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Four NEW Two-Element QUADS

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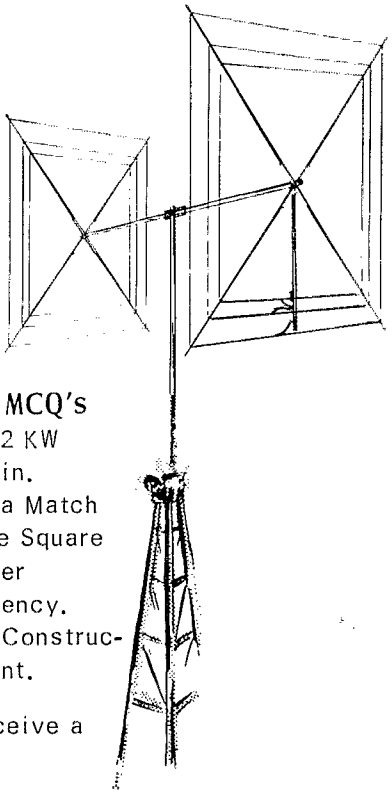
Model MCQ-3B for 10, 15 & 20 meters



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Power Input	SSB=400 watts CW=360 watts	SSB=175 watts CW=160 watts	SSB=300 watts CW=260 watts
Accessory "dual receive" VFO available	**Yes**	No	No
Noise Blanker	**Yes**	$135.00 Accessory	No
Receiver Incremental Tuning	**Yes**	No	No
Built-in notch Filter	**Yes**	No	No
Sharp CW Filter	**Yes** 200 cycles	No	No
Sensitivity	.3 uv for 10 db S/N	.5 uv for 10 db S/N	.5 uv for 10 db S/N
1 kHz dial readout	**Yes**	Yes	No
Carrier Suppression	60 db	50 db	50 db
Unit Price	**$799.95**	**$1,150.00**	**$599.95**

*Data from published specifications.

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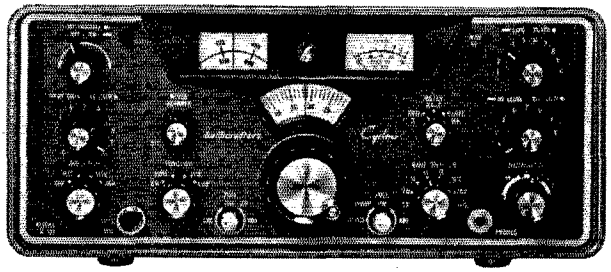
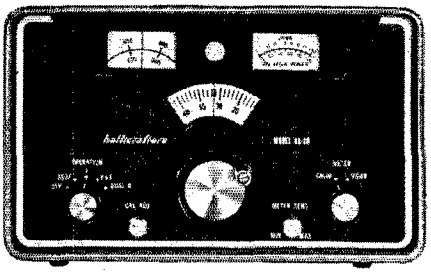


HA-20 VFO



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OCTOBER 1968

VOLUME LII NUMBER 10

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

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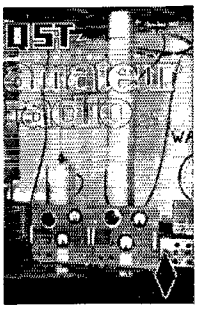

OUR COVER

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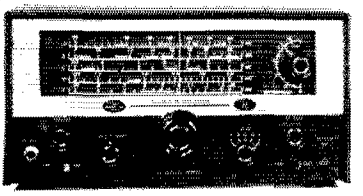

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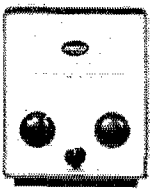

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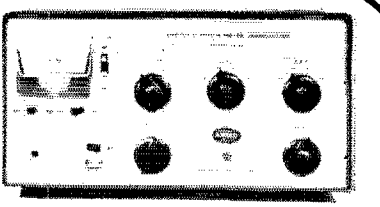

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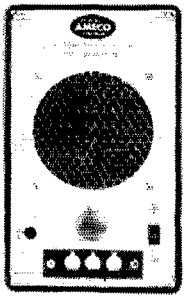

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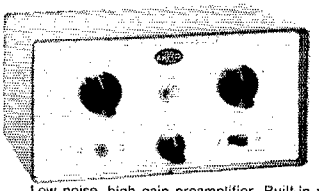

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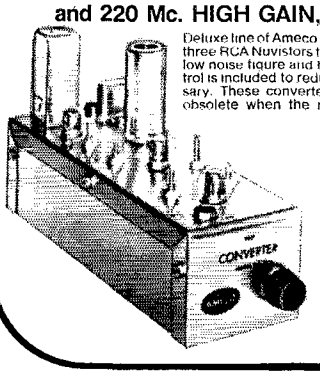

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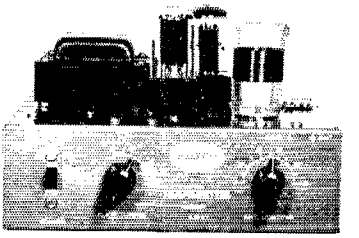

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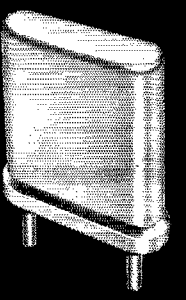

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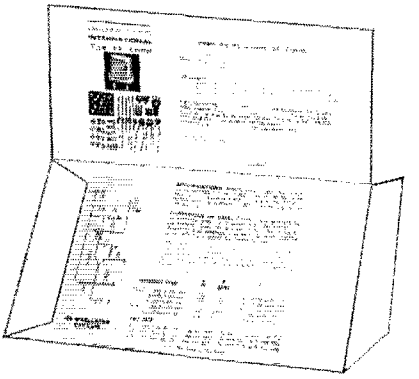

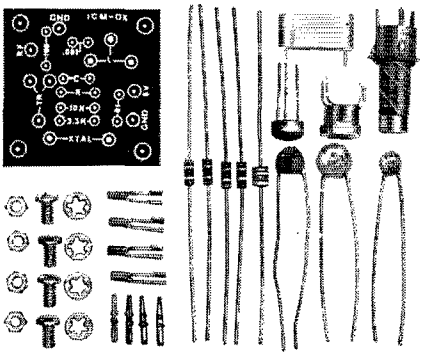

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* Member Executive Committee

"It Seems to Us..."

DXCC

Withdrawal of the "Miller suit" by W9WNV—and his admission that certain claims and statements by him to the Awards Committee and to the Board were, in fact, untrue—confirm the position taken by the Awards Committee and its actions concerning Dr. Miller's DXpedition operations.[1]

Of far greater importance, however, it marks the end, hopefully, of an unfortunate episode that benefitted no one. The incidents cast a shadow not only on DX and those who pursue this particular aspect of amateur radio, but raised questions in the minds of many about the basic values of our fraternity itself.

What is at stake, we would submit, is not at all our values, but our current perspective. Let's not, as happens all too often in so many aspects of our society, allow what involved only a tiny minority to color our judgment of an activity in which many thousands of amateurs of unquestioned integrity have participated with great pleasure and satisfaction for so many years.

DX has its own special appeal to many of us and its own unique rewards. It affords a great sense of accomplishment and achievement. It satisfies the urge to set and reach visible goals, to widen our horizons, to acquire recognized stature. This, perhaps, is why those of us who are DXers can become so ardent in the pursuit of our particular interest, and it helps to account for the development of DXpeditions, an activity which many non-amateurs find difficult even to comprehend!

The consequence of all this is that what was once an occasional, incidental aspect of amateur radio has become a major activity, involving many people, a lot of time, a great deal of effort, and very substantial amounts of money. DX is serious business for those involved in it. At the very core of DX is the League's DXCC. It provides the framework for organized DX activity, establishes the goals and standards, and is the source of recognition for achievement—all of which have evolved through a long tradition. It is no exaggeration to say that without DXCC there would be no DX as we know it.

DXCC could not have achieved this position, and it would have little meaning or value, if its integrity were not absolute and its adherence to established rules as unassailable as administratively possible. This is what thousands of members over the years have built and what they are entitled to have maintained. This is what the Awards Committee refused to compromise.

If nothing else, the Miller situation made inescapable our recognition that circumstances and requirements do change. The traditional Awards Committee policy of accepting DXpeditions and their related credit submissions at face value unless challenged and evidence of non-validity presented was a fine, gentlemanly basis of operation until it became evident that this was no longer adequate. DX has simply become too big and involves too many people of all types for so informal a policy. As a result the rules have now been revised to require validation of DXpedition operations in advance of granting credits so that the majority of DXers can continue to be assured that DXCC standards are being adhered to by all.

This is what is important now: that the efforts and accomplishments of DXCC members have not been undermined, that DXCC is and will continue to be what it always has been, and that the actions of an irresponsible few shall not be allowed to reflect on the majority or deteriorate the standards we all wish to maintain in amateur radio. QST

[1] See p. 83 this issue.

The Joint (IEEE-EIA) Technical Advisory Committee has issued a mammoth volume reporting a 4-year study of spectrum engineering principles and practices. In a substantial section dealing with frequency coordination and monitoring, the report says of TVI committees: "usefulness . . . beyond question . . . valuable service to the community at no expense to the users . . . committees should be publicly recognized, congratulated, and publicized."

One purpose of Hq. staff overseas travel is to establish better relations with telecommunications officials of other countries. This policy had an unusual by-product recently when W1IKE (who visited Cyprus in 1966) was asked to design a QSL card for their government broadcasting corporation!

Good opportunity coming up to expose youngsters to ham radio -- the 11th World Scout Jamboree-on-the-Air, October 19-20. Idea is for us to invite Scouts into our shacks and let them talk with brother Scouts around the world. The local Scout office should be listed in your phone book.

An anonymous note a few weeks ago asked why we hadn't done "something about the absurd, stupid FCC reg limiting RTTY to 60 w.p.m." If he'd signed his name, we could have reminded him that FCC for good cause will grant special temporary authorizations (STAs) to amateurs wishing to conduct serious investigations into almost anything not specifically permitted by the rules.

During fiscal 1968, ending the last of June, 11,480 persons took the General Class exam -- 5,425 passed and 6,055 failed (4,753 of them having trouble with the code). For advanced, 4,867 passed out of 6,780 attempting the test. Of 3,604 applicants for Extra Class, 957 failed the code and 804 the written; the remaining 1,843 were successful. But it does look as if some of us ought to bone up a bit more on code before we chance a waste of four bucks and a trip to the engineer's office. W1AW is still doing business every night of the week.

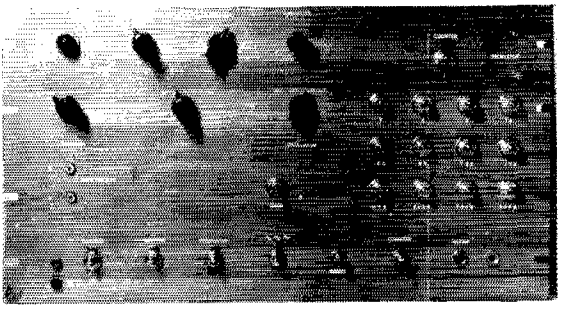
Speaking of exams, normally FCC engineers do not permit the use of a typewriter for amateur code tests except by the handicapped -- to the dismay of some Extra candidates who haven't practiced their longhand lately. Reason: room noise which bothers other applicants.

Got that tired, jaded feeling about DX? See "OpNews" this month for announcement of a new award from ARRL, for working 100 countries on each of five different bands. Contacts must be after January 1 next year, so everyone starts on an equal basis. If enough hams set their mark for the new 5BDXCC, activity on the lower-frequency bands may cause a boom in antenna wire production.

Hams at the Southwestern Division convention in Phoenix were treated to the breaking of the 40-GHz amateur DX record -- formerly 700 feet, now 3,700. New Arizona SCM W7CAF was kingpin of the group undertaking the project. Details next month.

There's still time to comment on FCC's proposed rulemaking to allow ex-amateurs another chance at the Novice test. See page 83, September issue.

Increasing the Accuracy of Frequency Measurement



Improved Gate Control for the Frequency Counter

BY ROYDEN C. GOLDING,* VE3CUS

DESIGNING equipment for frequency measurement suffers a major disadvantage when compared with designs for home-brewed transmitters and receivers. In the latter, an unsatisfactory stage can often be redesigned and rebuilt. It is seldom that this can be done with frequency-measuring equipment. If the equipment as a whole does not give the desired degree of accuracy, then there is little you can do about it, other than start again from the beginning. This, of course, is expensive, so any method of starting small and building on in the future is desirable for the newcomer to the game.

"Starting small" was the object in the design of the pulse generator to be described. The overall frequency-measuring setup eventually to be arrived at is shown in simplified form in Fig. 1. The beginner can commence with a straight 100-kc. source for use with his receiver. Later he can add a 10-kc. divider, which will add greatly to his ability to estimate actual frequencies. Then when the time comes he can extend the equipment, on the same chassis, to incorporate an accurate gate control to be associated with a frequency counter. Thus he can experiment with highly-accurate beating of WWV signals right from the early stages of injecting 100-kc. signals into his receiver. While high accuracy is of course not *necessary* at this stage, the experience is invaluable later when there will be other sources of possible error to deal with.

Thus even for the initial 100-kc. beating process we have to decide on the accuracy we desire to achieve eventually. We also have to decide whether to go solid-state or not. In frequency-measurement work the tube still has advantages over the transistor, unless a general-service portable laboratory-type instrument is the target. One tube will divide by ten, while eight transistors (four flip-flops) are required for the usual solid-state decade. Also, one could run into difficulty with the voltage required to energize neon lamps for display (though I have not checked this). One of the great advantages of transistors is that they can be assembled on plug-in boards, so spares can be plugged in to facilitate trouble shooting. This is a definite advantage for a commercial instrument, but an amateur is not likely to construct a spare board to get a quick result in the face of trouble. All in all, the balance appeared to be in favor of tubes, in the writer's case.

The fact that the equipment is eventually to be used for gate control of a counter means that the 100-kc. standard cannot be tucked

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By using a gate control tied in with the 100-kc. frequency standard, the accuracy of the audio-frequency counter described in January 1965 QST can be increased. This article also discusses some of the philosophy of accurate frequency measurement, and describes an equipment setup more-or-less typical of what those who place high in the ARRL Frequency Measuring Tests are using.

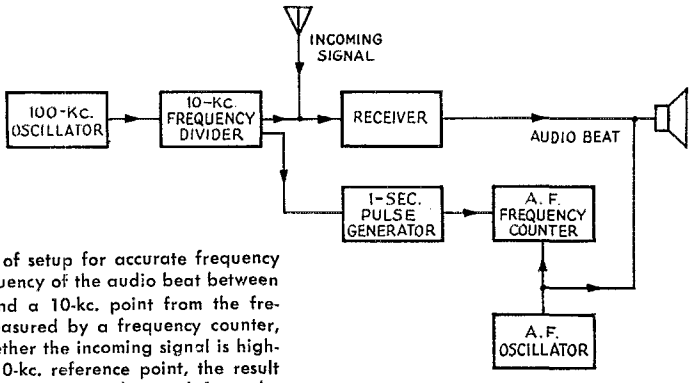


Fig. 1—Block diagram of setup for accurate frequency measurement. The frequency of the audio beat between the incoming signal and a 10-kc. point from the frequency standard is measured by a frequency counter, and depending on whether the incoming signal is higher or lower than the 10-kc. reference point, the result can then be either added to or subtracted from the frequency of the 10-kc. point. The audio-frequency count could be obtained directly from the receiver output, but to overcome noise, interference and fading the counter usually is driven by a variable audio oscillator which is set to the same tone as the beat, either by ear or with an oscilloscope.

