out to the wrecking lot and explain to her just how you propose to do the work. Once she understands, she will be much more likely to be cooperative and will be able to help install bolts, pull wires and aid in other jobs requiring three hands (at least, it is assumed that some wives will be as cooperative as mine!).



A heavy Lucite base serves as a mounting for the antenna tuning unit and distributes the stress of the whip over a wide area.

Band-Switch Extension

The Lucite base should be laid out and drilled (on a drill press to assure that the holes will be perpendicular) in such a manner that an extension of the band-switch shaft will clear the bulb and socket of the dome light. The screw-hole pattern should be arranged so that as many as possible of the hold-down screws engage the roof bracework, rather than the thin top metal alone. The Lucite base may be used as a template in drilling the holes in the car body for screws, insulator stud and shaft extension. The larger holes were made with a circle cutter. These holes should be large enough to provide at least $\frac{3}{8}$ inch of air gap between the stud or switch shaft and the surrounding metal. (The switch shaft is at high r.f. potential!) The coupling for the switch-



This antenna band-switch control, operating through the car dome light, is very convenient.

shaft extension should be a pinned insulating sleeve as shown in Fig. 1. The thinness of the sleeve and its composition are not well suited to the use of set screws. The hole for the shaft through the Lucite base should be no larger than necessary to avoid weakening the base.

Installation

In this particular case, the dome-light assembly is held in place with twisted lugs. The assembly was removed temporarily during the course of installing the antenna and tuning with a grid-dip meter. The eight hold-down screws can be inserted through the dome-light upholstery hole. Each is tightly secured by a nut on the outside of the car roof as shown in Fig. 1. These nuts serve to hold the screws in place until the Lucite base is mounted, and make it unnecessary to shape the bottom side of the base to conform to the curvature of the roof. A rubber gasket or a hardening or semihardening sealing material should be used at the seam between the roof and the Lucite base to prevent water seepage.

Feed-Line Connection

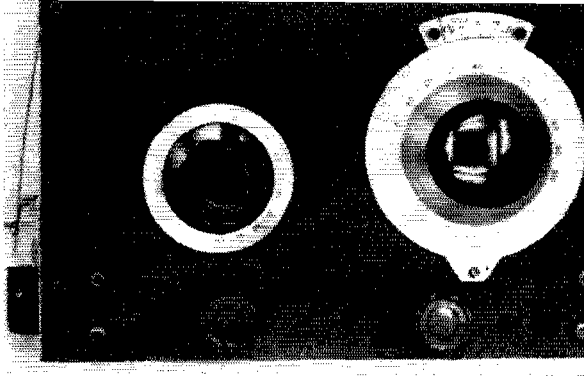
The new foam insulated type of RG-8/U cable is recommended for the feed line. This type is much more flexible than the solid-dielectric type and greatly facilitates pulling the line through the cable trough over the door frame and through the car-top stiffener bracing. The outer conductor of the cable is bent around and soldered directly to the roof metal, assuring an excellent ground connection. The inner conductor is fitted with a spade lug so that it may be readily disconnected from the antenna stud for the purpose of substituting a coupling link to a grid-dip oscillator. One terminal of this link is soldered to the roof of the car, and the coil is tucked out of the way, but available if required again in the future. The antenna stud was drilled and tapped for an 8-32 screw to facilitate connection of either the coax line or the grid-dipper link.

Adjustment

When it comes to checking resonances with the g.d.o., most mobiling amateurs will appreciate the advantage of sitting in the back seat of the car instead of being locked up in the trunk, as is the more usual case. It is also comforting to know that any adjustment you may make will not be thrown off by the lay-back of the whip when the car is in motion. In resonating the antenna at the center of each phone band, the following adjustments were found appropriate and are offered as preliminary guides in other installations of this type:

10 meters — Cut the whip to 7 feet 8 inches.
15 meters — Tap the coil at 2.30 turns up from bottom.
20 meters — Tap the coil at 3.95 turns up from bottom.
40 meters — Tap the coil at 12.95 turns from bottom.

(*Continued on page 146*)



The vernier tuning dial on the right is a now-obsolete National sometimes found in surplus. The straight dial to the left controls the r.f. amplifier tuning. Below are the r.f. and audio gain controls.

Balanced Detector in a T.R.F. Receiver

A Novel Tuner for 40- and 80-Meter C.W. and S.S.B.

BY JAMES R. WHITE, * W2WBI

In this receiver, the principle of the product detector is used to obtain better selectivity and freedom from blocking in a simple t.r.f. receiver.

I GREW to know amateur radio in the early 1930s when the t.r.f. regenerative-detector receiver occupied a position of prominence in nearly every ham shack. The sensitivity of these relatively simple receivers was remarkable and many hams have fond remembrances of rare DX contacts on the then relatively unoccupied bands. Unfortunately, regenerative detectors have inadequate selectivity and are unable to reject overriding strong signals. Moreover, strong signals pull the detector frequency and even block the oscillation. As a consequence, amateurs today generally use superheterodyne receivers, some with two or three separate converter stages, and the simpler early receivers are of little more than historic interest.

Product Detectors

With the introduction of single-sideband techniques to amateur radio in the late 1940s, methods of detection came under new scrutiny. Product detectors soon came into use. These detectors are frequently mixers, mixing the needed local carrier in with the received sidebands, at the same time responding poorly as rectifiers for all signals simultaneously present in the i.f. pass band.

An early paper by Villard, W6QYT, [1] describes the differences between diode or linear detectors and frequency-converter detectors, later dubbed product detectors. In particular, this paper describes a balanced detector exceptionally well suited for use as an s.s.b. detector in superheterodyne receivers. In this detector, comprised of two frequency-converter tubes as shown in the diagram of Fig. 1, "each tube produces the same amount of audio output from rectification caused by nonlinearity of the control-grid-voltage, plate-current curve. But since the tubes are connected in push-pull as far as their outputs are concerned, these audio signals cancel out.[2] The local-oscillator voltage, on the other hand, is fed to the two tubes in push-pull, and consequently the audio outputs resulting from the beat between this oscillator and the incoming signal add up in phase at the output transformer." Villard pointed out that in a detector of this sort the only signals effectively detected are those that beat with the local oscillator and that the selectivity is then determined by the audio pass band.

While Villard's detector was originally intended as an s.s.b. detector in superheterodyne receivers, after some recent experimentation it became apparent that such a detector could so effectively reject all signals except those beating with the local oscillator that it could form the

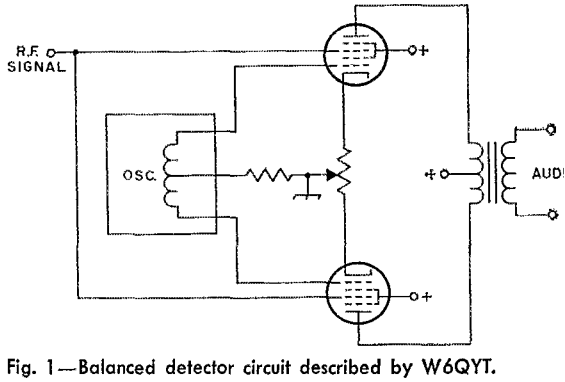
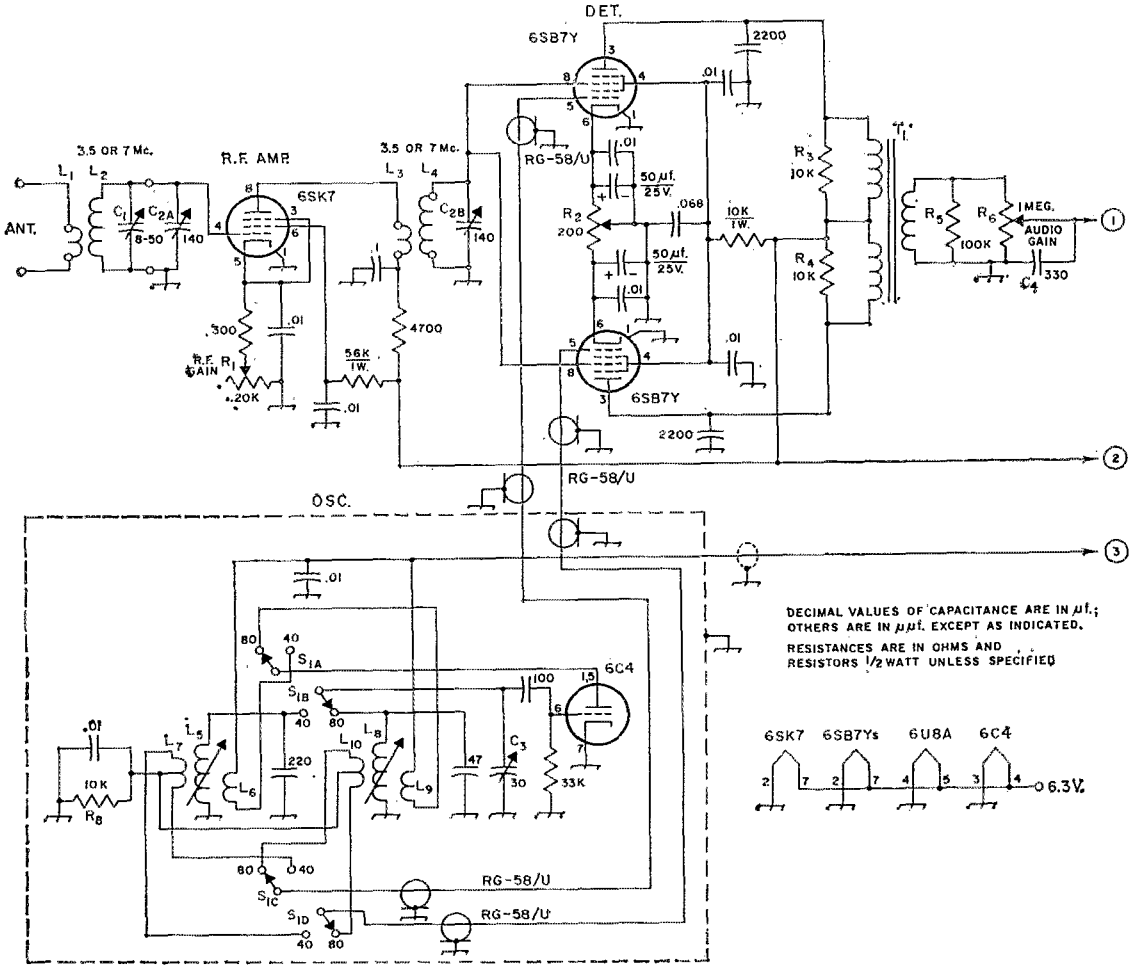


Fig. 1—Balanced detector circuit described by W6QYT.

* 118 Cedar Lane, Princeton, N. J.

[1] Villard, "Selectivity in S.S.S.C. Reception," *QST*, April, 1948.

[2] The signal grids being in parallel.



basis for an s.s.b. and c.w. receiver that has *no r.f. selectivity whatsoever* ahead of the detector. At this point, a simple t.r.f. receiver, differing only in the detector from the receivers of the 1930s, was built. Experience with this simple receiver has been so favorable that it was felt that others might be interested.

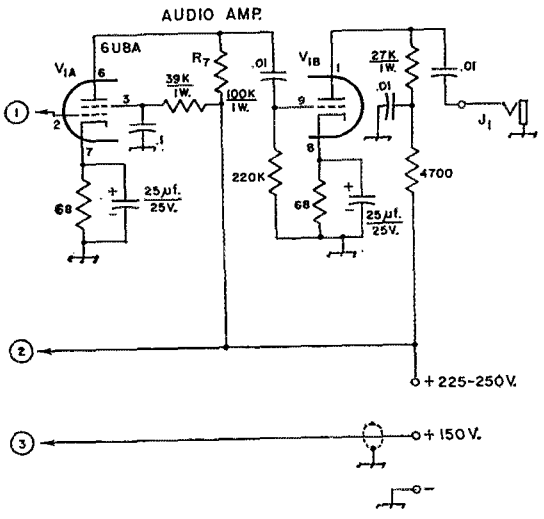
Receiver Circuit

The circuit diagram of the receiver is shown in Fig. 2. The 6SK7 r.f. stage is conventional in every respect. It is gang-tuned with the detector grid circuit by C_2. Both circuits use plug-in coils to permit band changing. While these circuits provide some small r.f. selectivity along with gain, the selectivity is unnecessary and, in fact, it is helpful to stagger-tune these circuits slightly, thus creating a broad-banding effect that annihilates the r.f. selectivity. The receiver is tuned exclusively by varying the frequency of the local oscillator, and C_2 is adjusted solely for peaking-up incoming signals. C_2 need not be re-adjusted, after peaking for oscillator frequency changes of at least ±50 kc. The r.f. and detector tuned circuits are made to track by adjustment of ceramic trimmers (C_1) mounted inside each r.f.-stage coil form.

The balanced detector is similar to Villard's except that 6SB7Ys are employed in the frequency-conversion circuitry. These tubes permit a much higher conversion gain than obtainable with the 6L7s used by Villard. 6SA7s have been tested and also work well in this circuit. The balancing adjustment for this detector is easily made by coupling an amplitude-modulated signal into the detector grids and, with the local oscillator disconnected or detuned to a frequency where it does not beat with the signal, adjusting the cathode-balancing potentiometer, R_2, for no audible detection of the signal modulation in the headphones. This condition occurs roughly at the center of the potentiometer range. Once the adjustment has been made it need not be repeated unless the detector tubes change characteristics.

The oscillator circuit is also conventional except that a push-pull output signal is obtained from the center-tapped coupling coils, L_7 and L_{10}.

Fig. 2—Circuit of the t.r.f. receiver using a balanced detector.



C_1—Ceramic trimmer mounted in each plug-in coil.
C_2—Dual midget variable (Hammarlund MCD-140-M).
C_3—35-$\mu\mu$f. midget variable with one stator plate removed.
C_4—See text.
J_1—Open-circuit headphone jack.
L_1, L_2, L_3, L_4—Wound with No. 26 enameled wire on 1¼-inch 4-prong plug-in forms with ¼ inch between primary and secondary windings (Allied Radio type 24-4P forms).
3.5 Mc.—L_1, L_3— 9 turns close-wound.
—L_2, L_4—38 turns, length 1½ inches.
7 Mc.—L_1, L_3— 8 turns close-wound.
—L_2, L_4—20 turns, length 1½ inches.
L_5–L_{10} inc.—Wound with No. 30 d.c.c. wire on ½-inch iron-slug forms (Miller 22A000RB1). Center-tapped secondaries are wound over center portion of primaries, insulated by layer of Scotch tape; feedback coils L_6 and L_9 are similarly wound and insulated at ground ends of primaries, with turns wound in the same direction as the latter and bottom ends connected toward plate.
L_5—15 turns, length 1 inch.
L_6—4 turns close-wound.
L_7—10 turns, c.t., close-wound.
L_8—45 turns close-wound.
L_9—10 turns close-wound.
L_{10}—10 turns, c.t., close-wound.
R_1—20,000-ohm control.
R_2—200-ohm wire-wound control.
R_3, R_4, R_5, R_7, R_8—See text.
R_6—1-megohm control, audio taper.
S_1—2-section 4-pole 2-position rotary switch (Centralab PA-2011).
T_1—Interstage audio transformer: push-pull plates to single grid, ratio 1:3, full secondary used (Thordarson 20A24).

To permit reception of both 40- and 80-meter signals, S_1 selects one of two separate tuned circuits. These tuned circuits spread each band over about 150 degrees of dial rotation. No attempts were made to compensate this oscillator for temperature changes, so a small warm-up drift occurs. By choosing ceramic capacitors in the grid circuits with proper temperature characteristics, this drift could be largely corrected. More stable v.f.o.-type circuitry could also be used to advantage. The frequency to which the receiver is tuned is determined exclusively by this oscillator, and there is no discernible interaction with the other tuned circuits. As a result, the stability and calibration precision can be as good as the best v.f.o.

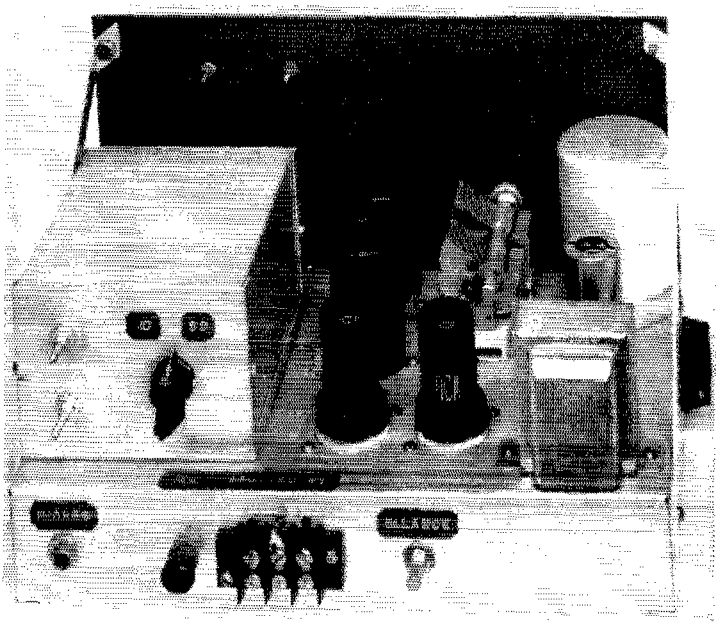
The oscillator operating voltage, amount of feedback, and the coupling coils are chosen to provide the correct current for the 6SB7Y injection grids. This current should range between 0.25 and 0.35 ma. for each grid. It can be conveniently measured by measuring the voltage appearing across R_8 with a high-resistance voltmeter.

Since the oscillator frequency is the same as the resonant frequency of the r.f. tuned circuits, some care must be exercised to prevent the strong local oscillator signal from blocking the r.f. amplifier. Accordingly, the oscillator is enclosed in a shielding box. Plate and filament leads to the oscillator are shielded and bypassed inside the shielding box. The two leads from the oscillator to the 6SBY7 injection grids are constructed of short lengths of RG-58/U cable with the shield braid grounded. By these techniques the directly-radiated signal from the oscillator is reduced until it is barely audible in a high-gain receiver in an adjacent location on the operating table, and causes no blocking difficulties in the r.f. stage.

The audio circuitry is straightforward. To conserve tubes, the two sections of a 6U8A are used in successive pentode and triode stages. The over-all audio gain is quite high. A tendency toward audio feedback was corrected by the resistors R_3, R_4 and R_5, and the capacitor C_4. In addition, to insure stability, the gain of the pentode section is slightly reduced by choosing a smaller than optimum plate load resistance, R_7. Because of this large audio gain, the transformer, T_1, must be located away from the hum fields of neighboring transformers. Thus the power supply for the receiver is located on a separate chassis. Many other audio amplifier designs would serve equally well. Because a large fraction of the over-all gain of the receiver is obtained at the audio level, a high-gain amplifier should be employed.

Construction

The receiver is built on an 11 × 7 × 2-inch chassis to which an 11 × 7-inch panel is bolted and braced with aluminum side angles bent in a vise. The front-view photograph shows the vernier oscillator tuning dial on the right and the r.f. peaking control on the left. The small knobs at the bottom control the r.f. and audio gain. The top view on a following page shows the component layout. The oscillator components are in the shield box on the left. The 6SB7Y de-



In this view of the receiver, the oscillator is enclosed in the aluminum box to the left. The band switch is mounted on the rear wall of this box. The plug-in r.f. stage coil is enclosed in the shield can in the upper right-hand corner. Audio and detector components are to the rear.

tectors are in the center rear, the 6SK7 r.f. stage is adjacent to the front panel, and T_1 and the 6U8A are on the far right. The plug-in coil for the r.f. grid circuit is shielded in the removable-top aluminum can on the right. The detector plug-in grid coil is unshielded. The band-changing switch S_1 is at the rear of the oscillator box, beside the adjustment screws for the permeability-trimmed oscillator coils.

The receiver requires a power supply of 225 to 250 volts at 30 ma., 150 volts at 8 ma. (regulated by a VR tube) and 6.3 volts at 1.5 amperes.

Adjustment

The receiver is most conveniently adjusted for operation with the aid of a signal generator with modulated output. If the generator is not available, the alignment can be done by listening on the ham bands. The principal adjustments required are (1) the setting of the oscillator permeability-trimmed coils to center up the 40- and 80-meter bands on the dial, (2) the adjustment of the r.f. trimmer capacitors to secure rough tracking of the r.f. and detector tuned circuits, and (3) the adjustment of the detector balancing potentiometer. This latter adjustment, with the aid of a modulated oscillator, has been previously mentioned; it can also be made by tuning in a *very strong* a.m. signal, using C_2. With the oscillator tuned to a different frequency, the potentiometer is adjusted for minimum detection of the a.m. signal.

This receiver tunes in much the same manner as a superheterodyne receiver with a fairly broad

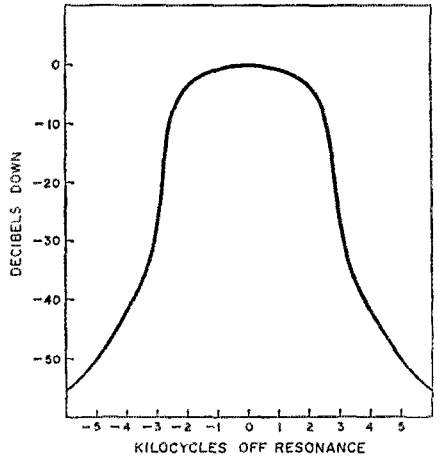


Fig. 4—Frequency characteristic of the filter of Fig. 3.

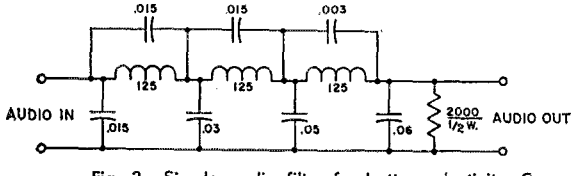
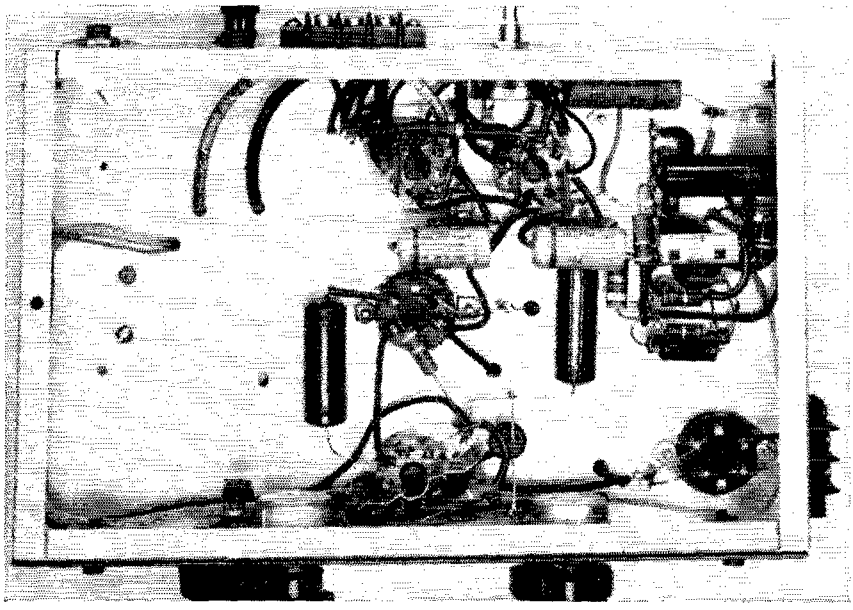


Fig. 3—Simple audio filter for better selectivity. Capacitances are in μf., inductance in millihenrys and resistances in ohms.

i.f. pass band and a good product detector. Each c.w. carrier will produce two audio signals, one on each side of zero beat. By the use of a peaked audio filter, such as the Selectoject, following the receiver, these two signals can each be made to occupy a band a few hundred cycles wide. Single-sideband signals are received when the local oscillator frequency coincides with the needed carrier injection frequency. Double sideband signals are also receivable. A.m. signals are receivable but



Bottom view of the balanced-detector receiver.

only when the local oscillator frequency coincides precisely with the a.m. carrier. When the frequency deviates even slightly, the a.m. modulation flutters at the difference frequency sufficiently to render proper reception difficult.

More Selectivity

A rather simple audio filter following the receiver, such as that shown in Fig. 3, adapted from a design in the 1949 ARRL *Handbook*, produces the over-all selectivity characteristic of Fig. 4. This particular filter, although it attenuates more than might be desired, has proven to be very effective in receiving s.s.b. signals.

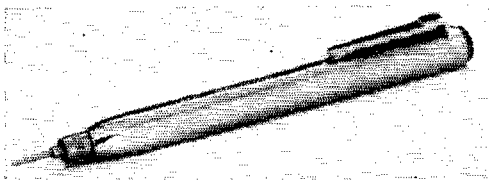
There is, of course, no discernible pulling of the oscillator by the received signal. Moreover, the modulation on strong signals adjacent to those which are being detected does not "ride through." Under the worst circumstances, when a *very strong* modulated signal is present adjacent to a weak signal being received in the broad r.f. pass band, a slight background hash can be heard.

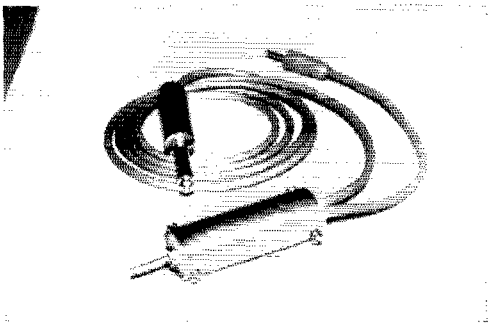
When provided with a 25- or 30-foot antenna, the sensitivity of the receiver is more than adequate for reception of 40- and 80-meter signals. Since relatively few stages are used, however, the receiver does not have the gain of a multistage superheterodyne receiver. QST

• *New Apparatus*

Transistorized Signal

THE interesting gadget shown in the photograph is called the "Mosquito" and is manufactured by the Don Bosco Electronics, Inc., Hanover, New Jersey. It's a transistor oscillator powered by a single 1½-volt penlight cell. The oscillator runs at about 2000 cycles but, since the wave shape is square, it puts out harmonics well up into the r.f. range. It can be used as a test-signal source for both transistor or vacuum-tube equipment and is useful at audio, intermediate and radio frequencies. Only 5⅝ inches long, ½ inch in diameter and weighing but 1 ounce, the chrome-plated "Mosquito" is in the shape of a mechanical pen or pencil, and even has a clip, which doubles as the on-off switch, for attaching it to the inside of a pocket. The injector is turned on by moving the clip holder down and is put into operation by touching the tip to the circuit under test. For some applications, it is necessary to ground the shell to the equipment. The device can also be inductively coupled to magnetic devices by placing it a few inches away from the unit under test. We connected the "Mosquito" to the terminals of a vacuum-tube communications receiver and the harmonics were still loud and clear at 30 Mc. —*E. L. C.*





The completed T Patch. The large plug fits the grid-dip oscillator jack, while the small plug fits an ohmmeter terminal jack to make the connection to the emitter in the T Patch. The probe tip fits the other ohmmeter terminal jack and makes the connection to the T-Patch collector.

Improved Sensitivity for G.D.O. Wavemeter Circuits

BY DON McAVOY,* W2PRT

The T Patch

The conventional grid-dip oscillator is well known for its versatility. However, the grid-leak resistance required for the oscillating mode impairs its sensitivity when the g.d.o. is used as an absorption wavemeter. This article shows a simple way of vastly improving this situation.

THIS is a story about a grid-dip meter, a simple patch cord and an ohmmeter. And, like most recent stories, it would not be complete without a transistor somewhere in the picture.

Before defining the purpose of the T Patch, let's consider the conventional grid-dip oscillator. In its transmitting or oscillating mode, it performs most of the functions of a signal generator and, in addition, it can be used to indicate the resonant frequencies of unenergized r.f. circuits and components, in many cases even when the latter are already wired into a transmitter or receiver.

In its receiving or monitoring condition, the grid dipper can be used as an indicating wavemeter to identify the fundamental frequencies and detect harmonic content of signals appearing at various points in the equipment when the circuits are energized. However, in this latter function, the conventional g.d.o. is not too sensitive.[1] This limitation accounts for the appearance of the T Patch whose purpose is to increase the sensitivity of the wavemeter circuit of a grid-dip meter. Some indication of this increase can be gained by noting the response to the oscillator signal from an ordinary transistor receiver. A half-scale deflection of the indicating meter can be easily obtained by simply placing the probe coil of the g.d.o. near the plastic case of the receiver.

In the first attempt to increase sensitivity, a more sensitive meter movement was substituted in the g.d.o. While considerable improvement was noted, the meter needle was easily pinned when the probe was placed too close to circuits carrying moderate amounts of r.f. energy.

The second attempt involved the design of a transistor amplifier-limiter circuit to amplify the signal output from the grid dipper and feed it to an external meter. It was found that large shifts in collector current could be obtained from small changes in base current. At the same time, the circuit operated so that changes in collector current above a preset level were negligible — exactly the characteristics needed to improve the sensitivity without driving the meter off scale on unexpected strong signals. Thus the T Patch was born.

Circuit

The circuit is shown in Fig. 1. The portions of the circuits to the right of the dashed lines in both A and B may strike many as being familiar, since they are essentially types of circuits often used in v.o.m. test units for measuring resistance. In fact, if a conventional ohmmeter (or v.t.v.m.) is available, it can be used for this portion of the circuit and the only other component required is the transistor. This method was used by the au-

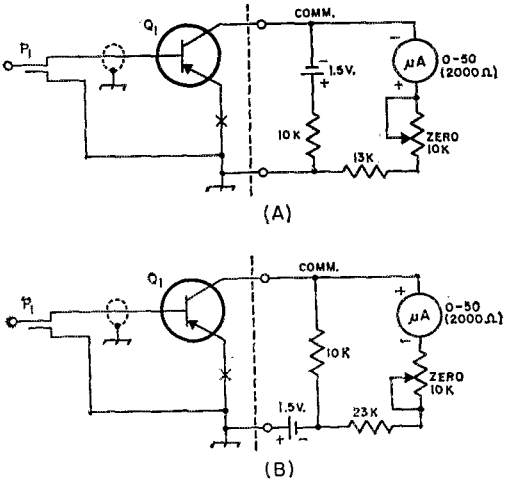


Fig. 1—T-Patch connections to two basic types of ohmmeter circuits.

* General Dynamics/Electronics, Rochester, New York.

[1] *The Radio Amateur's Handbook*, Measurements Chapter.

thor. The usual 1.5-volt battery in the ohmmeter will automatically supply operating voltage for the transistor when the transistor and ohmmeter are connected together properly. The additional current drain is usually a matter of less than 200 μa., and in any case will not exceed 2 ma.

The ohmmeter circuit shown in Fig. 1A is of the type where the initial zero-set adjustment is for a full-scale meter reading with the test prods open (infinite resistance). The circuit of B is of the type where the initial zero-set adjustment is for full scale with the test prods shorted (zero resistance). Either type of circuit will work in this application. Ohmmeters of the v.t.v.m. type will serve equally well.

The Transistor

The selection of a suitable p-n-p transistor for this application is quite important. The principal requirements are low leakage currents for the parameters I_{CBO} and I_{CER}, and a medium d.c. current gain (h_{FE}) at collector-current levels of 200 μa. or less. Germanium transistors having the following characteristics are recommended:

1) An I_{CBO} of approximately 2 μa. or less at a V_{CB} of −1 volt.

2) An h_{FE} between 20 and 50 at an I_C of 200 μa., and a V_{CE} of −1 volt. Transistors having an h_{FE} between 30 and 60 at 10 ma. and −1 volt will usually show ample gain at 200 μa.

The author has tried at least a dozen different types of low-power units and all except two worked well. Many types of low-power germanium transistors, especially those designed for switching, should meet the specifications and are obtainable at nominal cost. A Texas Instruments type 2N1373 was used in the original T Patch. The type 2N1372, which retails for about one dollar, should also operate satisfactorily.

Transistor Leakage

With all germanium transistors, some leakage current will flow in the collector circuit as soon as a collector voltage is applied, even in the absence of a base-driving current. However, by selecting the proper type of transistor, as described above, this leakage can be minimized, and the ohmmeter can usually be readjusted, by means of its zero-set control, to show zero deflection with no signal input. High-leakage transistor units should not be considered for this application. In general, leakage currents in germanium transistors increase with their physical size and dissipation rating. A few silicon transistors were tested in the T Patch. Although these units showed negligible leakage, their sensitivity at low signal levels was inadequate.

G.D.O.-Tube Leakage

There is also a small zero-signal leakage current through the vacuum-tube detector of the grid-dip meter, even when plate voltage is not applied. Part of this current flows through the headphone circuit, and is usually sufficient to cause threshold conduction in the base circuit of the transistor. With some grid-dip meters, the magnitude of this zero-signal current may be so high (a few microamperes) that it will be impossible to adjust the ohmmeter to its zero setting. If this occurs, correction or compensation may be made by one of the following methods:

1) Addition of a 120-ohm resistor in series with the transistor emitter to ground (at point marked *X* in Figs. 1 and 2).

2) Use of the $R \times 100$ ohmmeter range if sensitivity permits.

3) Substitution of a transistor with lower current gain.

4) Possible use of reverse current gain by simply interchanging the collector and emitter connections.

5) Replacement of a weak ohmmeter battery.

6) Replacement of the vacuum tube in the g.d.o.

Battery Polarity

The battery polarity in respect to the transistor must be as shown in Fig. 1: that is, with the positive battery terminal toward the emitter and the negative terminal toward the collector. In some v.o.m.'s, the polarities of the battery and the meter are the reverse of those shown in Fig. 1. With these instruments, connections between the transistor and the ohmmeter must also be reversed, as shown in Fig. 2. The polarity of any particular v.o.m. can be checked with a voltmeter, or by simply trying it with the T Patch which will not work with the wrong polarity. The polarities at the *common* terminal of several well-known instruments are as follows:

Hewlett Packard Model 410B	(+)
RCA Model WV-87B (Master Voltohmyst)	(+)
RCA Model WV-98A (Senior Voltohmyst)	(−)
Heath Model V-7A	(−)
Triplett Model 650	(+)

Ohmmeter Ranges

Ohmmeter ranges below $R \times 1000$ are generally not usable because of the decreased circuit

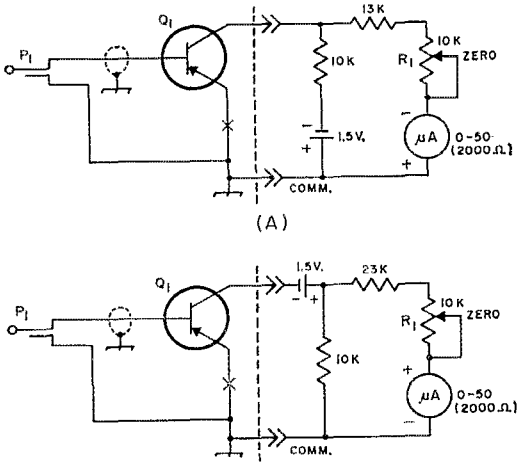
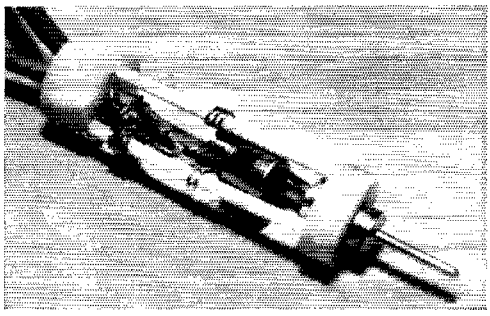


Fig. 2—These circuits are similar to those of Fig. 1, but with reversed battery polarity.



Interior view of the T Patch, showing the mounting of the transistor.

sensitivity. On ranges higher than $R \times 1000$, sensitivity may increase, but the effects of vacuum-tube and transistor leakage currents become pronounced. This is especially true for those instruments that switch to a higher battery voltage for the $R \times 10{,}000$ and higher resistance ranges, since the increase in collector voltage is invariably accompanied by an increase in leakage current.

V.T.V.M. Ohmmeters

V.t.v.m. ohmmeters may be used with excellent results. When using a.c.-operated instruments, the case of the ohmmeter should not be connected to earth ground through the power line if either the common or ohms terminal is connected electrically to the case. (The case is usually grounded when a 3-prong line plug is used, and is not generally grounded when a 2-prong plug is employed.) This note is included as a safety precaution because the case of most grid-dip meters is connected to one side of the headphone jack, and there is therefore a direct connection through the T Patch from the case of the g.d.o. to the case of the v.t.v.m., and not many operators care to hold a grounded case in one hand while working on equipment.

Construction

The T Patch may be built into any one of a variety of forms. One example is shown in the photographs. The case is a section of $\frac{5}{8}$-inch i.d. conduit. The end insulators were cut from a $\frac{5}{8}$-inch rod of Delrin, an acetal thermoplastic resin, and the three spacing rods were cut from a knitting needle — a gift from the XYL. Other insulating materials may be used, of course. The plug is suitable to fit the pin jack (or other form of connector) at the ohmmeter connection that goes to the transistor collector. This will depend on the battery polarity as indicated in the diagrams. The input cable should be made of some highly flexible insulated and shielded wire. Microphone cable is excellent for the purpose.

Provision should be made to avoid strain on the transistor leads. The leads were wound around adjacent spacing rods before making connections to the cable wires. Care should be exercised in soldering the connections to avoid melting the spacing rods. A soldering lug wrapped around one of the spacing rods is used as a tie point for the cable shield, the emitter connection, and the flexible output lead to the ohmmeter. The inner conductor of the input cable goes to the transistor base.

The input cable is terminated in a plug to fit the jack of the grid dipper, and the flexible output lead has a plug to fit one of the ohmmeter jacks. The unit itself plugs into the other ohmmeter jack, as indicated previously.

Stabilizing resistors were omitted from the circuit to keep the quiescent collector current at a minimum. After the unit has been in operation for a few minutes, negligible meter drift will be noted during normal usage. However, wide changes in ambient temperature will affect the zero setting. If desired, a 120-ohm resistor may be inserted in the emitter circuit at the point marked X in the diagrams to further reduce quiescent collector current and effect partial temperature stabilization.

If you would like to try the T Patch, insert a fresh battery in your ohmmeter, and experiment by connecting the circuit up in breadboard fashion. An almost full-scale meter deflection should be obtained with a base current of only a few microamperes. When you are convinced, decide on a suitable assembly package, construct it accordingly, and use it a few times. You will then be entitled to full T-Patch membership. QST

May 1936

. . . The great floods of 1936 received top billing this month, with *QST* reporting the heroic work done by some 400 amateurs in fourteen eastern states. It is interesting to note how many of the amateurs mentioned so prominently twenty-five years ago are still active.

. . . One incident that made headlines during these hours of emergency work by amateurs was the denouncing of Gerry Coleman, W8FRC (now W3KZW), by the mayor of Johnstown, Pa. Coleman was accused of broadcasting false reports on flood conditions and thereby causing a panic during which several elderly people died. The mayor got so worked up about the alleged incident that he placed a ban on amateur radio in Johnstown (which no station observed) and rushed off to Washington right in the middle of the flood rehabilitation work to petition the FCC to revoke Coleman's license. The League headquarters immediately sent Assistant Secretary Clinton B. DeSoto into the area to conduct an investigation, and he was able to prove conclusively that Coleman was utterly blameless. DeSoto called upon the mayor and the local press and was able to have the true facts brought to light and published so that the prestige of both Coleman in particular and amateur radio in general was restored in the Johnstown area.

. . . On the technical side, this issue of *QST* twenty-five years ago carried info on a novel low-cost u.h.f. superregenerative receiver, a meter-type modulation monitor, a station featuring separate transmitters on five bands (Budlong was co-author on this one), dual-diversity phone reception with single-control tuning, a selective antenna for receiving, a 100-watt transmitter for 20 and 10 meters that had worked over 30 countries (big deal in those days!), a 3-feeder double-antenna system, an i.f. coupling amplifier for the cathode ray oscilloscope, and the usual hints and kinks.

Transistor Two-Meter Converter

Using TV Tuner Transistors and Etched Circuitry at 144 Mc.

BY DANIEL MEYER *

Not content with building a good solid-state 50-Mc. converter, the author has come up with an equally simple and effective 144-Mc. design. The new converter is simpler to make and get working than many vacuum-tube models and is constructed on the same printed circuit board used for the six-meter version.

THE excellent results obtained with the six-meter transistor converter described in a previous issue of *QST* [1] led to thoughts of a transistor converter for the two-meter band. Philco Corporation has been using transistors in portable TV set tuners for some time, and these transistors can now be purchased in sets of three for less than $10.00. A properly-designed circuit using these transistors will have a noise figure of approximately 6 to 8 db. This is not the ultimate in low noise, obviously, but the other advantages that transistors offer make this converter ideal for mobile or local communication use. The circuit has been designed to be as simple, foolproof and inexpensive as possible. There are no r.f. stage neutralizing adjustments to make, and there is not a feed-through capacitor in the whole converter. If all parts are bought new, the cost should be approximately $35.00.

K5HVE has been using a converter of this type for approximately three months and regularly works stations in Austin, seventy miles away. Stations as far away as Houston have been heard.

Circuit

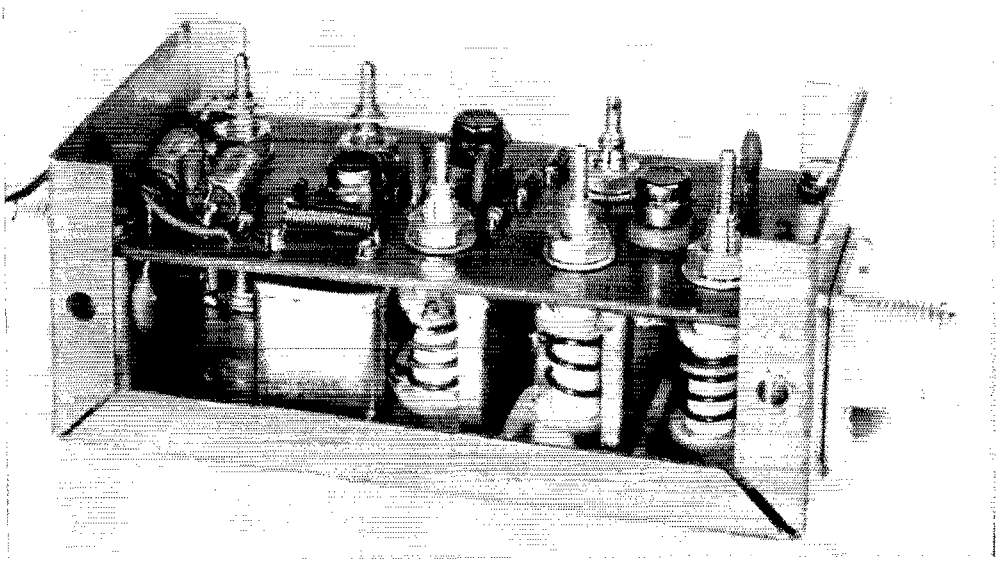
The antenna is link-coupled to a 10-Mc.-wide single-tuned circuit, L_2C_3 in Fig. 1. This wide bandwidth is necessary in order to hold input circuit losses below 1 db.[2] The r.f. amplifier is a T-1832 transistor, Q_1, operated in a grounded-base type circuit. The emitter of the transistor is tapped into the input circuit at the proper point to obtain impedance matching. The transistor's internal feedback is positive in this type connection, so neutralization of the stage to obtain maximum gain is not necessary. The amount of positive feedback present is not sufficient to cause the transistor to oscillate if the input and output circuits are properly shielded from each other.

The r.f. stage is coupled to the mixer with a

* Southwest Research Institute, 8500 Culebra Road, San Antonio 6, Texas.

[1] Meyer, "Transistor Converter for Six Meters," *QST*, December, 1960.

[2] As explained in the author's previous article, transistor input circuits must be designed for maximum power transfer. To obtain good efficiency, the tuned circuit must have a high unloaded-to-loaded Q ratio. The unloaded Q is limited by available materials and winding techniques, and the loaded Q must be kept to a small fraction of this value. Hence the wide bandwidth. — *Ed.*



The converter board mounts on ⅞-inch long spacers inside a 4 × 1⅛ × 1⅝-inch Minibox. The antenna fitting on the right end and the i.f. output fitting on the left are connected after the board is in place. The wires running through the grommet in the left end supply 6 or 12 volts at 6 ma. to the three transistors.

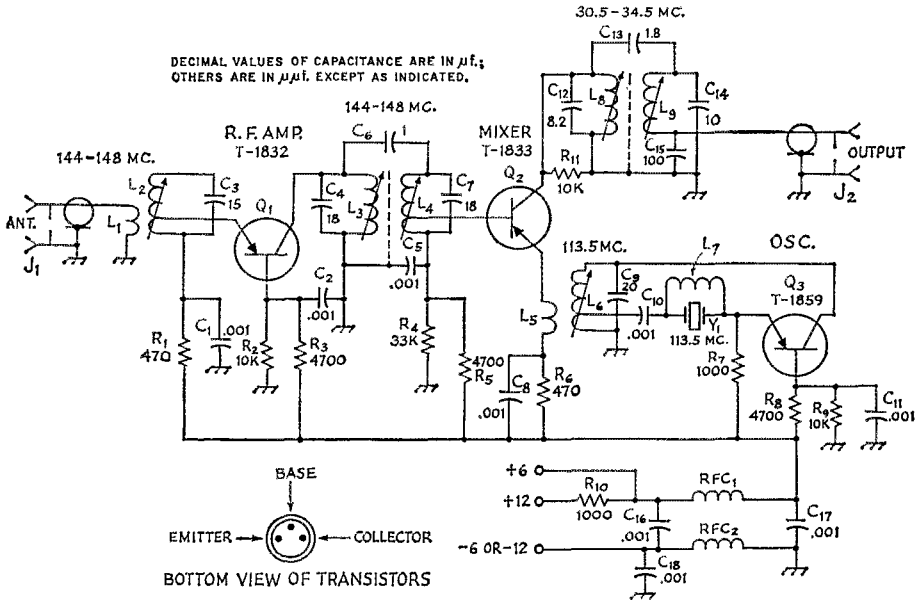


Fig. 1.—Schematic diagram of the converter and a sketch identifying the leads of the Philco transistors used. Resistances are in ohms, and resistors are ¼ watt. The 0.001-μf. capacitors are disk ceramic; other capacitors are ± 5 per cent silver mica or NP0 type ceramic. With the exceptions listed below, component designations are given for use in connection with the photographs on the following pages.

J_1, J_2—Coax receptacle, any 50-ohm type.
L_1—1 turn insulated hookup wire around cold end of L_2.
L_2—4 turns No. 20 enam., on ¼-inch ceramic form with v.h.f. iron slug (CTC PLS6-2C4L/D), tapped ¾ turn from bottom. See text.
L_3—2½ turns No. 20 enam., on same type form used for L_2. See text.
L_4—Same as L_3, but tapped ¼ turn from bottom.
L_5—1 turn insulated hookup wire around cold end of L_6.
L_6—4 turns No. 20 enam., on same type form used for L_2 and tapped ¼ turn from the bottom. See text.
L_7—25 turns No. 26 enam., close-wound on ⅛-inch diam. form.
L_8, L_9—20 turns No. 26 enam., close-wound on ¼-inch ceramic form with h.f. iron slug (CTC PLS6/E).
RFC_1, RFC_2—1 layer No. 26 enam., close-wound on 1-megohm 1-watt resistor.
Y_1—113.5-Mc. seventh-overtone type crystal.

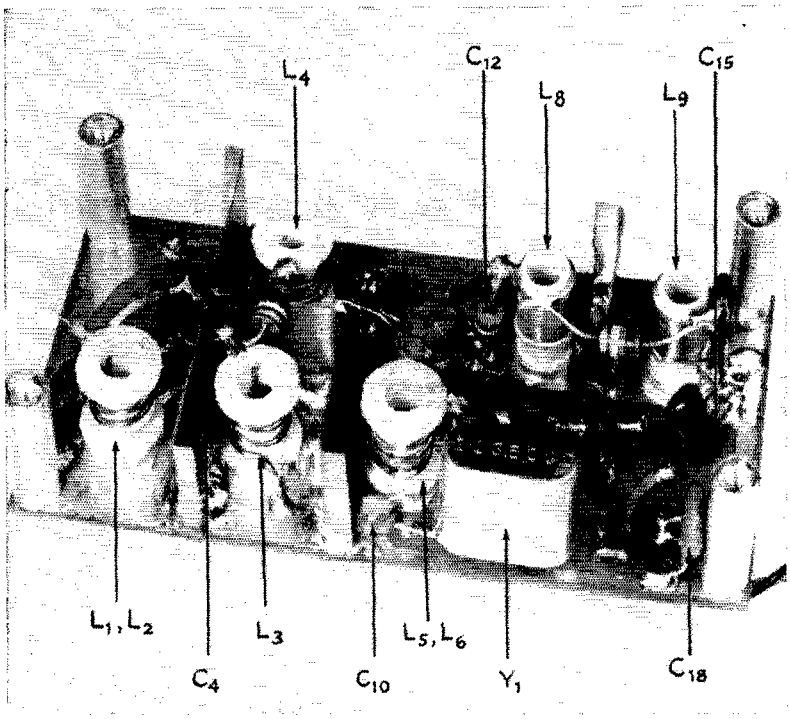
top-capacity-coupled double-tuned circuit. This circuit gives a flat-topped response 4 Mc. wide with steep skirts. Such a response is necessary if the image and i.f. responses are to be kept down to a reasonable level. The coils are wound on slug-tuned forms for mechanical stability and to make alignment easy. This type double-tuned circuit with capacitance coupling will produce much more uniform results when built by different people than the air-wound, inductively-coupled circuits sometimes seen in commercial equipment. This is due tc the greater chance of placement or component variations occurring among different constructors with the latter system.

The mixer transistor, Q_2, is a T-1833 connected with signal injection to the base and local oscillator injection to the emitter. The collector circuit is tuned to the difference between these two frequencies. The output network is another capacitively-coupled double-tuned circuit. The output coil, L_9, is in a pi-type system to match the mixer output impedance to a 50-ohm transmission line. The parts list shows coil data for 30.5-34.5-Mc. output, but either of the two networks shown with the six-meter converter previously described can be used if output on either 7–11 Mc. or 14–18 Mc. is desired.

The local oscillator uses a T-1859, Q_3, in a Hartley-type crystal-controlled circuit. A seventh-overtone crystal allows the oscillator to operate directly at the needed frequency, so no doubler stage is required. The extra parts that would be needed for the doubler would cost approximately the same as the difference in price between a third and seventh overtone crystal. By using a seventh overtone crystal, space is saved, making the converter smaller, and there is also less chance of developing interfering beats and responses from local TV and f.m. stations. The crystal capacitance must be neutralized for this circuit to operate properly. This is the function of L_7, which forms a parallel resonant circuit with the crystal's stray capacitance at the desired oscillator frequency. This prevents feedback at the oscillator frequency through the crystal and circuit capacitance. Such feedback, if not neutralized, would cause the crystal to lose control and allow the oscillator frequency to drift.

Construction

This converter is built on a circuit board identical to that used for the six-meter converter. The full-size pattern included with that article should be applied by tape, paint or photographic



Bottom view of the converter identifying the coils and several capacitors mounted on them. The crystal is held by pins removed from an old tube socket.

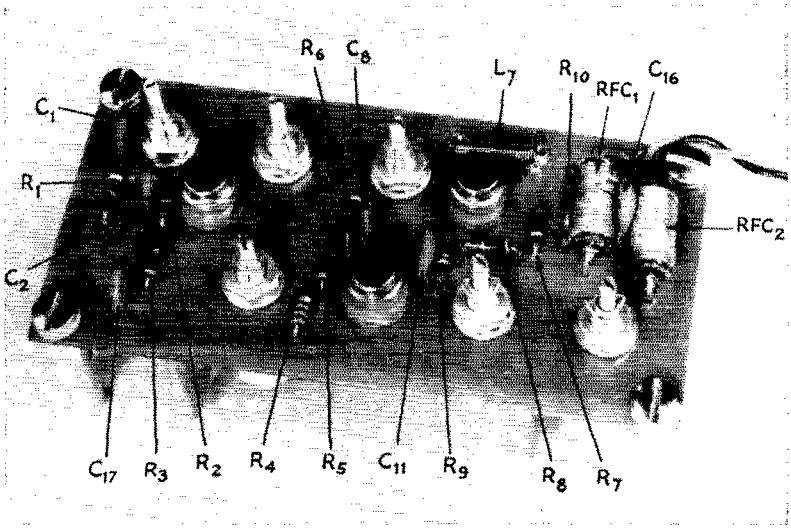
methods to a blank printed circuit board of the size shown.[3]

The photographs show the locations of the various parts. The resistors, capacitors and chokes are inserted in their holes and soldered to the conductors on the bottom of the board.

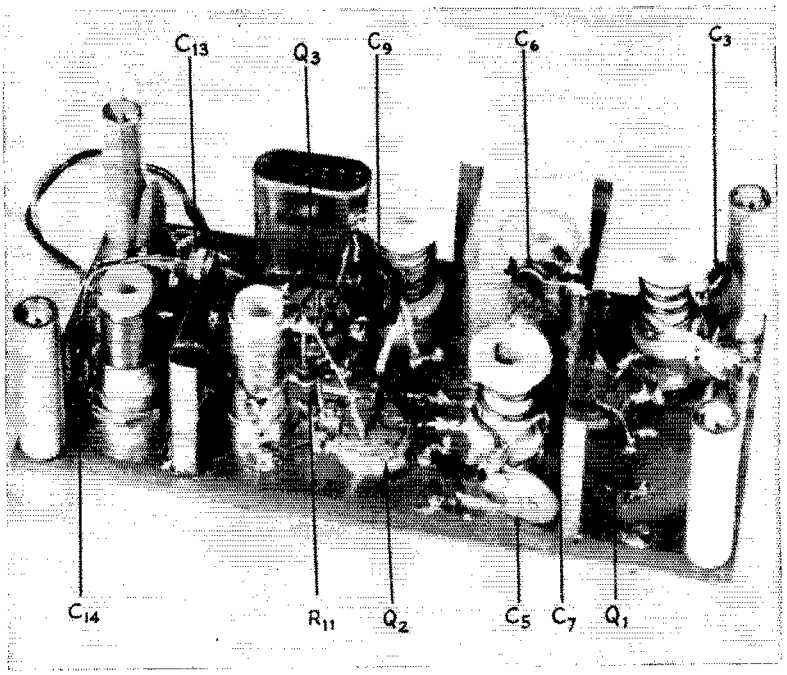
Coils L_2, L_3, L_4 and L_6 should be wound with their turns evenly spaced between the terminal collars that are glued to the specified forms. The solder lugs of these collars may be placed in any of four slots in the collars. This makes it easy to tap L_2, L_4 and L_6. Place the solder lug in the proper slot on the collar, bend the inside part of the lug against the body of the coil form, and then wind the wire over this part of the lug. The enamel insulation can now be scraped off at this point and the lug and wire soldered together to form the tap. To obtain the shortest lead lengths it is necessary to wind L_2 counterclockwise and L_3, L_4 and L_6 clockwise (viewed from the top of the coil form).

L_8 and L_9 should be wound for the output frequency range that is to be used. If other than

[3] The author will supply drilled and etched circuit boards for $2.00 each to anyone who would rather not attempt this process.



Top view of the printed circuit board identifying the resistors, capacitors and chokes which are mounted on the board itself.



Another bottom view locating the transistor sockets and the remaining components which are mounted on the etched side of the board. The long shield partition on the right crosses the r.f. amplifier socket, separating the base and emitter pins from the collector socket.

the specified output frequency is desired, it will be necessary to reduce the value of C_9 so that it will resonate the oscillator tank circuit at the frequency needed. The crystal frequency will, of course, also have to be changed.

Connections to the transistor sockets are made as shown in the photographs. The center pins of the Elco 3304 sockets are not used and should be pulled out. The transistor base connections are as shown in Fig. 1. After all other parts are in place, the shielding should be soldered in at the positions indicated. These shields are cut from ⅞-inch wide copper or, if available, silver-plated copper sheet stock.

Alignment and Testing

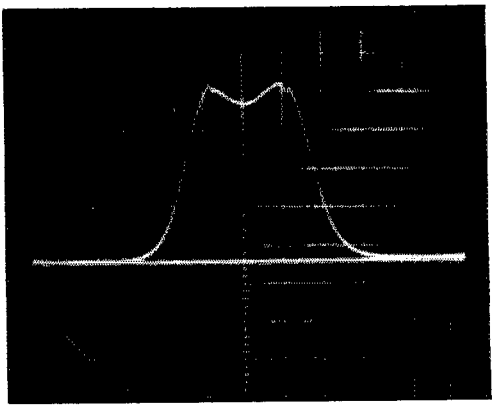
After completing the construction, check all connections and parts values again. Transistors are easily damaged by excessive current which might be caused by improper wiring.

All tuned circuits should be checked for resonance at the proper frequency. Using a grid-dip meter and with the power on, check L_2, L_3 and L_4 for resonance between 144 and 148 Mc.; L_8 and L_9 for resonance between 30.5 and 34.5 Mc.; and L_6 for resonance at 113.5 Mc. This must be done with the power on since the internal capacitances and loadings of the transistors are part of the circuit, and these factors are quite different when power is not connected to the device. If any of the circuits will not tune through the proper range, the value of the resonating capacitance may be changed slightly.

The oscillator is checked next. Using either a grid-dip meter or an r.f. probe and v.t.v.m., adjust L_6 for maximum output at 133.5 Mc. Then adjust the turn spacing of L_7 until maximum output is obtained from the oscillator. The oscillator output should be approximately 150 to 300 millivolts r.m.s. measured at the emitter terminal of the mixer.

The over-all response should be like that shown in the photograph when using the sweep alignment system described in the previous article. The width of the response curve is determined by the amount of capacitance used to couple the double-tuned circuits. If the frequency range is not correct, these capacitors may be adjusted slightly for correct response. A smaller amount of capacitance will decrease the frequency range and a larger capacitor will increase the range.

(*Continued on page 150*)



Work for a response curve like this when using sweep and marker generators and an oscilloscope to align the converter. The marker pips on the top of the trace are at 144 and 148 Mc.

• *Beginner and Novice —*

How To Attenuate Your Harmonics

An Antenna Coupler for 80 through 10 Meters

BY LEWIS G. McCOY,* W1ICP

ONE of the problems the Novice must always be on guard for is the radiation of harmonics from his station. Exactly what are harmonics and how can they cause trouble? When you turn on your transmitter what you want from it is a single signal, the one you intend to communicate with. If all your output power is on one frequency, fine and dandy. Unfortunately, transmitters don't happen to work that way. The fundamental output is usually accompanied by other signals that are simple multiples of the fundamental frequency. For example, if the fundamental frequency is 3725 kc. there will also be some output on 7450 kc. on 11,175 kc., on 14,900 kc. and so on up. If these signals reach the antenna and are radiated, they may interfere with other radio services since, in most cases, harmonics from the Novice segments fall outside amateur bands. When this happens you are likely to be the recipient of a "QSL" card from the FCC.

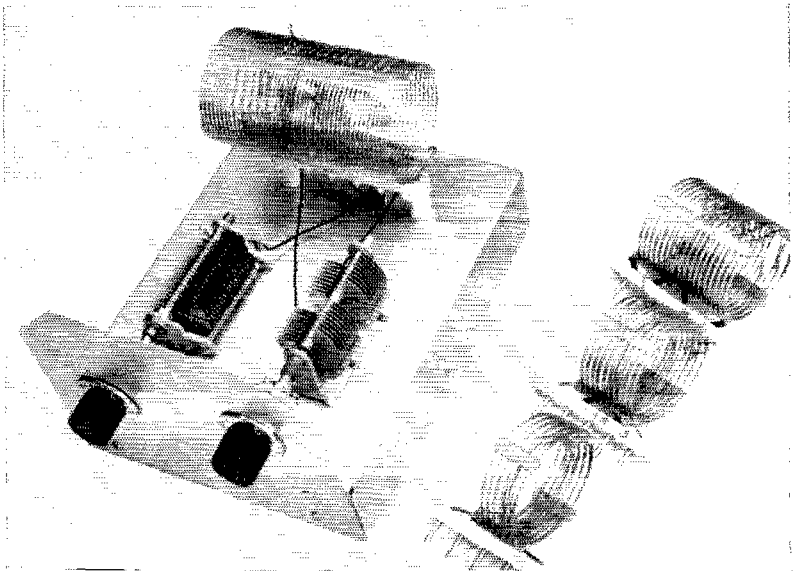
Another problem the Novice has is "feed-through" of signals lower in frequency than the band he is using, which reach the antenna and are radiated. In other words, assume you want to work 40 meters and are using an 80-meter crystal in the oscillator stage of your transmitter. The oscillator works as a doubler and drives the amplifier on 40. If there is insufficient selectivity in the amplifier stage some of the 80-meter signal will feed through the amplifier and reach the antenna. You will actually have two signals on the air, one on 80 and another on 40. A similar thing can happen when you operate on 21 Mc., and so you should take precautions to prevent this radiation of spurious signals. The system described in this article will do much to prevent such radiation.

How Strong Are Your Harmonics?

There are a couple of ways you can find out if you have a harmonic problem. The quickest method for checking harmonic radiation is to have a nearby ham listen at the harmonic frequencies. Don't pick a ham next door to you — he should be at least a mile away. A ham that lives too close couldn't help but hear harmonics radiated directly from your rig instead of from the antenna. In fact, your fundamental signal can easily overload his receiver, and that would cause harmonics to be generated in his receiver. In such a case his observations wouldn't be reliable. You are only concerned at the moment with harmonics that are getting out through the antenna.

If you are not fortunate enough to have another ham available to check for harmonics, there is a way you can do the job yourself. Build an absorption-type wavemeter that tunes the harmonic frequencies. A unit suitable for this purpose is described on pages 513–514 of the 1961 *Radio Amateur's Handbook*. To use the wavemeter for harmonic checking, the unit should be closely coupled to the transmission line. The wavemeter

* Technical Assistant, *QST*.



The variable on the left is C_1 and C_2 is at the right. The coil plugged in the coupler is the 80-meter unit. Note that soldering lugs have been soldered to the tap points. The other three coils are to the right of the chassis.

is then tuned through the harmonic frequency range. If there is *any* indication of harmonics, no matter how slight, steps must be taken to eliminate them. The wavemeter can also be used to make sure that your transmitter is actually tuned to the band you think it is. Many amateurs get into hot water by making the mistake of tuning their transmitters incorrectly and transmitting on the wrong band.

How To Attenuate Harmonics

An excellent method of attenuating harmonics is to use a link-coupled antenna coupler between the transmitter and the antenna. Actually, an antenna coupler, while providing harmonic attenuation, has several other points in its favor that are worth mentioning. The coupler can be adjusted so that your transmitter is working into the load it was designed for. Many amateurs run into loading problems with the antennas they happen to use. They find that, no matter how they try, it is difficult to properly load the amplifier in the transmitter. A coupler will solve this problem.

Another advantage of using an antenna coupler is the additional selectivity it offers to the receiver. If the antenna change-over relay or switch is installed between the transmitter and coupler (see Fig. 1), then the coupler will be in the circuit while receiving. If you have a tuned circuit (the coupler) between the receiver and antenna, the additional selectivity will help reduce such problems as images and cross-modulation from nearby strong signals, such as those from broadcast stations. Also, the use of a coupler will sometimes make the difference between hearing or not hearing weak signals.

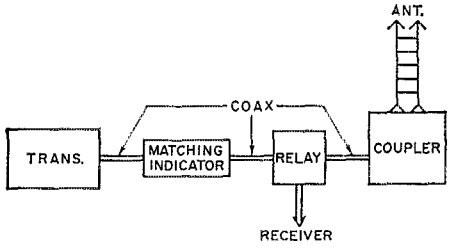


Fig. 1—This drawing shows where to install the matching indicator and antenna relay. If a low-pass filter is to be used it should be installed between the relay and coupler

As far as the low-frequency harmonics are concerned, the coupler should attenuate them to a point where they won't cause you any trouble. For harmonics in the v.h.f. range, those that fall in the TV frequencies, the use of a coupler may or may not be enough to eliminate TVI. To be safe it is a good idea to install a low-pass filter on the transmitter if you live in an area where TVI is likely to be a problem.

Making An Antenna Coupler

A multiband antenna coupler that can be used with most antenna systems is shown in Fig. 2.

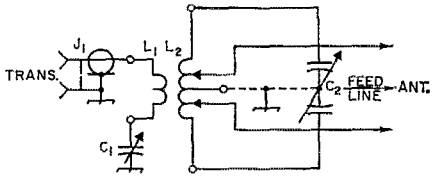


Fig. 2—Circuit diagram of the antenna coupler.

C_1—325 $\mu\mu$f. variable (Hammarlund MC-325-M).
C_2—140 $\mu\mu$f. per section dual variable (Hammarlund MCD-140-S).
J_1—Coax receptacle, chassis-mounting type SO-239.
L_1—10 turns per inch, 2-inch diameter, No. 16 wire (B & W 3907-1, Illumitronic 1610T).
3.5 Mc.: 10 turns
7 Mc.: 6 turns
14 Mc.: 3 turns
21/28 Mc.: 2 turns
L_2—3.5 Mc.: 44 turns No. 16, 2½-inch diameter, 10 turns per inch (Illumitronic 2010T).
Coils for 7 though 28 Mc. are 2½-inch diameter, No. 12 wire, 6 turns per inch (B & W 3905-1, Illumitronic 2006T).
7 Mc.: 18 turns
14 Mc.: 10 turns
21/28 Mc.: 6 turns

It consists of a parallel-tuned circuit link coupled to a coax line from the transmitter, and will handle transmitters up to the 150-watt class. The antenna feed line is tapped on the coupler coil, L_2. The link, L_1, and the coupler coil, L_2, are mounted on plug-in type jacks (Millen 40305) which can be plugged in a jack bar (Millen 41305). Separate coils are used for 80, 40 and 20 while one coil suffices for 15 and 10.

The coupler shown in the photograph was built on a 2 × 7 × 9-inch aluminum chassis; however, any size chassis large enough to accommodate the components is suitable. A panel, 6 × 7 inches, is used to dress up the front of the coupler. J_1 is the chassis type coax connector for connecting the lead from the transmitter. The connector is mounted on the back of the chassis. The lead from J_1 to L_1 is brought up from below chassis through a rubber grommet to a tie point on the jack bar. All the other components are mounted on the chassis top.

All of the L_1 coils are 2 inches in diameter and are mounted inside the L_2 coils, which are 2½ inches in diameter. The links are centered inside their respective coils and cemented in place with Duco cement. The leads from L_1 to the jack plug terminals are brought through the turns on L_2 and covered with spaghetti insulation to prevent shorting to the turns of L_2. Before soldering the the coil leads to the plugs take a file and remove the nickel covering on the plug ends. You'll find the plugs will take solder a lot better if the nickel is first removed. Be sure to remove any rosin from the plugs after soldering.

Using The Coupler

How you use the coupler will depend on the type of antenna feed line you have. Fig. 2 shows how either open-wire or Twin-Lead feeders are tapped on the coil. In Fig. 2 you'll note that there

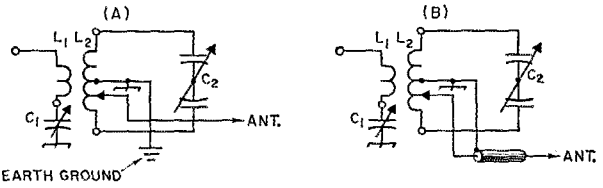


Fig. 3—A– method for using single-wire feed. B– with coax, the inner conductor is tapped on L_2 and the outer shield connected to the chassis.

is a dotted line drawn from the center of the coil and C_2 rotor to chassis ground. This indicates a possible ground connection between these points and chassis ground. Grounding the center of the coil and the rotor of C_2 may or may not help reduce harmonics. The thing to do is to try the coupler both ways and have your nearby ham friend check and tell you which condition gives the best harmonic attenuation. It is also desirable to connect an earth ground to the coupler chassis. A connection to a nearby water pipe should make a good earth ground connection. Fig. 3 shows how coax line or single-wire feed is connected to the coupler. With single-wire feed the center of L_2 must be grounded to the chassis.

The best method of adjusting the coupler is to use a matching indicator installed in the coax line between the transmitter and coupler. If you don't have such a unit, or don't want to build one, another method for adjusting the coupler is with an output indicator coupled to the feed line between the coupler and the antenna. The simplest indicator of this type is a dial lamp shunted across a portion of the line. See Fig. 4. Another output indicator is an r.f. ammeter connected in series with the feed line.

When using a matching indicator, the adjustment procedure is as follows. The feed line is tapped on the coil L_2 at points equidistant from the center of the coil. The correct tap points must be found by experiment. Assuming we start out on 80 meters, try a few turns each side of center for the first test. Tune up the rig for 80 and switch the matching indicator to read reflected power. Adjust the sensitivity of the matching indicator so that you get a reading of about half scale. Next, tune C_2, looking for a dip in meter reading on the indicator. Tune C_1, working for a greater dip. You'll have to alternate between C_1 and C_2 as the two adjustments interlock and you'll also have to keep the amplifier in the transmitter in resonance as you make the adjustments. Incidentally, you'll probably find that the C_1 adjustment will be near maximum capacitance (plates fully meshed) for 80 meters and be increasingly less on the higher bands. If you cannot get the matching indicator to read zero on reflected, then move the feeder taps out a couple of turns on each side and try again. You'll soon find a spot where you can get a match. Once you find the correct adjustment for C_1 and C_2, make a record of settings so you'll be able to change bands without going through the whole procedure each time.

When you have the correct settings on the coupler that show a match, then all loading adjustments should be made on the transmitter and the coupler controls left alone.

If you are using an output indicator in the feeders, the coupler should be adjusted to give the maximum indicated output. In other words, watch the dial lamp or r.f. ammeter as you tune the coupler and transmitter controls, working for maximum indicated output. While this adjustment method isn't as exact as using a matching indicator it should be accurate enough for your purposes.

With single-wire feed, the end of the wire is tapped on L_2, starting at one side of center and moving toward the outside of the coil, until a match is found.

Using coax feed line between the coupler and antenna the inner conductor of the coax is tapped on the coil the same as with single wire feed. The outer shield of the coax should be connected to the chassis. If you don't use a matching indicator for making your adjustments you can use an output indicator in the coax line. A combination wavemeter and output indicator of very simple design was described in a recent issue of *QST* [1].

While it is true that finding the correct settings for the coupler for each band requires a little time, once they are found it becomes a simple matter to change bands quickly if you keep a record of the control settings. Using the coupler will keep you out of harmonic troubles plus providing the features mentioned earlier. QST

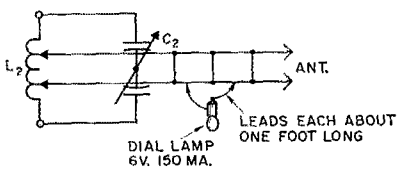


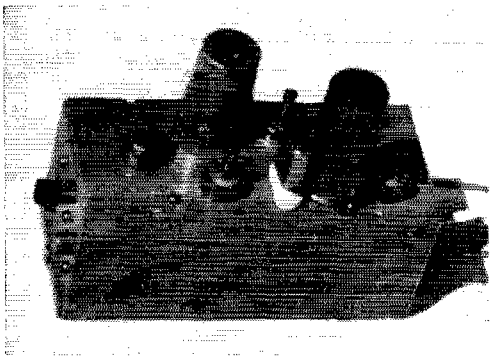
Fig. 4—This shows how a simple output indicator can be used with the coupler. Two clip leads, each a foot or so long, are connected to the dial lamp. The two leads are then clipped across a portion of one of the feeders. If the lamp should get too bright, reduce the distance between the clips, be sure to scrape any insulation covering off the feed line in order to get a good connection for your taps.

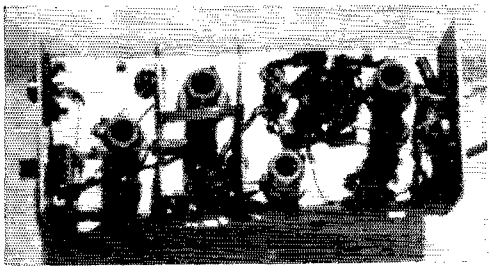
[1] McCoy, "Simple Wavemeter For Use in Coax lines," *QST*, Sept. 1960.

Strays

W5AHB (810 South Radium, Deming, New Mexico) wants us to find out how many hams are members of the Optimist Club International. He's a *real* optimist if he thinks we're going to start keeping tabs on that! So why don't you Optimists just register with him. Thanks!

Simple Six-Meter Converter





Interior and exterior views of the simple 6-meter converter. The mounting is a 2¼ × 2¼ × 5-inch aluminum Minibox. Baffle shields indicated in Fig. 1 help to isolate the r.f. stage from the remainder of the circuit. In the outside view, the r.f. amplifier tube and its input coils are to the left. The r.f.-amplifier output coil, crystal, 6J6 mixer tube and its output circuit are to the right.

Miniature-Size Unit with 10-Mc. Output

BY WILLIAM W. DEANE,* W6RET

A latest addition to a popular series of simple, compact crystal-controlled converters described in an earlier issue of QST. *The cost is about ten dollars.*

IN *QST* for December, 1954, the author described a series of simple, crystal-controlled converters covering the amateur bands from 80 through 10 meters.[1] Since that time, interest has been extended to the 6-meter band and it was decided to investigate the possibilities of a similar simple converter for this higher-frequency band.

Circuit

Basically, the circuit, shown in Fig. 1, remains the same except for the addition of a tuned circuit at the front end to help reduce strong-signal overloading, and a small coil in the 6AK5 screen circuit to improve the noise figure.[2] Briefly, the arrangement consists of a 6AK5 r.f. amplifier and a 6J6 frequency converter, one triode section of the dual triode being used as the high-frequency oscillator. All tuned circuits consist simply of slug-tuned coils that resonate with tube and stray capacitances. The crystal used in the author's model is a 50-cent surplus unit with a frequency of 40.55 Mc. which results in

(Continued on page 146)

* 8831 Sovereign Road, San Diego 11, Calif.

[1] Deane, "Simple Crystal-Controlled Converters," page 34; also the ARRL *Mobile Manual for Radio Amateurs.*

[2] Schuetz, "Reducing the Noise Figure of Pentode Amplifiers," Hints & Kinks, *QST*, May, 1960.

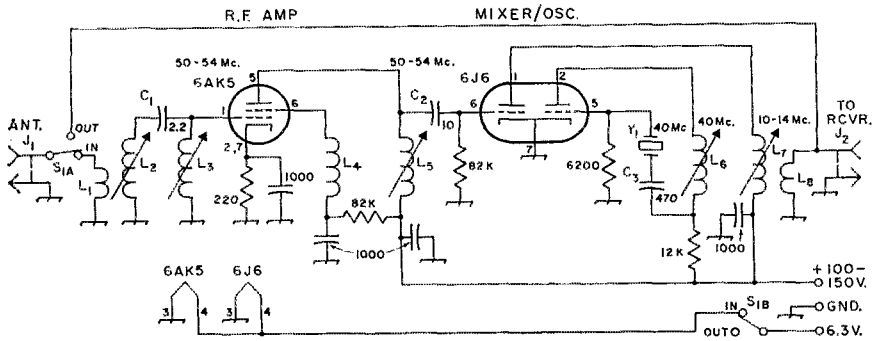


Fig. 1—Circuit of the 6-meter converter. Capacitances are in μμf. and capacitors are disk ceramic except as listed below. Resistances are in ohms and resistors ½-watt composition.

C_1, C_2, C_3—Mica or stable ceramic.
J_1, J_2—Phono connector.
L_1—2 turns of hookup wire, close-wound over ground end of L_2.
L_2, L_3—12 turns No. 20 enam., ½ inch long.
L_4—10 turns No. 20 enam., ⅛-inch diam., ½ inch long.
L_5—11 turns No. 20 enam., ½ inch long.
L_6—16 turns No. 28 enam., close-wound.
L_7—65 turns No. 28 enam., close-wound.
L_8—10 turns No. 28 enam., over cold end of L_7.
All above coils, except L_4, are wound on ⅜-inch iron-slug forms (CTC LS-3 or Miller 4400 form).
S_1—D.p.d.t. toggle switch.
Y_1—See text.

Ground Support for Project OSCAR

Elementary Tracking Principles and Procedures

BY RUSSEL GARNER,* K5VPN, and RALPH WELLS,* K6QMJ

This preliminary article is intended to acquaint you with some of the elementary principles involved in the amateur tracking of satellites, particularly in connection with Project OSCAR. The two authors are both with the Western Development Laboratory of Philco, working on satellite acquisition (see glossary), and are well qualified in the subject. Subsequent articles will discuss tracking procedures, expected ranges, and so on. We hesitate to make any firm promises of what information will appear which month, because the whole picture is changing so rapidly. But you'll have the current dope as soon as it is available.

A LARGE group of hams is hard at work in a project that will open a new field of activity for amateur radio: geo-space communications by means of Project OSCAR.[1]

At the present time it is hoped that the first Orbiting Satellite Carrying Amateur Radio (OSCAR 1) will be put into orbit during 1961. The satellite may move in the low-altitude polar orbit of the Discoverer project or in a higher, more nearly east-west path. The nature of the OSCAR orbit is of great interest. Of greater importance, however, is this question: Are we amateurs going to be ready to track and receive the OSCAR transmissions when the launch date arrives?

With few exceptions, every ham has the capability for hearing and tracking the amateur satellite. If you miss out it will not be due to the lack of a super-gain three-axis antenna, a parametric amplifier, and an elaborate receiver. All hams can participate in the various phases of the OSCAR project by using hardware that is now on hand — or easily scrounged. And we want to make certain that this important fact stands out clearly in your thinking!

Three Problems

The following discussion deals with three general problem areas that we will be concerned with when the OSCAR goes into orbit: (a) knowing the point of emergence and the time and frequency at which to listen (*predictions*), (b) receiving the right signal (*acquisition-identification*), and (c) positioning the antenna to maintain maximum received signal strength (*tracking*).[2]

Predictions

At least two methods are available to us for predicting and keeping up with the elements of the orbit: the *Simplified Satellite Prediction Method* and the *Equatorial Crossings and Map Overlay Method* (our terminology).

The Simplified Satellite Prediction Method calls for a special set of "orbital elements" and some calculations based on methods described in the IGY Satellite Report, Series No. 7 obtain-

* c/o Project OSCAR, P.O. Box 183, Sunnyvale, California

[1] Project OSCAR, *QST*, Feb., 1961, pp. 55 and 56.

[2] Not to be confused with the use of the same term for the accurate determination of the satellite's orbit.

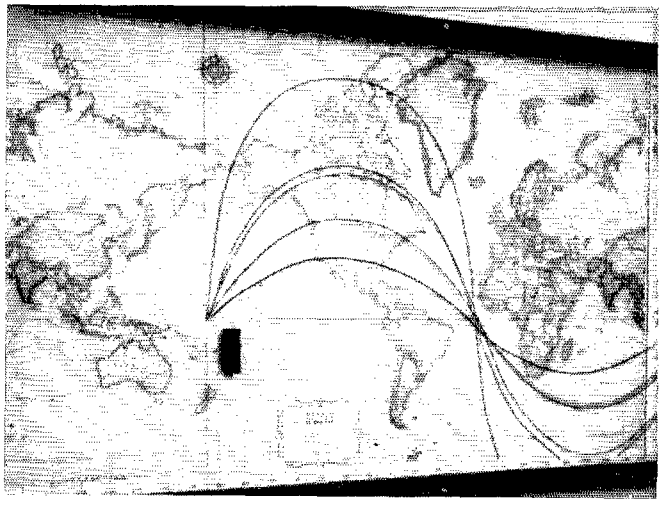


Fig. 1 — World map with orbit tracks on transparent overlay

able from the Printing and Publishing Office, National Academy of Sciences, 2101 Constitution Ave. N. W., Washington 25, D. C. The price is $1.00 postpaid, for the report and a kit of working papers. The orbital elements are published weekly and can be obtained free of charge from Volunteer Satellite Tracking Program, 824 Connecticut Ave., Washington 25, D.C. Using these two documents, you pick the day and then calculate when and where to look for the signal.

The Equatorial Crossings and Map Overlay Method may perhaps be better suited to our purpose. Under this plan, information on orbit and equatorial crossings can be sent from Space Operations Control Center, Goddard Space Flight Center, N.A.S.A., Greenbelt, Md., to W1AW and selected amateur stations on the east and west coasts. The amateur stations then bulletin the information and it might be published in *QST*. The operator receives the information and uses it to plot the orbit track on a transparent overlay. The overlay is then placed on a world map (Mercator or north-polar projection) and positioned as directed by the Space Control data. The overlay and map can be of any convenient size. The only requirement is that the position of the overlay be adjustable — along the map's equator for the Mercator type, about the map's center for the polar type (see Fig. 1).

The success of the equatorial crossings and map overlay procedure depends on our getting the orbit information from Space Control to the ham relay stations. We will let you know the details as soon as they are worked out.

In addition, the *No. 7 IGY Satellite Report* contains a nomograph that will give the satellite elevation angle, slant range and altitude if the angular distance between observer and satellite is known. (Angle between observer and satellite is measured from center of planet.)

Doppler Effect

If an object that is giving off sound, light, or r.f. energy is moving away from you (toward you), the wavelength of the energy reaching your ear, eye, or receiver will be longer (shorter) than the wavelength would be if no movement existed. Also, longer wavelength (source departing) means lower frequency; shorter wavelength (source approaching), higher frequency. This phenomenon was defined and formulated in 1842 by Christian Doppler, an Austrian physicist, mathematician and astronomer.

One of the most familiar instances of the *Doppler effect*, or shift, is the apparent change in frequency of the whistle or horn blast of a train as the train approaches, passes, and moves away from a person waiting at the crossing. The movement that caused the Doppler effect is better labeled *relative velocity*. This term immediately points out that movement by either the observer or the energy source, or by both, will produce the frequency shift.

The relative velocity of a satellite is zero when the direction of satellite travel is at right angles to your position on the ground. The relative velocity of a tennis ball attached to a string and whirled round your head horizontally is zero. In this case, relative velocity means the change in the distance between the ball and the person holding the string over a certain unit of time. Distance between ball and person does not change — relative velocity is zero.

If someone else takes the string and whirls the ball, the velocity of the ball in respect to the first person (who is now just standing by and watching) will be zero only at two points: the point at which the ball is closest to the observer and, half way round the circle, the point at which the ball is farthest from the observer. Note that the direction of travel at these two points is *exactly* at right angles to a line drawn from the position of the observer to the position of the twirler.

Understanding the Doppler effect makes it possible to determine the direction in which distant stars are traveling; to intercept and kill evasive and fleeing targets with small missiles; and to compute the range, velocity, and altitude of satellites and aircraft. The Doppler effect enables us to get rid of unwanted blips on radar scopes — such as those caused by mountain ranges, buildings and trees — leaving on the scope only those blips made by moving targets.

Doppler and Oscar

The signal received from the OSCAR will exhibit some frequency shift because of Doppler. The amount of shift depends on the transmission frequency and the satellite's relative velocity. At 145 Mc. we can expect a 5- to 7-kc. total shift on an overhead pass. The *total* shift will be less, the more distant is the *point of closest approach* (PCA). The *rate* of frequency shift depends on the attitude of the satellite track — highest rate on an overhead pass; the more distant the PCA, the lower the rate on an overhead pass; the more distant the PCA, the lower the rate. This is because on an overhead pass the motion is directly toward you and then directly away from you; on other passes the motion is tangential.

A Few "Space" Terms

ACQUISITION: moment at which solid reception of satellite signal is achieved.

EQUATORIAL ORBIT: orbit plane close to or parallel to equator.

PCA: point of closest approach.

POE: point of emergence, i.e. point on horizon at which satellite appears.

POLAR ORBIT: orbit plane close to or parallel to earth's axis.

SLANT RANGE: direct, "line-of-sight" distance to satellite.

TUMBLE RATE: revolutions per minute made by satellite on its axis.

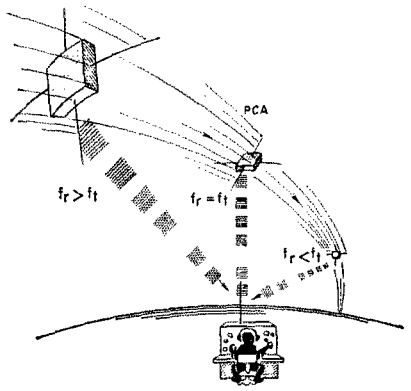


Fig. 2—Doppler shift at acquisition point of closest approach, and at fade-out.

The direction of the frequency shift will always be downward (Fig. 2). As OSCAR appears over the horizon, the frequency of the signal at your antenna will be higher than the frequency of the satellite transmitter, because of Doppler effect. As the OSCAR moves toward you, the received frequency will decrease because its relative motion is slowing with respect to you. At the PCA, the received frequency is equal to the transmitter frequency (relative velocity of the satellite is zero). The satellite now moves away from you and the received frequency continues to decrease. Then the satellite drops below the horizon and signal fade-out occurs.

Acquisition-Identification

If you know *where* to look and *when* to listen, the job remaining is to listen on the correct frequency, identify the signal, and keep your antenna correctly pointed.

The identification signal transmitted by OSCAR I has not been selected, but it will be distinctive and familiar. You will have no trouble in recognizing it, when you hear it. Some solutions to the problems involved in keeping your antenna pointed at the satellite will be discussed in another article.

As we said earlier, an elaborate setup at your station is not necessary in the OSCAR project. A horizontally polarized multi-element beam antenna, a good two-meter converter, and a communications receiver will put you in business.

The converter need not be expensive or elaborate. A low noise figure is certainly desirable. But if you have been making v.h.f. contacts consistently at varying ranges and under less than ideal propagation conditions, you can confidently plan on bringing in the signals from OSCAR[3].

Unstable oscillators in the converter and receiver will cause undesirable changes in the frequency of the receiver output. However, with reasonably stable equipment warmed up to normal operating temperature, the frequency changes caused by oscillator instabilities will be quite small, during a pass of the satellite, compared with the predicted Doppler shift.

On the other hand, your equipment can in a sense be "too good." For example: Since we can expect a Doppler shift of 5 kilocycles or more, a narrow-bandwidth i.f. channel will present a disadvantage because of the necessity of frequent receiver retuning.

Space Detection

By feeding a signal from a stable external oscillator into the antenna circuit, the effects of local oscillator and b.f.o. instabilities can be eliminated. Heterodyne action between the output of the external oscillator and the OSCAR signal will produce an audible tone in the receiver output, and it can be demonstrated that variations in the converter-receiver oscillators will not affect the frequency of the audio output.

The output of the external standard should be adjustable over a small frequency range in order that the standard frequency can be set 100 to 1000 c.p.s. *above* the frequency of the satellite signal at the time of acquisition (when you first hear it) and thus produce an audio tone of that order. As the received satellite signal frequency moves down, the (difference) frequency of the audio tone will increase. By reducing the frequency of the external standard, you can keep the difference component in the audible range.

The Pierce oscillator circuit shown in Fig. 3 will work well as an external standard. Using a crystal near 8-Mc. in this circuit, you will be able to hear the 18th harmonic on a good 144-Mc. receiver. The variable capacitor across the crystal enables you to make small changes in the output frequency. Control of the output amplitude, necessary to prevent overloading the receiver, is provided for by the 50K potentiometer. Additional control can be had by varying the degree of coupling between the oscillator output and the

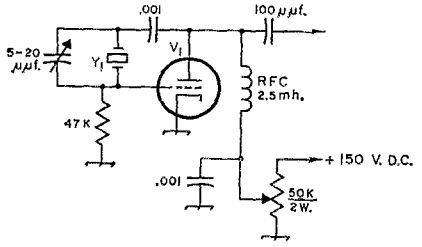


Fig. 3—Typical oscillator circuit for external frequency standard. V_1 may be a 6C4 or similar triode. The frequency of Y_1, in the 8-Mc. region, should be chosen so that a harmonic will be in zero beat with the satellite frequency when the 20-μμf. variable capacitor is near maximum capacitance.

[3] The crystal-controlled 144-Mc. converter shown in the chapter on v.h.f. receivers in *The Radio Amateur's Handbook* (page 403 in the 1961 edition) is suitable, as is also the design described by W2AZL in *QST* for December 1959. See also Tilton, "An Evaluation of the Nuvistor," *QST*, April, 1961. Those who do not already have 144-Mc. beams would do well to consider a simple four-element job such as is shown in the chapter on v.h.f. antennas in the *Handbook*, and also on page 228 of *The ARRL Antenna Book*, 9th edition (1960). A simple Yagi will give useful gain without the high directivity that makes precision tracking necessary.—*Editor.*

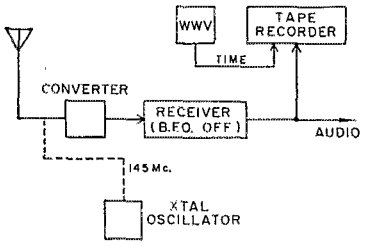


Fig. 4—Combining satellite and time signals to make tape recordings. The crystal oscillator reference standard (Fig. 3) is coupled to the antenna input of the converter to produce an audio beat with the OSCAR signal. Provision should be made for filtering out the unwanted tone and voice signals on WWV; information on a simple 1-kc. filter for this purpose is given in November, 1957 QST (Simas and Moriarty, "Tape Recording the Mark II Minitrack Signals").

antenna circuit. Use of the external oscillator provides one way of receiving c.w. signals on two-meter receivers not equipped with a b.f.o.

In addition, the problem of where to tune the receiver is solved: Tune in the signal from the external oscillator. Adjust the oscillator output level so that the receiver noise just starts to drop. Sit quietly and listen (antenna aimed in the right direction). When you hear an audio tone — any frequency — adjust the frequency of the external oscillator for a zero-beat condition. Then increase the oscillator frequency approximately 500 c.p.s. Adjust the position of the antenna for maximum tone strength. Tuning is now complete. From

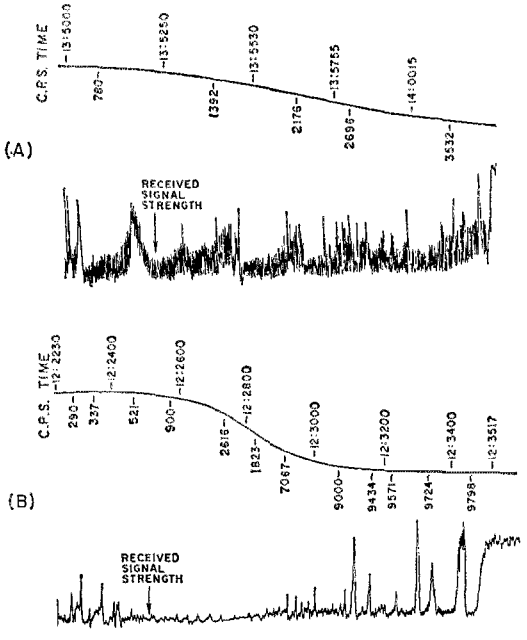


Fig. 5—Typical Doppler curves. Above (A), satellite Courier 1B on January 17, 1961; transmitting frequency 107.97 Mc. Below (B), Transit 2A on January 20, 1961; transmitting frequency 215.998927 Mc. Signal amplitude variation during each pass is shown below the curves.

here on, any change in the frequency of the tone will be caused by Doppler effects.

Information From the Signal

If you want to study the effects of Doppler shift, propagation conditions, and vehicle tumble (rotation), a tape recorder and a WWV receiver will enable you to make useful recordings of the OSCAR signal. (See Fig. 4).

The Doppler shift is determined by comparing the changes in the frequency of the received signal with time and plotting the curve that results. The curves in Fig. 5 show this. Curve A was made from transmissions of Courier 1B on revolution No. 1418, 17 January 1961. Transmitter frequency: 107.97 Mc. Curve B is a plot of the frequency shift in the signal from Transit IIA on revolution No. 3012, 20 January 1961. Transmitter frequency: 215.998927 Mc.

For the Courier curve, we see a total shift of 3.05 kc. at 108 Mc. (slant range 1240 miles — over west coast of Mexico). The Transit curve indicates a 9.5 kc. total shift at 216 Mc (slant range 600 miles — over Southern Nevada).

The center of each curve (Zero Doppler point) corresponds to the PCA — the point in space and time at which the satellite was closest to the antenna. Curves such as these can be used to determine the altitude, slant range, and velocity of the vehicle. The equipment available to most amateurs will not permit determining these quantities with high enough accuracy for establishing points of an ephemeris, but plotting an approximate Doppler curve by comparing your tape with a calibrated audio oscillator can be both absorbing and instructive.

By making a recording of signal amplitude variations, it is easy to determine the tumble rate, or how fast the satellite is rotating. But here you must know the number of elements in the satellite antenna system.

Put Something in the Pot!

We should like to wind up by inviting all of you to kick in your thoughts, inventions, complaints and suggestions. Send all correspondence to Project OSCAR, Box 183, Sunnyvale, California. This is your show.

A great deal more is to be said about orbits, tracking, satellite design, packaging, testing, etc. And a great deal of communications history is going to be made soon when amateur radio gets into space. QST

Strays

Send proof to K6BX that you have worked 25 of the 2600-odd members of QCWA (Quarter Century Wireless Association) and you will receive a handsome certificate.

—•••—

An eye-ball QSO the hard way. While backing out of a Chicago parking lot (he claimed he was trying to avoid a woman driver!), W9EGI backed right into W9GYR, who was entering the lot.

A Day to Remember

20 May 1961

WOULD you like to have an impressively engraved c.w. or RTTY certificate of proficiency, signed by the Secretary of the U.S. Department of Defense, to hang on the wall of your shack?

Would you like an officially approved opportunity to work the Hq. Army, Navy and Air Force Radio Stations WAR, NSS, and AIR crossband from your ham-band frequency to a frequency outside the ham-band?

Would you like to receive a colorful one-time QSL card from WAR, NSS, and AIR as evidence of the crossband operation?

The opportunity to get a certificate, to operate crossband and to capture one or all three of the QSL cards will come on Saturday, May 20, 1961, when the Department of Defense sponsors the Twelfth Annual Armed Forces Day Amateur Communications Program. You and all licensed amateurs are invited to take part in this program which is co-sponsored by the Assistant Chief of Naval Operations (Communications)/Director, Naval Communications and the Military Affiliate Radio System (representing the Army Signal Corps and Air Force Directorate of Communication-Electronics). This program has become a traditional part of amateur radio activities.