The accuracy of the audio-frequency count is set by the accuracy with which the counter is "gated" by the one-second pulse generator, and by the inherent plus-or-minus-one-count uncertainty in a gated counter.

away in the receiver, as with some models. It becomes a piece of ancillary equipment in its own cabinet, and is connected to the receiver antenna terminal by a piece of coax cable.

Suppose we decide to design for an eventual accuracy within 2 parts per million. Holding the error to 2 parts per million in the final result means that we can have no more than a 20-c.p.s. error in beating the 100-kc. harmonic with the 10-Mc. signal from WWV. With the equipment to be described no difficulty is found (after experience) in obtaining a beat of 2 c.p.s. at this stage, or about ten times the accuracy we have set for ourselves.

The technique of beating the signal to be measured against harmonics of the standard appearing at 10-kc. intervals means that no audio beat will exceed 5 kc., which therefore is as high as the counter needs to go. In view of the accuracy with which the standard can be set to WWV, we are going to assume that any inaccuracy in actual measurement of frequency will be in the beating techniques and in the equipment we shall build later—specifically, in the gate control, since it can be assumed that the counter circuits themselves will have no error.

The pulse generator shown here was designed for use with the electronic counter described by Skeen.[1] It replaces the 100-kc. oscillator and harmonic generator, and also the 6-to-1 and 10-to-1 dividers, shown on page 33 of the January 1965 issue. In the course of doing so it steps up the accuracy of the 10-kc. signal used for beating in the receiver, and also the gate-control timing. Fig. 2 is a reproduction of Skeen's overall diagram showing the changes made. In order to use a common power pack for all circuits, plus-B of 300 volts is applied to the counter circuits instead of the 250-volt supply in the original design. (This voltage is necessary for firing the VR tubes in the new pulse generator to obtain regulated 216 volts.) Of course, if the reader has already constructed such a counter a separate power pack can be used.

[1] Skeen, "Low-Cost Precision Frequency Measurement", *QST*, January, 1965.

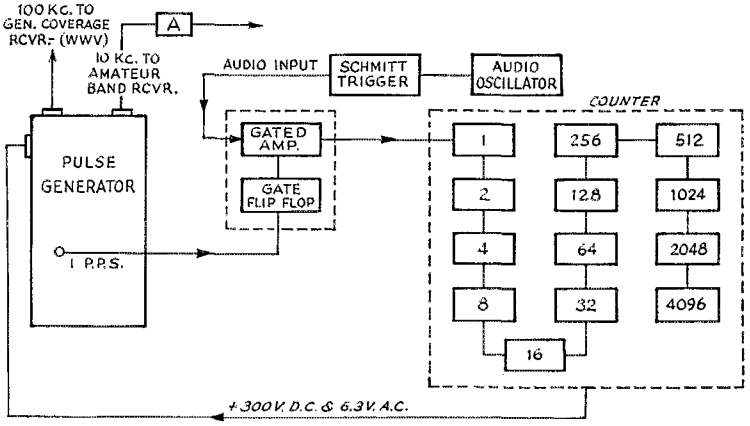


Fig. 2—The system used by VE3CUS, a modification of the counter described in January 1965 *QST*. A major difference between this and the referenced circuit is the use of a pulse generator actuated by the 100-kc. crystal oscillator in the frequency standard, thus improving the gating accuracy. A tuned circuit, *A*, is used between the receiver and the 10-kc. divider (in the pulse generator) to increase the harmonic strength in the amateur band in use.

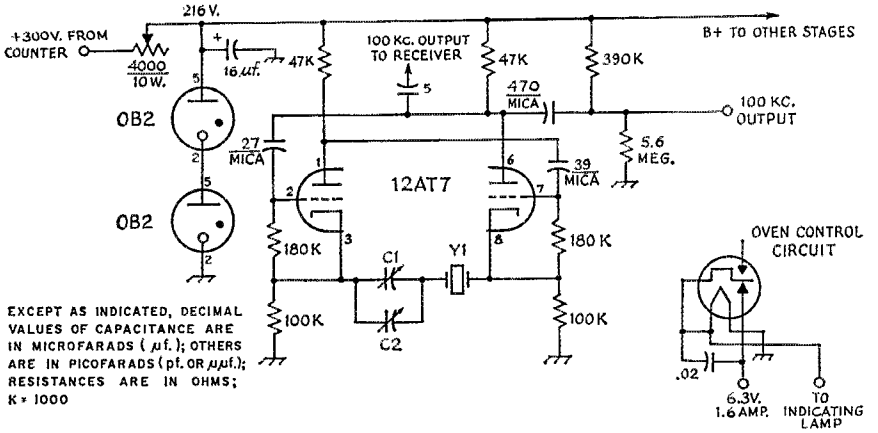


Fig. 3—The 100-kc. crystal oscillator circuit. The crystal at VE3CUS is maintained at constant temperature in an oven—a practical necessity for high-accuracy frequency measurement.

C_1—50-pf. variable (Hammarlund APC-50).
C_2—Approx. 10 pf., for fine adjustment of frequency (National NC-800).
Y_1—Oven-controlled 100-kc. crystal (Bliley TCO-14LS).

The Circuit

The circuit itself consists of six stages. The first, Fig. 3, is an Eccles-Jordan multivibrator circuit used as a 100-kc. oscillator.[2] However, the cathode-coupling arrangement shown is reminiscent of the cathode-coupled multivibrator. The degree of cathode coupling is controlled by the crystal, which keeps the oscillation under numerical control.

The other five stages are repetitions of Fig. 4, with slight modifications. They operate as frequency step-down stages, each dividing by 10, thus reducing 100 kc. to one pulse per second. Each of the five stages has a different capacitor in its plate-grid circuit, as listed under Fig. 4; the *RC* constants determine the rate of the output pulse. The fifth section has a slightly different output circuit, and is shown separately in Fig. 5. As the oscillations in this section are at the rate of 1 pulse per second, two stepped voltages can clearly be observed when the circuit is operating. The voltages shown in all sections are d.c., but of an oscillatory nature, and in the other cases, where the rate of oscillation is too high for the meter to follow, the meter reads the average voltage.

The output of the last stage drives the gate flip-flop shown on page 35 of January 1965 *QST*, and thus the gate. However, an integrating circuit is interposed in Fig. 5 to provide a drive of negative pulses. With this circuit arrangement the gate is put under control of the 100-kc. crystal oscillator.

With the idea of providing more-pronounced negative pulses from the incoming signal to be counted, a Schmitt trigger to square the signals from the audio oscillator is used where Skeen suggested an optional squaring amplifier. Also, an integrating circuit is added at the trigger output, Fig. 6, before passing the signals to the gated-amplifier grid.

The photograph shows the prototype assembly. There is some spare space, and a smaller chassis (this one is 12 by 8 by 3 inches) could have been used. Construction is by means of 12-connector, 7-pin Vector sockets (8-M-12T) for the oscillator and divider tubes, and normal sockets for the 6AL5s. The 6AL5s were used as coupling diodes because they were available in the junk box. As only one-half of the last 6AL5 is needed, the use of 6BC7s would reduce the number of tubes by one.

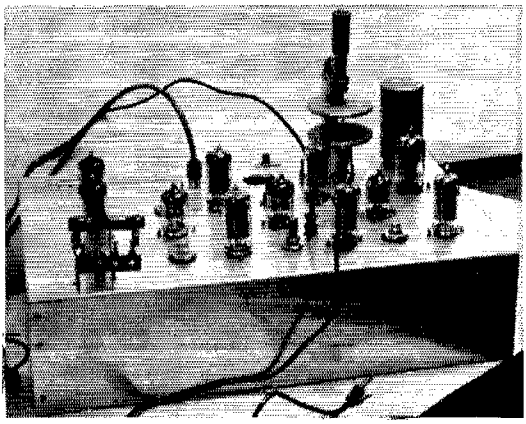
Adjustment

In putting the circuit into operation it will help if we understand the waveshapes involved. Providing the circuit is constructed correctly, maloperation will almost always be due to poor waveshaping. Changing the values of the resistors or capacitors in the integrating circuits (clearly marked in Figs. 5 and 6) should improve any marginal results obtained.

Adjustment of the circuit consists of two operations: adjustment of the frequency-dividing section (five stages), and adjustment of the oscillator to exactly 100 kc.

Dealing with these in this order, if the circuit works the first time (how lucky can you be?), a voltmeter connected to the output of the pulse generator will pulse regularly up and down at something approaching 1 pulse per second. If it does not do this, take the 100-kc. output-to-receiver lead and connect it to the antenna terminal of your receiver. As you tune the 3.5- or 7-Mc. bands you should hear the heterodyne at every 100-kc. mark. Having proved this, disconnect the 100-kc. lead and replace it with the 10-kc. supply lead, Fig. 4. The 10-kc. heterodyne should now be heard at every 10-kc. mark along the scale. If this does not occur exactly at every 10 kc., adjust R_2 in the first division stage (100 kc./10 kc.) until it does.

[2] Gottlieb, *Basic Pulses*, John Rider Publisher, New York. This book is recommended reading for those intending to build frequency-division circuits, both in the frequency-standard and electronic-counter fields.



The circuits described in the text are contained in this chassis. The crystal oven is at the right rear, with the oscillator tube in front of it and the capacitor for fine frequency adjustment to one side. Voltage regulator tubes are at the left. The remainder of the tubes are in the frequency-divider circuits for developing the 10-kc. output and 1-second pulses. Lead at left rear is the pulse output. Rear right is a test lead feeding 100 c.p.s. to the counter for checking purposes. Front lead 60 c.p.s. input (test) for calibrating last two stages (see text).

The first frequency-reduction stage is now adjusted correctly, and we have four more to do. We now adjust the last two stages, the 100/10 and the 10/1 cycle steps. Pull the 6AL5 tube which feeds the fourth stage. Connect to the fourth 5915 tube anode (one of the 6AL5 socket pins will do this) a lead which supplies 115 volts, 60 cycles, through a 1-meg. resistor (preferably through an isolating transformer, too) to the anode. The last two dividers should commence to pulse. This can be checked by a voltmeter connected to the output of the last stage. Or, if you have constructed the gate flip-flop, then feed this with the 1 p.p.s. and the neon lamp connected with it should commence to flash. Time the voltmeter or the flashes, which should go "on" thirty times and "off" thirty times exactly in 60 seconds. Set the controls, R_1, in both divider circuits reasonably near the center of their range. When the output timing is correct the first divider is dividing by 6 and the last one by 10. If the potentiometers adjust to the correct timing at their extreme ends, one is dividing by 5 and the other by 12. Another adjustment which gives the correct timing should be found.

Leaving these pots now at their settings, uncouple the 115-volt supply and replace the 6AL5 tube. Energise the whole pulse generator. We know the 10-kc. supply is correct, and it only remains to adjust R_1 in the second and third circuits, while keeping the output of the last stage at exactly 1 p.p.s. This can be done by trial and error. It is true that we left the fourth stage dividing by 6, and we are now expecting it to divide by 10 without further adjustment. However it was the output which was really adjusted (by the RC time constant) to produce pulses at ten per second. It will continue to produce at the same rate when fed by 100 c.p.s.

Other means of checking each stage will come to mind if an oscilloscope is available. By feeding the horizontal plates with 60 cycles, a sweep of 600 c.p.s. will give a Lissajous

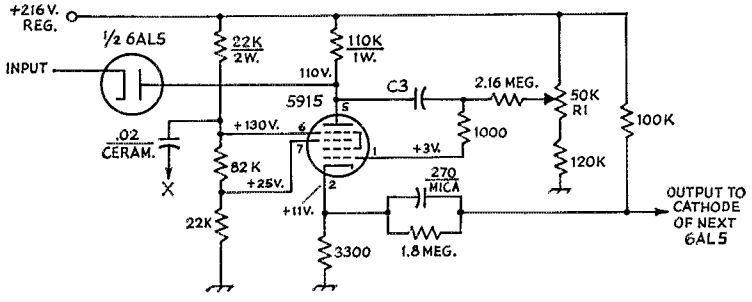


Fig. 4—Frequency-divider stage in the pulse generator. Five of these are required, the fifth being modified as shown in Fig. 5. X indicates 10-kc. output (on first divider only) to the receiver. The 2.16-megohm resistor is a Welywn N15; similar units can be obtained from the Electra Co., Kansas City, Mo. Other fixed resistors are ½ watt.

C_1—First divider (100/10 kc.): 39 pf. mica. Second divider (10/1 kc.): 390 pf. mica. Third divider (1000/100 c.p.s.): 0.0039 μf. mica. Fourth divider (100/10 c.p.s.): 0.039 μf. paper. Fifth divider (10/1 c.p.s.): 0.39 μf. paper.

R_1—50,000-ohm control, linear taper.

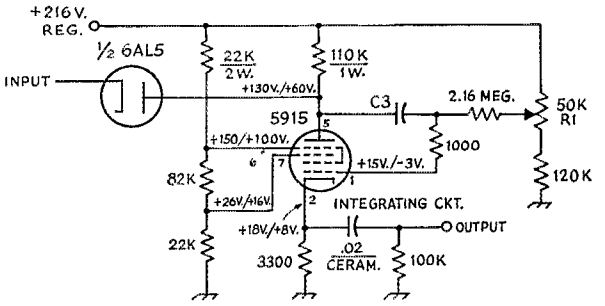


Fig. 5—The output circuit of the fifth divider (10/1 c.p.s.) is modified by incorporating an integrating circuit as shown. The output goes to the gate flip-flop circuit (C_3, Fig. 5, page 35, January 1965 QST).

figure having a 10-to-1 ratio. Retaining this sweep, feed the 100-cycle output from stage three to the horizontal plates, and adjust R_1 to give a Lissajous figure of 6. Of course, if you have built the counter first you can drive the last two division stages by 60-cycle current as above. If you then pass the outputs, in turn, of the two previous stages, 1000 cycles and 100 cycles, through the gate, the counter will count them for you, and do away with trial and error altogether.

It now remains to beat the oscillator with the WWV signal, in this instance probably with the 5- or 10-Mc. signal. The procedure here is quite normal: feed the 10-kc. signal from divider circuit 1 to the antenna terminal of a receiving set tuned to WWV, observing the necessary precautions as laid out in the chapter on measurements in the ARRL *Handbook*. Some ham-band receivers do this by an auxiliary mixer tube which converts the 10-Mc. signal into one of the ham bands. The same happens to the 100th harmonic of the 10-kc. signal, in theory, and the two can beat together and be heard in the audio circuit of the receiver. The author has had little luck with this system; in some sets the convertor produces too many spurious beats which are difficult to recognise. I favor using a continuous-coverage receiver, receiving the WWV 10-Mc. signal direct. One of the $75 Japanese receivers with capacitive bandspread works very well. A separate 100-kc. signal is provided in Fig. 3 to feed this receiver.

Measuring Frequency

Now comes the real test, the peak we have set ourselves to attain in all we have built so far. A dead beat is heard as a null, but the null is probably at least 60 cycles wide, depending upon your hearing and the audio response of the receiver. It is not sufficient to set to this null; it must be dissected and the exact center found, and it must be kept there (exactly) as long as the measuring period lasts. All circuits should be operated for 24 hours before calibrating, and this should be 24 to 48 hours before the test, as all circuits will be left operating for that period.