The program will consist of a c.w. receiving contest open to any amateur or short-wave listener who can copy International Morse Code at 25 w.p.m. A message from the Secretary of Defense will be sent.

Then there will be a radioteletypewriter (RTTY) transmission by Headquarters MARS and Navy radio stations. A message from the Secretary of Defense will be transmitted at 60 w.p.m. This contest is open to any amateur radio operator or other individual who has the equipment capable of receiving radioteletypewriter transmissions.

Finally, a military-to-amateur transmitting and receiving test will be conducted for all holders of valid U.S. amateur radio station licenses. Headquarters radio stations of the Army, Navy, and Air Force will operate on spot frequencies outside the amateur bands and establish radio contact with amateur stations.

The Awards Presented

Each participant who submits a perfect copy of the c.w. message will be awarded a Department of Defense certificate of merit signed by the Secretary of Defense.

A Department of Defense certificate of merit signed by the Secretary of Defense will also be awarded each participant who submits a perfect copy of the RTTY message.

A special one-time Armed Forces QSL card will acknowledge radio contact with amateur stations. Each service headquarters will acknowledge separately so amateurs will have an opportunity to qualify for three different QSL cards.

Complete Operating Schedules and Competition Procedures are as Follows

Each transmission for the c.w. and RTTY receiving contests will commence at the indicated times with a ten-minute CQ to permit the participants to adjust their equipment. The ten-minute CQ will be followed immediately by the message from the Secretary of Defense. It is not necessary to copy more than one station and no extra credit will be given for so doing.

Transcriptions should be submitted "as received". No attempt should be made to correct possible transmission errors. Time, frequency, and call sign of the station copied should be indicated as well as the name, call sign (if any), and address of the individual submitting the copy.

Competition entries should be submitted to the Armed Forces Day Contest, Room BE1000, the Pentagon, Washington, D.C. and postmarked not later than 31 May 1961.

C.W. Receiving Contest

Time 20 May 1961	*Transmitting Station*	*Frequencies (kc.)*
210300Z	WAR/AIR (Army & Air Force radio, Wash., D. C.	3347, 14,405, 20,994
210300Z (2200EST)	NSS (Navy Radio, Wash., D. C.)	3319, 4016, 6970, 14,480
210300Z (1900 PST)	A6USA (Army Radio, San Francisco, Calif.)	6997.5
	NPG (Navy Radio, San Francisco, Calif.)	3319, 7595, 14,927.5
	NPD (Navy Radio, Seattle, Wash.)	7455
	AG6AIR (Hamilton AFB, Calif.)	7832.5

RTTY Receiving Contest

Time 20 May 1961	*Transmitting Station*	*Frequencies (kc.)*
210335Z (2235 EST)	WAR (Wash., D. C.)	3347, 14,405, 20,994
	NSS (Wash., D. C.)	3319, 7375, 14,480
	AIR (Wash., D. C.)	7915
210335Z (2135 CST)	A5USA (Ft. Sam Houston, Texas)	5395
	NDS (Great Lakes, Ill.)	7455
	AG5FFR (Randolph AFB, Texas)	7305
210335Z (1935 PST)	AG6AIR (Hamilton AFB, Calif.)	7832.5
	A6USA (Army Radio, San Francisco, Calif.)	6997.5
210345Z (2145 CST)	NDF (New Orleans, La.)	7380
	NDW (San Francisco, Calif.)	3319, 7375
	NPD (Seattle, Wash.)	7455

Military-to-Amateur Test

Military stations WAR, AIR, and NSS will be on the air from 201500Z (1000 EST) to 210500Z (2400 EST) on 20 May 1961 to contact and test amateur radio stations. Amateur contacts will be discontinued from 210245Z to 210100Z to al-

(*Continued on page 148*)

Hints and Kinks For the Experimenter

CODE-PRACTICE OSCILLATOR

ABOUT any receiver with two stages of audio can be made to perform as a code-practice oscillator by the modifications shown in Fig. 1. Capacitor C_1, which can be a fixed or variable unit in the 100- to 500-$\mu\mu$f range, couples energy back to the low-level audio stages and causes

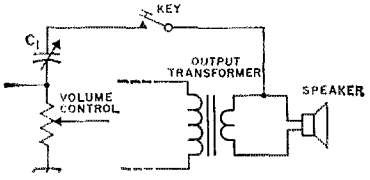


Fig. 1—KNØYOL's code-practice oscillator.

them to oscillate. The pitch of the audio oscillation can be controlled by the value of C_1. When the key is opened, normal receiver operation is returned. However, during code practice, the note generated is much stronger than the received signals, so they do not interfere with code practice. If the system fails to oscillate, it may be necessary to reverse the output transformer's primary leads. — *Ed Hartwell, KNØYOL*

COIL-WINDING TIPS

COIL winding is probably as old as amateur radio itself, and many methods of winding have been perfected. Many of the standard methods are not known to the newcomer or beginner, so it is well to repeat them from time to time for the "new generation."

Coil information included in constructional articles is usually approximate and it is sometimes a tedious process to cut and try coil lengths and spacing. One way to simplify coil winding is as follows: Usually the primary or tickler winding of the coil is located at the bottom of the coil and does not require much pruning. Therefore, holes can be drilled above the desired pin connection and the winding wound with the coil ends soldered to the pins. At the spacing desired between the primary and secondary windings, a hole for the cold end of the secondary is made above the pin to be used. A small closed loop is formed at the end of a length of bare tinned No. 20 wire. The wire is pushed through the hole from the outside of the coil and into the proper pin until the wire loop fits snugly against the hole. At a distance above the loop equal to the length of the secondary winding, drill another hole above the appropriate pin. Again, another wire with a closed loop is installed as before. The two loops now afford a readily accessible connection for the beginning and end of the secondary coil. It's an easy matter to modify the secondary coil by unsoldering the coil ends from the fixed loops.

If the coil requires a tap, drill a hole above the proper pin in the space between the primary and secondary coils. Push a length of flexible No. 26 bare wire through the hole and pin. Leave enough wire extending from the hole to reach the spot on the coil to be tapped.

To wind the coils, unwind a length of wire from its spool. Hold the spool in a vise and walk up to the spool while turning the coil under tension. Because of the loops at the beginning and end of the coil, it becomes a simple job to "cut and try" different lengths.

— *Cecil W. Guyatt, W4LFO*

IMPROVED SCREEN PROTECTOR

ONE of the screen protection methods described by Evans in *QST*, October, 1960, page 22, depends on the inertia of a relay armature to turn off the screen voltage in case of an overload. The circuit shown in Fig. 2 eliminates this short-

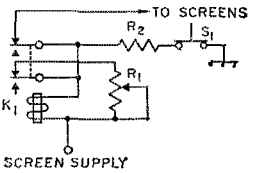


Fig. 2—Screen overload protector.

K_1—2500-ohm, d.p.d.t. relay.
R_1, R_2—See text.
S_1—Normally closed pushbutton switch.

coming and insures positive screen voltage cutoff. Most 2500-ohm relays will close whenever a maximum of about 25 volts is developed across the relay coil. Resistor R_1 is in shunt with the coil so that the trip point of the relay may be adjusted to the desired value. If the current should rise above the predetermined value, the relay armature will pull away from its normally closed position and turn off the screen voltage. As soon as the relay contacts which normally connect R_1 across the relay coil open, resistor R_2 will draw sufficient current through the relay coil to keep the relay energized. The relay will remain in this condition until the reset button is pushed, which opens the circuit to R_2 and drops the relay back to its normal position. This system assures positive operation of the relay and does not depend on the inertia of the armature to open the screen circuit. The value of R_1 is found by

$$\frac{25}{\textit{screen current}\ (\text{in amps.}) - .010}$$

and R_2 by

$$\frac{\textit{screen supply voltage}}{.010}.$$

— *James E. Goff, W4ZXB*

Real Ahhhhhh Swell QSO, Charlie

BY JOHN G. TROSTER,* W6ISQ

AHHHHHHHH W1AW ahhhhhh this is ahhhhhh W6ISQ. Ahhhhh real swell that time. One hundred per cent arm ahhhhh chair copy. Your sig was out in the ahhhhh clear the whole time. No ahhhhh QRM at all.

"OK on your ahhhhhhh name there, Charlie. Ahhhhh real swell.

"Thanks for the ahhhh swell report there too — ahhhhh Q5 S9 plus ahhhhhh 23. Got that all OK.

"OK on your ahhhhhh QTH also there, Charlie — there in Hartford ahhhhh Connecticut. Guess that was West Hartford. Suppose that's near the town of ahhhh Hartford only a little west or something ahhhhhh like that, ahhhhhh hi.

"OK on your ahhhhh layout there too, Charlie. That sounds like a real ahhhh fine rig, Charlie. 6C4 oscillator, 6AC7 doubler, 6AC7 ahhhhhh second doubler, 6146 buffer and that 4-250A final. Was that four ahhhhhh 250As or just a single 4-250A, ahhhhh — or what was that? Gee ahhhhh, that's quite a rig ahhhh, Charlie.

"OK, Charlie, on your ahhhh power. 967 ahhhh watts. Your sig sure doing ahhhh FB for that ahhhhh power.

"Swell on your ahhhh receiver, too, ahhh, Charlie. That's really a good receiver. Glad to hear it's doing such ahhhhhh swell job for you, Charlie. I've listened to those receivers and ahhhh they really receive — ahhh they receive swell I mean ahhh, Charlie.

"OK on your modified ahhhh 3-element variable trap-type ahh three band Quasi ahhhhhh omni-directional beam. Up 57 feet on a four section ahhhh tower. Guyed at two levels I believe ahhhh you said. That's ahhhh really a good lash-up there ahhhh, Charlie. Beam was all aluminum I think you ahhhh said, Charlie. That's ahhhhh real good antenna material ahhhhh, Charlie.

"Nice to ahhhh hear about your swell ahhhh weather there too, Charlie. Clear and cold, about 38 degrees, with some ahhhh ice and snow still left on the ground — but freezes up at night so you can go skating. That's ahhhh real nice, Charlie. I mean it's ahhhhh nice, Charlie, if you like it to drop below freezing ahhhh so you can go ahhhhh skating, Charlie.

"Well ahhhhhh, Charlie, ahhhh this has really been ahhhhhh real swell QSO. Real nice to ahhhhh hook up with you and ahhhh hear about your swell ahhhh rig and ahhhh receiver and ahhhhh antenna and ahhhh weather.

"Sure wish ahhhh you all the ahhh luck. Been real swell ahhhhh working you with that swell layout there and know you'll ahhhh work lots of DX. So if you ahhhh hear us on be sure to ahhhh give us a shout and we'll ahhhh do the same. Sure'd love to ahhhh have another swell QSO with ya any ahhhh time, Charlie.

"So until next time ahhhh very greatest 73 ahhhh, Charlie, and the very best regards ahhhhhh too. See ya on down the old ahhhhhh avenue Harry — ahhhhhh I mean Charlie.

"Ahhhhh W1 ahhhhh A ahhhhh — QRX one — Ohhhhh yeah, W1 ahhhhhh AW, This is W6ISQ. See ya ahhhhhh, Charlie." QST

* 45 Laurel Avenue, Atherton, California.

Strays

Kay Curtis, K6HIT, 425-5 Camino de los Colinas, Redondo Beach, Calif., offers a $25 reward for information leading to the recovery of the Communicator III, serial D1340, which was stolen from K6HIT's locked auto on March 14. The rig was a custom installation, with plug-in relays and a Gonset-6 receiver dial.

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The Rock Creek ARA is sponsoring a home-built equipment contest for all Novices living in Montgomery County, Maryland, the aim of the contest being to foster development of technical skills in newly licensed hams. Any Montgomery County resident holding a Novice ticket as of Aug. 31 is eligible to enter. Entry forms must be submitted by June 30, and equipment must be completed by Sept. 1, 1961. Entry forms and detailed contest rules may be obtained by phoning V. E. Kruger, WH 6-2351 (Silver Spring), or by attending a meeting of the RCARA. Meetings are held the 2nd and 4th Fridays of each month at the Perpetual Building & Loan Association, 8710 Georgia Ave., Silver Spring, Md.

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W4IE, Charlie Service, jr., 337 South Pineapple Drive, Sarasota, Fla., would like to get in touch with other hams who are lapidaries and micromounters.

1960 ARRL Sweepstakes

C. W. - Phone - Club Results

COMPILED BY ELLEN WHITE,* W1YYM

THE *Sweepstakes*, 73 c.w. and 73 phone contests rolled into one, embellished with an enthusiastic club competition, is the biggest, the best and the most fun to many, many hams in the ARRL field organization. From the moans accompanying miserable conditions November 12–13 to the cheers greeting band improvements November 19–20, this 1960 SS had it all!

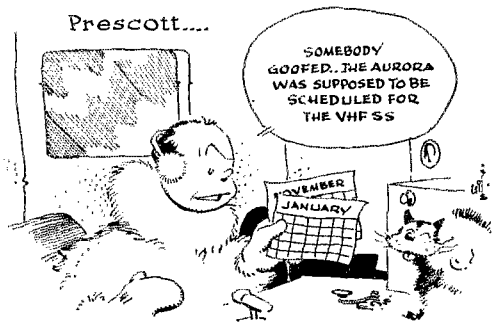
Slightly under 2000 logs were received representing all sections c.w. (1361 entries) and 70 sections phone (594 logs). If conditions are on the downgrade it's hard to tell by SS participation and enthusiasm. Universal lament: conditions that *first week end!* General approbation; the beneficial use of GMT.

On with it now, the tale of the 27th SS.

CALL-AREA HIGHLIGHTS

1 There's a first time for everything and the SS is no exception! Following a uniform log analysis, the E. Mass. c.w. logs of both K1DIR and W1AQE came up a dead heat, 600 QSOs — 72 sections — 108,000 points, even to 37 hours! Duplicate section awards, of course. Elsewhere in New England, W. Mass. multipliers were more than abundant thanks to W1s EOB and JYH. W1EOB edged out Rog by 25 two-ways, a real close one. Where was Vermont? Come now, W1QMM dispensed 329 messages, where were *you?* In Conn. W1DGL summed up the most, but John's Hq. status makes him ineligible for the award; section adjudication to K1HTV.

Vocally E. Mass. provided first district phone interest too with 17-year old K1KTH tallying 333/62 for 61,380 points. Old reliables W1GKJ (Me.) and W1FZ (N. H.) made their appearances audible and won familiar looking awards for their respective sections.



2 The New York–New Jersey circuit proves interesting in the light of K2s DGT and UPD making 1000 and plus reciprocal code contacts. If you'll note last May's *QST*, page 65, you'll see that K2DGT's credo is antennas. K2UPD maintained a rate of 33 exchanges hourly and along with all other second area section leaders bestowed 4771 messages, egad!

The microphone technique was mastered by K2GXI who parlayed 550/73 into 119,574 and highest score amongst the twos. S. N. J. provided drama as W2LBX squeaked by WA2IEK with 201 points to spare and topped 46 other S. N. J. fans. K2TAP led many an N. L. I. phone contender with his 424/64 combination.

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3 W3BES emerged victorious from the inveterate battle for E. Pa., with the third highest score in this portion of the competition. Jerry heads up a list of 20 W/K3s who made the clean sweep. A quick scan at the E. Pa. listing shows 15 who broke 100-K.

Reviewing the threes in an A-3 fashion, we see a repeat performance by K3DVS almost doubling his '59 total with 600 exchanges. Old pros W3ECR and W3MQC were in there pitching too while W. Pa. actives handed out almost 500 messages. Once again W3ZKH reaps honors for MDD.

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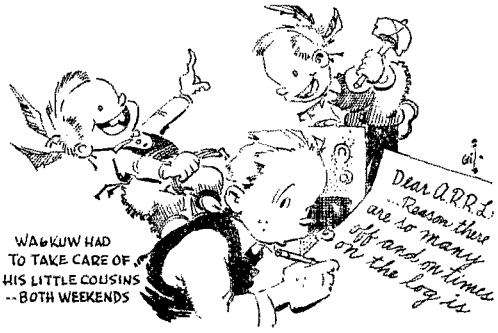
4 The fourth area touches the Delta, Great Lakes, Roanoke and Southeastern Divisions and top code man among the many sections therein is W4DQS who relinquished the 1.25 multiplier but piled up QSOs like crazy (1362 all told) for a final score a bit under 200K. He who knows the fourth district must ask "where was W4KFC?" Although ill the first weekend Vic's final score looks healthy enough with 173,813 points! Tennessee's K4PUZ and W4CVI (Ky.) as well as W. Fla.'s W4HQN bettered 150K. If you were paying attention, like, you too would be one of the 325 happy ones who exchanged messages with KP4AOO who led three entries from the popular W. I.

Perusing the fourth district for phone-band activity, we can't help but be impressed by the slam-bang job done by Tennessee's K4LPW. As adept with a mike as with a key (K4LPW/W3-DGM) Mel dominated the fours with 646 exchanges, all sections and 141,474 points. Virginia's W4BVV led a field of 24 phone operators but Division-wise, North Carolina's K4FWF edged him out.

* Ass't. Communications Manager, Phone, ARRL

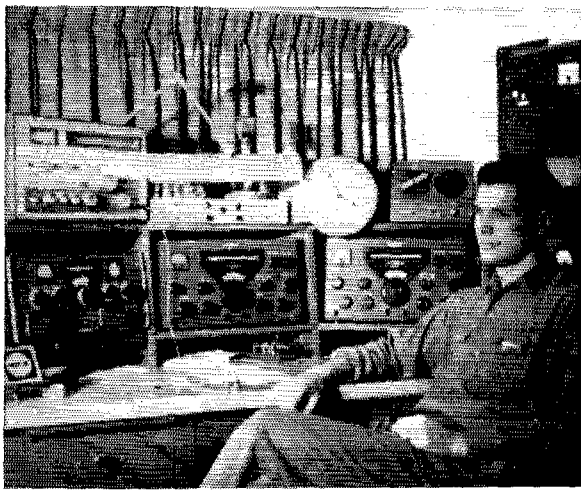
5 Among the fives are many Morse men and this year the maestro was W5WZQ who took time out from chasing DX (200 confirmed) to make 1301 QSOs and 2nd highest score on the A-1 frequencies. QSOs abounded from this district what with K5QNF and W5MCT topping 200 thousand points. Keep your eye and ear on the West Gulf Division for top scores in competitions to come. KZ5s TD and DF bestowed C. Z. multipliers on 656 of the faithful accompanied by many sighs of relief from the recipients.

Three fives talked their way to top positions with W5KC in his usual stronghold as top man in Louisiana, with a fourth high country-wide score. Followers up were K5HD with 576/67 and XYL W5DRI with 506/71. K5TST was one of the popular multipliers confirming Arkansas credits.



6 Continuing his evident mastery of the California code success formula, W6ZVQ keyed some 1200 SDgo exchanges for 220,278 and fourth high national spot. Upstate the Santa Clara Valley was the scene of a melodramatic melee as W6QHS operated W6YX for 185,968 while W6UTV did all but trod on his heels with 185,310. K6CTV led Los Angeles and accomplished the magic mark of 1000. Some 2688 KH6 exchanges were greeted with an *aloha nui* by multiplier seekers as 8 Hawaii stations pounded brass. In his own inimitable fashion, *kamaaina* KH6IJ gave his lesson on "how to win a section award."

K6EVR was more than audible in his reappearance on the A-3 Sweepstakes scene. Ron refashioned his 1958 record into a brand new version based on 1090 70 and 227K points. This represents the third highest total in the *entire* c.w.-phone competition. W5BJZ/KH6 was much in demand as he dispensed 459 in 62.



Code champs all, just check and see. From top to bottom: K6CTV, L. A. leader with 188,066 followed by one half of the winning E. Mass. tie, K1DIR. Bob used a Navigator-813 and SX101A plus a $5 homebuilt cubical quad. Second from the bottom is top W7, W7KEV. Ed was first licensed in '36 as W9WTW in Colo. and has been W7KEV since '45 with the big signal from Nevada. Happy indeed with the loan of a new Invader transmitter for the SS, K6SXA/Ø put it through its paces for the high spot in Iowa. Starting out in '56, Jim has won contests and awards galore and is currently studying at Grinnell College.

NOVICE CERTIFICATE WINNERS

WV2NPI	KN4ZRX	WV6MOW	KN9ZJK
KN3KKA	KN5AEE	KN8TLL	KNØBMH
KN3KRF	KN5ERQ	KN8UNP	
KN4WHV	KN5ZJK	KN9WRD	

7 Topping all sevens and always in c.w. demand was Nevada's W7KEV; coming up and passing the 200,000 target. A tight battle ensued in Oregon as W7JHA edged out W7TDK. Up in Alaska KL7KG dealt out 395 multipliers to avid followers of the SS game, while K7s CHH CRL and W7s BAJ HAH ZMD and ZN were on hand to furnish secs. galore.

Washington's W7BSW showed how to talk up the two-ways, summing up 714/73 and pointwise topping K7CHH's c.w. Washington computation. Wyoming was the scene of verbal excitement in a battle for section leadership as K7IAY outpointed W7CQL 48,198 to 47,676. Interesting were the line ups awaiting W7s JHL MKI and UGQ as they parcelled out Montana, Idaho and Oregon confirmations.

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8 The onslaught of eights always leaves us aghast and this year's stack of 165 code contestants takes some wading through. While W8OYI made the charmed circle with his 1005 attestations, the big race was for the *second* slot in Michigan with K8IPR and W8s VPC and DUS trading signals with the pack.

If you haven't guessed who won phone for Ohio you just haven't been with it 'lo these many years' and naturally W8AJW ditto'd his umpteen voice victories, in case there's any doubt. The East River Amateur Radio Club of Bluefield, West Virginia was active under the club K8MHH with 7 operators dispersing 327 augmentations.

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9 W9IOP set his c.w. sights even higher for 1960 and set a new SS record — 1424/73 and makes us ponder upon the possibilities some year of 300,000 SS points! The Wisconsin Valley mainstay W9RQM shows no signs of tiring as he keeps the pack in line and just about finishes papering a wall with 15 section awards! Averaging out the *over-90* code contestants in Illinois smooths out the QSO average to about 223 per — *zounds!*

Voicing verbal versatility in the Central Division was W9NZM with 379/73 from Illinois with a closely seconded *voilà* from Wisconsin's W9VZP 398/68. Phone as well as c.w., Illinois put on the big showing from the Ill.-Ind.-Wisc. area.

Ø The zeros in the Dakota-Midwest-Rocky Mt. Divisions set their sights east and west and you name it to register code scores worthy of respect. Out in Colorado the air may be thin but QSOs were thick and fast as WØEWH made close to 30/hour for the full forty. Meanwhile, KØMPH and WØSMV dispensed Dakota deals to 1348. Native Californian K6SXA/0 took time out from studies at Grinnell College to put a prototype transmitter through this most grueling of tests and *still* thinks 944/73 a "not very good" showing! WØYCR at 146K and WØJPH at 133K both helped put Minnesota in your log this time 'round.

WØPRZ always manages to find time to put South Dakota on the phone map in a big way. Up on the phone frequencies 640 vocal fanciers testify to *that!* Second top tally in zero-land comes from KØMMS (Iowa) at 81,165 followed by KØOER (Colo.) with 67,770.

The big c.w. signal from So. Texas was initiated by W5WZQ with 1301/73 and 235,608 points. Gear used: HQ170, Viking Valiant. Note the "proxos" on top and the judicious use of the clothes pin! Dave has been licensed 8 years on 80-10 and finds DX and contests irresistible.

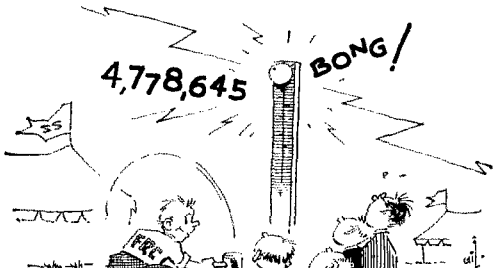
VE Among the most popular signals present in any SS are those emanating from Canadian sections to the north with that elusive VE8 prefix cajoling the unwary with the blandishment "work 'em *all*." To make the c.w. report complete for '60 we even received VE8RW's log in time for publication! Highlighting VE/VO efforts was B. C. brightlight VE7EH with 793/71, while other fine efforts came from VE3BFA operating VE3UOT, VE6AO, VE2-BAE, etc.

Phone-wise Canada caused many a moan this year, but cheers indeed for those who did get on and did report their results. *A votre santé bon amis* VE4SD, VE7CE, VE5ZM, VE3PV, VE6-AAV, VE3CKW, VE6GB, VO1DZ and VE3JF.

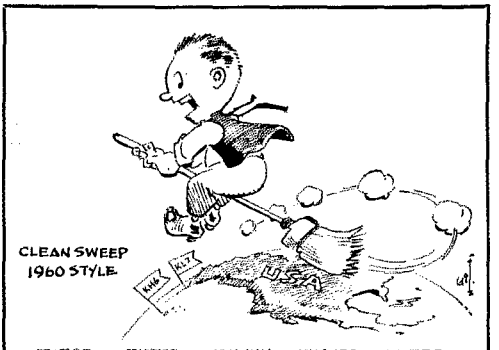
W8OYI has been a ham since '26 and has always been a "regular" in the SS. Joel used a Viking I on 10 and 15 and the DX 100 on 20-40-80, with 75A-4 receiver. A mighty fine code showing, top W8 with 1005 two-ways.

Club Scores

Nip and tuck it was, in fact — as it has been during recent years! The Frankford Radio Club, with 58 members in the melee, totaled up 4,778,645 points. Another silver-banded gavel to the FRC gang for a fine showing. A hair's-breadth behind, averaging just over 83,000 points per member, appears the Potomac Valley Radio Club. This particular club competition was decided by so seemingly small a thing as a few logs that had been neglected to be sent in. All told, 84 clubs appear on the accompanying tabulation, representing activity from all portions of the field organization. Some 106 club members will shortly be receiving special club certificate awards for their activity and club support. The South Jersey Radio Assn. moved from 8th to 3rd place and serves notice that it intends to offer serious competition in all low frequency *as well as* high frequency contests in the future. The Ohio Valley Amateur Radio Association increased their 1959 SS aggregate by 71,237 points and moved from 7th to 3rd. From 11th to 5th, a sizeable step upwards, went the Connecticut Wireless Association. Despite the poor conditions during the first weekend, the Lake Success Radio Club raised their club total almost 79% over that of the previous year. FB.!



On the negative side, 20 clubs failed to make the listing due to the lack of just one club score. Numerous others did not make the tabulation because of insufficient entries. It takes three to qualify for the listing, and three phone or c.w. submissions to warrant a club award.



W1EOB	W3EIS	K4LPW*	W5WZQ	K9KDI
W1JYH	W3EQA	K4PUZ	K6CTV	K9OTB
W1TS	W3GAU	K4VLN	W6JKJ	K9RFW
K2GXI*	W3GHM	W4AHY	W6JVA	W9GRF
W2AYJ	W3GOQ	W4CVI	W6SBB	W9IOP
W2GGE	W3GQF	W4DQS	W6YX	W9NZM*
WA2EFN	W3HHK	W4DVT	W6ZVQ	W9QQQ
WA2IZS	W3IYE	W4IA	KH6IJ	W9ZAB
WA2OJD	W3JNQ	W4JAT	W7BSW*	W9ZYD
K3CYA*	W3JSA	W4KFC	W7KEV	K6SXA/Ø
K3JQU	W3KFQ	W4LVV	K8KNT	WØEEE
W3ALB	W3KT	K5ABV	K8QJH	WØEWH
W3BES	W3NCF	K5ESW	W8OYI	WØNCS
W3CGS	W3VAN	K5QNF	W8QHW	WØPRZ*
W3DRD	K4JLD	W5BUK	W8ZJM	WØYCR

* Phone

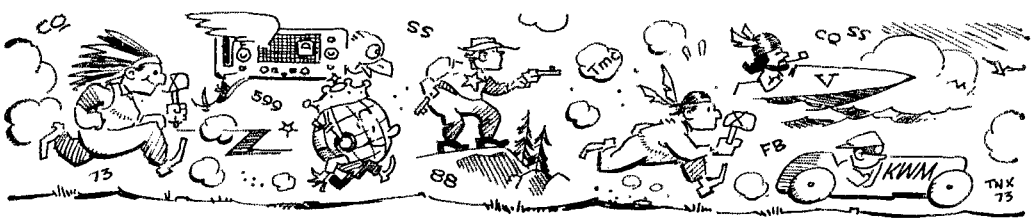
Soapbox

"This is one SS I'd like to forget but guess I'll always remember. Conditions were the worst I have ever heard, an almost universal complaint locally." — *W3JNQ*. . . . "My first serious SS effort and first time on c.w. for almost 3 years. I'll get the hang of this contest business soon. Try a rhombic for a real kick." — *W6QHS*, opr. W6YX. . . . "W1TS's impromptu GP erected with ease proved the best $4.68 ever spent, also the best antenna ever had. Worked all W7 sections in just ten W7 QSOs." — *W1NJL*. . . . "I'll be darned if I didn't miss Utah when I double checked my sections." — *W3MFW*. . . . "One station called me 4 times. Help!" — They need Op. Aid #6!!" — *W8QHW*. . . . "Sorry for this sloppy log (not so . . . *ed.*), I hadn't intended to enter the phone SS but once in I couldn't quit." — *VE7CE*. . . . "Didn't get Idaho or Hawaii which I need for WAS." — *WA2DES*. . . . "Don't know whether participating made me feel younger or older, but it certainly made me realize that a lot of changes have occurred in ham radio since last I took part before WW-II." — *W4JUK*. . . . "WA6BUX and W6LRU live less than 2 blocks away and they're *both* very active in the SS." — *WA6JFD*. . . . "Worked all states in this SS." — *W6OIV*. . . . "If my Oklahoma phone score holds up, this will be my 6th year to win, with the same homebuilt rig." — *W5IWL*. . . . "This

Several of the finest of the phone signals heard in the 1960 Sweepstakes started out right here. On the left, W5DRI ousted OM W5DQK right out of the operating spot in front of the B&W 5100-75A-3 for this, her first SS. Dena talked her way to honors for Miss. with 506/71. On the right is the old pro K4LPW with 141 thousand phone figures from Tennessee. Mel started out in '27 as 3ATZ, W3DGM in '32 and K4LPW in '56 and made this his initial crack at a phone SS. Note the HT32, SX101A and home-brew 400-watt linear in the HT31 cabinet (the latter not used in the SS). Among the items on the shelf are a homemade direction globe, Select-O-Ject, s.w.r. bridge, keying monitor, match box and FRC SS trophy with ARRL gavel.

PHONE WINNERS, 27TH A.R.R.L. SWEEPSTAKES

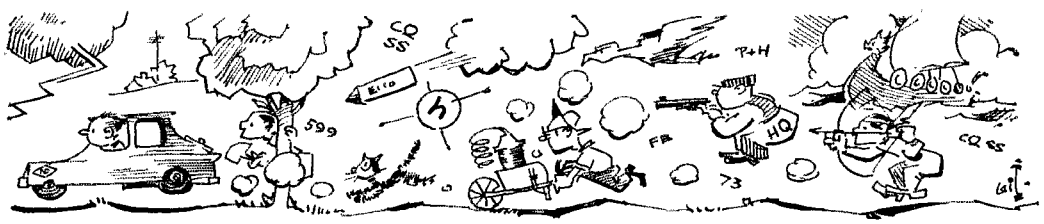
Section	*Call*	*Score*	*Transmitting Equipment*	*Receiving Equipment*	*Bands Used*
E. Penna.	K3DVS	121,788	Apache	HQ110	75, 40, 20, 15, 10
Md.-Del.-D. C.	W3ZKH	84,663	Viking II; GSB100	NC300; HQ150X; DB23	75, 40, 20, 15, 10, 6
S. N. J.	W2LBX	35,223	DX100	NC303	75, 40, 20, 10, 6, 2
W. N. Y.	K2GXI	119,574	5100-100V	75A4	75, 40, 20, 15, 10
W. Penna.	W3LWW	22,113	VFO-6146-8005	HBR14	75, 40
Illinois	W9NZM	82,454	32V1s; HT32	75A4; 75A2	75, 40, 20, 15, 10
Indiana	K9GMD	55,965	HT37	SX101	75, 40, 20, 15, 10
Wisconsin	W9VZP	81,192	Viking II	75A2	75, 40, 20, 15, 10
No. Dakota	KØUTL	61,992	Valiant	SX101A	40, 20, 15, 10
So. Dakota	WØPRZ	93,002	32S1-Viking KW	75S2	75, 40, 20, 15, 10
Minnesota	WØVIP	18,780	4-400A	NC183D	75, 40, 20, 15, 10
Arkansas	K5TST	63,657	Apache	S85	40, 20, 15, 10
Louisiana	W5KC	126,210	HT37	HRO7-GSB1	75, 40, 20, 15, 10
Mississippi	W5DRI	107,778	5100	75A3	40, 20, 15, 10
Tennessee	K4LPW	141,474	HT32	SX101A	75, 40, 20, 15, 10
Kentucky	W4NWT	71,208	7C5-2E26-812A	HQ160	75, 40, 20, 10
Michigan	K8PCZ	61,425	Apache	HQ170C	75, 40, 20, 15, 10
Ohio	W8AJW	96,063	32V1	SX101	75, 40, 20, 15, 10
E. N. Y.	W2AKN	35,616	DX100	HQ110	75, 40, 20, 15, 10
N. Y. C.-L. I.	K2TAP	79,680	Globe King	NC300, DB20	40, 20, 15, 10
N. N. J.	K2RBD	48,941	Viking II; Gonset II	SX71; Gonset II	75, 40, 20, 15, 10, 2
Iowa	KØMMS	81,165	DX100	SX100	75, 40, 20, 15, 10
Kansas	K4USB/Ø	15,674	Globe Champ 300	51J	40, 20, 15, 10
Missouri	KØLTK	51,678	DX100	Super Pro	40, 20, 15, 10
Nebraska	KØQJG	41,664	Ranger	NC300	75, 40, 20, 15, 10
Maine	W1GKJ	59,378	Viking II	HRO60	75, 40, 20, 15, 10
E. Mass.	K1KTH	61,380	5100	AR3, converter	75, 40, 20, 15, 10
W. Mass.	K1LRB	45,504	HT37	SX111	75, 40, 20, 15, 10
N. H.	W1FZ	42,750	Viking I; Gonset	75A4; Gonset	75, 40, 20, 15, 10, 6, 2
R. I.	K1HMO	22,650	Ranger	HQ100	75, 20, 15, 10
Vermont	K1MVV	240	DX100	SX110	75, 15
Alaska	W9KLD/KL7	976	431B1	51J4	10
Idaho	W7MKI	53,664	Ranger	75A1	75, 40, 20, 15, 10
Montana	W7JHL	66,336	DX100	RME4350A	75, 40, 20, 15, 10
Oregon	W7UGQ	60,117	Viking I	75A2	75, 40, 20, 15, 10
Washington	W7BSW	156,366	Valiant	75A4	75, 40, 20, 15, 10
Hawaii	W5BJZ/KH6	85,374	DX100	R390A	40, 20, 15, 10
Nevada	W7KOI	7,942	Globe Champion 350	HQ170C	75, 20, 15
Santa Clara V.	K6VGW	94,269	Apache	HQ140XA	75, 40, 20, 15, 10, 2
East Bay	W6VNH	85,800	Apache	Mohawk	40, 20, 15, 10
San Francisco	K6EIE	32,208	32V1	75A4	40, 20, 15, 10
Sacramento V.	W6SFH	4,719	Navigator	SX100	75, 40, 20, 15, 10
San Joaquin V.	K6OOW	69,225	Viking II	HQ145C	40, 15, 10
No. Carolina	K4FWF	77,004	811A	HQ145	75, 40, 20, 15
So. Carolina	WØYFT/4	3,525	32V3	75S1; 51J3	75, 40, 20, 15
Virginia	W4BVV	70,823	Apache	Mohawk	75, 40, 20, 15, 10
West Virginia	W8UYR	2,700	ART13	HRO50	75, 40, 20
Colorado	KØOER	67,770	Ranger	SX100	40, 20, 10
Utah	K7BHE	56,273	Ranger	NC183D	40, 20, 15, 10
New Mexico	K8DIO/5	95,067	DX100	SX100	40, 20, 15, 10
Wyoming	K7IAY	48,198	Valiant	SX101	75, 40, 20, 15, 10
Alabama	W4CWO	40,281	Valiant	75A3	40, 20, 15, 10
E. Florida	K4VXC	86,678	6146s	75A4	40, 20, 15, 10, 2
W. Florida	W4CMG	54,234	Globe Champion 300; Gonset	S85, QF1; Gonset	75, 40, 20, 15, 10, 2
Georgia	K4POL	28,392	Apache	SX99	75, 40, 20, 15
West Indies	KP4YT	8,694	Valiant	HRO60	15
Canal Zone	KZ5SW	26,832	KWM2	KWM2	15, 10
Los Angeles	K6EVR	227,220	GSB100; Viking II	75A4	40, 20, 15, 10
Arizona	W7WUC	60,885	DX100	NC183	75, 40, 20, 15, 10
San Diego	W6VAK	58,926	Valiant	NC300	40, 20, 15, 10
Santa Barbara	WA6IKO	19,325	Apache	75A2	20, 15, 10
No. Texas	K5IID	115,776	Valiant	SX96	75, 40, 20, 15, 10
Oklahoma	W5IWL	84,320	5763-5763-5763-6146-813	NC300	75, 40, 20, 15, 10
So. Texas	K5JCC	72,638	Globe Scout	75A4	75, 40, 20, 15, 10
Maritime	VO1DZ	1,283	Apache	Mohawk	10
Ontario	VE3PV	13,500	Ranger	NC240D	75, 40, 20, 15
Manitoba	VE4SD	28,944	Viking II	HQ120; RME HF10-20	75, 20, 15, 10
Saskatchewan	VE5ZM	22,613	TBS50D	SC77A	20, 15, 10
Alberta	VE6AAV	12,180	Ranger	HQ110	10
B. C.	VE7CE	26,514	Valiant	NC300	20, 15, 10



C. W. WINNERS, 27TH A.R.R.L. SWEEPSTAKES

Section	*Call*	*Score*	*Transmitting Equipment*	*Receiving Equipment*	*Bands Used*
E. Penna.	W3BES	226,483	Ranger-813	NC303	80, 40, 20, 15
Md.-Del.-D. C.	W3EIS	206,681	Ranger-813	51J	80, 40, 20, 15, 10
S. N. J.	W2HDW	154,263	Valiant; DX100	HQ140X	80, 40, 20, 15
W. N. Y.	K2SSX	137,113	Ranger-811As	SX101; Comanche	80, 40, 20, 15
W. Penna.	W3UGV	53,120	Viking II	HQ140X	80, 40, 20, 15, 10
Illinois	W9NPC	151,375	Viking II	Super Pro, DB23	80, 40, 20, 15
Indiana	W9IOP	259,424	Invader	RME6900	80, 40, 20, 15
Wisconsin	W9RQM	164,010	VFO-807-813	HRO50T	80, 40, 20, 15, 10
No. Dakota	KØMPH	83,920	Apache	Mohawk	80, 40, 20, 15, 10
So. Dakota	WØSMV	107,448	Ranger-Courier	HRO50T	80, 40, 20, 15
Minnesota	WØYCR	145,818	6AC7-6C4-6C4-6C4-807s	SP400X	80, 40, 20, 15
Arkansas	K5WTB	101,430	Apache	NC300	40, 20, 15, 10
Louisiana	K5ESW	179,945	Apache	Mohawk	80, 40, 20, 15, 10
Mississippi	K5QNF	203,448	20A-813	75S1	80, 40, 20, 15
Tennessee	K4PUZ	156,485	Apache	SX101	80, 40, 20, 15, 10
Kentucky	W4CVI	152,753	32V2	75A4	80, 40, 20, 15
Michigan	K8QJH	119,538	32S1	75S1, DB23	80, 40, 20, 15
Ohio	W8OYI	183,143	Viking I; DX100	75A4	80, 40, 20, 15, 10
E. N. Y.	K2UPD	177,500	Valiant	75A4	80, 40, 20, 15, 10
N. Y. C.-L. I.	K2DGT	201,995	4-65A	75A3; SX101	80, 40, 20, 15
N. N. J.	W2DMJ	172,530	Subraco-75T; Collins VFO	HRO	80, 40, 20
Iowa	K6SXA/Ø	172,280	Invader	NC303	80, 40, 20, 15, 10
Kansas	WØDEP	115,665	Ranger-811A	HQ129	40, 20, 15
Missouri	WØFLN	119,093	32V3	HRO50T	80, 40, 20, 15
Nebraska	WØNYU	125,038	Valiant	75A4	80, 40, 20, 15, 10
Connecticut	K1HTV	99,579	Viking II	HQ170	80, 40, 20, 15, 10
Maine	W1SWX	50,250	1626–1625s	HQ170	80, 40, 20
E. Mass.	K1DIR *	108,000	Navigator-813	SX101A	80, 40, 20, 15, 10
E. Mass.	W1AQE *	108,000	Viking II	— —	80, 40, 20, 15, 10
W. Mass.	W1EOB	157,534	VFO-2E26-4-100	Homebuilt (16 tube)	80, 40, 20, 15
N. H.	W1ET	97,554	KW1	75A4	80, 40, 20, 15, 10
R. I.	K1IFE	35,338	Apache	SX101A	20, 15
Vermont	W1QMM	44,019	6AH6-6CL6-6CL6-807-RK65	Homebuilt (double conv.)	80, 40, 20, 15, 10
Alaska	KL7KG	69,125	100V	75A4	40, 20, 15
Idaho	W7ZN	98,825	Ranger-Thunderbolt	SX28A	80, 40, 20
Montana	W7HAH	76,075	AF67	HQ140X	80, 40, 20, 15
Oregon	W7JHA	113,334	Valiant	HQ170	80, 40, 20, 15, 10
Washington	K7CHH	141,750	Ranger-4-125A	SX100	40, 20, 15
Hawaii	KH6IJ	122,202	HT32-4-250As	75A4	40, 20, 15, 10
Nevada	W7KEV	204,674	807-4-65A	HQ129X	40, 20, 15, 10
Santa Clara V.	W6YX	185,968	KWS1 (modified)	75A4	80, 40, 20, 15, 10
East Bay	W6GEB	93,500	Apache	Homebuilt (20 tube)	80, 40, 20, 15, 10
San Francisco	W6SIJ	107,985	VFO-4-65A	NC300	80, 40, 20, 15, 10
Sacramento V.	WA6GIS	66,463	Ranger	BC1147A	80, 40, 20, 15, 10
San Joaquin V.	W6BVM	88,560	Viking I	75A2	80, 40, 20, 15, 10
No. Carolina	W4AHY	119,629	5100B	HQ129X	80, 40, 20, 15, 10
So. Carolina	WØYFT/4	139,343	32V3; Ranger	75S1; 51J3	80, 40, 20, 15
Virginia	W4KFC	173,813	VFO-807s-4-250As	75A2	80, 40, 20, 15, 10
West Virginia	W8FNI	127,663	Apache	HQ129X	80, 40, 20, 15
Colorado	WØEWH	212,613	Valiant	NC300	80, 40, 20, 15
Utah	W7BAJ	73,030	DX100	75A4	80, 40, 20, 15, 10
New Mexico	W5CK	122,404	DX100-813s	Mohawk	80, 40, 20, 15, 10
Wyoming	K7CRL	62,372	Globe Champion 350	HHQ170	40, 20, 15
Alabama	K4BQU	78,705	T50	S53A	80, 40, 20, 15, 10
E. Florida	W4DQS	198,195	Ranger-Thunderbolt	75A4	80, 40, 20, 15, 10
W. Florida	W4HQN	154 070	VFO-4E27	75A1; HQ120X	80, 40, 20
Georgia	W4YE	154,100	Navigator-4E27	NC183D	80, 40, 20, 15
West Indies	KP4AOO	46,618	Ranger	HQ110	20, 15
Canal Zone	KZ5TD	66,480	DX100B	HQ170	40, 20, 15, 10
Los Angeles	K6CTV	188,066	100V; Apache	75A4s	80, 40, 20, 15, 10
Arizona	W7ZMD	126,630	DX100; 32S1	75S1; SX100	80, 40, 20, 15
San Diego	W6ZVQ	220,278	5100	75A3	80, 40, 20, 15, 10
Santa Barbara	W6YK	99,180	HT37	NC303	80, 40, 20, 15, 10
No. Texas	W5MCT	203,175	VFO-813	NC303	80, 40, 20, 15
Oklahoma	W5YJS	115,375	KWM2	KWM2	80, 40, 20, 15
So. Texas	W5WZQ	235,608	Valiant	HQ170	40, 20, 15, 10
Maritime	VE1ADH	21,712	6CL6-5763-6146-811As	SX99	80, 40, 20
Quebec	VE2RAE	48,813	Apache	NC109	80, 40, 20
Ontario	VE3UOT	72,072	Pacemaker-Thunderbolt	HQ170	80, 40, 20, 15
Manitoba	VE4IM	47,565	GSB100	SX101A	40, 20, 10
Saskatchewan	VE5DZ	28,379	6AG7-6L6-807-813	HRO	40, 20
Alberta	VE6AO	58,581	32V2	AR88	40, 20, 15
B. C.	VE7EH	140,669	DX100	AR88	80, 40, 20, 15, 10
Yukon-N.W.T.	VE8RW	3,565	AT3	SP600	20

*Tied for section award.



year improvements were made in nearly everything — new receiver, more power, greater frequency flexibility, roomier operating position, more comfortable chair and sponge rubber cushions for earphones." — *WØKCG*. . . . "Glad to get all 73 although R. I. was almost the spoiler." — *W3GQF*. . . . "My first serious SS and loved every minute of it." — *W6LRU*. . . . "Previous to this phone SS I had engaged tree trimmers to come and free my 80 and 20 meter antennas from the trees which surround them. What happened? Sunday morning of the 2nd weekend with the phone bands the best ever heard, they started their chain saws and were right up in the trees. Ever tried to copy phone through chain-saw ignition right up next to your beam?" — *W1DIS*. . . . "The widespread use of GMT eliminated much confusion." — *K8GJD*. . . . "Poor conditions, low power and low antennas equal no W1/K1 QSOs." — *KH6DVG*. . . . "1 netted 250 hard earned contacts that disastrous first weekend, an even hundred with E. Pa. stations." — *W3GYP*. . . . "While I worked K8VLU for an SS phone contact, I was QRMd by K8LUV who was carrying on a QSO. It took a minute or two to verify which one was in the SS!" — *W5FHL*. . . . "Kind of disappointing not to find more activity in the 40-meter Novice band." — *KNØYVZ*. . . . "Poor conditions the first weekend, the second weekend my daughter got married." — *W9LVQ*. . . . "All sections worked twice except Wyo. and C. Z. Worked all sections in the first 15 hours and 43 minutes. Sick the first weekend." — *W4KFC* (prime example of inherent superb timing, that first weekend *was* the time to be sick — *Ed.*). . . . "Gave up on Vermont for phone. Quite a while later I called CQ SS and sure enough, I was answered by Vt.'s K1KSS." — W7BSW. . . . "If it hadn't been for 14 Mc s.s.b. the first

CLUB SCORES

Club	*Score*	*Valid Entries*	*C. W. Winner*	*Phone Winner*
Frankford Radio Club	4,778,645	58	W3BES	.....
Potomac Valley Radio Club	4,743,024	57	W3EIS	.....
South Jersey Radio Assn.	1,089,287	76	W2PAU	W2LBX
Ohio Valley Amateur Radio Assn.	913,963	11	W8EV	.....
Connecticut Wireless Assn.	697,632	12	W1EOB	.....
Westpark Radiops (Ohio)	669,795	19	W8ETH	W8AJW
Sioux City Amateur Radio Assn. (Iowa)	666,817	29	W9CXN	KØMMS
Lake Success Radio Club (N. Y.)	643,472	17	K2DGT	W2YHP
Hamfesters Radio Club (Ill.)	607,615	25	W9ZYD	W9QXO
Miami Valley Amateur Radio Contest Society (Ohio)	597,967	13	W8ZJM	.....
Wisconsin Valley Radio Assn.	512,474	14	W9RQM	W9NUW [1]
San Diego DX Club	493,375	3	W6ZVQ	.....
Milwaukee Radio Amateurs' Club	487,906	30	W9DYG	K9MTM
Tusco Radio Club (Ohio)	421,497	10	W8NBK	K8JSZ
Richmond Amateur Radio Club (Va.)	415,363	12	W4BZE	.....
Order of Boiled Owls of New Mexico	414,505	4	W5CK	.....
Oak Ridge Radio Operators Club	407,439	4	K4PUZ	.....
Chicago Suburban Radio Assn.	380,511	12	K9KDI	K9KIC
Niagara Frontier DX Assn.	357,135	5	W2SSC	.....
Radio Club of Tacoma	352,787	14	K7HTV	W7BSW
Westside Amateur Radio Club (La.)	328,847	7	W5BUK	W5INL
Bronx High School of Science Radio Club	317,391	12	K2IAD [2]	WA2S ITR K8K
Denver Radio Club	311,542	11	.....	KØOER
Short Skip Radio Club (Pa.)	309,528	10	W3YLL	K3DVS
Kanawha Radio Club (W. Va.)	307,663	4	W8FNI	.....
El-Ray Radio Club (Mass.)	307,182	8	W1AQE	W1EJE
Suffolk County Radio Club (N. Y.)	304,743	15	W2DID	W2WPH
Cuyahoga Falls Radio Club (Ohio)	292,428	6	K8HGT	.....
Montrose County Amateur Radio Club (Colo.)	245,599	7	WØWME	.....
Roanoke Valley Amateur Radio Club (Va.)	240,408	19	K4IKF	K4EQT
Amateur Radio Society of CCNY	227,544	7	K2IYC	.....
Canton Amateur Radio Club (Ohio)	225,500	12	K8BXU	K8HZN
North Penn Amateur Radio Club	222,175	12	W3JSA	W3HGZ
West Suburban YMCA Amateur Radio Council (Ill.)	217,246	8	KØIND	.....
Niagara Radio Club	215,753	5	WA2ANA	.....
Larkfield Amateur Radio Club (N. Y.)	210,555	4	K2ZYR	.....
Starved Rock Radio Club (Ill.)	207,778	8	WØARV	KØMQI
Amateur Transmitters' Assn. of Western Pennsylvania	206,747	5	W3UGV	.....
Garden State Amateur Radio Assn. (N. J.)	206,237	4	W2CQB	.....
Columbus Amateur Radio Assn. (Ohio)	201,088	7	K8MTI	K8LWF
Central Michigan Amateur Radio Club	183,688	3	W8VPC	.....
Tri-County Radio Assn. (N. J.)	177,920	6	W2LRO	.....
Forx Amateur Radio Club (N. Dak.)	171,508	4	KØQWY	.....
Four Lakes Amateur Radio Club (Wis.)	170,763	6	K9ELT	.....
West Seattle Amateur Radio Club	167,885	9	K7HTZ	.....
St. Louis University Amateur Radio Club (Mo.)	163,743	3	WØFLN [3]	.....
North Shores Amateur Radio Club	162,231	6	K6LLI	.....
Radio Amateurs of Greater Syracuse	157,407	3	K2SSX	.....
Massillon Amateur Radio Club (Ohio)	155,936	3	K8HTM	.....
Eastern Pennsylvania Amateurs	140,029	4	.....	.....
Mohawk Amateur Radio Club	139,345	11	W2IJI	W2MGV
St. Clair Amateur Radio Club (Ill.)	130,602	7	K9OTB	W9QDM
Five Towns Radio Club (N. Y.)	129,495	9	WA2CWY	K2TAP
Waupaca Amateur Radio Club (Wis.)	120,013	5	W9KXK	.....
Atlanta Teenage Amateur Radio Club	116,726	3	K4TKM	.....
Sioux Falls Amateur Radio Club	113,865	4	WØSMV	.....
Detroit Amateur Radio Assn.	113,154	6	W8INJ	.....
Greater New Orleans Amateur Radio Club	113,053	7	K5WTL	W5QPS
Badger Amateur Radio Society (Wis.)	112,917	4	.....	.....
Oxford Circle Radio Club (Pa.)	101,214	7	K3IPK	.....
MIT Radio Society (Mass.)	95,477	3	.....	.....
Fullerton Radio Club	95,325	3	WA6JLM	.....
Bronx Radio Club	85,062	6	WA2BQK	WA2ITR
Chicago Radio Traffic Assn.	81,413	3	W9HPG	.....
West Allis Radio Amateur Club (Wis.)	76,476	7	K9JGC	.....
A. B. Davis High School Radio Club (N. Y.)	73,067	4	W2TER	.....
Bayside Amateur Radio Club (N. Y.)	71,033	5	WA2EFN	.....
Watchung Valley Radio Club (N. J.)	70,560	6	WA2FVQ	.....
King Philip Amateur Radio Society (Mass.)	65,793	3	.....	.....
Freehold Regional High School Radio Club (N. J.)	59,581	8	WA2EJZ	K2SFQ
West Philadelphia Radio Assn.	55,891	1	K3JJG	.....
Mid-Missouri Amateur Radio Club	46,145	3	.....	.....
Hellertown Amateur Radio Club (Pa.)	44,247	5	W3PQX	.....
Philadelphia Wireless Assn.	41,234	6	.....	W3RAE
Lexington High School Radio Club (Mass.)	40,513	3	K1MHM	.....
New Ulm Radio Club (Minn.)	38,575	3	K9WNV	.....
Waterbury Amateur Radio Club (Conn.)	32,932	4	W1ILV	.....
South Bay Hams	29,470	4	.....	K6OOL
Santa Monica City College Amateur Radio Club	19,701	4	.....	WA6ABZ
Washington University Amateur Radio Club (MO.)	16,616	7	WØNZW	K9GTG
Nittany Amateur Radio Club (Pa.)	15,046	3	W3NEM	.....
Syracuse VHF Club	10,569	4	.....	K2QWD
Albany Park Amateur Radio Club (Ill.)	1,762	4	K9ISP	.....
Forest City Amateur Radio Club (Ohio)	1,157	3	.....	W8IY

[1] K9PQT, opr. [2] K2JVB, opr. [3] KØGJD, opr.

weekend my score probably would have been halved." — *K6EVR*. . . . "Vertical on 15 helped me triple previous score and double section total, but still wish the score was as high as my enthusiasm." — *WA6CPM*. . . . "Called Wyo. W7HRN who came back with *Wkd B4* and since my check list was a page behind I believed him. I couldn't find him later and worked all except Wyo. Darn that W3EIS!" — *W3EIV*. . . . "Biggest complaint is about the stations that kept calling K7HDF and asking what section CZ was." — *KZ5DF*. . . . "It was a great contest this year and I am proud to have been a participant." — *K6VJT*. . . . "I can see missing KH6 and KL7, but how the heck did I miss N. C.?" — *K4CSY*. . . . "A bit of a busman's holiday for a commercial ships operator, but loads of fun anyway. My first since '55 as I'm generally at sea during the SS." — *W2BXS*. . . . "Pre-printed personal logs, automatic keyer and dipoles slanting westwards on 40 and 80 all seemed to help." — *W2GND*. . . . "Clock stays on GMT from now

VERMONT WAS A PRIZE FOR W4GF.....AND IT WASN'T EASY

on." — *W6QXF*. . . . "Heard a guy send Vt. after his call. Found he wasn't in the contest but persuaded him to give me a number and his time and left him there clutching my number and the rest. Ten minutes later I heard him sending *CQ No SS*, my only Vt. QSO." — *W4GF*. . . . "A very pleasant surprise to hear so many WA and K stations pounding brass, 46% of my QSOs were with these boys and their c.w. was excellent. Here is one old timer that was wrong. My hat is off to these boys and my hearty congratulations." — *W8NBK*. . . . "First time on phone and amazed at the results. Predict s.s.b. will eventually beat c.w." — *K4LPW*. . . . "Except for the blackout, mismatched coax, smoking rotor box, lack of grid drive on 20, sparkling rectifiers, blown fuses, lost pencils, drowsiness and the virus it wasn't bad. Highlights? When I worked 3 KH6s in 4 QSOs and when I finally got to bed Monday morning." — *K1KRP*. . . . "Conditions being what they were I'm glad that the SS does go two weekends 'cuz very few thrills in 28 years of hamming will match the one I got when I finally landed all 73 in an SS." — *K8QJH*. . . . "Still kicking myself for missing the C. Z. the first weekend." — *VE3BFA*, opr. VE3UOT. . . . "This was my first SS after a five year layoff and my best score to date. The general level of operating skill has risen considerably. I believe this to be a major factor in the increase of scores from year to year." — *W9NCS*. . . . "First weekend oldest son confirmed, second weekend youngest daughter born." — *K8DXZ*. . . . "What about a Q-signal for worked before?" — *K3DPQ*. . . . "I foiled Murphy's law by testing the rig two hours before the contest began. Yep, burned out the r.f. choke!!" — *K9RHN*. . . . "The 2nd weekend a gale force windstorm twisted my beam rotator mount 120 degrees from true. I had to climb the 67 ft. cedar tree during the contest and make repairs." — *VE7EH*. . . . "A tape keyer was used as a CQ wheel and worked fine. At times two receivers were used with split phones, using one to spot a CQ while finishing up with another." — *K2SSX*. . . . "If a man strive for the mastery, yet is he not crowned, except he strive lawfully." — II Timothy 2:5 — *W3EAN*. . . . "Finally worked W7KEV for Nevada, my 50th." — *K3JLI*. . . . "I hope next year everyone will use GMT and also will put my number on the QSLs they send me." — *KØMPH*. . . . "Thanks to the guys who took time to give an honest report. I was warned of a bad oscillator and able to get rid of a rough note. OO W3EIS took time to look me over." — *W5NTM*.

Disqualifications

In accordance with SS Rule #7, entries from the following amateurs have been disqualified: W9WNV, WØVXO.

C. W. SCORES

Twenty-Seventh Sweepstakes Contest

Scores are grouped by Divisions and Sections. . . . The operator of the station first-listed in each Section is award winner for that Section unless otherwise indicated. . . . Likewise the "power factor" used in computing points in each score is indicated by the letter A or B. . . . A indicates power up to and including 150 watts (multiplier of 1.25, c.w.), B over 150 watts (multiplier of 1). . . . The total operating time to the nearest hour, when given for each station, is the last figure following the score. . . . Example of listings: W3BES 226,483-1241-73-A-40, or final score 226,483, number of stations 1241, number of sections 73, power factor of 1.25, total operating time 40 hours. . . . An asterisk denotes Novice certificate winners. Multi-operator stations are grouped in order of score following single-operator station listings in each section tabulation.

ATLANTIC DIVISION

Eastern Pennsylvania

W3BES	226,483-1241-73-A-40	W3QKV	36,543- 311-47-A-22
W3JNQ	198,104-1087-73-A-38	W3PUP	33,150- 340-39-A-26
W3ALB	183,413-1005-73-A-40	K3HTZ	32,400- 270-48-A-27
W3GHM	165,801- 913-73-A-37	W3NHX	32,385- 254-51-A-30
W3MWC	159,715- 942-68-A-37	W3JNS	31,320- 232-54-A-12
W3MFW	149,760- 832-72-A-35	K3JCT	30,380- 248-49-A-30
W3HHK	146,456- 804-73-A-33	K3GIQ	27,976- 269-52-B-30
W3DQG	144,000- 800-72-A-40	W3JLI	26,125- 210-50-A-30
W3KFQ	140,343- 770-73-A-35	K3GNI	25,327- 299-43-B-20
W3CGS	129,210- 710-73-A-34	W3DVR	19,890- 156-51-A-15
W3KT	129,028- 707-73-A-36	W3AEM	18,894- 201-47-B-22
W3BHA	121,765- 686-71-A-40	W3WHK	17,500- 200-35-A-17
W3GYP	118,080- 662-72-A-39	W3DYL	17,254- 161-43-A-16
W3JSA	115,523- 633-73-A-40	W3HUR	16,752- 175-48-B- 9
W3EAN	106,838- 660-66-A-29	K3JIV	14,880- 186-32-A-23
W3GOQ	95,083- 521-73-A-40	W3PQX	14,275- 173-33-A-18
W3QMZ	90,880- 512-71-A-36	W3DFJ	12,705- 121-42-A-15
W3BQA	90,180- 501-72-A-29	K3BPQ	12,506- 140-45-A-13
K3DPQ	88,200- 490-72-A-36	K3GJQ	11,550- 154-30-A-23
W3OCU	87,685- 621-71-B-30	K3MVO	11,340- 158-36-B-17
W3DAO	81,738- 503-65-A-40	K3LJZ	10,838- 115-29-A-15
W3EER	81,125- 550-59-A-39	K3JNP	10,320- 129-32-A-18
W3KDF	80,240- 544-59-A-30	KN3KRF*	10,250- 104-40-A-32
W3NOH	80,160- 501-64-A-19	W3DUX	9788- 131-30-A-23
W3ADZ	79,875- 450-71-A-27	K3HYT	8555- 118-29-A-26
W3ISE	76,129- 455-67-A-37	W3GRS	8320- 104-32-A- 5
W3GSD	73,250- 425-68-A-36	W3FXK	8145- 181-18-A-18
W3YLL	69,825- 466-60-A-40	K3JGT	7245- 126-23-A-14
W3ARK	66,866- 500-67-B-23	W3KFK	7000- 112-25-A-13
W3EQA	62,634- 433-73-B-21	W3DBF	6200- 80-31-A- –
K3JGJ	62,505- 463-54-A-40	K3JJJ	5100- 120-17-A- –
K3DKC	61,534- 405-61-A-31	K3JSZ	4940- 77-26-A-16
W3ORU	61,380- 401-62-A-25	W3LEZ	4928- 73-27-A- 3
W3DBX	61,020- 339-72-A-24	K3HFX	4914- 67-30-A-10
W3DVF	58,781- 415-57-A- –	K3JHF	4654- 114-17-A-20
W3EVW	57,865- 326-71-A- –	K3ALL	4500- 90-25-B- 7
W3ADE	56,030- 431-52-A-29	W3IXN	3900- 60-26-A- 4
K3ILA	50,730- 356-57-A-31	K3ITH	3400- 80-17-A- 7
K3CTS	50,630- 332-61-A-24	W3QKU	2741- 66-17-A- 8
W3EML	49,613- 408-49-A-27	W3ZON	1980- 44-18-A- 7
W3DVC	48,011- 326-59-A-23	W3NF	1426- 31-23-B- 2
K3LYI	46,669- 337-57-A-36	W3IMN	1313- 25-21-A- 4
W3SOH	45,750- 300-61-A- –	K3AGU	1073- 39-11-A-13
K3ANU	43,875- 325-54-A-16	K3KUA	1015- 31-14-A-15
K3JJG	43,519- 320-55-A-34	W3CBH	991- 31-13-A- 6
K3ATL	41,820- 350-48-A-24	K3EXV	975- 26-15-A- 3
K3IPK	40,078- 351-46-A-24	KN3LWO	450- 18-10-A-15
W3CTJ	39,930- 242-66-A-10	W3UIU	260- 13- 8-A- 4
W3EFY	37,264- 263-57-A-19	KN3MFI	130- 13- 4-A- 4
K3DLX	37,200- 250-60-A-30	K3ALV	56- 10- 5-A- 1

E. Pa. is the usual scene for "top" scores—witness the highest Novice sum by the now K3KRF. Joe worked 104 on 40 and 15, currently uses an Apache, HQ110 and 2-element tri-bander.

KN3KVS 3- 1- 1-A- 3
K3KPV (K3s DFK KPV)
64,889- 430-61-A-37
W3ABT (4 oprs.)
33,330- 304-44-A-21
W3YP (5 oprs.)
31,836- 376-42-B-30
K3JJV (10 oprs.)
24,030- 274-45-B-27
W3MGF (K2MGW W2OIB)
3623- 69-21-A- 6
KN3LSG (KN3s LSG LSI)
254- 16- 7-A- 8

Md.-Del.-D. C.

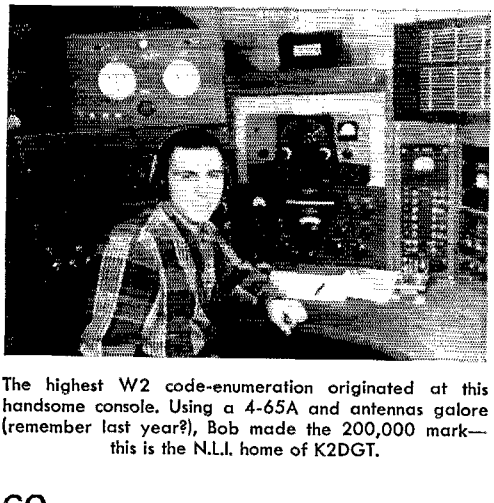
W3EIS 206,681-1133-73-A-40
W3MSR 192,330-1070-72-A-40
W3VAN 176,569- 969-73-A-34
W3EIV 142,290- 793-72-A-39
K3JQU 140,525- 770-73-A-29
W3IYE 138,335- 759-73-A-39
W1KGH/3
125,759- 711-71-A-36
W3MCG 124,020- 689-72-A-40
W3GRF 123,717- 900-69-B-30
W3JTC 123,165- 714-69-A-35
W3AEL 122,500- 700-70-A-28
W3MFJ 117,904- 684-69-A-35
W3TMZ 112,860- 629-72-A-22
W3RNY 111,608- 647-69-A-35
W3YOZ 105,875- 606-70-A-32
W3DRD 101,926- 560-73-A-27
W3GAU 86,870- 477-73-A-18
W3IWJ 86,400- 549-64-A-40
K3EST 85,510- 505-68-A-32
W3SAL 76,784- 504-61-A-23
W3FRZ 69,595- 450-62-A-35
K3GJB 68,416- 570-49-A-30
W4ZKU/3 66,000- 430-66-A- -
W3ZQ 65,320- 461-71-B-30
W3KZQ 59,798- 357-67-A-36
W3PZW 55,945- 334-67-A-20
K3JYZ 52,325- 322-65-A-40
W3DVO 51,013- 371-55-A-29
W3KYF 49,680- 311-64-A-33
W3EFZ 47,275- 390-61-B-24
W3HVM 46,810- 333-62-A-20
K3KHK 43,725- 330-53-A-23
W3BKE 40,600- 350-58-B-25
K3JET 37,193- 281-54-A-22
K3CYA 36,500- 250-73-B-15
W3HWE 33,020- 240-55-A-16
K3APM 19,380- 183-48-A-19
W3PZA* 19,000- 200-38-A-18
W3UE 18,040- 176-41-A-20
W3KHU 14,568- 122-49-A-10
W3WU 13,300- 133-40-A-12
K3CYX 12,648- 124-51-B-19
K3KPZ 8225- 94-35-A- 8
W3PRC 7648- 81-38-A-14
K3COO 5320- 67-32-A- 7
K3LFO 5319- 98-23-A-10
KN3KKA* 3965- 61-26-A-30
VE3DYK/W3
3098- 59-21-A-25
K3JVB 2100- 42-20-A- 8
K3AVE 2080- 55-16-A- 8
W3TN 1605- 54-12-A-10
K3MDL 428- 19- 9-A- 4
KN3LSQ 360- 17- 9-A- 8
K3JIX 348- 16- 9-A- 4
WØBPO/3 200- 10- 8-A- -
W3FYS (W3FYS, W6HOH)
126,360- 703-72-A-31
W3GQF (8 oprs.)
103,003- 706-73-B-35
W3WV (K3MZY, W3WV)
49,312- 371-67-B-21
K3BYM (K3BYM, W3FUQ)
1594- 38-17-A- 4

Southern New Jersey

W2HDW 154,263- 883-70-A-35
W2SHM 150,165- 846-71-A-33
WA2IZS 109,500- 600-73-A-35
W2PAU 103,868- 633-66-A-32
WA2BLV 98,588- 598-66-A-36
W2EXB 96,255- 558-69-A-30
W2QDY 95,393- 553-69-A-38
K2BZK 92,750- 530-70-A-39
K2ERC 92,712- 555-67-A-37
K2CPR 90,180- 502-72-A-33
W4HBO/2 87,465- 515-68-A-26
W2FYS 62,310- 402-62-A-35
K2BWR 61,215- 371-66-A-35
K2JXX 60,755- 420-58-A-17
WA2CUB 53,833- 353-61-A-17
K2PFT 47,369- 346-55-A-31
W2DAJ 45,696- 409-56-B-26
W2EBW 39,382- 340-58-B-34
W2HBE 39,188- 275-57-A-29
W2TLN 35,179- 267-53-A-13
W2BUI 34,500- 230-60-A-19
K2MIO 30,238- 205-59-A-18
WA2MEQ 30,100- 280-43-A-35
K2HG 29,025- 215-54-A-20
W2KHA 26,633- 203-53-A-12
W2FXN 24,208- 213-46-A- -
WA2IEK* 18,515- 161-46-A-10
W2SDB 14,100- 120-47-A-13
W2PKM 11,600- 145-40-B-15
W2KNR 10,237- 105-39-A- 7
K2BNS 10,080- 127-32-A-14
K2KMH 5940- 108-22-A-10
W2OQN 4523- 67-27-A- 9
W2DMU 3853- 67-25-A-11
WV2KWO 1820- 56-13-A-15
W2BEI 605- 22-11-A- -
W2PAZ 375- 30- 5-A- 4
K2HJY 360- 16- 9-A- 5
K2PWV 275- 23- 5-A- 6
K2GCD 250- 20- 5-A- 8
K2EJW 100- 10- 4-A- 2
WA2GGB/2 38- 5- 3-A- 2
WA2FFC 30- 4- 3-A- 1
W2FZP 20- 4- 2-A- 1
K2MPV (K2MPV, W2REB)
49,855- 338-59-A-39
WA2KUP (WA2s KUP NGS)
14,280- 180-32-A-34
WA2HSP (WA2s ABF HSP)
8625- 150-23-A-20
K2DEI (K2DEI, WA2HJI)
600- 20-12-A- 3
WA2NVS (WA2NVS, WØAGC)
213- 43- 2-A-10

Western New York

K2SSX 137,113- 785-70-A-34
W2SSC 127,488- 731-70-A-28
K2KWZ 66,883- 433-62-A-27
WA2ANA 66,410- 460-58-A-28
W2WOE 63,210- 453-70-B-28
W2KKT 48,748- 315-62-A-32
K2QDT 46,150- 284-65-A-23
K2GKM 45,978- 347-53-A-25
W2FXA 36,960- 224-66-A-20
WA2IBJ 34,545- 291-47-A-29
K2LMX 30,660- 292-42-A-23
K2DJD 27,135- 202-54-A-13
K2HVS 23,625- 177-54-A-21
W2UK 23,085- 162-57-A- -
W2QHQ 19,450- 196-40-A-34
WA2FVT 15,050- 156-40-A-26
K2PKK 9030- 105-43-B-10
W2KAT 8400- 112-30-A-17
K2SSB 7711- 100-31-A-10
W2FEB 5977- 70-43-B- 4
K2UZJ 5906- 68-35-A- 3
WA2KQK 4388- 66-27-A-14
WA2JZM 3075- 63-20-A-18



The highest W2 code-enumeration originated at this handsome console. Using a 4-65A and antennas galore (remember last year?), Bob made the 200,000 mark—this is the N.L.I. home of K2DGT.

WA2KKP 2840- 72-16-A-18
K2YMM 2050- 42-20-A-14
K2HWI 1260- 40-14-A- -
W2SJR 618- 19-13-A- 5
K2GWN 2- 1- 1-B- 1
W2TOP (W2TOP, WA2CUZ)
18,448- 160-47-A-22

Western Pennsylvania

W3UGV 53,120- 333-64-A-23
W3GJY 52,675- 301-70-A-23
W3YDK 51,675- 320-65-A-21
W3NCF 48,180- 330-73-B-27
W3KQD 36,685- 253-58-A- -
W3LMM 35,952- 321-56-B-13
W3RFX 17,596- 166-53-B- -
W3TFI/3 13,395- 141-38-A-10
W3NUG 13,325- 130-41-A-12
W3NEM 12,488- 185-27-A-17
K3IGP 10,290- 99-42-A-23
W3IDO 5760- 90-32-B-18
W3OEO 5475- 74-30-A- 9
W3EFW 3920- 56-28-A-12
K3KMO 1568- 33-19-A- 2
W3MLN 990- 22-18-A- 4
K3HUO (4 oprs.)
59 590- 413-59-A-40

CENTRAL DIVISION

Illinois

W9NPC 151,375- 865-70-A-36
K9KDI 146,548- 803-73-A-40
W9ZAB 133,408- 731-73-A-30
K9KYR 133,000- 761-70-A-36
W9ZYD 127,750- 706-73-A-35
W9RCJ 116,795- 658-71-A-25
W9CLH 115,996- 658-71-A-40
W9IPF 107,730- 599-72-A-38
W9PNE 105,696- 737-72-B-33
W9FVT 105,000- 600-70-A-28
W9AMU 104,940- 548-72-A-32
K9SIO 97,728- 631-62-A-34
K9OTB 90,976- 500-73-A-29
K9PUQ 90,000- 563-64-A-38
K9IND 83,425- 470-71-A-31
K9OVI 83,070- 488-71-A-35
W9ARV 81,090- 455-72-A-31
W9LNQ 73,485- 414-71-A-24
K9DWG 69,530- 410-68-A-33
W9HPG 52,140- 316-66-A-33
K9RHN 50,960- 365-56-A-31
W9ZSQ 46,578- 302-62-A-26
K9UOV 38,188- 326-47-A- -
W9JJN 33,345- 258-52-A- 9
K9MMS 32,450- 220-59-A-27
K9PPW 31,740- 276-46-A-31
K9GSR 30,810- 239-52-A-18
K9PIM 29,430- 218-54-A-24
K9UFJ 28,000- 225-50-A-29
K9HLW 27,540- 230-48-A-34
K9UFO 26,430- 235-45-A-20
K9UCR 26,000- 208-50-A-30
K9QER 25,860- 221-48-A-13
W9ZEN 24,050- 185-52-A-18
W9NUU 23,983- 181-53-A-26
K9QPJ 22,440- 191-47-A-17
W9FNX 20,273- 153-58-A-12
W9WIO 19,136- 150-64-B- 7
K9LTL 19,081- 180-43-A-17
W9WFS 18,336- 191-48-B- 7
W9AA/9⁴ 18,216- 207-44-B-35
K9SYK 17,850- 170-42-A-19
W9YDQ 17,500- 140-50-A-13
K9ALP/9 17,150- 140-49-A-13
K9IYW 16,272- 113-72-B-26
K9OCU 15,480- 147-43-A-13
W9REC 14,973- 113-53-A-24
W9NLF 14,688- 125-47-A-18
W9UKY 14,300- 146-50-B-16
W9FKH 13,395- 94-57-A- 9
W9NJAK 11,890- 116-41-A- 5
W9EIH 10,530- 108-39-A-14
W9AGM 10,250- 100-41-A- 5
K9IKI 10,045- 145-28-A-20
W9IEU 9528- 103-37-A- 8
W9YYG 9360- 96-39-A- 5
W9VOX 9000- 100-36-A-12
KN9ZJK* 8100- 113-30-A-37
K9KUN 7479- 98-31-A-19
W9OIJ 6800- 80-34-A- 5
K9UCG 6581- 102-27-A-18
W9TOI 6435- 99-26-A-15
W9KDH 6090- 85-29-A-22
KN9VWC 5520- 73-32-A-23
K9IWS 4134- 80-26-B-14
K9QJS 4025- 70-23-A-18
K9QVD 3956- 108-15-A-13
K9QCK 3570- 84-16-A-20
K9UFU 3476- 53-27-A-12
KN9VLZ 2940- 57-21-A- 9
W9BUN 2500- 40-25-A- 7
W9FDY 2473- 43-23-A-10
K9QLD 1625- 50-13-A-14
W9EZV 1520- 32-19-A- -
K9ISP 1470- 42-14-A- 3
K9VBS 1283- 57- 9-A- 9
W9YNK 1283- 57- 9-A- 6
W9ACS 845- 26-13-A- 2
K9WVD 375- 30- 5-A- 8
KN9VKC 375- 18-12-A-29
K9MDM 280- 14- 8-A- 1
K9IYV 210- 21- 4-A- 5
W9YAC 180- 18- 5-B- 3
K9SGY 158- 9- 7-A- -
K9JIN 3- 1- 1-A- -
K9KIC 2- 1- 1-B- -
W9WBY (K2MWK, WA2BEX)
127,945- 720-72-A-14
K9CJU/9 (6 oprs.)
56,575- 367-62-A-29
K9RKU (K9s RKU TFB, W9-TAX) 21,450- 165-52-A-23
K9SGD (K9SGD, KN9s VGT ZJW) 18,743- 153-49-A-29
W9OKV/9 (12 oprs.)
11,506- 136-35-A- -
K9TXK (K9s SLK TXK)
5293- 74-29-A-12

Indiana

W9IOP 259,424-1424-73-A-38
K9RFW 102,565- 562-73-A-34
K9UHH 91,874- 549-67-A- -
W9IVZ 76 160- 448-68-A-32
K9OET 72,000- 450-64-A-29
K9TZH 50,781- 317-65-A-33
K9UWA 50,065- 323-62-A-39
K9ICG 47,408- 302-63-A-25
W9CNG 33,333- 199-67-A-24
K9UKM 32,038- 234-55-A-29
K9RMQ 28,333- 223-51-A-31
K9EGM 27,163- 206-53-A-17
K9KRN 19,619- 183-43-A-17
K9ELE 15,170- 148-41-A-12
K9MAN 6078- 95-26-A- 7
W9YDP 4900- 70-28-A-15
K9GCE 4661- 61-33-A-12
K9MNJ 135- 9- 6-A- 1
W9YB (12 oprs.)
111,559- 629-71-A-40
K9QWT (4 oprs.)
42,624- 282-61-A-39

Wisconsin

W9RQM 164,010- 924-71-A-37
W9QQQ 101,835- 559-73-A-32
W9DYG 90,300- 516-70-A-32
K9ELT 69,173- 401-69-A-17
W9LVR 64,980- 361-72-A-12
K9JXW 62,601- 417-61-A-27
K9DAF 54,960- 348-64-A-30
K9UCX 54,103- 323-67-A-19
W9VZG 47,880- 309-63-A-18
W9EBC 47,750- 382-50-A-24
W9KXK 45,360- 282-72-A-24
W9NUW 40,820- 310-53-A- -
W9SCZ 40,575- 271-60-A-33
K9ENB 36,720- 216-68-A-28
K9KGC 35,674- 233-63-A-36
K9LWV 35,191- 300-47-A- -
W9UUU 33,750- 250-54-A-17
K9EQQ 31,710- 227-56-A-29
K9HFR 29,435- 203-58-A-25
W9CBE 29,375- 250-47-A-18
W9MBF 27,812- 205-68-A-24
W9MDG 26,460- 210-63-B-22
K9KBI 25,990- 230-46-A-20
K9WII 20,800- 161-52-A-19
W9GRF 20,623- 113-73-A-11
K9WWD 15,925- 182-35-A-30
K9QRQ/9 15,393- 131-47-A- 7
K9GSC 15,040- 160-47-B-20
K9GDF 14,620- 138-43-A- 7
W9LSV 13,800- 120-46-A-12
K9OPF 13,420- 122-44-A-10
W9QGR 13,388- 119-45-A- 6
W2MTA/9 11,200- 160-35-B- 6
W9RKP 11,200- 140-40-B- 7
W9SIE 11,121- 109-41-A-18
W9EDX 9900- 90-44-A- 8
KN9WRD* 6188- 90-30-A-22
W9FXA 5940- 88-27-A- 7
W9JCC 5625- 90-25-A- 8
K9TID 5600- 70-32-A-10
K9RZB 5000- 81-25-A-15
W9QVZ 4590- 54-34-A- 6
KN9XTJ 4538- 87-22-A-15
K9GDH 4088- 58-30-A-15
K9BOB 3713- 50-30-A- 6
K9JZE 3420- 73-19-A-11
K9OHR 3350- 67-20-A- 9
W9WUQ 2228- 41-22-A-16
K9QDA 2175- 44-20-A- -
W9VSO 2100- 42-20-A- 6
K9OCO 2070- 46-18-A- 6
K9UTQ 1580- 44-16-A- 6
KN9VSO 1333- 41-13-A-12
KN9YDY 1200- 46-12-A-12
KN9ZVC 990- 40-11-A-13
KN9ZMF 908- 38-11-A-35
W9KQD 870- 30-12-A- 2
W9UDK/9 683- 22-13-A- 1
W9LTD 564- 21-11-A-10
KN9VER 135- 10- 6-A- 8
KN9VVQ 125- 10- 5-A- -
K9OVZ 28- 7- 2-A- 2
W9CHD 3- 1- 1-A- 1
W9YT (4 oprs.)
50,863- 323-65-A-18
K9ANJ (2 oprs.)
11,340- 109-42-A-16
W9HHX (K8KDA, K9GDF)
2940- 42-28-A- 3
W4VRD/9 (W4VRD, W9AIW)
23- 3- 3-A- 1
W9SZR/9 (2 oprs.)
3- 1-1-A- 1

DAKOTA DIVISION

North Dakota

KØMPH 83,920- 532-64-A-35
KØQWY 79,613- 485-66-A-31

KØIVQ	62,155-	402-62-A-26
KØOSV	42,848-	300-58-A-28
KØOSW	39,971-	282-57-A-28
KØUXS	21,000-	470-50-A-16
KØRHE	15,900-	134-48-A-19
KØRSA	8740-	98-38-A-13
WØVST (KNØAIV, WØVST)	37,125-	283-55-A-33

South Dakota

WØSMV	107,448-	816-66-B-36
KØTDW	5774-	80-31-A-11
WØRRN	630-	21-15-B- 2
KNØALT	18-	3- 2-A- 1

Minnesota

WØYCR	145,818-	800-73-A-30
WØJPH	132,669-	821-65-A-40
KØRHO	116,440-	666-71-A-26
KØIJL	56,700-	381-60-A-24
KØSNG	53,625-	330-65-A-18
KØOGH	35,230-	273-52-A-28
KØAOU	34,088-	256-54-A-26
KØUKU	33,188-	225-59-A-40
KØWNV	29,470-	212-56-A-27
WØDAK	21,866-	172-51-A-12
WØRYM	10,353-	103-41-A- 9
WØYAC	9100-	94-40-A-18
KØVTG	3493-	66-22-A- 8
KØDRZ	1170-	26-18-A-13
KNØBPO	1056-	33-13-A- 3
WØKUI	978-	23-17-A- 9
WØNIDA	5-	2- 1-A- 1
KØDHH (KØs DHH RCF)	119,428-	714-67-A-35
KØEVS (KØs EVS OTH)	15,990-	333-66-A-23

DELTA DIVISION

Arkansas

K5WTB	101,430-	600-69-A-30
W5CAN	73,209-	556-69-B-40
K5ALU	62,969-	400-65-A-36
W5RIT	22,230-	172-52-A-17
K5ALQ	16,445-	178-44-A-33
K5VOL	16,445-	152-44-A-19
K5VON	750-	21-15-A-10

Louisiana

K5ESW	179,945-	1026-73-A-36
W5BHK	155,855-	856-73-A-39
W5EBR	100,725-	598-68-A-40
W5BAU	97,554-	691-71-B- –
K5VJT	78,919-	532-61-A-19
K5WTT	57,931-	360-65-A-35
K5SGO	36,830-	254-58-A-35
K5IGW	15,200-	160-38-A- –
K5MHG	14,681-	140-45-A-17
K5ZBV	12,389-	112-47-A-15
W5TL	4495-	78-29-B-32
W5CPD	2750-	44-25-A-16
KN5DSL	926-	33-13-A- 7
KN5DYD	454-	20-11-A- 6
K5WMN (K5WMN, KN5DQE)	17,038-	156-47-A- –

Mississippi

K5QNF	203,488-	1117-73-A-36
K5IIN	146,016-	1014-72-B-38
W5RMF/5	25,080-	209-60-B-23
W5CLS	21,263-	207-42-A-18
K5CFP	9435-	111-34-A-21
K5HFM	5974-	89-27-A-10

Tennessee

K4PUZ	156,485-	859-73-A-40
K4AMC	101,558-	625-68-A-40
K4LTA	100,730-	720-70-B-32
W4SQE	68,340-	408-67-A-40
K4ZWR	55,900-	344-65-A-40
K4AKP	55,476-	414-67-B-28
K4OSY	52,808-	349-61-A-35
K4GMR	30,805-	205-61-A-21
W4IQU	21,600-	160-54-A-15
K4KYV	19,950-	205-42-A-26
W4HOS/4	16,445-	134-52-A- 6
K4ESW	8750-	100-35-A-11
KN4WPO	788-	29-14-A-13
KN4ZIN	385-	15-11-A- 7
W4OGG	50-	5- 4-A- –

GREAT LAKES DIVISION

Kentucky

W4CVI	152,753-	838-73-A-37
K4KWQ	61,050-	370-66-A-29
K4QPJ	48,128-	314-62-A-32
K4UQV	45,283-	310-59-A-37
K4UQU	30,258-	261-47-A-37
K4TVC	20,103-	229-43-A-22
K4ZQR	1943-	37-21-A- 7
K4EMX	1758-	40-19-A-15
W4OMW (W4s OMW YFA)	86,250-	500-69-A-30

Michigan

K8QJH	119,538-	662-73-A-38
K8IPR	91,725-	616-60-A-33
W8VPU	91,288-	545-67-A-34
W8DUS	90,300-	654-70-B-30
W8PAW	88,825-	524-68-A-27
W8PXA	88,275-	535-66-A-31
K8NHC	87,615-	531-66-A-34
K8HTZ	81,656-	504-65-A-31
K8GHKN	73,281-	458-67-A-37
W8DM	70,990-	458-62-A-28
W8UMX	65,660-	490-67-B-34
W8MPD	60,206-	371-65-A-37
W8PVI	54,293-	381-57-A-30
K8QEX	53,433-	324-67-A-29
K8GJD	49,520-	314-64-A-23
K8PCU	44,683-	293-61-A-28
W8CXS	44,080-	304-58-A-31
K8OCO	40,321-	333-61-B-24
K8DVL	37,125-	275-54-A-18
W8MKM	36,193-	234-62-A-21
K8HWW	29,870-	207-58-A-23
W8LXJ	26,315-	277-38-A-26
K8BGZ	21,675-	170-51-A-29
W8KTR	20,040-	168-48-A-25
W8FX	19,148-	207-37-A-19
K8EPZ	19,100-	201-40-A-11

K8QLL	18,550-	140-53-A-20
K8ERO	17,910-	199-45-B-36
W8TRN	12,825-	114-45-A-12
W8YBH	12,375-	115-45-A-24
K8HLR	12,334-	152-33-A-14
K8KPU	12,188-	125-39-A-13
W8SPO	9750-	100-39-A-16
K8ODK	6375-	102-25-A-10
K8LZF	6313-	101-25-A-10
W8HAN	4340-	70-31-B- –
W8EGI	4125-	55-30-A- 3
K8MJZ	3500-	50-28-A- 4
K8DJO	3150-	60-21-A- 5
W8QQZ	2726-	47-29-B- 6
K8RWL	2363-	48-21-A- 9
K8TJC	2126-	41-21-A- 7
K8KQV	2015-	63-13-A-10
KN8TLL*	1530-	48-17-A-15
K8QKT	1065-	36-12-A-11
K8CVV	1100-	28-16-A- 7
KN8RQO	975-	31-13-A- 8
K8UFT	690-	23-12-A- 2
KN8TAH	326-	16- 9-A-13
KN8TOB	281-	16- 9-A- 3
W8IVK	200-	10- 8-A- 1
K8AVB	80-	8- 4-A-10
W8GDW (W8s GDW JUV)	15,132-	194-39-B-11

Ohio

W8OYI	183,143-	1005-73-A-37
W8SM	162,750-	930-70-A-40
W8EV	160,020-	889-72-A-38
W8QHW	155,034-	850-73-A-38
W8NBK	133,000-	760-70-A-36
W8ETU	128,700-	715-72-A-37
K8HGT	122,500-	700-70-A-33
W8ZJM	114,793-	635-73-A-30
W8RSW	154,425-	872-71-A-37
K8MITI	114,480-	636-72-A-31
W8YPT	101,880-	567-72-A-34
K8HFJ	95,445-	606-63-A-40
K8IPS	84,405-	500-68-A-38
W8CJN	81,428-	517-63-A-40
K8SMA	81,040-	512-64-A-36
K8PNU	79,888-	460-70-A-38
W8GFH	79,188-	454-70-A-39
W8CEA	79,060-	472-67-A-33
W8YCP	77,580-	432-72-A-22
K8KNT	75,190-	412-73-A-35
K8AZQ	72,135-	460-63-A-25
K8NPD	71,775-	500-60-A-38
W8DWP	68,765-	406-68-A-31
W8VQI	66,056-	408-65-A-33
W8GAC	64,400-	463-56-A-36
W8FGX	63,840-	533-60-B-15
K8KFP	63,483-	381-67-A-36
K8HTM	60,468-	405-67-A-40
W8IDM	58,541-	350-67-A-38
K8CFH	57,505-	371-62-A-22
K8DDG	56,788-	402-59-A-39
K8BXU	53,550-	340-63-A-36
W8UEX	53,250-	300-71-A-26
W8BOJ	52,998-	367-58-A-13
K8EKG	52,718-	394-54-A-23
K8EEN*	49,831-	301-67-A-23
K8HVT	48,205-	311-62-A-15
K8EGY	46,500-	300-62-A-23
K8NEB	42,750-	300-57-A-24
W8NMR	40,160-	251-64-A-18
K8PMG	33,460-	240-56-A-23
K8DJD	33,235-	289-46-A-34
W8LUZ	32,130-	204-63-A-19
W8VZE	31,778-	225-57-A-23
W8AL	31,196-	266-47-A-29
K8PLG	30,680-	208-59-A-30
K8TJW	28,855-	199-58-A-39
W8ENH	28,800-	180-64-A-19
W8STR	27,445-	252-44-A-17
K8RFU	27,430-	211-52-A-24
K8VDV	25,970-	196-53-A-18
K8BXT	23,940-	179-56-A-21
W8DNC	22,950-	180-51-A-22
W8MXO	20,859-	206-51-B-20
W8UPH	20,540-	158-52-A- 9
W8KMF	20,235-	142-57-A-38
W8APC	20,224-	159-64-B-12
W8MOH	18,225-	162-45-A-27
W8EXI	16,913-	165-41-A-15

K8RYU	14,981-	129-47-A-28
W8FIB	14,965-	146-41-A-16
W8TTJ	14,570-	124-47-A-10
W8RJH	13,018-	127-41-A-24
W8ELB	12,000-	120-40-A-16
K8VCW	11,275-	110-41-A-11
K8IYD	11,081-	100-45-A-10
W8JOB	10,800-	108-38-A-12
W8JUP	10,609-	104-41-A-11
W8MEI	9213-	98-47-A- –
K8PUR	8640-	102-32-A-17
W8KFC	8025-	107-30-A-16
W8AJH	7178-	87-33-A- –
W8DAE	7118-	110-26-A- –
W8GMK	6475-	70-37-A- 8
W8NPF	6394-	78-33-A-13
W8OKT	6365-	69-38-A- –
W8JIN	6120-	102-30-B- 2
W8IBX	6000-	100-24-A- 3
K8MGT	5920-	74-32-A-11
K8VSB	5440-	72-32-A- 8
W8DMV	4930-	68-29-A-13
K8QOJ	4633-	57-34-A-10
K8PVK	4070-	74-22-A-12
W8BUM	4000-	50-40-B- 6
W8ZLH	3843-	53-29-A- 7
K8DXZ	3806-	73-21-A- 8
W8VDF	3750-	51-30-A-13
K8RMK	3734-	53-29-A- 5
KN8INP*	3150-	67-15-A-38
K8HWZ	1573-	41-17-A- 8
K8BFZ	1470-	42-14-A-11
KN8UEI	1424-	36-17-A- 8
K8KMY	1140-	38-12-A- 8
K8JSM	495-	18-11-A- 7
K8OBG	349-	17- 9-A- 5
K8HBN	225-	10- 9-A- 1
KN8TVC	201-	13- 7-A-11
KN8VCR	94-	19- 3-A-11
K8PDF (K8s NYM PDF PFG)	24,440-	191-52-A-32
K8NLT (K8s JGU JYO NLT)	11,096-	139-33-A-13
W8YKO (K8DGH, W8YKO)	1520-	33-19-A- 6

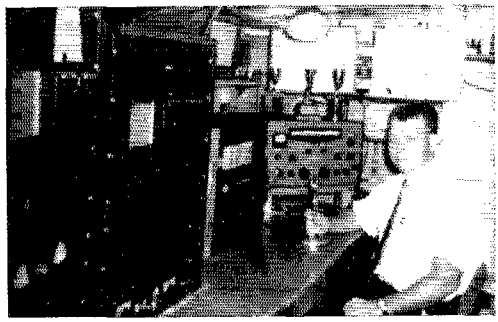
HUDSON DIVISION

Eastern New York

K2UPD	177,500-	1000-71-A-30
W2VCB	94,358-	547-69-A-35
WA2OJD	65,883-	361-73-A-27
W2TFR	52,635-	363-58-A-34
K2MBU	48,013-	422-46-A-36
W2HES	32,760-	273-48-A- –
K2YDD	26,000-	200-52-A-18
W2RZK	22,313-	262-34-A-33
W2PKY	22,000-	176-50-A-21
K2BIG	19,688-	175-45-A-20
K2OJJ	17,544-	205-43-B-19
K2QIX	3360-	64-21-A- 5
WA2EFY	2763-	67-17-A-10
WV2KHV	1663-	35-19-A-10
WV2OCW	523-	19-11-A- 8
K2LZW	125-	10- 5-A- 1
K2UAN	120-	8- 6-A- 4
W3TXL/2 (4 oprs.)	31,360-	224-56-A-31

N. Y. C.-L. I.

K2DGT	201,995-	1138-71-A-40
W2AYJ	176,660-	968-73-A-37
K3CIO/2	115,109-	655-71-A-40
K2ZYR	111,780-	621-72-A-36
K2IAJ6	108,275-	610-71-A-38
W2CWD	107,954-	648-67-A-33
W2BNS	106,605-	618-69-A-37
WA2GWF	104,281-	589-71-A-40
WA2CZG	103,870-	611-68-A-34
K2IYC	83,655-	509-66-A-38
K2HIY	75,024-	521-72-B-37
W2DID	74,245-	479-62-A-39
K2OFD	70,505-	478-59-A-40
K2UQT	69,225-	428-65-A-22
WA2BQK	66,360-	489-56-A-37
W2FCQ	62,098-	421-59-A-23
WA2EFN	61,685-	343-73-A-30
W2NCG	56,100-	408-55-A-34
WA2GMB	54,900-	360-61-A-31
WA2KSD	48,525-	329-60-A-35
W2GKZ	44,625-	298-60-A-23
WA2FNA	40,354-	320-51-A-30
W2KOY	35,636-	374-52-B-24
WA2FQN	38,122-	230-71-A-40
K2JQO	38,090-	293-51-A-25
K2UFT	37,170-	295-63-B-19
W2JBQ	36,300-	303-48-A-16
K2JOK	36,045-	267-54-A-25
W2TUK	32,500-	260-50-A-11
W2OBU	32,175-	330-39-A-19
K2CMY	31,800-	240-53-A- –
WA2IKL	30,635-	227-57-A-31
W2DUN	29,194-	260-45-A-34
W2YSL	29,133-	274-43-A-20
WA2BWS	29,081-	261-45-A-21
W2OOT	28,875-	242-50-A- –
WA2DES	28,178-	221-51-A-29
WA2CWY	27,143-	260-43-A-32
WA2BWO	25,000-	250-40-A-25
W2DUS	23,563-	145-65-A-20
K2CTK	21,000-	200-42-A-23
W2IIL	20,663-	146-57-A-25
W2UAL	20,000-	200-50-A-21
WA2FMS	18,544-	173-43-A-25
K2IVE	17,281-	200-35-A-19
K2TPZ	13,125-	177-30-A-25
W2AIZ	11,050-	170-26-A-15
W2UNS	10,800-	160-27-A-11
WA2DHF	10,050-	201-20-A-25
K2YOR	8200-	82-40-A- –
WA2GGB	7830-	109-29-A-19
WA2ITR	6983-	147-19-A-19



K6EVR has needed little introduction since his impact on ham radio back in 1954. Used in the phone portion of the contest was a Viking II, not shown in the picture. Ron's final score was 3rd highest in the *entire* competition!

K2BH 6825- 78-35-A- 8
W2BOT 5250- 75-28-A-13
WA2CXO 5075- 70-29-A-14
WA2KSJ 4923- 90-22-A- –
WA2BNK 4763- 127-15-A-15
WA2IMH 4590- 77-24-A-14
K2GV 4140- 72-23-A- 9
WA2KSK 4085- 109-19-A-18
W2HPO 3150- 53-24-A-13
WA2EFU/2 2950- 60-20-A-10
W2IHE 2862- 53-27-B- 7
WA2CXA 2750- 56-20-A-17
K2KHK 2678- 63-17-A- 6
K2UVV 2651- 51-21-A- 2
WA2IKN 3441- 51-21-A-18
WA2GMG 1610- 51-14-A- 5
WA2LAN 800- 32-10-A- 7
W2WAS 608- 27- 9-A- 3
W2KVL 396- 18-11-B- 2
WA2HMM 308- 21- 6-A- –
WA2HLZ 220- 13- 8-A- 6
WA2GLK 195- 13- 6-A- 8
WV2JIS 188- 15- 5-A- 6
WV2JSR 188- 18- 5-A- 8
K2PNK 30- 4- 3-A- 2
WA2BEJ 4- 2- 1-B- 1
WA2DDW 4- 2- 1-B- –
W2YHP 3- 1- 1-A- 1
W2PVQ 3- 1- 1-B- 1
WA2HKZ 2- 1- 1-B- –
W2HJ (7 oprs.)
115,515- 680-68-A-39
WA2KCM (WA2s KCH KCM)
11,674- 151-33-A-36

Northern New Jersey

W2DMJ 172,530- 965-72-A-39
W2GND 153,720- 855-72-A-40
W2GGE 151,384- 831-73-A-40
W2CQB 129,600- 812-64-A-40
W2TSL 100,480- 629-64-A-35
W2NNL 97,500- 604-65-A-38
W2GSY 75,520- 512-59-A-35
K2BJA 70,898- 411-69-A-33
W2LRO 63,938- 388-66-A-29
W2TPJ 47,568- 360-53-A-18
W2HDT 47,411- 405-47-A-29
W2DRV 45,100- 328-55-A-16
W2LHL 43,123- 368-47-A-31
WA2KKH 40,150- 292-55-A-30
K2BMI 38,870- 339-46-A-25
W2EHN 27,319- 233-47-A-21
W2OPE 27,024- 282-48-B-18
W2EWZ 23,495- 242-39-A-22
W2NEP 22,736- 195-47-A-14
WA2FVQ 21,263- 190-45-A-20
WA2EDG 20,475- 210-39-A-16
K2SBW 18,275- 170-43-A-25
W2COG 17,710- 161-44-A-28
W2IBZ 16,885- 156-44-A-11
K2MFF 15,698- 159-42-A- –
K2ULB 15,064- 155-39-A-23
WA2OTJ 12,294- 110-45-A- 9
WA2JHQ 11,500- 185-25-A-17
WA2EJZ 8610- 144-24-A-15
W2TWC 8573- 127-27-A- 6
W2FSL 8050- 115-35-B-18
W2UFQ 7469- 120-25-A-10
WA2CWA 5865- 102-23-A-17
W2CVW 5400- 101-27-B- –
W2BVE 5100- 103-20-A-13
W2ABL 4845- 58-34-A- 4
W2WW 4253- 63-27-A- 5
WA2IFS 4146- 54-31-A-11
K2BHQ 3655- 86-17-A- 5
W2VMX 3780- 72-24-A- 6
WA2EQT 2415- 70-14-A- 9
K2PTT 2340- 66-14-A- 5
W2ZVW 1955- 34-23-A- 2
WV2NPI 1725- 46-15-A-23
WA2JUB 1473- 31-19-A- 5
K2VZJ 1260- 42-12-A- 9
WV2KRJ 894- 30-13-A- 7
WA2AYA 300- 12-10-A- 1
WA2GUB 263- 15- 7-A- 2
WV2OCL 166- 10- 7-A- –
WV2LLU 150- 15- 6-A- 7
W2NIC 20- 4- 2-A- 1
K2SFQ 11- 3- 3-A- 1
W1DNK/2 4- 2- 1-A- 1
K2GKB 3- 1- 1-A- –
WA2CCF 2- 1- 1-B- –
WA2IDM (W2GIX, WA2IDM
50,400- 320-63-A-28
K2EKM (K2EKM, W2MPP)
39,598- 340-47-A-34
WV2OXT (WV2s KRC OXT)
245- 14- 7-A- 7

MIDWEST DIVISION

Iowa

K8SXA/0 172,280- 944-73-A-27
K0GXR 149,713- 864-70-A- –
W0NCS 140,981- 774-73-A-34
W0CXN 99,180- 551-72-A-34
W9EQN 90,865- 541-68-A-35
K0UAF 80,800- 505-64-A-32
K0AZJ 75,735- 459-66-A-31
K0JRT 67,113- 431-65-A-27
K0QAI 63,360- 384-66-A-31
W0DSP 46,649- 279-67-A-27
W0B8Y 43,155- 274-63-A-23
K0AUU 36,400- 260-56-A-35
K0UAE 32,889- 236-57-A-33
K0QWM 18,389- 157-47-A-28
K0VEJ 5619- 78-29-A-13
W0IO 4088- 56-30-A- 5
KN0BMH* 2128- 37-23-A-13
W0BGB 1575- 35-18-A- –
KN0ASI 1280- 32-16-A- 8
KN0AAR 1181- 36-15-A-27
K0YHN 994- 28-15-A-11
K0ASW 850- 34-10-A- 8
K0VQM 523- 19-11-A-10
KN0YVZ 60- 6- 4-A- 1

Kansas

W0DEP 115,665- 701-66-A-38
W0BYV 73,920- 560-66-B-32
K0HLC 61,076- 402-61-A-22
K0BHM 48,190- 317-61-A-21
K0QEC 38,740- 300-52-A-32
W0LTO 23,296- 215-56-B-23
K0IWK 20,410- 157-52-A-35
K0PFV 15,960- 155-42*-A-33
K0YGR 4905- 56-36-A-11

Missouri

W0FLN7 119,093- 711-67-A-40
W0KCG 100,403- 609-66-A-39
W0ARO 98,624- 736-67-B-40
W0MCX 83,918- 501-67-A-40
K0UDQ 56,865- 341-68-A-37
K0UYO 31,320- 216-58-A-22
K0VSH 20,028- 194-61-A-19
K0QCQ 25,578- 265-49-B- 8
W0DCD 24,875- 199-50-A-18
K0QMY 18,515- 161-46-A-14
K0DEQ 17,820- 138-54-A-16
K0VBT 13,330- 125-43-A-26
W0KIK 9405- 114-33-A-20
W0JFC 7659- 104-37-B-20
W0NZW 5981- 73-33-A- 8
K0VUK 750- 27-12-A- 7
K0CQA 100- 8- 5-A- 1
W0EEE (9 oprs.)
95,630- 665-73-B-39
K0AXU (K0s ECK JPL TKT)
49,010- 432-58-B-30
K0VBU (K0s VBU VXU)
24,681- 180-55-A-31
W0QEV (K0CQA, W0NZW)
2153- 41-21-A-10

Nebraska

W0NYU 125,038- 715-70-A-37
W0RDN 107,840- 674-64-A-37
K0QFK 76,803- 498-62-A-39
K8EET/0 75,990- 440-69-A-33
W0WLO 55,053- 362-61-A-18
K0YIZ 5653- 69-34-A- –
K0TCD 4410- 63-28-A- 9
KN0YZP 350- 16-10-A- 6

NEW ENGLAND DIVISION

Connecticut

W1DGL8 100,500- 608-67-A-37
K1HTV 99,579- 597-67-A-38
W1MHF 87,465- 511-68-A-21
W1TS8 77,198- 424-73-A-25
W1BDI8 62,913- 360-70-A-36
W1TX 61,548- 446-69-B-26
W1CKA 49,608- 349-72-B-24
W1FTX 42,320- 266-64-A-17
W1BIH 41,536- 357-58-B-15
W1ICP8 35,778- 267-62-B- –
W1ILV 25,956- 309-42-B-23
K1GUD 25,935- 250-42-A-18
W1ZJJ 21,448- 193-56-B-21
W1QAK 21,263- 203-42-A-15
W1AW8 9 20,076- 239-42-B- 8
K1EAO 16,005- 149-44-A-19
W1NJM8 11,954- 139-43-B- –
K1KRY 11,000- 138-32-A-22
W1INB 9450- 100-40-A-16
W1TUW 8209- 100-33-A- 4
W1ANO 6784- 102-27-A-15
W1LAS10 4563- 73-25-A- 8
K1ACQ 3515- 75-19-A-12
K1MZG 3500- 70-20-A- 9
K1MPU 3250- 66-20-A-15
W1RFJ 2800- 70-16-A- 7
K1ILJ 2380- 56-17-A- 7
K1HOD 2325- 49-20-A-11
W1YYM8 1148- 27-17-A- 1
KN1OAV 1058 24-18-A-14
KN1PQS 784- 31-11-A-24
W1EEW 500- 25- 8-A- 2
K1MJC 88- 7- 5-A- 3

Maine

W1SWX 50,250- 300-67-A-18
K1MZB 14,773- 156-38-A-17
W1GKJ 2613- 55-19-A- 5

Eastern Massachusetts

K1DIR* 108,000- 600-72-A-37
W1AQE* 108,000- 600-72-A-37
W1JSM 80,316- 453-71-A-28
K1CUD 57,420- 350-66-A-35
W1PTR 51,460- 332-62-A-16
WT1QS 14,800- 402-56-B-30
W1NJL 13,650- 292-60-A-17
K1JJW 10,365- 309-54-A-14
W1JDS 36,295- 238-61-A-34
K1PNN 33,852- 275-62-B-26

* Tied for Section Award.

W1PLJ 33,278- 230-58-A-34
K1MHM 18,813- 215-35-A-18
K1MEM 17,220- 164-42-A-15
K1MOD 11,563- 125-37-A-18
K1KKS 11,115- 116-39-A-14
K1BYL 10,585- 146-29-A-11
K1BIF 10,340- 120-44-B-26
W1BOD 9522- 69-69-B-17
W1PH 9420- 157-24-A- 9
K1KPS/1 7200- 90-32-A-12
K1IUS/1 6360- 107-24-A- –
K1MVN 4305- 82-21-A-13
K1DPB/1 3713- 55-27-A-18
W1CMW 1758- 37-19-A- 9
W1IEF 820- 41- 8-A- 6
W1AFU 266- 19- 7-B- 3
W1MX (9 oprs.)
86,496- 637-68-B-28
K1AIO (2 oprs.)
6626- 86-31-A-11

Western Massachusetts

W1EOB 157,534-1079-73-B-35
W1JYH 153,884-1054-73-B-32
W1EZD 56,100- 425-66-B-35
K1IJU 44,100- 315-56-A-30
W1AZW 31,675- 181-70-A-20
K1OOV 29,648- 201-59-A-25
K1ISW 22,828- 199-46-A-24
K1LNM 14,260- 124-46-A-27
K1KDP 12,550- 127-40-A-21
K1ITU 11,094- 130-43-B-21
K1MRB 5653- 70-34-A-16
K2PHF/1 813- 25-13-A- 1
K1LNC 40- 4- 4-A- 1

New Hampshire

W1ET12 97,554- 687-71-B-36
W1IJB 80,233- 479-67-A-32
K1NBN 76,725- 465-66-A-27
K1FDP13 68,160- 391-71-A-30
W1ZQR 43,500- 300-58-A-33
K1CXP 26,699- 205-53-A-21
K1KRP 13,168- 115-46-A-15
K1PMY 11,270- 124-46-B-27

Rhode Island

K1IFE 35,338- 257-55-A-22
K1BBK 26,379- 225-47-A-17
K1LPL 23,063- 225-41-A-38
K1LDK 11,275- 112-41-A-25
W1SXX 6650- 76-35-A-12

Vermont

W1QMM 44,019- 329-67-B-23

NORTHWESTERN DIVISION

Alaska

KL7KG 69,125- 395-70-A-23
W9KLD/KL7
3348- 62-27-B- 4
KL7AOL 88- 7- 5-A- 1

Idaho

W7ZN 98,825- 750-67-B-40
K7GTK 49,319- 305-65-A-40
W7WMO 46,699- 300-62-A-34
K7GJZ 26,993- 184-59-A-28
K7HLR 18,448- 160-48-A-32
K7CPC 16,450- 142-47-A-18
W7ZRF 6360- 106-30-B-26

Montana

W7HAH 76,075- 453-68-A-22
K7CTI 55,590- 328-68-A-26
W7EWR 41,020- 297-56-A-22

Oregon

W7JHA 113,334- 642-71-A-39
W7TDK 110,795- 667-68-A-39
K7ENA 86,800- 550-64-A-32
W7PLI 67,320- 415-66-A-31
W7AXJ 63,700- 370-70-A-40
K7HUW 52,054- 331-63-A-35
K7IWD 43,450- 316-55-A-37
W7IAQ 45,439- 300-63-A-33
K7MPR 36,344- 309-59-B-28
W7LT 36,295- 238-61-A-29
K7KCZ 21,794- 159-55-A-19
W7WHY 18,625- 152-50-A-21
K7KDC 10,226- 155-27-A-24
K7BDK 8415- 103-33-A-13
K7JBQ 4400- 80-22-A-26
K7GFH 3508- 61-23-A- 9
KN7MLO 630- 19-14-A-10

Washington

K7CHH 141,750- 810-70-A-39
W7AJS 105,311- 651-69-A-33
W7WIB 69,898- 451-62-A-37
K7HTV 67,680- 426-64-A-40
K7GPG 60,244- 386-63-A-39
K7HTZ 55,091- 378-59-A-40
K7JHA 54,600 403-70-B-29
K7KGP 54,366- 357-61-A-36
K7KPM 52,390- 345-62-A-32
W7IUS 51,040- 352-58-A-26
W7ZVY 49,916- 324-62-A-35
K7MFF 33,275- 230-60-A-28
K7IEY 34,935- 276-51-A-37
W7JC 34,589- 235-59-A-28
K7HSB 34,031- 253-55-A-26
W7IEU 32,256- 252-64-B-38
W7YFO 25,630- 234-55-B-21
K7EHV 22,515- 163-57-A-26
K7HPF 21,735- 192-46-A-23
K7EKY 16,273- 146-46-A-23
W7FZB 16,170- 154-42-A-18
W7GYF 12,303- 130-38-A- 9
WA2MMP/7
12,240- 146-34-A-21
W7AEA 10,534- 115-46-B- 7
W7MEA 6750- 100-27-A-10
W7TBR 5985- 86-28-A-17
K7DBU/7 5220- 72-29-A-20
K7INE 5075- 76-28-A- 6
K7IUT 4500- 60-30-A-10
K7JCA 4380- 73-24-A- 8
K7KDK 3870- 87-18-A-12
K7IAE 2713- 62-25-A-14
W3VXP/7 2243- 39-23-A- 5
K7IUZ 2180- 55-20-B-11
K7KXG 2114- 49-19-A- 8
K7GBW 1313- 36-15-A- 4
K7JNS 990- 34-12-A- 6
W7LGS 900- 46- 8-A- 7
W7CWN 875- 25-14-A- 5
W7PN 440- 22- 8-A- 4
W7WRT 358- 13-11-A- 1
K7LRS 120- 13- 4-A- 4
K7IUD 60- 8- 3-A- –
K7DTH (K7s DTH JZP)
40,343- 245-66-A- –
W7QBR (W7s QBR ZOI K9MUG)
11,960- 104-46-A-12
W7JHS (W7s ACA JH8)
2822- 84-17-B-10
KN7MXE (KN7s LXE MXE NJ1)
35- 7- 2-A- 3

PACIFIC DIVISION

Hawaii

KH6IJ 122,202- 837-73-B-39
KH6HAA 85,544- 632-68-B-35
KH6DVD 47,685- 291-66-A-29
KH6FAH14 40,800- 304-68-B-29
KH6CYB 24,830- 191-52-A-26
KH6IVG 21,938- 195-45-A-19
KH6DIG 15,750- 159-40-A- –
KH6DMU 4290- 72-24-A-11

Nevada

W7KEV 204,674-1127-73-A-40
K7KHA 86,044- 542-65-A-35
KN7LPF 563- 28-10-A- 8

Santa Clara Valley

W6YX15 185,968-1019-73-A-37
W6UTV 185,310-1030-72-A-37
W7MVQ 160,825- 920-70-A-36
K6VVA 113,750- 657-70-A-39
WA6BTN 80,000- 500-64-A-39
W6JKJ 70,883- 490-73-B-33
WA6AMW 65,960- 395-68-A-29
W6ASH 57,680- 412-70-B-22
W6KUW 48,140- 333-58-A-20
K6LRN 23,625- 175-54-A-27
WA6HZM 18,717- 184-51-B-20
K6RPB 13,566- 162-35-A-28
KN8SQN/6 1721- 43-17-A-29
K6BBF 128- 17- 3-A- 3

East Bay

W6GEB 93,500- 550-68-A-38
WA6ECF 86,625- 495-70-A-37
WA6BBJ 81,280- 518-64-A-32
W6MFZ 76,447- 571-67-B-31
WA6GIQ 22,591- 179-53-A-23
W6NBX 20,273 159-51-A-19
W6IPH 18,225- 135-54-A-12
K6UYK/6 17,825- 155-46-A- –
WA6LWS 10,950- 112-40-A-14
K2DNL/6 666- 21-13-A- 5

San Francisco

W6SIJ 107,985- 627-69-A-40
K6ANP 92,016- 648-71-B-39
WA6IVN 63,788- 405-63-A-30
K6JFY 52,080- 336-62-A-40
W6KON/6 43,819- 314-57-A-32
W6WLV 29,355- 209-57-A-31
W6YC 13,392- 140-48-B-12
K6EKC 3498- 54-33-B- 5
WV6MDY 538- 23-10-A- 9

Sacramento Valley

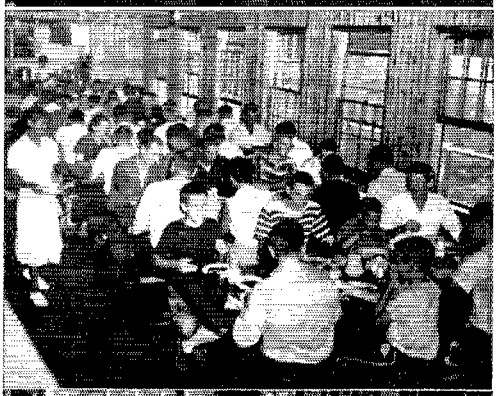
WA6GIS 66,463- 409-65-A-35
K6EIL 57,798- 380-61-A-37
W3FDX/6 18,370- 168-44-A-32
WV6MEK 1425- 42-15-A-15

San Joaquin Valley

W6BVM 88,560- 596-72-A-31
K6RTK 76,065- 464-66-A-32
K6OZL 74,195- 418-71-A-32
W6VPV 68,680- 508-68-B-36
WA6ETZ 28,855- 200-58-A-30
W6HYK 25,365- 178-57-A-17
WA6FKF 5321- 66-33-A- 9
WA6HUZ 3163- 57-23-A-10
WV6MWA 2280- 54-19-A-15
WA6OJC 1332- 37-17-B- 3
W6OXF 248- 11- 9-A- –
WV6MZQ 10- 2- 2-A- 2

(Continued on page 150)

A Summer Camp for Would-Be Hams



ATOP the Blue Ridge Mountains of North Carolina, at an elevation of 3800 feet, a unique radio camp drew 35 students from 16 states last year. It was a school for Novices and it was a huge success. In fact, it went over so well that applications are now pouring in for the 1961 camp.

The idea for this novel way of Novice training originated with Executive Secretary Carl Peters of the Gilvin Roth YMCA in Elkin, N.C. His "Y" operates Camp Albert Butler, 20 miles away, in the summer. For many years Camp Butler had drawn a capacity attendance of boys and girls for a variety of activities, including crafts, horseback riding, nature studies, sports, and so on. But last year Carl Peters had an even bigger idea. Himself an ardent ham (K4DNJ), he firmly believed that there were many beginners in radio over the country who would like to attend a cool, picturesque locale where they could obtain professional help in their hobby. He talked it over with his Y directors and they heartily approved.

It took persistence and confidence. It had to be a first-class operation or it would be "no go." So Carl started out right. He obtained a list of Novice and Technician applicants. He wrote them personal letters. Next he advertised in *QST*. After quite a tussle he wangled a promise from the FCC to send an examiner to the camp for final tests. The two-week course, with cabins and excellent meals furnished, drew its 35 students from age brackets of 11 to 65. In educational background, they ranged from the grammar grades to a retired college professor. There were a physician and a housewife, many teenagers, and some professional men. They were all after their General licenses.

You should have seen them. It was no time before antennas were strung over the "campus." Beep-beeps rang out all over the place and there were innumerable distant contacts. There was a general friendliness that one can find only among a group of dedicated hams such as those. Borrowing and trading of pieces of equipment went on constantly, as each student conducted his experiments.

The "profs" were James N. Thurston, W4PPB, of Clemson College, George M. Wallace, W4ZCC, of Georgia Institute of Technology, and Barney Dennison, W4ECD, of Virginia Polytechnic Institute. The school answered many vital purposes. In addition to improving the students in their hobby, it also equipped them to serve in essential capacities in time of emergencies.

The FCC man who came down to give the final examinations required, of course, that the students be able to send and receive at 13 words per minute. That was like giving a duck a swimming lesson so far as these students were concerned. Most of

(*Continued on page 162*)

Happenings of the Month

ARRL Adopts OSCAR
FCC Proposals: 14 Mc. Maritime Mobile, Conditional Exams Overseas

ARRL ADOPTS OSCAR

After an extensive examination of the status of amateur radio in the new field of space communications, the Executive Committee of the League has granted its endorsement to the activities of the Project OSCAR Association. (See pp. 55–56, February *QST*.)

The League commits its support in the form of facilities for the dissemination of information, both technical and operating, to amateurs throughout the world. Most important, this support will be assurance to authorities that the project has the backing of the national amateur association, and therefore of the amateur body in general. The Project OSCAR Association, also a non-profit society of amateurs, numbers among its membership many persons professionally skilled in the various phases of earth satellite projects. The OSCAR group will continue the project it has already commenced, with the coordination of the League.

This and subsequent issues of *QST* will bring you technical and operating data on individual and group amateur participation in the project as it develops.

BANNED COUNTRIES

Most amateurs are vaguely aware that there are certain countries they are not supposed to work, but there is some uncertainty as to why, and which countries are involved. First, let us say it has nothing to do with the "cold war" or the state of diplomatic relations between these countries on the one hand and the U.S. and Canada on the other. Neither do our own administrations take the initiative in placing a country on the banned list.

It originates with Article 42, Section 1 of the Radio Regulations attached to the Atlantic City Convention of 1947[1] which says:

"Radiocommunications between amateur stations of different countries shall be forbidden if the administration of one of the countries concerned has notified that it objects to such radiocommunications."

The United States and Canada, as signatories to the Convention, would not be living up to their treaty obligations if they did not publish and enforce, among their amateurs, the provisions of this section.

Unfortunately, some of the countries have worded their notices to the I.T.U. somewhat ambiguously. The U.S. interpreted these one way, the Canadian government the other. Another country notified the U.S. Department of State that it no longer objected to international amateur communications, but did not notify Geneva or Ottawa. Thus, we have the slightly confusing situation of one banned list for Canada, and another for the U.S.!

Canada

Canadian amateurs may not work amateurs in the following countries: Laos, Cambodia, Viet Nam, Indonesia, Thailand, Roumania, and Jordan.

United States

The U.S. version of the list comprises Laos, Cambodia, Viet Nam and Indonesia.

NOT BOOTLEGGERS

FCC has commenced the issuance of a new series of calls in the fourth area. As in the second and sixth area, these calls, for Technician, Conditional, General and Extra Class licenses, begin with WA. However, the WV4 prefix is already in use, signifying a Novice in the Virgin Islands. So the Commission has reverted to use of the WN4 prefix. It is very important for everyone — the Novice himself, those he works on the air, our Official Observers and the holders of W4 Calls — to realize that WN4ABC (for example) is the future WA4ABC and is an entirely different guy from W4ABC. Wherever possible, WN4s should give their complete address over the air for QSL purposes (and to receive any OO cards they may have "earned"!) There is bound to be some confusion for a while, but it should disappear gradually as amateurs become accustomed to the new series, and future issues of the *Call Book* list the new amateurs. In the meantime, it might not be a bad idea for WN4ABC and fellow Novices to send a stamped, self-addressed envelope to W4ABC and fellow Generals to collect misaddressed QSLs.

CONELRAD

As was mentioned very briefly in April *QST*, there will be a nationwide Conelrad alert on April 28, 1961. For the first time, amateurs have been requested to take part in the exercise, along with most commercial radio services. Though the participation of amateurs has been labeled "voluntary" for technical reasons, the FCC and OCDM desire a full-dress test of the Conelrad system. The League strongly urges every amateur to cooperate fully by going off the air for 30 minutes commencing at 2100 GMT (4 P.M. EST, 3 P.M. CST, 2 P.M. MST, 1 P.M. PST, 11 A.M. Alaska time, 10:30 A.M. Hawaiian time.) or equiv-

[1] On May 1, 1961, the Radio Regulations attached to the Geneva (Radio) Convention of 1959 become effective. Article 41, Section 1 of the new document is identical with Atlantic City's Article 42, Section 1.

alent times in areas adopting Daylight Savings Time. If you expect to be operating near those times, it would be well to check out your own Conelrad system, be it a fancy fail-safe alarm or merely a table radio, rather than relying only upon your clock.

This is an excellent opportunity for all American amateurs to prove once again that their operations meet the public interest, and that the amateur service can be trusted to police itself. Remind your friends in advance that the drill is coming, and when your local broadcast station leaves the air or shifts to 640 or 1240 kc., pull the switch yourself.

Amateurs holding RACES authorizations will follow the orders of their superiors in the Civil Defense organization. In some RACES plans, certain stations may be permitted to send certain types of messages during the Conelrad drill, usually using "tactical calls" rather than the regularly assigned amateur call; if you have such an assignment, of course you are expected to carry on in accordance with previously prepared instructions.

LICENSE SUSPENSIONS

The General Class license of Eddie Lamar James, K4JIC, of Decatur, Georgia was suspended by the Federal Communications Commission for the remainder of the license term (expiring January 17, 1962) after he was found to have assisted in an examination fraud. James certified that Woodrow T. Wilson passed a Conditional Class exam though he had knowledge that Wilson lived at Decatur (within 75 miles of a Commission examining point) rather than Charleston, South Carolina, as shown on the application. James also was cited for failure to answer two registered letters from FCC on the subject. The suspension, which was not contested, went into effect September 13, 1960. (*Sections 12.155 12.162 and 1.61 of the FCC regulations*)

George E. Webber, 3rd, W1DVG, of West Lynn, Massachusetts, lost his privileges as a Conditional Class licensee for the remainder of his license term (expiring September 11, 1964) for two instances of examination fraud. In the first place, in taking his own Conditional Class examination, Webber had stated under oath that he resided in Whitefield, New Hampshire, when actually he resided at that time in Lynn, Massachusetts. His application represented falsely that his code examination had been administered by an amateur who later stated under oath that he had not conducted any such examination. Later, Webber administered a code examination for Douglas K. Webber, falsely stating on Douglas's application that he (George) was the holder of a General Class license. The suspension became effective September 16, 1960, no request for a hearing having been filed. (*Sections 12.21, 12.44 (a) (1), and 12.162 of the FCC rules*)

In a companion action, FCC suspended until expiration (July 11, 1961) the Technician Class license of Douglas K. Webber, W1LRX, of Lynn, Massachusetts. Douglas, too, falsely certified that he resided in Whitefield, New Hampshire, on his application for a Conditional Class license, whereas his actual residence was in Lynn. Moreover, the Commission's order states that Douglas Webber was fully aware that George Webber did not hold a General Class license and therefore had illegally signed Douglas's application as a code examiner. The uncontested suspension went into effect on September 14, 1960. (*Sections 12.21, 12.44 (a) (1) and 12.162 of the rules.*)

MARITIME MOBILE ON 14 MC.

In response to a petition from the Maritime Mobile Amateur Radio Club, the Federal Communications Commission has issued a Notice of Proposed Rulemaking (Docket 14026) which, if adopted, will permit worldwide operation by maritime mobile amateur stations on the 14-Mc. band. At present, this privilege is only available to maritime mobile amateurs in ITU Region II (roughly, the Western Hemisphere). Elsewhere, at present, only the 21- and 28-Mc. bands are authorized.

Comment in support of or opposition to this docket may be filed prior to June 1, with an original and 14 copies being requested. The complete text appears below.

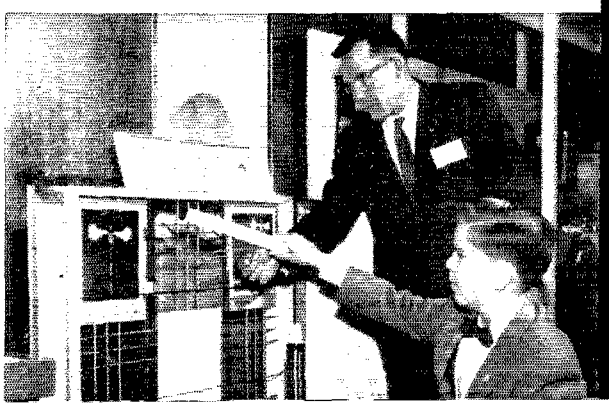
Before the
FEDERAL COMMUNICATIONS COMMITTEE
Washington 25, D. C.

In the Matter of Amendment of Section 12.90(b)(2) of the Commission's Rules to permit Maritime Mobile operation on a World-Wide Basis in the 14.00-14.35 Mc. Band.	DOCKET No. 14026

NOTICE OF PROPOSED RULE MAKING

1. The Commission is in receipt of a petition from the Maritime Mobile Amateur Radio Club (MMARC) 1317 Orangewood Avenue, Pittsburgh 16, Pennsylvania seeking to amend the Commission's Rules to permit maritime mobile operations in the frequency band 14.00–14.35 Mc. on a worldwide basis, i.e., outside the continental limits of the United States, its territories and possessions.

2. The Commission has adhered to a policy, supported by the petitioner, that as a condition precedent to permitting



WV6IPS (holding the tube) was recently honored by the Ford Motor Co. for his Tesla coil project, which was judged an outstanding entry in the electrical division of Ford's Industrial Arts Awards competition. He was awarded an Outstanding Achievement Award and a cash prize. His proud instructor is San Diego SCM W6LRU.

amateur maritime mobile operations on amateur frequencies on a world-wide basis, the frequencies involved must contain no international restriction on their usage. In the 1959 ITU RADIO REGULATIONS Table of Frequency Allocations, footnote 218 governs the use of part of this band as follows:

"218. In the U.S.S.R. the band 14,250–14,350 kc/s is also allocated to the fixed service."

The petitioner points out that other general explanatory footnotes in these Regulations lead to the conclusion that the above-quoted proviso is not to be regarded as a restriction in other areas, and that elsewhere other than fixed operations are permitted. In other words, this restriction should not be regarded as precluding the availability of the frequencies from 14.00 Mc. to 14.35 Mc. for worldwide maritime mobile operations. Perhaps more significantly, MMARC has submitted factual data showing that the U.S.S.R. permits its amateurs to operate on the frequencies in question despite the aforementioned footnote. The petition, therefore, seeks amendment of the Commission's Rules to permit amateur operations in the frequency band 14.00–14.35 Mc. outside the continental limits of the United States, its territories, and possessions. The Commission is of the opinion that the petition merits a Notice of Proposed Rule Making to amend Section 12.90(b)(2) to read as follows:

(2) When outside the jurisdiction of a foreign government: Operation may be conducted within Region 2 on any amateur frequency band between 7.0 and 148 Mc., inclusive; and when not within Region 2, operation may be conducted only on the amateur frequency bands 14.00–14.35 Mc., 21.00– 21.45 Mc., and 28.0–29.7 Mc. (Region 2 is defined as follows: On the east, a line (B) extending from the North Pole along meridian 10° west of Greenwich to its intersection with parallel 72° north; thence by Great Circle Arc to the intersection of meridian 50° west and parallel 40° north; thence by Great Circle Arc to the intersection of meridian 20° west and parallel 10° south; thence along meridian 20° west to the South Pole. On the west, a line (C) extending from the North Pole by Great Circle Arc to the intersection of parallel 65° 30′ north with the international boundary in Bering Strait; thence by Great Circle Arc to the intersection of meridian 165° east of Greenwich and parallel 50° north; thence by Great Circle Arc to the intersection of meridian 170° west and parallel 10° north; thence along parallel 10° north to its intersection with meridian 120° west; thence along meridian 120° west to the South Pole.)

4. The proposed amendment herein described is issued pursuant to authority contained in Sections 4(i) and 303 of the Communications Act of 1934, as amended.

5. Any interested person who is of the opinion that the proposed amendments should not be adopted or should not be adopted in the form set forth herein, and any person desiring to support this proposal may file with the Commission on or before June 1, 1961, a written statement or brief setting forth his comments. No additional comments may be filed unless (1) specifically requested by the Commission, or (2) good cause for the filing of such additional comments is established. The Commission will consider all comments filed hereunder prior to taking final action in this matter provided that, notwithstanding the provisions of Section 1.213 of the Rules, the Commission will not be limited solely to the comments filed in this proceeding. If comments are submitted warranting oral argument, notice of the time and place of such oral argument will be given.

6. In accordance with the provisions of Section 1.54 of the Commission's Rules and Regulations, an original and fourteen copies of all statements, briefs, and comments filed shall be furnished the Commission.

FEDERAL COMMUNICATIONS COMMISSION
BEN F. WAPLE
Acting Secretary

Adopted: 3-29-61

CONDITIONALS OVERSEAS

In response to a petition initiated by the League, the Federal Communications Commission has issued a Notice of Proposed Rulemaking (Docket 14025) to amend the amateur rules to permit civilians overseas to apply for Conditional Class licenses, regardless of the distance of their permanent (stateside) residence from an FCC examing point. The League had proposed that the privilege be made available for civilians who were temporarily resident outside the jurisdiction of FCC "for a reasonable period". The Commission has preferred to say "a continuous period of at least twelve months." Military personnel, wherever they are stationed, already have the option of applying for a Conditional Class license if it is not possible for them to appear for a General Class test.

Comments in support of or opposition to this proposed change may be made to the Commission, Washington 25, D.C. prior to June 1, 1961, with an original and fourteen copies being requested, as usual. The complete text of Docket 14025 appears below.

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

In the Matter of Sections 12.21(d) and 12.44(a) of Part 12, Rules governing amateur radio regarding eligibility for Conditional Class licenses.	DOCKET NO. 14025

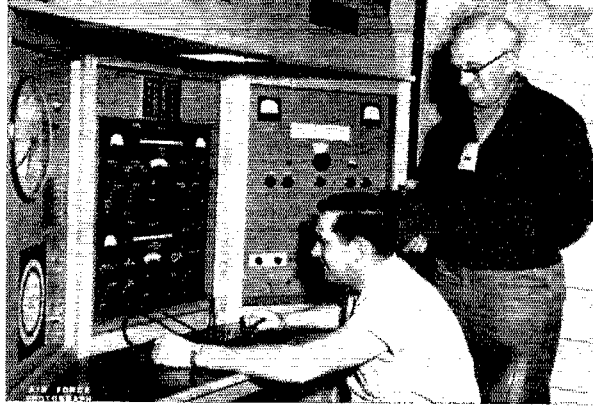
NOTICE OF PROPOSED RULE MAKING

1. The Commission is in receipt of a petition filed by the American Radio Relay League, Inc. (ARRL) Hartford, Connecticut, seeking amendment of the Commission's Rules to permit an applicant living temporarily outside the United States to take an examination for a Conditional Class license even if his residence in the United States is less than 75 miles from a legal Commission examination point.

2. The Conditional Class license was established to enable interested amateurs who would otherwise be precluded because of geography or physical disability from appearing for a Commission-supervised examination to obtain licenses by successfully passing an examination received by mail. One group specifically covered by the Commission's Rules consisted of members of the Armed Forces who furnished proof that because of their military service they were unable to appear for a Commission-supervised examination. The petition points out that the Rules are silent on the status of both the dependents of members of the Armed Forces and "other civilians whose work or studies takes them out of the country".

3. In instances where United States amateurs are stationed outside the territorial limits of the United States, possession of a United States amateur license may be a condition precedent to their operating in a foreign country. Recognizing this, the Commission has for some time as a matter of policy permitted civilians located in foreign countries whose legal residence in the United States was less than 75 miles from a Commission examination point to obtain a Conditional Class operator license only. However, the petition cites examples in which a station license as well as an operator's license is a prerequisite to obtaining permission from a foreign government to operate on amateur frequencies while temporarily residing in that country.

4. Hence, the ARRL proposes amendment of Sections 12.21(d) and 12.44(a) of the Rules to add another category to those now eligible to take the Conditional Class examination by mail. It requests that the following language be added to Section 12.21(d): ". . . or any citizen temporarily resident, for a reasonable period, outside the jurisdiction of the Federal Communications Commission and who maintains a legal residence within the United States, its territories or possessions, without regard for the distance of such legal residence from the Commission examination points listed elsewhere in the Chapter. (Note: Nothing in this Section shall be construed as authorizing Commission licensees to operate within the jurisdiction of a foreign government except in accordance with the provisions of Sections 12.90 and 12.91 of this Part.)" The word changes proposed by the ARRL for Section 12.44(a) are substantially the same. The Commission is of the opinion that the term "for a reasonable



W8WXG is holding a plaque which was presented to him by friends at the Dayton Air Force Depot in appreciation of the many noon hours that he has devoted to instructing prospective amateurs on the base. During the past five years 32 of his students have become licensed amateurs. W8WXG serves as an electronic repairman on the base, while after hours he conducts some more code classes in town, serves on the board of the Red Cross disaster committee, and is an active amateur and MARS member.

period" is too indefinite and will impair the efficiency of processing applications as expeditiously as possible. It is proposed, therefore, to substitute the phrase "for a period of at least twelve months" in lieu thereof and also to require the applicant to submit sufficient proof of such tenure. This would appear to provide a reasonable and definite standard for qualification for this type of license and would still accomplish the purposes of the League's petition. As a result, the Commission is proposing to amend Sections 12.21(d) and 12.44(a) as set forth in the attached Appendix.

5. Authority for these proposed amendments is contained in Sections 4(i), 301, and 303 of the Communications Act of 1934, as amended.

6. Any interested person who is of the opinion that the proposed amendments should not be adopted or should not be adopted in the form set forth herein, and any person desiring to support this proposal may file with the Commission on or before June 1, 1961, a written statement or brief setting forth his comments. No additional comments may be filed unless (1) specifically requested by the Commission, or (2) good cause for the filing of such additional comments is established. The Commission will consider all comments filed hereunder prior to taking final action in this matter provided that, notwithstanding the provisions of Section 1.213 of the Rules, the Commission will not be limited solely to the comments filed in this proceeding. If comments are submitted warranting oral argument, notice of the time and place of such oral argument will be given.

7. In accordance with the provisions of Section 1.54 of the Commission's Rules and Regulations, an original and fourteen copies of all statements, briefs, and comments filed shall be furnished the Commission.

FEDERAL COMMUNICATIONS COMMISSION

BEN F. WAPLE
Acting Secretary

Attachment
Appendix
Adopted: 3-29-61

APPENDIX

Part 12 of the Commission's Rules is amended as follows:

1. §12.21(d) is amended to read as follows:

§12.21 Eligibility for License

* * * * *

(d) Conditional Class. Any citizen of the United States whose actual residence and amateur station location are more than 75 miles airline distance from the nearest location at which examinations are held at intervals of not more than 3 months for General Class amateur operator license; or who is shown by physician's certificate to be unable to appear for examination because of protracted disability; or who is shown by certificate of the commanding officer to be in the armed forces of the United States at an Army, Navy, Air Force or Coast Guard station and, for that reason, to be unable to appear for examination at the time and place designated by the Commission; or who furnishes sufficient evidence of temporary residence for a continuous period of at least twelve months, outside the continental limits of the United States, its territories or possessions, irrespective of whether his permanent residence in the United States is more or less than 75 miles airline distance from the nearest location at which examinations are held at intervals of not more than 3 months for General Class amateur operator license.

2. §12.44(a) is amended by changing the period at the end of subparagraph (3) to "; or" and by adding a new subparagraph (4) to read as follows:

§12.44 Manner of Conducting Examinations

(a) * * *

(4) If the applicant demonstrates by sufficient evidence that his temporary residence is for a continuous period of at least twelve months, outside the continental limits of the United States, its territories or possessions, irrespective of whether his permanent residence in the United States is more or less than 75 miles airline distance from the nearest location at which examinations are held at intervals of not more than 3 months for General Class amateur operator license.

MINUTES OF EXECUTIVE COMMITTEE MEETING
No. 279
March 23, 1961

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 10:12 A.M., March 23, 1961. Present: President Goodwin L. Dosland, in the Chair; Directors Milton E. Chaffee, John G. Doyle, Morton B. Kahn and Ray E. Meyers; General Manager John Huntoon; Vice President F. E. Handy and Treasurer David H. Houghton. Director Charles G. Compton was also present.

The Committee first directed its attention to the subject of proposed amateur experimentation and communication via amateur facilities aboard earth satellites. By invitation, William S. Orr, W6SAI, and M. C. Towns, jr., K6LFH, representing the Project OSCAR Association, joined the meeting. There ensued a detailed discussion lasting more than two hours. (During the course of this discussion, former Traffic Manager F. H. Schnell, W4CF, joined the meeting by invitation.) The Committee agreed that the Project OSCAR Association should become an affiliated group of the League, and that such affiliation would be promptly granted on receipt of formal application. On motion of Mr. Meyers, it was unanimously VOTED that the American Radio Relay League endorses and lends its support to the Project OSCAR Association, and that General Manager John Huntoon is instructed to represent the League in this matter. The Committee noted that Directors Harry Engwicht and Ray Meyers are expected to become directors of the Project OSCAR Association.

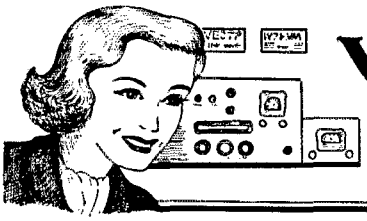
The Committee was in recess for luncheon from 12:25 P.M. until 2:15 P.M., reconvening with all those hereinbeforementioned present except Messrs. Orr and Towns.

The General Manager reported informally on numerous aspects of League membership and business affairs — 1960 operations, the outlook for 1961, a rise in *QST* advertising rates, availability of color in printing *QST*, a combination *QST*/Handbook advertising package, accounting procedures, expense account forms, new-member solicitation procedures, status of the proposed "junior handbook," League participation in the Panel of Experts Advisory Committee activities. The Committee examined and discussed these subjects in turn, but no formal action was found necessary.

Director Chaffee reported briefly for the Housing Committee, as its chairman, indicating that approval of the Newington Zoning Commission for a proposed Headquarters building on the W1AW property appeared likely. A brief discussion disclosed some concern over the estimated cost of construction. At this point Director Chaffee was obliged to retire from the meeting because of other commitments.

On motion of Mr. Kahn, unanimously VOTED that the Committee ratifies its earlier mail action in approving the holding of a Great Lakes Division Convention in Cleveland, Ohio, October 14-15, 1961, and a West Gulf Division Convention in Kerrville, Texas, October 13-15, 1961.

(Continued on page 166)



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

IN tracing back early introductions to ham radio, some will be able to boast exposure to age a few days, a few hours, or even while in the prenatal state. Of course, at the time they didn't have much appreciation for the art — but their mothers did!

Accounts of XYLs who, just hours after giving birth to a child, are back on the air ragchewing, checking into nets, giving orders to the OM via portable bedside rigs, are numerous — to us. To hospital personnel, however, the sight of a woman about to give birth, appearing at the registration desk encumbered with non-maternal-looking equipment, is still somewhat of a curiosity.

Experience has proved that it is usually advisable for the new mother, or more often for the new father, merely to carry in the equipment, rearrange the room, cast antennas out the window, while acting as though permission had been overwhelmingly granted from the top echelon down. To ask questions is to create doubt. This is to be avoided.

After commencing on-the-air operations, the new mother is virtually assured of inquiries and exclamations of all kinds emanating from the nurses, doctors, and aides who will make it a point to stop by.

The advantage of hamming of this type are obvious. Five to seven days of operating from a prone position without the usual household interruptions, make it a notable event, to say nothing about the adorable little bundle that was the object of the whole situation anyway.

K1JIX may have started something!

As mentioned, stories of XYLs who take to the air from their hospital beds soon after giving birth are fairly numerous. Added to the list are K8TOH and K1JIX. (see photos)

In preparation for the stork's visit, Arn, W8DQK, was building a 6-meter transceiver for his wife Shirley, K8TOH, to take to the hospital with her. Having worked all night at his job 25 miles away, Arn stopped to buy parts for finishing the "Maternicator". At home Shirley realized that activity was getting underway prematurely, and she tried to reach Arn via their 6-meter home and mobile rigs. A neighbor came to the rescue and started to take Shirley to the hospital in her car. Before leaving, Shirley relayed a message about her situation to Ruth, K8GYK. Harold, W4YWH, heard the conversation and relayed the message to Arn, who had just left the radio store. Arn sped for home, but met Shirley and the neighbor outside the city limits. They transferred her to his car and headed for the hospital.

K8GYK, meanwhile, contacted police for an escort. The police intercepted Arn and transferred Shirley for a faster trip in the police car. They arrived at the hospital with minutes to spare. Baby Shirley Grace entered the world shortly thereafter.

News traveled fast via the 6-meter band and Bill, K8WGH, a photographer for a local TV station, arranged an interview with Shirley and Arn, which later appeared taped on a local TV feature program.

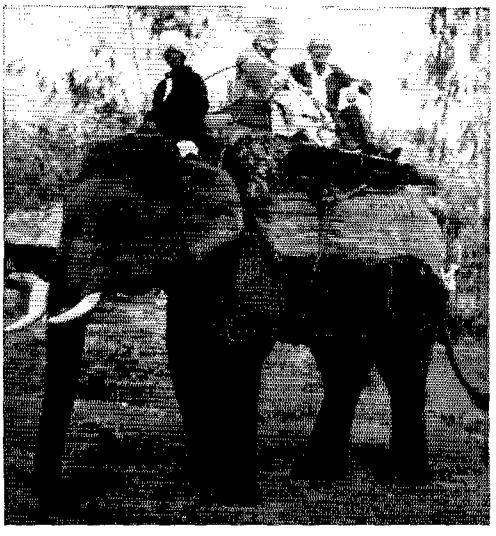
K1JIX, Janet Zimmer, of Harvard, Mass. initiated what probably is a "first" among

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

Maternity patient K8TOH's "Maternicator" took up little hospital room.

"mother hams". Janet used a handy-talky in the labor room to report progress to her OM John, W2BVU, stationed outside at his mobile rig, until one-half hour before the baby arrived. John says that the same arrangement was used for the first jr. op., now two years old, and that it "sure beats the waiting room ordeal"!

Raj Rendsland says that her debut as a Novice was the direct result of self-help applied over a cold start. With nary a ham within miles of her location on Hood Canal in Tayhuya, Washington, KN7NZO embarked on ham radio with curiosity as her chief aid. Raj uses a Drake 2-A receiver and Globe Chief transmitter for "still timid" excursions on 80 c.w.



The peripatetic Scotts, Evelyn, W6NZP, and Harold, of Long Beach, California, are back in the U.S. after 11 months and 50,000 miles around the world, another of their several safaris of far-flung sight-seeing and ham-visiting. In Ceylon Evelyn found that being hoisted up on Jumbo's neck was relatively easy— dismounting was something else.

"Sidebander of the Year 1961" is the title bestowed upon Dorothy Strauber, K2MGE, by the Single Sideband Amateur Radio Association. Dorothy is also the first YL to earn the "Worked 200" award issued by CQ Magazine for working 200 countries confirmed on two-way s.s.b. Dorothy and her OM Irv, K2HEA, edit *The Sidebander* publication of the SSBARA and the column on sideband in CQ Magazine.

A school teacher, Ann McDonough, KØTBV, is head of the commercial department at the high school in Clemons, Iowa. The XYL of KØUTC and mother of three young daughters, Ann's favorite operating frequencies are 29.1 Mc. and 3930 kc.

JA1FMQ "finds great fun" in mobile operation, according to her OM JA1YF, who forwarded the photo. Mobile hams please note that JA1YF, along with DU1GF, will issue a "Two Way Automobile WAC" award to the hams who confirm a mobile QSO between two continents.

K5ZHM, Mrs. Joan Nicholas, would like to know how many British "G.I. Brides" are now amateur radio operators. Write K5ZHM, Box 1215, Ozona, Texas.

—•••—

OM K6BX, editor of the "Directory of Certificates", says that the girls are out to excel in the awards field. CR7LU, Lucia, is the second YL to tally up over 50 achievement awards. K5BNQ, Doris, was the first YL to win the honor. KØIKL, Joy, is the first YL to win QCWA's new award. K2UKQ, Kay, the first YL to earn Clif's "Hunt the Hunters" award for working 25 members of his Certificate Hunter's Club, now has received the first HTH-50 award. K5BGT, Chic, is the first YL to receive DUF-4 and the first YL to win the WUN-1 award.

K6BX' newest project is the organization of a "Flying Ham's Club". Membership in the FHC is open to any person of any country who can produce reasonable proof that he or she has at any time whatever, even though not concurrently, held both an amateur radio license and an aviation pilot's license either private, commercial or military designation. Contact Clif Evans, Box 385, Bonita, California, if you qualify and are interested.

COMING EVENTS

WRONE — May 6, annual Spring luncheon at the Publick House, Sturbridge, Mass. Price of the buffet is $3.25. Send check to Mary McLam, K1ICW, 89 Denison Lane, Southbridge, Mass.

Third California YL Get-Together — May 12, 13, and 14 at the El Cortez Hotel, San Diego. Contact W6VSL for details.

Annual Midwest YL Convention — May 19 and 20, sponsored by the Ladies Amateur Radio Klub of Chicago, at Weller's Motor Lodge, 6450 W. Touhy Ave., Chicago. Friday night dinner at the Classic Bowl and Saturday luncheon and banquet at the Tam O'Shanter Country Club. Club members will use the call W9YL to operate a kw. s.s.b. station loaned by the Hallicrafters Co. Convention chairman is Bernice Schmidt, W9SJR.

Field Day — June 24–25. You'll want to keep the week end free for this major ARRL activity.

1961 AWTAR — The 15th Annual All Woman Transcontinental Air Race will start at Montgomery Field, San Diego, Calif., on July 8 and will terminate on July 12 at NAFEC (National Aviation Facilities Experimental Center) at Atlantic City, N. J. Radio Chairman Carolyn Currens, W3GTC, lists the following stop-over city chairmen appointed to date: San Diego, Barbara Davis, W6VSL; Yuma, Ariz., Harry McElfresh, W7ANB; El Paso, Texas, Wade Williams, K5ILG; Midland, Texas, George Martin, K5ODH; Shreveport, La., Evelyn Ewing, K5TXQ. Other cities along the flight route are Tucson, Arizona; Abilene and Dallas, Texas; Jackson, Mississippi; Montgomery, Alabama; Greenville, South Carolina; Lynchburg, Virginia; and Hagerstown, Maryland. Amateurs living in any of these cities who wish to assist in this interesting operation should contact W3GTC, Box 523, Norristown, Pennsylvania.

Keeping Up With the Girls

CLUBS:

St. Louis YL Club — "The Missouri Magpies" organized in Sept. 1959, but this is the first news we've had of them. WØMRJ, President, is supervising the group building of an oscillator, power supply, and Heathkit transceiver for 2 meters.

N. Y. C. YLRL — New officers are Pres. W2EUL; V. P. WA2DBG; Treas. W2EEO; Secy. K2DPN.

BAYLARC — W6QYL, Martha, was recognized as "BAYLARC of the Year" for outstanding service to the San Francisco club during 1960. Doubling its membership during the past year, the club now boasts 62 on the roster.

WAYLARC — Date and time of regular meetings have been changed to the first Saturday at 2:00 P.M. in the Museum of Natural Arts, 10th and Constitution Sts., N. W.

Los Angeles YLRC — Founded in 1946, club membership is now up to 81 licensed YLs. Meetings are the second Saturday at noon, Schaber's Cafeteria, 720 So. Hill St., Los Angeles.

WRONE — From K1ADY come the results of the WRONE Week contest conducted in February. K1EAV, Belle, was high scorer. Other WRONE participants, listed according to score, were K1EKO, W1ZEN, K1KYB, W1HOY, W1YPH, K1ADY, and W1YPT.

NETS: Wisconsin YL Net, a new net, meets Wednesday at 0900 CST on 3840 kc.

SSB Floridora Net — K4RNS invites all s.s.b. YLs to join this new net Tuesday at 0900 EST, 7215 kc.

Los Angeles YLRC two-meter net meets Wednesday at 1900 PST on 146.1 Mc.

Loaded Clothes Line YL Net — Corrections from KØEPE: the LCL YL Net meets 0900 MST, Monday 7235 kc., KØEVG NCS. The LCL c.w. net meets 0930 MST, Wednesday, 7150 kc., KØEVG NCS.

WRONE — K1IJV, net chairman, announces the club's three nets: "Yankee Lassies", Wed. 0830 EST, 3900 kc.; Six Meter net, Wed. 1400 EST, 50.65 Mc.; 80 meter c.w. net, Friday, 1400 EST, 3600 kc. The 10-meter net has been disbanded.

Miscellany:

DJ3TP, Ella, invites any touring YLs who might be in the area, to a get-together of German YLs May 20 and 21 at Dortmund in conjunction with the bi-annual Anniversary Party of the German Radio Operators. . . . At a meeting of the Washington Chapter of the Quarter Century Wireless Association, W3CDQ, Lix, was chosen Secretary of the Chapter, the first time a YL has held office in this predominantly male organization. Fran, W3AKB, is the only other YL of the 125 members of the Chapter. . . . After years of outstanding service as YLRL "International Correspondent", Arlie Hager, W4HLF, has resigned, and the position will be filled by Leta Cash, K6ENL, 7309 Walnut Rd., Fair Oaks, California. . . . News of Mary Meyer, W9RUJ, is encouraging. After suffering a stroke Dec. 20, Mary is now up in a wheel chair. While she has recovered her hearing and sight, she still is unable to talk, however. Mary's QTH is 17060 Patricia Lane, Brookfield, Wisconsin. . . . K1EKO is handling QSLs for OA4HK. Send Edie a stamped envelope for your QSL from Jean, P.O. Box 285, Westwood, Mass. . . . K6OQD, Jean, goes to school two nights weekly to study Braille. Her worthy object is to learn to transcribe radio material into Braille for blind hams and prospective hams. . . . W5JCY, Bertha, has worked 100 DX YLs — in addition to 200 countries!

QST—

Strays

The Totah Amateur Radio Club, Farmington, New Mexico, will hold a 4-Corner Field Day on May 27 and 28. They will be operating from the only spot in the U.S.A. where four states and three call areas come to a common point. Special confirmations will be issued.

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Submit proof that you have worked 25 Kansas hams (only 10 if overseas) and you'll receive the Sunflower Centennial Certificate. Two awards — phone-only and c.w.-phone mixed. Send 25¢ (free to overseas hams), QSLs or statement by a club officer that he has inspected the QSLs, to Sunflower Centennial. Certificate Committee, 1203 East Douglass, Wichita, Kansas.

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On Armed Forces Day there will be open houses at many military and naval facilities around the country. Check locally for what's going on in your area. Armed Forced Day — May 20.

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W1BSA, a special event station, will be on the air May 13–14 from the Pioneer Valley Boy Scout Council show — the "Cavalcade of Scouting" — in West Springfield. Chief operators of the demonstration station will be K1GTE and K1KBQ, and all other Scout and Scouter hams in the area are invited to participate.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Whereas:

Boyle Dowell, our unfortunate temporary chairman, gaveled frantically but fruitlessly for order. May's gay spring flood had carried in on its crest the yearly DX Hoggery & Poetry Depreciation Society recital at Long Hall. There the membership was having a bbl. of fun with our overseas guests of honor, the entire small population of the Aldabra islands.

Boyle's hambone gavel, the only remains of 1960's DX Hog of the Year, crashed again and again, each time merely triggering showers of radioactive rettysnitches and corrosive splashes of Old Haywire. Under one of these barrages poor Dowell failed to flinch properly, so the rostrum was cleared for the business portion of the meeting. Another decimating round of O.H. and a traditional rousing chorus of the Wouff Hong Song, our beloved DXHPDS anthem, were followed by the announcement that this chaotic gathering would also serve to celebrate the departure of our club's annual DXpedition. After a rafter-rattling series of cheers the hubbub subsided enough to let Mahan O'Mahan open the program. Like

That hog in the manger, MacSpray,
Enrages the rare ones each day.
They don't heed his squeaks
So he steps on their freqs
Till they naturally all go away.

Longway O'Round then braved a fusillade of Indian Ocean coral brickbats to deliver his quite needless contribution:

A lid with an artistic bent
Seemed to garner more cards than he sent.
Before he was through
With his bogus homebrew
He had cause to relent and repent.

The VQ7 natives were growing restless, so Lotta Chassis next sagged the stage to cow the crowd with her mustard-cutting soprano:

Sneek's phone score is utterly grand;
Few higher exist in the land.
But how does he do it?
There's just nothing to it;
He collars them outside the band.

Our one-man DXpeditionary crew, thrilled beyond words, was receiving his credentials, boat ticket, rations, credit cards, gear and instructions at the rear of the hall as Audie O'Howl closed the show with this timely rhyme:

Frequency-fouler McLugg!
Let's trample him flat as a rug.
With skywire connected
He does the expected:
Adjusts his electronic bug.

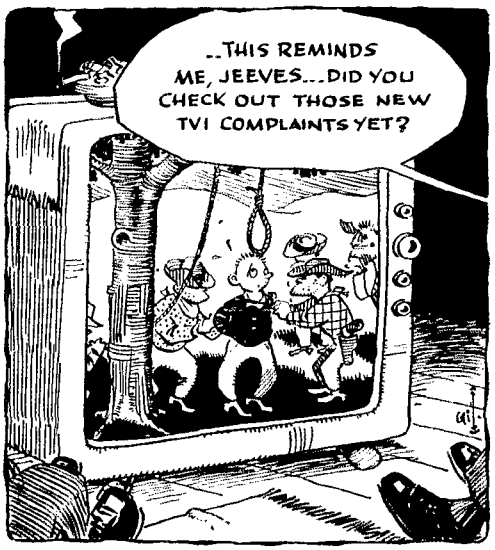
The visiting Aldabras High School Marching Band struck up *There'll Be a Hot Time*. In fiendish glee we poured into the streets and streamed down to the dock to bid bye-bye to our secretly chosen DX Hog of the Year. We knew he'd make it to the Aldabras on schedule. But we had given him enough juice for only one CQ. This would leave him utterly defenseless against the vaporizing r.f. onslaught we knew would follow. Good thing we moved those natives out of there.

What:

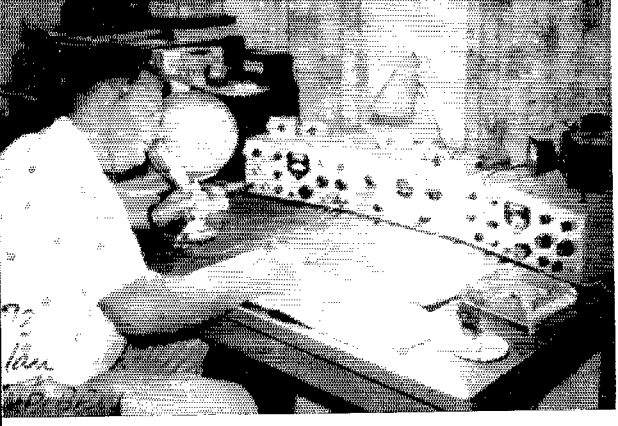
Poor conditions nearly ruined our diabolical plot, however. Those TV dinners saved the project. . . . In the spring a young ham's fancy lightly turns toward thoughts of getting a little more mileage out of 21 Mc. before the hush of summer closes in. So this month we call upon our fearless freshmen to lead our kilocyclic caravan across the "How's" dial. . . .

15 **Novice** news comes from WV2s MJF PMD, KN3s LIY LYW NLC, KN4s NIO VWX WQM YMQ (11/9 countries worked/confirmed), KN5s BND ERQ FLA FPU, KN8WSN (23/15) and KNØBQI who soon will be displaying the beautiful wall paper of **CE1AD**, **CN8LA**, **CRs 4AX 5AR**, a flock of DJ/DL*s*, **DM3OML**, **DU7SV**, EA2DM, many Fs and Gs, **HB9XE**, **HC2CB**, **HH2LD**, **IIs** AMC CFV, K4PLM/**KP4**, KA2JL, **KH6s** ACU DFW DKA DMU UL, **KL7s** CDY DHO, **KP4s** CGB TIN, **KW6DG**, **KZ5MM**, **LAs** 1OE 4Y 8YF, numerous OH-OK-ON-OZ entries, **PAØs** GNI VER, **PYs** 2OW 4AZY 4LW 5KK, **PZ1AG**, lots of SMs and SPs, **TF3SF**, **UAs** 1BE 1QC 3FM, **UB5KBB**, **UQ2KAE**, **UR2BU**, **VO2WW**, **VPs** 3RW 9CX 9EX, **WL7DNK**, **WP4s** AVP AWK AYM AYP AYZ, **XEs** IVB 2XX, **YVs** 1EM 4CT 5AMJ 5AWM, **ZE3KC**, **ZS6AFB**, **6W8BF** and **9U5MC**. Note that the 21-Mc. advantage has swung sharply toward our lower U.S. latitudes with the Four and Five lads still doing well.

15 **c.w.** observations from the varsity hold out hope that our solar-cyclic sunspot slide will continue painlessly gradual. W1GDQ, K1s JFF MOD, K2MMS, WA2s CLQ EFN EGK HZF, K2s CUI KHK, K4s DWU LRX ZRA/4, W5EHY, K5s ALU QPG (57/28), VTA, W6RCV, K6s CJF ROU, WA6IVM, W7s CNL DJU POU, W8s KML KX, K8s JCB KCO LNL PFY TJW (72/38), W9QQG, KPs QMJ TOK, KØs BHM OSV OSW PQW (35/30), RNK VTG, VE3PV, ZS2U, s.w.l.s. R. Kemp and A. Rugg



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



MP4s come and MP4s go, but MP4BBW stoutly holds out at Awali. Ian gets around quite a bit and may pop up almost anywhere at any time signing MP4QAN, MP4TAD, etc. *(Photo via KL7DKG)*

specify break-throughs by **CEs** 1AD (21,052 kc.) 2200 GMT, 3RY (48) 23, 4AR 4EC, **CN8**CJ, **CR5**AR (80) 20-21, **ELs** 1K 4A, **FAs** 2RI 8IH 9UO, **FB8**CS (36) 21, **FFs** 4AL (53) 18, 7AG 8CW, **FG7**XF (30) 19, **FM7**YF, **FQ8s** HD 18, HK 14, IIP (50) 19-20, GC3OBM (40) 14, **HAs** 5FD 5KFR 0HR, **HCs** 1JU 2IU (45) 23, **HKs** 3TH 7ZT (60) 22, **HP1**AC, **HZ1**HZ, **IT1**SOL, **JAs** 1LN 1VX (30), 3JM 7AD (50) 0, 8AQ (63), 9JG, **JZ0**PO, **KA2s** AB JL, **KB6**BC, **KGs** 4AP 6NAB, **KM6s** BI (42) 1, BJ (40), **KR6s** ID 1-2, JM LD LY (30) 0, **KS6**AH 23-0, **KV4**AQ, **KW6**DG (42) 0, **KX6**CB, **LA2**NG/p of Svalbard, **LU4ZO** (35) 22, **LZ1s** BZ KNB KSF, **OA4s** AGI HK, **OD5**CQ, **OEs** 2WC 16-17, 9EJ, **PJs** 2AK 3AD 3AK (108) 23, 3CY **PY7**LJ of Fernando de Noronha, 8M6VY/**9Q5**, SPs galore, **TT2**LA, **UAs** 2AG 0EH (68) 0-1, 0GF (50) 23, 0KZA (27), **UB5s** KCF KED LG UG WI (50) 17-18, **UC2s** AG (40) 14, OM (70) 17, **UG6**AW, **UO5s** AA (40) 17, KAA 12, **UP2s** AO AT, **UQ2**KAE, **VPs** 2LD 3FM 6AG 9CX 9EX (82) 22, **VQs** 2GD 2HD 2IE 2MS 2WR 8BM (70) 17, **VR2**BF, **VS9s** MB of the Maldives, APH (240), **VU2**XG, **XEs** 1PZC 2SO, YNs 1AA 4AB, **YOs** 2CD 6XI, **YVs** 1EM (47) 22, 4BH 5AGD, **ZBs** 1FA 1HC 2AD (18) 18, **ZC4s** IP SS (50) 17, **ZD6**RM (72) 18, **ZEs** 5JT 6JP 8JJ 9JO, **ZK1**AR (68) 23, **ZP5**LS, **ZS7**R, 4X4NJ, 5A1TP, **5N2s** ATU DCP LKZ, **6W8**BF (60) 22, **9G1**DS and **9U5**MC 14.

15 phone gives twenty a stiff battle for title as top springtime phone range. K1s IMD MOD, K2s MMS TDI*, W4LJV, K4s DWU LRX, W5CFJ*, K5s ALU VTA, K6CJF, W7MH, W8KML, K8s JCB KCO* LNL TJW, W9YMZ*, K9QMJ*, auditors D. Edger and R. Kemp keep busy with **CN8**CS, **COs** 2JL 19, 8RA (200) 16, **CP5**EA (200) 22, **CRs** 4AD 4AX (210) 21-22, **6**BH **6**BN (23) 21, **CT1s** EY SX (230) 20, **EAs** 8CM (240) 17-18, 0AC* (402) 15, **ELs** 6E* 8D, **FA2**TW (240) 18, **FF7**AB (225) 20, **FQ8**HN (232) 20, **HA9**OZ* (406) 14-15, **HCi**s HG 0, KA* (420) 16, **HIs** 7CJY 0, 8AN* (423) 15, 8DGC, HK4KZ, **HP1**AP (238) 21-22, **HRs** 1NX* (410) 18, 2BD, **HS2A*** (403) 1, **HZ1AB*** (426) 14-15, **KA2s** MM* (402) 1, SE* (432) 0-1, **KGs** 1AA* 21, 4AH (300) 17, 4AT, KL7CMI/-VE8 23, **KR6**VR* (390), **LX1**s DC HM, **LZ1**s BZ WD* (407) 19, **OA8**B, **OEs** 1DH 2WR (250) 18, **OK3**KGI, **PJs** 2CU (150) 22, **2MC*** 3AI, **PZ1**s AG (200) 18, AI 23, **SPs** 5PO* (406) 23, 7LA 9KJ, **SV1**s AB* (410) 15, AE* (410) 16, AH, **TF2WFF*** (414) 15-16, **TI2**RFT, **UR2**KAE (204) 14, **VPs** 2GAQ (240) 15, 4BO 4TP (220) 21, 5BB 5BL 23, 5WB 6ZX (230) 21, 7NF* 8EE (200) 23, 8EO 9FR* (440) 19, 9WB, **VQs** 2SB (232) 20, 2TU (254) 19, 2TV (205) 19, 2VG (240) 19, 4DT (240) 20, 4HX, **VR2**BU, **XEs** 1WF 1YJ 2PHG/m (254), 3VL, **YO3**GK* (404) 16-17, **YSs** 1MM* (413) 1, 3TM 13, **YVs** 1EE 18-19, 2CJ 4DU, **ZEs** 5JA 8JZ (230) 20, **ZP6**BB* (420) 16-18, **5N2s** ATU (240) 21, BRG (300) 21, FNX (200) 22, **6W8s** AP (222) 20, CY, **9G1**CI (224) 22, **9K2**AY, **9Q2**AA (210) 19, **9U5s** JH (232) 20, KU (249) 20 and PD (195) 19. The asterisks represent single-sidebanders in the preceding and hereafter.

20 c.w. commences to come back into its own as the equinoctial bloom fades from higher and lower frequencies. "How's" correspondents W1s GDQ OPR, K1s IMD JFF (88/77), MOD, K2s MMS TDI UYG, WA2s ASM (82/62), CZG EFN EGK (108/73), HZF, K3s KHK (89/70), MNJ, K4s DWU ZRA/4 (64/39), W5EHY, K5s ALU VTA, W6RCV, K6s CJF ROU, WA6s HRS IVM, W7s CNL DJU MH POU (77/53), W8s KML (301), KX (205/198), K8s JCB (146/126), KCO (127/44), PFY (55/26), W9QQG, K9s QMJ TOK UCG UHH (126/100), KØs BHM JPL OSV OSW RNK VSH VTG VXU, ZS2U and Mr. Rugg document the 14-Mc. code cooperation of **AC5**PN (79) 13, **BV1**US, **CEs** 1AD (50) 5, 3CB 9AI, **CNs** 2BK 8DJ (25) 20, 9CF 22, **COs** 2CO 7AH (10) 13, 7LG (7) 23, **CP3s** CD CN, **CRs** 4AF (89) 0-1, 4AH **5AR 9AH** 14, **CT3**AV, **DM8**SDA, **EAs** 8BW 19, 8CG 19, 9AP (20) 21, **0AB 0AF** (40) 21, **ET2s** US VB (42) 22, F2CB/FC (60) 18, **FAs** 2UB (55) 21, 3CT 8RJ (81) 22, **FB8s** CT XX ZZ (41) 13, **FFs** 4AL (45) 19-23, 7AG (35) 21, 8CR, **FQ8s** AJ 22, AX (60) 23, HO 21, **FR7**ZD 17, **FY7s** YE YF YI (45) 22, GD3FBS 19, **HA1**KSA (42) 18-19, **HCi**s JU LE, **HH2s** AR JV 20, **HKs** 1HV 1QQ (40) 0-1, 4PX 7YC (75) 6, **HP1**IE, **HRs** 1MM 2FG (10) 3, **HZ1**HZ (8) 7, **IS1**FIC, IT1s AGA AQ, **JAs** 1VX (75), 7WB 9AA, K4ASU/PJ/mm, **KA2s** AB (60), JL 2-3, **KB6**BC (45) 1, **KGs** 1BM 1FD 4AP 6AIG 4, 6AJZ 6NAB, **KM6s** BI CB 5, **KR6s** JM (40), KF LY, **KV4s** AA (81) 20-23, AQ (15) 23, LA8YB/p, far-south **LUs** 1ZN 3ZO 4ZO 4, **LZ1**KSP (70) 18, **OA4s** BR HK, **OD5**AI, **OX3s** DL NK UD, **PJs** 2ME 3AK 5MA, Fernando's **PY7**LJ (45) 19, **PZ1**BX, SMs 2AZR/**9Q5** (65) 19, 5KV/**9Q5**, **SVs** 1AM IAO ØWN, **TF3**AB, **TGs** 3TD 9EF (32) 18, **TIs** 2DN 3LA, **UA1s** KED (43) 12-13 and ZEC of Franz Josef Land, **UAs** 2AG 2AW 2KAE (45) 13, **9B**Z 9DN 9KDD 3, 9KOA (63) 13-14, 9KSA 0AB 0AG 0AZ (68) 21, 0BF 0BN 0GF 3, 0EV 0IX 0KAE (92) 13, 0KAR (53) 12, 0KID 0KQB 18, 0KYA of Tannu Tuva, 0KZA (55), 0RD, **UB5**KDS, **UC2s** AX BW (45) 18-19, WP, **UH8**DA (60) 15-16, **UJ8**KAA (55) 13, **UM8**KAB, **UO5s** KAA NB PK 19, SM, **UP2**AO, **UQ2s** AE/mm AS KAA 17, KAT KBR, **UR2s** BV DZ 19, **UT5**BL, **UW9s** AG KSA, VE8s OO TU, **VPs** 2LD 3MC 3YG (80) 22, 4TK 5CD 20, 5CI 5CV 6AP 8CN 8DG 19, 9DV (75), 9EH 9EP 9QQ, **VQs** 2HR 3HV (30) 19, 3HZ 4HT 4RF (80) 20, 5GJ (62) 19-21, 5IG 19, 8BM (15) 17, 9HB (80) 18, **VRs** 1B 2DK 6TC (168) 5, **VSs** 1JW 6AD 6AJ (15) 14, 9ASP 18, **XE1s** H MB 15, XZ2TH, YNs 3KM 4AB, YS1O, **YVs** 4BE 5ARS 5HM, ZA1AKB (85) 20, **ZB2**AD (32) 0, **ZD2**KHK, ZE5JT, **ZK1**AR (65), **ZP5s** AY (75) 1, LS 5, OG, **ZS3s** B (80) 20, DP (40) 20, K 23, **4X4**MB, **5N2s** GUP (40) 17-20, IND (71) 21, JM (40) 22, LGN LKZ (29) 21-23, **5U7**AC, **6Os** 1MT 2RS 21, **6W8**BQ, **7G1**A (47) 20 and **9U5**MC (3) 20-22.

20 phone seems to be a single-sideband reservation, judging by all the asterisks in the reports of K1JFF, K2TDI*, K4DWU, K8s JCB* KCO*, W9YMZ*, K9QMJ*, KL7DKG*, VE3DZL, scanners Edger and Kemp: **CO8**RA (190) 13 **CP5**EA* (320) 12, **CR9AH*** (282) 12, **CT1**CL, CX2CO* 0, DU1GF* (311) 14, **EA8s** AE (320) 12, CT* (287) 19, **EL8**D (173) 0, **FB8**CM* (347) 19, **FM7WQ*** (348) 22, **FP8**AP 17, **GD3**ENK* (317) 19, **HCi**s JU* (320) 0, KA* RB* (340) 0-1, **HH2**MC 23, **HK3**RR* (300) 22, **HP1**LO* (314) 22, **HRs** 1HP* (292) 13, 1KS* (310) 23, 2IB (196), 3HH* (327), **HS2A*** (315) 19, **HZ1AB*** 13, **JA1**BQZ* (338) 13, K4SDC/CN8* (284) 20, **KG4s** USG* (310) 19, USH* (274) 6, USN* (280) 6, USV* (260) 5, **KGs** 1BO* 1FS* 16, 4AA* (274) 0, 4AP*, **KV4s** AA* (330) 14, CE* (328) 23-1, **KW6**DF* 23, LX1DE* 19, **MP4BCC*** (283) 13, **OA4**BR* (320) 0, several OEs, **PJ2**AT (190) 13, **PZ1**BX*, **SP5**PO* 19, **TF2WFF*** (336) 19, **TG9AD*** (284) 4, **TI2**WR* 3, **UAs** 9OI* (294) 8, **0K1A*** (308) 6, **0LA*** (284) 20, **UB5s** FJ* (312) 5, VO* 13, **UC2AA*** (286) 12, **UP2CG*** (295) 7, **UQ2AN*** (310) 12, **UR2s** AR* (308) 5, KCA* (304) 12, VE0NA/mm 23, **VPs** 4TI* (330) 0, 5BL* (280) 2, 7NQ 13, 9FR* (317) 0-4, VQ4RF* 20, **VS6-AZ*** (283) 13, **VU2NR*** (312) 21, XEs 1DT* (340) 4, 2DS (195) 13, 3CP, YNs 1MW* 3LBV* (320) 3, YS1MS*, YV5s AGD* HW*, **ZS7P***, **9G1**BF* (312) 8, **9M2GA*** (310) 15, **9N1CJ*** (310) 12 and **9Q5US*** (327) 21.

10 phone fellows are too busy hanging DX QSLs to sit around hanging crepe. Sure, conditions are fuzzy, but what do you want — pipelines? K1IMD, WA2s EGK LKY, W4LJV, K4DWU, W5CFJ*, K5s ALU VTA, K6CJF, WA6IVM, W7s CNL MH, W8KML, K8LNL, K9s QMJ* SPO, KØs PQW RNK UTX (40/20 on ten), Messrs. Edger and Kemp make do with **CE1**FX 19, **COs** 2UM 7HQ 8RA, EL2C, **FF7**AB (590) 14-15, **FG7**XH 16, **HCs** 1FG 2DB 5HA, **HH2**ED, **HI8**DGC (500) 18, **HKs** 1XT 23, 3LX 4KZ (480) 22, **HP1s** AP 20, LB 17, **HRs** 1DL 21, 2HA 17, 3PD 19, **JAs** 1AHS 23-0, 1BNE 1BWA 1BZV 1CE 1CIB 1, 2CG 1, 3IW 0, 7JW, **KG4**AE, **KR6HM** 2, **KW6**DG (540), **KZ5s** BR FK JC 23, **OAs** 4HK 19, 5D 21, **PJs** 2AP 17, 3AI, **PZ1AX*** (670) 19, **TGs** 5HC 9BM 19, 9FI 19, **VPs** 2DQ 6AM 17, 7BM, **VQs** 2TM 4HX (300) 19, **XEs** 1JP 2DS 3CF 23, **YNs** 1JK 4CB 23, 4CF 23, 4NK 9DL (410) 20, **YVs** 2CJ (463) 18, 3AW (479) 19, 5AMG 5AQS (800) 22, **ZEs** 2KR (450), 3JU 19, 5JA, **ZLs** 1ALA 1AUI 1HS 1, 2BE 23, **ZP0**BM, **ZSs** 4LL 17, 4OB 18, 6PTA (400) 18, 6VJ 17 and **6W8AP** (420) 14.

10 c.w., now principally a week-end sideshow, holds the dogged interest of K2MMS, WA2EFN, K3CUI, K5s ALU VTA, W6RCV, K6s CJF ROU, K9SPO, KØs BHM OSV OSW RNK VTG and friend Rugg thanks to 28-Mc. radiotelegraph holdouts **CE1**AD (60), **COs** 2GR (75) 20, 7PG, **CX6**CB, **EA7**CP 17, **EL4A**, **HK7**ZT (18) 18, **KR6-**JM (20), **KW6**DG (100), **LUs** 1DAB 2DAW (40), 5DDF (40), **PJ2ME**, ubiquitous and flavorful **PY7**LJ, more PYs of the mainland variety, SVØWG, **UB5**KED, departing

VP7NT, VQ2s MS WM, YN1AA (67) 21, YVs 1EM (15), 5AGD (40) 16, 5AVS, ZL1ARL (80), ZS1s A VM and 5N2ATU.

40 **c.w.** treats W1s APA GDQ OPB, K1MOD, K2JUA, WA2s ASM BQK CZG, K3KHK, W5EHY, K5s ALU QPG VTA, K6CJF, WA6s HRS IVM, W7s CNL DJU LZF POU, K8s JCB PFY, K9s QMJ SPO TOK, KØs JPL VXU, KN3NLC, EL4A and dialer Edger to such talent as **CM2UZ**, CNs 2BK 8MB (10) 6, COs 2CT 2JP 2PY 2WI 7PG, **CR7CI**, **EA8CG**, **EI9J** 21, **EL4A**, **FA2VH** 6, **GC2-FMV**, **GD3UB**, **HAs** 1KSA 5KFR 6-7, **HC1JU**, **HKs** 2NF 3AH 7UL, **HL4KAQ** (20), **IT1AGA** (6) 4, K2BBY/VE8 4, **KC4USH**, **KG4AD** 0, **KM6BI** 7, **KR6JM** (5), **KW6DF** 7, **KZ5TJ** 2, Jan Mayen's **LA8YB/p** 4–5, **OA4AGH**, sundry OKs, **PJ2ME**, insomniacal **PY7LJ** (14) 8, **PZ1BR**, **SL5AB** 3 of Sweden, **SP9RF**, **TFs** 2MT3AB 3, **UAs** 2KAK 0EH 15, **UB5s** IF KCF (6) 2, KFF ZE ZR, **UG2BB**, **UG6GT**, **UP2AO** 5, **UQ2KAA**, **UR2KAE**, VEØNM/mm 7, lots of VKs, **VPs** 2SC 4TK 6AG 7BP 9AL 5, **VR2DK** (5), **VS6EN**, YN4AB (36) 4, **YOs** 3AC 4, 9IE 1, a dozen YVs, many ZL-ZSs, **5N2LKZ**, one **9G4AO** and **9M2FS** 14. In addition, QSOs are reported with 55 JA1s, 21 JA2s, 20 JA7s, 19 JA3s, 13 JA8s, 10 JA6s, 9 JA4s, 8 JA5s, 8 JA0s and 4 JA9s. Japan really goes for forty! By the way, EL4A observes the 7150–7200-kc. Novice gang boiling into Africa from the States with fine signals but they don't seem interested in turning up their gains off the low edge.

40 **phone** means **DL1BZ*** (100) 5, **EL4E**, **HR3HH*** (296) 5, **HZ1AB*** (296) 1, **JA1CE*** (105), **KC4USR*** (205) 9–10, **KG1AA*** (96) 6, **KP4s** AXS AXT* (205) 10–11, **PJ3AI*** (202) 9, **PZ1AX*** (92) 2, VO1BN (258) 2, **9G1s** CB and CW to doughty diggers like W1APA*, K6CJF*, K8-JCB* and EL4A.

80 **c.w.** comes alive only to bash head-on into the warm season's static in our latitudes. But WA2s ASM CZG, K4DWU, K5JZY (15 on eighty), W7s CNL DJU, K8JCB, W9JJN, KØVSH and KV4CI undauntedly dent the din for **CN8CD**, **CO2QR**, **DM2AQL**, **EI9J**, **EL4A**, **FA8BG**, **HB9EO**, **HP1SB**, **JA1CEU**, K2BBY/VE8, **KH6s** DVD (8) 7–8, VF, **KV4AQ** (10) 6, **LAs** 7RF/mm 8YB/p (50) 7, **LU1AA**, **LZ2KBA**, **OH2UQ**, **OZ5EL**, **PAØLOU**, **PY7LJ** (3) 7, **TF5TP**, **TGs** 3TD 9AL, **UAs** 3DG 3GM 9CM, **UB5s** KBA WF, **UW3AF**, **VPs** 2SC 5KT (80) 6, **XE1YF**, **YO3AC**, **YV5BX**, **ZC4PB**, a batch of ZLs and **4X4CJ** (5,10) 4–6. Eighty helped KV4CI sew up a five-band set of "WACs" within one year. K5JZY reports that JA1CEU gave his 400-watter and dipole all continents within two hours, 15 minutes on 3.5 Mc. As for **75 phone**, KP4AWH discovers that single-sideband is a cinch to get through to **DJ1LN***, **DL7ID***, **Gs** 2FTS* 3LBM* 3OEY*, **HB9MQ***, **HZ1AB*** (3695) 2 and **PAØSSB***.

160 **c.w.**, however, should be acclaimed scene of our DX stunt of the month. W1BB reports that W8GDQ's March 3rd QSO with **ZC4AK** completed a 160-meter WAC effort, only the second on record after Stew's. Neat! All told, late-winter 1.8-Mc. conditions were so good that the gang began to pass up the usual G-men for successful shots at **DL1FF**, **EL4A**, **EP5X**, **OK3EK**, **OD5LX**, **UB5WF**, **XE2OK**, **ZL3RB** and other 20-meter-style stuff. We note that ZL3RB topped a series of W/K two-ways with a VE7AKI contact, and **G3PU** added several new ones to reach the 160-meter 34-country level. Keen low-band man **KH6IJ** credits W2FYT, K2DGT, W6KIP, K6ZH, WA6CDR, W8SM and WØIFH with standout signals at his end. Stateside atmospherics take over now, but 1.8-Mc. specialists will be maintaining schedules throughout the hot months just to see what happens. Fine winter conditions are setting in south of the equator, you know.

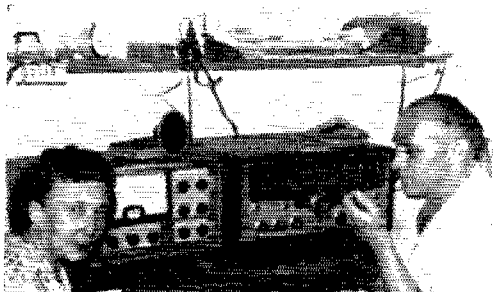
Where:

Asia — The new Taiwan American Radio Club, among other activities, handles BV-bound QSLs at Box 24, USTDC, APO 63, San Francisco, Calif. Or, where more applicable, address the club at U. S. Taiwan Defense Command, Taipei, Taiwan, Republic of China. Secretary W4OSG further writes that BV1US logs on hand date back only through 1959. Earlier QSOs with the station cannot be confirmed. "Due to the rapid turnover of operators at most BV1 stations it is urged that hams desiring confirmations QSL immediately on QSO." Sure will! . . . . . Ex-G6WY states, "Those who worked AP2F or VU2GI between October 18, 1947, and April 10, 1949, can obtain cards from VE3BWY by sending QSL, self-addressed envelope and one International Reply Coupon." . . . . . "Our call signs are issued alphabetically from AA through ZZ without regard to call area," informs HM1AJ, KARL secretary. "Thus, if HM1AA moves to the HM3 region he takes his suffix with him, becoming HM3AA. If he goes mobile or portable he signs HM9AA/p, HM5AH recently moved to Seoul, so he is now HM1AH." Sweden is another proponent of the unduplicated-suffix system. It's neat — if you don't run out of prefixes . . . . . "I am ex-XW8AO of Vientiane and Savannakhet, Laos, also ex-HS1H, Bangkok," declares K9CFA. "Both calls have been QRT since August, 1959, and I have not authorized a QSL manager. I believe I QSLd 100 per cent but, if I overlooked anyone or my cards strayed, I will be happy to send others." Marion's *new* address is *in the listing to follow* . . . . . VS9AAC QSL manager W3KVQ qualifies, "This will apply only for VS9AAC QSOs dated on or after December 2, 1960. All prior contacts were QSLd by Al via the bureaus. The calls MP4s BDF MAJ and TAL also have been issued to VS9AAC. He hopes to activate them shortly, as well as a tentative FL8 authorization, and I will handle all QSLs." . . . . . "I am *not* QSL manager for ST2AR," states W2-JXH, "save for single-sideband QSOs made by W3ZA under that call. I do handle Rundy's QSL chores for EP2AY, FL8ZA, MP4s BDD QAQ TAI, OD5CT, W3ZA/EP, W3ZA/3W and XW8AM." The usual s.a.s.e. courtesy applies . . . . . According to listener A. Rugg of Quebec, LZ1AF's QSL responsibilities for BY1PK are limited to QSOs made in 1958.

Africa — "FF4AL tells me that QSL duties have become too much for him," writes W8KMD. "So he turns the job over to W3KVQ." This is confirmed first-person by W3KVQ who specifies the customary self-addressed stamped-envelope consideration . . . . . "CR7CI has asked me to act as his QSL manager," informs K9GZK. "Logs dating from February 12, 1961, already have arrived and card stock is on order — s.a.s.e., please." This applies only to W/K contacts; Antonio will take care of the others himself . . . . . "We will soon get an all-Liberia QSL bureau," enthuses EL4A (W7VCB) . . . . . ARRL staffer W1YYM quotes FF7AB: "In April I go to France for six months." Andre's Continental address is in the roster to follow . . . . . G3LOE welcomes correspondence pertaining to his 6O2RS activities and vows 100-per-cent QSL. Write Wilf direct or via RSGB. "Got very fast results from 6O2RS," gloats K9UHH. "Wilf uses letter-type confirmations in the temporary absence of printed QSLs." . . . . . "I am *not* QSL manager for 6O2AB," assures W6BAF. Harold does, however, handle QSL matters for FB8CJ, VQ2AB, VS1JV and ZE5JJ. W6BAF wants his collection of 6O2AB mail claimed at once . . . . . "I am *not* ET3ECE's QSL manager," insists W9JUV, W9-DXCC club chairman. But if somebody can produce the fellow's logs Joe might be persuaded to clear the deck . . . . . Via VERON's *DXpress*: VQ5s AU EK FS GJ and IB are legitimate Uganda DXers. Cards incoming for many spurious VQ5 calls are cluttering the RSEA bureau, however . . . . . "FQ8HO was off to France in late March," affirms K6EC. "I have complete logs for W/K QSOs and some logs for other contacts." Ev will continue to attend to incoming QSL requests properly accompanied by s.a.s.e. or s.a.e.-plus-IRC so long as his FQ8HO QSL supply holds out.

Oceania — K2QXG's QSL labors in behalf of VKØVK (VK2VK) at Wilkes base, Antarctica, are complicated by the fact that Steve and colleagues sometimes sign KC4AAC. Not only that: Americans are appearing with Aussie calls; VKØJB is one. "VKØVK has supplied me with log data for 111 QSOs made so far, and I am receiving bewildered inquiries from W/Ks regarding both VKØVK and KC4AAC. Any spare tranquillizers in the house?" . . . . . "Numerous cards are arriving for VR2BC," notes Greg's QSL chief, K4LRX. "I say again: No s.a.s.e., no action."

Europe — "I am now acting as QSL manager for SV1AB," confirms W4HUE. "After running up 265 countries at W2BYP I've moved to Florida to start all over. Retired now, with plenty of time for ham radio." . . . . . Accentuating the negative: A. Rugg learns there's no SM2BW, M1D tells K2MMS that M1C has been off the air for years, and the genuine F2FC hasn't been active for many and many a moon . . . . . WA2DIG understands that a new USKA section has formed in Tessin where HB9ZE will be glad to entertain inquiries regarding QSLs



9Q5FD keeps Katanga workable on 15 meters where XYL Lily does her share to keep the log pages turning. *(Photo via K9VRV/4)*

and schedules for this rare Swiss canton. HB9s DE YC YT and ZE had intended to put "Ti" on 7 through 28 Mc. in last month's Helvetia-XXII DX test . . . . . VERON has it that CT2AH's s.s.b. operation at CT1JA may be QSLd via K8RTW . . . . . The Netherlands society also observes that ZA2s BAK and KC each claim status as the only officially licensed Albanian amateur station. Both QSL in response to proper s.a.e.-plus-IRC petitions . . . . . GI3ATH calls attention to the fact that his tenure at ZB2A extended only from February to September, 1946. "I'm receiving cards for contacts made in 1957 and later. ZB2A was a typical 'club' station in '46, and has since been operated by some people who sent out no QSLs. I can only suggest inquiry to ZB2A, A.R.C., Royal Air Force, North Front, Gibraltar," Harry assures 100-per-cent QSL for his own long-ago ZB2A activity.

South America — "VP3RS is back in the States and advises he will soon have cards printed," remarks W4MLE via W1YBH. "His W4CAA address should be used and he expects early reassignment to the Pacific area." . . . . . "I must commend HK4KZ for prompt QSL response," applauds s.w.l. D. Edger. Good idea. Let's intersperse our standard gripes about slow QSLers with an occasional pat on the back for stations who stay right on the QSL ball. Any candidates for "QSLers of the Month" listing?