For fine adjustment of the 100-kc. oscillator frequency the National neutralizing capacitor specified in Fig. 3 was chosen over a dozen others tried. It is bulky, and a miniature type which would be equally good for the purpose would be welcome, if found. Rough adjustments are made on C_1 and final adjustment on C_2. C_2 has a loose shaft (no backlash) and needs a trimming tool at least 12 inches long. (Bind two 6-inch rods together.) A metal-tipped

(Continued on page 160)

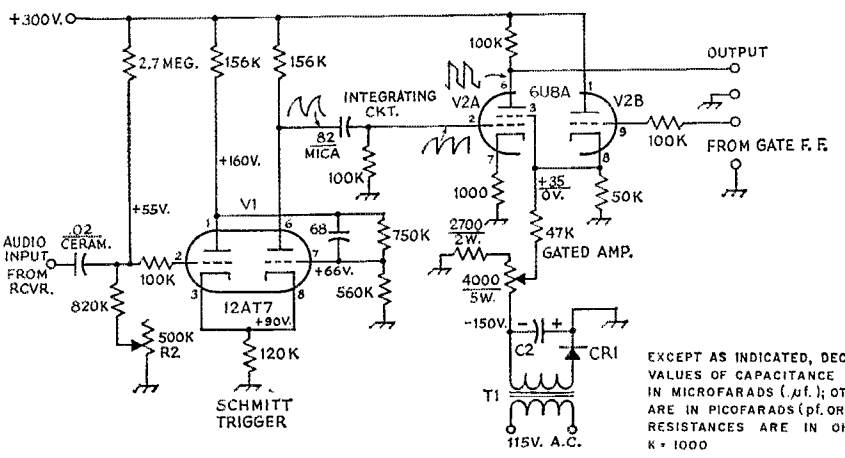
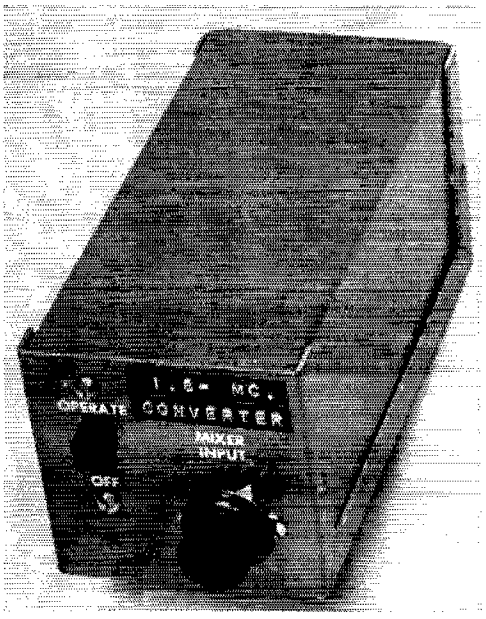


Fig. 6—Squaring and integrating circuit for applying the audio signals to the gated amplifier, V_2. This circuit also shows the modifications to the original gated-amplifier circuit given on page 34, January 1965 QST. Fixed resistors are ½-watt except as indicated. Adjust R_2 for steady operation of the counter. Adjust the 4000-ohm variable resistor to give the voltages shown on pin 3 of the 6U8A: +35 volts, gate open; 0 volts, gate closed.

C_3—40-μf. 250-volt electrolytic.
CR_1—Any silicon rectifier, p.i.v. 350 volts or more.
R_2—0.5-megohm control, linear taper.
T_1—Power, 125 v., 50 ma.

Solid-State Mobile Fixed Converter For 1.8 Mc.

BY DOUG DeMAW,* W1CER



Top-front view of the converter showing the location of the on-off switch and the input peaking control. Input and output jacks are on the rear and bottom sides of the 2¼ x 2¼ x 5-inch Minibox.

This converter can be used either for mobile operation, by feeding its output into the automobile b.c. receiver, or for fixed station use as an "up" converter using a receiver covering the 75- or 40-meter bands as a tunable i.f. A double-tuned hi-Q input circuit provides good front-end selectivity, and an FET mixer greatly reduces cross-talk from strong nearby signals.

With the new 160-meter regulations in effect it is quite likely that there will be a resurgence of activity on that band, possibly leading to increased activity by 160-meter mobile stations. Certainly, this is a band that should not be overlooked by those operators who desire reliable point-to-point communication, mobile to mobile or mobile to fixed station, over paths up to 50 miles or more. Ground-wave communication on "160" is superb when compared to other bands in the 1.8 to 30-Mc. range. Natural barriers such as mountains and forests have little effect on 1.8-Mc. signals. Tall buildings have a similar lack of effect on the signals. It is not uncommon for two mobile stations to have Q5 communication over a 30-mile path (ground wave) with but a few watts of transmitter power and base- or center-loaded 8-foot whip antennas. Another boon to mobile operation on this band is the lack of ignition noise as compared to that on the higher bands. All is not pure joy, however, in that atmospheric noise is quite prominent in the summer months, at times a deterrent to good reception. Nighttime propagation conditions permit "skip" (skywave) contacts as far away as a few hundred miles when operating mobile.

This converter can be an effective tool in obtaining good mobile reception. Similarly, it can be used as an "up" converter for fixed-station reception on 1.8 Mc. by making the modifications described in the text. Whatever its intended use, it is easy to build and put into service, and performs well despite the simplicity of the circuit.

Circuit Data

Only two stages are used in the circuit of Fig. 1. A double-tuned high-Q input circuit is used between the antenna and the JFET mixer, Q_1, an MPF105. Coils L_2 and L_3 are tuned for a peak at the receiving frequency by C_1, a two-section variable capacitor which is accessible from the front panel of the converter. Loose coupling is used between L_2 and L_3 to provide good tuned-circuit selectivity, an aid to image rejection and attendant interference from stations in the b.c. band.

A source-bias resistor, R_2, establishes approximately 0.8 volt of mixer bias — a value which is recommended for best conversion gain and minimum cross-talk with this transistor. Other brands and types of N-channel FETs can be used at Q_1, but the value of R_2 might require empirical derivation to obtain best mixer performance. Any FET with medium to high transconduc-

* Assistant Technical Editor, *QST*

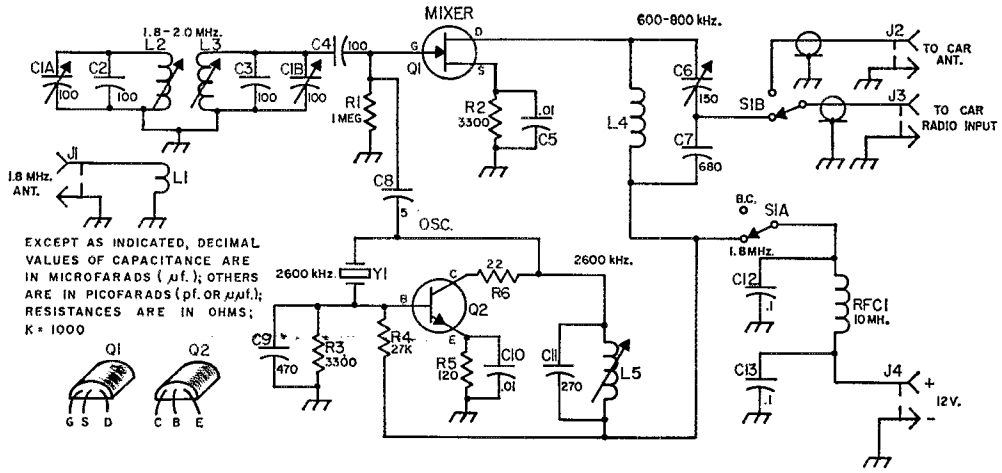


Fig. 1—Schematic of the solid-state mobile converter. Resistors are ½-watt composition. Fixed decimal-value capacitors are 50-volt disk ceramic for greater compactness. Other types can be used, but should be disk or tubular ceramic. Some mylar 100-volt miniature capacitors can also be used. Non-decimal-value capacitors are standard disk ceramic units.

C_1—Two-section miniature variable (James Millen 26100RM or equiv.).[1]

C_2-C_{13}, inclusive, except for C_6—For text reference.

C_6—10-160-pf. padder capacitor (J. W. Miller 160-D).[2]

J_1-J_4, inc.—Phono jack.

L_1—10 turns No. 30 enam. wire over ground end of L_2.

L_2, L_3—27.5 to 58 μh., slug-tuned (J. W. Miller 42A-475CBI).

L_4—500-μh. subminiature r.f. choke (J. W. Miller 70F-504A1).

L_5—9 to 16 μh. slug-tuned (J. W. Miller 4506).

Q_1—MPF105 (Motorola).

Q_2—2N4124 (Motorola) or similar.

RFC_1—10-mh. subminiature r.f. choke (J. W. Miller 70F102A1).

S_1—D.p.d.t. slide switch.

Y_1—2600-kc. fundamental-cut crystal (HC-6/U style holder).

tance and rated to at least 30 Mc. should work nicely at Q_1.

An i.f. output of 600 to 800 kc. is used with this circuit because most car radios have greater bandspread on the low end of the b.c. tuning range. L_4 is tuned to whichever 50-kc. segment of the b.c. band permits reception of the part of the 160-meter that is desired in any given geographical location. The i.f. tuned circuit has fairly low Q, resulting in sufficient broadness to cover the entire 1.8- to 2.0-Mc. range without a serious loss in the overall gain of the converter. It is a good idea, however, to peak it for the portion of the band that will most frequently be used. A capacitive divider, consisting of C_6 and C_7, matches the output of the converter to the input of the car radio. C_6 tunes L_4 to resonance in the i.f. range.

A bipolar transistor, Q_2, is used in a crystal-controlled oscillator circuit. Y_1 is a fundamental-cut crystal and is soldered directly into the etched-circuit board. C_9 is part of the feedback circuit for the stage and its value may have to be made somewhat smaller if a sluggish crystal is used at Y_1. The value given in Fig. 1 proved to be ideal for use with several crystals tried in the test circuit.

A 22-ohm resistor, R_6, prevents low-frequency parasitic oscillations — a common occurance when high-beta transistors are used as oscillators. Experience has shown that it is a good idea to include such a resistor as a matter of course when designing crystal-controlled and variable-frequency oscillators. A further aid to the reduction of spurious responses is assured by the use of a high-C collector tuned circuit at Q_2. This practice improves the selectivity of the collector tank, thus reducing the harmonic currents in that part of the circuit. Ideally, only the 2600-kc. signal from Q_2 should be injected into the gate of the mixer in the interest of the best image ratio attainable.

A switch-through feature has been added to the circuit to permit the car radio to be reinstated when the converter is not being used. By means of S_1 the auto-radio antenna is reconnected to the car receiver when the converter is turned to OFF. A brute-force filter, consisting of C_{12}, C_{13}, and RFC_1, keeps ignition pulses out of the converter by filtering the 12-volt lead. The filter also prevents broadcast-band, or other out-of-band signals, from entering the converter via the power lead.

Construction Methods

Almost any kind of a metal container can be used for a converter box. In this instance a 2¼ × 2¼ × 5-inch Minibox was used. There is nothing particularly "sticky" about the layout except for keeping the input and output leads electrically isolated to prevent b.c. signals from leaking through the system. Coaxial cable (RG-174/U,

[1] Available from the James Millen Co., 150 Exchange Street, Malden, Mass.

[2] If not available from local wholesale outlet, contact J. W. Miller Co., 5917 S. Main St., Los Angeles, California 90003.

or other subminiature 50-ohm coax line) should be used for all wiring between S_1 and J_1, J_2, and J_3 to assure good isolation between the input and output circuits of the unit.

Most of the small components are assembled on an etched-circuit board which mounts vertically near the rear wall of the Minibox. Metal spacers are used between the board and the back wall of the case to hold the etched-circuit assembly securely in place.

Details for the design of the circuit board are given in Fig. 2. There is no reason why the builder could not use standard construction practices and eliminate the circuit board. If this were done, Q_1 and Q_2 could be plugged into transistor sockets and point-to-point wiring could be used on a pegboard or aluminum subchassis. The circuit board, however, is neater and more compact.

L_2 and L_3 are mounted on an aluminum bracket and are spaced one inch apart, center to center. This spacing allows sufficient mutual coupling between them, eliminating the need for a coupling capacitor between their high-impedance ends. The bracket allows the tuning screws to be inside the case, preventing accidental damage which might occur if they were protruding from the box.

The i.f. inductor, L_4, is suspended between the circuit board and one of the terminals of C_6. Capacitor C_7 is mounted between the remaining terminal of C_6 and ground. L_5 is mounted on the rear wall of the box and C_{11} is attached to its two solder posts.

Capacitors C_2 and C_3 are mounted directly at the terminals of L_2 and L_3 and are grounded to a solder lug which is bolted to the bracket between the two coils. J_1 and J_3 are located on the bottom of the converter case, toward the rear. J_2 and J_4 are on the rear wall of the box.

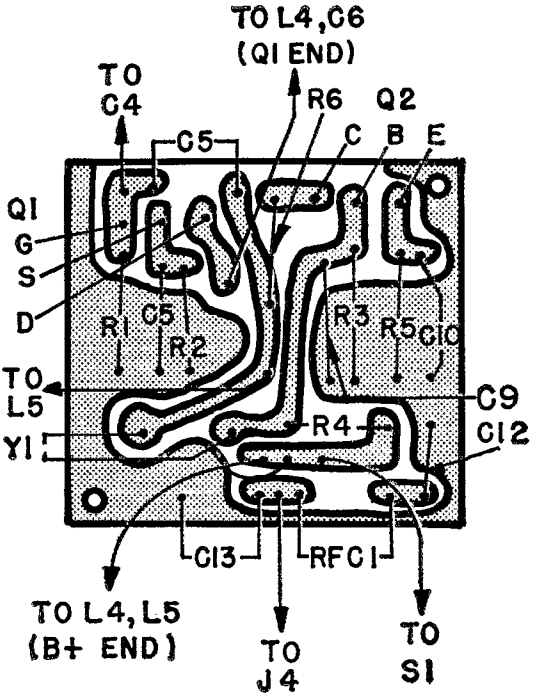
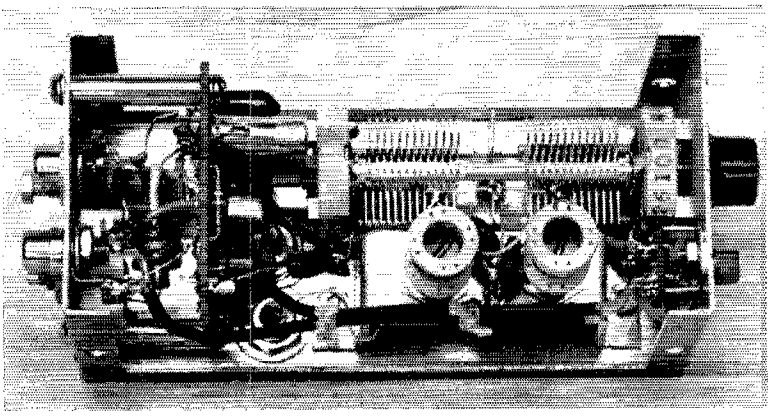


Fig. 2—Layout of the etched-circuit board showing location of most components. Drawing scale is 1:1. Dark areas represent copper strips which remain after etching. Drawing is shown with component side facing the reader. The copper sections are on the opposite side of the board and are shown for purposes of clarity.

Changes For "Up-Converting"

It is not unusual these days to use an i.f. which is *above* the signal frequency. Many s.s.b.



Looking into the converter, the two-section input-peaking variable is at the upper right. The two slug-tuned input circuit coils are at the lower right, mounted on an aluminum U bracket. An etched-circuit board contains most of the small components and is mounted vertically by means of two spacers near the rear wall of the Minibox (left side of photo). The peaking trimmer for the i.f. tuned circuit is mounted on the rear wall of the box along with two of the phono jacks and the oscillator slug-tuned coil.