Hereabouts — From W2DKS: "If any of the gang still need VP7NT QSLs for my 1959-'61 Bahamas operation they can reach me at my home QTH. Almost all cards have already been answered via bureaus. Complaint: Too many DXers are careless about dates and times of QSOs. When building a log at a contest rate of three pages per hour it surely complicates QSLing when the boys don't use the right GMT and GMD. From now on I don't answer incorrect QSLs." Fair enough . . . . . "I have *no* information regarding the operations of FP8DC," clarifies W1ISD to KØVSH . . . . . W1MGP's March KG1EE query in these pages received rapid attention from W9NN . . . . . "Since my return from Spain last July I've been very active at 5290d Missouri Ave., Plattsburgh AFB, N. Y.," pens K1BVI/2. "QSLs, however, are very slow to arrive." Bernie points up a problem we haven't touched on for some time. When operating "portable" in another call area you should keep envelopes on file at two QSL bureaus. DX QSLs for K1BVI/2, for instance, are likely to show up at both the W1/K1 and W2/K2 bureaus . . . . . Ks 3KLJ 3MNJ and ØVTG desire to get in touch with overseas rare ones in bona-fide need of QSL-managerial assistance . . . . . Now we present this month's random collection of postal suggestions arriving through the generous diligence of W1s APA UED WHL WPO YBH YYM, K1s IMD LVW, W2s APF SHC, K2s TDI UGY, WA2EGK, K3s CUI KHK, W4MLE, K4IKV, K5s ALU VTA, WA6HRS, W7s AMM MH UVR, W8s KMD KML KX, W9s QQG YMZ, K9UHH, KØs BHM PQW, DL5DU, GI3ATH, KL7PI, ZS2U, tuners Kemp and Rugg, Japan DX Radio Club, Newark News Radio Club, Northern California DX Club, Universal Radio DX Club, VERON of Holland, and West Gulf DX Club:

AP.CR (via W7VEU)
AP2F (via VE3BWY; see preceding text)
CE3IW (via RCC)
CE8BD, Casilla 25-D, Punta Arenas, Chile
CR7CI (via K9GZK)
CT3AA, Box 257, Funchal, Madeiras
DL4BS, R. Lawson (K1MOU), Darmstadt Postfach 3049, Germany
DM5SOP/mm (via DM bureau)
FF4AL (via W3KVQ)
ex-FF7AB, A. Dubois, St. Pierre de Fursac, Creuse, France
FG7XH, Box 335, Pointe-a-Pitre, Guadeloupe
HC2IU, H. Joachin, Box 5200, Guayaquil, Ecuador
HL4KAQ, P.O. Box 732, Pyongyang, No. Korea
HP1IE (via W2CTN)
ex-I5GN, 15 Fawnbridge Dr., Peekskill, N. Y.
K4THQ/VE8, Box 113, APO 432, New York, N. Y.
KC4AAB (via K9LGR)
KC4AAC (see preceding text)
KS6AK, N. Sparby, 1014 Katherine Ct., Sunnyvale, Calif.
KZ5TF, P.O. Box 174, Coco Solo, C. Z.
LZ1BZ, M. Grozev, Box 699, Sofia, Bulgaria
MP4s BDF MAJ TAL (via W3KVQ)
MP4TAC, Cpl. A. Dicker, Trucial Oman Scouts, BFPO 64, Sharjah, Trucial Oman
OD5CT (via W2JXH)
OX3UD (via W2CTN)
PJ5MA (to K2AAC)
PX1EP, F. Bates (K1HMG), Gen. Mola 49, Zaragoza, Spain; or, M/Sgt. F. Bates, 431st FIS, Box 5004, APO 286, New York, N. Y.
SL6ZK (via SM6BZT)
SM6BXC/9Q5 (via SSA)
SV1AB (via W4HUE)
TI2PZ (via KØDQI)
UA6LWW, A. Zhedtenykie, Gogodevskie 36, Taganrog, Caucasus, U.S.S.R.
UA9DT, Box 9, Sverdlovsk, U.S.S.R.
UB5KAX, Electrotechnical School, Lvov, Ukrainian S.S.R., U.S.S.R.
UB5KCE, G. Kha-ybov, 21 Duskinskaya, No. 90, Kharkov, Ukrainian S.S.R., U.S.S.R.

ZL4JF, one of the rarest of them all, used this operating position in the Campbells for a thousand QSOs with many countries and all United States. That's an Eddystone receiver and homespun v.f.o.; the 80-watt 807 final is out of view at left. *(Photo via W7PHO)*

UB5KCK, Stantsiya Yunykh Tekhnikov, Lugansk, Ukrainian S.S.R., U.S.S.R.
UB5KDS, Polytechnic Institute, Lvov, Ukrainian S.S.R., U.S.S.R.
UB5UG, Box 55, Kiev 1, Ukrainian S.S.R., U.S.S.R.
UP2NX, Box 224, Kaunas, Lithuanian S.S.R., U.S.S.R.
UT5BK, E. Kazakov, Vladimirskaya 15, Kiev 25, Ukrainian S.S.R., U.S.S.R.
VKØDA (via VK3RJ)
ex-VP1SD, S. Thompson, P.O. Box 68, Minburn Village Alta., Canada
ex-VP3RS (to W4CAA)
VP5CV (to W1CV)
VP7BM (via WØVSK)
ex-VP7NT (to W2DKS)
VP8FF, P.O. Box 156, Port Stanley, Falkland Islands
VQ3HV (via W2CTN)
VQ4RF (via W4MCM)
VQ8APB (to VQ8AP)
ex-VQ8s AQ AS (via G3NUF)
ex-VR3A (VK9GP)
ex-VR3Z (to G3DAF)
ex-VS5JS, J. Sietsma, Krimkade 75, Voorschoten, Netherlands
VS9AAC (via W3KVQ; see preceding text)
VS9APH, P. Hudson, RAF, Sgts. Mess, Khormaksar, BFPO, England
VU2GI (via VE3BWY; see preceding text)
VU2IR, Bindu Madhav Rao, 56/1 Hindustan Park, Calcutta 29, India
VU2NRM (via W4ANE)
W3UWW/KV4 (to W3UWW)
W3ZA/EP-etc. (via W2JXH; see preceding text)
ex-XW8AO-HS1H, M. D. Heinze, K9CFA, 1330 Chestnut, West Bend, Wis.
YV4AY, C. Blank, Box 4600, Maracay, Venezuela
ZA1AE, Box 131, Durres, Albania
ZB1HC (via W4MS)
ZB2A (see preceding text)
ZB2N (to GM3OEV)
ZD9AL (to ZS5SG)
ex-5A5TO, F. Vitringa, PAØETO, Banstraat 2, The Hague, Netherlands
5N2JM (via K9EAB)
5N2LKZ, O. Johnson, c/ IAL, Kano Airport, Nigeria
5U7AC, Niamey Airport, Republic of Niger
ex-602RS (to G3LOE)
6W8BQ, P.O. Box 190, Dakar, Senegal
6W8CB/mm (ex-FA8CB-FF8CB; via KØGZN)
6W8CK, P. Raigne, P.O. Box 971, Dakar, Senegal
6W8CU, P.O. Box 38, Ziguinchor, Senegal
9Q5MP, F. Feyer, P.O. Box 1612, Bukavu, Rep. of Congo
9U5VL, P.O. Box 1, Usumburu, Ruanda-Urandi (or to ON4VL)

NOTE: The preceding QTH catalog comes strictly caveat emptor. To confirm each entry might take until this time next year. G'luck!

Whence:

Asia — "Americans in Taiwan have formed the Taiwan American Radio Club," announces secretary W4OSG.

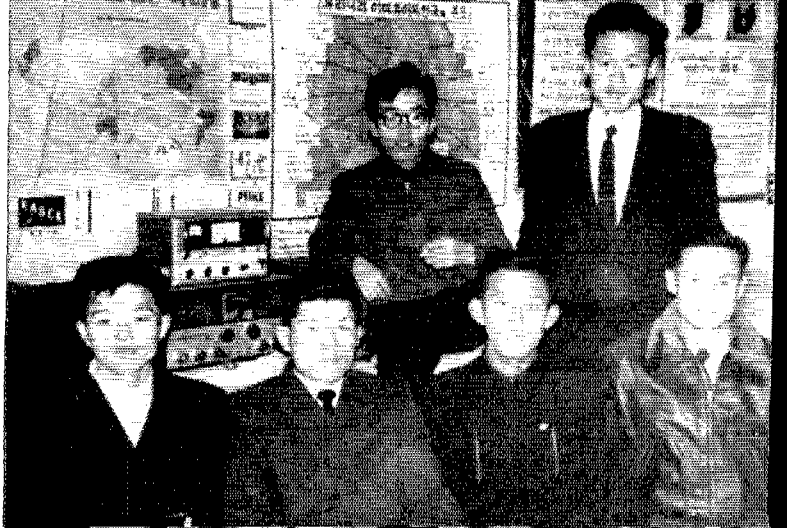
"There are 25 members at present. K9YLE is president, K7KLB vice-president, and K4YJQ treasurer. The club sponsors code practice, theory classes and other activities. We also have under consideration a BV-type communications award, so certificate hunters stand by." . . . . . Korean Amateur Radio League president I. K. Lee seeks to enroll his thriving society in the International Amateur Radio Union as Korea's amateur radio boom rolls on. KARL secretary HM1AJ reports that license examinations are to be given prospective hams each March and September, so the original 17 HMs should be steadily augmented. KARL DX editor HM1AP, active on 14-Mc. c.w., rushed his RCC application to ARRL Communications Manager W1BDI after a one-hour chat with ZL2GS. HM1AP is quite interested in DXpeditionary doings and hopes to accompany the HM9A/p group to Dokto island this summer . . . . . "EP2AP, my good friend ex-KL7TI, has been running 40 watts to a dipole pending arrival of his household goods at Tehran," writes KL7PI. "His DX results should be helped a lot when he gets his 200-watter, 75A-1 and Telrex array installed. Jim says that Russian ham QRM really is terrific in Iran. Conditions there have been poor for U. S. contacts, however." . . . . . W7AMM (ex-11DFB-PY7QB) regretfully writes, "Sorry to say my license application never received approval from the Saudi government. Now that I'm nearing return to the States it looks as though there will be no ham operation from Taif for some time to come." . . . . . "I'm now very active on 80-meter c.w.," states 4X4CJ. "Have the gang watch for me especially on week ends, 0400–0600 GMT, when I'm on the lookout for DX contacts on 3505 or 3510 kc." . . . . . K6CJF reached his goal of 100 February JA QSOs not without some difficulty. "Half of them were worked on 7 Mc. in three mornings. JA1CE, by the way, has a new single-sideband rig that sounds fine. He hopes to work into the East Coast with it on 40." WA6HRS also specializes in 7-Mc. JAs, collecting over 100 in a two-month effort . . . . . K2UYG reports W7s GUV PHO and a VU2 associate preparing a Sikkim DXcursion . . . . . Orientalities via VERON and WGDXC: MP4BBW's CR9AH stopover produced much 14-Mc. phone fun. . . . UA3FE, fresh from UAØ triumphs, is reported hobnobbing with such rarities as UM8FZ and UI8AG. . . . XW8AL is reported making a DX comeback on 21-Mc. phone. . . . Okinawa nationals are said to be pointing toward a KR8 outburst. . . . JA7QQ/1 and JA1EEB sampled DXpeditionary delights on Tori island.

Africa — W1WPO relays comments from 6O2RS, due for return to G3LOE: "I've been fairly active on 20 c.w. with 100 watts and a 4-wavelength-per-leg 100-foot-high rhombic beamed on England. Operating standards of U. S. stations are very high but I'm a bit sorry to hear so many electronic bugs. Straight-key here! To keep everyone happy and make as many QSOs as possible I regret the necessity to be very brief and impersonal. Calls two or three kilocycles off frequency usually have the best chance for reply." . . . . . Liberian notes via EL4A: "Regarding band conditions here, 10 is very weak but produced well during the ARRL c.w. Test sessions; fifteen is fair in the late afternoons and early evening hours and was very good in the Contest; twenty very sad with some good openings to Europe but few to the States; forty is always fair or better, good for contest work especially; eighty is good when QRN is down, likewise 160. This EL tropical QRN really blasts your phones off! I talked with EL2L, our director of amateur radio, and learned that Liberia is adopting a policy of regulations similar to the U. S. pattern. Official observers and license examiners are to be appointed. Code tests, theory and regulations examinations will be established." EL4A is scheduled to be visiting Stateside now and expects to return to Liberia in July . . . . . Ws 3KVQ 8KMD and 8KX report FF4AL (W3CGF) with his hands full around 14,032 and 14,053 kc., 1900–2200 GMT. Lloyd expects to be there for a couple of years, so let's take it easy . . . . . ZS2U finally heard a Caicos VP5 but the reception wasn't reciprocated. Caribbean types are local stuff to W/K/VE/VOs but the overseas boys really hunger for 'em . . . . . ZS6AVP tells W3NCF he lurks on 7005 kc., almost daily around 0400 GMT, hoping to nab the Dakotas, Idaho, Kansas, Maine, Montana, Vermont and Wyoming for his ARRL WAS certification . . . . . LARA, P.O. Box 484, Luanda, Angola, offers revised rules for its decorative *Diploma da Africa Portuguesa* (DAP) certification. Confirmed QSOs with two CT3s, three CR4s, one CR5, twelve CR6s and twelve CR7s are the basis . . . . . WGDXC Africa observations: A fresh ZS2MI staffer is expected to emphasize the Marion Island c.w. DX program. . . . VQ9TED is consistently mentioned in connection with Aldabras DXpectations. . . . CR4AX grabbed W7KOI in the nick of time to close out his WAS.

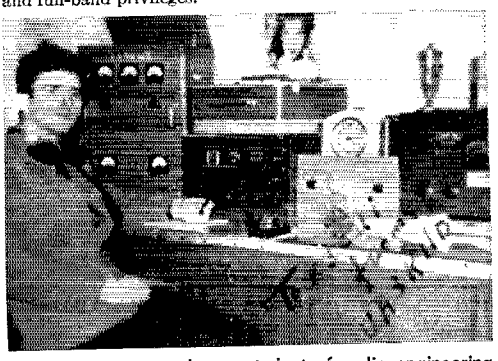
Oceania — Word from Seria's departing VS5JS: "At the moment I am the only VS5 on the air but VS5GS soon will be returning from U. K. leave. I recently spent a whole night operating just to see what could be done from here. Worked about twenty ZSs, a VQ8 and two American stations. Conditions were very bad, lots of QRN. There is much 14-Mc. commercial-type interference that should not be there. I am now a member of VERON as well as ARRL and MARTS. On May 15th I will be back in Holland to resume activity as a PAØ." John's new address appears in "Where" . . . . . K2QXG observes, "Apparently Australia is handling the old Wilkes base, former site of KC4USK. VKØs VK and WB now find themselves using a B&W rig with a rhombic aimed at St. Louis! The main base now signs KC4AAC with the original KC4USK Collins installation. Yanks are signing VKØ calls. Aussies are signing KC4AAC — it's all very confusing." . . . . . Oceania's ace contester, KH6IJ, is making a painstaking study of 160-meter DX conditions and techniques on the heels of an exciting 1960–'61 low-band season. "I live ten airline miles from a megawatt loran station that serves the Pacific. To pull signals through it I use a 25-kc. bandpass arrangement on my 75A-4, set the noise limiter to threshold, turn up the audio gain to drum-breaking strength, and make my ears separate DX from loran." Hmm — who once said that good DX results are only 90-per-cent operator? . . . . . NCDXC has it that ZL3VB of the Chathams works ZL2GX at 0745 GMT near 3585 kc. Meanwhile, ZL3VH lays plans for an early Tokelaus try.

Europe — PX1EP's target date is the first of this month, remind Ws 2APF 4LJV and listener Kemp. K1HMG, EAs 2CN and 4EP are involved. The accent will be on a.m. . . . . K3CUI notes that UAs 3CR 1DZ and UR2AR rest atop the Russian single-sideband DX ladder with 133/105, 137/99 and 124/99 countries worked/confirmed, respectively . . . . . W6UYE, on receipt of a photo of OZ4WR, observes that the chap is a ringer for the brother of neighbor K6DRM. Burt was *really* astounded to find that both look-alikes are named John Hansen. Small world — and getting smaller . . . . . East Germany's training schooner *Wilhelm Pieck* signs DM5SOP/mm on a voyage across seven oceans to Odessa. W7AMM says that the vessel is a convenient 41 meters long . . . . . "I'm trying to

HM9A/p was well staffed at Korea's National Science Exhibition last November. From left to right are HM1s AA AP, friend Kim, HM1s AC AJ and AF. HM9A/p is expected to be active on Dokto Island in July and August. (*Photos via HM1 AJ of KARL*)



interest M1B in DX again," writes K2UYG. "I hear he is mostly on 40 phone now, and not very often." . . . . "SL6ZK is QRV with 500 watts on 14- and 21-Mc. c.w. looking for W/Ks," notifies SM6BZT. SM6s CCA and CMU help Sune man the station . . . . . K1ITU and others were interested by the Uzbek DXpeditionary plans of UA4IF and UI8DA as UA4IF/UI8. . . . . From W2SHC: "GM3OEV, former ZB2N, is going back to Gibraltar with the RAF. He hopes to sign ZB2N and ZB2A on all bands 10 through 160 meters." . . . . . W1OPB discerns a general improvement in the quality of U.S.S.R. signals but feels the EA and PY brethren could do a little better tonewise . . . . . LZ1AF, via monitor Rugg, reminds us of Radio Sofia's 9700-kc. ham program beamed to eastern U. S. A. at 0100-0130 GMT, west coast at 0400-0430, on the first Saturday of each month . . . . . OE6UI is QRT and off to Hamburg after some 700 QSOs with 102 countries at Graz, mostly by c.w. . . . . W8KX and K0VSH find that IT1AGA has collected some 84 certificate awards, over 200 contacts with U. S. Sixes, and needs but ten more contacts to qualify for YLCC. IT1AGA's c.w. is regularly available at 1500-1700 and 2200-0200 GMT, 7 through 28 Mc. . . . . Club Continental commentary via NCDXC, VERON and WGDXC: UA1KED of Franz Josef Land drives 'em crazy, man, on 20 c.w. . . . K2DGT and W8FGX had standout 7-Mc. signals at the European end of this year's ARRL DX Test. . . . The new SV0WN is said to be of the ordinary Athens stripe. . . . Finland's Novice-style ticket is good for three years at 15 watts in 80-, 40-, 15- and 2-meter suballocations. Then come 200-watt and full-band privileges.



UA3KND is a second-year student of radio engineering at Riazan when not combing the kilocycles for rare ones. Another AR-88! *(Photo via K3CUI)*

Hereabouts — W1GOU checked in with "DXCC?" No. 39, the second all-phone filing after W8WT's, and the first one-band (28 Mc.) achievement called to our attention. Two days later came No. 40 from W8RQ (ex-W1RY) who has yet to file for his own Ohio DXCC membership. K6EC, incidentally, protests our recent "free-style" designation of his own squared-Century claim, a strictly-c.w. effort — hi! . . . . "DX operation from the Bahamas was a lot of fun," admits VP7NT (W2DKS). "I think I'll miss the attention I've been getting from the gang when I return to New York." Doubtless, OM, doubtless. K0PQW reports another shutdown down that way: VP7BM is reassigned to Vandenburg AFB . . . . . W9s JUV FKC and cohorts already are hard at work lining up a lively program for W9-DXCC festivities scheduled September 17th at Chicago's Sheraton . . . . . W8KX and the gang are sorry to learn of DX ace W9GVZ's illness and consequent recuperative KP4 sojourn . . . . . "Worked my first 87 countries in about a year but it took four months to produce No. 88," laments K1JFF, testifying to the rapid onset of our current propagational recession . . . . . W1ULR acknowledges the hospitality of HH2s JL and RS on his winter visit down Port-au-Prince way . . . . . KL7DKG (W1DCC) of the Aleutians looks for DX and W/K buddies around 14,270 kc. almost daily, 0600-1800 GMT. A comeback from 9G1BF qualified Len for DXCC, 20-meter s.s.b. solo . . . . . W1WHL and K0GZK are intrigued by the circumnavigational aspirations of 6W8CB/mm, his XYL and 6-year-old son aboard homebrew yacht *Danae II*. The family's recent 23-day voyage from Dakar raised Port-au-Prince in time to meet visiting K0GZK and XYL K0GZN. A 50-watter feeding a stern whip will keep them in touch with the DX world as they wend leisurely westward on a three- or four-year voyage around the world. Don't worry about the junior op's education; mama Claudine is a qualified schoolmarm . . . . . "I'm leaving for the Canal Zone," advises K0QHF, "and hope to be active as a KZ5 as soon as I get settled." Bill cut his DX teeth at Fort Leonard Wood's K0WBD . . . . . K4DWU, SM3ADF and friends are eager to set forth on their upcoming Swan Island sortie as KS4BC . . . . . Around June 17th-21st and July 16th-29th W1QLT/mm will be active en route to and from the Mexican reefs. Between those periods Bill intends to activate a coral-based XE0QLT/XE5. W1QLT is working with a five-year oceanographic survey that may later take him to Eniwetok, Funafuti and the Maldives . . . . . K0GJE managed his 122/111 DX score with 90 watts and no beam, a particularly stiff stunt from his part of the land . . . . . W8YGR says K8HBR/9 had a dandy 160-meter DX location aboard SS *Lyman C. Smith* while he kept ship last winter at Superior. Nice high hunk of wire 'twixt mainmast and foremast . . . . . K0RAU anticipates a few summer months in Europe with possibilities of sampling the bands from the DX end . . . . . This year's RSB Bermuda Amateur Radio Contest is slated for the 6th-7th and 20th-21st of this month, gang, and it's usually a snappy affair. The procedure apparently is the same as in 1960: Beginning and ending at midnight GMT on the dates mentioned, W/K/VE/VOs will transmit RS or RST reports to VP9s, while the latter will respond with the same plus parish locations. Each QSO per station per band counts 3 points; for final score multiply all QSO points by the number of band-parishes accumulated. Each contestant must sign a statement that all pertinent rules and regulations have been observed. Official report forms are available from Contest Committee, Radio Society of Bermuda, P.O. Box 275, Hamilton, Bermuda, and results should be mailed to the same address no later than June 30, 1961. It's a single-operator shindig, and adequate recognition of top performances will ensue . . . . . Unless he can put his talents to work and soon, ex-LU6DEM's prospects of remaining in the U. S. will pass away. Joe's Stateside address appears in last month's column . . . . . RCP of Paraguay will help celebrate that country's independence sesquicentennial with an a.m. phone contest among the 21 republics of the Americas on the 13th-14th of this month, 10 through 40 meters. A chance to sharpen up your *Español, señors* . . . . . Tidbits via NCDXC and VERON: PY1CK talks up a DX probe of St. Paul's Rocks come September. . . . Deception Island local QRM is swapped by LUs 1ZO 2ZO 3ZO and VP8FU. . . . Multibandsman PY7LJ may depart fair Fernando de Noronha too soon.

Ten Years Ago in "How's DX?" — W1AXF takes us to visit WCC, famous New England ship-working shore station, as leadoff feature for your May 1951 column . . . . . How's DX? Just great! On 160, for example, VE1EA scores the first North America-Asia 1.8-Mc. contact of all time, with HZ1KE. . . . . The 75-phone boys scramble for CN8EP, CT1BW, HC2OS, HK4DP, LX1JW and a bunch of VPs. On 80 c.w. we find FA8s BG DA, FO8AC, VP3CW, ZB2I, ZD4AB, ZM6AK and 4X4RE . . . . . The 40-meter crop includes EK1RW, KW6AR, MD4ZK, MP4KW, TA3GVU, VS7NX, W5NGE/KC6, ZDs 4BC and 9AA . . . . . Twenty-c.w.'s best: AC4NC, AR8AB, AP5B, CR5AA, CS3AA, EK1s AQ SP, FN8AD, HS1VR, HZ1AB, KH6KL/KP6, MD2s BD MD PJ, MI3s IM VG, ZZ, SU1AD, VR1C, VS7s NG NX, VT1s AC AF and YI3BZL . . . . . Fancy phones on 20 are HC8GI, MI3RP, VR5GA, VS7JU, ZD6HJ, ZK2AA and ZM6AA . . . . . Ten-meter tonsil-twirlers tangle with HI6EC, MI3XX, OQ5NK, VP2SE and VR1E . . . . . Jeeves is astonished at airborne magnetic-storm flotsam, and pictures of this prominent DX join the "How's" archives: KS4AI (W5KWY), Kangaroo Islander VK5XK, ZS7C, and grouped DXCC IIs A1V AY IY KN PL and RM.

Strays

W2KJY sends us a clipping that points out some dangers from mercury cells. (He clipped it from *PM Magazine*.) Seems that a weak or dead cell in a mercury battery will gradually fill up with hydrogen and oxygen. The result can be an explosive mixture which should be kept out of the hot sun and incinerators.

—...—

Raytheon Company recently put up new executive offices in Lexington, Mass., and some one of its many vice-presidents who are also hams hustled down to the post office and had the postal zone number of 73 assigned. At last count, over 800 amateurs are working for Raytheon, most of them in technical and engineering capacities. Not all of these are located at Lexington, of course, but the crew there does include W1GBE, W1RST, K1JTC, K1AA, W1CLS, W1GG, W1MEX, W1WMZ, and W1PKG.

Hamfest Calendar

Alabama — The Birmingham Amateur Radio Club will hold its Eighth Annual Hamfest on May 6 and 7. The May 7 activities will be at the State Fairgrounds. A barbecue lunch will be served at noon. This is the main hamfest event in the southeast, and this year promises to be better than ever. For further information, contact any member of the Birmingham Amateur Radio Club or write to P. O. Box 603, Birmingham, Ala.

California — The Fresno Hamfest will be held on Saturday, May 6, at the Towne and Country Lodge at Fresno. Registration starts at 8:00 A.M. and activities start at 10:00 A.M. There will be technical talks and demonstrations including u.h.f. and s.s.b, a swap table, mobile field intensity measurements, hidden transmitter hunts, and ladies' luncheon and special entertainment. The banquet will be at 7:00 P.M. and is included in the registration fee of $5.50. Reservations should be made for the hamfest through Fresno Amateur Radio Club, Inc., P. O. Box 783, Fresno, Calif., and room reservations should be made direct with Towne and Country Lodge, 3693 North Freeway 99, Fresno, California.

Georgia — The South Georgia Rag Chewers Club will hold its annual Hamfest at Thomasville, Ga. on May 21. All amateurs and families are invited. A picnic dinner will be served. For further information and reservations contact William J. Lewis, sr., P. O. Box 652, Thomasville, Georgia.

Georgia — The Atlanta Radio Club's 33rd Annual Hamfest will be held at the Shrine Temple, Ponce de Leon Avenue, N.E., Atlanta, Georgia on June 3 and 4. There will be a dinner-dance Saturday night at the Shrine Temple. The other main hamfest activities will be on Sunday June 4. For further information contact Betty R. Bennett, K4BZE, 2651 Valmar Drive, Doraville, Georgia.

Illinois — The Starved Rock Radio Club Hamfest will be held on June 4 at the LaSalle County 4-H Home and Picnic Area Southwest of Ottawa (same place as last year). Follow Route 23 to the South end of the Illinois River bridge at Ottawa, turn west on Route 71, following big yellow Hamfest signs. There is plenty of space and adequate facilities for all. Free swap section. Advance registrations are $1.00 and must be received by May 25. Registration at the gate is $1.50. The hamfest site is a short drive from the Starved Rock State Park and recreation areas. Food available on the grounds. Free coffee and doughnuts 1000 to 1030 CDST. New features and attractions. For additional information contact George E. Keith, W9QLZ/W9MKS, RFD #1, Box 171, Oglesby, Illinois.

Illinois — The Quad-City Amateur Radio Club will hold its hamfest at the Gra Ell Picnic Grounds east of Moline, Illinois on May 28. Tickets in advance are $1.50 and on the grounds that day $2.00. Wayne Blick, 2366-30th Street, Molin, Illinois, is in charge of advance ticket sales.

Indiana — The Columbus Amateur Radio Club will hold their 2nd annual Ham picnic and Swapfest at Donner Park, Columbus, Sunday, May 21. For further information, Contact Frank Reiser. W9AWH, Publicity Chairman, R.R. 2. Columbus, Indiana.

Kansas — The Hi-Plains ARC is planning its Twelfth annual hamfest, to be held in Plains on May 21. A basket dinner will be served at noon, with each person to bring his own service and a well-filled basket. Drinks are furnished by the club. For further information contact Mrs. V. F. Hachenberg, KØCJM, Kismet, Kansas.

Kansas — Sunday, June 4, will mark the 14th Annual Central Kansas Radio Club Hamfest, to be held in Kenwood Park at Salina, Kansas. Registration will begin at 9:00 A.M. Although everyone is welcome, only licensed hams and their YLs or XYLs are eligible for registration. Bring a covered dish and silver service for your own family! Registration is $1.00. For further information contact Dave Miller, KØRJL, 721 Morningside Drive, Salina.

Louisiana — The First Annual Delta Convention is to be held at Monroe, La., on May 19 and 20, at the Francis Hotel. Plenty of fun for all is promised. Registration is set at $6.00 for a single person, $10.00 for couples. For further information contact Clarence Gibson, 1402 So. Fifth Street, Monroe, La.

Massachusetts — A Central New England Hamfest will be held at the Nipmuc Rod and Gun Club in Upton on May 28. Sponsored by the Nipmuc Emergency Radio Corps, the theme of this Hamfest is to be Emergency Communication in both portable and mobile fields. For further information contact Paul W. Taylor, K1KQK, Upton, Mass.

Michigan — The Grand Rapids 14th Annual State Hamfest will be held on April 29, at the Pantlind Hotel. All the features which have made this annual affair so popular among Great Lakes hams will again be in evidence.

New York — The 1961 Western New York Hamfest is scheduled for May 14, at the Doud Post on Buffalo Road in Rochester, New York. Write to Rochester Amateur Radio Association, P.O. Box 1388, Rochester, N.Y.

New York — The annual Rome ham family day will be held on Sunday, June 4 at Beck's Grove, Rome. W1UED will be the speaker from ARRL Headquarters. The program will include dinner, contests and a program for XYLs and children. Registrations made prior to May 20, $4.00; children ages 5-12, $1.25. After May 20 and at the gate, $4.50 and $1.50. For information and reservations contact the Rome Radio Club, Box 721, Rome, N.Y.

North Carolina — The annual Charlotte Hamfest sponsored by the Mecklenburg Amateur Radio Society of Charlotte, North Carolina will be held June 3 and 4 at the National Guard Armory near Douglas Municipal Airport. Tickets will be available in May priced at $1.00 for Saturday and $3.00 for Sunday or $3.50 for both days. Plenty of displays, lots of swapping, interesting activities and plenty of good food are planned. Further details and information may be obtained by writing to the Society at P.O. Box 3230, Charlotte 3, N.C.

Oklahoma — The annual hamfest of the Oil Capitol Mobile Club will be held on May 7. No other details available at this writing, but you may contact Dick Weddle, K5GZY, 312 N. 78th East Avenue, Tulsa, Okla.

Pennsylvania — The Seventh Annual Hamfest of the Breezeshooters will be held on Sunday, May 28, 9 A.M. to 6 P.M., at the Lodge, North Park, near Pittsburgh, Pa. North Park is easily accessible from the Route 8 or the Route 19 interchange of the Pennsylvania Turnpike. Picnic facilities and refreshments are available. Mobile check-in will be on 29.36 and 50.4 Mc. There will be approximately 100 hams there, so come and meet your friends. The registration fee is a very modest $1.00. For further information, contact Dan Davies, W3OPF, Box 226, Silver Lane RD1, McKees Rocks, Pa.

Pennsylvania — The 16th annual banquet of the Lancaster Radio Transmitting Society will be held on Saturday, May 13, at Hostetters Banquet Hall, 363 Barbara Street, Mt. Joy. Mt. Joy is on route US 230, 10 miles west of Lancaster. Festivities will start at 1830 DST with a delicious meal, followed by entertainment of OMs, YLs, and XYLs. Plenty of free parking. Advance registrations are $3.00 per person, and may be obtained from Arthur C. Jacoby, W3OY, 136 Springhouse Road, Lancaster.

Pennsylvania — The Penn-York Hamfest Association announces its 3rd annual Hamfest to be held June 3 at the Ingersoll-Rand Employees Hall, Athens, Pa., starting at noon. Pre-registration is $4, or $4.50 at the door. This includes dinner, speakers, and the works; $1.75 for children or $1.75 for adults without the dinner. Tickets will be picked up at the door in all cases. Register in advance by writing Ticket Committee, Penn-York Hamfest Assn., Box 301, Corning, N.Y.

Virginia — The Roanoke Valley Amateur Radio Club will hold its annual Hamfest on May 20 and 21 in the Vinton War Memorial Hall, Vinton, Virginia. This annual event has been sponsored in the past by The Blue Ridge Amateur Radio Society, which is now inactive. Many of the members of this new club were former members of the BRARS. Plans include a dance on Saturday night, May 20, with Sunday, May 21, being the big day when hams get together and enjoy contests, games, win prizes, awards, and eat a fine meal. The club will assist out-of-town guests in securing reservations, and will have transmitters on the air most of Sunday at the site of the Hamfest. Advance tickets for the dance, meal and registration will be available. For more information, drop a card to P.O. Box 2002, Roanoke, Virginia.

(*More on page 164*)

The World Above 50 Mc.

CONDUCTED BY SAM HARRIS,* W1FZJ

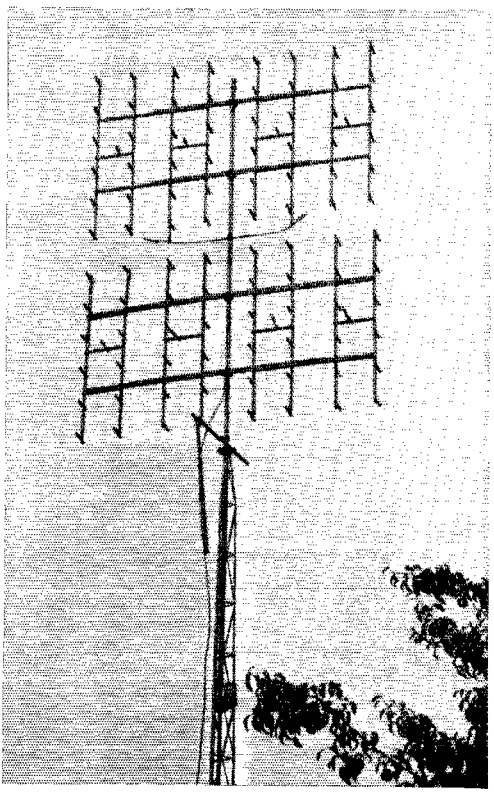
OPERATING on the theory "that any fool can calculate that it can't be done, so it must be possible," many experimenters have claimed to observe some reflected signals from Echo I. In the January column we printed a rundown on the results of experiments carried out by W4ZBQ and K4KYL. Assuming the authenticity of the data presented, we were at a loss to explain the mechanism by which they were able to obtain echos from Echo I. I have since received a note from Raphael Soifer, K2QBW/1, in which he comments on the phenomenon as follows: "I quite agree with your October sentiments that passive reflection from the Echo sphere simply will not explain these results; at 50 Mc. the theoretical received signal strength falls short by some six orders of magnitude of the minimum required for such effects. Additionally, there would be the questions of tracking and of Echo-edge *refraction* which, I am told by friends at Bell Labs, would further reduce reflected signal strength on signals below, say, 150 Mc. This is a consequence of the physical size of the balloon.

"Since passive reflection will not explain the experimental results, scientific method forces us to cast about for a new theory which will do a better job.

"The December 1960 issue of *Proceedings of the IRE* carries an item which I feel bears the best explanation we have yet. It is entitled 'The Relation of the Satellite Ionization Phenomenon to the Radiation Belts,' by J. D. Kraus and R. C. Higgy. Their theory, essentially, is as follows: Telemetered results from satellite Geiger counters indicate that the level of radiation and hence ionization in the Van Allen radiation belts is a highly variable quantity. (In fact, Jastrow of NASA has shown it to be partially dependent upon solar activity). At times when this level is at or near a peak, interactions between the charged, moving satellite and the highly ionized Van Allen belts occur, vastly enlarging the effective cross-sectional area associated with the satellite. They present experimental evidence of WWV signal enhancements correlated with Explorer VII telemetered radiation data (and, of course, with the position of the satellite involved) to support their view. In earlier papers, they describe Doppler effects quite similar to the one you report occurring during the course of these tests. Oversimplified, they say that, when Van Allen radiation is sufficiently high, an effect highly analogous to "H.F. Satellite Scatter" can be observed in conjunction with a satellite traveling at Van Allen belt altitudes — like Echo I. This theory would explain why, for example, effects were noted on 50 Mc. but not on 144 Mc. or higher bands. Ionization-type effects such as this one are known to be inversely frequency-dependent; i.e. they work much better at lower frequencies than they do at higher ones. At u.h.f., they are nonexistent and passive reflection becomes the only usable mode. It works just like meteor scatter, which, as you know, is much better at 30 Mc. than at 50 and much better at 50 than 144. It also does a much better job of explaining the signal strengths obtained. The discrepancy using this theory is only perhaps one order of magnitude compared with six or seven orders for passive reflection. This theory looks like a pretty good explanation until someone else comes up with a better one. At least it's much better than those proposed heretofore. What say?"

Now if we assume that the above explanation is valid, it becomes apparent that the 50-Mc. boys are in a much better position to take advantage

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



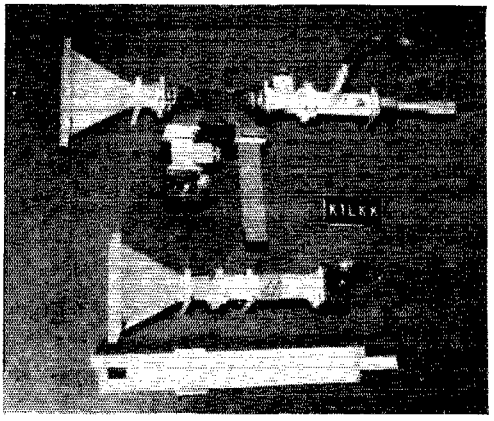
96 elements for 432 Mc. used by W8JLQ. Each 6 driven elements fed (16 feed points). (Oh to have it on 50 Mc!—*Helen*)

of Echo I type of satellite than has previously been assumed. The July 1960 *QST* carried an article by K2QBW in which he outlined a program to coordinate the efforts of amateur satellite, scatter workers. As Director of the Office for Satellite Scatter Coordination (Room 10–206 Massachusetts Institute of Technology, 77 Massachusetts Ave., Cambridge 34, Mass.) he is a fine source of information for prospective experimenters. In case you think that Echo I is your only target, consider this excerpt from his latest bulletin.

"As is generally known, there are in excess of three dozen objects in orbit at the present time, with the liklihood of this number increasing as time goes on. One can calculate that, out of any given hour one or more satellites will be capable of providing satellite scatter communication over a given path for perhaps twenty minutes, on the average. This is simply a consequence of the large number of satellites. This would tend, of course, to make statistical correlation between signal bursts and satellite passes quite difficult. This is complicated by theories which have been proposed saying that a satellite need not actually be in proximity to the two stations to produce a signal strength increase. For example, some say that a satellite in polar regions may produce bursts in many parts of the earth. Others feel that the ionized trail, if indeed one exists, may become separated from the satellite in flight, and therefore cannot be assumed to follow the tracking information for the satellite itself. In other words, assuming proper conditions, satellite proximity is a sufficient, but not necessarily a necessary, condition for burst incidence. This brings to mind a possible new method of research. Previously, one would first predict a satellite pass, then schedule the tests to coincide with it. Today, however, it might be worth the effort to reverse the procedure, i.e. to schedule the test for period of, let us say, an hour, which can be arbitrarily chosen so long as the ionospheric m.h.f. for the path in question is below the operating frequency. The satellites could then be correlated with the finished test results, if possible, rather than vice versa. This, of course, raises the point that there are two other principle modes of propagation which will enter into the results, *viz.* meteor scatter and ionospheric scatter. But, why not? It might be a good idea to see if a so-called "multiple scatter" communications system can provide useful communication. The strong likelihood is that any future use of the frequencies in question during periods of sunspot lull for other than local work will indeed be via some combination of the three modes, rather than via one alone. Therefore, why not use the multiple scatter system in our tests?"

Here and There on 6 and 2

A good beginning for the 50 Mc. news this month; Mac, K2QXG, sends word along that his friend VKØVK operating at Wilkes Base, Antarctica, has just completed an automatic keyer which will run a 100-watt rig to a beam on the States on six meters. It will operate at ten-minute intervals, six times during each twenty-four hours. If anyone should hear him, it is urgently requested that a card be sent to K2QXG. All reports will be acknowledged. The foregoing is the complete information we have; don't know what kind of equipment VKØVK will be using, or if and when he'll be listening. Here's hoping that a number of the 50-Mc. gang do hear him.



X Band receiver-transmitter setup used by K1LKK. Pete is interested in getting in touch with other hams interested in X Band.

Maybe VE8 land or particularly Yellowknife, N.W.T., is the place to be for good 50-Mc. conditions at this time of the year. Pete, VE8BY, sez: "Another six-meter opening tonight (March 6) into Winnipeg and an obvious aurora one. This is the latest of a series of openings in which VE4CV has been at the Winnipeg end, all on phone. It would appear that six meters is just right via aurora into Winnipeg but not to VE5 or VE6 land, as there are stations in both places looking for me, but there is never any sign of them. Tonight VE4CV was 5–9 plus 20 while VE4HW, VE4GU and VE4JK were very weak, and though I heard some phone signals in the U. S. section neither my c.w. nor phone signals received a reply." Pete goes on to say that he is working on 1225 Mc. gear and while he doesn't expect to work anyone he has two units and may be able to scare up some interest in VE8 land. On January 10, Pete heard W7EGN — no luck as far as a contact was concerned. He worked VE4CV on February 17, 20 and March 6, and heard him a number of times other than that but was unable to make a contact. On March 6 he also worked VE4HW and VE4GU.

Geoff, VE2AIO, in the Province of Quebec, came through with disheartening news indeed. Seems that Montreal experienced the worst wind and ice storm in living history on the nights of February 25/26. Guess wha' hoppen! You're so right! Wasn't the ice itself that took down Geoff's 28 and 50 Mc. beams, but the elm tree which fell against the tower. The 50-Mc. beam is a pile of scrap, according to Geoff, but miraculously enough the tower itself was undamaged and was the object which stood in the way of the elm tree so that it didn't strike the house. A second set-back to Geoff's 50-Mc. work is the fact that he'll soon be changing his QTH, but after the move is made in May or June equipment will be bigger and better if we know Geoff.

Seems like the 9's are taking over the State of Florida. Last month we reported that ex-W9EQC is now K4DU, now we have the news from ex-K9HWC that his new call is W4UBS in Pompano Beach, Florida. Gary, W4UBS, is running 50 watts on six meters and 200 watts on two meters from his new location. Sold his 220-Mc. equipment but is thinking seriously of building up something for 432 Mc.

Preliminary results of tests made by Brownie, W4ZZ, show that he gets much better results and reports when he bounces a signal off of Mt. LeConte than if he aims the beam directly at a station over the Valley of E. Tennessee. The mountain is about five miles away airline and rises over 5000 feet above Brownie. He'll let us know any further results he comes up with, with his 9-element beam on 50 Mc.

Aurora reports have been received from K3JHE and

Nick Franetovich, W2SWI, president of the East Coast V.H.F. Society, receives the club's charter of affiliation with ARRL from Ed Tilton, W1HDQ, V.h.f. Editor of *QST*. Occasion was the Society's annual dinner-hamfest, February 25, attended by some 500 v.h.f. enthusiasts from all over the Northeast.

K1CXX, K1AII and K3IPM for February 4. Bob, K3JHE, was hearing stations in Massachusetts, Connecticut and Rhode Island; says there were so many c.w. stations that it sounded greatly like 40 meters. K3IPM was hearing 1's, 2's 4's and 8's during the same period. K1CXX in Auburn, Maine, worked stations along the coast from VE2TT (2 meters) as far south a W4LTU in Virginia, accompanied by so much qrm that he kept losing his contacts (in the first 100 kc.). K1AII had good luck on 50 Mc. during the February 4 aurora, hearing signals from all call areas except W5, 6 and 7. Dick, K1CXX, also reports aurora on the 17th of February but sez it was very poor with only W1s 2s coming through. Did hear one W8 calling him but was unable to identify the call. K8SUJ makes the same comment on this aurora, "one too-weak signal coming through." Both K8SUJ and K8AEM report several good auroras during the month to the northeast and northwest.

A busy month was February for Lou, W8NOH, in Grand Rapids, Michigan. He sez that six meters was open for extended ground wave on February 5 and 6 to Indiana, Illinois, Wisconsin, Missouri and Ohio; while two meters was open to about 250 miles on February 7 and 8. Lou's sked on 432 Mc. with K9GVX, Green Bay, Wisconsin, was successful with S-7 signals both ways on the 10th and 11th of February; and he ended a successful month on 50 Mc. with a band opening on February 18 to Texas, Oklahoma, New Mexico, Louisiana and Mississippi. K7BBO in Washington says that there was a little skip during February into 4 and 5 land but the band hasn't been very lively. Dave is working on a 500-watt rig for two meters using a 4-250 in the final. WA6KVS reports several short openings during the month of February to W0, W5, and 7 land. Jim would like to obtain sunspot data and correspond with others interested in same.

From Georgia and W4FWH we hear that local activity is good but openings few. K4UWO also in Georgia reports hearing W5VC in New Mexico in QSO with K4YGK, Georgia. Does seem to be a great deal more 50 Mc. activity in New Mexico lately. Maybe it won't be quite so difficult for the New England area to work New Mexico in the future. From Indiana K9GFQ observed no solid skip although 2's and 4's were breaking through sporadically on February 26. Larry is one of the many who has converted the APX-6 to 1220 Mc., and is now "having a ball" with 1220 Mc. antennas of various types. He's been a busy fellow recently, having also completed recently a 220 Mc. rig with 832A in the final. He'll be using a 6-element yagi at 75 feet when he gets going. From K1AII in Massachusetts we hear that Sunday morning scatter activity continues on 50 Mc. with the W1LUN/W4RMU sked at 0700. W4KDH can be heard about 0815 calling CQ to the New England area, his frequency is 50.004–50.005. Art's (K1AII) running 800 watts and his frequency is 50.004 for anyone who'd like to try. Mike Dormann, W7ZVY, is seriously (?) thinking of getting rid of his two-meter gear and trading for six-meter equipment. Why? He's been reading about "Fletcher's Ice Island." Can't figure out from Mike's comments if he is thinking of going there himself or if he's just got the DX bug. Poor band condition reports come from K3IZM, W0HPS and K6SIX; W0HPS sez, "very poor except for bursts," K6SIX sez "extremely poor conditions here, although strange noises were heard frequently between 50 and 51 Mc." We'd be kind of interested in knowing more about W0HPS location after reading the following sentence. "The only *ground wave* signal on six meters at this QTH in two years was from my XYL or from mobile tourist hams at Oconto Mt., Wisconsin." K6RCK is working on a project close to every v.h.f.er's heart — building a complete 144- and 50-Mc. station to be installed in a new truck Charley says "for a new truck in the family."

Sideband station on 50 Mc., W4CIN, reports good results with his sideband rig, and he's increasing power to 250 watts. Gerney also operates 144 Mc. (a.m.) and will be on 432 Mc. by April. That's one of the increasing number of v.h.f.ers who is working more than one of the v.h.f. bands. Nice to see what these fellows are doing 'cause it seems like the more they do, the more they look for things more difficult to do. From Danville, Vermont, (Caledonia County) Bob Curtis, W1EXZ, is carrying on a weekly sked with W1UGV, Merrimack, New Hampshire with fair success. "It is 112-mile path of mountainous terrain and using low power c.w. produces weak but readable signals." Bob also noted the auroral sessions of the 4th and 17th of February but worked only W2's. 220-Mc. tests were made between W1EXZ and W1ET in Hanover, New Hampshire using 6 meters as liaison. W1ET is the nearest 220-Mc. station Bob has ever had the opportunity to make tests with and the two stations are sixty-five miles apart. A final comment from Danville, Vermont, mentions the enjoyable 3-ways being held with

220- and 420-Mc. STANDINGS

220 MC

W1AJR	11	4	480
W1AZK	9	3	112
W1HDQ	11	5	450
W1OOP	12	4	400
W1RFU	15	5	480
W1UHE	11	4	385
W2AOC	13	5	450
K2AXQ	8	3	230
K2CBA	10	4	325
K2DIG	4	3	140
W2DWJ	15	6	740
W2DZA	12	5	410
K2KIB	12	4	300
W2LRJ	10	4	250
W2LWL	11	4	400
W2NTY	12	5	300
K2PPZ	11	4	190
K2QJQ	13	5	540
W2SEU	4	2	150
W3AHQ	4	3	180
W3FEY	10	5	350
W3JYL	8	4	180
W3JZI	4	3	250
W3KKN	10	4	255
W3LCC	8	5	300
W3LZD	15	5	425
W3RUE	9	5	450
W3UJG	13	5	400
W3ZRF	5	4	112
K4TFU	8	4	400
W4UYB	7	5	320
W5AJG	3	2	1050
W5RCI	8	5	700
K6GTG	2	1	240
W6MMU	2	2	225
W6NLZ	3	2	2540
K7ICW	1	1	250
K8AXU	10	5	1050
W8IJG	9	4	475
W8LPD	6	4	480
W8NRM	8	4	390
W8PT	10	5	660
W8SVI	6	4	520
W9AAG	9	4	600
W9EQC	11	5	740
W9JCS	5	2	340
W9JFP	9	4	540
W9OVL	6	3	475
W9UED	4	4	605
W9ZIH	10	5	500
KØDGU	5	3	425
KØITF	6	3	515
KH6UK	1	1	2540
VE3AIB	7	4	450

420 MC

W1AJR	8	3	230
W1HDQ	8	3	210
W1MFT	8	3	170
W1OOP	10	3	390
W1RFU	7	4	410
W1UHE	6	4	430
W2AOD	6	4	290
W2BLV	12	5	360
K2CBA	5	3	225
W2DWJ	10	4	196
W2DZA	5	3	130
K2KIB	4	2	100
W2NTY	3	2	100
W2OTA	9	3	200
K2UUR	7	3	175
K3EOF	6	3	250
W3FEY	7	3	296
W3RUE	2	2	96
W4HHK	5	4	550
W4VVE	6	4	410
W5HTZ	3	2	400
W5RCI	9	3	600
W6GTG	1	1	180
W7LHL	2	1	180
W8HCC	3	2	355
W8HRC	3	2	250
W8JLQ	4	2	275
W8NRM	3	2	390
W8PT	4	3	310
W8RQI	4	2	270
W8TTY	7	4	580
W9GAB	9	4	608
W9AAG	5	3	375
W9OJI	6	3	330

The figures after each call refer to states, call areas, and miles.

W1FZS, Chichester, New Hampshire and K1CXX in Auburn, Maine. 144 Mc. activity is going "great guns" according to Dave, KØRWC, who also reports that WØVLD has changed his QTH to Pittsburg, Kansas. No openings in that area on six meters. K6SIX, K6TVC and KØAKC all report an abnormal amount of atmospheric noise on 50 Mc. K6SIX reports conditions extremely poor. K6TVC sez he observed no unusual events or results, and KØAKC sez "no band openings due to F_2 or Sporadic E as far as I know." KØPSE, KØVLG and KØAKC gave a demonstration of 50 Mc. amateur radio to the meeting of "Sky Pilots" held on February 27 in Minneapolis. They had two complete stations set up and worked out around the Twin Cities. The main rig was running 50 watts into a six-meter halo wired to a second-story fire escape and although mounted between two buildings, the boys did get remarkably good signal reports. One more successful demonstration of ham radio. Thanks, fellas!

Clubs and Nets.

Although the "Frye Amateur Radio Club of Chattanooga" is not exclusively a v.h.f. club, it seems that the 50-Mc. operators have decided to "land" the certificate offered by the club. To obtain the "Chattanooga Choo-Choo" Certificate requires U. S. stations to work 25 Chattanooga stations, foreign stations must work only 10 and local Chattanooga stations must work 50, all confirmed by QSLs of course. The local six-meter net boys known as the "Dauntless Dozen Plus Two" decided to hold a Jamboree to stimulate interest in six meters and to enable more of the gang to get the certificate. Under the able direction of W4JVM the Jamboree was held on Thanksgiving week end and was a great success. Besides providing contacts enough for six local and two out-of-town stations to obtain the certificate, the Jamboree convinced a number of the gang that v.h.f. is here to stay. At the present time there are twice the number of stations checking into the net as were checking in before the Jamboree. K4KTC suggests such action if 50 Mc. activity is lagging in your area.

144 Mc.

Many 144-Mc. DXers keep schedules with fringe range stations in their area. In the absence of any band markers or beacons these schedules, if well known, may be monitored to give indications of band characteristics. They might also act as inducements for others to call in and get some activity going. For instance, the following schedules are maintained by W2ESX from his QTH in Morristown, New Jersey: W2ESX-144.009, 2150 EST nightly with W2LWI-144.057; W2ESX-144.009, 2230 EST nightly with W4FJ-144.069; W2ESX-144.009, 2245 EST Sunday with W4OLK-144.020. W8KAY-144.300, 2200 EST nightly, CQ East. Speaking of schedules Ed, W1GFH/5 at Holoman AFB, New Mexico, is looking for meteor scatter schedules with anyone interested in New Mexico. Please address to A2C, Ed Zuromski AF11377843658OABG, Box 334 CMR, Holoman AFB, New Mexico.

Speaking of schedules and results, Arnold, C3HBW, picked up his 20th on January 3 when he contacted HB9RG That's 20 countries on two meters.

Apparently my dissertation on coaxial filters has achieved some results as witness the following from W5ML: "Oh yes! I just finished your coax filter and it absolutely is tops, it not only cut out all the TV hash from KTBS 65½ Mc. and KSLA 205 Mc. heterodyne, but it gives less noise from the converter and about three to four db. gain on the 1831D meter. Knowing there is no gain to a filter it is no doubt the result of a better match between the antenna and converter." We also just received a tape from Charley, W8AUE of Cortland, Ohio, on which he recorded the results of his coaxial filter and parametric amplifier combination. Needless to say the results he obtained were very gratifying. And it was certainly a pleasure to find that someone not located on the West Coast is actually making use of parametric techniques. I wouldn't want you to gather from this that everyone on the west coast uses parametric amplifiers but I received the first tape recording showing improvements obtained by using a parametric amplifier from W6 land well over a year ago. Furthermore, the only practical construction articles on parametric amplifiers have come from the west coast. This is not meant to imply that East Coast v.h.f.ers are slow, but perhaps just a bit on the stoogey side. Ohio seems to be fairly well represented what with W8LIO's 1296 paramp, W8ERQ's 432 paramp, (Primarily used on 432 Mc. TV). Speaking of parametric amplifiers, Louis, WØMOX, is collecting parts for his 1296 parametric amplifier. In case you think he's going to be neglecting 144 Mc. he points out "Will start on it as soon as I get the 144 Mc. kw. working just the way I want it to." Incidentally, with any luck at all we hope to have the two-meter listings properly arranged this month. We may even be able to get Louis listed as WØMOX instead of WØMDX. If you note discrepancies in your listings please drop me a card and tell me.

2-METER STANDINGS

W1REZ	32	8	1300	W6WSQ	15	5	1390
W1AZK	28	8	1205	W6NLZ	12	5	2540
W1KCS	24	7	1150	W6DNG	9	5	1040
W1RFU	24	7	1120	W6AJF	6	3	800
W1AJR	23	7	1130	W6ZL	5	3	1400
W1HDQ	22	6	1020	K6GTG	4	2	800
W1MMN	21	7	1090	W6MMU	3	2	950
W1IZY	20	7	1180				
K1CRQ	19	6	800	W7JRG	13	4	1040
W1AFO	17	6	920	K7HKD	11	5	950
K1AFR	17	5	450	W7CJM	5	2	870
				W7LHL	4	2	1050
W2NLY	37	8	1390	W7JIP	4	2	900
W2CXY	37	8	1360	W7JU	4	2	253
W2ORI	37	8	1320				
K2GQI	33	8	1200	W8KAY	38	8	1020
W2BLV	30	8	1020	W8SDJ	37	8	1220
W2AZL	29	8	1050	W8PT	37	9	1260
K2IEJ	27	8	1060	W8IFX	35	8	980
W2AMJ	25	6	960	W8LOF	33	8	1060
K2LMG	24	8	1160	W8SFG	34	8	1040
K2DWJ	23	6	880	W8RMH	32	6	910
K2HOD	23	7	950	W8GGH	32	8	1180
W2PAU	23	6	753	W8BAX	32	8	960
W2ALR	23	7	960	W8SVI	30	8	1080
W2RXG	23	8	1200	W8EHW	30	8	860
W2SMX	23	7	1090	W8LPD	29	8	850
K2CEH	22	6	940	W8WRN	28	8	680
W2LWI	21	6	700	K8AXU	29	8	1050
K2KIB	21	5	900	W8NOH	26	8	975
W2ESX	20	6	750	W8DX	26	8	720
W2WZR	19	7	1040	W8ILC	25	8	800
W2UTH	19	7	880	W8JWV	25	8	940
W2RGV	19	6	720	W8WNM	25	8	900
K2RLG	17	6	980	W8GFN	22	8	540
				W8LCY	22	7	880
W3RUE	33	8	1100	W8BLN	21	7	610
W3GKP	31	8	1180	W8GTK	17	7	550
W3SGA	31	8	1070	W8NRM	17	7	550
W3TDF	30	8	1125				
W3KCA	28	8	1110				
W3BYF	28	8	1070	W9KLR	41	9	1160
W3EPH	22	8	1000	W9WOK	40	9	1170
W3LNA	21	7	720	W9GAB	34	9	1075
W3NKM	20	7	730	W9AAG	33	8	1050
W3LZD	20	7	650	W9REM	31	8	850
				W9ZIH	30	8	830
W4HJQ	38	8	1150	K9AAJ	29	8	1070
W4HHK	37	9	1280	W9LVC	27	8	950
W4ZXI	34	8	950	W9EQC	27	8	820
W4LTU	34	8	1160	W9PBP	27	8	820
W4MKJ	33	8	1149	W9OJI	27	8	910
W4AO	30	8	1120	W9ZHL	25	8	700
W4VLA	26	8	1000	W9BPV	25	7	1030
W4EQM	25	8	1040	K9AQF	24	7	900
W4AIB	25	8	900	W8LF	22	7	825
W4WNH	24	8	850	W9KPS	22	7	690
K4EUS	24	6	765	W9CUX	21	7	800
W4JCJ	23	6	725	W9PMN	19	6	800
W4RMU	21	7	1080	W9ALU	18	7	800
W4VVE	21	6	720	WØBFB	37	9	1350
W4TLV	20	7	1000	WØIHD	31	8	1030
W4IKZ	20	6	720	WØSMJ	29	9	1075
W4OLK	20	6	720	WØLFE	28	7	1050
K4YUX	18	8	830	WØQDH	27	9	1300
W4LNG	18	7	1080	WØRUF	23	7	900
W4RFR	18	9	820	WØINI	21	6	830
W4CPZ	18	6	650	WØTGC	21	7	870
W4MDA	17	6	750	WØRYG	20	8	925
				WØIC	19	7	1245
W5RCI	35	9	1215	WØMOX	19	6	1150
W5AJG	30	9	1360	WØJAS	18	6	1130
W5JWL	29	7	1150	WØAZT	17	6	1100
W5DFU	28	9	1300	KØAQJ	16	6	1120
W5PZ	27	8	1300	WØIFS	16	6	1100
W5LPG	25	7	1000				
W5FYZ	26	9	1160	VE3DIR	30	8	1330
W5KTD	23	8	1200	VE3AIB	28	8	1340
W5JWL	29	7	1150	VE3PQN	19	7	790
W5ML	16	5	700	VE3DER	17	8	1340
W5FSC	12	5	1390	VE3AQG	18	8	1300
W5HEZ	12	5	1250	VE3HW	15	7	1350
W5CVW	11	5	1180	VE2AOK	13	5	550
W5NDE	11	5	625	VE3BPB	14	6	715
W5VY	10	3	1200	VE2ABE	9	4	580
W5SWV	10	3	600	VE7FJ	2	1	365
W5YYO	7	4	1330				
W5UNH	6	3	1200	KH6UK	1	2	2540

The figures after each call refer to states, call areas, and miles.

220 Mc. and Up

Ben, W9OVL, points out that activity in the Chicago area on 220 Mc. is picking up, possibly as a result of the first 220 Mc. Chicago gal, W9TOY. The Chicago boys are

(*Continued on page 148*)

Correspondence From Members-

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

IN A RUT?

¶ W6LDJ (March, *QST*, Correspondence) asks someone to tell him that a.m. QSOs are not routine: I think I can.

After QSOs with W2YJZ (now K8DKG) I got to know him so well I visited him in New York and we became friends. On returning to England I was in QSO with W2YJZ and having some difficulty. W2OQR/mobile broke in and offered to help. After that we had many 3-way QSOs. W2YJZ moved to Ohio and became K8DKG, and we still QSOd. When I returned to New York some years later I knew W2OQR so well it was like meeting an old friend.

A QSO with W1FB resulted in another personal contact and in many evenings spent together. He is Technical Secretary of 1RE and took me to the IRE Convention. W9NYY is another friend whom I visited and VE2IK in Canada is yet another.

Some years ago, Olavo, PY5GA, called me, but with a very weak signal. He asked me about my antenna as I had a good signal in Brazil. We discussed antennas. Later I sent him a diagram of my ZL Special and a small bit of 150-ohm r.f. cable for the phasing line. Some months later a tremendous signal called me: it was PY5GA with his new antenna. We've had dozens of contacts since then and one day I worked him from my mobile. Olavo was thrilled and during the mobile QSO told me he was coming to England. Naturally we met: he spent a week end at my cottage.

I work s.s.b. as well as a.m. and spend about an equal amount of time on each, but the QSOs listed above were all on a.m. before I had s.s.b. facilities. I have never found a.m. QSOs stereotyped but then I never take part in contests! — *E. M. Wagner, G3BID, London, England.*

VOTE OF CONFIDENCE

¶ . . . I have found *QST* very helpful in writing my term paper entitled "Project Ozma and the Ruby Maser." The article on the speculation of communication with other star systems by Drake was particularly useful. *QST* and the *Handbook* were also very helpful in the building of my 150 watter, and souping up my BC-312. Keep up the good work, and you will always have my vote of confidence. — *John J. Zizzo, K3JVT, Houtzdale, Pa.*

FORWARD . . .

¶ I have been very glad to see the articles on 1296 Mc., the Oscar Project, and RTTY in *QST*. I hope there will be more of them as I am very interested in these phases of radio.

I have been amazed at the complaints in *QST* about these subjects. Where has the spirit of experimenting in amateur radio gone? — *Dean W. Larson, W6HAB, Hilmar, Calif.*

. . . OR BACKWARD?

¶ I find myself compelled to speak out against the League's "population at any price" prorgram for the v.h.f.-u.h.f. bands. Encouragement of obsolete concepts for the 1296 Mc., band was unfortunate, but use of the APX-6 is tame beside Mr. Hadlock's proposal ("Wide-Band F.M. Gear for 220 Mc.," March, *QST*) to invade a v.h.f. band with wide band, unstable gear. Serious work is already being done on 220 Mc. with narrow bandwidths and stable equipment. There is no assurance that these unstable transmitters will be confined to the upper reaches of the band. Irresponsible operators will likely disrupt experimental communications at the low edge. The recent articles describing a paramp and converter for 1296 Mc., were excellent. Indeed, they point up the folly of the outdated techniques. Are we not to strive for excellence? The "cheap and dirty transmitters" could set the v.h.f.-u.h.f. bands back to 1938. — *W. S. Baker, K2LZF, Greenfield Center, N. Y.*

BEST EDITORIAL?

¶ Your March "Self-Policing" editorial is the best thing I have read in *QST* or any other ham publication in some time. With the increasing number of amateurs on the air I think the League should present more of this type of editorial to its members. It is going to be of great importance for us hams to keep each other in line. More articles on correct operating procedure should be presented too with comments, where needed, on the few "oddballs" who are operating and making a bad name for all the good operators. I am referring to those who insist on spoiling operation for many by putting poor c.w. sigs on the air and those phone operators who insist on overmodulation, unstable v.f.o.s etc.

So keep up the good — no, I'll say excellent — work. I appreciate it as do all amateurs who are interested in their hobby. — *Philip H. Warner, WA2JIL, Hampton Bays, L. I., N. Y.*

WHERE'S THE DX?

¶ As a general rule, if I want to find some good DX, I can usually find it under some W/K lid who is calling "CQ DX." — *Bob Todd, K8QJH, Milan, Mich.*

SAFE DRIVING?

¶ Three big cheers for WA6CYT! (*QST* Correspondence March '61) I agree with him one hundred per cent. It seems to me that the National Saftey Council is always stressing that drivers should give their undivided attention to *driving.*

Some philosopher said it in another way. He said that one should never kiss a pretty YL while driving 'cause you can't give proper attention to the kiss. Well I think that also holds true for c.w./m. If these ops don't realize that they are endangering themselves and others by trying to do two incompatible things at the same time, maybe they'll see that they won't be able to pay attention to their QSO or their fist.

As long as somebody is operating c.w./m I think I'll join Keith Lamonica and stay off the road! — *Benjamin H. Gorsky, K1IVR, Hartford 12, Connecticut.*

¶ In answer to WA6CYT's letter (March *QST*) expressing disapproval of KH6IJ's c.w. mobile operating, may I say that Katashi is one of the top ops in the country. I'd rather be on the road at 70 m.p.h. with him sending c.w. than with most 18-year-olds with their arms around their girls at 25 m.p.h. — *Bud Dolsberry, WØAQ, Leavenworth, Kansas.*

¶ Lest there be misunderstanding by WA6CYT I can honestly say that doing 70 m.p.h. (legal limit) with one hand on the Maine Turnpike is far less of a trauma than 50 m.p.h. with two hands on the 101 Bayshore or the Santa Anita Expressway.

About the time OM Keith was born, 18 years ago, wartime manpower shortage forced me to the 5:00 A.M. shift of a one-man broadcast station. I had to spin records (no LP then), cue in the network, man the control board, and simultaneously copy high speed press from WRM (Press Wireless, Long Island) beamed to La Prensa in Buenos Aires. Hawaii was 6000 miles away, off the side of his beam, on a jumpy HQ-120. I wish I had six hands then, so you see I'm really past my prime.

However, driving with one hand on the wheel, a girl friend in the other, well — that's more than I could have managed, even in my prime, with six hands! — *Katashi Nose, KH6IJ, Lihue, Hawaii.*

ANOTHER ARRL SERVICE

¶ This will convey in some small measure my thanks for the League's effort in clarifying my amateur license status.

In fact, I received my new "ticket" two days before the

arrival of your note. Fortunately for me, I turned to the right source for action rather than trying to handle the situation myself. This has been a prime example to me of the effective help available to hams through their own organization. — *Jack B. Stuman, K9UWN, Rockford, Illinois.*

WHAT *NOT* TO BE . . .

¶ To Chuck, WA2LTX: The amateur (let's call him W2XX) to whom you refer is well known on 75. You forgot part of his litany, however: ". . . no lids, no kids, no school bus riders or space cadets. . . ." Really, you must admit that it is musical and almost poetic. But Chuck, for hevvins sake, don't — I say again — *don't* drive him off the air! We need W2XX as a perfect example of what *not* to be. How else can we train new hams, how better can we educate the newcomer than to point a finger and say, "Do you want to grow up to be just like him?"

Sad though it is, some otherwise good operators have been baited into retaliation. Deliberate interference by our mutual friend is being repaid in kind. I have just a word for these operators. Please, don't do it. To do so is just like following an old yeller Ford up a winding hill and getting so mad that you finally pass just before the top. And you are the one who gets killed by the FCC truck in the other lane.

We at home consider it an honor to be noticed by the guy: K2LNG is referred to as "that jerk in Rome." Have you ever noticed that W2XX ignores the really bad operators? And the one thing that really disconcerts him is politeness? Every time he drives an otherwise good operator into an illegal act, I'm sure he experiences a warped feeling of satisfaction. Let's stop making him happy. He can't revel in any amoral victory if you refuse to get mad and instead, maintain your composure and apologize politely for his bothering you.

And anybody who doesn't think I have a right to speak up just because I have a "V" in my call can take it up with me personally, when I get that "A" this summer, and help me correct my operating errors before they get to be bad habits . . . that is, if any of you high falootin' old timers will talk to a WA . . . who is an XYL to boot. Come to think of it, I never did hear my idol exclude YLs. — *Terry van Dyck, WV2LVU, Rome, N. Y.*

(Editor's Note: Well, guess you missed part of W2XX's litany too, Terry: "No kings, no ***queens,*** no jacks!")

. . . OR INALIENABLE RIGHT?

¶ . . . The right to select one's conversational companions is a basic one. So is the right of selective CQs. One hears CQ DX or CQ New York State and never challenges the right of the sender to request a particular type of reply. Why, then, should one deny another the right to indicate the nature of a co-conversationalist?

A mature citizen, wishing to discuss matters of international politics, for example, does not seek his conversational companion in a kindergarten playground. Similarly, one wanting to discuss some technical phase of electronics would not seek a reply from a person whose call indicated a very great probability of being a newcomer to the art.

Also, there is a possibility that the caller possesses a 1919 model receiver (or mentality), not equipped with a b.f.o. to cope with c.w. or s.s.b. He then has a right to ask that such stations not reply.

There is a considerable body of radio amateurs who earnestly feel that any amateur who is so lacking in ambition, drive, and self-respect as to be content to stagnate with a bare-minimum qualification of a General Class license surely cannot be a challenging and enlightening co-conversationalist in a subject such as the fast-changing art of electronics. Can one be blamed, then, for seeking a conversation with a member of a group which has at least shown at one time an interest in some phase of radio other than a senseless and repetitious exchange of "handles" (how I detest that word!) and other garbage? . . .

. . . Let Mr. Hummel acquire a little more seasoning in amateur radio before he aspires to propound the tenets of the game to men who were pioneering the art when he was squalling for a change of diapers! — *Carl C. Drumeller, W5EHC, Oklahoma City, Oklahoma.*

HAM ON TV

¶ It was very heartwarming to observe on February 26, via NBC-TV, the interesting story of Lenore K. Conn, W6NAZ, of Sherman Oaks, California. Her life was presented on the Ralph Edwards show, "This is your Life."

By means of this program and others like it, the fine work of amateur radio can be shown to the many people of our country and abroad who are not familiar with it. It made me proud to be a member of the great ham fraternity. Let's all keep up the fine work. — *Marc E. Moss, K3HZS, Pittsburgh, Pa.*

[See page 67 April *QST* for a photo and for further details on the show.]

HALL OF FAME

¶ As an amateur who has distinguished himself by absolutely nothing except reasonably clean operating technique for many years, I have a tremendous respect for those of our brethren who do make vital contributions to amateur radio. These contributions take many forms: operating superiority, technical advances, public service, etc., but they have one thing in common — directly or indirectly they help all of us in the pursuit of our hobby.

I have long felt that through the ARRL a sort of "Amateurs Hall of Fame" should be established to honor those outstanding hams with an annual election of a prescribed number from each call area with nominations coming from their fellow amateurs and a selection committee making the final choices.

It also occurs to me that hundreds of our two-letter calls are now vacant and in a few years only a handful will remain active. Perhaps an arrangement could be made with the FCC to issue honorary two-letter calls to those selected for the Hall of Fame allowing them to retain their present call and use either or both calls.

I hope you will agree that those members of our fraternity who give so much should receive some token of recognition for the services they perform with no reward except the esteem of their fellow amateurs. — *Gene C. Finn, W9PSY, Princeton, Ill.*

LAND, SEA OR AIR . . .

¶ On c.w., there is no means of distinguishing between a land mobile, aeronautical mobile, or maritime mobile, when operating within continental USA. There is also no means of distinguishing between mobile stations and portable stations.

When I call "CQ de W4FIN/4" operating c.w. mobile, those hearing the CQ would in all probability assume that I am a fixed station operating portable while my license is being modified. If I had a positive identification that I was operating a *mobile station*, such as "W4FIN/LM4" for "Land Mobile 4," this would be very desirable. I would make more contacts because c.w. mobiles are rare, and therefore a good "catch" for the average fixed amateur. The same applies to aeronautical and maritime mobile stations.

I therefore suggest that the FCC could revise regulation 12.82 to permit c.w. mobiles to identify themselves by "/AM (*area*)," "/MM (*area*)," "/LM (*area*)," while operating in USA, for aeronautical, maritime, and land mobiles, respectively. — *Bill Latta, W4FIN, Louisville, Kentucky.*

WRIST-SLAPPING

¶ After just reading the latest list of FCC License suspensions in April *QST*, I find I can no longer hold back from commenting.

I believe it is a grave injustice to all law abiding amateurs to allow *deliberate* violations to be passed over with a mere slap on the wrist.

I am glad to see fair consideration given to those violations that come about from human weaknesses, such as miscalculations and even carelessness. But, I think it's time we amateurs demand that such *deliberate*, premeditated violations as Technicians operating 10- and 15-meter phone should be penalized so it will hurt. While not in favor of fines, I feel that a suspension of no *less* than five years would be the very least the violation would call for.

While my gripe is in no way against Technicians as such, it is true that every Technician I know personally is so only because he has not mustered the ambition to get his code speed up to the 13 w.p.m. for General Class. And this particularly hurts me, as nothing I ever accomplished in my life was so painful and called on me for such perserverance as learning and advancing my code speed to the necessary 13 w.p.m.,

(*Continued on page 162*)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
JOHN F. LINDHOLM, W1DGL, Ass't. Comm. Mgr., C. W.

ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE W1YYM, Ass't. Comm. Mgr., Phone

Get Your Field Day Log Forms Now. Last month we discussed on this page club and individual planning for the FD. That June 24–25 week end for Field Day will be coming up all too soon. No doubt you already have "plans." The Field Day is an operating-holiday for some, a real work out and an emergency-powered amateur radio equipment test for others. It takes some know-how to work rigs close together without undue interference. There's the challenge of constructing some lightweight low-powered really portable equipment, and finally it's a builder of operator know-how.

You can go with another operator and share the adventures and the operating; or you can make it entirely a try-out of individual equipment, or go with a club. Club activity is for most clubs at its pinnacle for the year on this occasion.

ARRL has the Field Day log forms for reporting ready to send you. We suggest you ask for these by radio or mail at once, if you will be on the FD, since you must allow time for third class mail to function and you will not want your forms to arrive late

Club Provisions for Exam Service to New Amateurs. Most clubs encourage and assist newcomers not only by running code and theory radio-classes at intervals through the club year, but by assisting when the budding amateur is ready for the Novice, Technician, or Conditional Class FCC-exam. Data on where you can buy code records, the W1AW-W6OWP code proficiency program and the like will be sent to any newcomer on request. Also on club request we'll send such information packaged in desired quantities for the members of a club-group-in-training.

Two ways to have examination assistance ready for new amateurs are recommended. Clubs get new members this way, also. Here is the mechanism. (1) Active club members of known proficiency and rectitude and some seniority are designated for mail examination responsibilities by official club action or appointment by the radio club president. (A telephone-number address-list is kept by the club secretary and published from time to time in club bulletins.) (2) Alternatively a club may appoint a Standing Examination Committee of three to five members. . . . Two or more work together to put on examinations and to do it well. Under either method the purpose is to create a club service, at the same time uniformly high club and F.C.C. standards are met. The examinee who has carefully prepared and checked his own ability to set down something *more* than the actual speed he will be tested at, usually has no trouble passing his tests. He gains respect for himself, and deserved praise from fellow amateurs as well as his examiners for having made proper preparation.

Examination Standards. The following information is briefly the letter-and-figure content of FCC code-examination material. Since a great many clubs give around-the-table code practice and others prepare carefully what they send over-the-air let us repeat this information that has been given in affiliated club bulletins so all will have it for reference whenever exams or code-practice material are made up. *Standards to follow* must be observed for the proper carrying out of this type of club or individual responsibility. Here is a guide for such matters.

FOR NOVICE. The *receiving* examination, as stipulated by FCC, does not require numbers or punctuation. However, each letter of the alphabet must appear *at least once.* Twenty-five words, groups, or 125 consecutive correct character equivalents should be transcribed accurately (Five minute runs are suggested to help your candidates settle down and do their best.) The object is to get the "perfect" minute, with *no omissions or errors* in copy. (Sec. 12.50). In the *sending* test, include numerals and simplest punctuation. Such tests are ordinarily made up of 4-, 5-, and 6- letter words, not forming or stating a connected thought.

FOR GENERAL CLASS. Such receiving tests should always contain Q signals and *at least one* letter-number-letter group (such as an amateur call or tube type number) in the plain language, in each minute of the test. The slant bar may be used in this examination. Use each number and letter at least once, and also use the question mark or repeat sign at least once. (This is because the DN is mentioned in Sec. 12.82 of the Regulations, so FCC tests each amateur's ability to recognize this.) The sending test should be equally difficult. A full minute with *no omissions or errors* in copy transcribed or sent is required to meet the specified FCC amateur rules.

Outstanding Observer Service. In December *QST* we mentioned the recommendation to SCMs that not more than seven or eight Official Observers be appointed per section and that they use such quota to assure the highest qualified men. We have had more than that in some Sections. However, we knew there would be OO openings, since the word had gone out to cancel all such appointees not sending out or reporting sending any ARRL advisory forms. To help shape a continuously strong Observer Corps, SCMs make selections of only the best qualified applicants . . . and it is the same with the activity requirement and reviews for annual appointment for other SCM posts though there are no quotas on ORS, OES or OPS appointments and almost all who qualify should get those! The OO's cooperative forms save many an amateur from FCC difficulties, of course.

For the calendar year '59 Observers reported around 18,000 notice-mailings. But it was for the year 1960 operations that we particularly want to commend every active Observer publicly. In this year just completed 302 different Observers made out and reported some 24,342 cooperative-notices! It was a slightly smaller group that did the job. Many letters of appreciation and friendly responses to Observers made us aware of the success of the program as it went along. The sixteen Observers listed below especially rate our thanks and commendations. Their efforts were in the 300-3000 report group, so we want you to know about their high standing and results in this field. Hats off to:

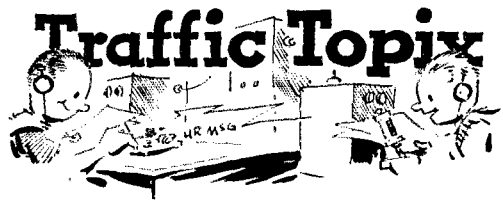
W1JNV	W2BLP	W2BKC	W3NNC
W3AHQ	W3KLA	W3ZAQ	W4PK
K4ARO	W6WLI	W8EMD	K8KCO
K8EEB	W9GFF	K9GDF	W9RKP

Sideband Use Makes News Again. As this *QST* appears your League's Board of Directors will soon be meeting. The Board receives reports on the status of every League activity, including its study of amateur modes and occupancy, also of the status of your Amateur Radio Emergency Corps and National Traffic System. In the report as usual we have one item reporting results in a survey of affiliated clubs. Part of this concerns how many club members are using s.s.b. or planning to install or build for s.s.b. In a random group of clubs representing 2291 licensees we found 389 s.s.b. users and in the same group 117 more were planning to add sideband. For those who have been following the course of changes in technique, we'll make a simple tabulation of the results in this survey for some consecutive years. The following represents "s.s.b. users per 100 amateurs surveyed through clubs." Note that in the *last* year, the use curve is up, and the gain in use is as much as for the first *six* years in the list.

'52	.56	'55	4.12	'58	6.36
'53	1.61	'56	5.0	'59	10.7
'54	2.41	'57	5.95	'60	17.00

—*F. E. H.*

Traffic Topix



As this issue reaches you, Spring will have sprung and the temptation to work in the yard or garden will often outweigh the need to report into traffic nets. Also, we will have gone, once again, to "daylight saving" time, in the delusion that we can add an hour of daylight by kidding ourselves into believing that it's some time it ain t.

Now that most of the amateurs in general and the traffic men in particular have gone over to Greenwich Time, it won't be so easy. This may come as a shock to those adherents of semi-annual clock-changing who never thought about it, but there is no such thing as Greenwich "Daylight Saving" Time — although GDST could stand for something like "Gosh Darn Silly Time." If we want to run our nets an hour earlier, we'll have to run them an hour earlier *by the clock*, and no nonsense about it; also, no confusion about it. With GMT getting entrenched, those who try to change the time of their meetings without changing its clock time are not going to kid anybody but themselves.

Of course, there are those who don't go along with this trend to GMT, who can't see any sense in changing the date in the middle of the day instead of the middle of the night, and who don't even *want* to. There is always resistance to change. But let those nets who are changing their time, say, from 1900 EST to 1900 EDST remember that they are changing from 2400Z to 2300Z and this is no fooling! It represents an entirely new time in your net listing.

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We quote from "ESN," the bulletin of the Eastern States Net, edited by WA2COO: "If each one of you traffic men could get another ham every month to QNI, our prospective growth would be great. Just stop and think this over. It isn't necessary that he copy 20 w.p.m. or that he has a firm knowledge of good operating procedure. As a matter of fact, the most desirable newcomer might be one straight out of the novice bands, who hasn't learned too many bad habits and whose ideas and style can be moulded by the seasoned traffic men. Take a second look at that lid at radio club who has been trying to get someone to show him how to build a modulator, or the guy across town whose key clicks are S9 on all bands. These are the fellows who might some day nail down jobs on TCC, EAN, or be appointed RM. Get behind your net. Show up regularly, with outlets on other bands, and *with traffic*. Advertise your service at work, or at school, but don't apologize for anything in advance. Remember, you can't have a traffic net unless you have traffic, and the more the better."

Net Reports (February).

Net	*Sessions*	*Check-ins*	*Traffic*
Eastern Area Slow	28	223	100
N. E. Area Barnyard	24	626	6
7290 Traffic	40	1486	547
20 Meter Interstate S.B.	20	560	1662
Mike Farad E & T	49	597	1950
Early Bird Transcon	28	...	512
75 Meter Interstate S.B.	..	706	419

—•••—

National Traffic System. Just in case you haven't noticed, we've been having quite a turnover of managers at region and area levels lately. In most cases, there has been someone waiting and eager to grab the job, and this is a good sign. In the Pacific Area, where we have the Pacific Area Staff of NTS to advise us on such matters, on occasions they have two or three candidates and have to have an election.

Being manager of an NTS net is not easy, but it is most certainly an honor to be selected and a source of real satisfaction to do a good job. It restores one's faith in the maturity of our amateur service to have competent, qualified operators step up, when a vacancy occurs, and indicate their desire to take over; and it's what keeps NTS going the way it has been.

This is W8BZX, RM of Ohio. He doesn't pack a very big wallop, but he can really wiggle that bug hand! You'll hear him on Buckeye Net (BN), 8RN and EAN.

Just to chronicle recent changes: W2EZB replaces W2PHX on 2RN; K6LVR replaces W6RSY on RN6; W7BDU replaces W7QLH on RN7; WØFEO replaces KØEDH on TWN. Also, K4AVU is going to have to give up 4RN, but so far finding a replacement has not been easy.

When a vacancy occurs in an NTS post at region, area or TCC level, we immediately take action to find a successor. First, we get the recommendations of the outgoing manager. Second, we get the okay of the resident SCM of the amateur recommended. Third, we write offering him the job. If he accepts, we give him full details on his duties (or we do this before he accepts if he insists). Fourth, often some time later, we send him a special hand-lettered certificate attesting his exalted status.

If *you* are interested in a NTS post at this level, your best bet is to be as active as you can on the net concerned, always ready and eager to accept assignments, prompt in QNI, efficient in making reports, exemplary in your operating procedure, and in every other possible way *persona grata* with the present net manager.

February reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation* (%)
1RN	56	1096	.555	19.6	82.7
2RN	56	1090	.889	19.5	99.3
3RN	56	698	.438	12.4	100.0
4RN	56	871	.466	15.5	95.1
RN5	56	974	.451	17.4	88.4
RN6	56	759	.332	13.5	83.9
RN7	55	382	.224	7.0	44.1
8RN	54	678	.306	12.5	82.7
9RN	56	1340	.818	23.9	74.7
TEN	84	1128	.663	13.4	70.0
ECN	18	170	.394	9.4	75.9[1]
TWN	28	424	.380	15.1	93.6[1]
EAN	28	1697	1.094	60.6	98.3
CAN	28	1802	1.187	64.3	100.0
PAN	28	1105	.688	39.3	100.0
Sections[2]	1081	7476		6.9	
TCC Eastern	92[3]	961			
TCC Pacific:	101[3]	913			
Summary	1796	23564	CAN	12.1	3RN/CAN/PAN
Record	1802	28659	1.183	19.1	100.0

[1] Region net representation based on one session per night. Others are based on two or more sessions per night.

[2] Section nets reported: QMN (2 Mich. Nets); Iowa 75 Phone; QFN (Fla.); SCN (S.C.); AENB, AENO, AENP & AENP Morning (Ala.); NJQ & SDN (S. Dak.); S. Dak. 75 Phone; KPN, KYN & MKPN (Ky.); QKS (Kans.); VSN (Va.); WIN & WSSN (Wis.); NJN (N.J.); WSN (Wash.); SGN (Me.); Tenn. Phone; Tenn C.W.; W. Fla. Phone (2 nets); TLCN (Iowa); PEN (Sask.); GBN (Ont.); NTX (Texas); SCN (Calif.); CN & CPN (Conn.); RISPN (R. I.); MSPN Eve, MSPN Morn, MSN & MJN (Minn.).

[3] TCC functions reported, not counted as net sessions.

Well, it begins to look as though our days of being blasé about breaking records are about over. In February, we broke only one record; the high rate. In case you don't remember, the "rate" is the traffic total divided by the number of minutes in session during the month — in other words, the number of messages per minute in directed (QND) session. The CAN February rate of 1.187 is really going some! But these variable conditions we've been having are beginning to separate the traffic men from the traffic boys.

W2PHX, in making his last 2RN report, pledges to remain active as a net member. W3UE is celebrating his sixth anniversary as 3RN manager and notes that 3RN achieved 100% representation of all sections in February, probably the first time ever! We're still looking for a 4RN manager; K4AVU is hanging on, but he'd like to be relieved. Mississippi is the weak link in RN5; W5CEZ has been designated assistant manager. K6LVR is starting off on RN6 like a house afire, with complete detailed report and a fine monthly summary bulletin. Five of the 8 sections in RN7 are now showing excellent-to-good representation; only Alaska and Alberta were goose-eggs in February. West Virginia has been low in attendance on 8RN, but February was a good month largely because of fair traffic. K9UGY has received his 9RN certificate. The 1700 (2300Z) session of TEN is beginning to pay off as conditions take their toll of the later sessions. WØFEO has continued the TWN monthly summary bulletin and things are running smoothly. CAN certificates have been awarded to the following: *KØs* IVQ JVX QCQ, *WØs* SAF SCA LCX DUA LGG BDR TOL PET NYU, *W9s* DO KQB USR CXY, K9UGY, K4ZXX, W4ZJY, W5CEZ, K2SSX, W1SMU, VE2AZI/W1. PAN certificates to K6ZYZ and K7NWP.

Transcontinental Corps. On his February report, W1SMU says "No comments, too d— busy." That's comment enough. PAN roster is full except for Station H vacancies on Monday and Friday. February reports:

Area	*Functions*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern	92	93.5	1473	961
Pacific	101	96.0	1814	913
Summary	193	94.8	3287	1874

The TCC roster: Eastern Area (W1SMU, Dir.) — *W1s* AW EMG NJM OBR SMU WEF, *WA2s* APY COO, *K2s* SSX UYW, *W3s* WG WRE, W4DVT, *W8s* ELW UPH, VE2AZI/W1, VE3CWA. Pacific Area (W6EOT, Dir.) — W5ZHN, *K6s* LVR ZYZ GID DYX, *WØs* ELQ EOT HC WPF, *WA6s* ATB HZM ECF, K7NWP, *W7s* ZB GMC DZX, *KØs* CLS/6, EDH, EDK, *WØs* WME FEO KQD.

A.R.R.L. ACTIVITIES CALENDAR

May 4: CP Qualifying Run — W6OWP
May 17: CP Qualifying Run — W1AW
June 7: CP Qualifying Run — W6OWP
June 10-11: V.H.F. QSO Party
June 15: CP Qualifying Run — W1AW
June 24-25: Field Day
Nov. 11-12, 18-19: Sweepstakes Contest

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

May 6-7: PACC Contest (phone), VERON (p. 69, last month).

May 6-7: SJRA QSO Party, South Jersey Radio Assn. (p. 92, this issue).

May 6-7 and May 20-21: Bermuda-U. S.-Canada Contest, Radio Society of Bermuda (p. 76, this issue).

May 12-14: West Virginia QSO Party, Mountaineer Amateur Radio Assn. (p. 132, this issue).

May 20: Armed Forces Day Receiving Competition and QSO Party, Dept. of Defense (p. 49, this issue).

May 20-21: Washington State QSO Party, Tacoma Amateur Radio Society (p. 124, this issue).

SUPPLEMENT TO NET DIRECTORY

The following list of nets will supplement and correct the listings on page 89, Nov. *QST;* page 96, January *QST;* page 78, March *QST;* and the printed cross-indexed net directory now in distribution. Only those nets devoted to a specific public service are listed. This brings the record up to date as of March 21, 1961, and is the last *QST* net supplement prior to fall re-registration. All nets must be re-registered after Aug. 1, 1961.

Numbered footnotes indicate whether listing is a correction from *QST* or the net directory, or whether the net listed is part of the ARRL National Traffic System.

Important note: ARRL lists of nets are for *information only.* They do not carry any official significance. Nets are registered as nearly as possible in accordance with information given by the registrant.

Name of Net	*Freq.*	*GMT*	*Days*
Ala. Post Office Net[1]	3885	2400	W
Beverly C.D. Net (Mass.)	147,150	0030	1/3T
Buckeye Rag Chewers Net	51,600	1600	Sn
		0100	M
Calif. Post Office Net[1]	3695	0400	T-S
	3835	0300	W
Colo. C.W. Net[1,2]	3652	0200	T-S
Dixieland Amateur Radio Service Net (N. C.)	3865	1100	T
	3885	0100	SnMThF
Eastern Mass. Net[1,2]	3660	2400	M-F
Florida CW Net[1,2]	3650	2330	Dy
		0300	
Florida Post Office Net[1]	3820	1230	Sn
Framingham Radio Club Net (Mass.)	51,150	0100	Th
Golden Bear Amateur Radio Net Inc.[3]	3975	0300	Dy
Golden Bear Amateur Radio Net (2 Mtr Section)	146,570	0330	Dy
Indiana Post Office Net[1]	3880	1900	Sn
	7106	1500	Sn
The Intercontinental Traffic Net	14,330	1200	MTThF
Iowa Post Office Net[1]	3885	1400	Sn
Kansas City Area Post Office Net	28,826	0245	Th
Mission Trail Net, Inc.[1]	3854	0300	Dy
New Mexico Post Office Net[1]	3850	0430	Dy
North Dakota Post Office Net[1]	3845	0030	M
Ohio Post Office Net[1]	3675	2330	Th
	3870	1300	Sn
		2300	M
Oklahoma Post Office Net	3900	2330	F
Owensboro Six Meter Emerg. Net (Ky.)	50,550	0300	S
Penna. Post Office Net	3765	0100	F
	3850	0100	T
Pine Ridge Emerg. Net (Nebr.)	3850	1700	Sn
Prairie Emerg. Net (Sask.)[2]	3685	0200	M-S
Regional Post Office Net	7045	0300	T-S
	14,090	0100	T-S
San Joaquin ARRL Sectional Net	3915	0230	T-Sn
Texas Post Office Net[1]	3935	1130	M
	7250	2400	Th
20 Meter Interstate Side Band Net	14,275	1500	M-F
Union County A.R.E.C. Net (N. J.)[1]	50,550	1530	S
Vigilante Net (Mont.)	3525	0400	T
Wayne County RACES Net (Mich.)			
Zones 3-4	28,720	0130	Th
Zone 8	28,680	0100	Th
Zone 10-12	28,710	0130	Th
Zephyr V.H.F. Society, Inc. Net (N. J.)	145,500	0200	W

[1] Correction from previous *QST* or net directory listing.
[2] Part of ARRL National Traffic System.
[3] Formerly American Legion Amateur Radio Net Inc.

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for February Traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W3CUL	303	442	3889	441	9053
W0LGG	243	1274	1186	75	2778
K4AKP	34	1146	1118	26	2324
K4SJH	91	1130	1073	1	2295
W4FPC	11	964	1079	7	2061
VE2AZI/W1	33	850	831	11	1725
WA6FCO/4	17	829	797	11	1684
K2UAT	157	768	684	33	1642
W6YDK	929	242	194	48	1413
W8DAE	16	696	541	104	1387
W4PL	14	685	610	54	1363
W9DYG	25	655	579	34	1293
K2YXE/4	24	629	628	5	1286
W3IVS	0	101	1064	4	1169
W0OHJ	4	569	563	6	1142
W0SCA	21	542	513	2	1078
W3GSU	13	981	43	17	1054
W3VR	61	473	444	11	989
W3EML	27	455	407	45	934
W9ZYK	24	461	342	106	933
W8UPH	13	438	379	59	889
W9DO	17	426	71	372	886
W6GYH	189	368	320	8	885
K4EHY	20	423	411	6	860
WA2GQZ	14	415	383	28	840
K6BPI	72	382	297	85	836
WA2CIG	8	407	382	24	821
K4KDN	27	395	385	3	810
W7BA	10	398	380	18	806
K8IUZ	16	397	352	33	798
W1SMU	15	397	356	17	785
K3HWX	14	379	260	101	754
VE3CWA	101	333	260	28	722
W9IDA	9	341	339	0	689
W2RUF	39	360	185	92	676
K4VDU	110	282	180	102	674
K4CNY	48	300	282	18	648
W4OGG	4	307	302	4	617
W7DZX	9	305	270	32	616
K1BCS	243	187	167	17	614
W6GQY	233	84	230	62	609
K9OZM	17	294	162	132	605
K4KYB	38	381	168	3	590
K6LVR	18	307	263	1	589
W7HUT	0	292	279	13	584
WØZWL	0	416	1	164	581
K6EPT	9	283	191	92	575
K2RTQ	10	276	139	138	563
WØBDR	86	277	195	2	560
K5OMA/1	18	269	253	10	550
K1MOZ	28	262	243	14	547
K2UBG	88	261	120	77	546
K9ORK	31	265	205	44	545
W1KYQ	18	293	217	11	539
K5USE	31	283	202	15	531
K9BTE	9	256	255	1	521
K1CIF	89	218	207	0	514
K4UBR	74	346	165	27	512
W9CXY	11	256	241	4	512
W5ZHN	18	253	176	63	510
K2UCY	17	238	235	10	500
Late Reports:					
WA6GKK (Jan.)	10	293	285	8	596
K4UBR (Dec.)	155	193	160	43	551
K5WIC (Jan.)	37	236	234	22	529
KØWWD (Jan.)	127	191	118	71	507

More-Than-One-Operator Stations

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W6IAB	37	1210	1191	19	2457
K6MCA	46	468	451	11	976
W4PFC	4	341	332	9	686

BPL for 100 or more *originations-plus-deliveries*

W4JSJ/4	279	K4FSS	112
K4OH	271	W7QMU/VE8	112
WØ3ES	233	K8PKU	112
WA2CCF	224	W1YLH	111
K4JZU	211	W2GKZ	110
W2ZW	208	W3MFB	110
K0HGI	172	WA6ECF	110
WA2EFN	163	K2VGD	109
W3KUN	161	WA2GLU	106
W8USZ	155	K1IVR	104
K2RBW	152	W9NZZ	103
K7BKH	128	K0DCW	103
W6WPF	123	K8KMQ	102
K2DEI	122	W9TT	102
K0ONK	119	K6SHZ	100
WA6OAQ	118	*Late Reports:*	
K2VVL	114	K1CIF (Jan.)	173
KN1OWU	113	K2RBW (Jan.)	140
WA2GPT	112	K4KYB (Jan.)	115

More-Than-One-Operator Stations

W1AW 101

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: K1GNR, K1LLX, WA2BNF, W3EML, W3WRE, K4BY, W4JSJ/4, WA6OAQ, K8KMQ.

The BPL is open to all amateurs in the United States, Canada, Cuba and U. S. Possessions who report to their SCM a message total of 500 or more or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.

In considering any controversial subject, it seems to be an inconsistency of life that those who are sure of themselves and who express themselves positively and loudly are listened to, respected, revered, while those who are in doubt and willing to consider the possibility that they could be wrong are, for the most part, ignored or castigated. The more prejudiced one is to any cause, the louder and more positively he states his unshakable opinion. The more open-minded he is, the less certain he is that his or others' opinions are either all right or all wrong. Beware of the man who is sure, for the intelligent are full of doubt. It's that kind of a world.

This opening gem of philosophy, original in expression if not in thought, leads up to the specific subject at hand: what guiding principles shall control the destiny of our amateur radio emergency communications activity? Shall we operate by the seat of our pants, wrestling with problems as they arise, taking one thing at a time, making policy as we go along, or should we have an over-all, underlying objective, a set of maxims that can be applied to each and every dilemma to assist in directing our course? To what extent shall we be swayed in such a course by prejudiced opinions, and how shall we determine whether or not they are prejudiced? We at headquarters do not make policy, we merely implement it; and yet, we doubt that you members who are our bosses want implementing robots or automatons on your headquarters staff. We would much rather think that we were selected for our jobs because we have the experience, the know-how, the intelligence and the judgment to do it properly and efficiently.

Pardon our thoughtful mood. It arises mostly from a recently-completed field trip during which we were treated to such diverse opinions that it became necessary to think carefully what is best to do and say. At the OCDM Region 3 communications conference in Thomasville, Ga., both compliments and criticisms came from unexpected sources, and some of the former were left-handed: in effect, "What you say is a lot of hogwash, but we admire your courage in saying it." Here, as elsewhere, the frothy-mouthed podium-thumping orator received enthusiastic acclaim, while the calm, serious, thoughtful type was only politely applauded. Should we, then, emulate those who receive the attention and applause, or should we appeal primarily to the serious and the thoughtful?

Our opinions along emergency communications lines are tentative. We are exploring, trying to be open-minded and at all times doing more listening than talking. Lest this be interpreted (as it often is) as a sign of weakness, it should also be pointed out that these opinions carry behind them the weight of carefully considered thought, lots of experience, exposure to criticism from many sources, and the force of unprejudiced logic. They can be changed only by superior weight of these same factors. We are not easily swayed.

To this extent tentatively, then, we feel that a strong AREC is the best vehicle for implementation of the radio amateurs' emergency communications service, and that the AREC is the *only* vehicle free of politics, selfish aims, restricted aims, empire building or other ulterior motives. We consider the old saw "If you can't beat 'em, join 'em" at best an apologist, at worst a defeatist, basis for action. And most important of all, we welcome the assistance of other organizations in accomplishing the maximum for public service through amateur radio provided we can direct our own efforts toward this end. — *W1NJM.*

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Big cities aren't often hit by tornadoes, but on Mar. 4 one of them hit Chicago right on the button, then cut across Lake Michigan and tore a six-mile path through the Western Michigan farming country. The tornado had not been forecast and its damage was slow in becoming known. EC W9IHPG was informed of the disaster about an hour after it hit, and went immediately to the South C.D. Control Center (K3) and activated the station. W9QKE was alerted and operations centered on 29.64 and 147.06 Mc. Net members began reporting in as the radio told of the storm damage. The mobile communications unit (Victor I) was dispatched to the disaster center and RACES net members were called out. At 2000 EST relief arrived at K3 so W9IHPG and W9QKE could go to Victor I with additional hand-carried units. Many messages were handled for public safety and other city officials, and contact was maintained with c.d. officials of Lake County, Ind., and LaGrange Park in case they were needed. W9IHPG lists the following amateurs as having taken part: *W9s* ASG DEP EFI FVB HPG IRE JOI PRH QKE SES VRS YVP, *K9s* BVW CSW DQU GDQ GOW HBZ HGZ HLV ICM IJC ISP JAU JOS JRQ KEJ KIJ MDM MLI OJV OOU OZM OZY PBN PQI QDO QCU QKB QPR QXA RBV RRO SJQ TOK UMU USV USX VXW WXK YHQ YMD, *KN9s* BGV WXP.

Additional details on the six-meter operation have been supplied by K9PBN, publicity director of the 6 Meter Club of Chicago. Shortly after the tornado struck the city, 24 mobile units and 27 club members were on their way to the disaster area. Three base stations were set up as net controls, with two other base stations as alternate controls. These stations helped keep frequencies clear for the mobile units, made telephone calls, relayed traffic to and from mobiles and dispatched mobiles to most-needed points. *K9s* UMV JFQ UAA LTC and W9NYO did most of this work. The first mobile units in the area were *K9s* QDY and PIZ, assisted by *K9s* UHV and YLN. Also early on the scene was K9RNW, who got into position at 72nd and Stony Island and acted as mobile net control and message center; this station was instrumental in informing mobiles where they were most needed and in passing valuable coordinating information to police, fire and other civic officials, who were making inspections and requested more mobiles in addition to placing very important official messages with those on the scene. Telephone circuits were either out of commission or greatly overloaded. K9RNW maintained contact with Net Control K9JFQ for this purpose. Mobile units also blocked traffic to keep out unwanted sightseers, relayed messages for workers in the area, radioed help for people trapped in demolished buildings and summoned police to needed points. In one instance, a couple whose children were trapped in the area was escorted in, the children rescued and escorted out again. Mobile units remained in the disaster area until 0130, when they were no longer needed, then returned home for a long-delayed supper — except K9JFQ, who remained in the area until 0430.

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Tornadoes in Oklahoma brought activity on the part of the Oklahoma Storm Warning Net and the Pottowatomie County AREC on Feb. 17. The Storm Warning Net was requested by the U.S. Weather Bureau to go into action at 1430, and in a short time the net was in operation with everything running smoothly. First reports of a twister came from Jones and Luther, which was being served by c.d. and Salvation Army rescue teams; a few minutes later the twister struck Konawa. Thanks to the way the warning system was working, practically everyone in town was under shelter; K5CAI at Ada was net control. EC K5LZF had the c.d., Shawnee Police Department and the highway patrol notified, then took off for Shawnee, where an AREC mobile caravan was formed and, after checking with local c.d. officials to ascertain that they would not be needed in Shawnee, took off for Konawa in a downpour of rain and lightning, taking their own 5-kw. power generator along in a trailer. The caravan consisted of mobiles *W5s* LXH LHY and K5LZF, with K5TMX pulling the generator. It arrived at the edge of Konawa at approximately 2200 CST, being talked in by W5VAV and K5HQA. After fishing its way through the debris, the caravan arrived at the midsection of town and was met by the Ada group consisting of *K5s* MYS KKN JQB JPY which was already set up and in operation in what was left of the police station. However, the small generator they were using was unsteady, so the larger generator brought from Shawnee was set up and by 2215 communications had been set up for good, handling welfare traffic, police and telephone company traffic and lending technical assistance to all concerned. The group dispersed and returned to their homes at 0300 CST after a job well done. Other amateurs active who were not mentioned above are *W5s* DEU MFX and SEF.—*K5LZF, EC Pottowatomie Co., Okla.*

We don't go in much for ancient history in this column, especially when we are cramped for space already, but it seems that a group of amateurs in northern Alabama contributed some very worthwhile emergency work back in March, *1960*, the details of which have just been reported to us. Considering the lateness of this report, we'll spare you the details, but must record for posterity the calls of those amateurs who did the job, to wit: *K4s* BLO DAB GUU IKR IQU MAY OCV PTA RSB SPP UEC VJL YEK YKQ YTL YUD YUI YUP YUQ ZGT ZPS, *W4s* DQJ DGH FUD GSN HFF HTE MAM NIQ RNX YFN, *W1s* HCZ/4 GEU/4, W5RYG/4.

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On Jan. 22, W2OXU/mobile ran into a ditch alongside the road he was traveling in a blinding snowstorm near Buffalo, N.Y. Unable to raise anybody on 75, and having left his 10-meter coil at home, and also finding the road abandoned of any other cars from whom he might have obtained help, he pruned his forty-meter coil down to ten meters with a pair of nail clippers and, after some time, managed to raise WA2ABK and K2ISO. W2OXU was unable to tell exactly where he was, but gave some landmarks that could be observed and the two amateurs made an approximate "fix" on him as being about 20 miles south of Buffalo. W2TKQ near Buffalo was contacted, and it was decided to call for assistance from the Erie County Sheriff's Department and, later, from the New York State Police. Meanwhile, W2OXU's station wagon had run out of gas and his signal had left the air.

Because of the activity of the amateurs in plotting his approximate location, W2OXU/mobile was found at 0300 by the Orchard Park police, curled up in the back seat of his station wagon, wrapped in blankets. The car was extricated from the ditch and returned home at approximately 0330 EST. — *K2ISO.*

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During the severe snowstorms on Feb. 3 which crippled traffic in the Baltimore area, a number of six-meter mobile stations fed up-to-the-second reports on traffic conditions to their control station which fed them into broadcast station WFBR. These reports were immediately broadcast to the public, thus providing a valuable service. At least 140 road reports were received from the amateurs and so broadcast.

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The Brooklyn, N. Y., AREC is right on the ball. When a plane crashed in Queens on Jan. 19, AREC nets on 2, 6 and 10 meters were on the air within ten minutes, with mobiles ready to move if needed. As it happened, their services were not needed, but 18 Kings County AREC members were set to respond and the Queens County EC was informed of their availability. "Our hams are aware," says EC K2OVN, "that when something happens they get to their rigs and get going."

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On Feb. 11, W4OOZ heard a call from K4DWN asking for contact with MacDill Air Force Base, Fla. He answered the call and was informed that K4DWN was adrift with four people aboard in Tampa Bay, near MacDill Fishing Camp. The camp was called and a rescue boat was dispatched immediately. W4OOZ and W4REJ maintained contact with K4DWN until help arrived. — *W4UHF.*

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On Feb. 17 a disastrous ice storm hit Central and Southern Iowa, disrupting telephone and electric service and felling trees across roads and streets. On Feb. 18 the Polk County AREC was called out by the chief of police to patrol streets and assist with communications. WØNTA was activated as net control at police headquarters with operation established on 29.6 and 50.55 Mc., under the supervision of Polk County EC WØMJH with WØPKH and KØQXT assisting as net controls. Mobiles reported to police headquarters to pick up an auxiliary policeman, then went out on an assigned patrol. *KØs* ZCA LUG TXL JRV GHD SVR LUP IEZ ALZ SAF, *WØs* QHB IVP and WSJ acted in this capacity. Assisting in a support operation were *KØs* MTB PCE and RIH. The net secured at 2330 CST. WØPZO acted for two days as Des Moines outlet for the Iowa Emergency Net, which was functioning statewide. In a special emergency call on Feb. 19, *KØs* JRV and SAF drove to Winterset to assist the telephone company, Red Cross and local officials to provide communications from that town, which was entirely without telephones or electricity. — *WØMJH, EC Polk County, Iowa.*

An explosion in an oil refinery in St. Marys, W. Va., on Jan. 14 took out communications lines in the area and brought amateurs into the picture. W8MZZ and W8HRQ in St. Marys maintained constant communication with K8DXU and K8BOT in Parkersburg to keep news media and relatives informed of the progress of the situation and check the well being of families. These four amateurs got on the job shortly after the fire following the explosion and worked constantly with police, firemen and newsmen in obtaining information from the scene. — *W8JM, SCM West Va.*

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Severe ice storms during the last week of Feb., 1961, disrupted electric and telephone service in the Waterloo, Iowa, area. Assistance was rendered by local amateurs in supplying communications for the Illinois Central Railroad on Feb. 18 between Waterloo and Fort Dodge. In a letter to WØJPJ from a railroad official it was stated that the railroad would not have been able to run on a near-normal basis had it not been for the assistance of the amateurs. Amateurs participating were *WØs* JPJ BTR DDV, *KØs* TBO FEP EAA and TVO. — *KØOTV, EC Grundy County, Iowa.*

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On Feb. 20, K3BBY was travelling to Washington along the Baltimore-Washington expressway when he saw a man lying along the side of the road. Thinking him to be "just another drunk," he passed on, but was later flagged down by a truck driver who said he had seen a man thrown from a car back on the road. K3BBY put out an emergency call on 50.25 Mc., the local emergency calling frequency, and immediately raised W3WLH, who called state police who dispatched patrol cars to the scene. It developed that the man had been robbed and beaten and thrown out of the car. Thanks to the prompt action of K3BBY and W3WLH, the criminals were apprehended within a half hour. — *K3KPZ, EC Baltimore Co., Md.*

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The amateur station aboard the *S.S. Hope* (W8OLJ) rendered valuable communications service when a medical technician aboard the *Hope* was stricken with a brain tumor requiring expert surgery. The *Hope* was in Amboina, Indonesia, at the time. Unable to reach Djakarta by ship's radio, W8OLJ/PK was fired up and contacted W6EJC, who telephoned Washington and set up a diplomatic exchange which resulted in a plane being dispatched from Djakarta within a matter of hours. The stricken technician was flown to Japan in a desperate attempt to save her life, regrettably without success. — *W8OLJ.*

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Amateurs in and around Jackson, S.C., worked closely with c.d. officials when a tornado hit that city in the evening of Feb. 24. K4UTY set up communications headquarters at City Hall, assisted by *K4s* KAB UTZ UAB and W4MTK. Their calls for additional assistance brought amateurs from nearby towns, such as *K4s* LBK MQG JMV, *W4s* MTK/mobile, PED/mobile and KYN. The two mobile units were used to set up patrols, enabling city and utilities officials quickly to spot trouble areas and send crews to them. W4KYN maintained contact with Aiken, which had telephone contact with Augusta. Amateur radio contact was also maintained with local t.v. and radio stations, with the Savannah River Plant of the Atomic Energy Commission and the state office of c.d. at Columbia. It is not clear from reports whether or not RACES was activated.

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The Madison County (Ind.) Emergency Net was alerted at 1700 EST Feb. 25 to establish communication with Lapel, which was without power or outside telephone service. W9DLF was the only means of communications out of this town; his station was set up temporarily at the fire station. Traffic from the sheriff's office, state police, civil defense and individuals was handled by the net until 0441 EST, Feb. 26. The net was opened again at 0710 EST. The sheriff called for mobile units to assist in communications in Lapel and the following responded: *K9s* BSR DLX HAB WJZ, *W9s* FWH VCF. Other amateurs who took part, some going along with the mobiles to Lapel to assist with the operating: *K9s* PYW QXU EEK QVZ OCX BBZ GEL IFY IEW YOR ZLC UZB JRB USE KGJ JTZ, *W9s* BHB FYC OJH VDN MJJ DZC BGV DOK. W9OBH operated net control assisted by *K9s* RPZ ONY HDQ SJR and BOF. The emergency was declared over at 1905 EST, Feb. 26. — *W9FWH, EC Madison County, Ind.*

This same snowstorm isolated Zionsville, Ind., on Feb. 25, including some 1500 out-of-town basketball fans. The town was without power or outside telephone service for 13 hours. The Boone County C.D. Amateur Radio Net was operating within the first hour of power failure, handling traffic to county highway departments, attempting to rescue stranded motorists and get emergency vehicles through. K9CRS, c.d. radio officer, using a two-meter mobile installation, provided the only communication out of Zionsville, maintaining contacts with K9TCM, K9JIR and W9QYY. With K9MGV working on six meters, the Boone County Net completed 88 message handlings during the 13-hour period. In addition to handling traffic for the Zionsville police department, numerous messages were delivered to families of the basketball fans to inform them of the situations of their loved ones. As though communications services were not enough, W9QYY also provided food and lodging for 17 stranded motorists. — *K9CRS, EC Boone Co., Ind.*

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We start off the new year with 28 January SEC reports representing 11,807 AREC members. This isn't quite as good a start as we made last January, with 31 reports, but almost a thousand more AREC members are represented. Sections whose SECs reported: S. Texas, E. Mass., Ga., Ohio, N.N.J., Ind., San Joaquin Valley, Nevada, Minn., Tenn., Colo., E. Fla., Mich., NYC-LI, Ore., S. Dak., Wyo., Utah, E. Bay, Wash., Okla., E. Pa., W. Mass., Santa Clara Valley, Maritime, Los A., Iowa, Va.

RACES News

We have recently received from OCDM a "review draft" of an appendix to Annex 15 (Communications) of the National Plan for Civil Defense Mobilization entitled "Frequency Allocation Plan for the Radio Amateur Civil Emergency Service (RACES)." This is a 24-page document which outlines in detail the plan worked out at the expense of time, effort and money on the part of officials of OCDM, USCDARA and ARRL (see *RACES News*, Sept. 1960 *QST*, p. 86). This is in final form pending highest approval. No copies are yet available for general distribution.

However, to us it looks good. The general principles mentioned in last Sept. *QST* seem to have been complied with. Moreover, the plan now has some teeth; RACES plans submitted subsequent to a certain date will not be approved unless they are in compliance, and plans now in operation must be brought into compliance by Jan. 1, 1963. Perhaps at long last, we will have an over-all nationwide coordinated RACES frequency allocation plan.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (KC.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

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

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

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 May 17 at 2130 Eastern Daylight Time (0130 GMT, May 18). Identical tests will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,800 kc. The next qualifying run from W6OWP only will be transmitted May 4 at 2100 PDST (0400 GMT) May 5 on 3590 and 7129 kc.

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.

Code-practice transmissions are made from W1AW each evening at 2130 EDST (0130 GMT). Approximately 10 minutes' practice is given at each speed. Reference to tests used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of *QST* text sometimes is reversed. To improve your fist, hook up your own key and audio oscillator and attempt to send in step with W1AW.

Date Subject to Practice Text from March *QST*.
May 2: *It Seems to Us*, p. 9
May 5: *Compact Packaging for the 6146 Transmitter*, p. 12
May 11: *65 Watts at Low Cost*, p. 20
May 15: *Wide-Band F.M. Gear for 220 Mc.*, p. 29
May 16: *All-Metal Quad for 15 Meters*, p. 36
May 24: *Gonset . . . Model 3338*, p. 47
May 25: *DX and Single Sideband*, p. 61

W1AW GENERAL-CONTACT SCHEDULE

(In Effect April 30, 1961)

W1AW welcomes calls from *any* amateur station. Starting April 30, W1AW will listen for calls in accordance with the following time-frequency chart.

Time (GMT)	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0000–0030[1]	.....	14,280	3555[3]	14,100	14,100	7080[3]	14,100
0030–0100	.....	14,280	3555	14,100	14,100	7080	.....
0100–0130[1]	.....	145.8 Mc.	21,330	145.8 Mc.	50.7 Mc.	21,330	.....
0230–0300	.....	.....	.....	1820	.....	1820	.....
0300–0330	.....	.....	.....	3555	.....	3945	.....
0330–0400[1]	.....	.....	3945	7255	3945	7255	3945
0400–0500[1]	.....	.....	3555[3]	.....	3945	7080[3]	.....
1700–1800[2]	.....	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	.....
1900–2000	.....	7080	14,100	7255	14,100	7080	.....
2000–2100	.....	14,280	7080	14,100	14,280	14,100	.....
2200–2300	.....	14,280	14,280	14,280	14,100	7255	.....
2300–2330	.....	7255	.....	21,075[3]	.....	14,280	.....
2330–2400	.....	14,100	.....	3555	.....	14,280	.....

[1] Starting time is approximate. General-contact period on state l frequency begins immediately following transmission of Official Bulletin, on c.w. at 0000 and 0400, on phone at 0100 and 0330.
[2] Operation will be on 21,075, 21,330, 28,080 or 29,000, depending on band and other conditions.
[3] W1AW will listen for Novice Class licensees on the Novice portion of this band before looking for other contacts.

W1AW SUMMER SCHEDULE

(Effective April 30, 1961)

(All times given are Greenwich Mean Time)

Operating-Visiting Hours:

Monday through Friday: 1700–0500 (following day).

Saturday: 2300–0630 (Sun.). Sunday: 1900–0230 (Mon.).

Exception: W1AW will be closed from 0500 May 30 to 1700 May 31 in observance of Memorial Day.

A map showing how to get from main highways (or from Hq. office) to W1AW will be sent to amateurs advising their intention to visit the station.

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

C.w.: 1820, 3555, 7080, 14,100, 21,075, 28,080, 50,700, 145,800.

Phone: 1820, 3945, 7255, 14,280*, 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 calibration purposes.

Times:

Monday through Saturday, 0000 by c.w., 0100 by phone.

Tuesday through Sunday, 0330 by phone, 0400 by c.w.

General Operation: Use the chart on this page for times and frequencies for W1AW general contact with any amateur. Note that since the schedule is organized in GMT, the operation between 0000 and 0500 each day will fall in the evening of the previous day in some U. S. and Canadian time zones.

Code-Proficiency Program: Practice transmissions at 15, 20, 25, 30 and 35 w.p.m. on Tuesday, Thursday and Saturday, and at 5, 7½, 10 and 13 w.p.m. on Monday, Wednesday, Friday and Sunday are made on the above-listed frequencies (except 1820 kc.). Code practice starts at 0130 each day. Approximately 10 minutes' practice is given at each speed. On May 18 and June 16, and on May 13, instead of the regular code practice, W1AW will transmit certificate qualifying runs and a frequency measuring test respectively.

* Single sideband.

DXCC Notes

Announcement is hereby made of two additions to the ARRL Countries List. The additions are Kure Island and East Pakistan.

Although Kure Island is the westernmost island of the Hawaiian Islands, its separation from the rest of the Hawaiian chain by Midway places it under Point 3 of the criteria (see page 80, April 1960 *QST*, DXCC Note). East Pakistan also comes under Point 3 of the Criteria. DXCC credit claims may be made for these additions starting July 1, 1961. Confirmations for contacts with Kure Island and East Pakistan must be dated November 15, 1945 or later. DXCC claims for either of these additions received before July 1, 1961 will be returned without credit.

Amateurs interested in the ARRL Countries List are advised that a new Operating Aid No. 7 is available. The list, revised 3 '61, is available without charge from the Communications Department, 38 La Salle Road, West Hartford 7, Connecticut.

DX CENTURY CLUB AWARDS

HONOR ROLL

PY2CK....307
W3GHD....307
W8JIN....306
W4DQH....306
W3JNN....305
W6AM....305
W9RBL....304
W8DMD....303
KV4AA....303
W2AGW....303
W6CUQ....303
W3KT....303
CE3AG....302
W8BKP....302
LU6DJX....302
W8BRA....302
W7GUV....302
W9NDA....301
W5ADZ....301
W2BSA....301
W6EBG....301
W2HTQ....301
W1ME....301
ZL2GX....300
W1FH....300
W1GKK....300
W9YFV....300
W6SVG....300
W8HGW....299
W7GBW....299
W4HPD....299
G4GP....299
G3AAM....298
W6BNV....298

Radiotelephone

PY2CK....307
W8GZ....301
W8BF....299
W3JNN....299
W9RBI....298
W6YY....296
W8KML....295
4X4DK....294
ZS6BW....293
VQ4ERR....293
CX2CO....292
W7PHO....292
W6AM....292
W4DQH....291

From February 1, to March 1, 1961 DXCC Certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

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W4CXA....254
W7DNU....164
W5EJT....153
K4JQR....150
WØFDL....133
W9JUO....117
PA0LU....113
ZC4AK....113
W3BXG....112
EA1GZ....112
JA2WB....112
K2MMS....110
HZ8S....109
W4AKP....105
G2CP....105
VR2DK....104
DJ2AJ....103
W6WX....102
KH6DLD....102
DU4SK....102
VP9EP....102
K3DCP....101
K6OHJ....101
W8SRF....101
WØTW....101
HK4JC....101
W1LQA....100
K2PXX....100
K2RNX....100
K3CUI....100
W3IWI....100
K4HDR....100
K8ERO....100
WØARO....100
WØPAH....100

Radiotelephone

G3NUG....139
VE7KJ....132
W9RKJ....120
VE1XY....110
WØOYP....108
XE1CV....106
W1BAB....105
HZ8S....104
VE3CDI....104
W1ECK....103
K2YEL....102
K2SHE....101
DU9MZ....100
EA3LA....100
YV3BJ....100

ENDORSEMENTS

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W5AFX....289
HB9EU....284
W5UX....275
W2CR....271
W6CAE....271
W2HQL....270
W2UVE....270
W2YTH....270
W6WWQ....270
WØQGI....265
HAOF....261
W2SSC....260
ZL2HP....260
K4AIM....259
W7GUI....255
WØSYK....254
W9RKP....251
K6KII....250
K4LPW....245
W1OOS....241
W3AYD....241
W2RDD....240
KP4YT....240
W2PCJ....239
W5GNG....232
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W1LHZ....231
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ZS1OU....224
W2FAR....223
W2OBX....222
W6RAN....220
G6SS....220
W3FMC....219
WØTJ....217
K5BGT....213
K2UKQ....212
W4NT....212
W6IPH....207
JA2JW....201
W3DPS....200
W6MUM....200
W6MVL....200
K9IYW....200
VE2WA....200
VE7KJ....200
SM5DW....200
F9IL....200
W8GB....195
W5VGR....191
KP4RK....191
W1HWH....190
W4JJL....190
ZP5LS....187
W2BAC....187
W1ORV....183
IT1AGA....183
K4RJN....180
K6CWS....180
G5VU....180
K4TWK....179
KØRAL....173
W9VZP....172
W1IKB....170
K2UPD....170
K6CTV....170
K6IEC....166
W6AUT....163
ZS6ATA....162
W8QWI....161
K1IEJ....160
W2ZXL....160
W1CKA....159
W4MS....159
W9LNQ....157
K5BEU....155
W1ICV....154
K7GCM....153
LU5ABL....153
W2REH....152
W8HEV....152
G3GSZ....152
ZS2U....152
W8KMD....150
K9GTK....149
VE3BMO....149
DL9OH....149
ZL1AMO....145
W4FUI....144
ZS5LU....144
G5DJ....143
W7LVR....142
W7VIU....141
K5EJQ....140
W8YAH....140
W9KXZ....140
WØVXO....139
W6QQW....138
DL6OS....132
K2MDL....131
KØSLD....131
W3GYP....130
VE2AFC....130
HB9TU....128
K4JEV....123
W4KWY....121
W5ANZ....121
W6ISQ....120
W7AIB....120
W7STC....120
VE7BW....120
K9KFS....116
JA1ACA....113
K2ZRO....112
W1ETF....111
K6CJF....110

Radiotelephone

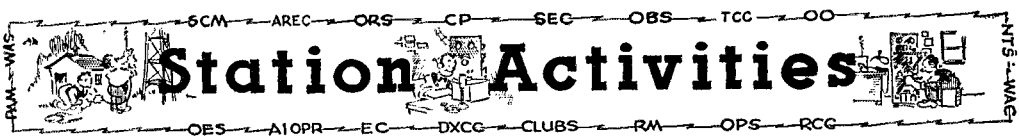
PY4TK....284
ZL2GX....280
K4AIM....251
W4EEE....241
W9JJF....231
W7ADS....230
W1OOS....226
W5AFX....226
W4DCR....224
W4AZD....222
WØSYK....207
ON4YI....201
G6BS....200
W5GNG....196
WØQGI....194
W5JCY....190
W3DPS....185
W4TDW....183
W6CVU....178
W2TP....173
W2GBC....170
W1LHZ....167
W1ZW....164
HB9EU....161
W1ORV....158
W5ABY....158
W1ICV....154
K5BEU....153
K4LPW....152
W8GLK....151
VK2DI....151
W2VCZ....150
K4HRG....150
WØTJ....150
W4MS....145
VE1WL....141
DL9OH....140
W7LVR....140
SM5DW....134
W2GRY....132
ON8EU....131
G5DJ....131
W1DGJ....130
YS1JR....130
W1AJV....125
K6FRV....122
VE1OC....120
ZS6AHW....111
W1ETF....110
W2MOF....110
W3TEC....110

U.S.-Canada Call Area and Continental Leaders

KH6CD....261
K17PL....249
WØQVZ....295
VE1PQ....252
VO1DX....241
VE2WW....280
VE3DIF....260
VE4XO....200
VE5RU....209
VE6NX....256
VE7ZM....290
VE8AW....195
ZS6BW....293
4X4DK....297

Radiotelephone

W1FH....289
W2RXA....283
W5BGP....265
KH6OR....259
KL7AFR....190
WØAIW....281
VE1PQ....154
VO1DX....129
VE2WW....226
VE3QA....241
VE4RP....102
VE5RU....192
VE6TF....181
VE7ZM....271
G2PL....266
ZL1HY....288



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

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—SEC: DUI. PAM: IVS. RM: AXA. New appointments: K3KPA, K3DSM and STL as OESs; ID as OBS; K3GBD as OO; JSX as ORS; K3HWX as ORS and OPS. K3KZG is now General Class and converting his 15-watt rig to 75 watts. K3NCD has a new Globe Hi-Bander. After 5 years HNK worked his counter-call, W1HNK. K3NUT is the station call of the St. James High School Club and the club is looking for General Class operators to run it. K3HIN added a 6-meter mobile to his Globe Hi-Bander. K3KBO is now using a Globe Scout 680. K3HXC built a home-brew electronic keyer. New club officers of the Lehigh Valley ARC are K3JTW, pres.; BOP, vice-pres.; K3AJH, secy.; DCR, treas. The high winds in the area had VR quite busy keeping the antennas and towers in shape for the skeds of CUL. EML tried his hand at the DX Contest and found out a trafficker was out of place here. K3JLW experienced receiver troubles and was given a helping hand by AMC. K3LKR spent a few days mobiling 6 meters in the Washington, D.C., Area. BNR/6 has prolonged his western visa another 6 months. The new Radio Officer for Luzerne County is NVO. NOH has been under the weather the past few weeks. EU reports the weather was too much for his area and his barn caved in under the heavy snow. NNL now boasts a 100 per cent home-brew station. He added his own design receiver. DUI got a glimpse of his mobile, the first since the snow fell in January. K3HTZ got WAS Award and HZZ received WAC. K3KFD made RCC and the W807 Award. K3s KUQ and LIZ are now General Class. YPF, the IRC Amateur Radio Club, is raising a new antenna for 40 meters. The Mt. Airy V.H.F. RC held its Annual Ladies' Night Apr. 15. The Eastern Pennsylvania Section picnic will be held at Hershey Park, June 18. Send all registrations to K3BHU, Secy., 19 W. Pottsville St., Pine Grove, Pa. A number of section appointees have failed to send their certificates in for endorsement. In order that your appointment be kept in force, your certificate must be signed annually by your SCM. See you at Hershey. Traffic: W3CUL 9053, IVS 1169, K3GSU 1054, VR 989, EML 934, W3HWX 754, W3HNK 258, K3HEX 149, W4DVT 114, W3MFW 112, AXA 91, K3IMP 84, W3AEQ 81, KMD 64, UIU 64, ZRQ 58, JSX 50, K3HTZ 48, MVO 46, CAH 39, CRU 36, W3NNL 29, BFF 27, K3JLW 26, KBO 19, W3OY 14, K3JSX 13, KFD 11, HXC 10, HIN 7, LKR 7, ANU 6, W3EAN 6, BNR/6 5, ITI 5, ADE 4, ELI 4, FAF 4, NQB 4, K3AKN 3, CNN 3, W3DUI 3, ID 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Thomas B. Hedges, W3BKE—SEC: CVE. The MDD Traffic Net meets on 3650 kc. Mon.-Sat. at 1915 EST, the MDDS (slow speed) Net on 3650 kc. daily at 2030 EST; the MEPN (phone) on 3820 kc. Mon., Wed. and Fri. at 1800 and Sat. and Sun. at 1300 EST. New appointments: K3JVB and K3KPZ as OPSs, VE3DYK/W3 as ORS. It is a pleasure to announce K3GJA as the new EC of Montgomery County. Harry is injecting some new blood in Montgomery Co. AREC and interested amateurs are urged to contact him for details. Net certificates went to EFZ, VE3DYK/W3, HLE, K3KPZ and K3LFD. K3ADS/3 has completed his 432-Mc. converter. AYD of Bermuda Contest fame, says his 500-watt rig blew up. BUD reports his son has received the Novice call KN3-OMJ. K3BYD has his 6N2 going again. CDG reports that CVC and K3LLQ are active in the Carroll County Net. This month we pay tribute to CDQ, who just received her 40-year pin from the Bureau of Standards, and has been an active amateur since 1922. CQS reports good DX on 10 meters. The BARC meets at the Baltimore Red Cross on the 3rd Mon. and invites visitors. K3CRF is now active in Army MARS. K3CWG is interested in slow-scan TV work. K3EJF checks in from Laurel. EQK worked his 146th country on 75-meter phone. EXM/3 is working at a radar station on Okinawa. K3GBV got his 417A going on 2 meters. K3GKF gave a talk on radio-isotopes before the Delaware Nurses Assn. K3GMD is giving code practice at the hospital where he is a patient. K3CVE reports that the CARC meets the 2nd and 4th Mon. at the Towsen Fire House. K3GZK reports from Bel Air. HC is building a new s.s.b. rig. HCE is now doing OO monitoring with a tape recorder. K3HDW likes 2-meter mobile. K3HPG reports on DX activity in Hagerstown. K3IZM reports that his sister, KN3NWN, is looking for skeds on 145.1 Mc. ENU reports on the FSARC handy-talkie project. K3JIQ advises that the PG RACES Net was alerted during the recent tornado alert. JSL has been appointed public relations manager for PG AREC. K3JVB is working on new equipment. K3JYZ has a panoramic adapter on his rig. 4X4CZ is now firmly established as K3KCS in Silver Spring. KHA checks in from Baltimore. K3KHK is doing a science fair project on transequatorial propagation. KLA is back on after a long illness. K3KPZ keeps up OBS activity. K3LEM reports from Baltimore. K3LFD leads the section in February traffic. K3LLR received his Tech. Class license. K3LUQ is preparing for active duty in Germany. K3MDL received a 20-w.p.m. sticker. K3MLY is looking for a 6-meter rig. KN3NFJ needs a receiver. OSF continues to do an outstanding OO job. TN says his retirement makes more time for traffic work. Congratulations to Dave, who has been an MDD regular for many years UE reports the first perfect 3RN attendance record since '49. K3WBJ maintains a high level of activity at Walter Reed Hospital. ZAQ laments poor conditions. ZNW is pushing the MDD Slow Speed Net. Traffic: K3LFD 201, W3UE 180, K3WBJ 126, W3TN 121, K3KPZ 53, W3ZNW 46, VE3DYK/W3 45, K3JYZ 42, GZK 35, W3BKE 25, K3JIQ 22, MDL 21, LUQ 18, W3EQK 12, CDG 11, CQS 11, K3GJA 9, HDW 7, W3BUD 6, K3LEM 5, KHK 4, W3JZY 2.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: K2ARY. RMs: W2BZJ, W2HDW and W2ZI. The following appointments have been made: K2ARY, Carneys Point, as SEC; W2QZE, Pennsville, as Salem County EC; WA2MEQ, Moorestown, as ORS. N.J. Phone & Tfc. totals: 28 sessions, 639 QNI and 261 traffic. K2RXB, Margate, hopes to have a tri-bander soon. W9NZZ will relieve K2DEI as net mgr. of EACGN. K2DEI will get a much-needed rest. In the Millville Area: WA2ARJ is now a member of MARS. WA2HYW is now General Class, WA2RBS is a new Tech. in Bridgeton. K2EWR, Haddonfield, hopes to be more active on NJN after his military hitch. K2JGU, Glassboro, has gone sideband. WA2KWB, Yardville, has a new rhombic working 160 through 15 meters. K2YYB, Northfield is teaching a class for the SCARA. K2BKG, K2CIR, WA2AWD, WA2KWM and K2HBA have been busy put-

(*Continued on page 100*)

2nd SJRA QSO PARTY

May 6-7, 1961

The South Jersey Radio Association announces its 2nd QSO Party to aid all amateurs in pursuit of their SJRA Achievement Certificate.

Rules: (1) *Contest Period*: Participants may operate any or all of the 29 hour period from 1700 GMT May 6 to 2200 GMT May 7. (2) *Contacts*: Stations outside the continental limits of the U. S. must QSO 25 SJRA members; stations within the country (including Alaska and Hawaii) must make contact with 35 SJRA members. Contacts do not have to be limited to any one band. General call "CQ SJRA." The exchange must consist of the QSO number, report, QTH and name of the operator. (3) *Logs*: Logs must be postmarked not later than June 7, 1961 and sent to: SJRA, c/o Awards Chairman, Stan Kasper, K2YIB, 609 Eight Street, Riverside, New Jersey. (4) *Awards*: An achievement certificate will be awarded to those who meet the scoring requirements in Rule 2. Endorsements will be made to indicate single band operation.

A VISIT TO HEADQUARTERS

It's only a short trip from New York so Fritz Franke and I decided to visit League Headquarters after the New York Single Sideband Dinner.

When we arrived we were greeted by John W1LVQ, George WIDF, Pete W1VG, Perry W1UED, Dick W1IKE and Lew W1ICP. Our tour started on the first floor where we saw the museum of ancient amateur equipment. We were surrounded by League lore and records of accomplishments of the amateurs who pioneered our hobby.

We then went to the lab where equipment is designed and built by staff members for league publications and where manufactured equipment is put through its paces. We were delighted to find Gus K9EBA, the voice of O'Fallon, visiting with Laird W1CUT. Gus had also been at the SSB Dinner.

In the DXCC room Bob W1WPO was verifying cards and issuing certificates and endorsements. In the international QSL bureau George K1LVW was sending foreign QSL cards to QSL bureaus throughout the country. Some 5,000 cards were being mailed while we were there.

While Joe W1JMY was taking us to the circulation department for a chat with Dave Houghton, we saw Dos WØTSN, Jack W9GPI, Mort W2KR, Ray W6MLZ, Milt W1EFW and Charlie WØBUO who had been attending an executive committee meeting. Fred W4CF was with the group. Later while chatting with Ed W1BDI we were told that Bill W6SAI and Chuck K6LFH had been there earlier to discuss Project Oscar.

Undoubtedly it is unusual to see so much League "brass" in the office but we still recommend a visit to Headquarters when you are in the area. You will find an efficient organization and a warm welcome. You will leave with a feeling of respect for the tremendous job being done at Headquarters.

— Trav Marshall, K9EBE

Bud Hallgren Jr. W. J. Hallgren W9AC for hallicrafters

"INVADER"

EXTENSIVELY FIELD

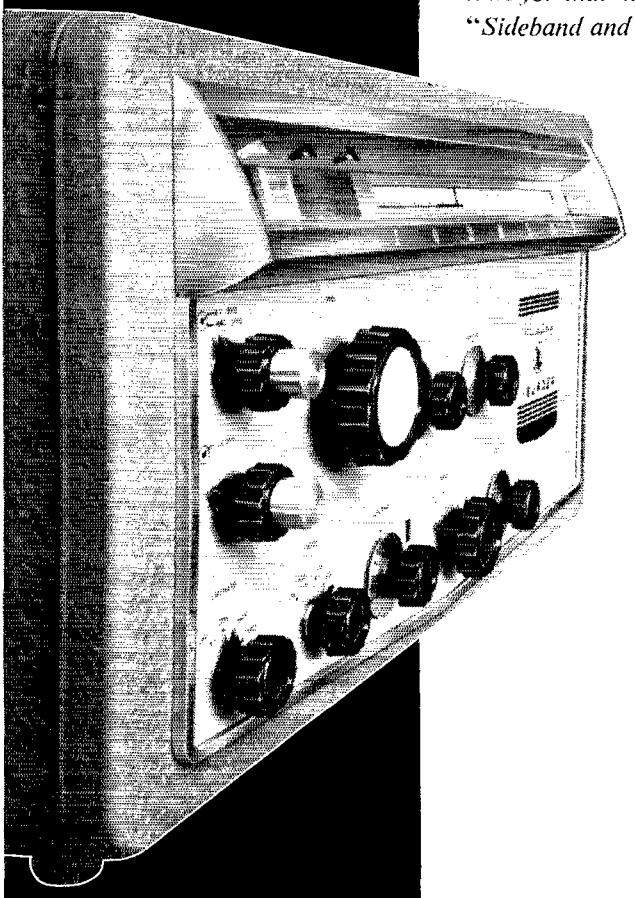
here are typical reports:

"Sideband never sounded so good!"

"Excellent penetration and an outstanding signal!"

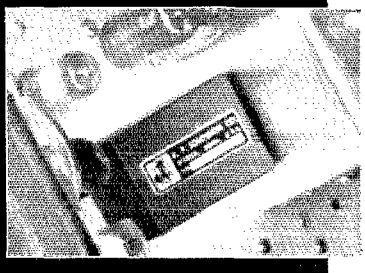
"Full-fidelity voice reproduction—picks up the lows for that 'natural' sound for the first time!"

"Sideband and carrier suppression is tops!"



Here's the transmitter with the sharp, penetrating signal you've been waiting for—plus *more* exclusive operating and convenience features than any other SSB Transmitter on the market today! A classic of modern communication equipment design, the "Invader" offers instant bandswitching coverage 80 through 10 meters—no extra crystals to buy—no realigning necessary—delivers a solid 200 watts CW input; 200 watts P. E. P. SSB input; 90 watts input on AM! Unwanted sideband suppression is 60 db or better! Built-in VFO is differentially compensated. Exclusive RF controlled audio AGC and ALC (limiter type) provide greater average speech power—high gain push-to-talk audio system has plenty of reserve gain for either crystal or dynamic microphones. VOX and anti-trip circuits are extremely smooth in operation—built-in anti-trip matching transformer—adjustable VOX time delay circuit. Mixer-type shaped keying is crisp, sharp—click and chirp free. Single knob wide range pi-network output circuit—fully TVI suppressed. Blocking and operating bias for noise-free T-R switch operation.

Cat. No. 240-302-2—Wired and tested with tubes, crystals and crystal filter. **Amateur Net** **$619.50**



superior to phasing-type units . . . sets a new standard in filter design!

EXCLUSIVE—Now, for the first time, not only **better** audio fidelity—but balanced audio response in a filter-type transmitter. The only equipment on the market using a specially developed high frequency, symmetrical, multi-section band-pass crystal filter for more than 60 db sideband suppression—more than 55 db carrier suppression! Select either upper or lower sideband instantly with a front panel "mode" switch.

the finest SSB signal on the air!

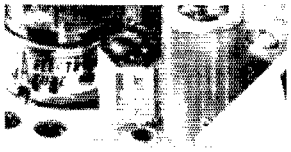
TESTED BY DOZENS OF UNBIASED AMATEURS!

A BOLD STATEMENT FROM E. F. JOHNSON CO.

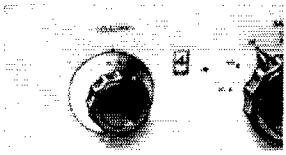
The sophisticated engineering and styling of the "Invader" is *unmatched* by other equipment within the amateur field—*bar none!*

Long recognized as the "first choice among the nation's amateurs"... Viking transmitters achieved popularity in a solid and healthy way. Known the country over as the line that gives you excellent engineering and performance, outstanding dollar value and more features at a popular price . . . the Viking line now achieves a new pinnacle with the introduction of the "Invader" and the "Invader-2000". We feel that the creative and imaginative engineering in the "Invader" sets aside "old fashioned" ideas that a unit is good simply on merit of the manufacturer's name alone! It has to perform—and nothing outperforms the "Invader!"

EXCLUSIVE—Converts to the Invader-2000, an integrated desk top transmitter, with the addition of high power conversion unit. (Remote power supply can be placed in any convenient location.)



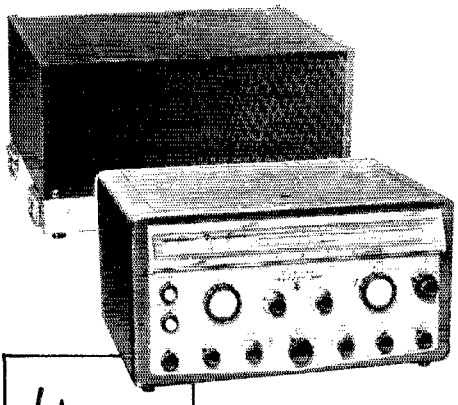
EXCLUSIVE—The only transmitter with both limiter ALC and audio AGC for an **extra** sharp signal! Reduces overdriving and flat-topping—increases average audio level for greater penetration and the **best** signal anywhere!



EXCLUSIVE—Single-knob wide range output circuit makes it possible to load into just about any conceivable type of antenna!

EXCLUSIVE—Full-time VFO heater element keeps VFO at operating temperature, even with the equipment turned off! No warm-up drift—rock-solid stability!

add hi-power conversion overnight for an integrated 2000 watt desk-top transmitter!



HI-POWER CONVERSION—Take the features and performance of your "Invader" . . . add the power and flexibility of this unique Viking "Hi-Power Conversion" system . . . and you're "on the air" with the "Invader-2000". Completely wired and tested—includes everything you need—no soldering necessary—complete the entire conversion in one evening!

Cat. No. 240-303-2 . . . Amateur Net $619.50

INVADER-2000—All the fine features of the "Invader", plus the added power and flexibility of an integral linear amplifier and remote controlled power supply completely wired and tested. Rated a solid 2000 watts P. E. P. (twice average DC) input on SSB; 1000 watts CW; and 800 watts input AM! Wide range output circuit (40 to 600 ohms, adjustable.) Final amplifier provides exceptionally uniform "Q". With multi-section power supply, tubes and crystals.

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free **8-PAGE BROCHURE...** Yours on request ... complete specifications and photographs on the "Invader" and the "Invader-2000"!

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STEPHEN HERZOG (left), K5RMA, and George Mayo, K1LYE, check out marine radar equipment at a Raytheon Electronic Services Division service center in Boston, Mass.

FIELD ENGINEERING WITH A FUTURE

From Boston to Seattle

Raytheon field engineers Steve Herzog, K5RMA, and George Mayo, K1LYE, are shown here on a special technical evaluation assignment at one of the Raytheon Electronic Services Division's 17 service centers, situated in major marine and industrial communities from Boston to Seattle, Duluth to New Orleans.

This time they're testing commercial marine radar. Tomorrow it might be an installation project or overhaul and repair. For Raytheon field engineers tackle a broad range of tasks all over the country and overseas. And, with continuing expansion of services, there is plenty of room for advancement to executive positions.

Perhaps you can qualify for a Raytheon field engineering future. Requirements: previous experience plus an E.E. degree or the equivalent in practical experience with guided missiles, fire control, ground and bombing radar or sonar.

Benefits: attractive salary, insurance, educational programs and relocation assistance. *For details, please write Ronald Guittarr, Electronic Services Division, 2nd & South Ave., Northwest Industrial Park, Burlington, Mass.*

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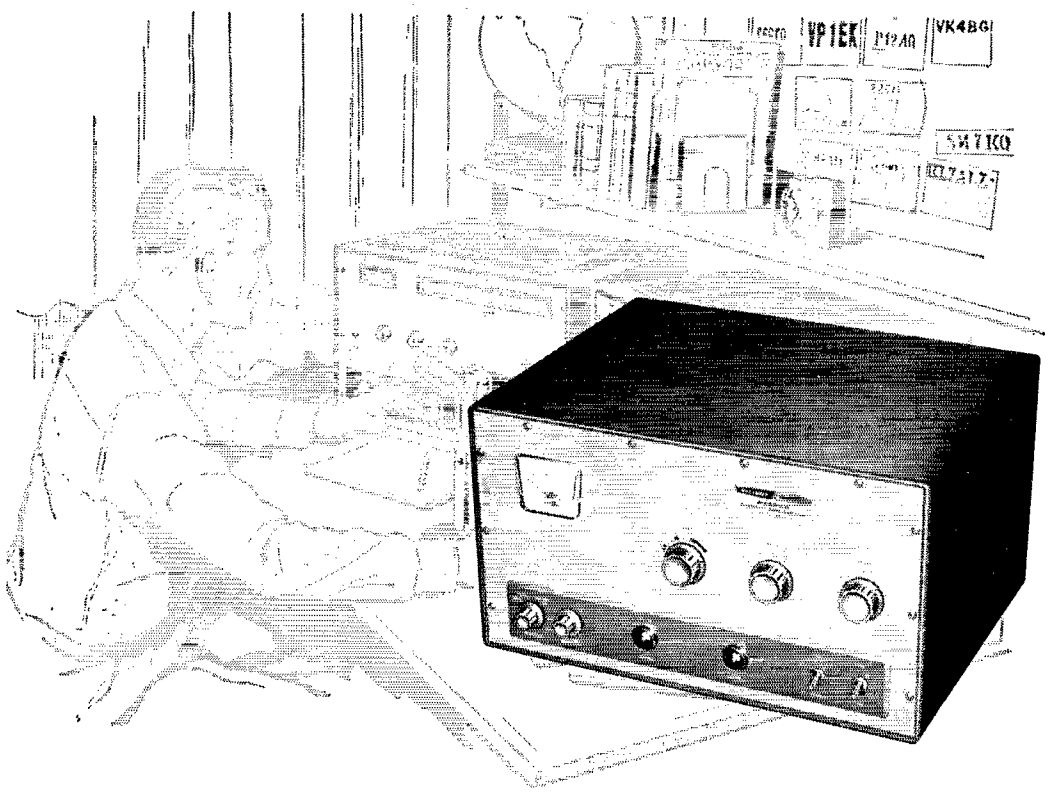
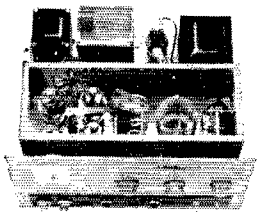
ELECTRONIC SERVICES DIVISION



HERE'S A NEW HEATHKIT® GROUNDED GRID KW LINEAR...JUST $229.95

The new Heathkit "Warrior" is a completely self-contained, desk-top kilowatt linear, loaded with special features, at half the cost of comparable units! Compare feature for feature, quality component for quality component, you'll find no shortcuts . . . only the finest watt-per-dollar value in a linear amplifier on the amateur market today!

Maximum power input: SSB—1000 watts P.E.P., CW—1000 watts, AM—400 watts (500 watts using carrier controlled modulation), RTTY—650 watts. **Driving power required:** 50 to 75 watts—depending on frequency. **Output circuit:** Variable pi-network (50 to 75 ohms). **Input circuit:** Broad banded—requires no tuning. **Input impedance:** Approx. 70 ohms. **Band coverage:** 80, 40, 20, 15, 10 meters. **Panel metering:** Switch-selected, grid current, plate current, high voltage and relative power output for ease of loading. **Tube complement:** 4-811A 2-866A. **Size:** 19½" W x 11⅝" H x 16" D.



This inside view shows the neat circuit layout and husky components that emphasize quality. Note the internal shielding of plate circuit for maximum protection against TVI.

CHECK THESE FEATURES . . .

Completely self-contained . . . HV, Fil. and Bias supplies built in.
Versatile . . . May be driven by any 50 to 125 watt transmitter or exciter—no matching or swamping network required.
Efficient . . . Stable grounded grid circuitry allows most driving power to appear in output for up to 70% efficiency.
Oil-filled capacitor . . . And 5-50 henry swinging-choke provide the excellent dynamic regulation required for high peak power output with low distortion.
Inexpensive tubes . . . 4 paralleled 811A's and 2-866A's, forced-air cooled by silent built-in fan.
Stable. .carefull design provides a high degree of over-all stability in conjunction with the grounded grid circuit configuration.
Exclusive . . . Internal RF shielding of plate circuit for maximum TVI suppression.
Interlocked switching . . . prevents accidental application of HV before switching on filament and bias.
Rugged construction . . . 16 gauge steel chassis—¼" aluminum front panel—welded one-piece cabinet.

Kit Model HA-10 . . . 100 lbs. $23 dn., $20 mo. **$229.95**

Assembled Model HAW-10 . . .
100 lbs. $33 dn., $28 mo. **$329.95**

HEATHKIT® by DAYSTROM

HEATH COMPANY Benton Harbor, Michigan

Model DX-60 $82.95

- Built-in low pass filter
- Neutralized 6146 final amplifier
- Grid block keying
- Handsome low profile styling

more features, better performance in this new Heathkit transmitter

PHONE AND CW TRANSMITTER KIT (DX-60)

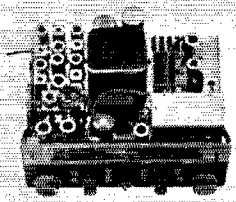
Smart modern styling . . . clean, rugged construction . . . and conservatively rated components all add up to ease of assembly, trouble-free operation and fine performance in the new DX-60 Transmitter. Offering far more than any other unit in its price and power class the DX-60 features a built-in *low pass filter* for harmonic suppression, *neutralized final* for high stability, *grid block keying* for excellent keying characteristics and easy access to crystal sockets on the rear chassis apron. A front panel switch selects any of four crystal positions or external VFO. Modulator and power supply are *built in. Single knob bandswitching* for 80 through 10 meters and the *pi-network output* provide complete operating convenience. A tune-operate switch provides protection during tuneup and a *separate drive control* allows adjustment of drive level without detuning driver. *Panel meter* shows final grid or plate current. A fine kit for the beginner as well as general class amateur, the DX-60 may be run at reduced power for novice operation. Operates CW or AM phone with crystal or VFO control. Power input is *90 watts peak*, carrier controlled phone or CW. Construction of the DX-60 is a breeze, with its clean circuit layout, precut and cabled *wiring harness* and the complete, informative instructions furnished. The handsomely-styled finished unit measures only 13¾" W x 11½" D x 6½" H. 29 lbs.

Model DX-60...$8.30 dn., $8 mo.....**$82.95**

you get twice as much for your budget

Model HW-20 $199.95

- Tracked VFO & Exciter Stages for single knob tuning
- 10-watt RF output to antenna—6360 final
- Built-in low pass filter
- Built-in 3-way power supply for 117 VAC, 6 VDC, 12 VDC
- Push-to-talk ceramic element microphone



new transceivers for 6 & 2 meter nomads

VHF TRANSCEIVER KITS (HW-10 & HW-20)

"Mobile" or "Fixed", the new "Shawnee" 6-meter or "Pawnee" 2-meter transceivers bring you unprecedented performance, for each is a complete AM & CW Transmitter/Receiver combination with features unmatched at this price . . . just connect an antenna and you are in business! Transmitters feature a *built-in VFO* with all frequency determining components mounted on a "heat sink" plate for temperature stability and *four* switch-selected crystal positions for novice, CAP, MARS or net operation. VFO and all exciter stages are tracked for convenient *single knob tuning* over any 500 kc band segment (greater excursions require simple re-peaking of final). A VFO "spotting" switch is provided to "zero in" signals with transmitter off-the-air. The 6360 dual-tetrode final RF amplifier provides 10 watts of power *output* to the antenna and a built-in *low pass filter* is incorporated to suppress harmonics and other spurious radiation. The *dual-purpose modulator* provides a full 10 watts of audio for high level plate modulation of the final RF amplifier or 15 watts of audio for paging or public address use, selectable with push-pull switch. Superheterodyne receivers feature double conversion with first oscillator crystal-controlled. All oscillators are voltage regulated for stability. A large slide-rule dial and vernier tuning provide more than ample bandspread for both receiver and VFO. RF gain, BFO, ANL, Squelch, AVC on/off and transmitter controls are front panel mounted. *Tuning meter* is automatically switched to read signal strength or relative power output. Units come complete with built-in speaker, heavy duty AC & DC power cables, primary fused relay, adjustable mounting bracket and push-to-talk ceramic element microphone with coil cord & mounting clip. 6" H x 12" W x 10" D. 34 lbs. each.

Model HW-20 (2 meters)...$20 dn., $17 mo.....**$199.95**
Expected Shipping Date Feb. 25.

Model HW-10 (6 meters) Coming Soon.

Model HW-29A

$44.95

lowest cost transceivers on the air

- Operate from low-frequency crystals for greater stability
- Push-to-talk Transmit/Receive switch
- Variable receiver tuning
- Built-In AC power supply—easy conversion to mobile operation, using accessory vibrator power supply

Attn. HW-29 owners: Convert your "Sixer" to the new improved "A" model with this easy-to-install conversion kit. Allows use of 8 mc crystal for maximum stability.
Model HWM-29-1 1 lb. **$4.95**

2, 6 & 10 METER TRANSCEIVER KITS (HW-30, 29A, 19)

These three outstanding transceiver models bring you top performance at the lowest prices offered in complete amateur facilities. Each model has a crystal controlled transmitter and tunable, superregenerative receiver with RF preamplifier. Receivers pull in signals *as low as 1 uv* and the *5 watt* transmitters are ideal for emergency work or "local" net operation. Features include push-to-talk transmit/receive switch, metering jack, ceramic element microphone, and two power cables. Less crystal. 10 lbs. each.

Model HW-19 (10 meter)...$4 dn., $5 mo.....**$39.95**
Model HW-29A (6 meter)...$4.50 dn., $5 mo.....**$44.95**
Model HW-30 (2 meter)...$4.50 dn., $5 mo.....**$44.95**

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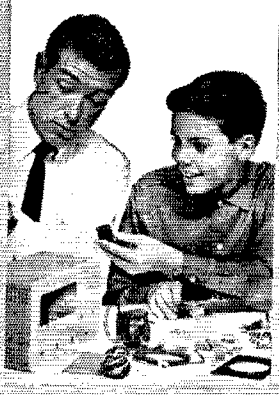

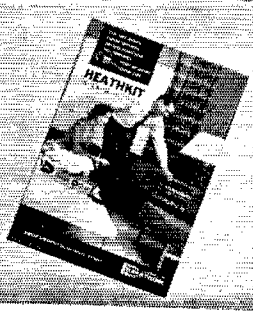

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Fill out the order blank below. Include charges for parcel post according to weights shown. Express orders shipped delivery charges collect. All prices F.O.B. Benton Harbor, Mich. A 20% deposit is required on all C.O.D. orders. Prices subject to change without notice.

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ITEM	MODEL NO.	PRICE

Ship via ( ) Parcel Post ( ) Express ( ) COD ( ) Best Way

( ) SEND MY FREE COPY OF YOUR COMPLETE CATALOG

Name _____

Address _____

City _____ Zone ___ State _____

Dealer and export prices slightly higher.

Station Activities

(*Continued from page 98*)

ting their local e.d. antennas in shape. The Burlington County Radio Club and the Levittown (N.J.) Radio Club have training classes in progress. W2OGZ, Moorestown, is back on the air. W2ZI, Trenton, worked 60 stations in 18 sections in the recent "160 Meter QSO Contest." K2BZK, is SJRA's Field Day chairman. Reports indicate an increase in all club Field Day participation in the section. W2CKX is vacationing in Florida. The Gloucester County ARC members are now using a new "special designed" QSL card featuring the club emblem. Note the change in the SEC. All ECs in the section are urged to report their activities to him each month. WA2NDK, Levittown, is NCS for the Burlington Co. 6-Meter AREC Net. The SJRA's directors meet each Mon. at 2100 hours on 145.80 Mc. Club meeting nights: Burlington Co. RC 1st Fri., DVRA 2nd Wed., Levittown 1st Tue., SJRA 4th Thurs., SCARA 2nd Fri. and Gloucester Co. ARA 1st Wed. W2YNR is secretary of the Gloucester Co. ARC; sorry we had the call wrong in this column. Many thanks for the fine monthly reports. Traffic: K2RXB 237, W2RG 217, K2DEI 191, W2BZJ 84, WA2MEQ 79, W2ZI 61, K2ECY 44, K2SOX 41, WA2KWB 20, K2SNK 16, W2BEI 12, K2JGU 11, WA2HJD 8, K2EWR 7, WA2-ARJ 4.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2LXE. RMs: W2RUF and W2ZRC. PAM: W2PVI. NYS C.W. meets on 3615 kc. at 1900, ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 1800, NYS C.D. on 3510.5 and 3993 kc. (s.s.b.) at 0900 Sun., TCPN 2nd call area on 3970 kc. at 1900, IPN on 3980 kc. at 1600. New Emergency Coordinators are W2IXR, Oneida, K2MEF, Tioga, W2PYC, Herkimer; W2BDK, Fulton; W2HXG, Seneca; W2QY, Monroe; W2FFU, Oswego; W2YIY, Steuben County. ORSs: K2KTK, W2QHH, W2BLO and K2SSX. OPSs: WA2GLA and K2DPA. OO: W2KEL. OBS: WA2ANU. OESs: WA2ASB and K2AVA. Please note that endorsements are made based on regular activity and faithful reporting to your SCM. W2OSL reports that the Walton Radio Assn. reelected its officers for 1961. They are W2WQU, pres.; K2TMJ, vice-pres.; W2FMU, secy.; W2THO, treas.; and W2TFL, act. mgr. The following ECs were not mentioned as recent endorsements: W2CYD, Onondaga; K2DNN, Chemung; K2ISO, Wyoming; K2QKM, Orleans; W2SB, Chautauqua; and K2VAW, Erie County. The SWNYVHFA elected K2LBS, pres.; WA2ADK, vice-pres.; WA2JMN, secy.; and K2OVB, treas. The club is working on a 144-Mc. transmitter utilizing 829B in the output stage. Congratulations to WA2CIG, W2RUF and K2RTQ on making the BPL. Don't forget the W.N.Y. Hamfest sponsored by the RARA at Doud Post, Rochester, May 6. Plans are in the finishing stage for the N.Y. State Convention to be held in Niagara Falls in September. All reports indicate that this will be the biggest affair in years. Many national figures already are lined up to speak. The North Country RC is planning a hamfest in July. W2IDM, W2BYZ, K2SRX, K2PQE, WA2HEC, WA2OEN and WA2EHW are all active on 6 meters in St. Lawrence County. The Kenmore HS ARC held its first Annual Reunion in January. WA2BQB reports that W2RX gave a talk on Square Waves and OTs and members enjoyed refreshments. 2-meter s.s.b. in the Auburn Area includes W2WZR, K2LMG, W2TVO, W2CTJ, K2GGA, WA2KJA and K2QPZ. K2MLT and K2QLE are building s.s.b rigs. Many correspondents lost their beams during the winter months. There is much interest in call letter license plates at present. Write your state representative. Traffic: (Feb.): WA2CIG 821, W2RUF 676, K2RTQ 563, W2EZB 430, K2SSX 203, WA2CRH 161, W2FEB 143, K2JBX 74, K2OFV 63, K2QDT 59, WA2IYB 58, WA2-HEC 43, K2TPV 43, WA2GLA 42, W2VUY 32, W2GXE 29, K2QQK 29, W2COB 22, K2DPA 21, K2EE 21, WA2EGX 19, WA2OTC 18, W2PVI 18, W2EFO 14, K2BBJ 13, W2PGA 13, W2BLO 10, K2HOH 10, K2GAO 8, K2MQA 5, K2RTE 4, W2EMW 3. (Jan.) K2MQA 17.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: OMA. RMs: KUN, NUG and GEG. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3585 kc. The Keystone Slow Speed Net (KSSN) meets 1830 EST Mon. through Fri. and 1900 EST Sat. and Sun. on 3585 kc. K3MNP now is General Class. The Monessen RC (CSL) has its club location on the Charleroi-Donora road. Congratulations to KUN and MFB on making BPL. LIV reports that the amateurs from Blair County C.D. assisted the Huntington County C.D. gang in evaluating 6 meters for full county coverage with good success. The Horseshoe RC reports via *Hamateur News*: TXQ has moved to Riverdale, Md.; KFD, ISZ and K3AYU are getting on 420 Mc.; K3LYK and K3OIH are father and son. Up Erie way: YLR moved to Florida; KPJ has an Apache; KN3NBH is a Brother at Sacred Heart Mission in Girard; MED is back on 6 meters. K3CJY is chairman of the HAMO-RAMA that the Greater Pittsburgh V.H.F. Society will stage June 18 at South Park. The Etna RC reports via *Oscillator*: This years' club Field Day will be held at SFA's farm; Mul is the new Radio Officer for Allegheny County; the Breeze-Shooters will hold its Annual Hamfest Sun., May 28 at the Lodge in North Park; APR has a DX-60; VEQ is in the Army. KUN worked his first JA on 80-meter c.w. The Nittany ARC reports via *QST de K3HKK*: MGP has the only Keystone Award certificate for 80-meter c.w. only; K3BRH has an Apache; K3CLX has a new antenna tuner; new club officers are SYY, pres.; RBC, vice-pres.; SMV, secy.-treas.; ZZO, K3AKR and K3KMO, managers. The Mon Valley ARC (ZHV) meets the last Tue. of the month at the Central Fire Hall on Lovedale Road (Route 48). JHT and UVD have new keyers. The Cumberland Valley ARC reports through *Valley QRM*: ZUX has received his Keystone Award; K3BZQ is back to mobiling; K3BGH now is on 2 meters; K3LUE received his General Class license. The Steel City ARC reports via *Kilowatt Harmonics*: KPI has a new crank-up tower; TQN has a Seneca; FML is in JA-Land. New officers of the Coke Center RC are K3JDZ, pres.; K3JCM, vice-pres.; NCE, treas.; K3BTF, secy.; TTV, trustee. IDO had good success in the 160-Meter C.W. Contest. K3HWL would like to hear from chess players. OMA visited KZ5-Land. PPF and LKZ have new NC-303 receivers. K3ILD is on 2 meters in Oil City. Traffic: (Feb.) W3KUN 411, MFB 405, K3-KMO 120, W3WRE 92, NCT 72, K3HWL 61, W3LSS 53, SMV 37, KNQ 30, K3GHH 23, W3UHN 15, BWU 1. (Jan.) K3HWL 84.

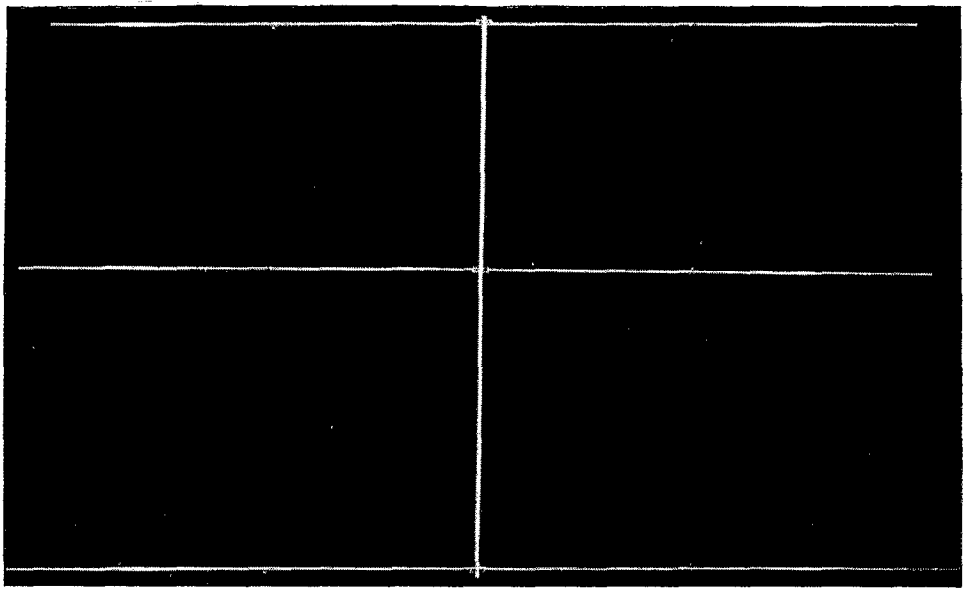
CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: PSP. RM: USR. PAM: RYU. EC of Cook County: HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CST. Now is the time to make your arrangements for the Central Division Convention to be held in Springfield, Aug. 26 and 27. The committees in charge promise that a varied program will be presented which will be of interest to all those attending. New appointees are IMN, NPC and K9HJO as OOs; K9HJO as OBS. The Greene County AREC group cooperated with the county c.d. in participation of Pearl Harbor Day, under the direction of EC IFA. News of coming events received by this column: The S.S.B. Dinner and the SARA Picnic will be held at the usual QTH Sat. and Sun., July 15 and 16, in Duquoin, and the Breakfast Club will meet in Palmyra, Sun., July 30. The Rockford Amateur Radio Assn. has moved into new quarters in Winnebago, Ill. K9JLC reports that the Vermillion County Amateur Radio Association's net meets Sun. from 10:30 to 11:30 on 3870 kc. JUV, HPG, K9JTD, K9OCU and K9QMJ took part in the recent Frequency Measuring Test held by the League. K9VUX, of Chicago 2-meter fame, is the proud father of a male harmonic. The Air Force ROTC of the Illinois Institute of Technology is setting up its station again after an absence of several years. USR, NCS of the ILN, reports that 346 messages were handled in 27 sessions. The February traffic count for the North Central Phone Net was 179 messages, according to K9QYW. K9ZRD is now General Class. The Kankakee Area Radio Society has incorporated in accordance with State laws. VQC has a new HT-32. K9PRP is now a Technician. K9QMJ received his WAC for all s.s.b. DQX and CRV recently were on the sick list. The Wright College Amateur Radio Club has been reorganized by K9LHV, K9TVA, K9MDM, K9UST, K9KLT and K9KEJ. KCR has finished his home-brew 50-144-220-Mc. v.h.f. receiver and reports that it is working FB. MSO is the new EC for McDonough County. Bud Drobish, of Hallicrafters, spoke at the Kishwaukee Radio Club meeting Apr. 3. KN9CWO is a new call in the Rockford Area. K9AMD has been selected to head the YL and XYL committee for the Central Division Convention. QKE, president of the Chicago Area Radio Club Council, informs us that the 1961 models of Zenith television sets are supplied with high-pass filters and in all probability the majority of the larger manufacturers will follow suit. The Joliet Amateur Radio Society participated in the 1961 Joliet Hobby Show held in late February. QLZ, secretary of the Starved Rock Radio Club, announces that its Annual Hamfest will be held Sun., June 4. Recipients of BPL certificates for February traffic are DO, IDA, K9OZM and K9BTE. Traffic: (Feb.) W9DO 886, IDA 689, K9OZM 605, BTE 521, UGY 322, QAE 185, IVG 128, W9JXV 92, FAW 76, K9OCU 65, W9SXL 64, K9UOV 61, QYW 53, CIL 50, JTD 40, LXG 36, W9PRN 30, K9CRT 29, OAD 25, TVA 21, ZRD 15, KEJ 13, BIV 11, QPA 11, OQJ 10, RHU 8, KN9BGV 5, K9LLA 4, W9SKR 4, K9MLI 2, W9WPC 2, KCR 1. (Jan.) W9USR 134, RYU 18, K9KCX 6, QPA 2.

(*Continued on page 104*)

Beautiful Beams By Gotham

AND THEY HAVE STOOD THE TEST OF TIME !



The Gotham beam shown above is our D103N, for ten meters and Citizens Band operation. Its performance is unexcelled. It sells for only **$22.95,** shipment by express, charges collect. As on all Gotham beams, the elements are a full half-wave, in a simple Yagi design; all tubing is aluminum alloy; and assembly is quick and easy.

FREE

Send a card for our valuable catalog of 50 different antennas with specifications and characteristics. Gives bands and frequencies covered, element information, size of tubing used, boom length, shipping weight, feed line used, polarization, and other data.

GOTHAM

1805 PURDY AVENUE
MIAMI BEACH, FLORIDA

IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—with only 65 watts and a $16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-T12TG)

OR IS K4ZRA THE NEW CHAMP?

Read his letter, and see his diagram of a typical installation and what it achieved:

2539 Christie Place
Owensboro, Kentucky

GOTHAM
Miami Beach, Florida

Gentlemen:

While I was at home last summer, I had occasion to use your GOTHAM vertical antenna on the air for about two months. I was quite amazed with the excellent performance of that inexpensive and simply installed antenna. It did everything you, K6INI, and others said it would, in spite of the generally poor band conditions during the summer months.

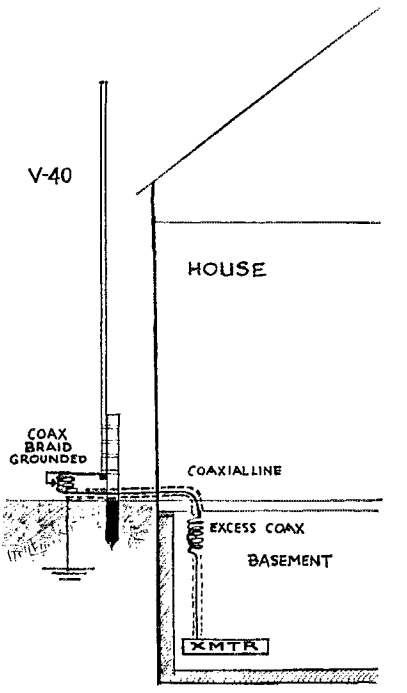
During the time I used this antenna, I worked well over 100 DX stations in 44 different countries, earned a WAS certificate, and worked the necessary stations for WAVE, receiving very fine signal reports from all. My rig ran from 75 to 100 watts plate input and the receiver was an old military ARR-7 (Hallicrafters reboxed SX-28.)

The above mentioned contacts were made with the vertical mounted several inches off the ground, without radials, with only a simple ground connection to the coaxial shield. Later I raised the antenna up about 20 feet and installed the radials and this improved the already good signal pattern and enabled me to pick off another 12 DX countries and other DX contacts in a couple of weeks of good band conditions. In the latter part of August I used several single-band vertical and ground plane antennas and found that the single GOTHAM vertical equalled all these individual antennas.

Another attractive feature is the versatility of installation. It works high or low on ground, with or without radials,

K4ZRA's INSTALLATION

THAT WORKED WONDERS WITH A GOTHAM V-40 VERTICAL



mounted in any space. Of course I did find that the best installations were the two mentioned above, but they were fairly simple to arrange, especially the first one!

The GOTHAM vertical is also a superior receiving antenna and I would strongly urge you to recommend that it be used for receiving as well as transmitting.

I just wanted to tell you how pleased I was with the overall performance of your antenna. For an inexpensive, easy-to-install, dependable antenna that really works for both DX and "local" W/K contacts, I don't see how one could ask for more and I would certainly recommend a GOTHAM V-40 to anyone desiring these features. Good luck in 1961 with those FB antennas!

Sincerely,
Daniel F. Onley, K4ZRA

Some Stations worked by K4ZRA using a Gotham V-40. Call, RST, freq. mc. given

CE1AD	-569-14	W1AW	-599-14	PX1PF	-569-14
CO7NR	-579-14	KG1FR	-579-14	PY7AIO	-579- 7
CN8MB	-579-14	KG4AB	-579-14	SP2KDT	-579-14
CT2RO	-579-14	KH6JG	-589-14	TI2DN	-599-14
DL1EE	-589-14	KL7AWR	-579- 7	UA3GM	-579-14
EA2FO	-589-14	KM6BT	-579-14	UB5FK	-579-14
EA8CP	-589-14	KP4TIN	-589- 7	VP2LD	-569- 7
EL4A	-589-14	KV4AA	-589-14	VP3YG	-559-21
F9ER	-579-21	KZ5BC	-589-14	VP4TK	- ? -21
FA2VC	-589-14	LA2IG	-559-21	VP5VB	-589-21
FP8BM	-599-14	LU2NZ	-589-14	VP7VB	-589-14
G3JLB	-589-14	OA4HK	-589-14	VP9G	-599-14
GW3IEM	-579-14	OE5HE	-559-21	VQ2IE	-559-14
HB1ZA	-589-14	OH3ND	-569-14	VO3HE	-569-14
HC1JU	-589-14	OK2PO	-579-14	XE3BL	-589-14
HH2OT	- ? -14	OX3MT	-599-14	YN4AB	-579-14
HK3RQ	-579-14	PA0MDG	-569-14	YU1KA	-569-14
HBVP	-599-14	PJ2AE	-579-14	YV5APR	-589-14

CANADA:

VO1DC	-599-14	VE3BU	-589- 7	VE7AIT	-589-14
VO2AW	-579-14	VE4MW	-589-14	VE8RW	-599-14
VE1DO	-589-14	VE5KY	-589-14	VE0NM	-589-14
VE2EA	-599-14	VE6VV	-589-14		

All states were worked with very fine reports.

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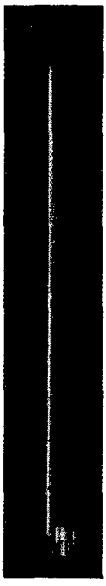

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Address.....

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

Station Activities

(*Continued from page 100*)

INDIANA—SCM, Clifford M. Singer, W9SWD—Asst. SCM: Arthur G. Evans, 9TQC. SEC: SNQ. PAMs: K9APM, BKJ, K9PFQ and RVM. RMs: DGA, TT and VAY. Net skeds: IFN, 0900 daily and 1830 Mon.-Fri. on 3910 kc. ISN (s.s.b.), 1930 daily on 3920 kc.; QIN (training) 1800 Mon.-Wed.-Fri. on 3745 kc.; CAEN, daily at 1900 on 1850 kc.; QIN, daily at 1900 and RFN, 0700 Sun. on 3656 kc. New appointments: K9ISA is EC of Porter County, K9ULW is EC of Jay County. New OESs are K9RXE and AQW. JVF is OO Class III and IV and K9GLL is OO Class III. The Northeastern ARC held its Annual Banquet with 65 attending. Many county AREC nets were activated during a crippling blizzard and snow storm. DZC, DUV and RVM acted as NCSs for the IFN for 9 hours on Feb. 26; 130 stations checked in to ask and furnish road information and to handle storm traffic; 150 messages were handled. New officers of the Hoosier Hills Ham Club are K9BSL, CNL, K9RUS, K9MXV and K9BEH. Newly-elected officers of the Notre Dame Radio Communications RC are K2OQQ and K5-JET. Lake County ARC held its Annual Banquet Feb. 11 with 300 present. K9LPM, who will be stationed in Monrovia for the next two years, is now EL2G and his wife, STU, is EL2N. They have a KWM-2 on order and will be working 14 Mc. A sturdy and reliable 6-meter traffic net is the I-M-O, which is managed by K9GLL. It is a directed net and handles traffic 50 and upward each month and serves as liaison to IFN, ISN and QIN. Circle July 16. See you at Garfield Park in Indianapolis for the Indiana Radio Club Council Hamfest and Family Picnic. Field Day Awards and Indiana's Outstanding Amateur Award will be presented on this day. New officers of the Winslow ARS are K9KRN, K9UQC, K9ULK, K9QAP and K9UOP. The club is applying for a club license. *Amateur Radio Exists as a hobby because of the service it renders.* February net reports: QIN 396 and QIN (training) 44, as reported by VAY. K9AOM reports a traffic total of 228 for ISN. IFN traffic was 291, reports RVM. K9PFQ reports 25 for CAEN and TT reports traffic at 115 for RFN. Those making BPL: ZYK, TT, and NZZ. Traffic: (Feb.) W9ZYK 933, TT 429, VAY 331, MM 270, NZZ 160, EJR 147, K9GLL 104, OET 102, RMQ 94, W9QYQ 66, GJS 58, DOK 49, K9LZN 45, W9FWH 44, RVM 41, K9SSI 41, AOM 40, W9DZC 38, SWD 31, K9CRS 28, VDP 26, HMC 25, W9DGA 24, RTH 24, YYX 22, IMU 21, FJI 20, ILK 20, CC 18, K9NBK 18, W9YB 18, BUQ 17, K9DUV 16, W9EJW 16, JBQ 16, OCC 15, K9LZJ 13, W9ZSW 12, BDP 11, CLY 10, SNQ 8, K9IXD 7, MAN 7, W9AB 6, YVS 6, K9TFJ 5, KN9CMG 4, K9VRU 4, W9STC 3, KN9BHH 2. (Jan.) K9GLL 70, W9YB 23, IMU 21, K9WST 16, W9DZC 9, K9SSI 9, LZN 8, W9STC 5, YVS 4, AB 3.

WISCONSIN—SCM, George Woida, W9KQB—SEC: BCC. PAMs: NGT and NRP. RMs: VHP and VIK. New appointees: K9QKG as EC, K9SQV as OBS, K9UJJ as ORS, DKH as ORS and OPS, FAA as EC. WIN certificates went to K9UJJ, W9s BCC, FXA, FZC, W8WQH and W2MTA/9. The new officers of the Racine Megacycle Club are K9MWL, pres.; K9SLS, vice-pres.; YYL, secy.-treas. The Door County Club elected JM, pres.; GJK, vice-pres.; UFY, secy.-treas. New officers of the Badger ARS of the U. of Wis. are K9EOP, pres.; OKN, vice-pres.; K9JIG, secy.-treas. GDW has a new home-brew all-band s.s.b. rig. K9LCA received his 2nd-class phone license. A 20-meter 2-way s.s.b. endorsement was added to the WAS certificate of YSZ for 50 states. GIL, UNJ, FDX, KQD, K9s ENB and CJK received A-1 Operator certificates. The Amateur Radio Ragchewers of Whitewater received BKC as its club call. K9CJM, currently stationed aboard the USS *Saratoga* in the Mediterranean, is due home in June. EC K9UTN appointed K9CER and K9CHK as Assistant ECs for Vernon County. OTL is working on efficiency with flea power and antennas. The Mancorad Club has begun its 10-week study course of the ARRL *License Manual* and code instruction. Add to the list of new appointees, K9PQT as OPS. Milwaukee AREC is active with operational changes. OES K9RRS claims good results with his transistor mike preamplifier on 6 and 2 meters. KN9CKA is new in Waupaca. FZC invites us to visit the c.w. room of the State Traffic Patrol on the 3rd floor of the State Office Bldg. Official Bulletins by K9SQV may be heard at 5:45 P.M on 3950 kc. Mon., Wed. and Fri. weekly. Traffic: (Feb.) W9DYG 1293, CXY 512, W2MTA/9 237, W9KQB 125, SAA 74, K9SQV 67, W9VHP 67, WJH 61, K9GSC 53, W9FXA 34, K9ELT 26, W4VRD/9 25, W9FZC 25, NRP 23, K9UJJ 23, W9VIK 22, K9HDL 17, W9ONI 10, K9JQA 9, W9MWQ 9, OTL 7, SIZ 7, CCO 6, DKH 6, K9LWV 6, W9APB 5, RQM 4, KN9YTJ 2, K9PQT 1. (Jan.) K9GSC 41, SQV 30, W9OTL 23, FXA 17, YT 16, SIZ 9.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØHVA—SEC: KØKBV. PAM: KØKJR. RM: KTZ. The North Dakota 75-Meter Phone Net reports for February: 21 sessions, total check-ins 536, minimum check-ins 10, maximum 35; 79 pieces of formal traffic, 60 informal and 16 relays. KØTFB has been named Assistant EC for Williams County. WNØFKG is a new ham in Williston. A new call in Valley City is KØBZE. Very little news was turned in, which is the reason for the short reports. Please, how about some news items? Traffic: KØIVQ 210, RSA 59, ITP 53, MPH 40, TYY 35, GGI 15, GRM 13, PVH 12, WØPHC 10, KØKJR 9, TNI 8, WØYCL 8, KØRRZ 7, AJW 5, WØDNJ 5, OMA 5, CAQ 4, KØIAB 4, WØBHF 3, MQA 3, AQR 2, BHT 2.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN. SEC: SCT. New Conditional Class licenses at Huron include KØYBZ, KØYCD, KØYJD and KØYTG. The Radio Research Club, Inc., of Brookings elected KØDEL, pres.; Robert Mundt, vice-pres.; and KØBRC, secy.-treas. SCT is conducting a class for beginners. LXD, Centerville, has assumed ownership of a drugstore. BTK is EC for Hughes, Hyde and Sully Counties, and MMQ for Yankton County. PMA and VTX have a new SX-111. The Black Hills ARC conducts a transmitter hunt every Sun. afternoon. YVF has installed a set of Morrow "Twins" in his Chevy. KØSZJ and PRL are active on RTTY from Sioux Falls. Section Net certificates have been mailed to 39 participants in the S. D. 75-Meter Net who met requirements set by the PAM. More than 70 amateurs from the Watertown Area and Sioux Falls attended a meeting to discuss reorganization of the Howlin' Wind ARC. RRN's wife won a new car in a contest. KØPEF vacationed in Florida, mobiling along the way with his home rig in the back seat, and power from accommodating filling stations and motels along the way. KØDYR spent a month in Arizona and ZRA works into the State from Arizona using a friend's station. Traffic: WØZWL 581, SCT 257, DVB 131, KØBMQ 103, AIE 74, YNR 48, WØVQC 30, VTX 27, OFP 26, KØVYY 25, SZJ 20, WØPMA 14, KØWJT 14, WØRWM 12, SMV 9, KØINZ 8, WØYVF 7, KØDHA 6, KOY 5, BSW 4, DUR 2, WØHYB 2, PDW 2, RQY 2, TNM 2, TLU 2, ACG 1, KØSEJ 1, WØTPF 1, UXC 1, VIZ 1.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, WØKJZ—Asst. SCM: Charles Marsh, ØALW. SEC: TUS. PAMs: OPX and KØEPT. RMs: PET and KØIZD. Newly-appointed OESs KØAKC, PSE and VLD demonstrated a 6-meter station at "Soul's Harbor" Auditorium for the Crystal Evangelical Free Church members. EC KØMEQ and his AREC group demonstrated amateur radio in action for the civil defense officials in Le Sueur County. EC HPN remodeled his home. EC GGQ installed the Collins S/Line except for the final which is the 600L; he also uses a Model 26 RTTY machine and a 75A-4 receiver. EC THY is the new president of the SPRC. KØMVB resigned because of ill health. KØLNE vacationed in Florida, and ICG in Alabama. YL TOP resides in Carleton. EC MNY can be heard on 160 meters nightly. He and his XYL, UOZ, were week-end guests of KØLWK and VPJ. OOs LST, WMA and KØJCF listed a total of 7 violations. KØORK made BPL with a total of 545. KØZON uses a Viking I. MUZ purchased an HQ-110 receiver. KØBLB and KØSND moved to Illinois. The RARC station received the call MXW in memory of Dr. Maytum of Mayo Clinic. KØKCJ, ex-W9EWA, lives in Rochester. KØRGP made WAS. KØPWQ received the Eagle Scout Award. KØTXB's XYL is KNØDQA. AGL and his XYL were Inaugural guests of Vice-President Lyndon Johnson. New officers of the RARC are KØSBB, pres.; KØSXB, vice-pres.; KØSAZ, secy.; PQS, treas.; and TJA, station custodian. SARA officers are PSF, pres.; VPR, vice-pres.; SZU, secy.; TNU, treas.; ARU, TVI committee; TKX, trustee. OMO has the Collins S/Line. KØSNG, SNC and MGT are Net Controls on both the phone and c.w. nets. EC KØOQT has a KWM-2 driving a Viking Thunderbolt. ISJ, JMI and KJZ are "VAVS" operators in conjunction with the hospital amateur radio station BIV. The following appointments were renewed: OET, FGP, ICG and LST as OPSs; RIQ as ORS; HPN, THY, GGQ, FGP, OJK, YHR, ICG, KYK, EGE, BFS, OBP, MNY and SNC as ECs. Cancellations: EWC, CRB, EPT and LWJ as ECs; YAC as OO; DUO as OES; LST as OBS; MAH as OPS. Traffic: (Feb.) KØORK 545, WØTUS 373, PET 184, KJZ 163, OJH 129, ISJ 95, OPX 92, KØQBI 69, WØHEN 56, KØUKU 49, SNG 32, IZD 30, SBB 30, EPT 26, WØLST 26, KØJCF 24, WØUMX 20, APO 19, KØGKI 19, LWK

(*Continued on page 108*)

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19. WØKLG 18. KØOQT 18. ZKK 18. WØBUO 17. KØMIGT 16. JYJ 15. RHN 15. WØFGP 14. KØAKM 13. BAB 13. IKU 12. WØWVT 12. RIQ 11. THY 11. KØVPO 11. WØWMA 10. KØKYK 8. WØOET 8. KØMNY 7. VPJ 7. WYV 7. WØOOU 6. KØTXT 5. KNØCIB 4. KØQLM 4. VXW 4. MAH 2. VPP 2. WØRA 1. VPO 1. (Jan.) WØUYR 3. (Dec.) KØVPP 1. (Nov.) KØVPP 2.

DELTA DIVISION

ARKANSAS—SCM, Daniel B. Patterson, W5SMN—SEC: K5CIR. PAM: DYL. RM: TYW. Congratulations to K5USE on his activity in the OZK C. W. Net. A Section Net certificate will be awarded to him; also this is the second time that he has made BPL. Activity is normal in the OZK C.W. Net. Mid-term exams keep the school boys activity low. We have a new ham already starting to handle traffic. KN5CNH is the proud owner of a 40A and is on the air with a Globe Scout. His antenna farm consists of a dipole and a 15-meter beam 70 feet high. I think one of the things that has made ham radio go over so big is the fact that you can get any kind of help that is needed. Quite often you can get parts that you need for that gear that you are building, and sometimes too much advice. We are in a tornado belt here and have an active storm warning net. The operators at the radar station can now measure the speed of the storm and tell the difference between a severe hail storm and a tornado. They can predict when a storm will hit within minutes and do it far enough in advance to let all the storm warning devices be sounded. Traffic: K5USE 531, W5RYM 56, K5IPS 44, W5DTR 31, K5UEK 12, W5SMN 10, SZJ 10, K5TYW 6, KN5CNH 5, K5ABE 2, W5DYL 2.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—Hope to see you at the Delta Division Convention at Chattanooga Apr. 7, 8 and 9 for some eyeball QSOs. The Metropolitan Council of three New Orleans clubs was formed with MXQ as president for the task of putting on the Delta Division Convention in New Orleans sometime in 1962. The Delta 75 Net that has been operating on 3905 kc. for the last 25 years at least, now has another branch operating on the same frequency daily but on sideband.GKT, PAM and Net Control, was the originator. MXQ will be s.s.b. as soon as the equipment comes in. UQR is having good 6-meter activity and the 50.4 Mc. meets each Sun. at 2000 CST. K5QXV still is having trouble with the rig. K5UYL is busy pounding brass. EA should have his new DX-100B on the air soon. K5LZA, at Texas A&M, has been handling a good bit of traffic. KN5FNQ now has a new HQ-145 and a Challenger. The Dixie Early Bird Net, which meets daily on 7235 kc. at 0630 CST, has been very busy with traffic. The Jefferson ARC code class had 7 pass the Novice and 1 the Technician Class exams. A new net is in the making to be known as "The Mouth of the South." It meets each Sat. 0900-1100 CST on 7250 kc. CEZ is back home from a trip to Nebraska to attend the funeral of his mother. His RTTY is working but not with QRM so he is sticking with c.w. GAD was hospitalized again with a recurring ailment but is back home and getting along well. Ex-W9-WØFUX is now W5CRQ. Traffic: W5CEZ 271, K5USO 98, UYL 61, LZA 20, W5MXQ 10, K5QXV 5.

MISSISSIPPI—SCM, Floyd C. Teetson, W5MUG—I just had a fine meeting with the Tupelo gang. Even though they are a small group they are doing a fine job. I'm glad to have had the chance to meet with you fellows. K5LIC has moved to Jackson and is back on the air. OSA has been in the hospital for a bit of surgery, and seems to be doing nicely. DIX, at French Camp, has a new beam about 90 feet in the air. Be careful, Bob, it's a long way down. The recent floods in the section have given some of the gang a workout handling welfare traffic. Yours truly is sporting a Model 19 teletype. I've just about got it on the air. New appointees are BX and K5HYD as OPSs. Traffic: K5RUO 111.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: K4OUK. RM: FX. PAMs: UOT and PAH. New officers of the Oak Ridge Club are K4LPW, VOP, EDB, SSS, W4HPN, VQE and BBL. SGI reports there are at least 17 APX-6 sets in the Oak Ridge-Knoxville Area. HSR reports he is NCS to AENT and also MKPN. OGG reports formation of a new club in Whitehaven. WBK says the Memphis group is making plans for the Cotton Carnival. IQU has been transferred from Memphis to Norfolk. K4CNU, Oak Ridge, is Tennessee editor of *The Monitor*. Send her your news items. ZJY, K4OUK, AMC and AKP took 1130 messages from DUG/4 at the Florida State Fair. New appointments: VJ and WXH as ORSs; VJ as OBS; TBS as EC. Renewed: TZG as OO; TZG and K4DLC as ECs. Traffic: (Feb.) K4AKP 2324, W4PL 1363, OGG 617, K4AMC 382, W4FX 256, WXH 240, K4OUK 204, W4ZJY 202, VJ 122, PQP 105, PFP 32.

(Continued on page 108)

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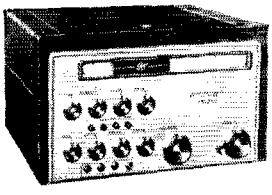

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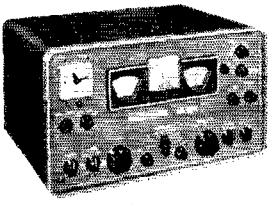

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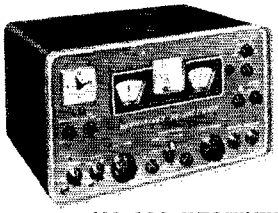

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HSR 31, TZG 30, UIO 25, PAH 23, K4YFC 17, RKG 12, W4UVL 11, TYV 9, K4TSC 4, W4VTS 4, K4FNR 3, W4VNU 2. (Jan.) K4FNR 54, W4YRM 6.