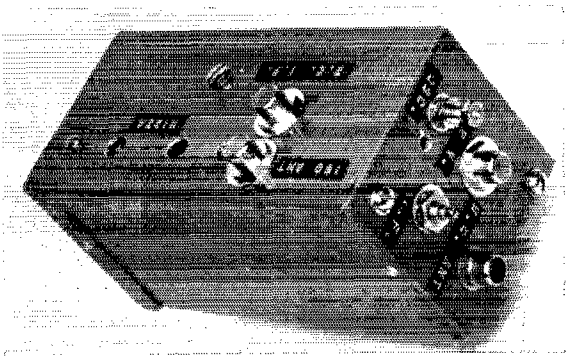
receivers that operate, say, from 3.5 to 4.0 Mc., use a 9-Mc. i.f. Since most modern-day ham receivers do not include the 160-meter band, it requires that an external converter be used in order to have coverage from 1.8 to 2.0 Mc. The "up-converting" scheme can be used effectively for this by tuning the i.f. from 3.8 to 4.0 Mc., or from 7.1 to 7.3 Mc., for example. In order to use the circuit of Fig. 1 in this manner, certain small changes are required. To tune "160" on 75 meters (2.0 Mc. being at 3800 kc., and 1.8 Mc. appearing at 4000 kc.) a 5800-kc. crystal must be substituted at Y_1. Feedback capacitor C_9 should not need changing. Coil L_5 should be changed to one whose value is approximately 3 μh. A J. W. Miller 4307 can be used for L_5 and will provide an inductance range of 2.7 to 4.2 μh. L_4 should be changed to a value of 15 μh. A J. W. Miller 70F155A1 subminiature r.f. choke will serve nicely there. No other circuit modifications should be required for up-converting. If 75-meter leak-through is noted, it may be coming in via the antenna lead and leaking across S_1. If this happens a low-pass filter, designed to roll off just above 2 Mc., can be installed ahead of the converter. Details on filter design are given in the *Radio Amateur's Handbook*, Chapter 2.

Adjustment

Apply power to the converter and listen on the main station receiver for output from the oscillator stage, Q_2. It may be necessary to couple an r.f. probe to L_5 and connect it to the antenna terminals of the receiver in order to hear the signal. Adjust L_5 until the oscillator signal appears. Cycle S_1 several times to make sure the oscillator starts each time. If it doesn't, adjust L_5 to a point where the crystal kicks in reliably. If a general-coverage receiver is not available for this test, a wavemeter can be placed near L_5 to show when the oscillator starts. Next, connect an antenna to J_1, and connect the i.f. receiver to J_3. Apply power and tune in a weak station (nighttime may be best for this if there is no activity in your area). For operation at or near 1800 kc., set C_1 to almost full mesh. Then, alternately adjust the slugs of L_2 and L_3 for peak response of the signal. C_1 will be at near midrange for peak response at 2000 kc. Adjust C_6 for peak response in the portion of the band where operation will take place.

Operation

When checked in an area where several strong local b.c. stations operate, this converter showed good immunity to cross-talk and image responses. The sensitivity is good — the overall gain of the converter checked out at roughly 8 decibels. A 0.1-μv. test signal (unmodulated) provided a perfectly audible c.w. note in the speaker of the station receiver. A 1-μv. 30-percent-modulated test signal produced a room-volume signal with audio gain to spare. Since atmospheric and man-made noise levels are



A view of the rear wall (right) and bottom surface of the converter. The signal input and output jacks are mounted on the bottom of the case. Also on the bottom of the box are two access holes for aligning the slugs of the two input coils.

usually well above a few microvolts on 1.8 Mc., this converter should perform as well as the best tube-type equivalent, yet with considerably less d.c. power required. Actually, a 9-volt transistor-radio battery should be satisfactory for powering the converter. At nine volts the total current drain is only 8 ma. Good performance resulted when the supply voltage was varied between 6 and 15 volts, but slightly less converter gain was noted at the lower voltages. The converter draws 10 ma. when operated at 13.6 volts, the usual car-battery voltage. QST

Strays

Stolen Equipment

On August 6, my NC-200 transceiver and a.c. power supply were stolen from my house. The transceiver serial number is 105 434. Glen Hedderig, WA1CFQ, 175 Cocasset St., Foxboro, Mass. 02035.

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The Delaware Valley, Central New York, and New England Chapter of QCWA nets will change their frequency from 3810 kHz. to 3917 kHz. as of August 25. These QCWA nets operate from 0900 hours through 1030 hours every Sunday morning.

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A recent Army MARS bulletin makes a good point. "To be of maximum benefit to MARS or any other amateur radio organization, an individual radio amateur should be knowledgeable about amateur radio affairs in general. He should not immerse himself so deeply in any one activity that he loses contact with amateur radio as a whole." That's a pretty good philosophy for any person of whatever interest.

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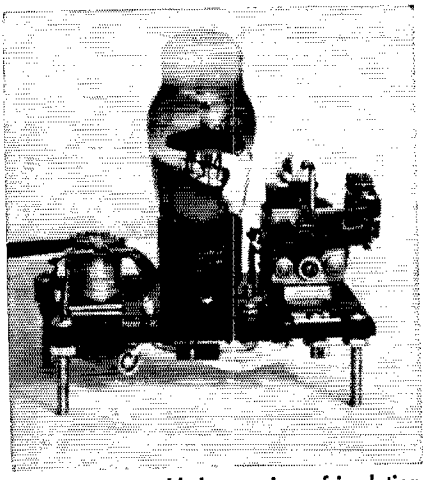
I would like to get in touch with . . .

those who have interesting old-time radio experiences that could be included in my book on this subject. My thanks to those who have already made contributions. Col. Haydon P. Roberts, 2015 Louise Lane, Los Altos, Cal. 94022

Touch To Talk

BY COL. CHARLES FELSTEAD,* KH6CU



The t.t.t. unit is assembled on a piece of insulating material large enough to accommodate the tube and two relays. It can be mounted in any convenient spot where it cannot be touched accidently (the 115-volt line is on some of the exposed connections).

MANY different methods have been devised for switching back and forth from receive to transmit for voice operation of a rig, but each one has some disadvantages. A push-to-talk (p.t.t.) switch on the microphone requires that it be held closed as long as the operator is speaking. A push-on, push-off switch is a nuisance to operate, and a foot switch has the annoying habit of never being twice in the same spot. VOX operation requires steady talking to prevent the carrier from popping off and on.

The touch-to-talk (t.t.t.) system described here overcomes all those disadvantages. To switch between receive and transmit, it is merely necessary to touch a metal plate, Fig. 1, located in any convenient spot. Body capacitance to earth makes the 0A4G gas triode conduct, and the current passing through the tube actuates the 2500-ohm plate-circuit sensitive relay, K_1. The contacts of this relay are connected to control the receive-transmit relay in the rig through the p.t.t. contacts. A 1000- or 2000-ohm relay will also work very well.

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This same principle is used in the contact buttons of modern elevators that control the stopping at floors. The elevator buttons, however, employ gas diodes, and the ionized gas that appears in the diode when it is conducting serves also to provide the light which indicates that the button has been touched.

With the basic circuit shown in Fig. 1 it is necessary to keep contact with the metal plate to hold the relay closed. When the fingers are removed from the contact plate, the tube ceases to conduct and relay K_1 opens. This simple circuit is recommended only as an economy measure.

By adding a single-coil impulse latching relay (K_2 in Fig. 2), such as the d.p.d.t. Potter & Brumfield PC11A, which operates on 120 volts a.c., TTT operation becomes a pure joy. A momentary touch on the contact plate causes the impulse-operated relay to close and remain closed until another brief touch on the contact plate causes its contacts to open.

The second set of contacts on K_2 may be used to turn on an "On the Air" light. This has an extra advantage, for the contact plate may previously have been accidentally touched, and when the rig comes on it may be in the transmit mode without the operator otherwise being aware of it.

Resistor R_1 is necessary to limit the initial current surge; without it in the circuit the tube will be destroyed.

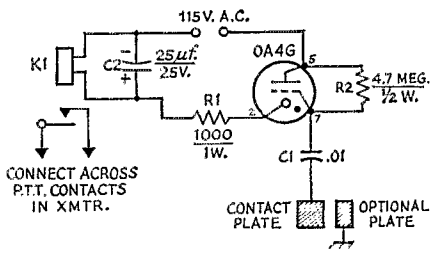


Fig. 1—The basic touch-to-talk circuit.
C_1—0.01 μf. or larger, 200 volts working; paper or mica.
C_2—Electrolytic.
K_1—Plate-circuit relay, 2500-ohm coil, 60-mw. d.c. (Potter & Brumfield RS5D or equivalent).
R_1, R_2—Composition.

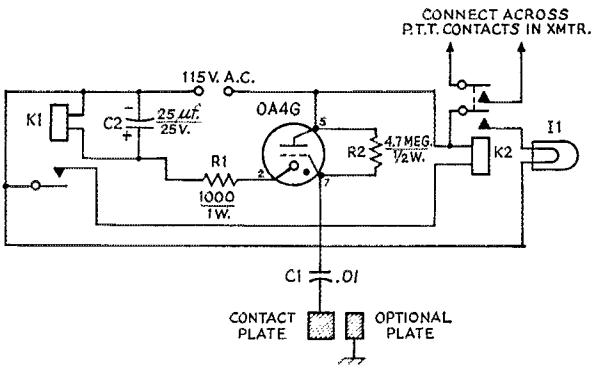


Fig. 2—The TTT circuit. Components listed below are in addition to those shown in Fig. 1

I_1—115-volt lamp ("on the air" indicator).

K_2—Latching type, 120-volt a.c. coil, d.p.s.t. (Potter & Brumfield PC11A or equivalent).

The capacitor C_1 is not critical in value; it could be left out of the circuit, although this is not recommended. It should be Mylar, paper, or equivalent, with a 200-w.v.d.c. rating or higher. The electrolytic capacitor C_2 also is not critical in value; however, a larger capacitance will cause a slight delay in the closing and releasing of K_1.

The 110-volt a.c. supply to the t.t.t. unit must be correctly polarized to ground to make the unit operate. If the tube does not conduct when the cord is plugged into the a.c. outlet and the contact plate is touched, pull out the plug, reverse it and plug in again.

If there is a thick rug on the floor, if the operator wears rubber-soled shoes, or if he has a habit of resting his feet on the desk while operating, relay K_1 may not pull in, since it is the capacitance to ground that causes the t.t.t. unit to operate. The solution to this problem is simple: fasten the metal contact plate to a piece of insulating material, and next to it, spaced just far enough away so that they do not touch, attach another small metal plate that is connected to ground. Touch both plates at the same time and the relay will snap closed.

The lead to the contact plate may be extremely long if required, and the contact plate can be of any shape and be placed wherever it is most convenient. It may be a long metal strip fastened under the edge of the operating desk or on the arm of the chair, or it can become ornamental and be a metal ashtray on the desk.

Operators who pick up and hold the microphone during each transmission can experiment with a contact plate secured to the side or back of the microphone where the hand will touch it when the microphone is held. With a metal-encased microphone, the contact plate must be insulated from the metal. A piece of plastic for insulation and epoxy glue could be used. In this case, the simplified circuit of Fig. 1 should be employed.

If the 04AG gas triode tube in the t.t.t. unit is installed so its upper half is visible, when the tube is conducting the ionized gas is a beautiful flickering lavender—quite a conversation piece for visitors!

No power is consumed when the 0A4G tube is not conducting as it does not have a filament, so it may be left connected permanently to the a.c. line.

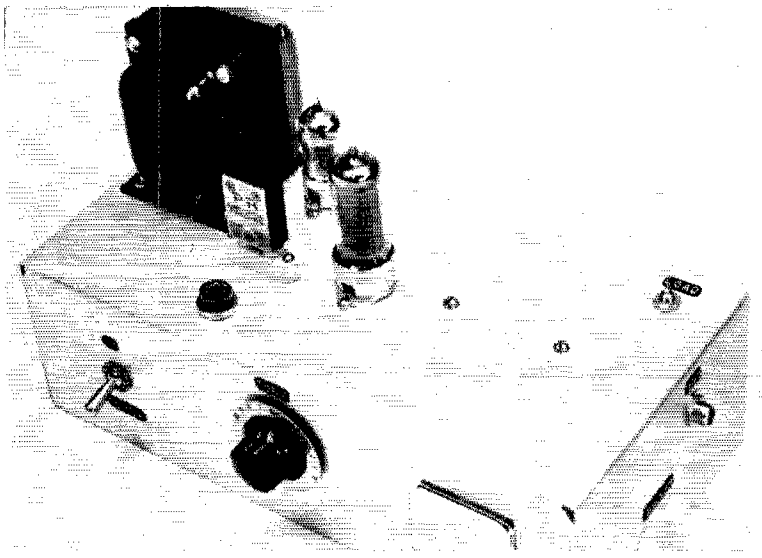
There is an added bonus when a small fry visits the station. Tell him to hold onto the contact plate. If he is small enough, or if his feet do not touch the floor, his body capacitance will not cause the tube to conduct. Have him touch you, or some metal that is grounded, with his other hand and the tube will glow. You can keep a youngster amused this way for an amazing length of time.

Many other uses for this unit can be devised, such as switching the rig on and off, turning on the room lights, or temporarily turning off the sound of a TV set that is located near the operating position. QST

NEW BOOKS

RCA Solid-State Hobby Circuits Manual, HM-90. Published by RCA Electronic Components, Radio Corporation of America, Harrison, New Jersey 07029. 5⅜ by 8⅜ inches, 224 pages, including index. Paper cover, price $1.75.

Although written primarily for the electronic hobbyist, this manual should prove to be a valuable asset to the beginning amateur's library. The manual begins with a well-written, concise discussion on the theory and operation of solid-state devices. Of particular interest should be the general circuits chapter where such things as power supply regulators, oscillators, and switching circuits are discussed in a non-technical and comprehensible manner. Basic construction practices are discussed along with testing and troubleshooting procedures. Of the 35 projects described, 13 apply directly to amateur radio. Typical projects covered in the ham radio field include power supplies, two keyers, several audio circuits, a Dip/Wavemeter, and a v.f.o. Each project is described with text, a schematic diagram, photographs, and a drilling template.



The oscillator-tube socket, crystal socket and pilot lamp are centered on a line 1 inch to the right of the power transformer. The amplifier tube is centered on a line 1½ inches to the right of this line, and 2¼ inches back from the front edge.

A Simple Transmitter for the Beginner

12 Watts on 40 or 80

BY DON MIX,* W1TS

Most transmitters consist of an oscillator to generate the desired frequency, and one or more amplifiers to increase the power output. But, for low-power operation, and where the cost must be kept down, the amplifiers are sometimes omitted, and the oscillator power fed directly to the antenna. However, with the antenna load imposed directly on the oscillator, the keying characteristics of the oscillator may depend quite critically on the way the transmitter is tuned in coupling power to the antenna. With one adjustment, the keying may be satisfactory; with a slightly different adjustment, the keying may become "chirpy" or "yoopy." In some cases the oscillator may key only intermittently, or not at all. More often than not, the adjustment that gives satisfactory keying will be one that results in considerably less power output than the maximum of which the oscillator is capable. In any event, the necessity for fiddling around to find the right combination can be quite a nuisance.

At the cost of only a few additional inexpensive components, this condition can be avoided by using an amplifier between the oscillator and the antenna. With such an arrangement, the oscillator can be operated at lower power input, where satisfactory keying is easier to attain, since the amplifier, which now supplies the power to the antenna, requires only a small amount of driving power from the oscillator. Furthermore, the amplifier isolates the oscillator from any effect that adjustment of antenna loading might otherwise have.