GREAT LAKES DIVISION

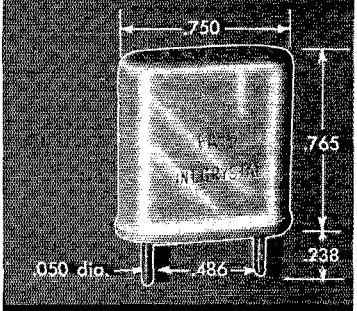
KENTUCKY—SCM, Robert A. Thomason, W4SUD—Asst. SCM: W. C. Alcock, 4CDA. SEC: BAZ. PAMs: SZB and K4OZI. RM: K4KWQ. V.H.F. PAM: K4LOA. The Owensboro ARC has its c.d. and emergency communication bus almost completed. Equipment has been purchased or donated for low-frequency and 6-meter amateur, state and local police and citizens' band. Cooperation between the amateur, city and county officials, PTA and other has made this unit possible. BAZ visited in Florida. K4LRX has WAC and 76 toward DXCC and is QSL Manager for VR2BC. K4ZHI is working on a 600-watt final for 20-meter c.w. BAZ is showing results with his efforts to get more traffic on our section nets. K4HSB has KPN and OPS certificates. KN4YKI reports that JDU, K4LDE, K4QDD, W8GFH, KN9ZVT, W8RGJ, KN4WZU and K4VHF are all related for one of the largest amateur families. EPA added two more DX stations during the Contest to total 284. K4CC has the mobile rig in a new station wagon which is kept ready for emergencies. KNN certificates went to KN9-WWD, KN4YZU and K4PXW. Look for KNN on 3720 kc. at 1700 CST M-F. K4OZG has a Heath KW, a TX-1 and an SB-10 on our section nets. K4ZRA and K4TZP are operating portable from school in Louisville. ZRA is very active with OO work and is planning a new frequency meter. K4ZQR, K4DMU and K4DLK are on 6 meters. K4MPR, active on KYN from Mayfield, is building a high-power final. K4OLT and SZB had perfect attendance on MKPN. K4QDD is on with a Viking. K4AVX is away at school. We may lose K4HOE to Wisconsin. K4AVF is going to U.K. K4YOU, at Irvington, is off because of transmitter trouble. K4JOP is at Northwestern. ADH is working on his receiver. Traffic: K4KWQ 234, VDL 156, CSH 121, W4SUD 57, BAZ 46, K4LOA 35, W4RNF 32, K4CC 30, W4CDA 30, K4ZQZ 25, W4SZB 15, ADH 14, KJP 13, SZL 13, K4VDO 13, W4YYI 13, K4PXW 12, HSB 11, QCQ 10, ZQR 9, OLT 8, KN4YZU 5, K4OZG 4, W4VJV 4, EPA 1, WVU 1.

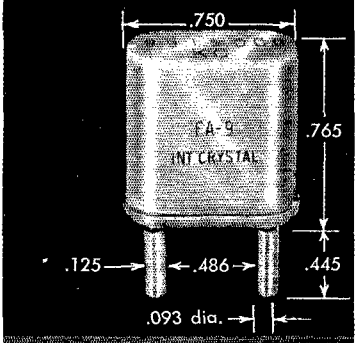
MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: ELR. RMs: SCW, OCC, QQO and FWQ. PAMs: K8CKD, K8JUG. V.H.F. PAMs: NOH and PT. After more than three years of excellent work, YAN has resigned as SEC. Don brought the Michigan AREC from nothing to a top section in AREC standings. ELR takes over as SEC, and LOX takes the Oakland County EC job. Other appointments: K8AZR, K8BZL, EWE, IUC and K8JKK as ECs; TBP and WQH as ORSs; K8BZL and K8CKD as OPSs; MPD as OBS; TIN as OES. The AREC has 1103 members and 46 emergency nets. All OBSs and OOs not active are being dropped. This SCM wishes to thank all of the Michigan section for their confidence. Six club bulletins were received. Lansing: K8EFC is going RTTY. K8PUU has 100V—with bugs. UGO has line noise. WDA is having antenna trap trouble. K8HKM is going hi(?) power 150 watts. WYC got a club write-up. CKK was NCS for mobiles in the March of Dimes with K8CWQ, K8CWP, JEG, K8NUG, K8GWW, LPK, BQD, K8NXW, K8HKM, K8DHN and K8VKX all in the act. AHV got a hand across 2300 V. Saginaw took on the "Mothers March" again, with mobiles CTY, LNE, HZF, QPO, CAM, WMU, HIO, K8s JLD, LIT, PNX, AQA, CJE, DDV, GOU, MEQ, SWG, NUN, LHK, CYL, DZV, JHI, MJM, OIC, JXS and DAC participating. Port Huron-Sarnia: New officers are VE3-DDL, pres.; MYU, vice-pres.; VE3DYJ, secy.-treas. (Canadian); K8PBV, secy.-treas. (U.S.) IM is trying to sell(!) a Sargeant TRF. Aw, put it in the Michigan Museum, Joe. The Motor City RC sponsored OT Nite at Greenfield Village. Flint: Those taking part in the Klondike Derby: ATB, VGG, HRL, EFF, SYL, RTN, VXM, K8s ACQ, JZV, TXJ and JXR. Kent RC's new officers are QBA, pres.; TXH, vice-pres.; PEY, secy.; EOB, treas. BPLers: K8IUZ, K8KMQ, USZ and K8PKU. ORS reports were received from K8AEM, K8BGZ, K8-GIV, NOH and K8PBA. New on RTTY: JGK, SYA, TOX and ZKZ. K8DQJ now has his old call, DSW. The Shiawassee ARA's officers are K8BDR, pres.; K8GHK, vice-pres.; CXG, secy.; AZI, treas. Traffic: (Feb.) K8IUZ 798, OTJ 330, W8RTN 311, FDO 265, K8KMQ 253, W8OCC 158, USZ 155, FWQ 143, NOH 133, K8PKU 130, W8IXJ 122, ELW 119, K8PDU 98, W8WQH 83, K8HLR 74, W8SCW 73, K8JJC 72, LZF 65, NHC 65, DJQ 63, W8FX 55, QQO 51, EU 46, EOI 45, AUD 40, ILP 36, K8AEM 32, W8DSW 32, HKT 32, JTQ 28, K8GJD 26, BZL 23, W8ZHB 22, YAN 20, IUJ 19, K8MEG 17, W8TBP 15, ZJE 15, MPD 10, K8PSY 10, W8BEZ 8, JKK 8, K8PMJ 8, W8QBA 8, K8QEX 8, W8QIX 7, EGI 6, K8TJH 5, W8WVL 5, WXO 5, K8CKD 4, W8TUX 4, K8EFY 2, KCO 2, KPU 2, KVV 2. (Jan.) K8OTJ 245, W8WQH 69, K8EXE 65, W8ACW 34, DSW 29, K8PSV

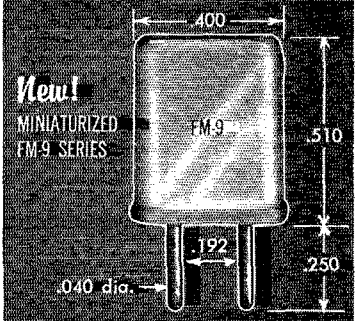
(*Continued on page 110*)

Amateur Crystals

1000 KC to 137 MC - .01% TOLERANCE







Wire mounted, plated crystals for use by amateurs and experimenters where tolerances of .01% are permissible and wide-range temperatures are not encountered.

Just any crystal in any oscillator will NOT combine to produce spot frequencies. These crystals are designed to operate into a 32 mmf load on their fundamental between 1000 kc and 15000 kc. Overtone crystals operate at anti-resonance on 3rd mode and series resonance on 5th and 7th mode crystals.

- **HOLDERS:** Metal, hermetically sealed. FA-5 and FA-9 are HC/6U pin type while the FM-9 is an HC/18U pin type.
- **FREQUENCIES** (Specify crystal type and frequency when ordering.)

	FA-5 and FA-9	Price	FM-9	Price
Fundamental	1000 - 1499 kc	$ 5.75	Not available	
	1500 - 1799 kc	$ 4.95	Not available	
	1800 - 1999 kc	$ 4.40	Not available	
	2000 - 9999 kc	$ 3.30	8000 - 9999.999 kc	$ 5.00
	10000 - 14999 kc	$ 4.40	10000 - 15000 kc	$ 5.50
	15000 - 20000 kc	$ 5.50	15001 - 19999.999 kc	$ 6.50
Overtone (3rd)	10 - 14.99 mc	$ 4.40	Not available	
	15 - 29.99 mc	$ 3.30	20 - 39.99 mc	$ 5.00
	30 - 59.99 mc	$ 4.40	40 - 59.99 mc	$ 5.50
Overtone (5th)	60 - 75.99 mc	$ 4.95	60 - 89.99 mc	$ 6.50
	76 - 99.99 mc	$ 7.15	90 - 100 mc	$ 8.50
	Not available		101 - 110 mc	$10.00
Overtone (7th)	100 - 137 mc	$ 9.35	Not available	

Overtone crystals are calibrated on their overtone frequency. They are valuable for receiver-converter applications and are NORMALLY NOT UTILIZED IN TRANSMITTERS, since only a small amount of power is available under stable operating conditions.

- **CALIBRATION TOLERANCE:** ± .01% of nominal at 30° C.
- **TEMPERATURE RANGE:** —40° to + 70° C. ± .01% of frequency at 30° C.
- **DRIVE LEVEL:** Recommended, maximum 3 milliwatts for overtones; up to 80 milliwatts for fundamentals, depending on frequency.

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20, W8JTQ 17, JKX 16, MHZ 12, K8AEM 9, W8TIN 5, K8JJC 4, KVM 4, EFY 2.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE. SEC: HNP. RMs: BZX, DAE, VTP and K8ONQ. PAM: HZJ. HPP and K8IJW were blessed with a baby girl and now HPP is 4TDC and K8IJW is 4SWF. K8MTI received his DXCC, PYZ and WJB are Silent Keys. Received a copy of *The Mike and Key*, the official publication of the Greater Cincinnati ARA, the first in two years, and want to say "thank you." I presume these are their 1961 officers: PKD, pres.; QBJ, 1st vice-pres.; K8HKP, 2nd vice-pres.; K8IMC, corr. secy.; LPC, rec. secy.; HCV, treas.; ALW, club station administrator; and MGP, editor. K8JQX spoke to the club relating his experiences while operating aeronautical mobile on amateur bands. The club station, K8DQF, is in operation, code classes are conducted under the direction of IVE and these are classes in theory, the use of test equipment and all phases of building and operating an amateur station. The Canton ARC's *Feedline* states that KYR underwent surgery in Kentucky. K8EJN is back on 10 meters and K8RMY is using a new coax vertical. Findlay ARC's *W8FT News* informs us the club has purchased a movie projector with sound. Tusco RC's *The Beam* tells us there are about forty in the code class run by JHJ and many have taken the Novice exam; and the stork brought K8ESN a baby girl. Toledo's *Ham Shack Gossip* names SQX as its Ham of the Month, and reports that the Fulton County ARC's 1961 officers are K8CSX, pres.; OFN, vice-pres.; UPR, secy.-treas.; ZHQ, act. mgr.; OFN, net control; K8IQB vacationed in Florida; KN8WOE is a new Novice; the stork brought a new harmonic to K8RRZ. K8HEF very kindly sent me two recent copies of Dayton ARA's *R-F Carrier*, which tells us that a 15-week theory course has been started; K8MTK is attending the U. of Wash. and is now K7MFF; CUJ has a new Collins KWM-2; new Novices in the Dayton Area are KN8s WHW, WPF, WTM, WZG, WZS, YDE, YDF, YDO and YFG. The Seneca RC showed an Ohio Bell film, The Thread of Time. Another new bulletin received was the Lorain County ARA's *Monitor*, which informs us that LWH showed slides of his recent trip west. It tells the history of the club from 1949 up to the present time; UUJ was home on furlough as was K8DXW on a week-end pass. K8BAX received his General Class license. K8OGF is in the hospital. K8VPX received his General Class license. The Norwalk ARC conducts classes in code and theory with K8s QCC and RNH at the helm and the club holds its meetings on the 1st and 3rd Mon. of the month. ERR was in the hospital for surgery. Springfield ARC's *Q-5* reports having two nets in operation, one on 75 meters and other on 2 meters, and that KN8YFH is a new Novice. CSK joined the married ranks. WTO is in the Air Force. The Buckeye Net has a bulletin known as *The Buckeye Net News Bulletin*, edited by K8ONQ, typed by Elaine, his XYL, which gives helpful suggestions on net operation, hints and kinks. The latest copy of BNNB has a photo of BZX sitting at his station and gives a thumbnail sketch of his amateur history. Columbus ARA's *Carascope* relates that K8WYU (ex-K1DRX) spoke on antenna construction and quads, multi-band beams, long-wire and v.h.f. antenna types were discussed; a new club was started in Marion called the V.H.F. Highbanders with K8NQQ, pres.; K8LMK, vice-pres.; and K8TFL, secy.-treas. K8OKM passes along this information: The Hydrographic Distribution Office, 5801 Tabor Ave., Philadelphia 20, Pa., will send you a world map, with time chart on it for sixty cents. It is Map 5192, Standard Time Chart of the World (size 36x48). Appointments made in February were K8CAG as OO and K8RXD as OES. KN8YLK is a new Novice in Canton. DAE and UPH made BPL in February. Traffic: (Feb.) W8DAE 1387, UPH 889, BZX 267, HCR 133, K8ONQ 128, AAG 126, W8AL 57, K8KSN 50, W8CTZ 49, K8LUP 49, PBZ 44, MYG 39, SQK 35, OEX 32, W8YGR 28, STR 20, K8HTM 13, QHH 13, W8LT 12, OKN 12, WE 12, K8HEJ 9, W8IBX 8, HQK 6, WYS 6. K8NPC 5, BDZ 4, W8BEW 4, BLC 4, K8BNL 4, W8GAC 4, K8DDR 2, W8HFK 2, K8QOJ 1. (Jan.) W8YGR 44, K8MTI 34, W8BEW 33, LZE 28, K8MFY 28, W8PMJ 23, K8PBZ 18, W8QCU 17, K8BNL 6, W8RO 2. (Dec.) K8MFY 16, MTI 8.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RM: W2PHX. PAMs: W2IJG and W2NOC. Section nets: NYS on 3615 kc. at 1900; NYSPTEN on 3925 kc. at 1800; ESS on 3590 kc. at 1800; MHT (Novice) on 3716 kc. Sat. at 1300. Sorry to report the passing of Jim Murphy, W2HCS, in Albany; he was the M.C. of many a hamfest. W2URP reports a new SX-101 with HT-32 and HT-33 linear. Lacking Hawaii, WA2-EKE is 49 on his WAS. The Putnam Club holds nightly schedules between members on 2 meters and is well along with Field Day plans. W2SZ reports 55 contacts in 6 sections on 2 meters and 53 in 7 sections on 6 meters during

(*Continued on page 112*)

To the hundreds of Hams who have taken the time to write, we at EICO can only say...

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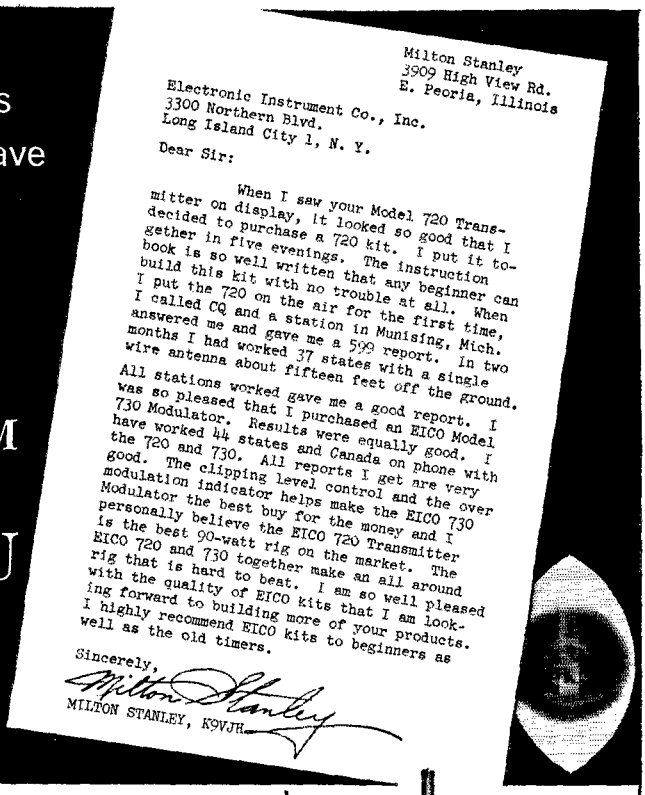

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Dear Sir:

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Sincerely,
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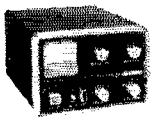

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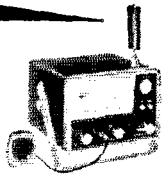

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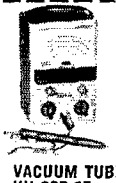

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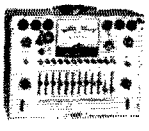

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the Jan. V.H.F. Party. Both W2ZBS and K2UTC did very well with the Nov. Frequency Measuring Test. St. Paul's Friary in Garrison is on the air from WV2PCM with a Gonset II and a T-90 Bandmaster. Endorsements: WA2AUC as ORS and W2SZ as ORS, OPS and OES. New Generals interested in traffic handling at 15 w.p.m. should try ESS listed at the top of the column. You can then graduate to the high-speed NYS as you become proficient. We need EC candidates from Westchester Co., except for New Rochelle, Larchmont and Mamaroneck. Talk it over at club meetings and send information to W2KGC, our SEC. WA2BAH reports there are more than 12 active 2-meter stations in Albany. The NYS RACES Command Net (3993 kc. Sun. at 0900) is nearly 100 per cent s.s.b. Its companion net, YCD (3509.5 kc. Sun. at 0900), is looking for members. If you like c.w., apply to State Radio Officer, 124 East 28th St., New York 16, for information. Traffic: K2MBU 302, W2EFU 283, W2THE 189, K2QJL 102, W2PHX 79, WA2HGB 38, WA2KUS 37, W2MTS 32, K2TXP 32, K2HNW 19, W2URP 16, W2BXP 12, WV2MID 7, WA2EKE 1.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals, W2TUK—SEC: W2ADO. RM: W2GXC. PAM: W2UGF. V.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. at 0030 GMT nightly and 0015 GMT on Sat. NLI (early), 3630 kc. at 2330 GMT nightly; NYC-LIPN, 3908 kc. at 2230 GMT nightly; V.H.F. Traffic Net, 145.8 Mc. at 0130 GMT Tue.-Wed.-Thurs. BPL cards were earned by K2UAT, K2UBG, W2EW, WA2EFN, WA2GPT, K2VGD, K2RBW, W2GKZ and WA2GLU. Congratulations, gang! New officers of the South Side Radio Club are K2RBW, pres.; WA2DXH, vice-pres.; and WA2KAK, secy-treas. WA2CZG and his "powerful" DX-40 worked ZL-Land on 3.5 Mc. Ed needs only Asia for his 3.5-Mc. WAC. WV2OTS is enjoying traffic-handling on the V.H.F. Net. A new Gonset linear improved the 144-Mc. signal at W2LDC. WA2GAF is using a new SX-111. Bob's dad is W2CPS, his uncle is W2HEJ and his cousin is K2HYE. County Emergency Coordinators once again are listed for your information: Manhattan, K2JVB; Bronx, W2DUP; Richmond, W2VKF; Kings, K2OVN; Queens, W2LGK; Nassau, W2FI, and Suffolk, W2KNA. K2OKX uses a 2-meter Communicator II in his mobile and a Communicator III at home. A new Viking Valiant and a TA-33JR are on the air at WA2GLU. WA2KWZ will be operating portable on 2 meters week ends from Rye. W2EW reports that the v.h.f. traffic group is holding open sessions on the days when the V.H.F. Net is not normally in session. Hank monitors the net's alternate frequency, 146.25 Mc., starting at 2230 GMT. Report in and help keep the traffic moving. Life memberships in the Staten Island ARA were awarded to W2ACZ and W2GMG, both of whom have been members in good standing for well over 30 years. In order to provide a training net for the section, K2UFT has requested the NCSs to slow down to 15 w.p.m. on Early NLI. WA2KUQ is using a Valiant and an HQ-129X. W2MES has now worked 130 countries and has a new Viking 500. WA2OGU passed the General Class exam. I regret reporting W2BSQ as a Silent Key. Excellent club newspapers were received from the New York RC, Larkfield ARC, Mid-Island Net, Levittown ARC, Amateur U.H.F. Club, Tu-Boro RC, Five Towns RC and Suffolk County RC. Many thanks for remembering this office. Your papers permit the SCM to know more about your club activities and advise prospective members of your existence. It would be my pleasure to meet with your club before my term of office expires in July. The Hudson Amateur Radio Council is planning another Hudson Division Convention in the fall. Watch for details. Traffic: (Feb.) K2UAT 1642, K2UBG 546, W2EW 475, K2UYW 427, WA2EFN 319, K2UFT 289, WA2GPT 256, K2VGD 252, K2RBW 225, W2GKZ 219, WA2GLU 151, K2OFD 119, WA2FBC 80, W2AEE 78, WA2CZG 68, W2GP 59, K2THY 39, W2JBQ 25, WA2KWZ 24, W2UGF 21, W2PF 20, W2OBU 16, WV2OTS 15, WA2GAF 14, W2LDC 14, W2DBQ 12, W2-LGK 12, W2EC 9, K2OEI 8, W2OKU 8, W2DUS 5, K2QBW 4. (Jan.) K2RBW 169, W2GXC 82, WA2GLU 54, W2JBQ 29, W2DBQ 10, K2QBW 5, K2SJP 2.

NORTHERN NEW JERSEY—SCM, J. Sparks Remeczky, K2MFF—SEC: WA2APY. RM: K2VNL. PAM: K2SLG. V.H.F. PAM: K2KVR. Sections nets: NJN daily at 2300 GMT on 3695 kc., NJPN Mon. through Sat. at 2200 GMT and Sun. at 1300 GMT on 3900 kc., N.J. 6 & 2 at 0300 GMT Thurs. and Sun. on 51.15 Mc. and at 0200 GMT Wed. and Sun. on 147.75 Mc. The above times are based on EDT. New appointees: WA2HFI and K2SCD as OESs and K2MHP as OBS. The NJN reports 28 sessions held, attendance 595 and traffic 570. The NJPN reports 28 sessions, attendance 639 and traffic 261. The N.J. 6 & 2 nets report 20 sessions, attendance 189 and traffic 30. K2KVR reports that the Raritan Bay RAC has plenty of room in its new meeting place and would like to fill it with new members. Also the club's new officers are K2KFE, pres.; W2TTM, vice-pres.; W2ILF, treas.; and WA2CHF, secy. K2PTI received his Extra Class license.

(Continued on page 114)

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WA2BDP received the Keystone Certificate. He made all the contacts on 6 meters. Two new Generals in NNJ are WA2KWJ and WA2MOI. WA2EJZ received the WANJ Award. W2CVW is giving 160 meters a fling. K3OHS is operating /2 from Westfield. WA2ARV, K2RGF, K2YNT, K2SCD, K2GQI and W2TTM are all putting the finishing touches on 1296-Mc. equipment. K2VVE has a new Heath "Twoer" in his car. W2FIK gave a talk about the MARS to the Garden State ARA. WA2CCF built a Heath SB-10. K2UUR and W6NTW/2 are also on 1296 Mc. now. WA2-KKH built a TO keyer and a Select-O-Ject. K2PVH finished his 220-Mc. gear. K2DDM is getting results in his campaign to improve AREC in his area. K2DSW is experimenting with f.m. on 2 meters. W2IN moved to California. K2KDQ has a new 5-over-5 array on 2 meters. K2VZJ received the WWCNY Award. K2UCY received a card of thanks from President Kennedy for the large volume of Inauguration Day traffic he handled. WA2CJD has been appointed chief radio operator for c.d. at Clara Maas Hospital in Belleville. WA2CCF, WA2GQI, K2UCY and K2VVL earned BPL cards for February traffic. W2-QNL is looking for a tranquilizer that he can give over the air to nervous net operators. W2OPB went back to his bug. Seems he was sending too well with his keyer. The Boonton High School RC is active on 80 meters afternoons around 4 o'clock. W2MNO was assigned to duty in Germany. K2YWG and WA2CRY announced the arrival of their fourth harmonic. Traffic: (Feb.) WA2-GQZ 840, K2UCY 500, W2OPB 333, WA2CCF 298, K2VNL 230, K2VVL 207, WA2JHQ 197, K2KDQ 182, W2QNL 165, W2BVE 161, W2RXL 115, WA2EQO 112, K2MFF 91, WA2-KKH 88, W2EBG 64, WA2EJZ 47, W2DRV 38, K2PVH 33, WA2COO 30, W2CVW 29, WA2AKM 27, K2EQP 25, K2AGJ 22, W2EWZ 18, K2SLG 17, K2JTU 15, K2MFX 13, K2TWZ 5, W2VMX 4, WA2IOX 2, W2NIY 2, K2ZFI 2. (Jan.) K2KDQ 78, K2SLG 28, W2CVW 13, W2CFB 5, W2VMX 5, WA2GZR 4, W2NKD 4. (Dec.) K2JTU 30.

MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, WØBDR—Asst. SCM: Walter G. Porter, ØUJC. SEC: KØEXN. PAM: KØMFX. RM: PZO. Feb. report of TLCN: 24 sessions, QNS 229, QTC 347. For the Iowa 75-Meter Phone Net: 28 sessions, QNS 1194, QTC 241. KØEAA was reelected president of the Central Iowa Radio Club with DGY, vice-pres.; and EFL, reelected secy.-treas. Second semester officers for the SUI Radio Club are KØRAP, pres.; JNK, vice-pres.; and KØKDA, secy.-treas. New officers of the Central Iowa V.H.F. and U.H.F. Radio Club at Des Moines are QHB, pres.; KØHPQ, secy.-treas.; ZCA, act. mgr. A radio club has been organized at Storm Lake for Buena Vista County. DUA received an A-1 Operator Club certificate. A new 6-meter net has been formed in Burlington called the Des Moines County Hi-Banders Emergency Net and meets Wed. at 0330 GMT on 50.4 Mc. New ECs are WUR, SVJ, KØPOI and YVZ. The following stations renewed their EC appointments: DWD, FDL, JAJ, UIZ, KØDQI, HLF, GOT and EVC. KØCTD was appointed net manager for the Cedar Valley Six-Meter Civil Defense Net, which meets at 0200 GMT on 50.4 Mc. every Thurs. Traffic: (Feb.) WØLGG 2778, SCA 1078, BDR 560, DUA 462, KØHBD 158, WØPZO 214, NTB 100, KØYOZ 73, KTP 50, WØIO 26, KØKAQ 25, WØPTL 22, YDV 22, KØPOI 18, VKT 18, WØFMZ 17, QVA 15, REM 15, KØVSV 15, WVK 14, GXP 13, WØEEG 10, KØQKF 10, WUR 10, WØNYX 9, KØVHR 8, BRE 6, WØBTL 6, KØGOT 5, YVZ 5, ZMU 5, MYU 4, RTF 3, WØHNE 2, KØKBX 2, LUZ 2, OFK 2, WØQVZ 2, KØVDY 2, VXN 1. (Jan.) KØAUU 18, EVC 13, EXN 9, WØREM 7, QVZ 1.

KANSAS—SCM, Raymond E. Baker, WØFNS—SEC: KØIZM, Asst. SEC: LOW. RM: QGG. PAM: ONF. V.H.F. PAM: HAJ. Section nets: KPN, 3920 kc. Mon., Wed., Fri. 1245Z. Sun. 1400Z, NCSs KØQKS, EFL, WØFHU. IFR: QKS, 3610 kc. daily 0030Z, NCSs SAF, TOL, BYV, BXF; Area Net Hambutchers, 7280 kc. Mon. through Fri. KØWNZ mgr., KØHGI asst. All stations are invited to sign in on each net whenever possible. The Air Capital Club of Wichita elected ZXX, pres.; KNØ-DPT, YL director, KØDHT, experimental; PHZ, mobile; CJW, phone, GIC, v.h.f., SMQ, Emergency Coordinator; DSM, c.w. and Novice. New appointments: KØYRQ, VBQ, BYV and KØIRL as ORSs; IFR, KØIZM and ORB as OBSs; KØYWG, YBV, BLS, KØTRM and IRL as OPSs. BMW received the No. 1 Sunflower Centennial certificate. The Air Capital Club is starting code classes. BYV is to be congratulated on the manner in which he is working on QKS. We need more like him on both QKS and KPN. VZM has resigned as Section Emergency Coordinator to enter Wichita University. Thanks very much for a very splendid job. KØIZM will take over as SEC. Let's give him all the help possible. JJ, of the *Ham Monitor*, has some very good tips on RTTY. RJF now is equipped with a new ham shack and all the trimmings. Traffic: (Feb.) WØOHJ 1142, KØHGI 330, YRQ 188,

(*Continued on page 116*)

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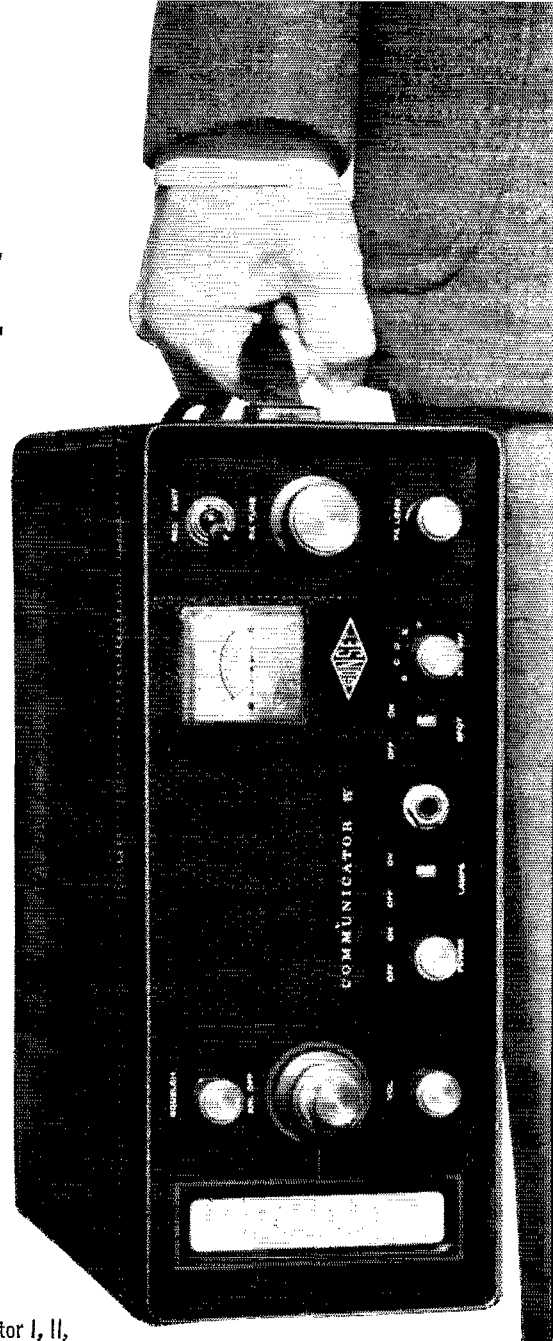

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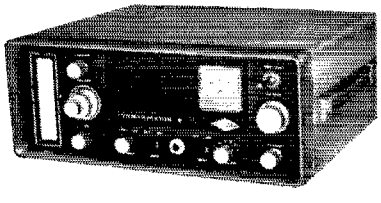

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WØABJ 142, TOL 120, QGG 105, FNS 91, BYV 80, KØHVG 27, QKS 17, BXF 15, WØIFR 15, KØPSD 15, WØTSR 8, EFL 7, WØFDJ 6, FHU 4, KØQOB 4, UNE 4, YBV 4, VLD 3, GEL 2, GIG 2, UER 1, VIY 1. (Jan.) KØBXF 104, WØRJF 64, ORB 32, KØPSD 4, WUD 1.

MISSOURI—SCM, C. O. Gosch, WØBUL—EC, KØLTP. PAMs: BVL and OVV. RMs: OUD and KØONK. Net reports (Feb.): HBN (7280 kc. 1805 GMT, M-F), sessions 20, QNI 541; QTC 299; NCSs KØWNZ 7, YWT 6, K5JXD, KØMMR, QJU 2, KØHGI 1. MON (3580 kc. 0100 GMT, M-S), sessions 24; QNI 218; QTC 225; NCSs OUD 13, KIK 4, KØQCQ 3, WYJ 2, ARO, KØYRQ 1. MSN (3715 kc. 2230 GMT M-F), sessions 18; QNI 134; QTC 138, NCSs, KOONK 4, VPH 7, RPH 1, YCU 1, BXF 1, YRQ 1, VAY 3, SMN (3580 kc. 2200 GMT Su.), sessions 4; QNI 18; QTC 20; NCSs, OUD, WAP 2. MEN (3885 kc. 2400 GMT MWF), sessions 12; QNI 437; QTC 136; NCSs KØONK, OHC, KØMMR 3, OVV 2. EEE/-KØMMR 1. Appointments: KØVPH as ORS, WYJ as ORS. KØIHY as EC (Jasper County). Endorsements: KY as OBS, KØJPL as OO (Class III and IV), KØHIM as ORS, KØQCQ as ORS. Cancellations: KØSGJ as OPS, KØLWX as ORS. We regret to report that ZBR lost his home and ham gear in a fire. KØQHF, who has been acting as chief operator at KØWBD (Ft. Leonard Wood), has been transferred to KZ-Land. KØJPL reports late evening and early morning QSOs in the St. Louis Area with several local fellows. A 100-watt 144-Mc. rig has been donated to KØAXU, club station. RCL, an ORS, has his s.s.b. rig ready for operation. KØERL is a new operator at St. James. KØJPJ continues as OO Class I with 1.08 per cent measurement error. The SCM wishes to express his gratitude for the excellent cooperation of all the members of the section. He extends thanks to section members for his reelection to another term. Traffic: (Feb.) KØONK 356, WØOUD 192, ANT 121, KØVPH 96, LTP 90, WØKIK 84, WAP 81, MKJ 77, KØMMR 62, WØBVL 55, KØRPH 51, WØRTW 48, BUL 44, OVV 36, KØPCK 35, WØAYB 32, KØWBD 31, WNZ 28, WØARO 24, LII 22, KØBLJ 13, VNB 12, QHF 7, WØEPI 6, GBJ 5, KØIHY 4, WØZLN 4. (Jan.) KØQCQ 28, WØAYB 20, KØIHY 8. (Dec.) WØVFP 3.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—SEC: KØTSU. The West Nebraska Emergency Net, KØRRL NC, had QNI 594, OTC 372, 100 per cent reporting KØUYP and PZH. The Western Nebraska Net, NIK NC, had QNI 511, QTC 474, 100 per cent reporting KØAIE, W7TVX, DVB, NIK, PZH and RIH. The Nebraska Emergency Phone Net, EGQ as NC, had QNI 874, QTC 67, 28 sessions EGQ, 27 sessions NNL and KØYNR. The Nebraska Morning Phone Net, KØDGW as NC, had QNI 585, QTC 80. The Dawes County Radio Club has changed its name to the Pine Ridge Amateur Radio Club, because of increased membership out of Dawes County. GGP is president. The Chadron Annual Picnic will be held this year at the Chadron State Park on June 4. Lincoln MARS Club officers for 1961 are KØHPT, pres.; KØMES, vice-pres.; KØRAU, secy. KVM, the State Radio Officer, attended the North Platte Amatur Radio Club meeting recently and talked on Nebraska c.d. operation. KØRAU passed the Amateur Extra Class exam in Omaha. January report for the Nebraska PO Net was 26 sessions, QNI 398, QTC 22 as reported by KØKRJ. Traffic: (Feb.) WØNIK 473, KØRRL 175, KJP 96, KTZ 73, WØDDT 57, PZH 55, OCU 54, KØBRS 53, WØRIH 53, MSS 34, OKO 32, ZJF 32, KØ-CYN 31, DGW 31, WØAHB 27, EGQ 22, WUV 19, KØUWK 18, WØVZJ 17, QFK 15, KØSLB 15, YDS 14, WØBOQ 13, GGP 12, LFJ 12, PDJ 12, UOV 12, KØGTG 11, WØRHH 11, HOP 10, KØMZV 10, WØYFR 6, KØ-KKJ 5, WØWKP 4, KLB 2, ROA 2, KØSCN 2, ELU 1, WØKFY 1. (Jan.) KØRAU 53, VAZ 6.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Henry B. Sprague, jr., WICHR—SEC: EOR. RM: KYQ, H.F. PAM: YBH, V.H.F. PAM: FHP. Traffic nets: CPN, Mon.-Sat. 2300Z, Sun. 1500Z on 3880 kc.; CN daily 2345Z and 0300Z on 3640 kc.; CVN, Tue., Thurs. and Sat. 0130Z on 145.98 Mc.; CTN, Sun. 1400Z on 3640 kc. K1BEN says the local AREC group meets weekly on 10 meters and is trying to get regular 6- and 2-meter skeds. KYQ and K5OEA/1 made the BPL. K1IVR, AW and YBH did also with originations plus deliveries. K1MNX says 2 meters opened to N. Y., N.J. and Pa. during February. The CVN held 16 sessions with 65 stations reporting and handled 33 messages. High QNI were JZA 12, FHP 12, KN1PKQ 7 and HJG 7. The CPN had 28 sessions and handled 266 messages for an average of 10 per session. Daily attendance averaged 21. Honor Roll for 80 per cent attendance or higher: K1AQE 28, FHP 28, K1BSB 27, K1DGK 27, DAV 26, YBH 25, K1GOX 24. The CN handled 628 messages on both sessions (28 each) with 425 on the first for an average of 16.1 and 176 on the second for an average of 6.2.

(*Continued on page 118*)

Attendance averaged 11.1 on the first and 4.9 on the second. High QNI were K1MZM, OBR and K5OEA/1. K1s NNB and DRC have General Class licenses now. ECH writes that he and MFX merged their gear with the former's souped-up DX-100 and the latter's SX-28A. They are roommates at U.Conn. LIG likes frequency-measurement work. It is sad to learn that Father Knight, K1JAD, is a Silent Key. In his memory, the newly-formed Spiritan ARC, at St. Mary's Seminary, has applied for his call so it will be heard again on CN soon. The club officers are K1JXG, pres.; K1LAH, vice-pres.; K1LQD, secy.; and K1ORU, trustee. ADW advises that the CARA is using 3750 kc. for a club frequency. K5OEA/1 has been named traffic manager of Groton C.D. and NTH as chief of radio repairs. QV has a new TA-33 and c.d. ham rotor. K1KSH worked his 8th country on 160 meters. FHP reports that the CQRC has sessions on 146.7 Mc. Tue. at 2400Z. K1JXB got the 3rd club certificate for working 10 or more members. JJL designed and built the 220-Mc. transceiver 11 members are building as a club project. Reports: OO from K1s KSH, IVR, GUD, ILJ, IFJ; OES from FVV and K1MNX. Appointments renewed: K1BEN as EC; K1s IVR and EQV as OOs; K5OEA/1 as ORS and OPS; K5SPD/1 as OPS. New appointments: LIG as OO; NTH as ORS; K1s MPA and MNX as OESs. Traffic: (Feb.) K5OEA/1 550, W1KYQ 539, OBR 289, RZG/1 286, YBH 266, AW 242, K1IVR 172, GGG 83, W1FHP 76, EFW 68, K1LQD 68, MZM 60, W1QV 54, RFJ 52, CHR 51, K1MBA 48, W1NTH 47, CTI 40, K1KSH 40, AQE 37, BSB 36, DGK 33, W1BDI 28, JZA 16, CUH 9, VIY 9, BNB 7, HJG 7, ADW 2. (Jan.) K1MBA 18.

MAINE—Acting SCM, Herbert S. Merrill, K1JDA—New appointments: K1MDM as OPS; NXX and K1MBM as ORSs. GRG is doing a swell job as SEC. His new ECs are: Androscoggin, K1IMI; Aroostook, K1CLF; Cumberland, AHM; Franklin, KVA; Hancock, K1DYG; Kennebec, K1BZD; Knox, K1OAZ; Oxford, WXI; Penobscot, QJA; Piscataquis, OTR; Sagadohoc, BYR; Somerset, K1QVH; Waldo, FKH; Washington, K1GWX K1BOM has moved to Strong from Massachusetts. K1AVC/MM was active in February off the coast of Spain. TCF has a new Seneca and is looking for Aroostook activity on 6 meters. HXQ says there are nightly chess games in Presque Isle on 10 meters. Sunday on 75 meters has 6 Maine nets—0900 on 3940 kc., State AREC; 0930 on 3940 kc., Waldo County AREC; and on 3960 kc., International Phone; 1000 on 3940 kc., Andy Valley; 1230 on 3960 kc., Cumberland County; 1700 on 3940 kc., Horsetraders. To receive a WAM certificate, work each county (any band, any mode) and send QSLs to the PAWA, C.D. Room, City Hall, Portland. Secretary K1GUC requests you enclose sufficient postage for return of the QSLs. YDA is having a ball working DX on 10 and 15 meters with RTTY. Bangor AREC is getting good attendance in its theory and trouble-shooting course. SPARK and the Knox County Club are each conducting code and theory classes. SPARK is offering a certificate to anyone working 15 members, according to President K1KAK. The Fifth Annual Augusta Hamfest will be held on June 18, 1961. Traffic: K1KSG 165, MBM 112, W1GPY 96, K1MPM 86, W1QJA 85, GRG 57, FV 54, K1MDM 19, GSF 12, DUG 11, JFG 10, OAZ 9, EFZ 8, DYG 6, LHE 6, W1OTQ 6, LXA 3, K1OJH 3.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—AOG is our SEC. New appointments: EHT Wayland as EC and RO; EHT and PTR as OOs; PTR as ORS; K1KKS as OES. Our Eastern Mass. C.W. Net meets on 3660 kc. Mon. through Fri. at 1900 (2400 GMT) and anyone is welcome to check in. QGJ and SNK are Silent Keys. Heard on 75 meters: DT, QAF and QEY. Heard on 2 meters: FR, GAC, RJS, YCR, RGM, AHB, DNO, K1s HGT, PYI, GXT, ORE, CPT, MPF, DGG, JPX, MCC, IOE and KN1OHG. POW and POV are brothers. K1HYF has a "Twoer." CRE is on 20-meter c.w. some. DDV has a "Twoer" and a "Sixer." FR is on 75 and 10 meters. K1AVS is going to B.U. K1LLQ has an HT-37 and an SX-101A. LJT says he has retired. FJJ, MX, K1s BUF, IXT, JAW and JIU are handling traffic on 40 meters. K1JAW passed the 3rd-class radiotel. exam. K1JIU has a 2nd-class phone license. K1HOA is on 15 meters. WZA will be active soon. K1MEM, CZX, AOR and IWI are going on 220 Mc. K1MEM made DXCC. K1GKA built a 6-meter converter, is working on a transmitter and has a "Sixer." K1IZS is moving back to Pennsylvania. HIX now is in MARS. PTR had TVI trouble during the C.W. DX Test. K1MEM has 123/95 countries. IAU has 60 watts on 6 meters. He, DDV and K1ORE are mobile on the way to work on Route 128. BGW worked ZS1FD on RTTY and was in the SS Contest. He and GBW have a sked on 2 meters. K1MCL has an Apache and a Mohawk receiver. His XYL is KN1NNV. BHD is on 6 meters. PSG has a new antenna and a pair of 4-125As in the new rig. K1IUS/1 is on from the Boston YMCA with a DX-40, a VF1 and a Super-Pro. RGX underwent heart surgery and is fine. The T-9 Radio Club

(*Continued on page 120*)

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met at GGV's QTH. CTW is going to live up in New Hampshire. The QRA had a talk by Frank Roberts, of National Co., on the NC-270 receiver. AYG, BGW, BB and WAJ took part in the Nov. FMT. The Framingham Club had two films, "SAGE," which W8UDL/1 got and one from the phone company. The Capeway Radio Club operates on 28.8 Mc. Work 8 of its members and you will receive a certificate. K1IPB is group manager, K1DFJ is asst. manager, K1BTA recording secy., K1HGT certificate secy., ZST treas. It was organized by K1EAF, W1TCH and K1DFJ. ZE7JV got the first certificate. K1MHC is on 6 meters with a 522 and a Halo. K1KUY has a new G-63 receiver. NKA built a preamplifier for 6 meters. K1JML, on 6-meter c.w., built a c.w. monitor. K1AII has 800 watts on 50.004 Mc. The Barnstable Radio Club held its monthly meeting and also its Annual Banquet, and has a Collins transmitter donated by b.c. station WOCB. The Dennis-Yarmouth Radio Club is on 2 meters every day at 1330 looking for contacts. ZWQ has a new long-wire antenna out over a salt marsh. ZTI is on 75 meters. The Wellesley Radio Club visited WBZ-TV. K1-MHM has rig trouble and school work. Mr. Hallenstein spoke at the Yankee Radio Club. Our Eastern Mass. 2-Meter Net had 28 sessions, 298 stations, 283 traffic. Appointments endorsed: IBE Rockport, TWG Lexington, RM Newton, PSG Gloucester, HKG Malden as ECs; ZSS as PAM for 2 meters; K1JML as OES. I think many new hams are missing a lot by not joining a radio club and taking part in its activities. We have quite a few active ones in this section. If you want information on any club, drop me a line. DBY has been endorsed as EC for Chelmsford. QPT is in the hospital. The 6-Meter Cross-Band Net had 342 check-ins and 161 traffic. QXX is manager. K1OHQ has a new beam on 6 meters. K1-OCD has a new QTH in Greenwood. K1LLX has a Seneca. K1OCE is in the hospital. K1DOH is new on the air. K1LJK has an SB10 s.s.b. adapter to his Valiant. ACB has 238/229 and a new SX-101A. FQA is in Florida. OHA is in KG4-Land with the Naval Reserve. K1EHX and dad, K1GUI, are both working on 6 meters. Traffic: (Feb.) K1GNR 315, W1EMG 307, K1LLX 287, JAW 204, BUF 196, JIU 186, W1ZSS 149, PEX 140, K1MEM 138, W1OFK 113, K1DIO 70, W1AWA 69, FJJ 55, K1DGI 44, MHM 42, W1ADL/KLQ 40, SIV 38, K1BGK 37, IUS 28, CMS 25, DTJ 23, W1RQL 22, K1OJQ 21, LCQ 20, W1DFS 16, VYS 16, DOM 15, K1GKA 15, GYM 13, AII 11, W1RCQ 11, HIX 9, K1GTX 5, MHC 5, W1ALP 2, K1DSA 2, W1PTR 2. (Jan.) K1MEM 81, W1EPE 29, K1GYM 19, W1HGN 14, IAU 12, K1MHC 4, IWE 3. (Dec.) K1CMS 12.

WESTERN MASSACHUSETTS—Percy C. Noble, W1BVR—SEC: BYH/K1APR. RM: K1IJV. PAM: DXS. One hundred and seventy copies of the Midwinter West. Mass. C.W. Traffic Bulletin were distributed this month with practically all the work on it being done by our RM, K1IJV. The following endorsements were made during February: *SEC*: BYH/K1APR; *ECs*: HRV, RFU, BKG, LLN, OBA; *OESs*: RFU, STR; *OPSs*: JYH, LDE; *ORSs*: AJX, AMI, EOB, JYH, LLN, DVW, WFF. We need more Emergency Coordinators. If you are interested, please drop a line to BYH. QWJ and RFU submitted excellent OES reports which are being forwarded to ARRL Headquarters for possible inclusion in one of the OES Bulletins. WMN cleared 190 messages in 24 sessions with an average of 7.9 messages per session, and WMSN cleared 31 in 12 sessions. K1PES and K1PKZ recently got rid of the "N." KN1PZR has a new Heath "Sixer." At the February meeting of the HCRA, ALL showed slides of his recent trip to Greece. The Pittsfield Radio Club is starting a building project—to be either 6- or 2-meter walkie-talkie units. Rumor has it that TV Channels 10 and 19 are starting an instruction course in radio theory Tue. and Thurs. at 6:30 A.M. KN1QDV has a new HT-17 transmitter. MDS is sporting a new HQ-170. LKQ and NEV have a new HQ-180. The following are on s.s.b. BNO, K1BBV, FVM, K1DPP and GUI. Our sincere sympathy to VBT on the loss of her mother. Our section had 100 per cent attendance during the month on the First Regional Net. Traffic: W1BVR 207, K1IJV 184, LBB 125, W1ZPB 56, LDE 41, GCV 32, DVW 24, K1LRB 23, W1FAB 15, K1IQZ 8, KN1PZR 7.

NEW HAMPSHIRE—SCM, Ellis F. Miller, W1IIQ—SEC: K1GQK. RM: K1CIF. PAM: KVG. GSPN meets Mon. through Fri. at 2400 and Sun. at 1430 on 3842 kc. CNEN meets Mon. through Sat. at 1145 on 3842 kc. NHN (c.w.) meets Mon. through Sat. at 2330 on 3685 kc. Endorsements: K1JDN as OPS and OO. The Manchester Radio Club held its annual dinner Feb. 18 with 120 in attendance. An FB dinner was enjoyed by all, followed by an address by the SCM in behalf of ARRL. The principal speaker was Col. G. B. Daughton, of the New Boston tracking station, who gave a splendid illustrated lecture on the Discoverer Satellite. K1CIF has been busy talking to clubs in the Portsmouth Area. K1BCS gave a demonstration of amateur radio to a large group at the Mt. Cardigan Ski Lodge. Look for details

(*Continued on page 122*)

"I have had many unsolicited compliments..."

...writes J. O. Baumgardner, W8BF, of his Electro-Voice Model 729 Ceramic Cardioid Microphone.

W8BF, consistently among the top-rated hams throughout the world, has a DX Century Club certificate almost covered by endorsement stamps that put his score at a hefty 299. Working successful DX phone requires a top-notch signal, and "Orrie" tells us that a good microphone is vital for good scores. "*Because of my many years of working DX on fone, I know that it is important to have audio quality that will penetrate heavy QRM and, at the same time, be smooth and pleasant to listen to.*" W8BF goes on to say that, "*After running many tests with both local and DX stations, I am sure the Electro-Voice Cardioid Model 729 fills the bill very well. I have had many unsolicited compliments since using the 729.*"

"Orrie" concludes by saying he, "*recommends this mike to those amateurs using VOX operation, due to its low background pickup. All in all, I think it is a very fine mike for amateur use.*" W8BF is just one of many hams all over the world who are switching to Electro-Voice cardioid microphones for higher modulation, less interfering room noise and more positive VOX operation. The result is more and better contacts, even in the face of heavy QRM. The 729, with its high quality is modestly priced to fit every ham's pocketbook. We suggest that you follow W8BF's lead and try an Electro-Voice Model 729 Ceramic Cardioid on your rig today.

TECHNICALLY SPEAKING: Model 729 Ceramic Cardioid uses sound entrances to both sides of diaphragm to provide uniform cardioid pickup pattern at all speech frequencies. Cardioid pattern reduces random noise pickup by 67% over non-directional types, permits greater working distance. Placing monitor speaker at rear of 729 allows higher listening levels without triggering VOX circuits. Smooth response from 60 to 8,000 cps is free from peaks for natural voice reproduction. Peak-free response also means maximum modulation levels. Rugged ceramic element is unaffected by heat, humidity or rough handling . . . ideal for mobile or fixed station operation. Slip-in stand mount, table stand provided. Available with relay-control switch.

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Model 729SR (with relay-control switch) ..... Amateur Net Price: $15.90

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soon on the John W. Singleton Memorial Trophy to be awarded by the GSPN. BPL cards went to K1BCS, K1MOZ, K1CIF and KN1OWU. The Exeter ARS is going strong on 6 meters and has thirty crystals for operation on 50.2 Mc. Anyone can join. Contact K1KOB. Traffic: (Feb.) K1BCS 614, MOZ 547, CIF 514, KN1OWU 244, W1TA 143, CUE 57, IIQ 34, YHI 29, KVG 23, EVN 13, K1GQH 11, JDN 11, W1KPA 8, K1MID 4, IIK 2. (Jan.) K1CIF 221.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: PAZ, RM: SMU, PAM: TXL. Appointment: K1-LPL as OES. RISPN reports 28 sessions, 328 QNI, 56 traffic. The W1DDD Club of Woonsocket reports its kw. is ready to go, thanks to IHW and AUT. A full-size 20-meter beam has been built by members YRC and K1JLD. A new Seneca, built for the club by DYK, is on the air. Congratulations to YRC and his XYL on the arrival of a new baby daughter. We wish K1OHD, who is in the hospital, a speedy recovery. New officers in the Tiverton Club are UHE, pres.; K1HND, vice-pres.; JOD, secy.; JOB, treas.; SFX, JXA and K1BHK, directors. The WIAQ Club of Rumford will hold a Ham and Bean Supper at the Rumford Community Hall May 20. Tickets may be obtained from K1BDN, NSY or W1-LFW. The club will monitor 6 and 10 meters for mobiles going to the supper. The Tolman H. S. Radio Club of Pawtucket has completed an AR-3. The NCRC of Newport announced results of its QSO Party. LUG was the winner, followed by TXL. Elected to membership in the club were K9QBC/1 and WA2FJO/1. Members taking part in the c.d. program were WLG, MMX, ETM, JHF, JFF and K1DPY. Traffic: W1SMU 785, TXL 120, K1GOX 113, DZX 29, GRC 17, AAV 15, BBK 14, LSA 7.

VERMONT—SCM, Miss Harriet Proctor, W1EIB—SEC: K1DQB. PAM: HRG. RM: KRV. KJG has a pair of 16-ft. Yagi beams on 2 meters for the NAPS project. KN1OFX is a new Morrisville amateur. UHI and his XYL have moved to Chester. K1DQB soon will be on the air with a much bigger voice. RNA, of Swanton, in one week on RTTY worked 25 stations in 18 sections two of these being in California on 80 meters. In Springfield there's good activity. K1LJL has 49 states. K1LEC is working on his 80-meter mobile. CBE is s.s.b. with 1 kw. JLZ is on the air with higher power. New licensees in the Barre Area are K1NEI, K1MQX and KN1QPW. K1HKI has moved to his Newport parish and plans to be on the air. K1AEY, of Hardwick, has only two countries to go for DXCC. Traffic: (Feb.) VE2AZI/W1 1725, K1BGC 78, W1KRV 77, K1OAJ 55, W1GQJ 49, K1BQB 38, W1OAK 37, EIB 26, K1IRH 22, W1RNA 20, HRG 17, K1DKN 16, W1KJG 13, K1OXD 4. (Jan.) W1OAK 60.

NORTHWESTERN DIVISION

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—All ECs and ROs are called upon to take an active part in the Annual C.D. Alert planned for the last week in April. We hope every county will check in on 3997 kc. during the drill. Bonner County Club officers are K7JEP, pres.; KN7NHY, vice-pres.; FL, secy.-treas.; IDP and K7MKW, directors. The Eastern Idaho Radio Society has merged with the Pocatello Amateur Radio Club. YON spoke to the club about amateur communications c.d. setup in the State. K7IKR moved to California. CTY moved into Lewiston. K7GNS visited ACD in Arizona. DHL conducts code classes in Shelley. Lois, K7JIK has a new son, thereby making Ella, K7JIL, a grandmother. K7NHA and K7NEY dropped the "N" from their calls. New hams are K7OAL, K7OEE, KN7-OJM and KN7OOY. FARM Net traffic: 72. Traffic: W7VQC 27, GGV 19, EEQ 18.

MONTANA—SCM, Ray Woods, W7SFK—SEC: BOZ. PAM: YHS. RM: K7AEZ. MPN meets M-W-F at 1800 on 3910 kc. TSN meets Mon. through Fri. at 1200 on 7230 kc. MSN meets T-T-S at 1830 on 3530 kc. Your SCM had the pleasure of attending a meeting of the Capitol City Radio Club Feb. 3. KJX is president, CBY is vice-pres., and HIZ is SEC. of this club. Anaconda is real active with its club of 30 members and TQC as pres. Harlo's Annual Picnic will be held May 28. YQZ celebrated his 89th birthday. On Wed. the YLs can be heard in the Intermountain Area on 7230 kc. at 1400. VPY, HTB and EOI still are active in s.s.b. DX work. CRD reports a lot of 160-meter activity. We hear that Kalispell is building up to 6-meter operation. OVJ moved to Seattle. AU/M still works all over the States with that s.s.b. mobile. Some new calls in Great Falls are KNs OHZ, OIA, OIB and OIC. BOZ has a three-element tri-band beam up. The Hi-Line Radio Club's officers are EJC, pres.; KN7OCJ, vice-pres.; K7BQN, secy.-treas.; EWR, act. mgr.; K7GXB, custodian. Treasure State Award: The Old Faithful Club (B.A. Roylance, K7CHA, P. O. Box 621, Harlowtown, Mont.) on receipt of QSLs, alphabetically *by Montana counties*, with 50¢

(*Continued on page 124*)

NOW — A 400-WATT BEAM PENTODE DIRECTLY INTERCHANGEABLE WITH THE 4-400A!

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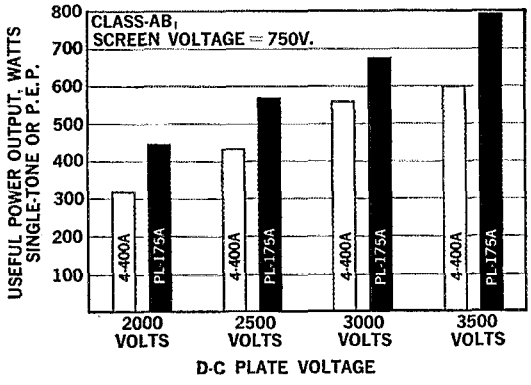

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Output	4.5	9.8 mmfd
Grid-Plate	0.12	0.06 mmfd
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Maximum Plate Voltage	4000	4000 volts
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OREGON—SCM, Herbert R. McNally, W7JDX—We regret to announce the untimely death in Portland on HDN. Ed was one of the founders of OEN, had been an SEC and was very active in many other activities of ARRL. Also we are sorry to say that MW, who has been EC for Benton County, has had to resign because of a change in jobs. Sorry to lose you, Herb. K7CNZ is busy getting his new teletypewriter on the air. K7KBK is back on the air after rig trouble. Looks like the SCM will have to pay a few visits to the Rogue River this spring to protect his fair name as far as fishing is concerned. JBP, formerly of Grants Pass, is now an Army man stationed in Fort Gordon, Ga. DEM still is in Grants Pass! DIC has been busy furnishing communications to Alaska for persons in distress. K7CBA is off on a trip to Europe and expects to visit quite a few countries. K7IMH is going on 6 meters with n.f.m.! BRATS in OSN were AJN, BVH, ZFH and K7IWD. A fine report was received from K7KZP, EC for Union County. *Special*: Your SCM, JDX, is leaving next Jan. 3 on the SS *Mariposa* from San Francisco on a 42-day cruise to Tahiti, New Zealand, Australia, Fiji, Samoa and Hawaii. Anyone having any special word or anything for their ham friends in those places should contact Mack, who will be glad to try to make delivery, if the package isn't too large. Hi. Traffic: W7ZB 352, K7AXF 155, W7BDU 145, ZFH 62, K7CBA 31, W7MTW 24, DEM 17, DIC 17, K7KBK 15, CNZ 13, W7DTT 7.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—SEC: HMQ. RM: AIB. PAMs: LFA and PGY. The Fourteenth Annual Banquet of the Valley Amateur Radio Club was held at Ivan's in Puyallup on Feb. 17 with some 40 persons in attendance. Elections followed the banquet and the following were elected: SLB, pres.; BUG, vice-pres.; WHV, secy.; HZE, treas.; K7DYL, sgt. at arms. OEB and ZAS are new OOs. IST a new OES and K7MFF a new ORS. The following renewed their certificates: VPW as OPS, JHS as OBS. KN7IQA passed the General Class exam. K7EVA sends code practice every Wed. from 1500 to 1600 PST on 7090-7100 kc. and 1900 to 2000 PST on 3690-3700 kc. The Columbia Basin Net meets daily at 1900 PST on 3960 kc. The Tacoma Radio Club will hold its banquet at the Top of the Ocean. The club has located the first four officers who started the club back in 1915 and is working on a scrap book of the club since it was first started. PSD, the new EC for Clallam, is doing a nice job organizing the AREC for his county. KN7JRP obtained his fiftieth state for WAS. KN7OFW and KN7OFX have a new fan type 80 and a new vertical on 40 meters. The Richland Amateur Radio Club is QRL laying plans for Field Day. The BEARS (Boeing Employees Amateur Radio Society) soon will have new QSL cards of two 707s flying near Mt. Rainier. Congratulations are in order for the King County EC and his assistants on their excellent job of organizing the Totem Net and all the AREC Corps for the county, which now has 100 members. The club station of the Prosser High School soon will be on the air with the call K7OXP. LWX is on the air from the Spokane Area. K7APJ received his DXCC. Everybody reports band conditions are extremely bad with lots of QRM and blackouts. K7GPG has a new SX-101. DK has a new RME receiver. The new Stevens County EC is JTR. FQD is

(*Continued on page 126*)

WASHINGTON STATE QSO PARTY

May 20-21

The Tacoma Amateur Radio Society Inc. wishes to announce their first annual Washington State QSO Party, for Washington state hams only. The QSO Party starts 1600 GMT May 20 and ends 0400 GMT May 22. Scoring will consist of one point for each separate contact times the number of Washington State counties. Any mode may be used. Prizes will be awarded for the highest overall score. In addition the highest Technician and Novice entry will receive recognition. No amateur will be eligible for more than one award. All logs should be sent to the club secretary, Richard Ohls, K7ITX, 7803 Dixie Road, Tacoma 66, Washington and must include the call of the station worked, time, date, signal report and name of the county.

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Virginia
Key Electronics, Arlington
Washington
Radio Supply Company, Seattle

in DL-Land with the Armed Forces. OIV, of Puyallup-Sumner, plans another AREC drive. RMI will head the VARC plans for Field Day this year. The Section Emergency Coordinator (HMQ) is looking for an EC for Garfield County to complete the 39 counties in the State. Any hams in that county are requested to speak up. DZX blew his 814 on the AREC Forum during the February get-together. Thirty-five of the 39 ECs reported for February. EQU and KDV have model 19 teletype printers. OD left for a vacation in W6-Land. WHV will have a new mobile soon, according to OM HMQ. The State had 34 AREC drills during the month of February. Traffic: (Feb.) W7BA 806, DZX 616, HUT 584, K7MIFF 116, W7GYF 90, KZ 88, APS 50, JEY 48, AMC 43, ACA 31, GIP 27, IEU 26, USO 25, CGA 20, VPW 20, AIB 15, AXT 6, LFA 6, IST 5, BTB 4, EVW 4, K7APJ 2, GBW 2. (Jan.) W7KZ 106, GIP 54.

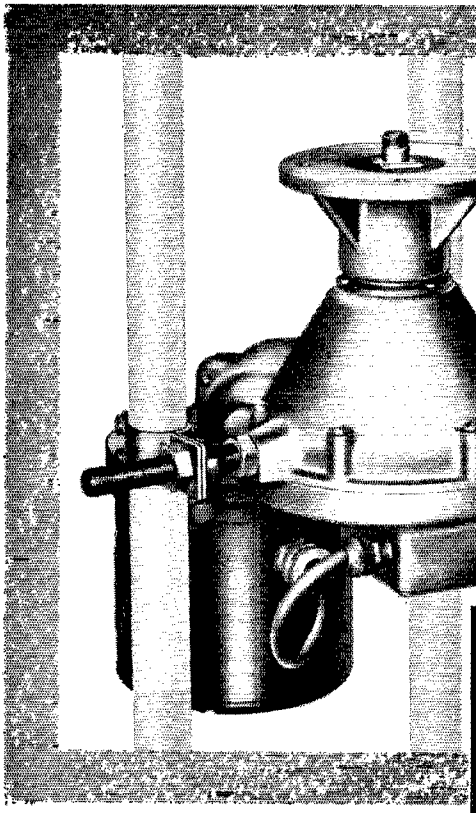
PACIFIC DIVISION

NEVADA—SCM, Charles A. Rhines, W7VIU—ZHW has a new Health "Twoer." PRM and BJY are new converts to 2 meters. JU has a solid 2-meter contact on c.w. with W6WSQ each Sunday A.M. AZF is working for the Nevada Highway Dept. CX is working on his TU unit. MAH is building a gallon linear. HYL has a new crank up-tilt over tower. VIU received his DUF IV and is a member of the CHC. BEM, of Bishop Gorman High School, received a commendatory letter from Holmes and Narver, Construction Co., for its work in handling traffic for their overseas personnel. K7ETN still is active on the Mission Trail Net and with OO work and is a new ORS. CJZ is active on the Calif. Net. MER is a new AREC registrant in Las Vegas, likewise JHB in Sparks. OIR is on the air with the Ranger. 9LXW received Award No. 73 for working 25 Nevadans. WA6ATY received endorsement for 50 Nevadans. M. Meyers and T. Boyer, of I.B.M., gave a fine talk at the NARA Fez. meeting on "Binary Counters and Basic Elements of Computers." Traffic: K7CJZ 20, ETN 12, W7VIU 2.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—Asst. SCM: Ed Turner, W6NVO. SEC: W6ZRJ. PAM: W6ZLO. RM: W6RSY. The San Mateo RC has a new meeting place in the rec room at Central Park in that city. Your division director, W6HC, along with your SCM, Asst. SCM and your SEC, visited this very active club at its meeting for a program devoted to emergency preparedness including a talk on NIKE sites by Capt. T. J. Spaulding. EC W6HZW gave a talk on the amateur and civil defense at the March meeting of the Palo Alto RC. Field Day preparations for this club are under way with K6JJU as chairman. Redwood City Club station W6WWJ, recently appointed OBS with K6-TQN as trustee, provided communications for the peninsula boat races at the port of Redwood City. W6SAI gave a talk on hamming in Monaco with colored slides at the club's February meeting. Old-timers back on the nets include W6YHM, former SCM, W6PLG, former mgr. PAN, and K6GZ, important MARS liaison. W6ZRJ is interested in starting traffic activity on 160 meters. WA6OLQ, whose traffic count is zooming, is active on five nets. W6RFF has a three-element 20-meter beam. W6MMG has a Mosley vertical. W6QDE works from a shielded room and reports a new antenna tuner using vacuum variable and roller coil with vswr 1:1 on all bands. W6AUC has been chasing 75-meter DX with an Apache and an SB-10. WA6HRS has worked Shizuoka and JA Double Call Club awards and is awaiting cards. New appointees: WA6KRG and K6KCB as ORSs. Traffic: (Feb.) K6KCB 440, K6ZCR 353, WA6OAQ 305, K6DYX 199, WA6HZM 149, W6AIT 141, WA6OLQ 108, W6DEF 101, K6GZ 52, W6HC 52, W6YBY 44, W6ZLO 33, W6FON 32, W6YHM 30, K6YKG 27, W6AUC 26, W6ZRJ 20, K6-VQK 15, K6BBF 10, W6OII 10, W6RFF 10, W6PLG 6, K6EQE 5, W6MMG 3, WA6ENC 2, K6SMH 2. (Jan.) W6FON 46.

EAST BAY—SCM, B. W. Southwell, W6OJW—SEC: K6DQM. ECs: K6TYX, K6VXK, K6ESZ, W6FAR, W6WAH AND K6HTJ. WA6ECF lost his beam in a windstorm. WA6NDD got his General Class license. W6NBX is rebuilding. W6ZF is putting up a new 70-ft. skyhook. WA6JCD is working on a 2-meter quad and has a RACES Gooneybird. K6KVZ and W6NQJ set up a trial 144-Mc. repeater on Mt. Vaca and relayed W6WLI and W6BEM from the Sacramento Area to W6QWX and W6RCE in the Bay Area. The EBRC heard a talk on amateur TV by W6VSV at its February meeting. The Livermore ARC joined the CCRC with K6GVV representing them. WA6ECF is a regular check-in on NCN and made BPL. K6TWT is back from college and setting OES fires anew. The North Bay Amateur Radio Association meets the 1st Fri. of each month. K6TWT is on 50-Mc. mobile. K6OIK, WA6CAP, K6TWT, W6WAH, WA6IEC, WA6IEB, WA6KLK and W6IZU attended the V.H.F. Luncheon in Berkeley. K6OIK, WA6CAP and

(*Continued on page 128*)



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MARK III ANTENNA ROTATOR

- **Worm cut into large, one-piece steel jack shaft.** ¾" thick gear welded to main shaft and specially hobbed. **No keys... no screws... no pins** to work loose.
- **High strength rotator** withstands 12,000 inch pounds. Absolutely will not drift or pinwheel in high wind.
- **High torgue, 1/6 H.P. custom-built G.E. motor.** 1-1/6 R.P.M. turning speed.
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- **Compact size** fits three leg towers, as small as 8½ inches.
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- **Electrical equipment** is contained in separate cavity of lower casting, not exposed to lubricants.
- **Easy connection** to seven-wire terminal board.
- **Continuous rotation** in either direction with 50 ohm coax feed system through rotator. SO-239 connectors.
- **Accurate direction indicator.** Compact, easy-to-read. Adjusts easily to true position of antenna.
- **Push control** for clockwise or counter-clockwise rotation.

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WA6KLK issue a new certificate on 50.250 Mc. at 0200 PST Sun. mornings. Two check-ins a month are required for membership in "BRADS," known as Brother Radio Amateurs Don't Sleep. WA6IEB and WA6IEC are new YLs in Vallejo on 50 Mc. The Vallejo mobile and emergency net is on 3985 kc. K6VXM is on s.s.b. with a Pacemaker, 813s combo with 800 watts. W7SQQ/6 is a new ham in Livermore. The LARC held a c.d. drill Feb. 1. WV6ONO and WV6LTC are new members of the HARC. WA6KCZ has a new 50-ft. skyhook. WA6-LTG has a new amplifier. K6UID is Senior Class President at Castro Valley High School. Congrats. WV6ONO made General Class. WA6BDJ has 61 countries worked. K6YBS's XYL is QRL sick list. WV6NRB worked an HR station on 21 Mc. K6QFT and WA6JYB are trying out for the tennis team. W6IPY moved to Sunnyvale. W6YKP has a new 6-meter antenna. K9PSV/6 was a visitor at the HARC. WV6MXK has a Globe Chief 90 and an SX-110 with a dipole on 50-ft. masts. W6NYK has a DX-100, an HQ-129X and a three-element beam. WV6OSY is on 2 meters. K6ZNH is mobile on 2 meters. W6LDD was speaker at the February meeting of the ORC. K6ZBL won a trip to Las Vegas at the ORC's 36th Anniversary Party. WA6FLD is building a *modulator*. WA6FKN is working on a vacuum keyer. WA6MIE is a new OO. Traffic: (Feb.) WA6ECF 442, W6NBX 123, K6ZYZ 36, K6DQM 10, W6ZF 7. (Jan.) K6DQM 8.

SAN FRANCISCO—SCM, Leonard R. Geraldi, K6ANP—The San Francisco RC had its annual auction in March with the usual bargains and goodies. The BAYLARC had a Valentine YL/OM Dinner which was most successful. About 46 attended. The gals now have *a new meeting place in the Old* Lomita Park Firehouse in San Bruno. The mailing address remains in San Francisco. WA6BPS, a senior at Eureka High School, has been named finalist in the 1960-1961 National Merit Scholarship Program. Congratulations, Gary, and every wish for your success. W6OKR is building a 250-watt transmitter. K6OHJ has acquired his DXCC. Nice going. W6MXJ was *elected to the Board* of Directors of the NCCARTS. Lots of activity was heard in the first half of the ARRL DX Contest from W6SR, W6GQK, W6BIP, W6WB, K6ANP, K6OHJ and W6ERS. K6ACN has moved to Petaluma and the lucky guy has one of those dream locations—the quietest spot in California! Congratulations to W6KFS and his XYL on the recent marriage of their daughter Lynn Ellen. We regret the passing of two of our favorite amateurs, W6SZ, Stanley W. Johnson, and ex-W6BAF, St. Clair Adams. We wish a speedy recovery to W6FEA, Gertie, and to K6EEE Vi, on their recent operations. W6OPL donated a 15-watt p.a. amplifier to the Sunshine School in San Francisco, which is a school for handicapped children. Traffic: W6GQY 609, K6JFY 55, W6GGC 51, K6SSA 35.

SACRAMENTO VALLEY—SCM, George R. Hudson, W6BTY—*SEC*: K6IKV. ECs: K6BNB and K6GOT. OBS: W6AF. OES: W6PIV. OPSs: KØEIL, W6PIV and W6GQS. PAM: W6GQS. OOs: W6WLI and K6ER. ORS: K6CEI. The section congratulates the YLs and XYLs of the Camellia Capitol Chirps on their 4th birthday. New officers are K6ENL, pres.; K6DLL, vice-pres.; K6HHD, secy.-treas. Contact K6HHD if you would like to join the gang. A tip of the hat to an old-timer, W6EJC, for his help in obtaining medical aid for one of the nurses stricken on the *S. S. Hope* while it was in the Far East. W6BNX reports that the Northern Calif. Net, on 3635 kc. at 1900 PST Mon. through Sat., is going fine with W6VIJ, K6YLT, W6UUN, K6YZU and WA6CJU reporting regularly. New section appointments are W6UUN, NCN net certificate; W6GQS, Phone Activities Manager and Official Phone Station; K6ER, Official Observer. Fellows, there are a number of fine appointments open. How about inquring about those of your choice? W6QYX, up Hayfork way, reports again with the news of a possible RACES set-up being formed. Contact him for details. W6WLI is doing a bang-up job as OO and says that W6NQJ and K6KVZ set up a temp repeater on 144 mc. on Mt. Vacca. W6BEM and W6WLI worked W6QWX and W6RCE through it! So many of Ma Bell's men have moved to Sacramento that they now have a net going on 144.27 Mc. Mon. at 8 P.M. Traffic: K6EIL 3.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—This is a final reminder that the Fresno Amateur Radio Club is holding its Annual Hamfest at the Town and Country Lodge, May 6, 1961 and the main prize will be an HX-500 s.s.g. exciter. W6EFB is installing a 20- and 10-meter beam on a crank-up tower, and is active in the Mission Trail Net. K6IXA is on 3620-kc. RTTY and is building 2- and 6-meter gear, K6BVY is on RTTY. K6LRH and K6DMH are converting APX6 equipment. W6HAB is on RTTY and is building a 4X250 final for 2 meters. The Turlock Radio Club held a Valentine's Day Dinner for the XYLs.

(*Continued on page 130*)

LONELY

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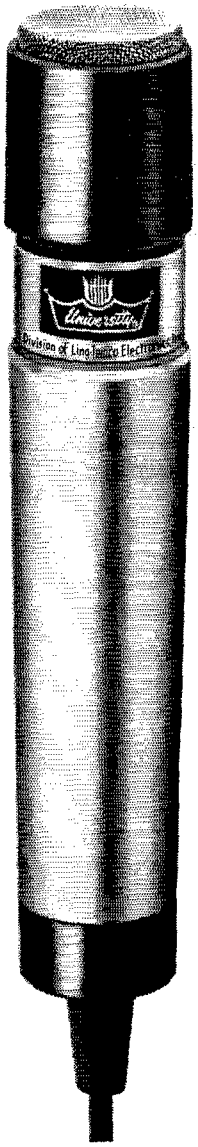

K6OZL is running 400 watts on phone. The new officers of the Kern County Radio Club are K6MWW, pres.; WA6KKV, vice-pres.; W6UZG, secy.; W6LRQ, treas. W6VMB is the TVI chairman in Kern County. K6BKZ is the TVI chairman in Fresno. K6CKL is running 500 watts on 2 meters. WA6KKV is active on 2 meters. K6ACR, K6ZGD, W6BUT and K6APE are going on 1296 Mc. The SJVN had 24 sessions, 397 check-ins, 111 traffic count. K6EJT has a Globe 300 transmitter. W6VVU has a DX-100. WA6OZX has a new DX-40. WA6GWL is a steady check-in on SJVN. W6QQE broke down. W6LOS is recuperating from a slight heart attack and is back on the air. W6WGZ checks in regularly on SJVN. WA6CHI is on the Golden Bear Net. K6QOK is building a new transmitter using 3-807 in the final. W6BYY is running 400 watts on all bands. W6GUZ is building an s.s.b. exciter. WA6ENH is running 4-6AG7 on s.s.b. All appointees, please keep the reports coming in. Traffic: K6OZL 67, K6EJT 36, W6EFB 18, K6ROU 18.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—PAM: DRC, V.H.F, PAM: ACY. January and February seem to have been an extra heavy traffic month with a reported total of 4211 messages handled. Of this number only a total of 80 was reported from the Tar Heel Emergency Net. I am very sure that more than this number was handled via the phone net. LEV, with four operators, was high for the month. K4KYB was high for the NCN with 596. I wish more traffic-handling stations would report. I now have ORS certificates. Anyone interested in an ORS appointment should write me. If you have written previously, please write again. *I have moved my office and rather than hunt the letters* I would give up. K4FXL indicates revival of the Dixieland Amateur Radio Club in Raleigh, N.C. Congratulations, fellows. Incidentally I need an Emergency Coordinator in that area. Too, I need Official Observers for both c.w. and phone. When you write tell me the equipment *you have for measuring frequencies and the equipment* you have to check modulation. Also, give me some time to get the information and appointment to you. Much as I hate to admit it, I work for a living just as many of you, so please be patient. Some reports are required with any appointment. No report after three months means the appointment will be cancelled. Traffic: (Feb.) K4KYB 59, YCL 22. (Jan.) K4KYB 180, CPX 133, W4BAW 80.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—SEC: K4PJE. PAM: K4IIE. RM: PED. New members of the Mike & Key Club of Greenville are K4NGT, TLC, K4JQY and K4CGS. TLC has taken the Conditional Class exam. VIW is very active on DX. During February SCEN on 3930 kc. handled 46 formal, 118 informal messages, 6 announcements with a total of 668 stations. Formal traffic for SCN on 3795 kc. was 162 in February with a total of 2870 for 1960. K4KIT has qualified as ORS. NTO and K4HDX diagrammed an excellent all-band antenna in the recent issue of *SCN News*. New officers of the Spartanburg ARC are K4GVE, pres.; HDX, vice-pres.; NTO, secy.-treas.; K4LEI, act. mgr. K4GVE is RO in RACES for the county. K4VWL has taken the General Class exam K4BRP will be at Fort Jackson for the next six months. UMW, president of the Rock Hill ARC, has many activities planned for the club—a Novice class is being taught, a 10-meter local net is in formation and plans are being made for the October Hamfest. K4JPT states that the Annual Picnic will be held Aug. 27 at Kershaw State Park. LUI is active in promoting a v.h.f. club in Greenville. There is great activity on 6 meters in the area. Traffic: K4AVU 128, ZHV 115, W4KNI 90, AKC 87, K4HDX 56, W4PED 50, VIW 42, K4KIT 33, W4CHD 16, K4WJR 10, W4NTO 2, K4PJW 1, VVE 1.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—PAM: BGP. RMs: K4QER, K4MXF, K4KNP and QDY. JSJ/3 reports that his BC-342 blew up and he is trying to get the XYL to buy him a new receiver. The following ORSs have earned and received their Section Net certificates: K4MXF, ZMH, K4FSS, IA, ZM, LK, JSJ/4, K4LRL and MYA. The following made BPL in February: PFC, K4VDU, JSJ/4 and K4FSS. Our PAM is now sporting a brand-new G-76 mobile. OOL reports that the snow which slid off his roof took down four out of six antennas. RHA says that he thought he had retired but now has three jobs. K4LTK says he checked into the VFN 25 times but his traffic count doesn't show it. He says, "Nobody in VFN Area 3 has anything to say except me." Keep trying, Bill, originations would help. Your SCM attended the Edison Award Dinner and renewed acquaintance with a number of old friends and made some new ones. Our Communications Manager, 1BDI, was there and we resolved a couple of problems in person. JUJ received the new CHC Award and re-

(*Continued on page 132*)

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FEATURES

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- Simplifies adjustment of antenna match
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- Each unit accurately calibrated and perfectly balanced
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MODELS CM-52-2
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Identical electrically to models CM-52 and CM-75 and has all features except in two units for remote control. Supplied with ten feet of cable and plug wired to control and indicator unit. Standard finish Dove Grey.

Amateur and Industrial Net Phase and Control Unit **$34.95**

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SPECIAL CONTROL PANEL
For Collins Speaker Grill or Built-In Installations

Special panel containing meter, control, reversing switch and with ten feet of cable and plug. For use with CM-52-2 or CM-75-2 phase units. Standard finish control panel and phase unit Machine Grey.

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MINIBRIDGE MODEL CL-52-72

A resistive type unit for observing line standing waves when adjusting antenna match. For use with either 52, 72 or 75 ohm coaxial line. Designed for use with small amounts of RF excitation or Grid Dip, Meter. Requires the use of an external indicator such as 0-100 Micro-amp meter.

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ports participation in the QWCA and YL-OM Parties. K4LPR reports the Tidewater Hunt Club held its 100th hidden transmitter hunt. K4SSK has moved to New Orleans. WOX has gone to sea as supply officer on the USS *Newport News*. K4ARO now is checking into VN from V.P.I. in Blacksburg. K4TFL says, "Got a certificate for REF 1961 Contest, as apparently I was the only woman in the *whole world* to turn in a log!" CXQ added DXCC for 150 countries, also WAG and WAA Awards. Traffic: (Feb.) W4PFC 686, K4VDU 674, W4-JSJ/4 355, LK 171, K4MXF 164, FSS 160, K9CVJ/4 148, W4QDY 125, K4PQV 120, W4IA 96, K4AL 58, FMJ 45, W4BGP 40, K4KNP 37, W4MYA 34, OOL 34, K4PQL 31, W4KX 29, K4RSP 28, W4RHA 22, BZE 17, K4JQO 13, W4TE 12, KRX 11, K4LTK 8, W4AAD 6, KFC 5, K4PRQ 5, ELG 4, W4JUJ 4, K4LPR 4, ARO 2, W4OWV 2, K4TFL 1. (Jan.) W4CXQ 240, K4FMS 17, W4ZM 2.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—DYA, a new OBS, is active on 75 through 10 meters with a 4-1000A linear. K8RPB reports a new club, the Ohio Valley V.H.F. Club, with AXR, pres.; K8PDO, vice-pres.; K8RPB, secy. K8JLF's schoolwork keeps his traffic total down. K8LOU has a new DX-60 and received WAS and CP-25. OIV is active in OO work. ESH is NCS for the Huntington Weather Net Mon. at 1900 on 50.5. K8QOH and GQE are active on 75-meter s.s.b. from Fairmont. K8ELH is back on 75 meters from a new hilltop QTH. K8CNB's fine traffic total helps boost the WVN C.W. Net. HZA is back on the air. Welcome back, John. SSA, SEC for West Virginia, would like to hear from those interested in EC work. Contact SSA at Box 62, Bluefield. The radio club at W.V.U. continues to grow and the members hope to have a club call soon. Don't forget the Annual West Virginia QSO Party to be held in May. This contest is always a good time to pick up some new counties for your WACWV. Traffic: K8CNB 201, JLF 66, LOU 37, W8NYH 36, K8MMZ 28, W8WUB 28, K8QXS 17, W8ESH 2.

WEST VIRGINIA QSO PARTY

May 12-14

The Mountaineer Amateur Radio Association will sponsor a W. Va. QSO Party from 6:00 P.M. EST May 6 to 11:59 P.M. EST May 8. The contest is open to all West Virginia amateurs and to all others who have held calls in W. Va. in the past. Only these contacts may be counted. There are no power or band limitations and the same station may be worked on different bands for credit. C.w.-to-phone QSOs are allowed but cross-band contacts are not permitted. Score 2 points for each completed contact, exchanging the following information and submitting it with your logs: date; call; time; city, county. When contacting stations outside of W. Va., obtain the ex-call of the former W. Va. station. Mobiles operating in more than one county may be worked once in each county by a fixed station, and the mobile can count the fixed station once from each county. Each contact with stations in Morgan, Hardy, Doddridge counties will count 6 points for a complete exchange. Multiply the final score by the number of counties worked. Awards for first and second place. To be eligible, logs must be postmarked not later than May 29 and mailed to MARA, Box 909, Fairmont, West Virginia.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald S. Middleton, WØNIT—SEC: SIN. PAMs: CXW and IJR. RMs: MYB and WME. OBSs: KØDCC and KØEPD. Please take notice of the change in SCM and send news and reports to 920 West Adams, Pueblo, Colo. The new Section Emergency Coordinator is SIN. KØWWJ is a new OES and DPD is Class III OO. Reports of club officers are as follows: Western Slope Radio Club—OIA, pres.; FKY, vice-pres.; RTO, secy.; Boulder Amateur Radio Club—QXF, pres.; WKO, vice-pres.; ZCM, secy.-treas. Pueblo Amateur Radio Assn.—TTB, pres.; RSA, vice-pres.; STX, secy.; MVT, treas. Montrose County Amateur Radio Club—VIM, pres.; TRX, vice-pres.; EDH, secy.-treas. *Splatter Chatter* reports that FRQ, KTX, MZV, YAE, KØs AYK, JSQ, JTZ and KZY are active on 2 meters. New Novice calls in Grand Junction are KNOs FNL, FNR, FNY, FNZ, FOB, FPF and FPH. IIT has a new RME-6900 receiver and 300-watt linear. In the Boulder Area 21.3 and 28.8 Mc. are monitored as local listening and working frequencies. Congratulations to IUF and his new XYL; also to SJK and his XYL.

(*Continued on page 134*)

2-ELEMENT THUNDERBIRD

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FROM hy-gain

The hy-gain 2-Element Thunderbird is extremely light weight, easy to handle and simple to install in a matter of minutes, almost anywhere. This TH-2 develops the maximum gain possible in a 2-Element tribander, rotates easily with a TV rotator. Boom length: 6 ft., longest element: 26 ft. Less than 2:1 SWR on all bands. 52 ohm coax fed.

The hy-gain Solid State Slim Trap is the world's smallest (1½" dia.) and lightest, assuring minimum wind loading as well as a trim, handsome silhouette against the sky. The highly efficient coil and capacitor are wound on and imbedded in the new low loss polypropylene plastic. Completely impervious to all weather conditions and withstand maximum legal power.

All aluminum construction of 2" OD booms and 1¼" telescoping to ¾" OD elements. New plastic and steel gusset bracket assemblies. Steel fixtures and hardware "iridite" treated to military specs. 100% rustproof. Weight: 19 lbs.

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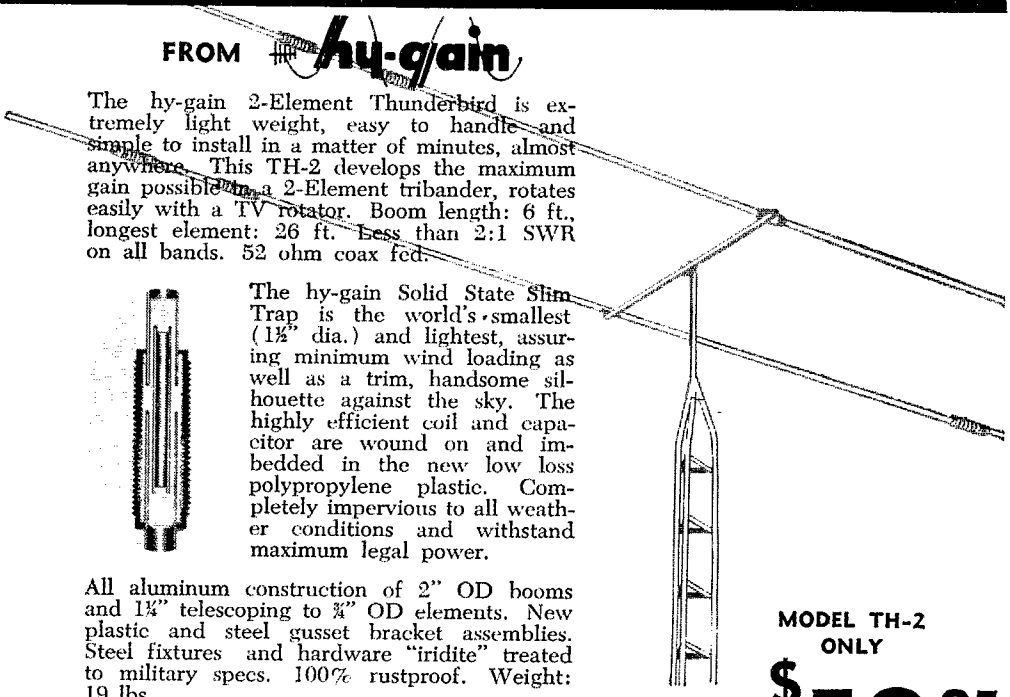
Model TH-4 3-Element Thunderbird tribander Deluxe, weighs 38 lbs. and sells for $117.50.



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ZRI, on their new daughter, and QAN and his XYL on a new son. KØDCW, FEO and BES made the BPL. Traffic: WØBES 449, FEO 260, KØDCW 189, IIT 173, WØEKQ 94, MYB 75, CBI 65, ENA 62, KØQGO 48, EVG 24, ANA 12. (Jan.) KØWWD 507.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM, John H. Sampson, 7OCX. SEC: K7BLR. The Salt Lake County AREC provided communications for the Intermountain Ski Association Junior Giant Slalom at Alta, Utah. Taking part were K7s HFV, BLR, JIZ, W7s DQW, ZKL and QWH. K7s BGU, NWP and DJM have qualified for the net certificate on BUN, OCX, QWH and JQU made BRAT on BUN and QWH qualified for MTHC. Utah needs some OO appointees. Anyone interested, please contact the SCM. GRC is now president of the Utah Amateur Radio Club (Salt Lake). The Ogden and Salt Lake clubs are working hard on the arrangements for the Rocky Mountain Division Convention which takes place June 16-18 at the Ben Lomand Hotel in Ogden. Traffic: K7NWP 436, W7OCX 123, WØFVD 7 50, W7QWH 25.

NEW MEXICO—SCM, Newell F. Greene, K5IQL—Asst. SCM: Carl W. Franz, 5ZHN. SEC: BQC. PAM: ZU. V.H.F. PAM: FPB. RM: ZHN. Beginning May 1, morning nets meet one-half hour earlier. The New Mexico Brass Pounders meets Mon., Wed., Fri. at 1900 MST on 3570 kc.; TWN daily at 2000. BQC, our new SEC, is busy trying to whip AREC into shape on a Statewide basis, while ZHN has reorganized the Albuquerque group. UBW left the peanut-whistle class and now has a 20A and a linear. VC should have his new Zeus cooking on 6 and 2 meters. RTTY is booming with 8 or 10 stations building or debugging converters. K5DAA is pleased with his transistorized converter. Traffic: W5ZHN 510, UBW 85, K5VLG 28, W5GB 9.

WYOMING—SCM, Lial D. Branson, W7AMU—SEC: IAY. The Pony Express Net meets Sun. at 0830 MST on 3920 kc.; the Wyoming Jackalope Net meets Mon. through Fri. at 1200 MST on 7255 kc. for traffic. The YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc. The Casper Radio Club had a very nice meeting with BWJ, the new ARRL Rocky Mountain Division Director. Carl gave a talk explaining the line-up for the coming term. BXS has been appointed Assistant Director. Club President, K7LJB told of club activities. BHH gave a report on RACES activities. LKQ, Natrona County EC, gave a report on the AREC and RACES. DTD has completed a new 4-811As transmitter, grounded grid, and it is working fine. The Wyoming Civil Defense Radio Net averages 17 check-ins once a week. RACES network for the State had a very good alert Mar. 5. BHH is the chief for the State. ABO participated in the 160-Meter Contest. HH is promoting reactivation of the Laramie Radio Club. Traffic: W7HH 268, DXV 80, AXG 53, BHH 44, K7IAY 26, W7GSQ 16, K7KLE 15, W7JHO 12, AMU 10, YWW 8, LKQ 7, K7MAT 7, W7CQL 6, AEC 2, BKI 2, GDX 2.

SOUTHEASTERN DIVISION

ALABAMA—SCM, William D. Dotherow, K4AOZ—SEC: JDA. RM: RLG. PAMs: K4PHH, BTO, and W4JJX. New appointees: YER as ORS, OXU as EC for St. Clair County, CWO as OO Class I. K4TRJ as OBS. New Muscle Shoals ARC officers, K4LGF, pres.; K4ODU, vice-pres.; K4KHC, secy.-treas.; are busy with plans for the North Alabama Hamfest. The club also is conducting code classes with approximately 30 attending. K4TRJ is sporting a Collins 32-V1 and reports two new Novices in Jasper, KN4YSD and KN4NWV. Walker County hams interested in forming a radio club should contact K4TRJ or K4BAE. K4IQU, recuperating from an operation, is catching up on his hamming and OES experiments. FQQ has been appointed RACES Officer for Morgan County. Congrats to a new club, the Springville ARC, with 9 licensed hams and others awaiting licenses. The four latest to receive calls are KN4NSD, KN4NUW, WN4ABX and WN4ADQ. The Springville Novice Net meets daily except Sun. at 1600 CST on 3725 kc. SQV's New Year's resolution was to send his Form 1 report in on time! K4GXS casts a vote of thanks for a job well done by AEN members in Selma and Montgomery during the flood emergency. K4KDE is minus his 15-meter beam. Alabama is lucky to have K4IWI as OO; he sends out approximately 120 cooperative notices each month. K4EFN has WAS on 40-meter c.w. using a DX-40. As usual, the Alabama section called on WAZ for the nice AENB-NCS and AENP Liaison Captain certificates now being issued. K4MMO now is working in Alaska with the Telephone Company. K4SDG is on RTTY. Congrats to K4YUD, the new manager of AENS, a Madison County AREC Net which meets each Sun. on 3825 kc. at 1330 CST. All AREC

(Continued on page 136)

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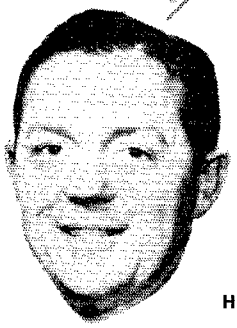

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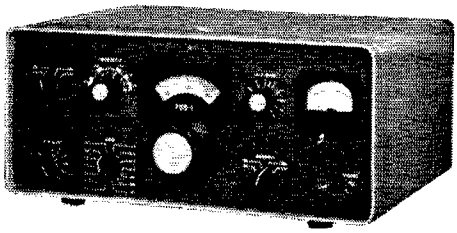

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members are reminded to watch the expiration date on their cards and send them to the EC for endorsement when required. *Six-Meter News:* JJX reports K4YWE, K4QMM and ELV are on 6 meters. K4FJZ has a new 14.2 d.b. gain Telrex beam on 6 meters and reports 8 stations in Auburn on 6 meters with a new informal net, the Auburn 6-Meter Emergency Net, on 50.550 Mc. Wed. at 2000 CST. K4TIY, AENX mgr., is starting a new program to increase membership. K4TIY reports that JJX still is on the critical list. His address is Room 1448, Jefferson Hospital, Birmingham. EFF has a program, building mobile units for AENX net members. K4TIY pledges AENX full cooperation with new EC K4TJG. AUP has a new Gonset Communicator and beam for 6 meters. Traffic: (Feb.) K4PFM 222, W4RLG 106, K4AOZ 66, PIH 58, W4PVG 50, K4YUD 36, YTQ 50, HJM 45, W4MI 36, OKQ 31, K4GXS 30, ZNI 30, BTO 27, TDJ 22, KDF 20, SAV 19, TJG 19, W4WHW 18, K4BFT 12, W4OXU 11, K4ZBX 5, W4TOI 4, YRO 4, K4KDE 3, RIL 2, W4ZSH 2. (Jan.) W4OKQ 37, CWO 13, K4BFT 11, W4OXU 7, K4ZBX 6, W4DS 4, K4SSB 2.

EASTERN FLORIDA—SCM, Albert L. Hamel, K4SJH—SEC: IYT. RM: K4KDN. PAMs: SDR and K4LCF, V.H.F. PAM: RMU. Our section nets: FPTN, 3945 kc. Mon. through Sat. 0700; FMTN, 7230 kc. Mon. through Sat. 12 noon; TPTN, 3945 kc. daily at 1730; GN, 7115 kc. daily at 0830; QFN, 3650 kc. daily at 1830; FEPN, 3910 kc. Tue. at 1830. Other nets are the Fast Net daily on 5910 kc. at 1930 and Florida Sidebanders 1700 Sun. on 3940 kc. The Ft. Lauderdale Hobby Show traffic-handling proceeded without a hitch. Close to 600 pieces of traffic were originated. Most all traffic was passed on 6 meters for further relay during off hours of the show. We wish to thank all who participated. YOX, the BARC's vice-president, resigned because of school commitments and Sam Brewer is now doing a fine job at that post. Also K4LJS found it necessary to resign as treasurer. He was replaced by K4VGD. The Hillsborough Club of Tampa boosted amateur prestige by supplying communications to Tampa Police in traffic work during Gasparilla Day Feb. 13 and on the Mothers March of Dimes Jan. 31. K4ILB resigned as manager of FMTN and has been replaced by K4ENW. K4BZ racked up a traffic total of 451, *all on 6 meters.* K4SWS died Feb. 2. As your new SCM I thank you for your confidence. I hope that you will stand behind me during the coming months to make Florida the best—*but the best*—in all the 50 states. Let me know what you are doing in your Activity Reports. Traffic: (Feb.) K4SJH 2295, W4FPC 2061, WA6FCO/4 1684, K2YXE/4 1286, K4EHY 860, KDN 810, W4SDR 467, K4BZ 451, BY 410, W8LDU/4 312, W4AKB 298, K4OJI 287, FMA 285, RNG 257, W4EHW 251, K4JZU 232, LCF 230, RCV 209, COO 131, ENW 120, DBT 108, W4CNZ 97, K4VSA 96, W4FE 91, K4AX 81, BNE 80, LVE 80, RNS 76, DAX 59, W4TRS 56, K4AKQ 52, W4SMK 46, K4LLB 42, BZS 40, OZS 37, W4NLX 36, LMT 34, BKC 33, EAT 32, AYD 29, K4ZIF 29, RDX 28, BHL 22, MTP 22, W4GOG 21, SGY 20, KN4YSN 18, K4ANR 14, BLM 13, W4LSA 11, K4DAD/4 8, W4DQS 8, K4MHX 4. (Jan.) K4EHY 138, FMA 73, YOQ 41.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4BKH—SEC: MLE. PAM: WEB. RM: K4UBR. Blountstown: K4FTJ is the new EC for Calhoun and Liberty Counties. Perry: KQP is going s.s.b. K4NJH is looking for higher power. Madison: RDQ is converting an ART-13. Tallahassee: MLE and IYT have completed the State of Florida AREC Communications Plan. Every Florida ham should have a copy. Contact your SEC or SCM if you don't have yours. Panama City: K4CEF recently got his A-1 Operator certificate; he is now QRL studies at Ga. Tech. Members of the PCARC and Tyndall AFB MARS aided in the search for two lost boys. Those active were FIU, HQG, IYB, JDT, K4AHV, K4FQQ, K4GVV, K4PTP, K4RGE and WA2LQA/4 Fort Walton: K4UBR is trying RTTY. QFN, Fla. C.W. Net, now holds a late session at 2100 CST, in addition to the 1730 session. More members are needed. NVW is transferring to Greenland. Pensacola: K4IVD/aeromobile works into Ft. Walton on 2 meters K4FTI, UUF and 2 C.D. Communications are now equipped to operate on 145.2 Mc. New officers of the NAS Club are SRM pres.; K4IYL, vice-pres.; and K4FOG, secy. PBC handled considerable traffic at the Hobby Fair and relayed it through K4BDF and K4QOJ. Traffic: (Feb.) K4CNY 648, UBR 512, BDF 138, VND 49, SMB 44, W4WEB 32, PBC 10, K4QAC 7, W4PBO 2. (Jan.) K4CNY 433, UBR 110, SMB 37, BDF 4. (Dec.) K4UBR 551.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: PMJ. PAMs: LXE and ACH. RM: DDY. GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs., 0800 EST Sun. GSN meets Mon. through Sun. on 3595 kc. at 1900 and 2200 with DDY as NC. The 75-Meter Mobile Net meets each Sun. on 3995 kc. at 1330 EST

(*Continued on page 138*)

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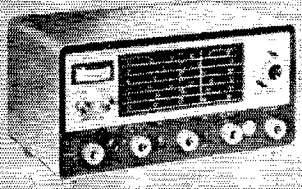

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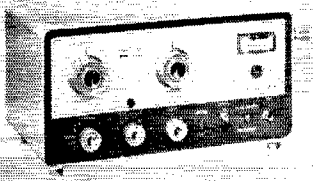

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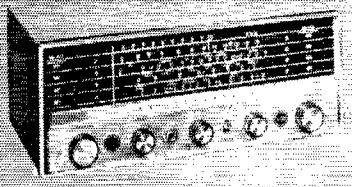

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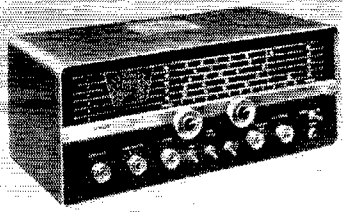

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with K4YID as NC. The GPYL Net meets each Thurs. on 7260 kc. at 0900 EST with K4ZZS as NC. The Atlanta Ten-Meter Phone Net meets each Sun. on 29.6 Mc. at 2200 EST with BGE as net mgr. The Ga. S.S.B. Net meets Mon. through Fri. on 3970 kc. at 2000 EST with K4RHB as net mgr. The Atlanta Radio Club meets at 2100 EST on 21.36 Mc. each Sun. night with DOC as NC. The Atlanta Radio Club will hold its Annual Hamfest June 2 and 3. The Savannah Amateur Radio Club is getting started again and those of you around Savannah are cordially invited to attend club meetings. New officers of the club are K4MHP, pres.; K4TTJ, vice-pres.; K4JAC, secy.-treas.; and G. Ross Parsons, act. mgr. Hats off to K4KAR for stressing more 6- and 2-meter activity in the *Augusta Splatter*. K4MDR gave a nice talk on "Railroad Radio" to the Atlanta Radio Club at its March meeting. K4TEF likes the color green: he is treasurer of the Atlanta Radio Club. If other clubs would send in news of their happenings they would get their listings in this column. LNG is working on an automatic noise generator for v.h.f. converter alignment. K4ZYI is having a good time working 3.5-Mc. DX. Don't forget to renew your ARRL appointments. Traffic: W4DDY 185, K4ZYI 164, BVD 159, OGG 156, FJO 52, BAI 28.

CANAL ZONE—SCM, Thomas B. DeMeis, KZ5TD—The Air Force MARS group had a nice picnic on Mar. 5. SB reported a good time was had by all. George and Grace Dunlop, formerly GD and DG, spent a three-week vacation down this way. VR reported several fine get-togethers. JW may be going s.s.b. VR will take over the code teaching classes at Fort Clayton. LF is back from Stateside for a short while before entering the Armed Forces. FM was the first FAA amateur to be moved to the new FAA Housing Site at Cardenas. MM has completed his quad and also is loading the tower for 40 meters. Dave is now using a DX-35 and a Super-Pro. LV was rotated out of the Canal Zone. Evelyn, EJ, was hospitalized but is now home doing nicely, reports her OM, HK. AX, the Air Force MARS station, recently was reactivated and is on s.s.b. FK also is reactivated from Fort Kobbe and operator Cliff really is putting that call back on the air. RB is back after some schooling in the States. KR and SW report very good s.s.b. QSOs to Stateside on both 40 and 80 meters. Traffic: KZ5SB 96, JW 55, TD 30, HO 24.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, Jr., W6JQB—SEC: W6LIP. RMs: W6BHG and K6LVR. PAMs: W6BUK, W6ORS and K6PZM. The following stations earned BPL in February: K6MCA, W6GYH, K6LVR, K6EPT, W6WPF and K6SHZ. Congrats, gang! K6EPT received a BPL Medallion. Congrats, Smitty! W6VOZ is overhauling the receiver and rig. WV6OWM is doing very fine on 80-meter c.w. W6SRE, back from Chicago, did not like the snow! WA6CKR is doing NCS duty on MTN. WA6KQN replaced the "J" antenna that the wind took down. K6GLS purchased a new HR-60. WA6GSP is busy in Lakewood RACES. W6NKR has been hitting the contests. WA6KVS has 6-meter RTTY going. K6GJM is working on the 6-meter rig. WA6GHW reports spotty openings to San Diego on 1215 Mc. W6ORG and K6OZJ are converting APX-6 rigs for 1215 Mc. W6LIP reports AREC membership is increasing in the section. K6TVC reports high noise level on 6 meters. W6ORS expects to have a Scout code class going soon. WA6DJB has a new HQ-170, an Apache and an AF-68! K6YVN gives the new frequency of MCAN-7 as 7275 kc. WA6FBA reports there is increasing interest on 6 meters in San Gabriel. W6FB was active in the DX Contest and has a new HA-10 linear. WA6LPS is using a 522 into a five-element beam on 2 meters. The Downey Amateur Radio Club had a nice Mobilcade to Lake Hodges. K6JSN is giving code practice to 12 men from the San Bernardino County Sheriff's Office Command Post! Support your section nets: On c.w., the Southern California Net meeting nightly on 3600 kc. at 0300 GMT; on phone, the SoCal 6 Net meeting nightly on 50.4 Mc. at 0300 GMT. Traffic: (Feb.) K6MCA 976, W6GYH 885, K6LVR 589, K6EPT 575, K6CLS/6 399, W6WPF 366, WA6DJB 330, W6SYQ 329, K6OZJ 310, K6QPH 246, K6SHZ 240, W6BHG 214, K6JSD 113, K6SIX 103, K6BAY 89, WA6DWP 87, WA6KVS 72, K6YVN 69, WA6CKR 44, W6LIP 40, WA6KQN 31, K6EA 23, WA6JOC 19, W6BUK 10, W6CK 9, WA6MFH 8, K6HOV 6, WA6LPS 6, W6NAA 6, W6USY 5, W6NKR 2, W6SRE 2, W6VOZ 2. (Jan.) WA6GKK 596, K6YVN 62, K6PZM 58, W6CIS 8.

ARIZONA—SCM, Kenneth P. Cole, W7QZH—PAM: OIF, RM: LND. The Copper State Net meets at 1930 MST Mon. through Fri.; the Grand Canyon Net Sun. at 0800 on 7210 kc.; the Tucson AREC Net Wed. at 1900 on 3880 kc. *Zero Beat*, the newsletter of the Catalina Radio Club, has a new editor, Betty Hill. Bett, inci-

(*Continued on page 140*)

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dentally, just passed her General Class exam and is anxiously awaiting the issuance of a call from FCC. BFC, Bill and BFE, Joan, are the proud parents of another potential amateur, whom they have named Jean Marie. Congratulations! The Southwestern Division ARRL Convention Committee was honored at a recent meeting with the presence of Col. Hugh Avary, W6CD. The U.S. Signal Corp., acting through Col. Avary, will have two (2) large surprise displays at the convention. Shuttle and taxi service at the convention will be provided by the Mobilaires. This 6-meter mobile group, one of the most active in the State, is becoming well known in Central Arizona for its activities with the city, county and state law enforcement agencies. For the benefit of any amateur wishing to contact Arizona with traffic, Ft. Huachuca is maintaining a watch on 3865 kc. and 28.6 Mc. from 7:45 A.M. until 1:00 A.M. MST the following morning. AKX, the wife of PG, is in the hospital in Willcox, Ariz. Traffic: W7LND 83, WØWHE 7 23.

SAN DIEGO—SCM, Don Stansifer, W6LRU—W6IAB, the Marine Corps station at Camp Pendleton, has added two complete S/Line positions, and now has five complete operating positions. ORS WA6CDD reports that a number of ZLs on 3796-kc. s.s.b. are looking for W/K QSOs. A new Novice in Escondido is WV6PNP. K6LKD built and is now operating with an electronic keyer on his traffic nets. YLs who plan to attend the Third Annual California YL Get-to-gether in May in San Diego should contact W6VSL for reservations. K6RCK, in Orange County, reports that a recent RACES drill in Fullerton with c.d. and RADEF personnel was a success. The Annual Spring Banquet of the Newport Amateur Radio Society will be held in Santa Ana Apr. 15. OES K6BTO reports his APX-6 is operating on 1240 Mc. and he is looking for Los Angeles contacts. Chief Operator K7ENC at the Marine Corps Recruit Depot, W6YDK, in San Diego, has been transferred to Washington, D.C., for duty. k6BHM is now an OO and becomes the seventh member of the San Diego DX Club to so qualify. W6HL has a new ten-element 144-Mc. beam. K6HQJ, 10-meter EC and active in AREC and c.d., retired Apr. 1 from the City Engineering Department and was given an appreciation dinner by fellow hams. WA6DKW, an ex-San Diegoan, is now in Pasadena and is in charge of RADEF for Southern California. K6RDB is now the chief operator for the 3991 kc. RACES monitoring net. W6AM, well-known DXer, showed slides of his recent trip to Europe to the Orange County Amateur Radio Club at its February meeting, and told them about European amateurs he met. Traffic: W6JAB 2457, W6YDK 1413, K6BPI 836, W6EOT 320, K6LKD 211, WA6CDD 194, WA6ATB 124, K6RKC 27.

SANTA BARBARA—SCM, Robert A. Hemke, K6CVR—New appointments: W6JLY as SEC; W6OUL as OES. WA6AGO is ready to hoist a 40-meter beam but still needs an anti-sag gimmick. W6OUL reports that 2-meter activity is picking up in the Lompoc Area. The calls of those stations are WA6DAX, W6JFP, and K2JZP/6. WA6DAX is working Palos Verde from Lompoc on 2 meters, about 160 miles over mountains with 30 watts input. The Santa Barbara ARC has the biggest code class in the history of the club with a total of 35. Those instructing are W6RNZ, K6JCR and K6CVR. Their goal is 35 licensed hams. The Ventura Co. ARC has a new meeting place. A new recreation center was completed and the club wasted no time in getting a room. W6YCF, who is an OO, looked for poor operating practices during the DX Contest. Traffic: W6YCF 16, W6JLY 8, W6FYW 6, W6OUL 6.

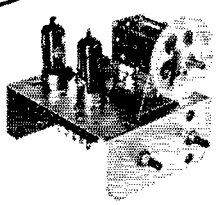
WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—If you are unable to sleep agout 5 A.M. you might try 3893 kc. The Grandaddy Club meets on that frequency and time. K5MMV usually acts as NCS. This club has members in at least 15 states and Mexico. XE2DS is usually on 7 days a week. If you are looking for Fun, Foolishness and Fellowship you will find it on this frequency. The Arlington State College ARC has been reactivated with K5RKO, pres.; K5AKB, vice-pres.; and K5WII, secy.-treas. The Tyler ARC operated a special net for the March of Dimes Telethon on 40- and 75-meter phone from 10 P.M. Sat. through 6 P.M. Sun. Jan. 28-29. BJ, LJ, FKE, BUJ, CUD, FET, K5LUB, ZJR, 1BY, QJA, WZT and others took part in this operation. ZJR is working on a modulator. FKE is entertainment chairman for the South Texas Emergency Net meeting to be held in Victoria, Tex., June 9-10-11 and promises it will be a "No Neck-Tie Party." Thanks to K5WZT for the news from the East Texas Area, the first I have had in a long time. Now is the time for all good hams to start making preparations for the annual Field Day. New Official Observers are in the

(Continued on page 142)

BULLSEYE BUYS at ARROW!

AMERICAN GELOSO V.F.O.'s



Wired, tested, calibrated, ready for use. Mod. 4/104 for driving one 807 or 6146 final in AM or CW under Class "C" conditions.

Mod. 4/102 for driving two 807's or 6146's final. Has 5 bands. Supplied with Mod. 1640 dial ass'y.

Mod. 4/103 for 144-148 mc bands. Combines VFO primary freq. of 18 mc with xtal fundamental freq. of 12 mc. Supplied with Mod. 1647 dial ass'y.

Mod. 4/104, 4/102 or 4/103 less tubes and xtal, each $29.95

AMECO 2 & 6 METER CONVERTERS

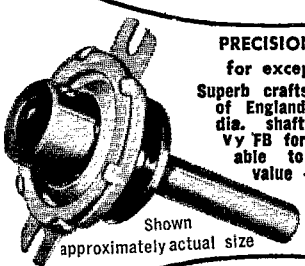
Crystal Controlled
Gain: over 30 db
Noise Figure: better than 4 db

Tube Lineup: 2 meter Converter has new, imported 6ES8 high gain, low noise, cascode 1st RF Amp., 6U8A 2nd RF Amp. & Mixer, 6J6 Osc.—Multiplier.

6 meter Converter has 6BS8 Cascode RF Amp and 6U8A Mixer and Osc.

	6 meter	2 meter
Converter complete with tubes and xtal for 7-11 or 14-18 mc. IF output in	CB-6	CB-2
Kit form with instructions	$19.95	$23.95
Wired and tested	$27.50	$33.95

PRECISION PLANETARY-VERNIER for exceptionally fine tuning

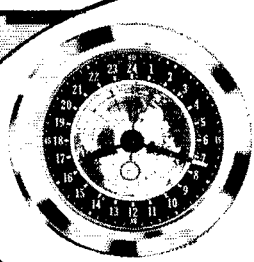


Shown approximately actual size

Superb craftsmanship by Jackson Bros. of England. Ball bearing drive, ¼" dia. shaft, 1⅛" long, 6:1 ratio, Vy FB for fine tuning. Easily adaptable to any shaft. Comparable value — $5.95.

Amateur Net $1.50 ea.
10 for $13.50

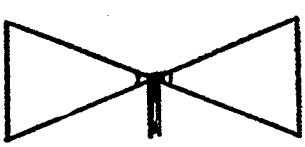
24 HOUR CLOCK



24 hr. chrome plated 8" metal wall clock. Inner dial with south polar projection map of world indicates time around world. Polar projection dial adjustable for various time zones. Shpg. wt. 2 lbs.

Amateur net $8.47
tax inc.

220V. 50 cycle model.....9.95

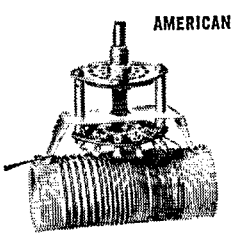


"Wonder Bar" 10 Meter Antenna

As featured in Nov. 1956 QST. Complete with B & W 3013 Miniductor. Only 8 ft. long for 10 meters. Wt. 5 lbs.

Amateur Net $7.85

AMERICAN GELOSO PI TUNING COILS

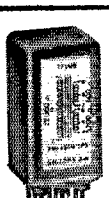


Units have 6 posit. tap switch mounted on ceramic coil form. Mod. 4/111 designed for use with two 807's or 6146's (in parallel). Freq. Range 3.5 to 29.7 mc.

Mod. 4/112 is designed for use with single 807 or 6146. Handles up to 60 w. Range: 3.5 to 29.7 mc.

Mod. 4/111 or 4/112, each $4.95

Versatile Miniature Transformer



Same as used in W2EWL SSB Rig — March 1956 QST. Three sets of CT windings for a combination of impedances: 600 ohms, 5200 ohms, 22000 ohms. (By using center-taps the impedances are quartered.) The ideal transformer for a SSB transmitter. Other uses: interstage, transistor, high impedance choke, line to grid or plate, etc. Size only 2" h. x ¾" w. x ¾" d. New and fully shielded.

Amateur Net $1.39
3 for $3.49 10 for $10.75

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process of being appointed so watch your harmonics, frequency and procedure. Traffic: W5BKH 334, K5BKH 276, W5SMK 137, K5YPO 73, W5BOO 62, K5ILL 58, ZOM 41, W5CF 35, GY 33, K5VWJ 25, QWR 19, WSF 17, W5GNF 15, K5TMS 8, W5ANK 4.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—K5KTW is SEC. His address is 1220 S. Owasso, Tulsa, Okla. We will miss K5JAW, EC from Major County. Bill became a Silent Key Mar. 9. Our sympathy to his family. IER had the top score from 5-Land in the Bermuda Amateur Contest. K5BBA is just five confirmations away from DXCC. K5IYK/3 has a new Viking. BBA has an ART-13 on the air. The ACARC presented the invalid son of M. H. Jackson with a new receiver. Our commendations to this Oklahoma City Club. ODO has acquired quite a reputation as a writer in *Collector-Emmitter*. Two hundred were registered at the Lawton-Ft. Sill Hamfest. K5RCW and K5WPP now are on 2 meters. Two-meter activity is up all over the State. SSZ (slow-speed net) is a good place to learn c.w. net procedure. All are welcome; it meets at 1930 CST on 3682.5 kc. K5IRZ is the RM. The Ada and Shawnee boys were Johnny-on-the-spot with generators, transmitter-receiver and operators during the recent Konawa storm. The Electron Benders have new club rooms, thanks to K5JKD and the Spartan School of Aeronautics. Traffic: (Feb.) W5OOF 397, K5IBZ 154, W5DRZ 87, K5USA 80, JGZ 59, AUX 51, W5JXM 51, K5ELG 48, DLP 46, OOV 33, OVR 30, DUJ 29, W5MFX 28, CCK 22, KY 22, K5INC 18, SWW 18, YTH 18, W5CYQ 15, K5LAD 15, W5UYQ 15, CYQ 14, GIQ 14, ADB 12, K5LYM 12, JOA 10, W5WAF 10, WAX 10, K5WNQ 10, W5EHC 9, K5LZF 9, W5WDD 9, PNG 7, K5VNJ 7, GNX 5, W5BBA 4, VLW 4. (Jan.) K5GNX 8.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: AIR. PAM: ZPD. K5BSZ, RM. K4BSS/5 has been having transformer trouble. We want to congratulate him and the XYL on the new harmonic; also K5SOT and K5SOV on the twin girls. Officers of the Southmost Radio Club are K5MFS, pres.; K5INU, vice-pres.; K5AYX, secy.; and K5PXJ, treas. Sorry to report K5EAN and BDI as Silent Keys. AQK and BKG were in Kentucky for the wedding of their daughter. The 7290 Traffic Net had 1519 check-ins with 551 messages handled. The new call of the University of Texas Amateur Radio Club is EHM. QKF and QEM, K5SCR and K5KRZ attended the planning session for the South Texas Emergency Net's Convention to be held at Victoria on June 9, 10 and 11. Everyone should start making plans to attend, as it is shaping up to look like one of the best conventions in several years. Glad to hear that the El Paso gang has the c.d. plans working. GI is the County Civil Defense Officer and MVL is the Radio Officer. Between these two, and with the help of the other amateurs in the El Paso Area, it should be a very good organization. MLV is the new Assistant SCM for the El Paso Area. He will have forms for all appointments, and will be glad to supply them to anyone interested. Traffic: (Feb.) K5WIC 487, W5AIR 33, K5-ABV 27, W5ZPD 11, K5YHX 2. (Jan.) K5WIC 529, MXO 89, K4BSS/5 44, W5AIR 31, K5JFP 25, W5ZPD 24, K5MWC 17.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCM: H. C. Hillyard, VO1CZ. SEC: BL. OC has resigned from the post of Asst. SCM because of other commitments. Our sincere thanks to Aaron for his valuable assistance in the post. The results of the recent VE1 Contest have been announced, with TG taking top honors in both the c.w. and phone sections. The winning scores were 2772 for the c.w. section and 9088 on phone. FR was second with 2520 points (c.w.), while JM and ADH tied for second place on phone with 8512 points. Newly-elected officers of the Sydney Club are DO, pres.; XD and ZB, vice-pres.; PB, secy.; ABM, treas. AEB has a new station control panel which he claims does everything but fill in the log. WG has a new class of embryo amateurs at the Halifax Police Boys Club. Ex-VO1FA has been transferred to Montreal. PW has just found out that he will be signing VE1 for another two years or more. Recent visitors to Halifax were VE2s DR and JZ. It would be appreciated if club secretaries would pass along details of club and individual activities from their districts to this office. Thanks. Traffic: (Feb.) VE1OM 29, DB 9, AEB 8, ES 2. (Jan.) VO1EX 54.

ONTARIO—SCM, Richard W. Roberts, VE3NG—With sincere regret we report the passing of VE3CHF. DCX is in the hospital. TX is home and is recovering rapidly. AML is the Section Emergency Coordinator for Ontario. The Sky-wide ARC manned the AREC booth at the Sportsman Show in Toronto. Over 500 messages were handled. The Nortown ARC held a suc-

(Continued on page 144)

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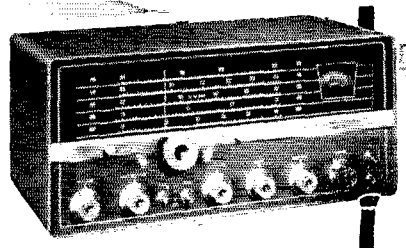

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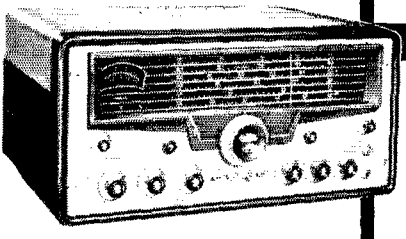

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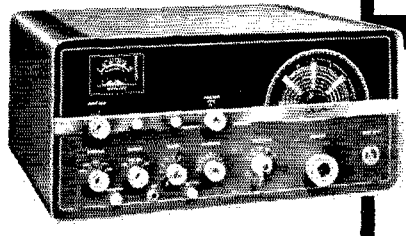
Use Trade-in as Down Payment!



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HT-37 TRANSMITTER

$450.00

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Low monthly payments!

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HALLICRAFTERS
HT-32A TRANSMITTER

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$32.50 monthly

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730 Commonwealth Ave., Boston 17, Mass.
230 Crown St., New Haven 10, Conn.
29 High Ridge Road, Stamford, Conn.
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- ☐ Check
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- ☐ C.O.D.

Name _____

Address _____

City _____ Zone ____ State _____

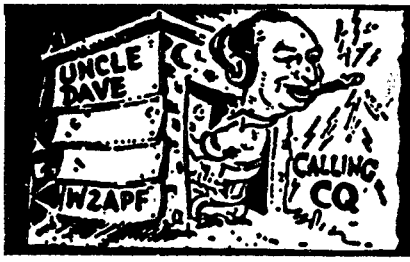
cessful contest known as the WAN (Worked all Nortown). From North Bay we hear that ERM just got his ticket. EIC and AGL had QRM with a Hydro pole and both were injured but are now O.K., DXG is on 10 meters. TX is coming along fine. West Side is getting ready for Field Day. BKF is moving to Toronto from the Belleville Area. BLY is on s.s.b. The Ottawa Ramblers Mobile Club held a dandy skating party. CEZ is mobile. DUP is going to VE5-Land. BCL is on 6 and 2 meters. UY is in Florida, the club has more than 55 members. The Niagara Club is running c.w. classes. DQK will have five new hams soon. The Algoma ARC is getting six would-be hams ready for the exam and the club is getting ready for Field Day. The St. Clair Valley ARC held one of its meetings in Detroit and visited the Lightship *Huron*. DFU is on 75-meter s.s.b. the club held an FB banquet recently. DDL is pres.; W8MYT, vice-pres.; DYJ, secy.; K8PBV, secy. (U.S.A.). From Sarnia: DHB is working DX, the club held an auction. AML is the new SEC. The Northshore ARC, CEU, has a 25-w.p.m. sticker. CMG will be mobile soon, from the Seaway Valley ARC. The local TV station gave valuable coverage to this new group. ARF is in Florida and BIV is in Toronto again; DU is on 160 meters. Traffic: VE3CWA 722, BUR 190, DPO 183, BZB 117, BAQ 77, AIL 70, CFR 65, NG 57, CYR 54, EHL 54, NO 37, DWW 30, TM 30, AMT 28, HK 28, CP 15, DTO 15, DLC 12, AML 11, DH 7, DU 4.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—An extremely severe sleet storm with 70-mile gusts hit Montreal and vicinity at the end of February, completely demoralizing antennas, trees, communications, etc. As usual the mobiles stepped into the brief and carried out valuable service. 3CJ, ARRL Canadian Division Director, delighted a large audience at a Montreal Amateur Radio Club meeting with a most enlightening talk. He answered numerous questions on practically all our "tough" problems. Unfortunately BE, Past-Director, sustained a back injury and was unable to attend. YA, QSL Mgr., bemoans the increase of W QSL cards, many of which obviously are directed to non-existent stations. U.S. hams are requested to refrain from burdening the QSL Bureaus with their cards. The Montreal Mobile Club elected AFM, pres.; ABV, vice-pres.; BDV, secy.; Judy Alton, treas.; AUV, act. dir.; QG, comms. dir. QN, our SEC, reminds all ECs to report to him and ARRL once yearly, or more often if possible. JZ is very happy with a new Drake 2-A receiver. HW, who is ex-3DEL, swings a mean fist. FF likes 2 meters exclusively. BDP got his Class A license in exactly one year. ABE, who lost a ten-element Yagi during the storm, expects to be back on 144.34 Mc. with a new fifteen-element Telrex. WT, hardworking manager of OQN, issues an interesting Net Bulletin. OJ quietly works DX on 80 meters with his QRP, TQ, at Magdalen Island, has a new DX-60 and reports IY is busy working DX with a DX-40. Traffic: VE2WT 213, W7QMU/VE8 175, VE2DR 57, AGM 36, EC 21, AGQ 19, BG 18, APR 8.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB —This being my first SCM report since 1949 I wish to say how pleased I am to be back and hope we can have an active two years. Our SEC, Don Hughes, Box 564, Kamloops, requests all AREC members to bring their cards up to date by submitting Forms #7. Our RM is Brent Ewing, 3120 Service Street, Victoria. SH, Edna, and FB, Ernie, have a son Harold James, Kamloops is forming a radio club. For information contact Betty, ACH. The British Columbia Amateur Radio Association's officers are ALE, pres.; SH, secy.-treas. BQ, TVI. The Comox Club is progressing fast with its code class members. LL is offering forty dollars for the arrest of the carrier on 3755 kc. We wish to thank JT for the service he gave B.C. amateurs in his four years as SCM. Support the net of your choice—C.W. Net 3650 kc.; Phone Net 3755 kc.

MANITOBA—SCM, M.S. Watson, VE4JY—Noel B. Eaton, ARRL Canadian Division Director, has announced he will visit the Brandon ARC May 31 and the ARLM, Winnipeg, June 2. A very successful banquet and dance was held by the Brandon ARC on Feb. 18 at which 42 attended; also on Jan. 10 a farewell banquet was held to honor PX on his promotion and transfer to Regina. The Winnipeg ARC's officers for 1961 are MH, pres.; CF, vice-pres.; OK, secy.; PI, treas.; KR, program; BK, technical; and RE, editor of its bulletin *Splatter*. A feature of the ARLM February meeting was a report from each member present as to his activities and hobbies. The by-laws of the league were revised at this meeting. The v.h.f. boys now have 26 active members on 6 meters and more nearly ready. AY is in Modern Hospital. Get well fast, Jack. Welcome to WS and his XYL on their return from an extended visit in the U.S. CH is back on the air on 75 meters. 5GO, a regular voice on the net, left Mar. 8 for a

(Continued on page 146)



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HT32 SSB Xmtr. 525.00
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351D1 (mount for KWM-1) 39.95

JOHNSON XMTRS. & ACC.

Thunderbolt Linear $425.00
Viking 1-w/VFO 122 Xmtr. 125.00
Valiant Xmtr. 325.00
Ranger Xmtr. 150.00
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"WRL"—GLOBE XMTRS. & ACC.

300 Xmtr. $250.00
666 (VFO) 25.00
LA-1 Linear Amp. 79.50
AT-4 Ant. Tuner 54.95

HEATH XMTRS. & ACC.

IT-1 Isolation Xmtr. ..... $ 18.00
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5100 AM Trans. $250.00
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CENTRAL ELECTRONICS XMTRS., ETC.

10A Exciter ..... $ 74.50
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720 (Transmitter) ..... $ 69.95

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NEW—Demonstrators—Display Models. One of a kind -Subject to prior sale-List second and third choice.

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2 mtr. VFO & Preamp. ..... $ 44.95

ELMAC

AF67 Mobile Xmtr. $125.00
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JOHNSON

10 Watt Amplifier (W) ..... $ 69.95
500 Kit Xmtr. AM 595.00
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NATIONAL

VFO 62 6&2 m. ..... $ 29.95

WRL—GLOBE XMTRS.

DSB-100 Xmtr. ..... $ 89.50
DSB-100 (Kit) 69.50
LA-1 Linear Amp. 79.95

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Bandhopper (VFO) ..... $ 99.50

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Telrex 3EL20 mtr. (Used) 49.50
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Mosley V144GP (2 Mtr.) Used 17.50
Mosley VPA20-2 (New) 39.50
5A-6M Taco (New) 9.95
10A-6M Taco (New) 17.50
BA6M (Baluns-for-above) 3.95
Hy-Gain 152 MT3 New 99.50
Hy-Gain HH-6 (6mtr.-Halo) new ... 9.95
Vertrod-108 (BC & SW) Window Ant. 2.95
Mosley TA31 Jr. 16.95
Mosley V3 ..... 19.95
Mosley V3 Jr. 15.95
Mosley TA32 ..... 59.95
Mosley TA32 Jr. 42.95
Mosley A320 ..... 66.95
Mosley S153 ..... 42.50
Mosley S103 ..... 37.50
Cushcraft AGP15 ..... 11.95
Cushcraft AGP10 ..... 10.95
Cushcraft ATGP3 ..... 24.95
Cushcraft A28A 21.95
HiPar 2H 8.95
Hi-Lite 3E10F 49.50
Gonset 3220 ..... 94.50
Hy-Gain 153G 29.50
Hy-Gain 152MT2 ..... 49.50
Hy-Gain 203G 49.95
Hy-Gain 113G 39.95

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	Reg.	Special
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T-1-J	11.95	8.95
RB-1	2.95	1.95

Lynmar TR Switches:

TRS-1 ..... $11.95 ..... **$ 8.95**

Collins Receiver Filter:

35U1 ..... $17.50 ..... **$10.00**

Hammarlund Xtal Calib. for HQ100, etc.

XC100 ..... $15.95 ..... **$10.95**

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Stromberg Carlson Dual 20 power Amplifier ASP422. Reg. $99.95. **Sale...$59.95**
Stromberg Carlson AS-433 Dual 12 watt stereo amplifier. Reg. $129.95. **Sale.....$97.50**
Bogen DB-212 Stereo Amplifier Demonstrator. Reg. $119.95. **Sale....$79.95**
Bogen STA-1 Stereo Adaptor. Reg. $16.00. **Sale.....$8.00**
Fisher SA-300 Dual 35 watt Power Amplifier. Reg. $179.50. **Sale.....$120.00**
Fisher 600 Stereo Receiver. Reg. $369.50 **Sale.....$277.50**
Fisher X202 Stereo Amplifier. Reg. $229.50 **Sale.....$182.50**
Fisher 400C. Stereo-Pre-amp. Reg. $174.50 **Sale.....$117.50**
Fisher 30-20 watt amplifier. Reg. $59.50. **Sale.....$39.50**
Scott 222 Stereo Dual 12 Amplifier Demonstrator. Reg. $144.95. **Sale....$99.95**
University S-11-H Speaker System. Reg. $260.00. **Sale.....$130.00**
Utah Coaxial speaker model CSP-12J3. Reg. $25.00. **Sale.....$9.95**
Electro-Voice Stereon 100. Reg. $49.50. **Sale.....$32.50**
Electro Voice Stereon 300. Reg. $69.50. **Sale.....$42.50**
Pickering model 196 Unipoise Arm. Reg. $49.50. **Sale.....$32.50**
Audax CA-60 Speaker System. Reg. $59.95 **Sale.....$39.95**
Connoisseur Professional turntable 33-45. Model C-99. Reg. $59.50. **Sale..$42.50**
Connoisseur Base for C-99. Reg. $14.95 **Sale.....$10.50**

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UNCLE DAVE'S RADIO SHACK
A SUBSIDIARY OF FORT ORANGE RADIO DISTRIBUTING CO.

few weeks visit in Ottawa. Traffic: VE4PE 22, KN 20, JY 12, PA 6, QD 6, AN 4, OB 4, TE 4, CB 3, JQ 3.

SASKATCHEWAN—SCM, H. R. Horn, VE5HR—Do not forget these important dates in your area: Noel Eaton, ARRL Canadian Division Director, will be in Saskatoon Mon., May 29 and Regina Tue., May 30. Special meetings will be held. This is a good opportunity to meet our new Director and put your questions and problems to him. All amateurs will be welcome. The c.w. net, PEN, is going great guns and traffic is building up well. GW and AG are new NCSs on PEN. TI reports activities and uses a TA-12 and 1155 receiver. VL is on s.s.b. with a GSB-100. HR has a new Ford Falcon and will have to convert from 6 to 12 volts before resuming mobile activity. Ex-PZ is now 8JS and looks for VE5s on 20 and 75 meters. We extend our sympathy to ex-ER, now a VE3, on the death of his father. 50-Mc. activity is on the upgrade in Saskatoon with 8 calls being heard. QC is the latest with a Globe 6 and 2. 144 Mc. also is active Thurs. at 1930 MST. How about some OES appointees, fellows? RP is a new call heard. Traffic: (Jan. and Feb. combined) VE5NX 62, NQ 48, DS 38, MS 38, IJ 32, HQ 31, EO 25, GW 14, AH 13, FX 13, LM 10, VE6AEN 9, VE5AT 8, SC 8, AG 6, CR 6, QL 6, JK 5, BF 4, PV 4, RE 4, TI 4, YR 4, KZ 3, HX 2, IG 2, TM 2, VE4TV 1.

Roof-Top Mobile Antenna

(Continued from page 28)

The 75-meter tap was made for 4.0 Mc. with the trimmer capacitor set at minimum capacitance. The proper tap point was found at 0.45 turn down from the top of the coil.

Although excellent grid-dip indications were obtained on the 10-, 20-, 40- and 75-meter bands not a trace of a dip could be found at 15 meters. Out of desperation, the tap for this band was placed at about half the number of turns required for 20 meters, and this has worked out very well.

Probably the best final adjustment of the coil taps is achieved by checking the remote field strength. This involves the help of a friend closely observing an S meter some two or three miles away while small changes are made in the tap location. The final-amplifier input should be held constant, or any change taken into account.

In summary, this project has been very rewarding in outstanding performance and convenience. Surprisingly, the over-all height of the whip itself is very nearly the same as that of most rear-mounted base- or center-loaded whips.

73 and DX! QST

Six-Meter Converter

(Continued from page 44)

output frequencies of 9.45 to 13.45 Mc. with input signals in the range from 50 to 54 Mc. The essential constructional details are evident from the photographs. The unit requires 6.3 volts for the heaters and 100 to 150 volts d.c. at 20 ma., which may be taken from the receiver or a separate supply.

Alignment

The oscillator should be adjusted first. Using a g.d.o. as an indicating wavemeter, place the g.d.o. coil close to L_6 and tune the g.d.o. to the vicinity of 40 Mc. A slight deflection of the meter as the g.d.o. is tuned to the oscillator frequency should be obtained, indicating that the oscillator

(Continued on page 148)

Your Ham Headquarters — WASHINGTON to FLORIDA

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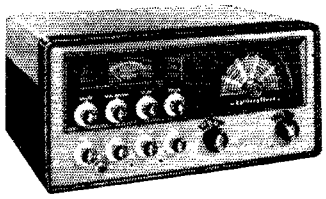


HT-32B
Transmitter:

Now—Hallicrafters' famous "32" offers a major innovation in SSB generation, the *beam-switching modulator*, with greater carrier suppression stability than ever before. All other time-proven features of previous models *plus* C.T.O. direct reading in kc. and complete 10-meter coverage make the HT-32B the outstanding choice of experienced amateurs.

FEATURES: Beam-deflection, high level sideband modulator for low-noise, high-stability signal, Hallicrafters' exclusive 5.0 mc, quartz crystal filter with sideband rejection of *50 db. or more;* C.T.O. direct reading in kilocycles to *within 1 kc.;* 10-meter coverage in four band-switched segments (calibration accuracy same as lower bands); 144 watts plate input (P.E.P. two-tone). Five band output (80, 40, 20, 15, 10 meters). All modes of transmission—CW, AM, S.S.B. Unwanted sideband down 50 db. or more. Both sidebands transmitted on A.M. Precision gear driven C.T.O. Exclusive Hallicrafters patented sideband selection. Logarithmic meter for accurately tuning and carrier level adjustment. Ideal CW keying and break-in operation, Push To Talk and full voice control system built in. Keying circuit brought out for teletype keyer.

FRONT PANEL CONTROLS: Operation—power off, standby, Mox., Cal., Vox.—P.T.T. Audio level 0-10 R.F. level 0-10. Final tuning 80, 40, 20, 15, 10 meters. Function—Upper sideband, lower sideband, DSB, CW.

HT-33B
Linear
Amplifier:

Beautifully engineered with extra-heavy-duty components, the HT-33B is *conservatively rated* at the maximum legal limit. You are guaranteed one of the big signals on the band, plus the effortless performance that means so much to efficiency and long life. (Conforms to F.C.D.A. specifications.)

FREQUENCY COVERAGE: Complete coverage of amateur bands; 80, 40, 20, 15, 10 meters.

FEATURES: Rated *conservatively* at the maximum legal input. Third and fifth order distortion products down in excess of 30 db. Built-in r.f. output meter greatly simplifies tune-up. All important circuits metered. Maximum harmonic suppression obtained through pi-network. Variable output loading. Protection of power supply assured by circuit breaker. HT-33B is a perfect match to Hallicrafters' famous HT-32 in size, appearance and drive requirements.

CIRCUIT DETAILS: This power amplifier utilizes a PL-172A high efficiency pentode operating in class AB1. The tube is grid-driven across a non-inductive resistor, thus assuring the maximum stability under all possible conditions. Band switching is accomplished by one knob which selects the proper inductance value for each band. The output circuit is a pi-network with an adjustable output capacitor, accommodating loads from 40 to 80 ohms. 2 panel meters are provided: one is circuit switched to measure Grid current, screen current, plate voltage and R.F. output voltage. A second meter continuously monitors cathode current of the PL-172A.

is functioning. Adjust the slug of L_6 for maximum indication on the g.d.o. meter. The slugs of the remaining coils should then be adjusted for maximum response on background noise or maximum signal strength if a suitable signal is available.

The simplicity of the circuit and relatively low cost (about $10.00) makes an attractive combination. When used with a two-element beam antenna 32 feet high, many states and South American countries have been logged. QST

A Day to Remember

(*Continued from page 49*)

low the Armed Forces Day c.w. and RTTY broadcast competition in accordance with the schedule above.

Station	*Military Frequencies (kc.)*	*Appropriate Amateur Band (Mc.)*
WAR (Army Radio, Wash., D. C.)	4020 (a.m.)	3.8 to 4
	6997.5 (c.w.)	7 to 7.2
	20,994 (c.w.)	21.1 to 21.25
NSS (Navy Radio Wash., D. C.)	4010 (c.w.)	3.5 to 3.8
	6970 (c.w.)	7 to 7.2
	13,680 (c.w.)	14 to 14.2
	14,480 (c.w.)	14 to 14.2
	*4012.5 (c.w.)	3.8 to 4
		7.2 to 7.3
	14,385 (s.s.b.)	14.2 to 14.35
	3319 RTTY	3.5 to 3.8
	7375 RTTY	7 to 7.2
	**20,050 RTTY (see note)	7 to 7.2
AIR (Air Force Radio, Wash., D. C.)	3347 (c.w.)	3.5 to 3.8
	7635 (a.m.)	7.2 to 7.3
	14,405 (s.s.b.)	14.2 to 14.35
	15,715 (c.w.)	14 to 14.2

* Operator transmitting on 4012.5 (a.m.) will listen in the a.m. and s.s.b. sections of the 40- and 75-meter bands for a.m. or s.s.b. stations.

** NSS will key 20,050 kc. simultaneously with one of the RTTY frequencies listed above. This frequency will be utilized as frequency propagation conditions dictate.

Military stations will listen for calls from amateurs within the appropriate amateur bands. Contacts will consist of a brief exchange of location and signal report. This is a test of military-to-amateur communications and no traffic handling or message exchange will be permitted. QST

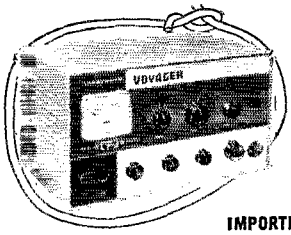
World Above

(*Continued from page 81*)

looking forward to schedules on 220 during the coming v.h.f. season. Address inquires for schedules to W9OVL. W9JFP and son, Bill, W9JCT, are already overhauling their 220- and 144-Mc. beams for the coming season. They are running 700 watts to their 28-element beam and looking East on Monday, Wednesday and Saturday at 8:00 P.M. CST. Naturally Vic is also on 144 Mc. and 50 Mc. for liaison work if necessary. W9OJI has his small 64-element 432-Mc. beam fed at 432.021 plus or minus 1 kc. and is looking for schedules. Interested parties please contact Steve Gross, W9OJI. W9OKB and W8MJT have completed modifications on their APX-6's and are in nightly communication over a 16-mile path using 16-element colinear beams. Anyone in the Chicago area interested in obtaining assistance on his APX-6 conversions is invited to contact Ken, W9OKB. 1296-Mc. activity in the East Coast area seems to be centered in the New Jersey, New York area. K2UUR is on with

(*Continued on page 150*)

THE LAFAYETTE ROUNDUP OF HAMSHACK VALUES



MODEL HE-25
"VOYAGER" TRANSMITTER

Single knob bandswitching 80 through 6 meters with a full 120 watts CW or 70 watts phone operation. High Q pi-network matches antennas from 40-600 ohms.

109.50

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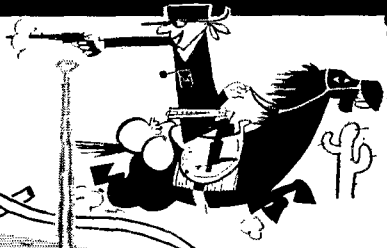

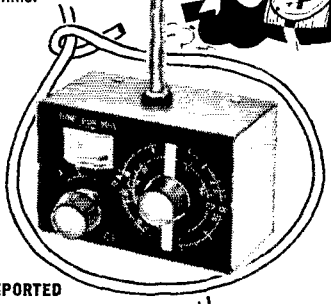

MODEL TM-15
WAVE METER

Checks transmitter output for harmonics, parisitics, and out-of-band operation. Provided with magnetic feet. Perfect for the novice.

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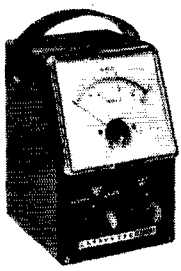

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HE-28 RF WATTMETER AND SWR BRIDGE

150 watts full scale—Built-in dummy load—Wattmeter ±5% to 54 mcs. SWR ±5% for in line use.

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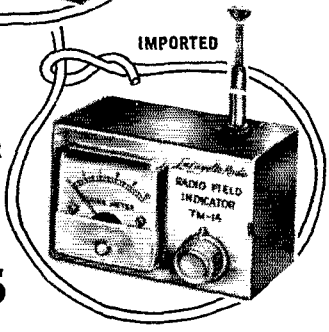

MODEL TM-14
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Complete, no wires to connect. Monitor transmitter output, check antennas, etc. Perfect for mobile, provided with magnetic feet.

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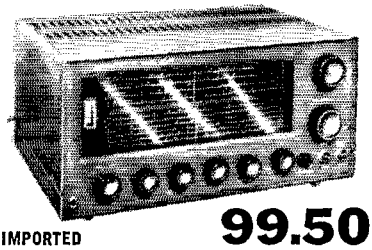
AN UNHEARD OF BREAKTHROUGH IN THE COMMUNICATIONS RECEIVER FIELD

THE LAFAYETTE HE-30



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- BUILT-IN Q-MULTIPLIER FOR CROWDED PHONE OPERATION
- CALIBRATED ELECTRICAL BANDSPREAD ON AMATEUR BANDS 80 THRU 10 METERS • STABLE OSCILLATOR AND BFO FOR CLEAR CW AND SSB RECEPTION • BUILT-IN EDGEWISE S-METER

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a 2C39 tripler and is very anxious to arrange schedules to try contacts on 1296 with any station in the East Coast area. W6NTW/2, W2TTM, K2GQI, and W3FEY are all also active on 1296 in this area. W3CGV is calling CQ 220 on 220.170 every night except Thursday at 2130 EST with the beam north. Naturally he's looking for schedules. East coasters might note that the "Mount Airy V.H.F. Net" operates on 221.4 at 2200 EST. Larry, W2ALR, reports three APX-6's in operation in the Lockport, New York area, with W2RUI and K2KYJ. Eight other units in the "I am working on it" stage. Incidentally Larry just converted two 4CX250 B's and "gave my 4-125's to a v.l.f. man, why did I wait so long." WA6GHW reports his 1215 Mc. station total is up to 16. Distances in excess of one hundred miles are being worked regularly by the Los Angeles area boys. W1RFU reports activity on 1215 Mc. in the Springfield area can be found most any night at 8:30 local time. Billis using a ubiquitous APS-6 and is working on 32 driven elements with a screen reflector. W1QWJ also of the Springfield area reports activity on crystal control converters for 1215. And suggests the possibility of moving the local activity to 1296.

A principle reason for matching the antenna to the feed-line impedance is that a flat line operates with the least power loss. QST

Transistor Converter

(*Continued from page 40*)

After the cover is installed, the coils should be touched up slightly to maintain correct response.

In using this converter, precautions should be taken to insure that r.f. voltage reaching the input of the converter during transmissions is held to less than 1 volt. This will usually be the case if a coaxial antenna relay is used. The converter may be powered from batteries, the receiver itself, or an a.c. supply. The last two arrangements were described in the article on the six-meter converter. Current drain is 6 ma. at either 6 or 12 volts.

The original unit has a power gain of 18 db. Image and i.f. responses are down 65 and more than 80 db., respectively, from the response at 144 Mc.

Transistors have already been developed that will provide even better performance. Philco has a transistor that will give noise figures of 3 to 4.5 db. at 150 Mc. This transistor should be available soon, and its use in a converter such as this should result in a unit that can match some of the better vacuum-tube converters in every way. QST

Sweepstakes

(*Continued from page 62*)

ROANOKE DIVISION

North Carolina

W4AHY[16]	119,629-	661-73-A-38
W4LYV	99,450-	557-72-A-27
K4YEP	89,283-	504-71-A-33
K4MWB	81,900-	527-63-A-27
W4WE[17]	31,119-	258-61-B-18
K4FIJN	24,570-	255-39-A-14
K4FEQ[18]	22,126-	243-46-B- -
K4DWU	12,200-	138-50-B-18
K4KYB	9150-	122-30-A-20
KN4WLX	555-	19-12-A- 8

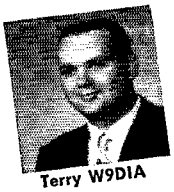
South Carolina

WØYFT/4	139,343-	847-66-A-40
W4ZRH	118,928-	714-67-A-39
W4BWZ	76,466-	490-63-A-40
K4ZHV	63,900-	430-60-A-32
K4YYL	36,192-	312-58-B-25
K4KIT	7788-	91-35-A- -
K4ITA	6615	104-27-A-12
K4DOF	5720-	90-26-A-10

Virginia

W4KFC	173,813-	1194-73-B-34
W4JAT	170,090-	934-73-A-37
W4BZE	133,214-	751-71-A-29
K4GMX	123,950-	740-67-A-33
W4HTV	115,675-	661-70-A-35
W4DVT	115,340-	634-73-A-40
W4GF	113,068-	638-71-A-35
W4ZM	109,020-	632-69-A-36
W4JNE	101,840-	608-67-A-39
W4NH	100,800-	630-64-A-35
W4KXV	99,165-	601-66-A-23
W4SLD	97,920-	578-68-A-35
W4PK	87,100-	520-67-A-31
K4IKF	81,413-	504-65-A-30
K4MXF	77,636-	464-67-A-32
W4RIM	74,594-	546-55-A-37
W4PNK	68,425-	402-68-A-17
W4SNH	60,025-	342-70-A-25
W4KVH	58,000-	400-58-A-25
W4WBC	57,015-	362-63-A-31
VE2BX/W4	56,856-	415-55-A-34
W4MYA	51,155-	401-52-A-31

(*Continued on page 152*)



Terry W9DIA

In response to many letters and comments received from customers in the Chicagoland area who are doing business with our Milwaukee store, I am pleased to announce the Grand Opening of our second store devoted exclusively to ham radio operators.

GRAND OPENING CELEBRATION May 1 to May 31

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Store Hours: Daily 10–5:30, Monday–Friday evenings 7 to 9; Saturdays 9 to 3. Open every Sunday during month of May only for Grand Opening Celebration from 12 to 5

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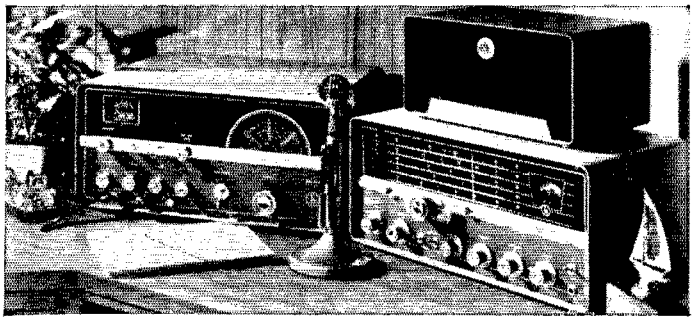

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Doc W9HJS
Manager
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2. You may register for the SX-111 receiver drawing by getting our deal on any new or reconditioned Hallicrafters Equipment. Use handy form below.

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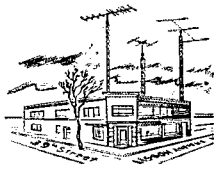

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W4JUJ	36,960-	225-66-A-17
W4FJ	36,640-	230-64-A-23
W4HZZ	34,428-	302-57-B-18
K4JVE	29,820-	251-60-B-24
K4ZHA	26,390-	204-52-A-23
K4IYK	24,480-	206-48-A-22
W4JDX	23,664-	249-48-B-33
W4VBX	18,450-	180-41-A-11
W4SLT	13,860-	156-36-A-25
K4IPV	12,000-	150-32-A-32
W4NLC	6078-	96-26-A-21
W4NDN	4843-	75-26-A-10
K4QET	4793-	73-27-A- 7
W4QAR	3465-	53-33-B-14
K4ACZ	3334-	64-21-A- 8
KN4ZRX*	2393-	48-22-A-26
KN4RNH	2048-	39-21-A-19
W4JUK	1254-	29-22-B- -
K4EJG	510-	17-12-A- 4
K4DBD	425-	17-10-A- 5
K4TSU	10-	2- 2-A- 1
KN4VCY	3-	1- 1-A- 1
W4DKL	3-	1- 1-A- -

West Virginia

W8FNI	127,663-	731-70-A-38
K8HID	93,155-	601-62-A-38
W8DIE	85,968-	600-72-B-29
K8JLF	66,700-	460-58-A-26
K4CQA/8	23,850-	183-53-A-32
W8HRQ	25,250-	202-50-A-25
K8LOU	20,145-	158-51-A-11
K8OQL	16,915-	199-34-A-17
K8QXS	13,538-	147-38-A-22
W8MLX	694-	19-15-A- 5
K8ELF (K8s ELF SUE)	35,075-	231-61-A-19

ROCKY MOUNTAIN DIVISION

Colorado

WØEWH	212,613-	1165-73-A-40
WØWME	112,875-	649-70-A-36
KØMIC[19]	98,348-	635-62-A-30
WØMYB	80,410-	473-68-A-40
KØDTK	75,075-	458-66-A-20
KØVFN	59,365-	383-62-A-40
KØEDH	56,343-	364-62-A-19
KØEDK	48,233-	327-59-A-15
KØVVV	31,265-	256-52-A-23
KØGEU	24,623-	201-49-A-25
KØVFZ	22,149-	198-47-A-23
KØLMD	20,540-	161-52-A-14
KØRTI	1785-	34-21-A-28
KØTRX	438-	18-10-A- 7

Utah

W7BAJ	73,030-	436-67-A-30
W7JQU	9360-	104-36-A- 5
W7POU	7220-	80-38-A- 6
W7MWR	3645-	54-27-A- 5

New Mexico

W5CK	122,404-	863-71-B-38
W5FJE	120,870-	711-68-A-40
W5LEF	98,192-	722-68-B-36
W5NTM	91,000-	523-70-A-36
WIGFH/5	59,738-	405-59-A-40
K5MAT	37,335-	262-57-A-16
K5VDI	15,680-	130-49-A-22
W5DEC	6375-	75-34-A- 8
W5CA	4950-	55-36-A- 3
KN5AEE*	3813-	70-25-A-22
K5YEZ	1530-	36-17-A-10

Wyoming

K7CRL	62,372-	505-62-B-36
W7HRM	52,164-	414-63-B-24
W7BHH	1500-	30-20-A- 3

SOUTHEASTERN DIVISION

Alabama

K4BQU	78,705-	487-66-A-36
K4IWI	47,275-	310-61-A-25
K4D8M	10,118-	111-38-A-19
W4U8M	4440-	56-32-A- 3
KN4QZB/4	4350	68-29-A-17
W4NML	4340-	62-35-B-16
KN4WHV*	3815-	59-28-A- 9

Eastern Florida

W4DQS	198,195-	1362-73-B-40
K4RAD	155,790-	868-72-A-40
W4LVV	148,281-	819-73-A-40
K4JLD	144,905-	794-73-A-36
W4BTO	103,766-	626-67-A-30
W4RUO	86,933-	520-67-A-34
W4JTA	63,156-	429-60-A-28
K4BQP	56,880-	372-63-A-27
K4FMA	55,931-	397-57-A-20
W4DXL	49,500-	305-66-A-29
W4QVJ	45,580-	349-53-A-26
K4KDN	31,635-	222-57-A-10
K4LVP	30,095-	246-52-A-28
W4OMG	19,035-	141-54-A-28
K4ZQU[20]	6734-	91-37-B- 6
W4KPB	578-	17-14-A- 6

K4GRD (K4s GRD IIN)	29,563-	240-50-A-21
W4QAS (K4QDL, W4QAS)	5154-	70-31-A- 9

Western Florida

W4HQN	154,070-	879-71-A-36
W4WKQ	136,290-	834-66-A-39
W4MLE	102,270-	732-70-B-38
K4TZS (K4s BJT TZS)	9446-	117-33-A-25

Georgia

W4YE	154,100-	920-67-A-40
K4BAI	139,231-	981-71-B-40
W4EAW	132,828-	794-67-A-40
W4MCM	89,930-	529-68-A-25
K4TKM	65,081-	401-65-A-36
K4UJS	39,874-	326-49-A-21
W4TKD	32,500-	255-52-A-24
W4HYW	22,852-	197-58-B-14
W4LVX	21,980-	157-56-A-17
K4ADU	20,588-	183-45-A-22
K4EAW/4	16,185-	168-39-A-13
K4FJD	15,960-	134-48-A-18
K4TEA	11,771-	110-43-A- 5
K4RPK[21]	9141-	142-33-B- 4
W4UDS	6956-	82-35-A-14
K4YSB	1800-	37-20-A- 3
W4MJI[22]	480-	20-12-B- 1

West Indies

KP4AOO	46,618-	325-58-A-16
KP4ATV	13,325-	136-41-A-16
KP4AQY	6038-	81-30-A- -

Canal Zone

KZ5TD	66,480-	417-64-A-21
KZ5DF	39,435-	239-66-A-24

SOUTHWESTERN DIVISION

Los Angeles

K6CTV	188,066-	1039-73-A-40
W6SBB	170,820-	939-73-A-40
W6HAL	111,648-	633-71-A-36
W6SRT	76,590-	444-69-A-31
W6OIV	75,762-	549-69-B-29
W6NKR	70,380-	510-69-B-30
WA6CGS	60,915-	393-62-A-23
W6OO	58,276-	429-68-B-39
WA6AYU	34,100-	249-55-A-27
K6QPH	32,348-	227-57-A-25
W6GQX	23,396-	189-51-A-17
W6ACL	23,055-	174-53-A-24
K6UYZ	22,195-	194-46-A-18
WA6FVL	21,866-	175-51-A-29
WA6AJD	19,858-	169-47-A-16
WA6KXY	17,190-	194-36-A-36
WA6BAH[23]	14,850-	155-50-B-15
K6KUU	12,760-	116-55-B-16
WA6CPM	12,139-	127-39-A-17
K6TXU/6	11,610-	130-36-A-17
WA6KZI	11,331-	131-35-A-32
WA6FVA	10,965-	102-43-A-21
W6LVQ	10,600-	80-58-A-13
WA6JDB	9931-	117-35-A-21
WA6EFI	8316-	126-33-B-11
W6JGB	7740-	96-42-B- 6
WA6GSP	6815-	97-29-A- -
K6MSL	5425-	70-31-A-10
WA6GOB	5231-	68-31-A-12
K6KQT	3990-	90-19-A- 7
WV6MOW*	3315-	51-26-A-24
WA6EOL	2843-	47-25-A- 5
WA6AWD	1710-	58-15-B- 7
W6AM	182-	13- 7-B- 1
W6QAE	38-	5- 3-A- 3
K0CLS/6 (WA6CTK, K0s CLS CVI)	70,688-	439-65-A-35
W6UFJ (W6UFJ, WA6FXJ)	31,050-	230-54-A-26
WA6FDB (2 oprs.)	5720-	75-32-A- 8
WA6ANB (5 oprs.)	1538-	41-15-A- 5

Arizona

W7ZMD	126,630-	708-72-A-33
W7QAP	113,103-	802-71-B-33
W7ATV	81,504-	578-72-B-29
K7KOK	7995-	82-39-A- 8
KN7MLG	700-	48- 8-A- 4
K7IKT	3-	1- 1-A- 1

San Diego

W6ZVQ	220,278-	1207-73-A-40
W6JVA	146,273-	808-73-A-39
W6LRU	126,824-	718-71-A-35
WA6BUX	84,660-	501-68-A-35
K6SDR	69,360-	445-68-A-30
K6LLI	65,081-	402-65-A-34
WA6JLM	56,935-	400-59-A-28
W6UME	56,720-	356-64-A-29
WA6CZR	47,250-	304-63-A-40
WA6FJD	41,501-	264-63-A-34
WA6FYW	27,848-	244-47-A-26
W6IYG	26,500-	200-53-A-16
WA6GRB	24,495-	216-46-A-33
WA6DBC	24,413-	155-63-A-19
WA6BNG	22,000-	178-50-A-23
K6BXP	11,890-	116-41-A- 7
K6EJK	10,238-	105-39-A-16
WA6AEE	2925-	45-26-A- 5

(Continued on page 154)

K6STZ	2240-	64-14-A-10
WV6NHO	1530-	41-18-A-16
WA6GKX	538-	22-10-A- 4
W6YZD	378-	14-14-B- 1
WA6HHJ	120-	16- 3-A- 3
W6KXN (K1MOT, K9HVL)	11,568-	122-48-B- –

Santa Barbara

W6YK	99,180-	561-72-A-36
K6LZU/6	29,795-	204-59-A-28
W6BHZ[24]	17,595-	153-46-A-10
WA6FGV	13,195-	203-26-A-33
W6FYW	240-	12- 8-A- 3

WEST GULF DIVISION

Northern Texas

W5MCT	203,175-	1168-70-A-40
K4VLN	181,223-	997-73-A-40
K5RHZ	179,353-	1011-71-A-39
W5QF	92,027-	534-69-A-36
K5YAA	88,560-	559-64-A-39
K5PSL	35,475-	216-66-A-34
K5PXV	28,899-	192-61-A-28
K5RDQ/5	21,560-	154 56-A-17
K5DER	12,363-	115-43-A-22
KN5ERQ*	7264-	93-39-A-35
KN5FLD	338-	15- 9-A-12
KN5ZAI	275-	14-10-A- 6
W5SOD	75-	6- 5-A- 3

Oklahoma

W5YJS	115,375-	650-71-A-31
K5OCX	107,865-	643-68-A-33
W5CWX	101,589-	608-67-A-29
K5VYA	89,638-	519-71-A-40
K5VTA	78,641-	490-67-A-40
W5CKT	46,810-	302-62-A-16
K6WZJ	40,046-	272-59-A-28
K5ZBS	28,000-	250-56-B- 7
K5WVX	25,125-	205-50-A-23
W5EHY	18,240-	190-48-B-20
K5TAJ	13,380-	112-48-A-15

Southern Texas

W5WZQ	235,608-	1301-73-A-40
K5ABV	182,591-	1003-73-A-39
W5AWT	137,375-	792-70-A-31
K5LWL	79,463-	489-65-A-28
K5RPC	56,715-	409-57-A-39
K5LLJ	22,540-	161-56-A-13
W5LGG	16,250-	130-50-A- 4
K5WQM	8455-	92-38-A-16
KN5BFB	4118-	66-27-A-32
KN5ZJK	2473-	43-23-A-12

CANADIAN DIVISION

Maritime

VE1ADH	21,712-	238-46-B-16

Quebec

VE2BAE	48,813-	365-55-A-24
VE2AZN	27,923-	221-51-A-21
VE2AIL	13,644-	157-37-A-19
VE2AWR	9938-	159-25-A-19
VE2ADD	975-	30-13-A- 6

Ontario

VE3UOT[25]	72,072-	606-72-B-32
VE3EAM	68,935-	406-68-A-24
VE3ES	60,775-	359-68-A-28
WØAIH/VE3	58,823-	342-69-A-12
VE3ACB	51,513-	317-65-A-27
VE3DBP	46,735-	362-52-A-32
VE3DUS	42,000-	341-50-A- –
VE3MI	33,944-	278-49-A-26
VE3DR	15,275-	130-47-A- 8
VE3YV	14,900-	149-50-B-20
VE3AHU	14,260-	124-46-A- –
VE3DYJ	10,850-	111-40-A-20
VE3CZX	5658-	82-31-A-17
VE3BWL	3203-	61-21-A- 4
VE3AUU	1976-	38-26-B- 2
VE3JF	1926-	36-23-A- –
VE3EHL	330-	12-11-A- 4
VE3RN	203-	9- 9-A- 2
VE3BLY (VE3s BLY DXM)	16,188-	175-37-A-20

Manitoba

VE4IM	47,565-	302-63-A-17
VE4UM	35,496-	317-58-B-30
VE4KZ	10,643-	99-43-A-15
VE4GB	2125-	43-25-B- 6

Saskatchewan

VE5DZ	28,379-	248-59-B-12
VE5MS	9080-	115-40-B-11

Alberta

VE6AO	58,581-	363-65-A-22
VE6MA	33,390-	252-53-A-23
VE6UW	31,564-	222-57-A-24
VE6HH	16,391-	143-47-A-25
VE6VV	11,378-	111-41-A-13
VE6ADA (VE6s ADA ADB)	84,150-	519-66-A-27

British Columbia

VE7EH	140,669-	793-71-A-39
VE7AAF/7	60,690-	361-68-A-34
VE7AC	14,560-	140-52-B-10
VE7AGN	22,385-	207-55-B-22
VE7JQ	23,206-	200-47-A-24

Yukon — N. W. T.

VE8RW	3565-	59-31-B- 3

[1] W3WJD, opr. [2] K3NNC, opr. [3] WA2H8P, opr. [4] K9EEC, opr. [5] W8FEM, opr. [6] K2JVB, opr. [7] KØGJD, opr. [8] Hq. staff, not eligible for award. [9] W1WPR, opr. [10] K1MJC, opr. [11] W1ETH, opr. [12] KØITF, opr. [13] WØWWJ, opr. [14] KH6DGL, opr. [15] W6QHS, opr. [16] W3BOA, opr. [17] W4GHQ, opr. [18] K4FEQ opr. [19] K6LSG, opr. [20] K4LDR, opr. [21] K4TEA, opr. [22] K6SXX, opr. [23] WA6ORJ, opr. [24] K6OGT, opr. [25] VE3BFA, opr.

Phone Scores

ATLANTIC DIVISION

Eastern Pennsylvania

K3DVS	121,788-	600-68-A-36
W3ECR	53,463-	251-71-A-21
W3MQC	40,320-	240-56-A-24
K3EYL	27,216-	192-48-A-16
K3JHA	17,820-	220-27-A-28
W3JXI	12,183-	132-31-A-12
W3IAR	6840-	114-20-A- –
K3LSX	6750-	78-30-A-23
K3JNP	6498-	115-19-A-20
K3BKL	3750-	51-25-A-13
W3EAN	3750-	75-25-B- 3
W3RAE	2850-	50-19-A- 5
W3HGZ	2295-	51-15-A- 7
K3ANU	1980-	54-12-A- 3
W3AHX/3	1443-	37-13-A- 5
W3GSC	1202-	45- 9-A- 7
K3IDY	1092-	28-13-A- –
W3BRU	900-	50- 6-A-20
W3QEZ	627-	19-11-A- 4
K3BPQ	570-	38- 5-A- 3
K3HLN	375-	25- 5-A- 4
K3AWD	360-	40- 3-A- –
W3NHX	180-	10- 6-A- 1
K3MBS	153-	26- 2-A-11
W3JMG	138-	23- 3-B- 3
W3FWC	117-	13- 3-A- –
K3HFZ	48-	8- 2-A- 5
W3WNE	36-	6- 2-A- 3
K3JGI	27-	3- 3-A- –
W3ZXV	27-	9- 1-A- 1
W3YLL	3-	1- 1-A- 1

Md.-Del.-D. C.

W3ZKH	84,663-	411-69-A-40
K3LFO	3630-	56-22-A- 6
K3JIX	3366-	52-22-A- 9
WØBPO/3	1491-	36-14-A- –
K3MDL	36-	6- 2-A- 5

Southern New Jersey

W2LBX	35,223-	200-59-A-36
WA2IEK	35,022-	225-52-A-30

(Continued on page 156)

W2BLV 33,300- 185-60-A-18
K2PZF 19,908- 120-56-A-21
WA2DWT 19,251- 140-46-A-25
W2ADA 14,859- 128-39-A-16
W2DMR 10,974- 118-31-A-19
W2HXF 10,965- 89-43-A-25
W2QKJ 8736- 104-42-B- –
W2ZX 8600- 108-40-B- 5
WA2NEO 7722- 101-26-A-12
K2ODZ 7500- 100-25-A-13
WA2LME 5775- 77-25-A-19
K2MKD 2847- 73-13-A-12
W2OSD 2640- 40-22-A- 5
WA2ETY 2478- 59-14-A-12
WA2EMB 2400- 100- 8-A-24
K2KCI 2208- 92- 8-A-15
WA2GJE 2160- 80- 9-A-17
WA2GSO 2160- 80- 9-A-17
W2EIF 1809- 67- 9-A-11
W2ESG 1240- 33-20-H- 3
W2GVB 972- 54- 9-B- 6
W2ZUL 960- 40- 8-A-15
K2OHM 585- 39- 5-A- 9
W2BAY 414- 46- 3-A- 7
WA2NVS 336- 15- 8-A- 2
K2SXN 330- 55- 2-A-20
K2MGZ 324- 27- 4-A- 6
K2RZL 318- 53- 2-A- 8
W4HBO/2 315- 16- 7-A- 1
K2MGZ/2 279- 31- 3-A-10
K2EJW 276- 46- 2-A-10
W2ORA 240- 40- 2-A- 3
WA2HJI 228- 38- 2-A- 6
K2YIB 216- 24- 3-A- 4
W2LFN 140- 10- 7-B- 2
K2UWH 120- 20- 2-A- 1
W2FZP 84- 14- 2-A- 2
WA2NWY 84- 14- 2-A- 4
W2WKI 42- 7- 2-A- 2
W2SDO 32- 4- 4-B- 1
K2HBY 24- 4- 2-A- 1
WV2LCB/2 6- 2- 1-A- 1
K2HJY 3- 1- 1-A- 1
K2UQD (K2s UQD YIB) 46,170- 270-57-A-31
K2SHJ/2 (K2SHJ, WA2EIE) 43,680- 260-56-A-36
K2DEI (4 oprs.) 14,508- 156-31-A-13
K2MPV (K2MPV, W2REB) 3510- 78-15-A- 9

Western New York

K2GXI 119,574- 550-73-A-40
K2BHP 80,190- 405-66-A-38
W2VDX 51,972- 284-61-A-28
K2MNE 11,554- 109-53-B-21
W9PVH/2 5250- 76-35-B-18
K2QWD 1350- 75- 6-A-28
K2GZT 700- 25-14-B- 5
K2HND 234- 13- 9-B- 8
W2MAU[1] 129- 43- 1-A-12
K2TXG 60- 20- 1-A- –

Western Pennsylvania

W3LWW 22,113- 189-39-A-20
W3KTW 14,910- 142-35-A-12
W3BBO 11,152- 139-41-B 21

CENTRAL DIVISION

Illinois

W9NZM 82,454- 379-73-A-37
W9QXO 69,948- 349-67-A-36
K9UIT 41,126- 242-57-A-28
W9VBV 34,485- 209-55-A-18
K9MQI 29,205- 177-55-A-25
K9MDH 27,600- 192-50-A-11
W9PNY 19,890- 130-51-A-29
K9OZY 17,640- 140-42-A-22
K9SJQ 17,451- 139-42-A-35
W9RHV 15,990- 130-41-A-26
K9KIC 13,860- 140-33-A- –
K9VQA 11,985- 118-34-A-19
K9TNA 11,760- 100-40-A-15
W9IWG 11,234- 137-41-B-15
K9KHZ 11,070- 90-41-A-14
W9FVU 8554- 91-47-B- –
W9JJT 8091- 87-31-A-11
K9OUY 7482- 86-29-A- 9
W9NZS 7392- 77-32-A-13
K9UMB 7200- 80-30-A-18
W9QDM 7172- 82-44-B-15
K9GTG 6624- 70-32-A- 5
K9WNX 6426- 79-28-A-13
K9CSW 5382- 69-26-A-12
W9LQF 4950- 55-30-A- 6
K9BTR 4620- 70-22-A-13
W9JMY 3705- 65-19-A- 9
W9UWP 3528- 56-21-A- 5
W9QKE 3338- 45-25-A- 7
W9ZYL 2808- 54-26-B- 9
K9QFR 1638- 42-13-A- 2
W9FDY 1311- 23-19-A- 4
K9QLD 1065- 36-15-B-19
W9CRN 990- 22-15-A- 6
K9UIL 336- 21- 8-B- 6
W9TAL 147- 7- 7-A- 3
K9VLQ 140- 16- 3-A- 4
W9AA/9[2] 114- 19- 2-A- 3
K9WEH 46- 4- 4-A- 1
K9RWK 30- 5- 2-A- 1
K9ISP 9- 3- 1-A- 1
K9OCU 3- 1- 1-A- 1
K9KDI 2- 1- 1-B- –

K9OYT 2- 1- 1-B- –
W9BMQ-9 (9 oprs.) 24,840- 192-45-A-34
K9QFZ (K9s QFZ RJP) 18,306- 138-46-A-14
W9OKV/9 (12 oprs.) 1092- 57- 8-A- –

Indiana

K9GMD 55,965- 267-70-A-37
K9PNY 44,640- 240-62-A-35
W9EPI 21,060- 132-54-A-35
W9UEM 12,227- 105-39-A-14
K9CUY 7098- 88-28-A- 9
K9MAN 36- 4- 3-A- 1
K9TZH 4- 2- 1-B- –

Wisconsin

W9VZP 81,192- 398-68-A-38
W9NUW[3] 37,212- 223-56-A-21
K9MTM 35,280- 196-60-A-40
K9CJK 33,660- 220-51-A-25
W9VQG 24,360- 140-58-A-30
W9CJO 19,500- 126-52-A-20
K9QHR 9558- 90-36-A-16
W9PQA 8256- 86-32-A- 7
K9PSH 5363- 72-25-A-15
K9SNO 5148- 54-33-A-13
W9UGT 3564- 54-22-A- 7
W9DOS 3180- 53-20-A-11
K9SBQ 2328- 50-16-A-13
W9VSO 1620- 60- 9-A-11
W9ABU 1407- 34-14-A-12
K9UTQ 900- 22-15-A- 5
K9TID 612- 17-12-A- 2
K9JPS 512- 16-11-A- 4
K9ELT 264- 11- 8-A- 1
W9KQD 144- 12- 4-A- 1
W9ULA 135- 9- 5-A- 3
K9GDF 66- 11- 2-A- 1
K9VSY 48- 4- 4-A- 1
W9YT (4 oprs.) 61,523- 341-65-A-26
W9HHX (K8KDA, K9GDF) 1326- 26-17-A- 3
W4VRD/9 (W4VRD, W9AIW) 528- 16-11-A- 2
W9SZR/9 (2 oprs.) 3- 1- 1-A- 1

DAKOTA DIVISION

North Dakota

K0UTL 61,992- 332-63-A-24
W0WFO 44,880- 220-68-A-23
K0VWG 17,126- 118-49-A-22
W0GQD 12,878- 137-47-B-16
K0MPH 312- 13- 8-A- 1
W0HSC (13 oprs.) 64,740- 335-65-A-36

South Dakota

W0PRZ 93,002- 640-73-B-33

Minnesota

W0VIP 18,780- 157-60-B- –
K0KYK 630- 22-10-A- 2
K0RFG/0 (4 oprs.) 6222- 61-34-A-19

DELTA DIVISION

Arkansas

K5TST 63,657- 333-66-A-30
W5TIQ 48,090- 233-70-A-21
W5CGR 45,792- 212-72-A-40
K5USE 780- 20-13-A- 1

Louisiana

W5KC 126,210- 601-70-A-36
W5HMU 89,046- 444-68-A-35
K5YMY 64,320- 336-64-A-32
K5KLA 54,891- 321-57-A-27
K5MPM 50,112- 266-64-A-20
W5INL 41,757- 227-62-A-12
K5QXV 41,490- 240-60-A-33
K5QXR 36,477- 291-63-B-24
K5BSL 31,977- 188-57-A-19
K5BXX 17,907- 134-47-A-10
K5LXZ 17,250- 125-46-A-26
W5QPS 15,000- 125-40-A-12
K5SNO 14,280- 120-40-A-11
K5UNP 14,145- 117-41-A-13
K5CVY 9207- 100-31-A- 3
W5GFM 6232- 85-38-B-13
W5LDH 3248- 59-28-B- 4
W5LJY (K5s PCS PGT) 27,384- 250-56-B-25
K5AQY (K5AQY, KN5DEJ) 5110- 77-35-B- 9

Mississippi

W5DRI 107,778- 506-71-A-26
K5CFP 1008- 24-14-A- 4

Tennessee

K4LPW 141,474- 646-73-A-33
K4KIN 62,400- 323-65-A-29
K4RTA 54,300- 275-68-A-23
K4TTA 42,240- 220-64-A-20
K4RSY 36,075- 185-65-A-25
K4QNI 30,508- 263-58-B-27
W4FJR 23,772- 160-56-A-26
W4OGG 6825- 65-35-A- 7

(Continued on page 158)

GREAT LAKES DIVISION

Kentucky

W4NWT	71,208-	344-69-A-38
K4VUD	28,728-	174-56-A-14
K4JHR	25,136-	238-56-B-27
K4MZW	2640-	40-22-A- 8

Michigan

K8PCZ	61,425-	315-65-A-33
K8RFC	49,043-	252-65-A-35
K8MJZ	6603-	71-31-A-11
W8JKD	2916-	54-27-B-16
W8TWJ	1392-	29-24-B- 3
K8OZN	60-	21- 1-A- 4

Ohio

W8AJW	96,063-	452-71-A-37
W8KZH	49,502-	271-61-A-34
W8BMX	43,550-	335-65-B-34
W8QEQ	42,608-	223-65-A-31
K8AAG	34,821-	220-53-A-32
K8HZN	34,503-	224-53-A-23
W8HQK	30,363-	176-58-A-26
W8TKM	28,188-	162-58-A-22
W8BIM	27,376-	236-58-B- -
W8UQN	22,800-	152-50-A-18
K8JSZ	22,724-	220-52-B-26
W8ZZC	11,560-	145-40-B-21
W8NCV	8652-	103-42-B-20
K8OIR	7770-	76-35-A-16
W8OYV	7500-	100-25-A-18
K8DWQ	7242-	110-34-B-14
K8PMW	6561-	83-27-A-12
K8KSN	6075-	81-25-A-28
W8YAB	5976-	83-24-A-22
W8LDQ	4672-	74-32-B-22
W8FNX	4640-	80-29-B-13
W8NHO	3591-	57-21-A-11
K8LWF	2040-	34-20-A- 5
W8BSR	1872-	39-16-A- 5
W8IBX	1709-	34-17-A- 2
W8CRKQ	1700-	43-20-B- 3
W8LKD	1216-	38-16-B- -
W8NAL	1170-	30-13-A- 6
K8EMIL	990-	30-11-A- 6
W8VSJ	736-	23-16-B- 5
W8IY	567-	21- 9-A- 2
W8DOG	561-	17-11-A- 8
W8MEI	330-	22- 5-A- -
K8HBN	45-	5- 3-A- 1
K8MMJ	28-	10- 1-A- 2

HUDSON DIVISION

Eastern New York

W2AKN	35,616-	213-56-A-20
K2TMC	8721-	82-38-A-12
WA2FPT	252-	14- 9-B- 7

N. Y. C.-L. I.

K2TAP	79,680-	424-64-A-31
W2WPH	35,526-	191-62-A-23
WA2FBC	29,670-	215-46-A-34
W2MGV	29,058-	167-58-A-26
WA2GWT	27,676-	207-45-A-36
K2KHL	22,409-	154-51-A-11
W2YHP	22,545-	167-45-A-31
K2HQR	22,343-	166-45-A-30
W2TUK	19,221-	149-43-A- 7
W2JFU	17,640-	140-42-A-24
W2EEN	17,595-	115-51-A-12
K2LDB	14,994-	119-42-A-19
W2OQI	13,536-	144-47-B-22
K2JVD	11,378-	108-37-A-14
K2TAQ	9405-	105-30-A-20
K2JTW	8811-	89-33-A-17
WA2EER	6360-	106-20-A-18
K2ZGZ	5580-	62-30-A-12
K2KJX	4640-	80-29-B-12
K2MSY	3465-	55-21-A-21
W2JGQ	3192-	56-19-A-10
WA2GWF	2337-	41-19-A- 5
WA2HRX	2268-	45-18-A- 8
K2ENC	2220-	37-20-A-15
W2NNH	1620-	45-12-A-10
W2MQB	1254-	33-19-B- 5
WA2BEI	1240-	31-20-B- 2
K2IHS	1062-	30-14-A- 5
K2RYI	897-	23-13-A- 9
K2OJQ	504-	28- 6-A- 6
W2JRQ	504-	21- 8-A- 1
K2JZF/2	351-	13- 9-A- 8
K2VBJ	192-	16- 6-B- 2
K2OGJ	113-	8- 5-A- 1
WV2PQV	69-	23- 1-A- 4
K2CTK	54-	6- 3-A- 1
W2KLS	48-	8- 2-A- 6
WA2ITR	36-	6- 2-A- 1
WA2KSK	36-	4- 3-A- 1
WA2FMS	30-	10- 1-A- 1
K2CMY	24-	4- 2-A- 1
WA2EMM	15-	5- 1-A- 1
WA2ECN	12-	4- 1-A- 1
WA2EFN	12-	2- 2-A- 1
WA2BQK	6-	2- 1-A- 1
WA2KCH	3-	1- 1-A- -
WA2IQC (2 oprs.)	6399-	79-27-A- -
K2KAZ/2 (K2KAZ, WA2NWJ)	66-	6- 4-A- 1

Northern New Jersey

K2RBD	48,941-	281-59-A-40
W2PEV	30,687-	193-53-A-26
K2HLC	25,875-	174-50-A-29
WA2FVR	16,236-	125-44-A-23
W2JKH	5072-	82-21-A- 5
K2BPG	4446-	58-26-A-11
K2UFM	4032-	72-28-B- 6
W1SBD/2	1680-	35-16-A- 8
WA2GUB	552-	24- 8-A- 2
K2GDR	456-	19- 8-A- 8
K2SFQ	75-	5- 5-A- 1
WA2EJZ	63-	7- 3-A- 1
WA2CCF	32-	4- 4-B- 1
K2KOD	27-	3- 3-A- 1
K2MUT/2 (3 oprs.)	26,579-	190-47-A-31
W2NSG (9 oprs.)	18,819-	153-41-A-17

MIDWEST DIVISION

Iowa

KØMMS	81,165-	387-70-A-36
WØAXE	12,987-	112-39-A-11
KØSLY	8436-	74-38-A- 6
KØIHC	6405-	61-35-A- 9
KØBNF	6300-	71-30-A-14
WØBGB	4320-	45-32-A- -
KØVND	3402-	54-21-A- 6
WØWWM	3150-	30-21-A- -
WØGQE	630-	30- 7-A- 4
WØNCS	312-	13- 8-A- 2
KØMMQ	192-	16- 4-A- 2
WØJAQ	45-	5- 3-A- -
KØVEJ	18-	3- 2-A- 1
WØMHC (4 oprs.)	69,966-	339-69-A-37

Kansas

K4USB/Ø	15,674-	123-43-A-10
KØYWG	12,771-	103-43-A-22

Missouri

KØLTK	51,678-	263-66-A-39
KØORB	21,150-	150-47-A-28
KØETY	2052-	29-24-A- 8
KØYIP	2016-	32-21-A-10
KØMJZ	1950-	34-20-A- 8
KØWKZ	96-	16- 2-A- 2
KØCQA	6-	2- 1-A- 1
WØQON (13 oprs.)	9920-	135-40-B-21
WØQEV (4 oprs.)	1722-	41-14-A- 5

Nebraska

KØQJG	41,664-	227-62-A-24
KØTCD	24,360-	140-58-A-14
KØWIF	22,368-	237-48-B-22
KØQH	6342-	76-28-A-16
KØAGC	4934-	74-23-A-22
KØLWX	1700-	52-11-A-25
KØLDP (5 oprs.)	69,480-	397-60-A-40
WØFBY (2 oprs.)	1056-	44- 8-A- 8

NEW ENGLAND DIVISION

Connecticut

W1AW[4,5]	1980-	30-22-A- 2
W1ICP[4]	8-	2- 2-B- -
W1ETF (K1s ANV EAT, W1ETF)	32,208-	265-61-B-21
K1OOJ (2 oprs.)	23,814-	221-54-B-24

Maine

W1GKJ	59,378-	313-65-A-34
W1DIS	31,800-	265-60-B-17

Eastern Massachusetts

K1KTH	61,380-	333-62-A-36
W1EJE	32,214-	182-59-A-25
W1OTH	16,065-	128-42-A-17
K1LXQ	13,482-	107-42-A-16
K1INO	10,157-	92-37-A-17
W4ADU/1	5141-	75-23-A-11
K1JFM	1395-	31-15-A- 4
W1IEF	63-	7- 3-A- 2
K1MVN	48-	8- 2-A- 1
K1KUG (K1KUG, W1JDA)	61,419-	351-59-A-31
W1MX (W4ADU, K9CDD)	3840-	64-30-B- 6
W1AF (W1FTH, W2ROH, WA2IVO)	429-	19-11-B- 2

Western Massachusetts

K1LRB	45,504-	237-64-A-32
W1DGJ	34,200-	190-60-A-19
W1DXS	16,704-	116-48-A-13
W1MHS	5288-	73-25-A-21
K1LNM	630-	21-10-A- 3
K1LNC	240-	14- 8-A- -

New Hampshire

W1FZ	42,750-	250-57-A-21
K1HK	792-	22-12-A- 1

Rhode Island

K1HMO	22,650-	151-50-A-23
K1HYG (K1s HYG LNP)	51,243-	279-62-A-34

(Continued on page 160)

COAXIAL TYPE SWITCHES
.... now available in single or multi-gang

Now you can switch coaxial line circuits quickly and without error. These handy, inexpensive units are available with "UHF", "BNC", "N" and Phono type connectors for use with either 52 or 75 ohm lines. Phono connector types are specific for Hi-Fi applications. Other types are designed to handle RF Power up to 30 MC, 1 KW input.

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Model 551A—Single gang, 2 pole, 2 position special purpose switch with UHF connectors. Ideal for switching any device in or out of series connection in coax line circuits. Price: $7.95 each.

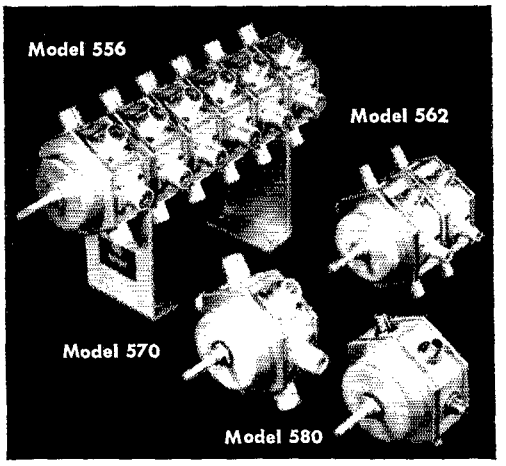
Model 560—Single gang, single pole, 5 position switch, same as Model 550A except with BNC type connectors. Price: $11.95 each.

Model 561—Single gang, 2 pole, 2 position special purpose switch, same as Model 551A except with BNC type connectors. Price: $9.95 each.

Model 570—Single gang, single pole, 5 position switch, same as Model 550A except with N type connectors. Price: $13.35 each.

Model 580—Single gang, single pole, 5 position switch, same as Model 550A except with Phono type connectors. Price: $7.35 each.

Multiple gang types, up to 6 gang for single pole—5 position switches, and as required for 2 pole—2 position switches, are made to order with any connector types listed above. Prices on request.