In the transmitter shown in the photographs (circuit shown in Fig. 1), a 6C4 Pierce crystal oscillator drives a 5763 amplifier. The two stages are keyed in the common cathode lead. Trimmer capacitor C_1 permits adjustment of oscillator feedback for best keying characteristics. The pi-network output circuit is arranged to offer a choice between operation in the 80-meter band, and 40-meter operation. C_{10} is the "tuning" capacitor, and C_{12} is the "loading" capacitor. C_{11} adds loading capacitance for 80-meter operation. As shown in Fig. 1, the connections are for 80-meter operation. If 40-meter operation is desired, the arrowhead lead is transferred to the coil tap. This one operation

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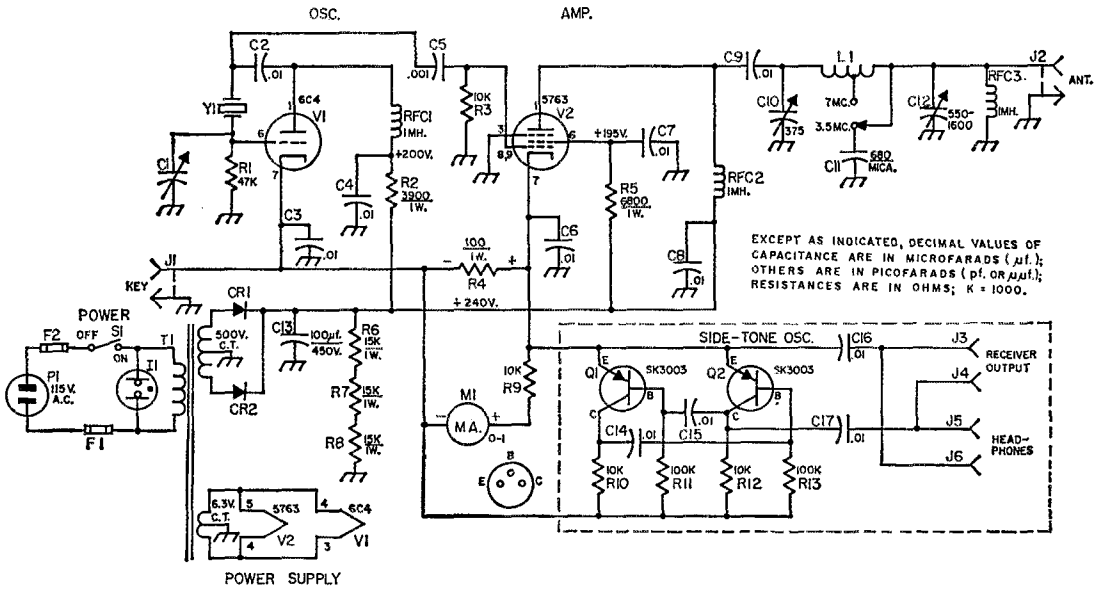


Fig. 1—Circuit diagram of the beginner's transmitter.

C_1—Compression trimmer capacitor, 3-30 pf. (Elmenco).
C_{10}—Variable capacitor, single section, approx. 375 pf. maximum, receiver t.r.f. type.
C_{11}—680-pf. mica.
C_{12}—Similar to C_1, 550-1600 pf.
C_{13}—100-μf. 450-volt electrolytic.
All other capacitors are disk ceramic, 500 volts min.
CR_1, CR_2—Silicon diode, 1000 p.i.v., 300 ma. (RCA 1N3563).
F_1, F_2—½-ampere fuse (Littlefuse 3AG).
I_1—Neon panel lamp, 115 volts (Leecraft 32-2111, or similar).
J_1, J_2—Single-hole-mounting phono jack (Switchcraft 3501-FP).
J_3, J_4—Insulated banana jack (Johnson 108-901).
J_5, J_6—Insulated tip jack (H. H. Smith 202).
L_1—27 turns No. 20, 1 inch diam. 16 turns per inch, tapped at center (Barker & Williamson 3015 Miniductor, Illumitronics 816T Airdux, Polyphase 1748 Polycoil).
M_1—0-1 d.c. milliammeter (Lafayette 99 H 5052).
P_1—Fused plug (Eagle, or similar).
Q_1, Q_2—P-n-p transistor SK3003 (RCA).
R_1-R_{13}—Composition resistor, ½-watt unless specified otherwise, R_4 and R_9 preferably 5% tolerance.
RFC_1 FRC_2, RFC_3—1-mh. r.f. choke (Millen 34300 1000).
S_1—S.p.s.t. toggle switch.
T_1—Power transformer: 500 volts, r.m.s., center-tapped, 40 ma.; 6.3 volts, 2 amperes (Knight 54 B 2551).
Y_1—Quartz crystal, 0.486 pin spacing, 0.95-inch pins, specify frequency (Peterson Z-9C, or similar).

disconnects C_{11} and shorts out part of L_1 to reduce its inductance so that the circuit will tune to the higher frequency.

The portion of the circuit enclosed in dashed lines is a transistor audio oscillator, which serves as a keying monitor. Inclusion of this part of the circuit is optional, but you'll find it highly useful if you have no other means of monitoring your keying. Sometimes you can monitor your sending by listening to your transmitter signal on the receiver. But some receivers will "block" when tuned to the transmitter frequency, and all you will hear is a series of clicks or thumps when the transmitter is keyed. In any event, if you are working another station whose frequency is not the same as the one you are using, you cannot monitor without retuning the receiver to your own frequency each time you transmit.

The monitor gets its operating voltage from the voltage drop across the cathode resistor, R_4. When the transmitter is loaded normally and keyed, the cathode current flowing through R_4 results in a voltage drop of about 6 volts, with the cathode end of the resistor positive in respect to the other end. This voltage is fed to the monitor circuit, the positive going to the emitters of the p-n-p transistors, Q_1 and Q_2, and the negative to the collectors.

The voltage drop across R_4 is also used to actuate the meter, M_1. The combination of M_1 and R_9 in series actually constitutes a voltmeter, although the reading is in terms of milliamperes of current. If a current of 50 ma. flows through R_4, the voltage drop across R_4, according to Ohm's law, will be $E = RI = 100 \times 0.05 = 5$ volts. This 5 volts is applied to R_9 and the meter in series. Since the resistance of the meter is negligible, the current through R_9 and the meter will be $I = E/R = 5/10{,}000 = 0.0005$ ampere = 0.5 ma. So, the cathode current flowing through R_4 at any time can be determined by multiplying the meter reading by 100 (0.5 × 100 = 50 ma.).

Additional Components

1 7-pin miniature-tube socket (Amphenol 147-505).
1 9-pin miniature-tube socket (Amphenol 59-410).
1 3 × 5 × 10-inch aluminum chassis.
1 Type 6C4 tube.
1 Type 5763 tube.
1 Crystal socket, 0.486-inch pin spacing, 0.95-inch pin diameter (National CS-7).
2 Phono plugs.
2 Insulated banana plugs.
7 Terminal strips (see Figs. 2, 3, 4 and 5).
1 Key.
4 No. 4 machine screws, ¼-inch long (for tube sockets).
2 No. 4 machine screws, ½-inch long (for crystal socket).
14 No. 6 machine screws, ¼-inch long.
Nuts for above screws.
A few feet of lamp cord.
Several feet of insulated hookup wire.
Wire for antenna.
Pipe clamp for ground connection.

Note: All components used in the construction of this transmitter are listed in the combined current catalogs of Allied Radio, 100 N. Western Ave., Chicago, Ill. 60680, and Lafayette Radio Electronics, 111 Jericho Turnpike, Syosset, L. I., New York 11791. Catalogs may be obtained by writing to these addresses.

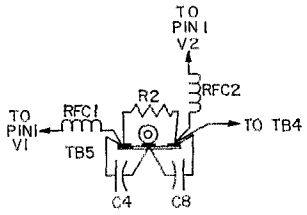


Fig. 3—Sketch showing subassembly TB_5, and connections thereto. (Terminal strip is H. H. Smith 864.)

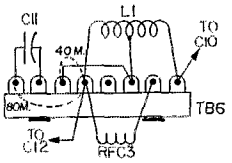


Fig. 4—Sketch showing coil mounting. (TB_6 is H. H. Smith 870).

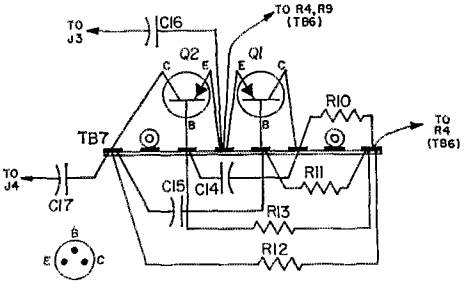


Fig. 5—Sketch showing subassembly TB_7 and external connections. (Terminal strip is H. H. Smith 870).

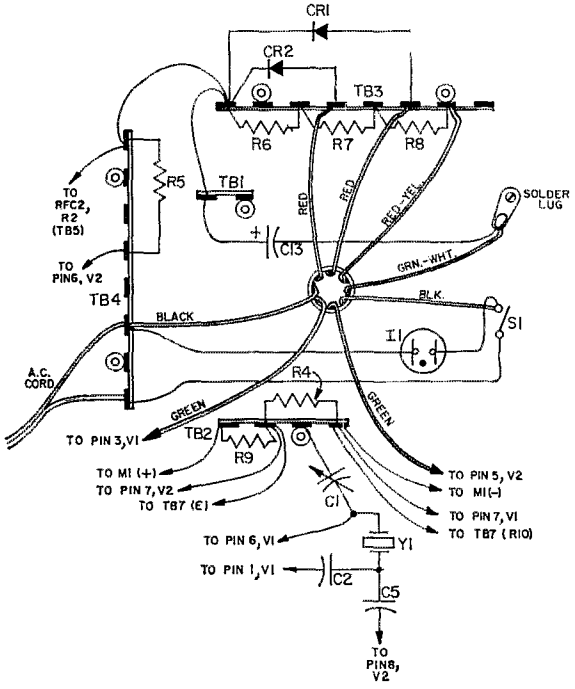
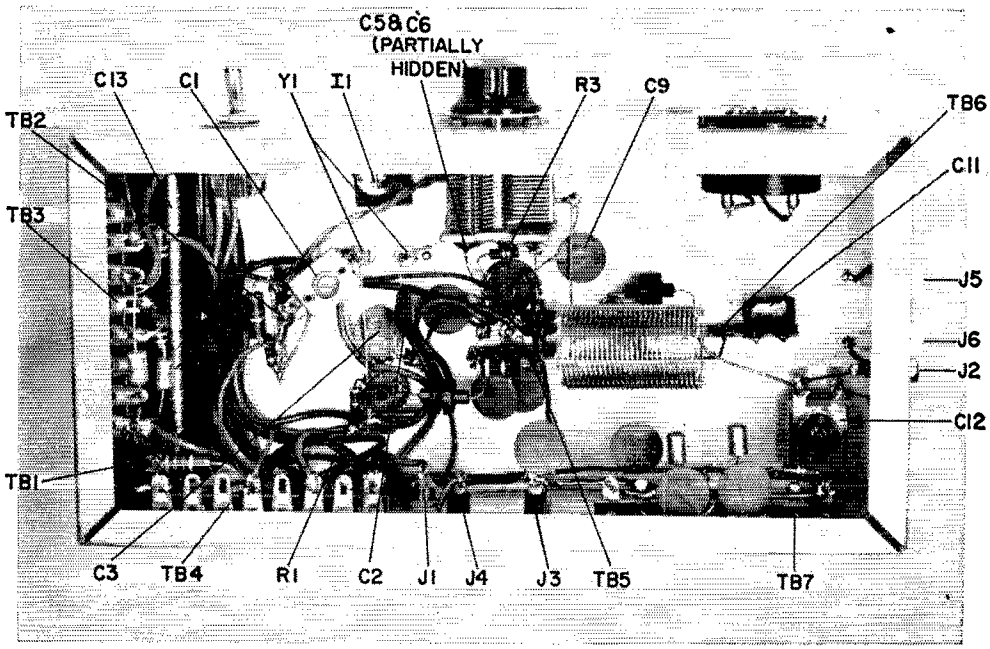


Fig. 2—Sketch showing subassemblies TB_1, TB_2, TB_3 and TB_4, and the connections to be made to each. (TB_1 is type 861; TB_2 is type 866, one contact not used; TB_3 and TB_4 are type 870. All are H. H. Smith types).

Construction

The transmitter is built on a 5 × 3 × 10-inch aluminum chassis. The layout of components isn't critical, and you'll come close enough by locating the major components only approximately as shown in the photographs. Most of the small components are mounted on terminal strips as subassemblies that can be prepared outside the chassis, and then mounted in the chassis as a unit. These subassemblies are indicated in the sketches of Figs. 2, 3, 4 and 5. The locations of most of the components not included in the subassemblies are pointed out in the bottom-view photograph. Don't forget that a ⅝-inch hole in the chassis will be required for the transformer leads. This hole



Bottom view of the beginner's transmitter.

should be fitted with a rubber grommet.

The capacitor used for C_{10} in the original model has threaded mounting holes in the front side of the frame, so the capacitor was mounted against the front apron of the chassis, using ¼-inch tubular spacers on the mounting screws. Other capacitors of this general type may have mounting holes on the bottom side of the frame. This type may be mounted against the under side of the top of the chassis, using spacers of the proper length to line the shaft up with the shaft hole in the front apron. With either type of mounting, be sure that the mounting screws are short enough so that they do not make contact with the plates of the capacitor.

In mounting the tube sockets, turn them so that the No. 7 pin of the V_1 socket and the No. 9 pin of the V_2 socket are toward the front of the chassis. Place a soldering lug under each socket mounting screw so that you'll have convenient points for grounding bypass capacitors and grid resistors.

The filter capacitor, C_{13}, is mounted in the corner of the chassis, at the left-hand end, by using an insulated terminal strip (TB_1) at the positive end, and a grounding lug at the other (see Fig. 2). You'll have an easier time if you mount this capacitor before mounting T_1, or any of the other components underneath the chassis. Then connect C_3, C_6, C_7, R_1 and R_3 between the respective tube-socket terminals indicated in Fig. 1, and the nearest grounding lug. Keep these components close to the chassis. Connect Pin 3 of V_2 to the nearest grounding lug. Connect Pin 7 of V_1 to J_1. Connect C_9 between Pin 1 of V_2 and a stator terminal of C_{10}; connect C_5 between Pin 8 of V_2 and the nearest terminal of the crystal socket.

Now make up subassemblies TB_3 and TB_4 (Fig. 2) and mount them. When soldering to the diode leads, hold the leads with a pair of long-nose pliers to conduct the heat away from the diodes. Any solid-state device can be easily ruined if it is subjected to appreciable heat.

Bunch the transformer leads together and feed them down through the grommeted hole, and mount the transformer. Make the connections shown in Fig. 2, dressing the leads to follow the contour of the chassis as closely as possible. Connect TB_3 to TB_1 and TB_4, as shown. Connect Pin 5 of V_2 to Pin 4 of V_1, and Pin 3 of V_1 to Pin 4 of V_2. Make the connection from TB_4 to pin 6 of V_2.

Make up subassembly TB_2 (Fig. 2). Mount TB_2 in the chassis using the right-front transformer mounting screw, and make the external connections indicated, except those to TB_7. Make the connections to the meter with a twisted pair of different-colored wires, so that the plus and minus connections can be identified.

Make up subassembly TB_5 (Fig. 3). Leave about ⅛ inch of lead between TB_5 and RFC_2, and about ⅝ inch between TB_5 and RFC_1. Mount TB_5 and make the external connections indicated in Fig. 3.

Connect one terminal of C_{12} to the center terminal of J_2, and the other terminal of C_{12} to the ground lug of J_2.

Make up subassembly TB_6 (Fig. 4). Cut the coil stock to the specified number of turns,

adding one turn at each end. The extra turns are to be unwound and used as connecting leads. Locate the center turn on the coil. Indent the turn on either side of this turn by pushing inward firmly with the narrow blade of a small screwdriver. Remove the insulation from a few inches of hookup wire; bend a small hook in one end. Coat the hook, and the spot on the center turn of the coil, where the tap is to be made, with solder. Fish the hook around the turn, and solder fast. Make sure that no turns are shorted. Mount the coil on TB_6, as indicated, and complete the assembly. If the 80-meter band is to be used, wire a jumper between the first and fourth terminals of TB_6, as indicated by the dotted lines. If operation is to be in the 40-meter band, wire the jumper from the third to the fourth terminal, instead. Make the other connections indicated. The lead to C_{12} should go to the terminal of C_{12} that is already connected to the center terminal of J_2.

Make up subassembly TB_7 (Fig. 5). Leave plenty of lead length on the transistors so that they will reach the proper terminals without stretching. Be sure to hold the leads with pliers while soldering. After the subassembly is finished, examine it closely to make sure that no leads are shorted to each other, or to the mounting lugs, which will be grounded to the chassis. Mount the assembly in the chassis, and make the external connections indicated in Fig. 5. Connect J_3 and J_4 to J_6 and J_5, respectively.

If you have followed instructions carefully, this should complete the construction and wiring of the transmitter. However, as a precaution, it is always a good idea to run through the connections once more, before applying power, since a wrong connection may cause damage to one or more components. Check the wiring against the circuit diagram.

Testing the Transmitter

Caution: The voltages required for the operation of any transformer-powered tube transmitter, including a low-power transmitter such as this one, are always high enough to be lethal. No danger is involved in normal operation, since the transmitter is designed so that high voltage appears at no point on the outside of the chassis. But it is a different matter when it comes to probing the inside. *Never* touch anything inside the chassis until you have turned the power switch to off, pulled the power plug out, and made sure that the filter capacitor C_{13} is discharged. The filter capacitor becomes charged to the full supply voltage as soon as the power switch is turned on, and it will hold this charge for hours after the power has been turned off, unless it is discharged by some means. The bleeder, consisting of R_6, R_7, and R_8 will automatically discharge the capacitor to a safe level in about 30 seconds, but a defective resistor, or a poor soldered connection can render the bleeder useless. Therefore, always make doubly sure that the capacitor is discharged by shorting the high-voltage terminal to the chassis momentarily with a long screwdriver having an insulated handle. (The high-voltage terminal is the one on TB_3 to which *both* diodes, and R_5 are connected.) Wait at least 30 seconds after the power has been turned off before making the short, to give the bleeder a chance to do its job. Otherwise, the short may result in a large and loud spark. If this occurs after waiting the required time, it indicates that the bleeder is defective and should be investigated. Normally, after waiting 30 seconds, the spark on short will be small and make little noise. After a delay of a minute or so, there should be no spark at all.

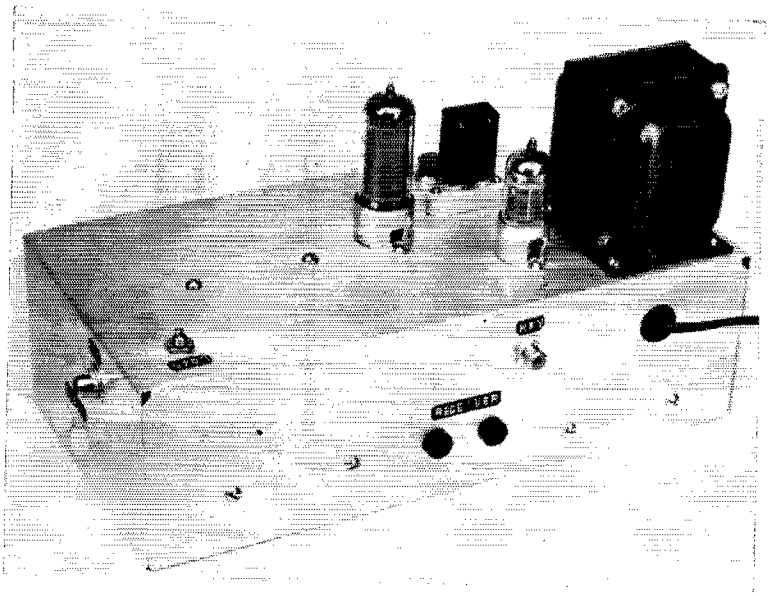
To test the transmitter, use a 15-watt 115-volt lamp as a dummy load. (The transmitter should always be operated with a load of some sort.) Unless you want to make up a phono plug to fit J_2 for the purpose, insert a long No. 6 machine screw into J_2 until it makes contact. Clip one lamp connection to this screw, and the other to some point on the chassis.

Plug the tubes into their sockets, a crystal for the desired band into the crystal socket, and a key into the key jack. Make sure that the jumper on TB_6 is in the right position for the crystal being used.

Insert two ½-ampere fuses in the power plug, and plug it into an a.c. outlet. Turn the power switch to ON. Allow about 30 seconds for the tube heaters to warm up. Turn both C_{10} and C_{12} to maximum capacitance. To set C_{12} to maximum capacitance, turn the adjusting screw all the way in the direction in which friction increases. (When turned toward minimum capacitance, the screw will go quite loose.) C_{10} is at maximum capacitance when the plates are fully meshed.

When the key is closed, the meter should show a deflection somewhere above half scale —about 0.6, indicating a cathode current of 60 ma. Now turn C_{10} very slowly toward minimum capacitance. At some point, the meter deflection should dip to a lower value, and then rise again. Set C_{10} at the center of this dip. If the load lamp lights at all, it will probably be quite dim.

Now decrease the capacitance of C_{12} a bit—one turn or less of the adjusting screw—and readjust C_{10} again for the dip in deflection. This time, you will probably find that, although it is still there, the dip is not as pronounced as it was on the first trial. Repeat the process, decreasing C_{12} a bit at a time, and retuning to resonance with C_{10}, until the current dips only about 5 ma.—say from 60 to 55 ma. By this time, the lamp should be lighting fairly brightly. Go through this procedure several times, until you are thoroughly familiar with the adjustment that gives the greatest power output to the lamp. (This is important, because the transmitter will be tuned in the same manner when the antenna is susbstituted for the lamp, and the meter readings will be the only means



Rear view. All labels are made with a Tapewriter.

you will have for determining when the transmitter is tuned properly.) During the adjustment with the lamp load, you will notice that if the loading is carried too far—to the point where the current dip is very slight, or disappears entirely—the power output indicated by the lamp will fall off. This is a result of overloading.

Whenever you tune the transmitter up, *always* start with C_{10} at maximum capacitance. The reason for this is that if C_{10} is turned down near minimum capacitance, a second dip in current may be found. This second dip indicates resonance at twice the crystal frequency, and this adjustment should be avoided, of course. With proper adjustment, C_{10} will always be set at at least 30% of maximum capacitance.

With the antenna disconnected from the receiver, listen to the transmitter signal as you key the transmitter. Back the receiver r.f. gain control off until the signal is fairly weak. If the keying sounds "chirpy" or "yoopy," try adjusting C_1, using an insulated screwdriver. (Don't put your hands into the chassis.) All crystals tried with the original model keyed well with C_1 at maximum capacitance, but you may find some other adjustment necessary.

With the transmitter tuned up and working into the lamp load, plug a pair of headphones into J_5 and J_6. You should hear a clear crisp tone each time the key is closed.

Antenna

This transmitter is designed particularly to work into one type of antenna—a quarter-wave wire in conjunction with a connection to earth ground. For 80-meter operation, the wire should be approximately 60 feet long. The transmitter should be located as close to a window as possible, so that a minimum portion of the antenna will be indoors. It can be fed to the outside by lowering the upper sash of the window, passing the wire out, and reclosing the window. If the sash is of metal, or if the wire must also pass a metal screen or storm-window frame, wrap the wire with a layer or two of plastic tape so that it will not make contact with the metal. Once on the outside, the wire can be run in any manner that will result in getting as much of it as possible as high as possible above ground. Best results should be obtained with the wire running vertically. However, good results should be obtained with the wire running diagonally upward to the top of a tree, or other support. The wire may also be bent, part running vertically, and part horizontally. Any bend, however, should not be less than a right angle. Those living above the ground-level floor should get good results with most, or all, of the wire running horizontally.

A quarter-wave wire for 40 meters is about 30 feet long. Such a wire will work, but the shortness of the wire makes it impossible to get very much of it at a good height above ground, unless the transmitter is located above the ground-level floor. Much better results will usually be obtained on this band, if the antenna is made ¾ wavelength (about 90 feet).

Ground Connection

A ground connection to a cold-water piping system is preferred. However if the connecting

lead to such a system must be over 10 feet for 80-meter operation, or over 5 feet for 40-meter operation, connection may be made to a hot-water pipe, or to pipes of a heating system, if they can be reached without exceeding these lengths. A connection to a hot-air heating system may also be satisfactory. A series of two or three TV ground rods driven into the soil may also be used. If no ground connection can be made without exceeding the lead lengths mentioned, a counterpoise may be substituted. This consists of a second wire running more or less horizontally at a height above ground that will avoid obstruction to pedestrians or vehicles. Those living above first-floor level can drop the wire down vertically, or slant it downward to a support. The counterpoise wire should have the same length as the antenna for 80-meter operation. However, the length can be 30 feet for 40 meters, regardless of whether the antenna is a quarter wave long or three quarters.

The station end of the antenna should be connected to the center pin of a phono plug to fit J_2. Make sure that the wire does not make contact with the metal shell of the plug. The ground connection may be made to the shell of the plug, or to a convenient point on the chassis.

If the keying monitor is to be used, make up a two-wire cable terminated at one end by a plug to fit the receiver headphone jack, and banana plugs at the other end to fit J_3 and J_4. Then, when the headphones are plugged into J_5 and J_6, you will be able to hear both the signal from the receiver and the signal from the monitor without switching of any kind.

With the antenna and ground connected to the transmitter, the tuning procedure should be exactly the same as for the lamp load. Be sure not to carry the loading beyond the point where the current dip shown on the meter is less than 5 ma., as mentioned earlier.

Receiving Antenna

The same antenna may be used for both transmitting and receiving. This will require a single-pole double throw switch. This switch should be of the rotary type. However, a separate antenna for the receiver permits break-in operation, and makes it unnecessary to do any switching in going from transmit to receive. This antenna need not be an elaborate one. It can be a random length of wire run to any available outdoor support that will space it several feet from the transmitting antenna, or it may even be an indoor antenna strung up in the attic, or run around the picture molding of a room.

Although the final amplifier in this transmitter runs at a normal input of only about 12 watts, with a reasonably-located antenna, you should have no trouble in making good contacts within a radius of several hundred miles on either of the two bands. QST

Tidewater Handicap

Something for the Chesapeake Bay Area

THE indefatigable Lew Gilmer has come up with another set of computer-calculated DX predictions—inspired, perhaps, by his recent move from W2-land to the small town of Sarah, Virginia. This time they should interest an Eastern concentration of DXers. They differ in approach from those in the earlier "Los Angeles Handicap" (May 1968 *QST*) which, it will be remembered, covered the probabilities between two fixed points, Los Angeles and Athens, Greece, for two-way phone and c.w. under four grades of noise background. The "Tidewater Handicap" picks out eighteen spots, most of them exotic DX, spread around the compass at a variety of great-circle distances.

Complete calculations for each of these to develop the same type of information that was presented in the Los Angeles Handicap tables would make even a computer sweat. So to keep the thing within reason the predictions shown here are based on hearing a c.w. signal using a receiver bandwidth of 500 Hz. A "residential" noise level and unity (0 db.) signal-to-noise ratio are assumed, along with a transmitter power output of 100 watts at the DX station, and 3-element Yagis about 30 feet high at both ends.

The tabulation shows the probable percentage of days during October on which reception could be expected from the selected point. It gives no indication of *which* days will be good and which poor; that is beyond anybody's prescience. Where the tabulation says "00" a signal *may* get through, but where you see "--" it means that suitable skip is so extremely unlikely that the chances are negligible.

If the noise level is lower than "residential," phone may be usable. "Rural" noise, which means a pretty quiet location, would be low enough to make phone reception possible with a 2.1-kHz. receiver bandwidth, in most cases. So even though the probabilities are based on narrow-band c.w. reception they may be useful for phone—if your location is a good one.

As always, higher-gain antennas at greater height will do better. So will more power at the transmitting station, but the 100 watts assumed for the DX station in the calculations is a pretty fair average. Your chances of being able to transmit to the given point depend on the same factors, of course, plus the added one of competition.

If you're in the general area of Washington, D.C., you could have an interesting time this month checking out the predictions in the tabulation. We'd like to know how you make out, and so would W4VXD. His new postoffice address is Lewis B. Gilmer, Onemo, Virginia 23130. QST

SSN = 112

TIDEWATER HANDICAP
(October, 1968)

Man-Made Noise "Residential"

Great Circle Information			
SIGNAL FROM	BRG. AT XMTR	BRG. AT SARAH	DISTANCE, KM
ANCHORAGE	82.8	323.0	5,579.2
ANKARA	310.1	47.6	8,789.7
BUENOS AIRES	345.3	164.8	8,213.4
CAPETOWN	300.5	115.9	12,583.6
EDINBURGH	281.1	43.8	5,645.6
HONG KONG	9.5	348.9	13,289.4
HONOLULU	56.3	282.6	7,869.8
LHASA	349.3	11.7	12,437.4
LIVINGSTONE	304.1	97.5	12,251.6
LONDON	286.6	48.7	5,961.4
MOSCOW	309.9	32.9	7,924.0
PERTH	57.9	295.2	18,749.9
RANGOON	352.6	8.9	13,935.3
SINGAPORE	0.2	359.8	15,712.7
SRINAGAR	336.7	24.4	11,516.0
TEHRAN	321.0	40.0	10,264.5
TOKYO	28.3	331.0	11,076.8
WAKE IS.	45.6	301.9	10,911.0

Percentage of Days CW Signals Copiable at Sarah, Va.

Band	GMT																		GMT
40	02	31	19	31	55	89	00	00	00	55	88	31	00	00	00	00	06	00	00	02
	04	60	18	26	55	86	00	77	00	51	85	33	00	00	00	00	00	00	00	04
	06	61	00	26	00	87	00	82	00	00	88	15	00	00	00	00	00	00	07	06
	08	59	00	31	00	92	00	81	00	00	87	02	00	00	00	00	00	02	52	08
	10	69	00	02	00	61	00	83	00	00	27	00	00	00	00	00	00	04	53	10
	12	60	00	00	00	00	00	85	00	00	00	00	01	00	00	00	00	01	26	12
	14	05	00	00	00	00	00	14	00	00	00	00	00	00	00	00	00	00	00	14
	16	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	16
	18	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	18
	20	00	00	00	00	19	00	00	00	00	12	00	00	00	00	00	00	00	00	20
	22	00	05	00	09	81	00	00	00	10	79	16	00	00	00	00	01	00	00	22
	24	12	19	26	47	89	00	00	00	47	88	31	00	00	00	03	06	00	00	24
20	02	75	35	71	66	22	00	87	06	80	33	23	00	00	00	33	40	00	07	02
	04	56	47	69	55	*	00	86	00	74	*	00	00	00	00	11	45	04	50	04
	06	09	48	69	73	*	00	68	00	67	*	50	00	00	00	03	22	18	60	06
	08	*	12	41	11	09	01	65	00	00	14	21	03	00	00	01	04	27	54	08
	10	*	07	33	00	48	08	00	03	00	56	39	09	01	00	02	02	14	01	10
	12	*	00	00	00	83	20	62	10	00	76	19	51	08	00	02	00	31	64	12
	14	09	00	00	00	68	02	51	01	00	56	04	02	00	00	00	00	15	64	14
	16	52	00	00	00	70	00	58	01	00	58	07	00	00	00	00	00	07	25	16
	18	47	08	00	00	80	00	00	02	00	76	22	00	00	00	05	04	03	14	18
	20	43	37	00	32	91	03	00	09	43	90	42	00	02	00	17	25	03	00	20
	22	61	46	33	85	70	08	01	20	78	71	50	00	10	05	27	41	00	00	22
	24	79	46	78	79	36	00	49	34	87	35	40	00	12	00	34	41	00	00	24
15	02	13	*	36	*	*	10	69	16	24	*	*	00	12	01	20	04	24	29	02
	04	*	*	31	*	*	05	*	15	27	*	*	*	05	00	17	11	11	*	04
	06	*	*	31	44	*	03	*	06	35	*	*	*	01	*	00	04	09	*	06
	08	*	*	00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	08
	10	*	*	*	00	*	*	*	*	00	*	00	*	*	*	*	*	*	*	10
	12	*	48	66	02	75	14	*	29	12	81	51	09	25	10	38	38	03	*	12
	14	*	41	11	00	91	27	*	33	04	92	56	46	29	14	40	27	00	17	14
	16	08	51	03	03	88	12	66	13	33	90	52	33	25	09	21	41	00	*	16
	18	56	42	09	56	84	13	81	12	70	87	55	06	15	09	08	19	*	15	18
	20	70	*	43	73	49	*	76	11	88	56	19	*	17	19	10	04	18	62	20
	22	76	*	82	68	*	25	83	09	93	*	*	02	*	00	01	04	39	52	22
	24	69	00	69	18	*	34	88	37	46	*	*	00	34	15	02	04	40	61	24
10	02	*	*	*	*	*	03	*	*	*	*	*	*	*	*	*	*	01	*	02
	04	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	04
	06	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	06
	08	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	08
	10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	10
	12	*	17	29	74	27	*	*	09	76	41	35	*	04	*	19	25	*	*	12
	14	*	55	71	75	65	12	*	16	81	71	47	28	35	20	40	55	*	*	14
	16	*	47	66	81	60	*	27	*	85	69	47	08	22	30	*	24	*	*	16
	18	05	*	72	84	39	*	73	*	93	48	00	*	05	39	*	*	*	*	18
	20	25	*	82	12	*	*	80	*	85	*	*	*	03	12	*	*	*	78	20
	22	33	*	76	00	*	04	72	*	64	*	*	00	*	*	*	*	54	74	22
	24	09	*	37	*	*	22	74	17	00	*	*	25	13	10	*	*	32	33	24