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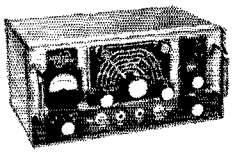

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PMR-8
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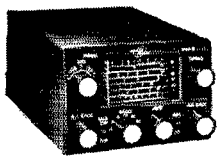

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Vermont

K1MVV	240-	10-	8-A- 2

NORTHWESTERN DIVISION

Alaska

W9KLD/KL7	976-	32-	16-B- 2
KL7AWR (6 oprs.)	19,250-	175-	55-B- –

Idaho

W7MKI	53,664-	282-	64-A-38
W7FTK (K7CJR, W7FTK)	7673-	83-	33-A-22

Montana

W7JHL	66,336-	348-	64-A-30
W7CRY	49,248-	288-	57-A-23
K7KME	13,770-	109-	45-A-20

Oregon

W7UGQ	60,117-	358-	58-A-34
W7SPX	40,362-	326-	62-B-23

Washington

W7BSW	156,366-	714-	73-A-34
W7UWT	102,240-	538-	64-A-33
K7ILQ	66,681-	361-	62-A-36
W7COP	24,150-	161-	50-A-33
K7AYD	19,224-	178-	54-B-27
K7CHD/7	13,560-	113-	40-A-20
W7OVJ	5535-	63-	30-A-13
K7AYC	1292-	38-	17-B- 7
W7TJS	702-	20-	12-A- 5
K7MFF	486-	19-	9-A- 3
K7ATD	21-	7-	1-A- 5
K7GBW	12-	2-	2-A- 1
W7AZI (W7s AZI WLX)	8544-	89-	32-A- 6
W7WLX (W7s AZI WLX)	3312-	46-	24-A- 4

PACIFIC DIVISION

Hawaii

W5BJZ/KH6	85,374-	459-	62-A-36

Nevada

W7KOI	7942-	106-	38-B- 9

Santa Clara Valley

K6VGW	94,269-	478-	67-A-38
K6ERV	77,586-	391-	67-A-36
WA6HZM	12-	2-	2-A- 1

East Bay

W6VNH	85,800-	442-	65-A-30
W6BSY	81,532-	603-	68-B-34

San Francisco

K6EIE	32,208-	176-	61-A-25
W6YEJ	7290-	68-	36-A-12

Sacramento Valley

W6SFH	4719-	72-	22-A-26

San Joaquin Valley

K6OOW	69,225-	358-	65-A-22
K9PKJ/6	37,791-	222-	57-A-27
WA6FOL	7008-	73-	32-A- 9
W6HYK	83-	6-	5-A- 1

ROANOKE DIVISION

North Carolina

K4FWF	73,004-	414-	62-A-36
W4AWM	34,626-	204-	58-A-21
W4TS	23,850-	159-	50-A-27
K4DGK	5250-	70-	25-A- 9
K4JYN	48-	16-	1-A- 2
K4BUJ (8 oprs.)	59,160-	435-	68-B-39

South Carolina

W9YFT/4	3525-	47-	25-A- 5
WA6IHJ/4	1584-	33-	18-A-18
K4YYL	198-	11-	9-B- 1
W4HNW (9 oprs.)	57,260-	423-	70-B-40

Virginia

W4BVV	70,823-	337-	71-A-40
K4EQT	41,832-	249-	56-A-39
K4JQO	41,468-	243-	57-A-39
K4LPR	37,224-	259-	72-B-27
K4HUU	14,904-	111-	46-A-14
K4FTQ	12,528-	116-	36-A-20
K4LUA	11,700-	100-	39-A-21
K4SQP	10,185-	97-	35-A-21
K4RDT	7440-	80-	31-A-21
W4DKL	6789-	73-	31-A-15
K4TSU	5775-	77-	25-A-18
W4ULY	5580-	61-	31-A- 9
K4IAU	5292-	74-	24-A-16
K4EPO	2064-	43-	16-A- 7
K4VCL	1755-	46-	13-A-12
K4CGY	756-	28-	9-A- 5
K4WVS	378-	21-	6-A- 6
W4SDK	105-	7-	5-A- 2
K4LHB	102-	17-	2-A-17
K4UMK	90-	15-	3-B- 3

(*Continued on page 162*)

K4IKF	72-	12-	2-A- 1
K4CEK	54-	18-	1-A- 9
K4ZHA	54-	9-	2-A- 1
W4ZZV	39-	13-	1-A- 1

West Virginia

W8UYR	2700-	46-	20-A- 6
K8QYG	210-	10-	7-A- 1
K8MIH (7 oprs.)	61,824-	327-	64-A-39

ROCKY MOUNTAIN DIVISION

Colorado

KØOER	67,770-	382-	60-A-29
KØPGM	51,437-	330-	53-A-26
KØTMM	40,320-	240-	56-A-15
KØMZN	35,568-	209-	57-A-22
KØSUB	24,170-	203-	41-A-11
WØECY	22,568-	203-	56-B-19
KØWWJ	18,603-	117-	53-A- –
KØUKB	15,876-	126-	42-A-16
KØVGN	12,000-	100-	40-A-16
WØSIN	9630-	107-	30-A- 9
KØJSD	7871-	80-	33-A-14
KØYGH	5175-	57-	30-A- 5
KØZQR	3735-	43-	30-A-13
KØFGJ	2178-	33-	22-A-16
KØGAS	900-	25-	12-A- 5
KØRGU	432-	24-	6-A- 5
WØYQ (11 oprs.)	112,058-	568-	67-A-39
KØPXB (KØs PXB RXJ)	78,306-	655-	62-B-35
KØRGV (KØs RGV RJA)	23,865-	190-	43-A-15
WØOUI (5 oprs.)	8417-	91-	31-A- 9

Utah

K7BHE	56,273-	313-	61-A-30
W7MWR	6324-	68-	31-A- 7
K7HVF	2489-	40-	21-A- 8

New Mexico

K8DIO/5	95,067-	504-	63-A-34
K5UYF	80,231-	428-	63-A-25
W5AHB	38,970-	221-	60-A-38
W5FHL	29,520-	204-	48-A-15

Wyoming

K7IAY	48,198-	419-	58-B-40
W7CQL	47,676-	275-	58-A-29
W7SZZ	12,360-	105-	40-A- 5
W7LKQ	3150-	50-	21-A- 8
W7SQT	288-	12-	8-A- 1
W7AMU	24-	8-	1-A- 1

SOUTHEASTERN DIVISION

Alabama

W4CWO	40,281-	234-	58-A-38
W4DS	34,706-	255-	67-B-30
W4USM	27-	3-	3-A- 1

Eastern Florida

K4YXC	86,678-	449-	65-A-20
K4VSA	41,003-	264-	55-A- –
W4HVD	34,371-	204-	57-A-18
K4GSD	25,125-	174-	50-A-21
W4CQQ	12,128-	119-	35-A-11
K4YBF (4 oprs.)	39,852-	259-	54-A-26

Western Florida

W4CMG	54,234-	402-	69-B-35
K4DSW	25,358-	206-	62-B-17
K4ZAC	13,332-	103-	44-A-12

Georgia

K4POL	28,392-	182-	52-A-24
W4OPB	11,781-	94-	42-A-12
W4YJV	1890-	32-	20-A- 7
K4JNS	9435-	128-	37-B- 8

West Indies

KP4YT	8694-	95-	46-B- 6
KP4AWH	8033-	77-	35-A- 8

Canal Zone

KZ5SW	26,832-	172-	52-A-12
KZ5VW	17,348-	130-	45-A-12

SOUTHWESTERN DIVISION

Los Angeles

K6EVR	227,220-	1090-	70-A-33
W6CFM	51,883-	184-	65-A-30
K6OOL	23,550-	158-	50-A-16
WA6FRA	18,480-	148-	44-A-27
W6BYT	14,841-	150-	51-B-23
WA6ABZ	11,520-	100-	40-A-19
W6OPT	6318-	85-	26-A- 7
K6SUC	6120-	68-	30-A- 4
W6SWE	1854-	34-	19-A- 3
K6YYN	419-	16-	9-A- 3
K6THW	405-	15-	9-A- 4
K6QPH	390-	13-	10-A- 1
WA6HQC	270-	10-	9-A- 1
W6BUK	234-	13-	9-B- 3
WA6EOL	30-	5-	2-A- 1

W6UFJ	12-	2- 2-A-	1
W6WGV	9-	3- 1-A-	1
WA6ANB (4 oprs.)	6840-	83-30-A-	12
W6UGU (2 oprs.)	1491-	36-21-B-	4
K6ICQ (K6s ICQ ICS)	842-	27-11-A-	3

Arizona

W7WUC	60,885-	313-66-A-	33
K7LKN	55,283-	299-63-A-	39
W7ENA	54,945-	278-66-A-	22
K7HDH	41,949-	241-59-A-	25
K7CLA	31,379-	184-57-A-	22
K8VTB/7	12,051-	104-39-A-	14
K7CAX	6255-	71-30-A-	3
W7IQS/7 (4 oprs.)	102,528-	542-64-A-	35

San Diego

W6VAK	58,926-	322-61-A-	23
WA6CZR	480-	16-10-A-	1

Santa Barbara

WA6IKO	19,325-	150-43-A-	30
W6UWL	7772-	79-33-A-	11
W6MNE	36-	4- 3-A-	1
WA6GBC (WA6s GBC JAB)	39,029-	222-59-A-	40

WEST GULF DIVISION

Northern Texas

K5IID	115,776-	576-67-A-	30
W5KHP	58,404-	315-62-A-	23
K5SEK	55,800-	300-62-A-	21
K5YIB	55,125-	264-70-A-	34
W5KZX	24,264-	170-48-A-	21
K5KZA	19,037-	130-49-A-	19
W5SOD	16,023-	109-49-A-	17
K5ZOM	11,009-	88-41-A-	23
K5UTV	5904-	62-32-A-	7
K5RDQ/5	3-	1- 1-A-	1

Oklahoma

W5IWL	84,320-	422-67-A-	30
K5MID	37,224-	283-66-B-	22
K5MIZJ	16,224-	111-49-A-	23
W5OUE	3168-	50-22-A-	4
K5LDM (3 oprs.)	15,876-	113-49-A-	26

Southern Texas

K5JCC	72,638-	375-65-A-	36
K5RQI	60,390-	330-61-A-	–
K5ATT	47,523-	260-62-A-	34
W5AVM	46,508-	296-53-A-	23
W4GYX/5	39,930-	243-55-A-	23
K5ZIT (K5ZIT, W5BKM)	79,165-	560-71-B-	32

CANADIAN DIVISION

Maritime

VO1DZ	1283-	30-15-A-	7

Ontario

VE3PV	13,500-	100-45-A-	10
VE3CKW	7296-	76-32-A-	8
VE3JF	10-	2- 2-A-	–

Manitoba

VE4SD	28,944-	203-48-A-	12

Saskatchewan

VE5ZM	22,613-	168-45-A-	16

Alberta

VE6AAV	12,180-	104-40-A-	8
VE6GB	2657-	39-23-A-	8

British Columbia

VE7CE	26,514-	248-54-B-	21

[1] K2ZRX, opr. [2] K9EEC, opr. [3] K9PQT, opr. [4] Hq. staff, not eligible for award. [5] W1WPR, opr.

ARRL thanks the following amateurs for submitting their logs for checking purposes: G.W.; W1RWR, K2ESO, W2MES, WA2IBF, W3s CDQ LC, W4WHK, W5ARJ, W6BES, K9IFB W9WEN, VE1DB, VE2BEY, VE3AO. **PHONE:** K1KPS/1, W4RLS, WA6AUD, K7ADI, VE3AO, VE6LN. QST

Summer Camp

(Continued from page 68)

them could transmit that rapidly after they had been in school only one week. One young fellow could transmit well over 20 w.p.m. after he had been in camp only a few days.

"Amazing," said Secretary Carl. "Wonderful," said the students. So everything is being set for the second school this summer. From the way things look already, it will be another sellout before long. Queries are coming in from some who heard about the school by communicating directly with the students while they worked last summer.

It really is quite a sight, 'way up there in the Blue Ridges, to drop into Camp Butler and watch the Novices at their hobby. It is a group that is as enthusiastic and happy as you'll ever find anywhere. And all of it springs from the idea of a fellow ham, K4DNJ. QST

Correspondence from Members

(Continued from page 83)

Mere "slaps on the wrist" of 2 or 3 months suspension, for such violations, make a mockery of the FCC regulations and license requirements. It's easy to figure the odds: a Technician, for instance, could operate on other bands for possibly a lifetime without being caught. So why not, if nothing is going to happen if you should get caught? This same logic could and does apply in many cases other than the ones I mentioned.

I say if this kind of punishment makes sense, then why have the farce of license requirements? Why not just do away with requirements and merely have permits, like the Citizens Band? Heaven forbid!! — *Carl W. Hoffmeier, W4LJV, Fort Lauderdale, Florida.*

Strays

A course in amateur radio is being presented over WTEN-TV, channel 10 in the Albany area, Tuesdays and Thursdays at 0630 local time. It is sponsored by the Mohawk Hudson Council on Educational Television, an educational corporation chartered by the Board of Regents of New York state. Instructors are WA2FPT and K2ZEL.

—•••—

The Foundation for Amateur Radio, Inc., with headquarters in Washington, D. C., has announced the John Gore Memorial Scholarship for either graduate or undergraduate study, full or part time. The scholarship pays $250 for the academic year, and is subject to renewal.

To be eligible, applicants must have completed one year in an accredited college or university and must be enrolled in a course of studies leading to a degree. They must hold an amateur license of at least General class. Preference will be given to applicants from the area served by the Foundation.

Applications should be made not later than June 1, 1961, for the academic year 1961–1962. Address the Chairman of Scholarship Award Committee, Foundation for Amateur Radio, Inc., Room 600, Munsey Building, Washington, D. C.

The Foundation of Amateur Radio, Inc., is composed of trustees elected from the 17 radio clubs in the Washington-Baltimore area. John W. Gore, W3PRL in whose honor the scholarship was named, was president of the Foundation until the time of his death last year. A prominent radio amateur in Baltimore for many years, he was a vice president of the Bethlehem Shipbuilding Corporation there.

—•••—

On Sunday, May 7, the Texas Tower Net will meet for the 1000th time. The net was originated by W1EUE to handle traffic to the various Texas towers. On this anniversary the net will open promptly at 1230 EDT on 3935 kc.

—•••—

Oh, boy! These coincidences. WØCGQ of Boulder, Colorado, says his first QSO was with KØCGQ, also of Boulder.

Hamfest Calendar

Alabama — The Annual Hamfest of the Mobile Amateur Radio club will be held May 27 and 28 at the Fort Wright Armory. Dutch Supper and Dance at Moose Lodge Saturday night. The following frequencies will be monitored for mobiles — 3955 kc., 29.560 Mc., and 50.7 Mc. Meals will be available at the hamfest site at noon Sunday. Assistance will be given those requiring motel reservations. For further information contact Victor N. Chambles, jr., K4KVF, Post Office Box 4422, Mobile, Alabama.

Kansas — The annual Hamarama of the Kaw Valley Radio Club of Topeka, Kansas will be held May 21, 1961, at Garfield Park in Topeka. There will be stations on 3920 and 29.6 for general information and directions. The program will include mobile hunts on 75 and 10 meters, and an auction. The covered dish lunch will be at noon. For further information contact "Bud" Weiser, WØKKF, 3300 Burlingame Road, Topeka.

Happenings

(Continued from page 67)

On motion of Mr. Meyers, unanimously VOTED to approve the holding of a Rocky Mountain Division Convention in Ogden, Utah, June 16–18, 1961; an Ontario Province Convention in Windsor on September 29–30, 1961; a Midwest Division Convention in Omaha, Nebraska, on October 7–8, 1961; a Kentucky State Convention in Lexington on October 28, 1961; and a Southwestern Division Convention in Anaheim, California, on June 1–3, 1962.

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

Bear Mountain Radio Club.....Arvin, Calif.
Brighton High School Amateur Radio Club.Rochester, N. Y.
Champaign County (Ohio) Amateur Radio Club
Urbana, Ohio
The Cleveland Twist Drill Amateur Radio Society
Cleveland, Ohio
Columbia Amateur Radio Club.....Columbia, Miss.
Coon Valley Amateur Radio Club.....Iowa
County Radio Association of Manistee....Manistee, Mich.
Greater Pittsburgh V.H.F. Society, Inc....Pittsburgh, Pa.
Henry Leavenworth Amateur Radio Club
Fort Leavenworth, Kansas
Ivyridge Amateur Radio Club.....Philadelphia, Pa.
Jamestown Area Radio Amateurs.....Jamestown, N. Y.
Kessler Amateur Radio Club.....West Orange, N. J.
Niagara Frontier DX Association.....Buffalo, N. Y.
The Northeast Oklahoma Very High Frequency Society, Inc.....Tulsa, Okla.
QRV Radio Club (High School).....Lawrenceville, Va.
Stanford H. Calhoun Amateur Radio Club (High School)
North Merrick, N. Y.
Sarnia Amateur Radio Club.....Sarnia, Ont., Canada
Scottsdale Amateur Radio Club.....Scottsdale, Ariz.
Terrace Amateur Radio Association.Terrace, B. C., Canada
Wyoming Amateur Radio Club....Grand Rapids, Mich.
Experimental Amateur Radio Society.....Rockford, Ill.
IMO V.H.F. Amateur Radio Club, Inc.....Angola, Ind.
Sun Prairie Amateur Radio Klub, Inc....Sun Prairie, Wis.
The Zephyr V.H.F. Society, Inc.....Woodcliff Lake, N. J.
West Jersey Radio Club, Inc.....Glen Gardner, N. J.
Convair-Pomona Ham Club.....Pomona, Calif.
Douglas Santa Monica Amateur Radio Club
West L. A. 64, Calif.

Director Meyers sought the opinion of the Committee as to whether his possible acceptance of a directorship of a company manufacturing antenna towers would affect his status as a League director; the Chair directed the General Manager to obtain a ruling from the General Counsel.

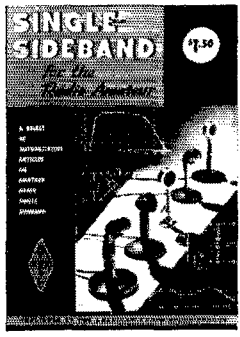
Communications Manager Handy announced briefly a summary of the results of the survey of opinion of amateurs on band usage between 3.5 and 29.7 Mc. On motion of Mr. Kahn, unanimously VOTED that the Communications Manager transmit to each director the blue-card responses from members in his division as soon as the statistical analysis is completed.

There being no further business, the Committee thereupon adjourned, at 4:45 P.M.

JOHN HUNTOON
Secretary

Going Sideband?

Planning to join the ever-increasing ranks of amateurs on sideband? If so, you need a copy of "Single Sideband for the Radio Amateur." It assembles under one cover the most noteworthy contributions to the art that have appeared in *QST*, revised and grouped as necessary to present a useful reference book. Amateur sideband is covered from its earliest history all the way through the theory and practice of sideband generation, detection, modulation, linear amplifiers, and various accessories which round out the well-equipped amateur station. Keep up to date. Get your copy now.



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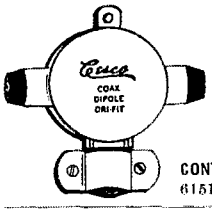

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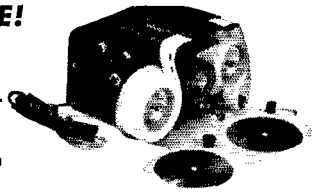

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Type CA Bumper Mounting, Chain Style	$6.60
Type R-200 Universal Ball Mounting — Coax type	6.90
Type R-300 Universal Ball Mounting — Standard	6.90
Type SA-2 Heavy Duty Stainless Spring Adaptor	7.50
Type RS-300 Comb. Ball and Spring Mounting — Standard Type	13.50
Style BXS — Center loaded Antenna for standard frequencies — 72" S. S. Whip	9.00
Style BSS — Same as BXS with SA-2 Spring	15.00
TS-896 — 96" one piece Stainless Whip — taper ground	4.50
TS-884 — 84" Same description as above	4.50
TS-872 — 72" Same description as above	4.20
BASE STATION	
GP-430 — Light weight Aluminum Ground Plane Antenna fully adjustable from 40-60 MCS	30.00
GP-450 — Same as above — adjustable from 20-40 MCS	24.00
GP-312 — Civil Defense VHF Ground Plane Antenna — Efficient and inexpensive — 108-120 MCS	4.80
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HAM-ADS

(1) Advertising shall pertain to products and services which are related to amateur radio.
(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.
(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (6) below.
(4) **Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.**
(5) Closing date for Ham Ads is the 20th of the second month preceding publication date.
(6) **A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously noncommercial in nature.** Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.
(7) **Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.**
(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

MICHIGAN State Hamfest, Grand Rapids 14th Annual, April 29, 1961. Pantlind Hotel. Write Post Office Box 333.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

WANTED: All types of aircraft or ground revrs, xmtrs or test equipment. Also large xmtr or special tubes needed. Ham gear bought and sold. For immediate action for cash write or phone Ted Dames, W2KUW, 308 Hickory St., Arlington, N. J.

MOTOROLA used FM communications equipment bought and sold W5BCO, Ralph Hicks, Box 6097, Tulsa, Okla.

WANTED: Military or Industrial laboratory test equipment. Electronicraft, Box 399, Mt. Kisco, N. Y.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase. W8RP, Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmany 8-8262.

CASH for your gear. We buy, trade or sell. We stock Hammarlund, Hallicrafters, National, Johnson, Gonset, Globe, Hy-Gain, Mosley and many other lines of ham gear. Ask for used equipment list. H. & H Electronic Supply, Inc., 506-510 Kishwaukee St., Rockford, Ill.

KWM1 and a few high plate dissipation tubes wanted. 304T1/TH 4-1000A, 4PR60A, etc. Ted Dames, W2KUW, 64 Grand Place, Arlington, N. J.

CHICAGOLAND Amateurs! Factory authorized service for Hallicrafters, Hammarlund, Globe, Gonset. Service all amateur equipment to factory standards. Heights Electronics, Inc., 1145 Halsted St., Chicago Heights, Ill. Tel. SKyline 5-4056.

WANTED: Old time commercially built and unaltered amateur spark transmitting and audiotron receiving equipment. Al T. O'Neil, Camp Lakeview, Lake City, Minn.

RECEIVERS: Repaired and aligned by competent engineers using factory standard instruments. Authorized factory service station for Collins, Hallicrafters, Hammarlund, National, Harvey-Wells. Our twenty-fifth year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

SSBERS! Keep up with SSB news and views! Join the Single Sideband Amateur Radio Association, dedicated to furthering good SSB operating; promoting advancement of SSB equipment; and disseminating SSB technical information. Read "The Sidebander", official publication of the SSBARA. Dues $3.00 yearly. Write for membership application, sample "Sidebander". to SSBARA, 12 Elm St., Lynbrook, N. Y.

BEGINNERS: Code memorized in one hour. New method. Used in armed services, ham radio, scouting. "Ketchum's Hour Code Course", $1.00 postpaid. Money-back guarantee. O. H. Ketchum, 10125 Flora Vista, Bellflower, Calif.

HAM License prep, resident courses, Novice and General classes; 3 evenings weekly. Delehanty Institute, 117 East 11th St., New York 3, N. Y. Tel. GR 3-6900.

COAXIAL Cable, new 58Ω—30 ft. length, $1.00; 180 ft. six lengths, $5.00. Send postage one pound per length. Radio magazines, buy, sell, trade. R. Farmer, Plainview, Texas.

WANT. Need, must have: ML-203-B wind measuring equipment, as used during WW-2. Top price. Will take complete units or parts. Made by Lionel Corp. N. K. Thompson, W1LWV, 99 Water St., Millinocket, Maine.

WANT 1925 and earlier ham and broadcast gear for personal collection. W4AA, Wayne Nelson, Concord, N. C.

HAM TV Equipment bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

DISTINCTIVE QSLS! Largest variety samples 25¢ (refunded). Sakkers, W8DED, Holland, Mich. (Religous QSL samples 10¢).

QSLS, Twenty exclusive designs in 3 colors. Rush $3 for 100 or $5 for 200 and get surprise of your life. 48-hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

QSLS. Quality and economy complete samples dime. QSL Printing, 4319 Wuthering Heights, Houston 45, Texas

QSLS. Giant packet samples, 25¢ (refundable). Don Tucker, K5OWT, Box 332, Ada, Oklahoma.

QSLS. Kromekote 2 & 3 colors, attractive, distinctive, different. Free ball point pen with order. Sample 10¢. K2VOB Press, 162 Midland Blvd., Maplewood, N. J.

QSL-SWL-CB-WPA. Finest. Since 1946. Largest assortment. Priced right. Send 10¢ for samples to: Glenn Print, 1103 Pine Heights Ave., Baltimore 29, Md.

QSLS "Brownie." W3CJI, 3110 Lehigh, Allentown, Penna. Samples. 10¢ with catalogue. 25¢.

C. FRITZ for better QSLS! Samples 10¢. P. O. Box 1684, Scottsdale, Ariz.

QSLS-SWLS. Samples 10¢. Malco Press, 1937 Glensdale Ave., Toledo 14, Ohio.

QSLS. Faster, lower prices. Catalog 25¢ (refundable) samples stamped envelope. Dick Crawford, K6GJM, Box 607, Whittier, Calif.

QSLS. Economy prices, prompt delivery. Send for samples. W7IIZ Press, Box 183, Springfield, Oregon.

CREATIVE QSL and SWL Cards. Are you proud of your card? If not let us print your next order. Write for free samples and booklet. Personal attention given to all requests. Bob Wilkins, Jr., KN6ZMT, Creative Printing, P. O. Box 1064-C, Atascadero, Calif.

SUPERIOR QSLS, samples 10¢, Ham Specialties, Box 3023, Bellaire, Texas.

QSLS, 3-color glossy, 100—$4.50. Rutgers VariTyping Service, 7 Fairfield Rd., New Brunswick, N. J.

PICTURE QSL. Cards of your shack, home, etc., Made from your photograph. 1000, $13.00. Raum's, 4154 Fifth St., Philadelphia 40, Penna.

QSLS, SWLS, reasonable prices. Samples 10¢. Robert Bull, W1BXT, Arlington, Vt.

QSLS that are different, colored, embossed card stock, and "Kromekote". Samples 10¢. HomePrint, 2416 Elmo, Hamilton, Ohio.

QSLS, SWLs, XYL-OMs (sample assortment approximately 9¾¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fantabulous, DX-attracting, prototypal, snazzy, unparagoned cards (Wow!). Rogers, KØAAB, 961 Arcade St., St. Paul 6, Minn.

QSLS-SWLS. Samples free. W4BKT Press, 123 Main, McKenzie, Tenn.

GLOSSY QSLS, 100, 4 colors, $3.50, Others less, Samples 10¢. Dick, W8VXK, 7373 No. M-18, Gladwin, Mich.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

QSLS. Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

QSLS-SWLS. 100 2-color glossy, $3.00; QSO file cards, $1.00 per 100. Samples, 10¢. Rusprint, Box 7507, Kansas City 16, Mo.

QSLS-SWLS. Free Samples. Spicer, 4615 Rosedale, Austin 5, Texas.

QSLS, 300 for $3.95. Free Samples. W9SKR, "George" Vesely, R.R. #1, Box 208-A, Ingleside, Ill.

OUTSTANDING (1½" Call) QSLS. One style; 100, $2.75; sample free. Gariepy, 2624 Kroemer, Fort Wayne, Ind.

QSLS Samples dime. Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLS, SWLS, Rubber stamps. Samples 5¢. Nicholas & Son Printery, P.O. Box 11184, Phoenix, Ariz.

DON'T Buy QSLs until you see my free samples. Boiles, 7701 Tisdale, Austin 5, Texas.

QSL: Samples 25¢ (refundable). Schuch, W6CMN, Wildcat Press, 6707 Beck Ave., North Hollywood, Calif.

QSLS, $2.50 and up. Samples 10¢. RLB Print M.R. 12 Phillipsburg, N.J.

FAST Service, send stamp for QSL samples. K2 Press, Box 372, Mineola, L.I., N.Y.

RUBBER Stamps, $1.50. Call and Address Hoar, W2UDO, 32 Cumberland Ave., Verona, N.J.

NEON-GLO 3-D QSL! Call letters stand out in dazzling colored "lights"! Also, new Outer Space designs. Free samples. Immediate reply. 3-D QSL, 5 Wood End Rd., Springfield, Mass.

QSLS. Samples, dime. Printer, Corwith, Iowa.

COMIC QSLS. Large variety of styles, with 4 choices of ink. Ed Mathis, Box 1056, Valdosta, Ga.

JUNE. July only! 10% Discount QSLS. Samples 10¢. Savory, 172 Roosevelt Rd., Weymouth, Mass.

RUBBER Stamps for hams, sample impressions, W9UNY, 542 North 93, Milwaukee, Wis.

SNAPPY, different QSLs. Dime. Filmcrafters, Box 304, Martins Ferry, Ohio.

QSLS. Large selection styles including photos. Lowest prices. Fast service. Samples dime. Ray, K7HLR, 679 Borah, Twin Falls, Idaho.

QSLS. Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

QSLS: $1.75 per 100, postpaid USA only. Glossy, red and green. All orders mailed within 10 days. Free Sample. Hobby Print Shop, Umatilla, Fla.

YLRL Specials. OM's, reasonable, nice designs, samples dime, W2DJH Press, Warrensburg, N.Y.

QSTS. Sell, swap 1932-1959. W9PLW.

NATIONAL SW-3 thrill box circa 1932 for sale. Also 40 albums *UPU stamps from 1957 Congress*. VE3ATU, 2408 Drury Lane, Ottawa 3, Ont., Canada.

CANADIANS: Sell Ranger, $250.00; SB-10, $105. Excint condx. KW coils, xfrmrs, tubes. Write for list. Rev. P. Bittner, WØAIH/VE3 Desboro, Ont., Canada.

TRADE Zeiss Contax IIIA 35mm camera with Zeiss Sonnar F2/50MM and Zeiss Sonnar F4|135MM lenses also Zeiss Universal viewfinder for Collins 75A3 or 75A4 receiver, cash adjustment if necessary. M. D. Samson, VE4GZ, RCAF Station, Westwin, Winnipeg, Manitoba, Can.

CANADIANS! G4ZU antenna's now stocked in Canada. Freight shared east of Winnipeg. Free literature from Canadian Distributor: Global Enterprises, 2033 W. 37th Ave., Vancouver, 13, B.C.

KWS-1, SC-101 integrated control unit and 75A-4. A complete and superb station in top condition. Package $2000. W2ADD.

LOWEST Prices: Latest amateur equipment. Factory fresh sealed cartons. Self-addressed stamped envelope for lowest quotation on your needs. HDH Sales Co., 919 High Ridge Rd., Stamford, Conn.

DON'T Fail FCC tests! Check yourself with a time-tested "Sure-check Test". Novice, $1.50; General $1.75; Extra, $2.00. We pay the postage. Amateur Radio Specialties, 1013 Seventh Ave., Worthington, Minn.

COMPLETE File of QST for sale: 1915-1951. Landa, R2, Clayton, Ga.

SOUTHERN California: Transmitters and receivers repaired, aligned, bandwidth, frequency, harmonics measured. Used ham gear bought, sold, traded. Robinson Electronics, 922 W. Chapman, Orange, Calif. Tel. KEllog 3-0500.

WANTED: Cash for surplus tech manuals, one or one hundred. State condition and equipment type. W4FXQ, Box 2513, Norfolk, Va.

TRANSFORMERS (3) W2EWL Special, $3.00 PP. Coils L1 thru L7, 3 xfrmrs, template for "W2EWL Special", $10.95 PP. Vitale, W2EWL, Denville, N. J.

SELL: 2mfd. G. E. Capacitors 4000V DC $9.00. F. G. Dawson, Detroit 10. Mich.

6 COILS for Transistor 6 meter converter December QST $5.95. Postpaid U.S.A. Specify I.F. W5ZKT, 1441 Pleasant Dr., Dallas, Texas.

SELL Complete station: all in exc. condx: Late serial No. Collins 75A4 with spkr, Phasemaster 2B, D-104 mike and will sell as package deal only for your best offer over $750. Also first check for $100 can pick up Johnson Matchbox, RME speech clipper, DB23A, 380B T-R switch, Bud FCC90 xtal calibrator, B&W 550 switch, B&W 650 Match-Master. Sry, cannot ship. Equipment must be picked up. Al Spiewak, K2CKZ, 1150 Broadway, N.Y. 1, N.Y.

COMPLETE Service: Transmitters and receivers. QSLS. Reasonable. KØDGX. Keith, 601 East 4th St. South, Newton, Iowa.

WANTED: Collins KW-1. A. Jensen, 208 N. Foothill Rd., Beverly Hills, Calif.

MAGAZINES: QST, 233 volumes, 1940 to current date; CQ, 86 vols., 1945 to 1953; 3 Handbooks; 1945-1946-1948. Best cash offer for lot. W8SWF, Dearborn, Michigan.

IF You held a two-way contact 40 or more years ago, you should join The Old Old Timer's Club. This is the Grand-daddy of all Radio Clubs. Once a member, always a member because initiation fee covers lifetime dues. Write S'y.-Treas., W2EG, Earl C. Williams, 507 Wayside Rd., Neptune, N.J.

TOROIDS: Uncased 88 Mhy, like new. Dollar each. Five/$4.00 P.P. DaPaul, 309 So. Ashton, Millbrae, Calif.

COLLINS 75S-1, in exc. condx, with spkr, $350.00. No trades, please! W7NOI, 1126 S. W. Curry, Portland 1, Oregon.

LAMINATE Your ticket, cards, photos at home. No heat! Guaranteed! 14 sheets of plastic, $1.00. Namecraft, Box 56N, Ft. Lee, N.J.

SELL: Mosely V-5 vertical antenna, complete; 80 thru 10 mtrs. Very reasonable; no shipping, sry. S. Savoia, 31 Scoville St., Torrington, Conn.

BRAND New Hammarlund HX-500 transmitter in factory sealed carton with warranty. W9DOO, Madison, Wisconsin.

VIKING "500" for sale. Ser. #41479, wired and aligned professionally, 4-400A final, in perf. condx: $700. K9ZEQ, 506 Maryhill Dr., Green Bay, Wisconsin.

TRADE Electronic parts for firearms. Want war Mausers, souvenir rifles or pistols. W5UZI, 1351 Sage Loop, Los Alamos, New Mexico.

NEW TV tubes, 6198 or 5527, $50.00. W1BYX, Box 122, Rockville, Conn.

SRY, Error in earlier ad! KWM-1, AC supply and mobile mount: $675 in perf. condx. H.T. Howard, 3719 Redwood Circle, Palo Alto, Calif.

FOR Collins in Detroit Area it's Michigan Ham Headquarters, also large selection of trade-ins on display. M. N. Duffy Ham & Electronics, 2040 Grand River, Detroit 26, Mich. Tel. WO 3-2270.

TRIGGER-W9IVJ. We buy short-wave equipment for cash. 7361 W. North Ave., River Forest, Ill. Business and residence Chicago TUxedo 9-6429. Mon-Fri. 12N-9 PM. Sat. 9 A.M.-5 P.M. by appointment.

TRANSMITTER DX-100, $155. K. Bedell, 260 Autumn Ave., Brooklyn 8, N.Y.

AF67, James C-1060 6/12 p.s., ps-2V, 115 p.s., $150; Super Six, noise limiter, $35; 600-D, $15. K5OKY/O, 15 Elm, Rolla, Mo.

GOING To college, must sell! Knight Ham Receiver w/s-meter and spkr, $99; Eico #147A sig. tracer, $18. Both are professionally wired and are in beautiful condx. R. Doane, 1516 Louisa Ct., Palo Alto, Calif.

SELL: 833 tube, $25; plate transformer 110-220V, 3300V, $25; DB20 Preselector, $35. Ben Hassell, W8VPC R 3, Okemos, Mich.

304TLs, new, $30 each, two for $50. W2WHW, 305 Hamilton Rd., North Syracuse, N.Y.

SELL: Heathkit mobile, Cheyenne, Comanche, power supply, mount. SX-101 MK III. Must sell. Offer? W2YCS, 145 Ackerman Ave., Ridgewood, N.J.

ATTENTION Novices! Adventurer, $25. W4SEB, 200 Weston Circle, Hopewell, Va.

B&W Linear amplifier L-1000-A in perf. condx in orig. carton and with instrux book, no scratches, $215.00. F.o.b. Spring City, Penna. Walt Clevenstine, W3CUO, 711 Arch St.

SELL TA-33 KW. Used only six months, $80. Contact Dick Snyder, K3IMR, Airville, Penna.

ATTENTION: Sell Valiant with GD-104 mike, $2.75; SX-100, $160; 1A33, $45. Harold Herring, Box 441, Phone 7486, Royston, Ga.

FOR Sale: Western Electric, Mercury wetted relays number D-168479, ideal for electronic keyers, $4.00 each of pair, $7.00 postpaid. K4DKJ, 3289 Hallwood Circle, Macon, Ga.

ATTENTION Arizona Amateurs: HT 37 $450; SX111, $249.50; SX140, $190.95; HT40, $99.95; G50, $319.50; G76, $379.50 (AC Supply $145; DC Supply $145); SX101A, $399.50 KWM-2 $1150; 32S-1, $666; 75S-1, $495; 30S-1 $1556; 312B-4 Console, $185, HX-500, $695; HQ145, $269; HQ 100, $189 HQ 110, $249; HQ 170, $359; NC270, $249.95; NC 303, $449; 100V, $795; MM-2 Analyzer, $149.50; SX 110, $159.95; S-38-E, $59.95; S-95, S-94 $64.95; 6N2 Converter, $89.95; 6N2 Transmitter, $129.50; Viking 500, $949.50; Citizens Band Messenger, $144.95; Invader, $619; Invader 2000, $1229; Ranger, $329.50; Drake 2-A, $269.95; Liberal Trades. Mail Orders Accepted. Southwest Electonic Devices, INC., 129 E. Jefferson, Phoenix, Arizona, AL 2-1741-42.

NEW York Area: Apache, SB-10, SX-100, spkr, assembled by extra amateur, all immaculate, a giveaway at $450.00. Write or call UL 3-2698, Armando Villamor, 425-41st St., Brooklyn 32, N.Y.

B&W 5100, $225; HQ-145 w/clock and calibrator, 3 mos old, $245; Harvey-Wells TBS-50C, w/home brew supply, $40; Johnson Matchbox, $40; DuMont 213A modulation 'scope, $30; homebrew transistor supply 6VDC in, p. 400 v., 100 Ma. outp., $20. Sry, no shipping! KIMUN, Joe Phillips, 4 Naples Ave., Norwalk, Conn. Tel. TEmple 8-1303.

FOR Sale: Ham and test equipment. Mostly in mint condx. Some junk. Want to clean out shack for RTTY equipment. Will sacrifice. Please send 4¢ stamp for list. K8NQH, 238 Knower St., Toledo 9, Ohio.

WANTED: Linesman's safety belt and antenna rotator system. Will answer all inquiries. A. J. Bertolisi, 382 Fulton St., Farmingdale, N.Y.

NEW THN Thunderbird beam, Triband, $85 and Globe King 500C. W2LFB, 13 Shepard, Nutley, N.Y. Tel. NO 7-7552.

SELL: HT-32, $400; Johnson KW w/desk, $1250; Johnson audio amp, $75; Johnson KW Matchbox, $50; Johnson swapping pad, 250-29, $10.00; Hallicrafters S-85, $75; RCA transmitter keying unit TE-497-E, $75; W2PAT teletype converter, $10; Model 26 teletype with table and power supply, $85. All equipment in a like-new condx. S. Bernie Kamp, K2GEI, 525 Westmoreland Ave., Syracuse, N.Y. Tel. GR 2-4184.

SWAP TV Repair Kit for SSB Exciter, etc. W4HHL, Troy, Alabama.

HAMFEST, June 4, Starved Rock Radio Club, George Keith, W9MKS, Secretary, RFD #1, Oglesby, Illinois.

WANTED: One Motorola FMR-13V receiver, dual channel, or any commercial dual channel receiver. Will buy straight out or swap FMR-13V single channel plus cash for dual channel. Robert W. Pyle, 122 Bruce St., Salem, Indiana.

KITS Assembled, quality workmanship. Twenty percent plus shipping. K4QCP, 2405 Spring Valley, Louisville 5, Ky.

HY-GAIN Forty-Eighty meter doublet, new, $25.00. W7GBJ, 1019 Roberts, Roseburg, Oregon.

VIKING II, in exc. condx, you pick up. $180.00. W2DCQ, 208 Phillips Ave., Trenton, N.J.

WANTED: Banjo, any style or condition. Will buy or trade good ham equipment. Richelieu, W9JS, 419 E. Willow, Wheaton, Ill.

TELREX 5-element 10-meter beam, $50.00; prop pitch motor with indicator, $35. Fred Norton, 1450 Winchester, Muskegon, Mich.

FOR Sale: Panadapter, Mod. PCA-2T-200, in exc. condx, w/instrux handbook, $70. Robert B. Hupper, K2PLD, 47 Willits Road, Glen Cove, L.I., N.Y.

SELL: Viking I. Want SSB transmitter. K9LQR, Hillsboro, Ind.

DUMONT 208 'scope, $60 or trade for six and two meter converters for NC-300: 4X150A tube, chimney and Eimac socket, $10 each set; three 115VAC blowers, $5.00 each. K1ABE, 130 Bishop Ave., Rumford, R.I.

SELL: NC-303 A-1 shape, no modifications: $270.00. John, WA2BJJ, 22 Ditmars, Brooklyn 21, N.Y. Tel GL 2-1973.

SELL: Columbia 2-speed tape recorder in gud working condx: $75. Tom Perron, KN8VRF, Ontonagon, Mich.

FOR Sale: 2500-2000 DCPS 500 Ma., $75; KW plate modulator Pr. 805s with speech amp, less PS, $65; pair 100THs, $35. All above for rack mount. Meissner Deluxe signal shifter, $35; 1000-6000 Mc. rcvr, 110 60cy. Make offer. K4DUR, 162 Persimmon St., Jesup, Ga.

QSTS. Complete run July 1923 to date. Cash and carry. Make offer. George F. Kirchhoff, 169 Riverside Island, Fox Lake, Ill.

SELL QST 1938-1960 run, $25.00. W9QON, Jerry Miller, 8414 Keystone, Skokie, Ill.

COMMUNICATOR III, 6 meter, for sale: $170 plus shipping. W1SUZ.

KITS Wired 1/3rd cost, K4LRX, W. L. Hilyerd.

SELL: 6-meter Gonset Communicator III with halo, 6 xtals, mike, in exc. condx: $170. Jeffrey Poll, WA2KHW, 254-24 84th Road, Floral Park, L.I. New York, Tel. FI-7-3521.

SX-99 with manual, $95; 10 mtr. 3-element Hy-Gain beam with T-match and balun, $15; Alliance T-10 rotor, control and bearing, $16. All are F.o.b. Wallingford, Penna. T. W. Johnston, Jr., W3TDZ, 305 Bickmore Drive.

CLEANING House: Johnson Viking I, TVI suppressed, $95; Johnson Matchbox, #250, $25.00; 90711 Millen VFO, $35; 6V Gonset I, $120; BC231 signal generator, $50; 6V Elmac transmitter, A54, $80; Elmac receiver PMR64, $85; Sonar M120 mobile transmitter, new, $60; 522 transmitter, 110V AC with cabinet, xtal mike connection, meter, electric channel switching, $40.00; BC1161A, surplus receiver for 2-meter in cabinet and S-meter, $20; CW receiver, new 2-3 Mc coils, $20; Sonar mobile 10-20-40 meter receiver 6V, $15; RK 41D22, RK4D, 32 tube, new, $10 ea. W2MHM, 2465 Knapp St., Brooklyn 35, N.Y.

WANTED: Set of 15-meter coils for HT-6 or HT-9 transmitter. W3AVW, Box 182, Rte 7, Pasadena, Md.

120 Mfd. 3000V oil-filled capacitor, $38.00 included crating. Jennings vacuum variable condenser Barry spec. $30; FCC 90 xatl calibr., $14.00; FC30 choke, $7.00; four 701A tubes, $9.00. W8LTF.

NEW Industrial dielectric heater 833A final, 3000 volt power supply, relay controls, timers, cost over $1000. Rebuild for kW linear, $100. W9ECC, 770 7th, West Bend, Wis.

DX-35, $35.00; VF-1, $10. K8CVV, 46 12 Woodland, Royal Oak, Mich.

CLEARING Unused Hallicrafters floor samples, liwe new, HT32A, $555; SX-101 with matching spkr, $365; HT-37, $385. Melville Radio Corp., 43 Hamilton Ave., White Plains, N.Y.

SELL: Elenco compression amplifier, new, never used: $32; Elmac AF67, $100; Kreco dynamotor 12V supp, $25.00; Sonar VFO for CW and NBFM, $20. W2PLB, 314 East 52nd St., Brooklyn, N.Y.

FOR Sale! In gud condx: Elmac AF67, $110; PMR-6A converted for 6/12 volt operation, with 6 volt supply, $70. Will trade for GSB100. Gordon Nordstrom, 7200 West 91st St., Los Angeles 45, Calif.

RTTY: Extra Hi-Q toroids, Q better than 200. Limited quantity of selected pairs. Complete specs with coils, $8.00 pr., 2 pr., $15.00. CQD! W5EIX, 2228 NW 56, Oklahoma City, Okla.

NEW BC221 complete, $49.50; 250TH tubes, $14.00; 829Bs, $4.00; run of QST 1933 thru 1950, $30; two kilowatt 3000V pwr. supp, $150; 120 watt allband am/phone xmtr, complete, $100; Gonset 10/11 meter converter, $15.00. Noise clipper, $5.00. W9DFW, 101 Fairview, Jeffersonville, Ind.

FACTORY-Wired CE20A with VFO and QT-1, $225.00; factory-wired P&H LA400 $125.00; Drake 1-A, $200; 20-40M birdcage ant. less mast, $45.00. W82BD, Charles Snover, 1605 Iowa, Midland, Mich.

HAMMARLUND HQ-150 in perf. condx, for sale: $176.00. R. C. Theurer, WA2HOH, R.D. #1, West Lake Rd., Skaneateles, N.Y.

FOR Sale: DX-100 w/latest modifications and HQ-140X. Both in like new condx. Best offer. William Masho, W3LZE, 894 Providence Rd., Media, Penna.

FOR Sale: Hammarlund SP-600 receiver; tunes 550 Kc to 54 Mc, 20 tubes. Excellent condx. Will ship RR Exp. $495.00. G. Carpenter, K3IBJ, Box 1122, Kingston, Penna.

ANTENNA Farm: 20 acres bordering two state highways. Tall pine trees, brook. Fine radio location, 7 miles to Capitol. $2000. Terms. WITHM.

SELLING Out. Sacrifice LA-1 Globe Linear factory w/T, never used, $90. Many other components and parts. Write for list. Bert Lenny, W7IBC, 1215 Gary St., Wenatchee, Wash.

SALE Or Trade: 8 mc. sixer, with 12 volt mobile supply, also carbon mike. 6-9 Mc Command rcvr, 300 volt P/S, converter p/s, B&W balun, K4JCX, 121 Maple, Oak Ridge, Tenn.

SURPLUS Owners, power sups 110VAC inp. 24VDC at 14 amps, 475VDC at 125 Ma, 450VDC at 30 Ma 6.3V at 16 amps —24V at 30 Ma, $25.00, PP. Robert Armstrong, 702 Union St., Schenectady, N.Y. Tel. DI 6-1266.

KWM-2, Collins AC pwr. supply and Ten Four mike, brand new condx. All for $1045. Sry, won't ship. W8WOA, Bedford, Ohio. Fone BE-2-4792.

HAMMARLUND HQ-145, like new, cry, cal, and QF1 with matching spkr, $200. Leon Reckinger, 31-22 84 Street, Jackson Heights 70, N.Y. Tel. Illinois 7-3772.

FOR Sale: HQ-150, used only 3 months; with book, in original carton. All letters answered. Contact Gary Foskett, W1ECH, 56½ Rockwell St., Winsted, Conn. Phone: FRontier 9-4898. First $200 cash or check.

FOR Sale: SX-110 Hallicrafters, perf. condx, $100. WA2KTZ, Jack Novak, 29 Warner Dr., Trenton 9, N.J. or call JUniper 7-7680.

MAKE Offer, SX-101 Mark IIIA, Globe 500A, and VFO. Both excellent condx. K9AXE, R.R. #2, Box 104, E. St. Louis, Ill.

FOR Sale: Complete station: TMC GPR-90, GSB-1, speaker (matched units), $495; Valiant factory-wired, $350.00; DX-40 with hand mike, key, 2 xtals, $55.00; Dow relay, $10; D-104 with P.T.T. stand, $25.00; Tymeter (G.M.T.), $10; Vibroplex, $15.00; Model #15 teletype, $125.00 (no waiver); terminal unit CV-57 (RCA), $75.00. All above equipment absolute mint condx. R-100 receiver, xtal calibrator, S meter, speaker. Needs work, $55.00. Please write ot W. K. Lindeman, W9LNH, 116 Beverly Ct., Michigan City, Ind.

FACTORY Aligned Knight kit R-100 receiver in mint condx, with S-meter, xtal calibrator and speaker. Instruction manual. $95.00. You pay shipping. M. Bruton, K1OHZ, 98 Cowles St., Bridgeport, Conn.

TRADE: Marlin-Sako microgroove, .222 rifle with 'scope for 6 or 2 meter transceiver. VHF or mobile gear. WØOUU.

75S-1 Collins receiver. Perfect condx. I will ship upon receipt of certified check or PMO for $400. KØCYM, 3095 19th Ave., Marion, Iowa.

CHEYENNE, Comanche, AC supply, speaker, FS meter, mobile mounting bracket, all cables, Master Mobile 10-75 whip, all perfect, $265 or trade of SSB. KØYAB, 2819-15th Ave., So., Minneapolis 7, Minn.

FOR Sale: DX-20, xtals, and S-40A, rcvr, vy gud condx. $75.00 or your best offer. Jon Scott, Box 1713, Calfax, Wisconsin.

FOR Sale: KWM1, 310B spkr, 12VDC and AC pwr. supplies, Mobile Mount with spkr, AC power cord but no mobile power cable. In perf. condx used vy little, $900 cash. Will ship anywhere. Sydney Rodin, 920B N. Milwaukee, Libertyville, Ill.

KNIGHT R-100 rcvr with spkr. In gud oprtg. condx. Cd use alignment. Best offer. WA2FIV, 15 Joyce Drive, Spring Valley, N.Y.

GONSET GSB 101 Linear, used 5 hours, $325.00. Like new. Ed Rosen, 229 E. 18th St., Brooklyn 26, N.Y.

COLLINS S-Line 32S1 and 75S1, excellent, used about 3 months: high serial Nos., $850.00, 4-el. Hornet TB1000 4 beam with TR-4 rotator, $85. K2YDZ, Rte. 1, Box 535, Grovetown, Ga.

ATTENTION Mobileers! Leece-Neville 6 volt 100 amp. system, $50; 12 volt 50 amp system $50; 12 volt 60 amp system, $60; 12 volt 100 amp syst. $100. Guaranteed no ex-police car units. Herbert A. Zimmermann, Jr. K2PAT, 115 Willow St., Brooklyn 1, N. Y. Tel. DEwey 9-9673.

WANTED: QSTs for personal collection: Jan. 1917, February 1917, May 1917 and September 1917. W1CUT, Box 1, West Hartford 7, Conn.

THREE Band Quad Antennas. $49.50. Am-Tennas, P.O. Box 642, Cedar Rapids, Iowa.

WANTED: Homebrew Preselector, K3MNJ.

SELL: Excellent condition, DX-100, $165; 75A4 w/spkr, $549; Homebrew rig with P.S. and mod. in rack cabinet, $40; miscellaneous items; take trades. Sparky, K9ORK, 220 East Grant, Macomb, Ill.

FOR Sale or trade: Meissner Signal Shifter, 2 meter FM rcvr, new 304TLs, new 701As. Need Bliley crystal-controlled signal generator, DB-23 Preselector, and 6 meter converter. Byron Fortner, W9IYM, RFD #10, Box 486, Indianapolis 19, Ind.

SELLING Out: Perfect KWM-1 complete with A.C. and D.C. power supplies, mobile mounting tray and cables and Mosley Triband mobile whip, $698. Hallicrafters HT-30, $175; SX-111, $175; 2-meter Communicator III, $175; Hornet TB-600 with new traps, $30. Call or write W2RQA, 7 Sweet Hollow Rd., Huntington, L.I., N.Y. Phone HA 3-7739.

FOR Sale: Like new HT-37, SX-101A, R47 spkr, $640. Dr. Keith Saylher, WØKBQ/5, 1304 Christopher Ct., Metairie, La.

SELL: QSTs January 1921 through December 1938, ten cents each or twenty dollars for entire run. Few issues missing. WIGM, 14 Washington Park Road, Braintree 85, Mass.

TWO Meter Communicator III, like new condx, $199; Globe Scout w/Heath VFO and pwr. supp., $75; DX-20, like new condx, $35.00. K4BPG, 24 Dean St., Gainesville, Ga.

TOROIDS: Uncased 88 mhy, like new, dollar each, five/$4.00. PP. DaPaul, 309 South Ashton, Millbrae, Calif.

FOR Sale: Collins 32V3, $375; Harvey-Wells T-90, APS-90 Supply, R9A Receiver, $225; all one owner and in exc. condx and appearance. Also 12V Gonset Super Six, noise limiter, 12V Gonset Commander transmitter, complete and ready to install with filtered 12V dynamotor supply, Gonset VFO and coax relay, $100. F.o.b. Joplin, Mo. Karl Lipscomb, 87 Canterbury Lane.

FOR Sale: One new 4-250A, price $25 or trade on equipment. KØUDB.

75A-4 receiver. Operated very little, like new. B&W T-R switch Mod. 380; SSB KW xmtr driver (par. 807s) to par. 813s (G.G.) final, complete with power supplies, meters, electrically driven Variac, etc. Mounted in 7 ft. RCA rack, designed to be used with Central Electronic Mod. 20A exciter. Final contains B&W 1 KW all-band pi tank; also new Elmac tubes for sale, 3 each of 4-400As, 4 each of 4-12JAs and 4-250As. Will sell for any reasonable offer. Call or write N. W. Scott, Jr., W4LNL, Ex W5UBN, Rt. 1, Pfafftown, N.C. Tel. Winston-Salem WA 4-2491.

HALLICRAFTERS SX-101, $250; Viking II, Viking 122 VFO, Viking Matchbox, Bud low-pass filter, $200; Viking Challenger w/t, $75, in perf. condx. F.o.b. Chicago, Ill. K9LTU, 10219 So. Green St., Chicago 43, Ill.

WANTED: Jack N. Brown's "SSB Techniques". W2PTI.

SELL: 1958 S85 receiver with QF1 and built-in crystal calibrator, $95, or trade for test gear. 32 ft. Rohn self-supporting tower, $30.00. F.o.b. Wilmington. All inquiries answered. K3BYJ, 1211 Virginia Road, Hilltop Manor, Wilmington 3, Del.

SOS! Radio Operators earn $127.00 per week, 60 days paid vacation. Complete details send $1.00. Lansing Information Service, Dept. T-1, Box 74, N.Y. 61, N.Y.

COLLINS 3S-1 with AC power supply, 75S-2 with 5 extra xtals, both in superb condition, used only 50 hrs. $1050. K9PPJ, Donald Glisson, 912 W. Roscoe, Chicago 13, Ill.

VIKING "Kilowatt" amplifier and Matchbox, never on the air; brand new, both $1,200 pkg. firm. Must pick up. W1FOA, Westbrook, Conn.

A-1 reconditioned equipment. On approval. Trades. Terms. Hallicrafters SX-99 $99.00, SX-100 $199.00, HT-37, S-85, SX-110, SX-111, SX-101A, HT-32; Collins 75A-1, 75A-2, 75A-3, 75A-4, KWM-1, 32S-1, 75S-1, KWS-1; Central 20A $159.00; Elmac PMR-6 $69.00, AF-67 $109.00; Gonset G-66B, G-77A, G-50, GSB-100, GSB-101; Hammarlund HQ-100 $129.00, HQ-110 $179.00, HQ-129X, HQ-140X, HQ-140XA, HQ-150, HQ-160, HQ-170, HQ-180; Johnson Adventurer $29.00, 6N2 $99.00, Navigator $99.00, Viking II $179.00, Valiant; National NC-98 $89.00, HRO-50T $199.00, NC-300, HRO-60, NC-183D, NC-303; Heath, Globe, RME other items. List free. Henry Radio, Butler, Missouri.

FOR Sale: Mobile Gonset Twin: G-77A transmitter, 3201 AC-DC supply, modulator: G-66B receiver, AC-DC supply, EV 600D mike, Master Mobile Slim-Jim antenna, base, connecting cable: $350.00. E. H. Shuller, M.D., 400 East Seneca, McAlester, Okla.

SALE: Johnson Valiant, looks and operates like-new. Factory-wired: $300. Jerry Chenoweth, 6940 Y St., Lincoln, Nebr.

SSB 20-A exciter, P&H 400B linear, 400 watts P.E.P., $295. F.o.b. K4JLD, 5175 Lake Howell Rd., Winter Park, Fla.

FOR Sale: National HFS w/pwr. supp. In exc. condx. $135.00. *Sry, no shipping!* F. O. Kugel, *335 Brevoort Rd., Columbus 14,* Ohio.

6NR SR-34 Hallicrafters transceiver. 6-12-110 volt. In exc. condx. $325.00. K4RTG, Penhook, Va.

SELL: HQ-110; Johnson Adventurer. Dow Relay, low-pass filter, in gud condx $220. Abrams, 67 St. John's Ave., Yonkers, N.Y.

C.W. Transmitter, RF section, fully wired. 813 final, new parts, $40.00: *Par-Metal rack 40" high;* shelves, panels, $20.00 Transformers, chokes, condensers for three husky power supplies, $20.00. W2ADC, Box 201, Elmont, N.Y.

WANT: Drake SSB receiver. State serial number, condition, and price. Col Ed. Sears, 4725 Bridle Trail, Santa Rosa, Calif.

PHILMORE Model CR-5AC receiver with cabinet. Expertly wired. $60.00. Michael Henderson, Box 93, New Sarpy, La.

OSCILLOSCOPE, Heath OM-3 signal monitoring adapter included (GE Ham News version), $39.00. Dr. William Cunningham, W4LAN, 19 Twelfth St., Columbus, Ga.

COMMUNICATOR III, 6 meters, CD model; Halo: in original cartons, never used. $250.00. K1IUY, Bristol, Conn.

HALLICRAFTERS SX-101 Mk III, spkr, $275.00, in exc. condx. W2UJJ, Robert Meyer, 6015—5th Ave., Brooklyn, N.Y.

FOR Sale: New Gonset Communicator IV, $290.00: two *grounded grid kilowatt* PAs custombilt, $200; and $450; write details. New 813, $10; 4-400A, $20. Johnson 226-5 Varinductor, $25.00. W6HHN, 3467 Rambow, Palo Alto, Calif.

COLLEGE Bound! Cleaning shack! Hallicrafters SX-71 w/spkr, Viking II with 122 VFO, Collins 70E8A PTO, new; Heath SWR-2; bugs, pushto talk mike, B&W 3852 rotary inductor, new; Knight 50W xmtr, unused. 75W Handbook xmtr, all new parts, compact, neat. Make offers. Write for details. Ron Condry, 205 E. 1st, Anamosa, Iowa.

SELL: Hallicrafters SX-71, late model, excellent, $115; Johnson Signal Sentry 250-25, $15.00; Bud Codemaster COP-128B w/spkr, $14. R. Kingerly, W3WNG, 104 Lyndhurst Ave., Wilmington 3, Del.

BC-683, 684 complete with FT-237, dynamotors, tubes, xmttr *needs minor repair.* $50.00. J. W. Raine, Uvalde, Texas.

SELL: 300 issues of QST, 1920-1956, $75 F.o.b. list free. R. B. Frank, 7794 Lilac Way, Cupertino, Calif.

SALE: Good S-85, $72.00; QF-1, $9.00, both for $80; Lysco 600-S, built-in VFO, screen modulator, low pass filter, 30 watts 80-10 meter, $70.00. First check takes them. You pay freight. K1CSD, 45 Lincoln Ave., Rutland, Vt.

WANTED: Crank-up tower. Trade: DB-23 Preselector for Johnson Matchbox *or similar coupler.* WA6GCP, 15929 Dalmatian, La Mirada, Calif. Tel. LAwrence 1-3379.

WANT to buy used ham gear—Reconditioned for sale: 15MFD 1000V oil filled 99¢: Weston R.F. Ammeters $2.99; HQ100, 129X $129.40: Military Super Pro $99.59; Globe Chief 90A $49.95; Scout 65 $79.95; Globe Citizen $79.00; DSB-100 $99.50; Adventurer $29.50; *Navigator* $129.95; Ranger $229.00: *Viking II* $199.50; Gonset G-76, Gonset 6 meterlinear $89.95; Comm. III 2 meter $229.95; 32VII $275.00; 75A4 $595.00; KWM-1 *W/AC supply New $695.00: SX110, S38D* $34.95; *S38C* $29.95; S-40 $69.95; NC300 $219.00; 173 $129.50; 57 $49.95; SW54 $29.95; HRO-STA-1 $159.00; RME 4300 $139.00; 4301 $49.00; *RME 84* $39.95; *Mobile Carbon Mikes* $5.95; *Eldico SSB-1000* $69.95; PMR6 $79.95; Lysco 600 $49.95; C.E. MM-1 Scope $79.50; Harvey Wells T-90 $99.50; Babcock MT5A $49.50; New Beams, Verticals. Bargains!—*Ken WØZCN, Ken-Els Radio Supply Co.*, 428 Central Ave., Fort Dodge, Ia.

EICO Citizens Band transceiver, cleanly built, 117 VAC supply, $55.00. K2OVM, 509 So. Division, Ann Arbor, Mich.

KWM-2, Collins 516F-2 AC pwr. supply, both in mint condx and in original cellophane containers and cartons, operated 3 hours, Collins conversion bulletins; $1000; Li. Fred L. Capossela, W2IWC, NRTD, TAGSUSA, Ft. Harrison, Ind.

WANTED: Courier, Matchbox, receiver. KØKVY, 443 West Lucas, Marshfield, Mo.

KWM-2, No. 1052, 516F-2 pwr. supply, 5 months old, like new condx. First certified check for $1065.00. Charles T. Day, Jr., 11 Ridgeway Dr., Paris, Ky.

FOR Sale: Gonset Communicator III, 6 meter little used, like-new condx in original factory-carton for $175.00 money order. John S. Niendorff, K5WTZ, 3313 Cornell Ave., Dallas 5, Texas.

GSB-100, in perf. condx, $375; HQ-110A, in A-1 condx, $185. Will ship in orig. carton at your cost. Michael Chubirka, Jr., K3ITP, 23 W. Elm St., Emmaus, Penna.

PERFECT Condition and finish, used 25 hours: Viking 500 transmitter with push-to-talk E-V 664 mike. Cost $1000, will sell for $700. New job requires constant travelling. K5INT, 504 E. Hugo, Yoakum, Texas.

FOR Sale: Hammarlund SuperPro BC-794 and BC-779, set of PRC-6 walkie-talkie, EE-8 field phones, meters, tubes. Tilleman, 8409 Mt. Tibet, El Paso, Texas.

SELL: NC-300, Spk. 100 Kc. Best offer. W3ARI.

TRADE: 400-watt all-band SSB station: CE-20A (f/w), 458-10 VFO, LA-1 linear, HQ-140X, xtal calibrator, Precise 308 eight *inch scope for KWM-1 with AC supply.* WØRVB/5, 499 Weaver, Mississippi City, Miss.

COLLINS S-Line. Practically unused. 75S-1. Has CW BFO and filter, $375; 32S-1, $395; 516F-2, $75. In cartons with connectors, manuals, warranty cards. K5YSY, 3607 Morningstar Lane, Dallas 34, Texas.

BC-779-A receiver, 100-400 Kc, 2.5-20 Mc, for rack mounting, in gud condx. $90. Don Salley, Rte. 5, Winston-Salem, N.C.

SELL: KW final using 8000s, B&W CX49A and variable link *20 and 80 meter coils, 19" panel, meters,* etc., $50.00: RCA surplus KW modulation transformer, pair 810s with sockets, filament transformer and Stancor A-4763, $50; pair new 4X150As, $10; *FCL-1 speech clipper kit, $7.50: Millen 90800* 50w exciter with pwr. supply, as is, $15.00; 2 850V CT 1 amp. transformers, $5.00 each. F.o.b. Wynne, Ark. W5LCI, Box 195.

WANTED: Collins "S" Line, prefer later series. List units, condx, serials and lowest price prepaid. Would consider a KWM-2. W3QKW, 1509 Juniper St., Norristown, Penna.

FOR Sale: Like new condx, HT-37, $335.00; SX-101, Mark III, $260.00; both for $575.00 and pick up. Sry, no shpng. M. Ruth, 513 Kohn, Norristown, Penna.

WANTED: Eldico SSB-100 M w/P.S. Give condx, price. W3FSZ.

COLLINS: KWM-1, AC supply, $595; 51J2, $495; 51J3, $675; 75A2, $275; 75S2, $525; R-390A, HT32A, $475; Valiant, $299; Ranger $210; R-274 .54-54 Mc., $295; BC-1031C Panadaptor, $125; BC-610-1, $295; HRO-60, $325; HRO-50T1, $225; Northern Radio VFO, $125. Want teletype equipment for cash, or trade for new amateur equipment. Tom, W1AFN, *Alltronics-Howard* Co., Box 19, Boston 1, Mass. Tel. RIchmond 2-0048.

EXCELLENT 75A3 with product detector and 800 cycle filter, *$400, or will trade for U.S. coins.* W8LQJ.

MOBILE. For sale: Heath "Comanche", MR-1, "Cheyenne" MT-1 power supply, stand and cables. All new. Receiver factory aligned. Reasonable offer will be accepted. Thomas Adams, W3RDB, 2617 N. Wahl Ave., Milwaukee 11, Wis.

FOR Sale: Super Pro, HQ-120X *Millen model 90800, 50 watt* exciter; 10 meter 200 watt transmitter homebrew. Par-Metal enclosed cabinet Hy-Lite Beam w/rotator. Prefer to sell complete. Complete run of QSTs, 1933 to 1960. Make offer. King Fothergill, K3IPY, Ocean City, Md.

KWM-1 complete mobile and fixed station. Bargain for cash. K6TWL.

COLLINS 75A3, excellent condx, spkr and 100 Kc calibrator, $335.00; Gonset Triband, $25.00; Millen 90801 exciter, $40.00. All for $375. C. V. Hussey, 5134 S. New Haven, Tulsa 35, Okla.

SELL: *Complete station, HQ-140X, $165.00: Globe Scout 66,* $55.00; VF-1 $12.00; Ranger w/push-to-talk, sequence keying, $185.00. All F.o.b. Carlisle, Iowa. KØKZB, Dave Runyan.

SELL HT-32, $300; GSB-101 KW linear, $200. Both like-new condx. Woolfries, WØDSP, Box 382, University Station, Ames, Iowa.

We Buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., 199 Front St., Hempstead, L.I., N.Y.

SELL: Hallicrafters SX-100 in top condx! Will be willing to deliver, NYC—L.I. Write your best offer. K2RUR.

SELL Heath Baluns. Wanted: Heath AC-1. K3AGM, Ft. Washington, Penna.

CLOSING Out complete station: HT32A with new spare finals, $495; SX-101A with R47 spkr, $295; Johnson Matchbox $35; Johnson Directional Coupler and SWR meter, $19; D-104 on G stand, $23; new D-10, $20; many other items of ham and test equipment: VTVM, RF generator, Grid Dipper, 'scope. All near new condx, mint physical and operating condx. List and prices for stamped envelope. KØQVX, C. Brown, *6001 University* Ave., Des Moines, Iowa.

FOR Sale: National NC300, $225; Central Electronics 20A an matching VFO, $185.00: Hallicrafters SX25, $750. All in A-1 shape. A. London, WA2OTA, 380 Broad Ave., Leonia, N.J.

WANTED: Apache and SB-10. Metzler, K3KVN, *Manheim,* Penna.

SELL: Heath Apache, $185.00 and SB-10, $80, both for $250.00, *in exc. condx. Write for details. Will ship* prepaid within 1000 miles. H. R. McCreery, K6HBP/8, 475 Cass St., Benton Harbor, Mich.

WANT: 15 meter band coil for an HRO-50T1. Write, state price. W5DIU, C. Chaffin, 2329 60th, Lubbock, Texas.

HT37, $350.00 New Drake 2-A *with multipiler, calibrator,* $265.00. W8NYA, 213 West Morrison, Santa Maria, Calif.

SELL: Two 120mfd. 3 Kc. capacitors, $30.00 each, $50 pr. Two 2mfd. 12.5 Kv., $35.00 each, $60 pr. Two 110V selsyns, 5F, new, $15 pr. PE103, new, $10. Art Koch, W2RMA, RD 3, Clay, N.Y.

SELL: NC-183 w/spkr. Perf. condx. $160.00. KNØEHD.

GONSET Communicator II, six meter, complete, $152.00; NC-300 with spkr, 6M converter, xtal calib., $310.00. Robert Hunter, W1QXE, 72 East Main, Westboro, Mass.

SELL: 75A4, exc. condx, 3.1 Kc., 800 cycle filters, $525. W6KEV, *3088 Greenoak,* San Mateo, Calif.

FOR Sale: One Johnson TR switch, $20.00; B&W balun coils with connectors, $5.00. Ed Vilagi, 502 Sixth St., Fairport Harbor, Ohio.

COLLINS 32S1 and power supply. Guaranteed new condition. Used less than 100 hours. $450.00. *First check or money order.* Shipped prepaid. W9IOP, L. LeKashman, 3019 York Rd., South Bend 14, Ind.

CRYSTALS Airmailed: SSB, MARS, Novice, Commercial. Net. Custom finished FT-243 .01% any kilocycle 3500 to 8600 $1.49 (10 or more FT-243 99¢), novice 99¢. 1700 to 20,000 $1.95. 20,001 to 30,000 $2.25. Add 50¢ each for .005%. Add 60¢ for HC-6/u hermetics. QST packaged crystals: "SSB Package", June 1958 and SSB handbook; "Phasing" November 1959; "IMP" May 1960; DCS-500 Feb. 1960; Listed sets (5-FT-243) $9.95, hermetics $13.95. Filter; "SSB Package", 7 matched $7.45. Multiband Receiver February 1961—$16.95. Crystals for all projects, write. Airmailing 9¢ per crystal, regular 5¢. Crystals since 1933. C-W Crystals Box 2065Q El Monte, Calif.

WANTED: Early Hallicrafters receivers for private collection. Please state price and condition. Thank you. H. E. Hoagland, 3036 South Robertson Blvd., Los Angeles 34, Calif.

CASH For Collins 51J4, 51J3, R388 or R390 receiver. Give full particulars. L. M. Divinia, 115 S. Battin, Wichita, 18, Kansas.

TEACHER Gives $$ credit towards radio parts for used foreign stamps. H. Pitt, 129 Spencer, Winsted, Conn., USA.

WANTED: Professional banjo and 4X250B tubes, trade ham gear or cash. Have unused 250TH, 250TL, 810, 833A tubes. W7AST, 1302 West 80th St., Seattle 7, Wash.

TELREX 6-meter beam, 6M624B, brand new, $25.00; Fifteen DB gain 6-element. S. Kaplan, Box 313, Billerica, Mass. K2RDO.

COLLINS 30S-1 amplifier, $1095 cash & carry. WA2FMC. Rte. 111, Smithtown, N.Y. Tel: ANdrew 5-6137.

HIGHLY Effective home-study review for FCC Commercial Phone exams. Free Literature. Wallace Cook, (Q5), Box 10634, Jackson 9, Miss.

WANTED: Collins 32S1 with 516F-2 pwr. supply. John Thomas, P.O. Box 198, Gallatin, Tenn.

COLLINS 75S-1 receiver plus set of 10 new spare tubes. New cost $535.00. Sacrifice for $385. Shipped in original packing. F.o.b. Chicago. R. Yeager, 1455 Wilson, Chicago 40, Ill.

ART-13 unused, mint, instructions an circudit plus complete conversion instr., $54. W4LMY, 304 Elizabeth, McLean, Va.

BEST Offer takes Collins KWS-1, Vernier dial. Used vy little. Just given modernization at Collins factory. Unopened factory cartons. WØHBG/3, 5605 Overlea Rd., Washington 16, D.C.

COLLINS KWS-1 Ser. 1438 75A4. Ser. 4871, both in beautiful new condition. Approximately 50 hours operating time. Mike SWR indicator complete station, $2000. Cash. Pick up only. Cdr. Zammit, W5HKP, Cmdg Off., USN Rad Sta., Cutler, East Machias, Maine.

COMMUNICATOR III, 2 meters, perf, condx, $185. Scharneck, 315 Willowbrook Rd., Staten Island, N.Y.

F/W Eico 720, Heath VFO, Pr. 807 modulator, BC 779B w/power supply, spkr, 4 ft. rack, all for Heath SB-10 or $90 F.o.b. John Bagwell, Somerville, Tenn.

KITS Wired. 25% of kit cost. Experienced technician. Inquire R. R. Lamb, 1322 S. E. Linn, Boone, Iowa.

SELECTED, Reconditioned equipment. Free list. Collins 75A2, $295.00; Central "B" slicer, $49.00; Elmac, most models; Hallicrafters SX-71, $149.00; HT32, $435.00; HT-37, $395.00; SX101, $275.00; Johnson Ranger, Valiant, Viking I, National NC183, $115.00; NC109, $125.00; HRO-50T-1, $225.00; NC33, $399.00; Heath, Eico, Gonset, many others. Radio Distributing Co., 1212 High St., South Bend, Ind.

FOR Sale: SX-101A, practically new; original carton, will ship; best offer over $315.00. W2KVL, 138 Cypress St., Floral Park, L.I., N.Y. PRimrose 5-9626.

SELLING Out: Bought new, used less than 20 hours: well below original cost. HT-37, HQ-170, tower, Tri-Bander, etc. Al Keller, K6UEI, 1936 Willow, San Diego, Calif. Tel. ACademy 2-1800.

"Horse Trader" Ed Moory, will accept best cash offer without trades for following Equipment—Collins WM-2 Used, Collins S-Line and 516F-2 Pwr Supply, Mint Condition Collins 32V-3, 2-Collins 75A-4's perfect, "Specials' Drake 2-A demonstrator $229.00, Used 312B-4's $139.00, 75S-1 receiver with F455Q-5 Filter $439.00, 30S-1 Collins linear used 9 hours $1195.00, LA-400-C Linear New $179.00, SX-71 $99.00 SX-111 Perfect $195.00, HT-37 Demonstrator $349.00 C.E. 200-V like new $619.00, 32S-1 transmitter $459.00, 75S-1 Receiver $379.00. Terms Cash no Trades. "Ed Moory Wholesale Radio, Box 506, DeWitt, Ark. Phone Whitney 6-2820.

FERRIS 18-D michovolter, 8-220 MC. Good. $50.00; Gonset Super 12, like new, $45.00. Dumont 304H 'scope, good, manual, $50.00. Eastman Cine 16, magazine F1.9 lense, case, good ($55.00) want HP200AB. Trade or buy. W7FRA, Box 1223, Escondido, Calif.

MOBILE Amateur receiver for sale. Health "Comanche" MR-1. Makes excellent base station. Price $145.00. Stanley Sitka, Box 1234, Bristol, Conn.

SELL: 75A4, in perf, condx, S.N. 2533, $515 or offer. W6WZD, 98 Fairview Ave., Atherton, Calif.

PLEASE Notice! For the best new and reconditioned used ham gear, try Bob Graham, W1KTJ (Graham Radio), New England's only exclusive amateur radio stores. North of Boston, 505 Main St., Reading, Tel. 944-4000; South of Boston, 1105 No. Main St., Randolph, Tel. WO 3-5005.

SALE: Mobile or fixed Heathkit MT-1 transmitter, MR-1 receiver, MP-1 mobile power, UT-1 110v power, AK-K7 spkr, AK-6 mobile base, Master Mobile all band antenna, bumper mount. In new condx. Wired by electrical engineer. All $300 or inquire about separate items. Also SSB exciter SB-10. $65; HO-180C w/spkr, new $40. Deliver 200 miles of Harrisburg. W3SAU, Berry, Yellow Breeches Dr., Camp Hill, Penna.

SELL: DX-100 with erratic oscillator, otherwise FB $75. W4JBV, Disputanta, Va.

TRIBAND Beam, W3DZZ, excellent, used less than one year. Wonderful FB ratio & forward gain. Cost $225.00. Sell $150. Adam Gamon, M.D., K8ACF, Saginaw, Mich.

HT-32, $400; SP-600JX rcvr, clean and late serial, $450.00; both cash and carry. Want QSTs from early 1920s back. W2-DYU, 36 New Lawn Ave., Kearny, N.J. Phone WYman 1-6498.

CE20A with QT-1, Deluxe 458 VFO. Factory wired, late model, in mint condx: $200.00. I pay freight in USA. Johnson Matchbox, perfect, $40. Mike Erickson, K7GFM, Box 423, Newport, Oregon.

FOR Sale: Gonset Communicator IV carefully wired and in good operating condx. Local buyer preferred. Price $299.50 or you make offer. George Bronson, RFD 1, Englishtown, N.J.

FOR Sale: Great Variety of transistors, test gear, meters, and radio parts. Send stamp for list. K1GEJ, Rt. 2, Mountain Road, Ridgefield, Conn.

WANTED: Collins KWM-2, state cash price and condx. C. J. Hire, W8ZES, 81 Parkwood Blvd., Mansfield, Ohio.

ELMAC Mobile: AF67, PMR-7, M1470 (12v, or 110v.) pwr. supply; Dow coaxial relay, mounting racks for AF67 and PMR-7; connecting cables and operating manuals; all in gud shape. Surprise bonus, $300. K5JLF, Troy Morrow, Station A.C.C., Box 834, Abilene, Texas.

SELL: HQ140XA receiver, in excint condx. Complete w/operating manual, speaker and earphones. $150. Robert Gordon, K2IPV, 166-25 89th Ave. Apt. A-3, Jamaica 32, N.Y.

VALIANT. FW, late model, not a scratch, original carton and instructions. Dow-Key relay, mike and cables, $350. K3CSV, 1316 Faxon Circle, Williamsport, Penna. Phone 326-5553.

SX-100, $160. You pay shipping. Danner, 840 So. 29th St., Omaha, Nebr.

SELL-Best offer: B&W 5100B, NC-98, DB-23, 3-el. w/s 15 mtr. beam, 4-el. w/s 10 mtr. beam: Bud Gimix, in top condx. Package deal or singles. Send stamp. Base bid ½ of new price. K5CAV, 205 Pine, Hammond, La.

FOR Sale: Eico 720 transmitter. In excnt condx, perf. Novice rig. Used 6 months. $75.00. Harvey Allen, WA2NMP, 11 Flower Lane, Great Neck, N.Y.

HAMMARLUND HQ-180C, $350.00 Htath Apache TX-1, $200. Will deliver up to 100 miles. Gene, WA2LRV, 803 Bay Shore Ave., West Islip, L.I., N.Y.

SELL: Gonset GSB 100, in exc. condx. First certified check or money order for $325.00. Ferris, 1768 Fruitdale Ave., Indianapolis, Ind.

HAMMARLUND HQ-140X w/spkr, recently recondxn, like new. Best offer. Also EX Sig Shifter, $40.00. F.o.b. Brooklyn, N.Y. Phil Perlman, K2GSE, 2830 Bedford Avenue, Brooklyn 10, N.Y. Tel. GE 4-9097.

GOING To College. All in perf. condx. HRO-60T complete, $425.00. Apach, $250: complete Kw. fone amplifier. Nothing commercially available that's as rugged. Beautiful construction. Built last fall. Latest circuitry. Write for info. $695.00. Package deal only. $1250. BC-610 modulation xfrmr. $11.50. KW pwr. supply. Dual filter. Variac. $55. Write Irving Craiger, K8GPI, RFD #1, Box 302, Ironton, Ohio.

FOR Sale: SX-99 in excellent condition. 1½ years old. $95. J. Bergren, 10 Willofs Lane, White Plains, N.Y.

NC-300, $215; Lysco 600, $45; Harvey-Wells Matchmaster, $35.00; Heath VOX, $18; buy combo for $300. Will include Workshop ten meter beam, 50 ft. coax and rotor. W3FBT, Jay L. Davis, 1326 Markley St., Norristown, Penna.

JUST Out! Our 1961 Catalog, over 5000 items, receivers, transmitters, test equipment, tubes, tech manuals, schematics, walkie-talkies, transformers, parts, plugs, write Bill Slep Company, Drawer 178Q, Elenton, Fla.

NATIONAL HRO-5 rcvr w/power supply and spkr. $85; Hart 75-watt xmtr, $30. Both in excellent condx. Stephen Parrott, 902 Baldwin, Ann Arbor, Mich.

SELL: B&W 5100B, excellent condx, little use, $300. Call WH 9-7660 evenings, ORegon 9-0600 ext., 362 during days. Dick Doherty, W2ZQX, 4 Rose St., White Plains, N.Y.

FOR Sale: 32S1, 75S1, P.S. and speaker. Used less than 25 hours. Best offer. Richard Laplander, Box 88, W8ZDQ, Dollar Bay, Mich.

BC-614E speech amplifier, $30.00. New 450TH $10.00, two 304TH, $3.00 each. W5BWA, 4 Ida St., Alexandria, La.

SELL: DX-100, perfect condition, Heath variable loading and SSB switching modifications installed, $160.00; Heath SB-10 SSB Adapter, late model perfect, $75.00; Hallicrafters SX-100 in A-1 condx, $175.00; matching spkr, $8.00; Signal Sentry, $10.00. All with manuals. F.o.b. Roseville, California. John Dijkstra, K6KLK, 614 Clarice Lane, Phone SU 3-4875.

DX-40, $45.00. Terry Osborn, 503 N. Pleasant, Jackson, Mich.

COLLEGE Student wishes summer employment in radio or television field. Second radiotelephone, amateur licenses. Willing to travel. David Elliot, 136 Morris Parkway, Valley Stream, N.Y. Tel. VA 5-7402.

6 MTR. Converter 10/14 Mc IF, $10; 10 mtr. mobile converter 12V, $10; 15 Mtr. Preselector, $5.00; W6RET, 8831 Sovereign Rd., San Diego 11, Calif.

AN/ART-13 Maintenance Manual. Abridged copy of the original TM, 129 pages, schematics, VFO tuning charts, alignment procedure, autotune adjustment, pictures of part placement and other info vital for amateur use. $4.25 pp. J. W. Barbiaux, W3NGL, 2537 Leslie Dr., New Kensington, Penna.

MUST Sell HT-37, in perf. condx, $350, HQ-110C perfect in original carton, $200. Both for $525. Ted Blaho, K8WNL, 342 Sherwood, Hilliard, Ohio.

FOR Sale: Telrex "TB7E" Tri-Band beam, $75; SX101A, R-47 spkr, $295. A. J. LeBel, c/o Richard Murphy, Middleton, Mass.

POWER Supply 3000 volt 300 mils, $50. P. DeClaive, 6646 MacArthur, Oakland, Calif.

FOR Sale: TR-1A tape deck and electronics system by Heath, with manuals and mike. Excellent working condition and appearance: $70.00. W2EPZ, 80-44 259 St., Floral Park, N.Y.

MUST Sell SX101A Valiant, $500 EV665 mike, $40; Dow-Key TR, Johnson Lowpass, all less than 7 months old, perfect, no scratches. K9VQN.

WANTED for cash: Amateur call-book for 1927 and any copies of QST prior to 1925. Harry Register, 25-94 42nd St., Long Island City 3, N.Y.

SELL: Eico 720, perfect, expert wiring, $75; power supply, 2000V at 300 Ma, or change 1 condenser and set 3000v at 300 Ma. In bottom of 5½ ft. rack, $75; 25 watt modulator, rack panel mounted, monitoring meter, $50; 3120 and 2500 vct xfrmr, like new, $25.00; 1600VCT xfrmr, $15; Meissner Deluxe VFO, $25. Surplus receiver, 2-6 Mc. runs on its own batteries, very sensitive, w/carrying case, batteries, $20.00. First check or 20% deposit. You pay shipping. Denis Sharon, WA2NBU, Garrison, N.Y.

MILLEN 89er antenna matching preamplifier, coils 6 and 10, $6.00; Meissner signal shifter, old style, coils 10, 20, 80, 160 complete, $20.00; two station 110v AC intercom, wire, $5.00. W9TRD, Charles O. Stimpson, 1525 Sunset Ridge Road, Northbrook, Ill.

MUST Sell: Hammarlund HQ-110C rcvr in original carton. Like new condx, $170. Howard Ablan, Jr., 9 Sycamore Rd., Dumont, N.J. Tel. DU 4-4362

RME 4300 receiver, in exc. condx. $130. Stan Thayer, 25 Atlantic, Metuchen, N.J.

JOHNSON Pacemaker: Brand new. Has been checked out on all bands. Guaranteed perfect. Will sell for cash or trade for a late model 4 x 5 press-type camera outfit. I prefer Linhof. All deals promptly considered. Write or call Jim Reed, W4ZAV, 3012 Wilkinson Blvd., Gastonia, No. Carolina.

SELL: Collins 75S-1 and 32S-1. Immaculate. Paul Elliot, W5-GGV, Rte. 2, Bishop, Texas.

SELL: HT-37, SX-111, R-48 speaker, Heathkit, and Antenna relay. $650 or best offer. K9MPC, Murphy, 5546 Howard Ave., LaGrange, Illinois.

SELL: DX-100, S-40B, QF-1, AM-2 and two BC-1335s. All excint condx. $325.00. W4HXE.

VALIANT: $300; Viking II with Viking VFO, $200. Spare tubes for bonus. One owner. Set up sked and hear them. John D. Boyle, W4ZDV, Rte. 1, Box 373, Englewood, Fla.

EICO 720 xmtr like new for sale, $68.50. K3GXX, Al Bowers, 1306 Garden Lane, Reading, Penna.

FOR Sale: Handbook 4-250A kilowatt amplifier complete with tunes for A.M., C.W. and S.S.B. AB1 or AB2 with many extras. Built-in regulated bias supply, screen modulation choke for A.M. and 2.5 KV voltmeter to measure plate voltage. Completely debugged and TVI-suppressed. Jennings UCS 10KV vacuum variable 10-300 mmfd. alone cost $105.00. Total cost of parts, $337.70. Will sell F.o.b. Belvidere for $225.00 Larry Kleber, K9LKA, Belvidere, Ill.

FOR Sale: Heath DX-40 xmtr, National NC-109 rcvr, w/spkr, Heath Balun coil set, Heath reflected power meter, Dow-Key coax relay, Bud low-pass filter, Johnson Speed-X auto. Key, xtal mic., and Bud 100 kc. xtal calibr. In exc. condx and $200 takes all. J. Fuhr, W3FHZ, 33 Hilltop Rd., Levittown, Penna.

SUPERIOR Thunderbird receiving tubes available only at Southwest Electronic Devices, Inc., P.O. Box 3751, Phoenix, Ariz. Cost no more; improved reception. Guaranteed one full year.

SELL: Harvey-Wells Mobile rig R-9A, T-90 and 12 volt supply, Hallicrafters SX-71, Heath Apache and SB-10. Best offer buys all or any. W4CHC, Box 2343, Macon, Ga.

LINEAR Amplifier, KW, power supply, has everything, worked 150 countries, a beauty; asking $350. Will trade for mobile or make offer. K6ZZE, 5776 Nottingham Dr., El Sobrante, Calif.

G50 Transceiver for sale. Write for details. WA6IDB, 707 Main St., Huntington Beach, Calif.

COLLINS 75A4 Christmas present, make offer. Will trade on HRO BC221, DB22A, KWS-1 power supply. W8NCL, 32045 Valley View, Farmington, Michigan.

SELL KWM-1 perf. condx. $600. 516F2 power supply, $100. W5YMX, 1311 Kabel, New Orleans 14, La.

FOR Sale: Hallicrafters SX-100 Mark II, $170, R-47 speaker, $5.00. K8DCE, Joe Shafer, 1020 Lausman Dr., St. Joseph, Michigan.

SELL: 32S-1, $480; 75S-1, $375; 516F-2, spkr, $90; new Tri-band beam, best offer. Huston, KØWMN, 1026 26th St., S.E., Cedar Rapids, Iowa.

DYNAMOTOR Brushes for DM-35 and DM-37, 50¢ per pair, postpaid. Bill Jones, 129 Davis St., Eufaula, Ala.

SX-101 Mark III, just like new, matching speaker, headphones, express collect original carton, $225.00. Instructograph with complete tapes, $25.00. Vaughan Moore, West Point, Va.

TUBES, 250th, $30 pair; mercury rectifier tubes, RX21A, $20 pr; TR relay, $10; 40M dipole, $3.00; Bud LP filter, $10. All new or unused. Will ship. K6ZZE.

FOR Sale: HQ-129X and Viking Ranger, $300 F.o.b. or sell separately for best offers. R. Sheppard, W8CGG, 153 Huffman, Doylestown, Ohio.

AMERICAN Missionary priests working in Latin America need amateur equipment to establish contact with their six parishes in Peru. Three priests have licenses in Peru, but have no radios. Contact Society of St. James, 49 Franklin St., Boston, Mass.

EXCELLENT Condx: Heath VFO, Globe Chief 90A, Harvey-Wells R-9A, all $150.00. G. Warner, Long St., Thomasville, N.C.

CLEANING HOUSE. Old HRO (rebuilt) table rack, .55-30Mcs. coils, $75; WU teletype that uses narrow tape, $25.00; BC645, $10; PE103, $10; tubes, used, gud, 211- $2.00; 833A, $10; 8008, $5.00; 6146, $3.00; Collins 310-B4, fair condx, $100 or you make me an offer on any item. You pay shipping. Enclose reply envelope. R. D. Corbett, 46 Prospect St., Torrington, Conn.

FOR Sale: National NC-183D receiver, new condx. Write David Read, K4LUQ, 1189 Martin, Prattville, Alabama.

SELL: VF-1, $15; AT-1 with SM-90, $25. K7EVW, Oracle, Ariz.

HT-37, only 100 hours use and in like-new in orig. carton; $365. WØGTU, Ray Scrivner, Rte. 3, Topeka, Kans. Tel. CE 4-9301.

6 METER Coupler, guaranteed SWR 1.5 to 1 max. will handle up to 1 kw. send for full info, $19.95. Graff Couplers (K9MFE-K9RHC), 2072 Walnut Circle, Northbrook, Ill.

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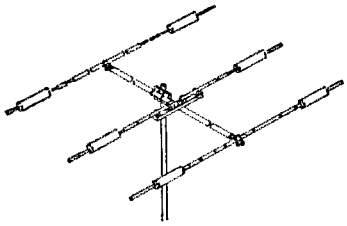

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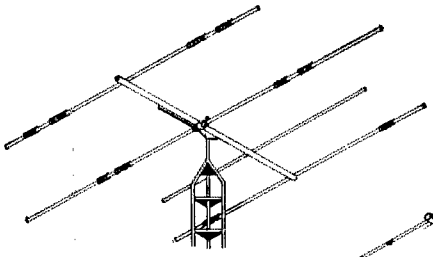

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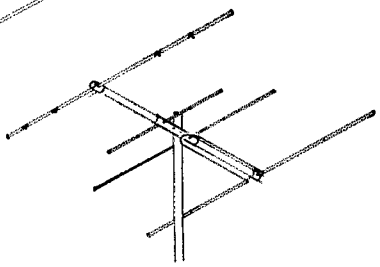

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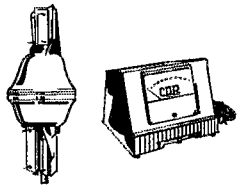

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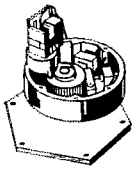

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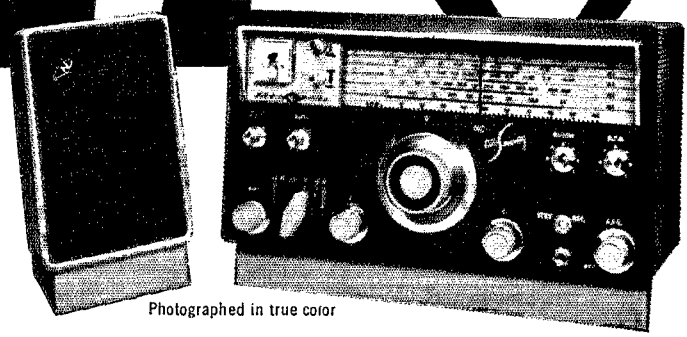

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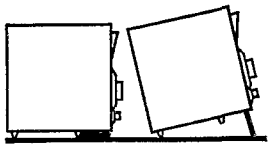
Only $24.99 down*



And National Radio's patented "Flip Foot" makes operating the NC-270 so easy.

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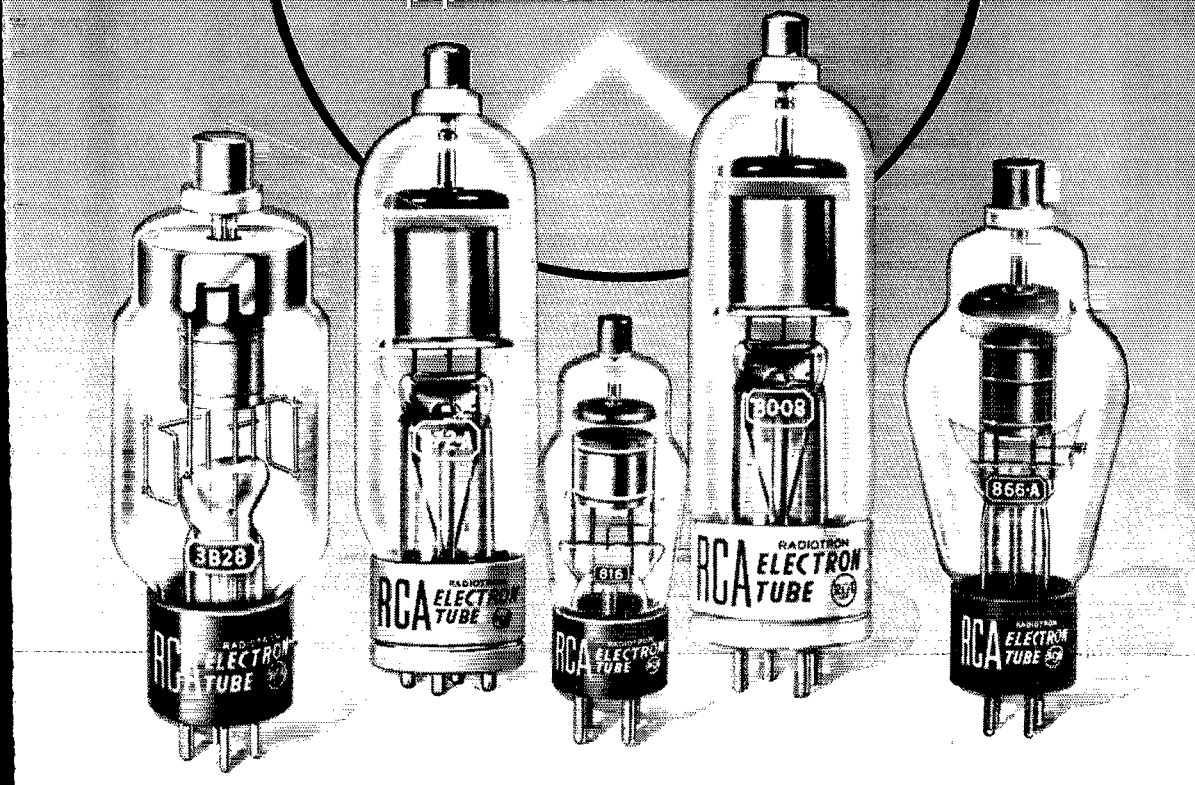

In accordance with RCA's continued policy to provide the radio amateur with the highest performance tubes consistent with the best engineering practice known, every rectifier tube shown here is now designed and built with the new, improved coated filament—N-85-R!

N-85-R filament design prolongs peak emission capability. Immediate "in-rig" benefits to you are; increased rectifier-tube reliability, and longer rectifier-tube life.

Check the chart for the types that fit your DC power requirements. Then order direct from your RCA Industrial Tube Distributor. For technical data on any of these types write: Section E 37-M, Commercial Engineering, RCA Electron Tube Division, Harrison, N. J.

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(Based on use of 2 tubes in full-wave circuit, choke-input filter)

Type	Name	Max. Transf. Sec. Volts (RMS)	Approx. DC Output Volts	Max. DC Output Amperes
RCA-3B28*	Half-wave, gas	3500 1700	3200 1600	0.5 1.0
RCA-816	Half-wave, mercury-vapor	2600	2400	0.25
RCA-866A	Half-wave, mercury-vapor	3500 800	3200 800	0.5 1.0
RCA-872A	Half-wave, mercury-vapor	3500	3200	2.5
RCA-8008†	Half-wave, mercury-vapor	3500	3200	2.5

*For low noise-level applications. †Same as RCA-872A, but has long-pin base.

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