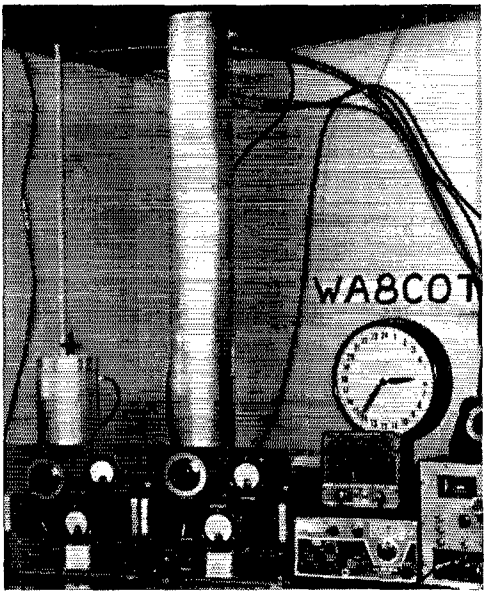
Performance Computed With Al. Barghausen's ITSA Program

Lewis B. Gilmer - W4VXD

"Stovepipe"

Transmitting Converters For 50 and 144 Mc.

BY AL MOORE,* WA8COT



Though some might call the two units at the left, "the ridiculous and the sublime," it would be in name only. Both work extremely well and are very stable. The 2-meter section is at the left with its 6-inch diameter, 17-inch-high tank assembly projecting up from the main chassis. The top cap is perforated to allow forced air to flow out through it. The inner element of the coaxial tank is made from a section of 1½-inch diameter copper tubing. The outer conductor is a section of aluminum irrigation pipe which has a wall thickness of approximately ⅛ inch.

To the right of the 2-meter assembly, with its ponderous 49-inch high coaxial tank towering above the chassis, is the 6-meter unit. It is similar to the 2-meter model except for the design of the transmitting-converter section. Construction details for the 4CX250 tank assembly were given by W4GJO in another magazine (see text). Both units have plate-current meters at the upper right of their panels. Screen-grid current is monitored by the meters at the center of the panels. At the lower center of each panel is a small meter for reading r.f. output voltage (rectified) for tune-up purposes. Plate tuning for the coaxial tanks is done with home-made disks which are controlled by adjustment of a threaded shaft, accessible at the upper left of each panel. Directly below the plate tuning knobs (large) are the controls for grid tuning.

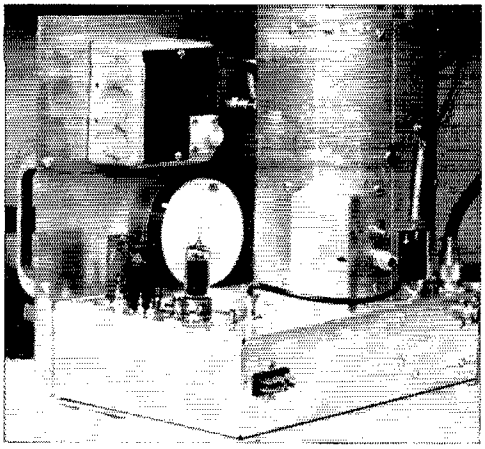
THIS picture story shows how a low-power v.h.f. transmitting converter and a medium-power 4CX250 linear amplifier can be combined on a single chassis. Similar units were built for 6- and 2-meter operation, the main difference being the dimensions of the 4CX250 coaxial tank assemblies—or "stovepipes."

These two units are excited by 28-Mc. s.s.b., c.w., or a.m. energy (low-level) taken from a Heath Marauder transmitter which is part of the low-band station. Also, the operating voltages for the transmitting converters are borrowed from the Marauder. Operating voltage for the 4CX250 is taken from the power supply of the main-station linear amplifier, a Heath Warrior. A small d.c. supply provides screen voltage for the 4CX250s, though it could be obtained from one of the Heath units. The screen voltage is removed from the power-amplifier stage of the Marauder by means of a toggle switch when it is used to excite the "stovepipe" units. This reduces the Marauder's power output to a practical value.

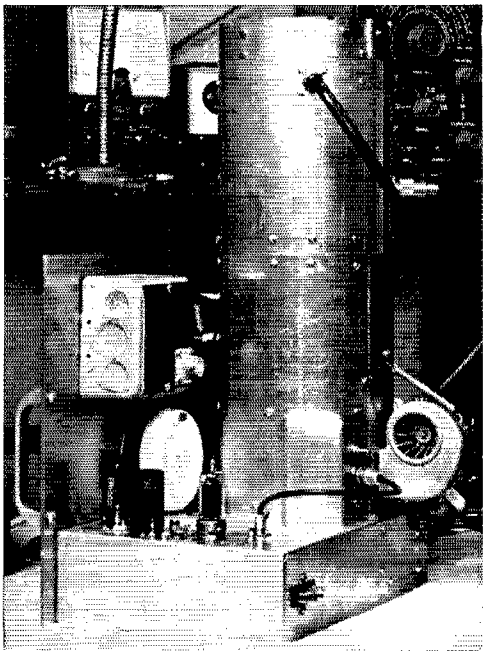
The builder claims no particular originality for the basic design of these units. They were inspired by earlier good results obtained when the author and Gordon Douglas, W8PMK, built lower-power units which used the same general circuit for the transmitting-converter sections. The 2-meter section is an adaptation of a circuit described by Hall, *QST*, January 1966. Ideas for the 6-meter transmitting converter came from an article by D. Crowell, K6RIL, *73*, November 1967.

The coaxial-tank design was decided upon in the interests of good p.a. efficiency and reduced harmonic and spurious output to the antenna—sometimes a problem where TVI is concerned. The results obtained since putting the "stovepipes" in service has been excellent, thanks to the earlier efforts by W4GJO, who described a 6-meter coaxial-tank amplifier in May 1964 *CQ*. His design was used as a guide when building the 6-meter tank, and the scaled-down 2-meter version. Both amplifiers run at approximately 500 watts p.e.p. input when fully excited. High voltage from the Warrior is 1600. Peak plate current for normal operation of the 4CX250 amplifier stages is approximately 300 ma. QST

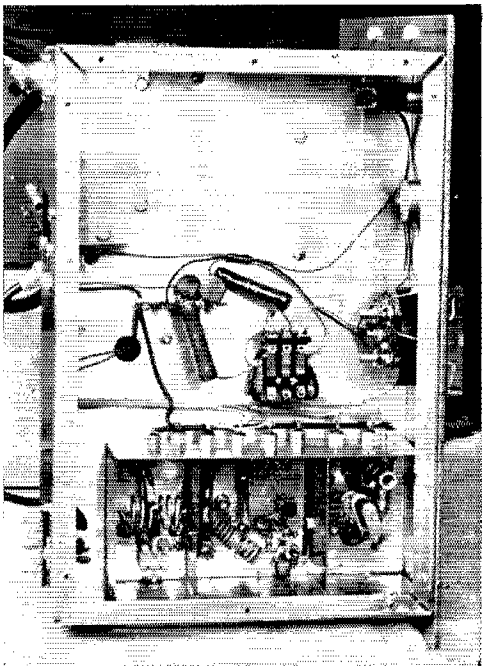
*RFD 1, Box 46, Branch, Mich.



A closeup view of the 2-meter tank shows the hole where the blower motor attaches. The same motor is used for both the 6- and 2-meter units, and is switched back and forth as needed. The spring is used as a retainer. An r.f. input jack and the shaft for the input link tuning capacitor are just to the left of the blower hole. R.f. output is taken from the connector at the far right of the chassis.



Looking at the back of the 2-meter unit, the plate-current meter is enclosed in an electrical-outlet box to prevent accidental contact with the high voltage. The 1600-volt bus is fed in and out by means of RG-8/U, shield grounded, for safety reasons. Directly below the plate-meter housing is a plastic cap from a household product. It prevents the operator from coming in contact with the screen-voltage meter terminals. The small rectangular can on the side of the coaxial tank (lower) is part of an old i.f. can. It is used to cover the filament and bias terminals where they enter the tank assembly.



Looking into the underside of the 2-meter assembly the transmitting-converter section occupies one side of the chassis (bottom of photo). Shield partitions divide the stages of the converter, and feedthrough capacitors filter all incoming power leads. Disk ceramic bypass capacitors are used on each terminal of the power socket (lower left) for TVI reduction. A bottom plate is used to contain the r.f. during operation. The chassis size for both assemblies is 12 x 8 x 3 inches. The panels are 13 inches wide and 12 inches high.

Strays

Arch Doty, K8CFU, was working some VKs one evening when there came a knocking at his door. A traveler, who had lost his way, turned out to be Neil Pollard, VK5WX, attracted by the 6-element quad in the yard! Since the VKs were coming in strong, Neil talked to several of his countrymen before returning to his motel.

—•••—

W6OWD expresses gratitude to all hams who did such an outstanding job in handling traffic during the maiden voyage of the Apollo Tracking Vessel *Redstone*. Stations who are still in need of a QSL may write Wesley Wiley, W6OWD, Apollo Tracking Vessel, *Redstone*, Fed. Elect. Corp., P.O. Box 436, Port Hueneme, Califonia 93041.

—•••—

The *Richmond* (Va.) *News Leader* 2-column headline, "Feeding Quads is Next Problem," struck W4ZSH as unusual newspaper emphasis on ham antenna problems until he discovered the article actually concerned the Irvine quadruplets of Wheatfield, Ind., and a meal schedule.

Perfect Teletype at Your Fingertips

Modifying the Keyboard Morse Machine for RTTY

BY PAUL HOROWITZ,* W2QYW

About a year ago W2QYW modified his keyboard code generator to make it usable for RTTY as well as Morse, and this is the story of the rather simple changes that result in this dual-function operation. In addition to generating the Teletype code pulses, it includes an end-of-line warning device to remind the sender that the machine at the other end of the circuit needs to be told when to change lines. Some useful modifications to the original circuit are described, too.

SINCE the article on the Morse typer-keyer appeared[1] nearly a hundred letters have been received, asking for parts or explanations, or suggesting possible changes or additions. The most interesting one in the last category came from Bill Johnson, W6MUR, of the Codamite Corp., suggesting a combined Morse and teletype sender; this article describes the rather simple circuit modifications necessary to make the keyer send either Morse or 5-unit (standard RTTY) code, selectable by a switch on the front panel. First, though, there are a few corrections and alterations to be made to the original Morse circuit, motivated mostly by letters from confused readers and by the twenty or thirty amateurs who have actually constructed the keyer (among these the following are reported to use their keyers regularly on the air, incidentally: W3UCU, W3LOS, W4DGC, W5FRE, W5FRZ, W8RMH, W9TO, WØDCP, DJ3VY).

*31A Sacramento St., Cambridge, Mass. 02138.

[1] Horowitz, "Perfect Code at Your Fingertips," *QST*, August 1965.

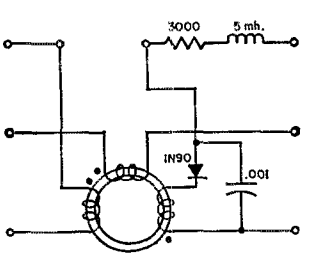


Fig. 1—Internal wiring of the A67C module. Dots indicate similar winding direction. Terminal arrangement corresponds to that shown in Fig. 7, August 1965 QST, page 18.

Corrections to the Original Keyer

In Fig. 4 on page 16 of the 1965 article the cores should have been labelled 1-10 going from left to right; in addition, the general method of figuring out the wiring of the rest of the matrix apparently escaped quite a few readers: Starting from the left side of Fig. 4, and from the beginning of the Morse character, insert a diode for each dot, and a space followed by a diode for each dash, in the order in which they appear in the Morse character. Try it out for the characters in Fig. 4 to see if you've got it. In Fig. 7, use a 1N90 (or other germanium diode), which has much lower capacitance than the original silicon unit, for CR_8 and CR_{10} through CR_{16}, inclusive, as well as for homemade shift register modules. The circuit of the A67C, incidentally, for those who wish to wind their own, is shown in Fig. 1 here. Also, in Fig. 7 of the original article the rather expensive 2N1132s can be replaced by a 2N3703, a recent TI epoxy-case p-n-p silicon which presently goes for 39 cents.

The main correction is a modification, shown in Fig. 2, in the keyboard disconnect circuit. Instead of driving all the cores to be magnetized with a constant total current and using this current pulse to start a monostable delay, as in the original circuit, this circuit drives each core individually through an 1800-ohm resistor from a voltage source; and AND from the matrix outputs to cores 1 and 2 (one of which must *always* be magnetized for any Morse character) senses the voltage change, which is integrated in $R_{13}C_4$ to switch Schmidt trigger $Q_{16}Q_{17}$ at a predetermined level which corresponds to 10 microseconds of integrated read-in current. The advantages over the original circuit are that the shift-register cores need not be matched to give reliable operation, the magnetizing current per core is independent of the Morse character, and the delay cannot be triggered by spurious pulses, since it integrates the input for 10 μsec. before firing—all of which combines to give completely trouble-free operation.

The last change is necessary only if a remote keyboard with a long interconnecting cable is used; in that case the capacitance between

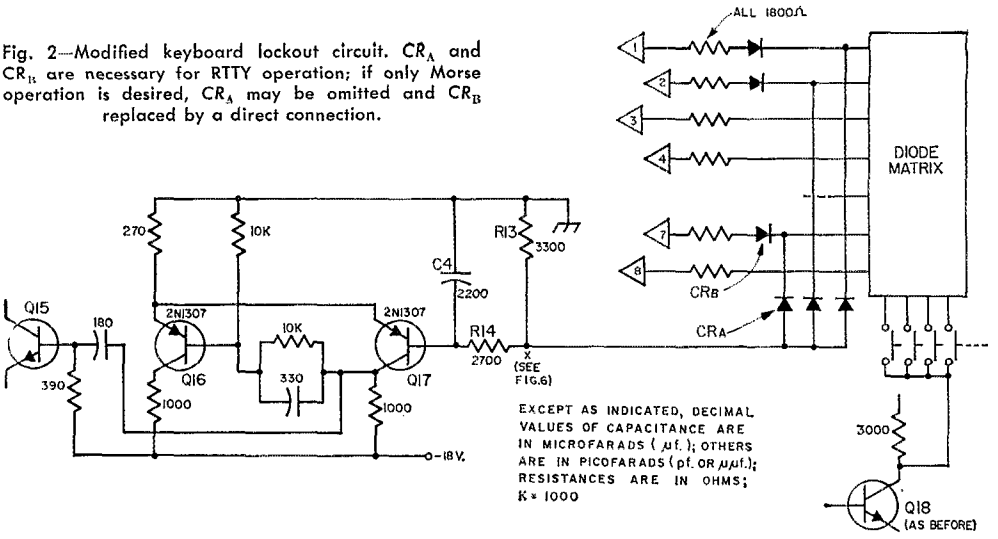


Fig. 2—Modified keyboard lockout circuit. CR_A and CR_B are necessary for RTTY operation; if only Morse operation is desired, CR_A may be omitted and CR_B replaced by a direct connection.

keys may cause extra cores to magnetize. The cure is to connect a 2200-pf. capacitor from each of the ten matrix outputs to ground, and then include a diode in series with the 1800-ohm resistor in all ten leads as is already done in the first two. This forms a voltage divider which reduces capacitive coupling effectively to zero, but leaves the normal d.c. magnetizing signal unaffected.

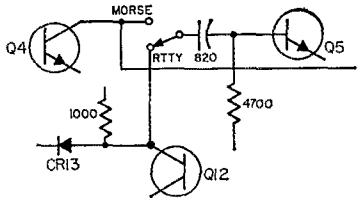


Fig. 3—Core 11 driver change. Connections not shown explicitly remain as shown in Fig. 7, August 1965 QST.

Converting the Keyer to RTTY Operation

Those unfamiliar with Teletype should probably stop at this point and read an introduction to the subject—for example, the excellent review by K8DKC in *QST* for February, 1965. Briefly, each character is represented by a serial code of 5 bits, each either "mark" or "space", preceded by a start (space) and followed by a stop (mark). Because the teleprinter is started anew by each character, no long-term synchronization is necessary; the printer comes to a full stop between each character and remains dormant until the next character is initiated. In the system used by amateurs the start pulse and the five code pulses are each 22 milliseconds long, and the stop pulse is a minimum of 31 msec., though it may be longer. In the system here it has been made twice as long as the other pulses, or 44 msec., for convenience. The only effect is to reduce the maximum possible sending speed from 61 w.p.m. to 57 w.p.m., with some compensating improvement in copy in the presence of noise, as described in the article mentioned above.

In RTTY operation of the keyer, the code is inserted into cores 2-6, magnetizing for each mark, with core 7 always magnetized. Cores 1-10 are shifted, and then, using the trailing edge of the shift pulse, core 11 is cleared 2 μsec. later. Shifting of cores 1-10 results in a space, if any of them were magnetized, but clearing core 11 immediately changes the output to a mark, if core 11 contained a "1". Two microseconds is far too short for the relay to follow, so the net effect is to produce a mark for each "1" in the register and a space for each "0". Since core 1 is not read into, each character begins with a start pulse. Because core 7 is always read into, a stop pulse is begun following the character code, and, by virtue of the gating action of Q_{10} upon Q_{12}'s reset pulse to flip-flop $Q_{13}Q_{14}$, is caused to last exactly one more pulse length, for a total of

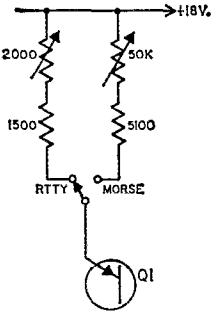


Fig. 4—Time-base change. The 2000-ohm variable resistor is adjusted for a 22-millisecond period, as described in the text.

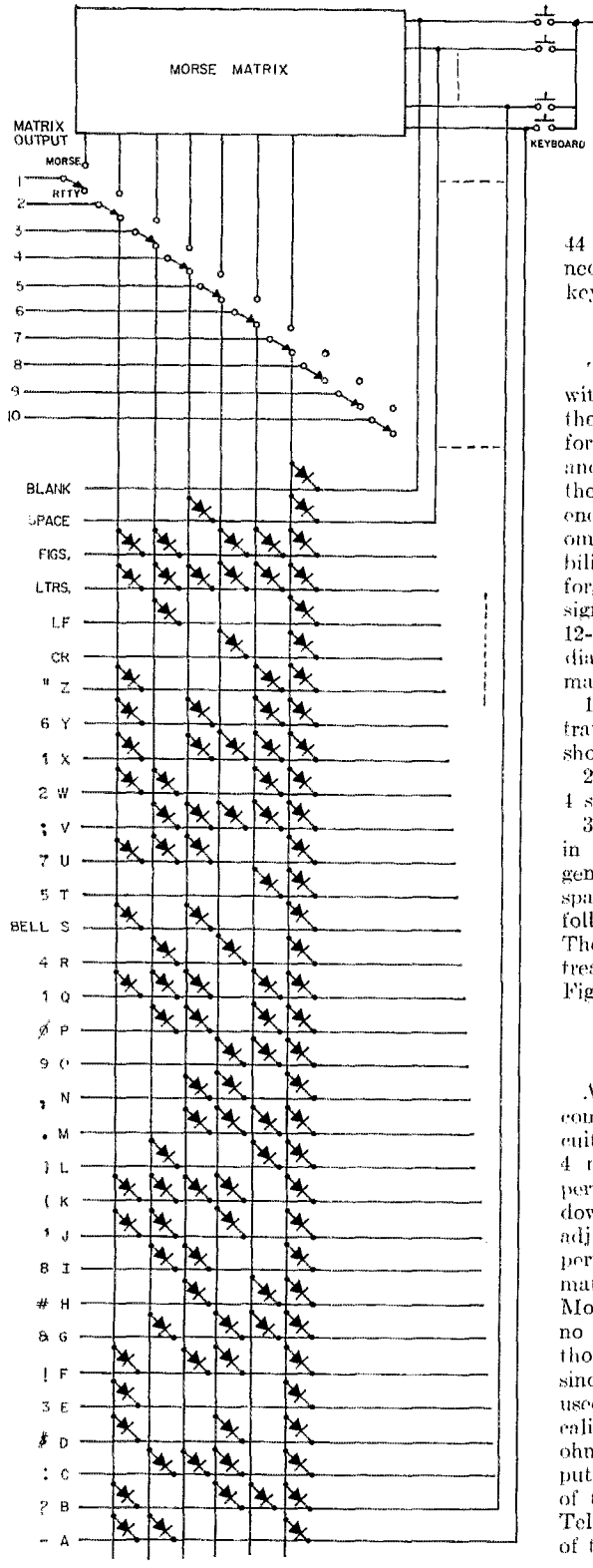


Fig. 5—Complete RTTY matrix. The inputs from the keyboard are paralleled with the corresponding Morse matrix inputs and the outputs are switched between the two matrices with ten poles of a 12-pole two position switch (the other two poles are connected as shown in Figs. 3 and 4).

44 msec. At this time the keyboard is reconnected, but the mark output persists until a key is actuated, beginning a new cycle.

Circuit Changes

There are four circuit changes associated with conversion to RTTY: 1) Re-timing of the core 11 shift pulse; 2) a fixed higher speed for the time base; 3) a new encoding matrix, and 4) a character counter to indicate when the other fellow's teleprinter is nearing the end of its carriage. This last feature may be omitted if desired, though we take no responsibility for the tempers that may be inflamed by forgetting to send a carriage return/line feed signal. The first three changes are made with a 12-pole 2-position rotary switch so that immediate switching between Morse and RTTY may be made.

1) Core 11 driver Q_5 is driven from the trailing edge of Q_{16}'s collector pulse. Fig. 3 shows the change.

2) The time base must be speeded up; Fig. 4 shows the change.

3) The encoding matrix for RTTY is shown in full in Fig. 5. For each character a diode generates a mark, and no diode generates a space. In addition, a diode is always inserted following the five encoding diodes, as shown. The outputs from the ten switch poles are treated exactly like the ten matrix outputs in Fig. 2.

Adjustment of RTTY Speed, and Character Counter

At this point the change to RTTY is almost complete, with only the character-counter circuitry remaining. The 2000-ohm pot in Fig. 4 must be adjusted to a 22-msec. oscillator period; probably the easiest way is to hold down V, M, O, T, or the letter shift and adjust the pot until the output has a 176-msec. period, with the weight control set at approximately unit mark/space, as observed with a Morse "5". Note that the weight control has no effect on the RTTY mark/space ratio, though it has a slight effect on the speed, since only one oscillator pulse per cycle is used. The 60-cycle line power can be used to calibrate the scope sweep, adjusting the 2000-ohm pot so that one cycle of the teletype output from the relay corresponds to 10.6 cycles of the 60-cycle sine. The keyer will now send Teletype, using the normally-closed contact of the relay; as with Morse operation, holding

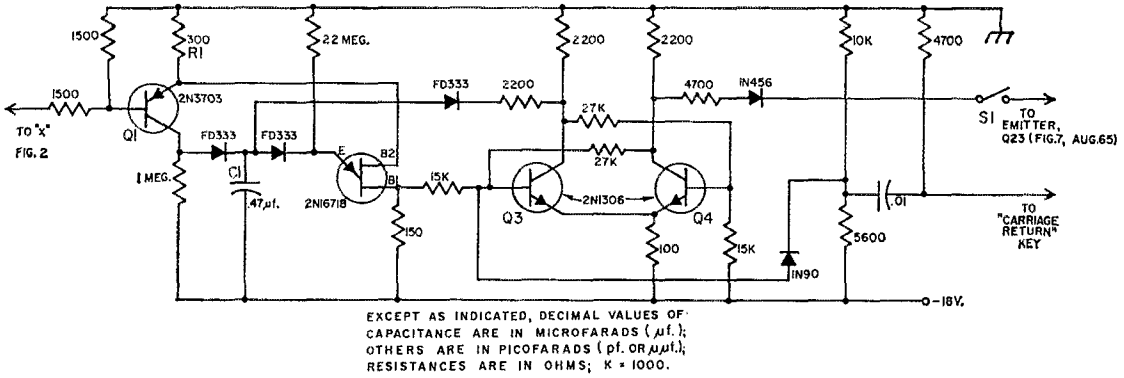


Fig. 6—Analog counter circuit for end-of-line warning indicator. R_1 should be adjusted to give a count of 62. S_1 cuts off the counter when no count is desired. C_1 is a mylar capacitor; see text. Resistors are ½-watt composition. The FD333 is a low-leakage diode made by Fairchild.

down a key causes the character to repeat, with proper spacing.

4) The character counter is shown in Fig. 6. Each time a character is read into the shift register, a 10-μsec. 5-volt pulse is applied to Q_1's base; Q_1 acts as a current source and dumps a standard amount of charge into C_1 (the 1-meg. resistor and the diode keep the leakage current from charging C_1). When the voltage on C_1 reaches the firing point of Q_2, a pulse is generated which flips Q_3Q_4, raising the pitch of the monitor several octaves as an end-of-line indicator; C_1 is then clamped down until the carriage-return key is pressed, resetting the flip-flop. Note that Q_1 serves the dual purpose of an emitter follower, reducing the base-2 voltage and hence the firing point of Q_2 for 10 μsec. for each character; this keeps the average emitter current of Q_2 very low, while still sampling the level of C_1 each pulse. Emitter leakage current flows through the 22-meg. resistor, the back-biased FD333 decoupling this from C_1. The use of ultra-low-leakage diodes in combination with resistors to solve the leakage problems of Q_1 and Q_2, along with the base-2 sampling technique in Q_2, result in extremely long storage times; the circuit was found to "keep its count" to within one count in 62 even when the characters were read in over a period of 20 minutes.

In operation the keyer is perhaps a bit easier to use with RTTY than with Morse, since every character has exactly the same length and one soon gets into the rhythm of things. It should be pointed out, however, that, unlike a regular RTTY machine, this keyer doesn't have mechanical feedback to the keys, nor does it provide the usual symphony of chugging machinery. QST

Strays

The San Bernardino Microwave Society, Inc. has moved to a new meeting place, the second floor of the Security Pacific National Bank, 204 East Sixth St., Corena, California. Entrance is to be made at the south side of the building. All hams and non-hams are invited to attend the meetings which start at 7:30 and are informal and technical in character. Club interest is primarily in communications above 1000 MHz.

—···—

Want to get the "drop" on the other guys when starting a contest? You'll need one of the new atomic clocks developed by the Army Electronics Command. The new clock is portable and measures 7 × 7 × 16 inches and weighs, including its battery, 38 pounds. It is extremely rugged and can be carried around casually in any kind of weather. Using the natural atomic resonance of rubidium, tests show a stability of a single second in 3000 years. Battery life has been extended from 15 minutes in an older model to eight hours.

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Radiation Resistance of Inverted V Antennas

And Some Observations on Resonant Length

BY DALE W. COVINGTON,* K4GSX

This theoretical and experimental study of the feed characteristics of the inverted V antenna supplements the same author's earlier analysis (*QST*, May, 1965) in which the radiation patterns of the antenna were worked out. Together, the two articles give a comprehensive picture of the effect of bending a dipole at its center.

"ES ANT IS INVERTED V ABT — FT ABOVE GND . . ." Phrases such as this form an integral part of many 80- and 40-meter QSOs. The following discussion deals specifically with the radiation resistance of this popular antenna as a function of the antenna's height above ground. With such information it becomes an easy matter to select combinations of V heights and angles which approximately match the antenna resistance with the proper transmission-line characteristic impedance, or to select a transformer to go between the antenna and the feed line.

Technique

A basic problem in calculating the input impedance of the inverted V rests in the fact that the antenna is commonly used on the lower frequency bands, and hence is usually installed just fractions of a wavelength above ground possessing finite conductivity and a dielectric constant other than 1. Thus the V analysis described by King[1] for the isolated antenna is of limited value. Even if the case of perfectly-conducting ground is assumed, a strictly formal treatment of the problem remains quite difficult as the calculations must account for that part of the total current in the antenna which is induced by current flow on the ground plane.

On the other hand, a rather straightforward numerical solution can be obtained by utilizing a specialization of the method of moments.[2] Here the radiated power including the mutual radiation terms along with the self-impedance terms is evaluated from a spatial distribution of small current elements representing the antenna and its image. The radiation resistance follows from the computed value of the radiated power, once a current distribution is assigned to the antenna. Such was the approach taken in the present analysis.

* 281 Vance Circle N.E., Marietta, Georgia 30060

[1] King, *Theory of Lineur Antennas*, University Press, Cambridge, Massachusetts, 1956, p. 389.

[2] Schelkunoff and Friis, *Antennas, Theory and Practice*, John Wiley and Sons, Inc., New York, 1952, p. 162.

Of course, the antenna *impedance* includes an inductive term which varies with V height, angle, and conductor length/diameter ratio. For the isolated V this component ranges between 15 and 40 ohms for included V angles between roughly 90 and 180 degrees [4]. By shortening the antenna slightly the inductive reactance is reduced to zero, leaving only the more slowly-varying real component. Consequently the antenna resistance measured at resonance is slightly smaller than the real part of the input antenna impedance or actual radiation resistance.[3]

Fig. 1 illustrates the general model and nomenclature. The inverted V symmetrically located over perfectly conducting ground is replaced by current elements positioned in the center of ⅛-wavelength intervals along the antenna and its image. The elements are weighted by the assumed cosinusoidal current flowing on the thin wire filaments. Certainly, subdividing the antenna into more than four current elements would add both toil and accuracy to the computation. As will be shown in the next section, however, the even cruder two-element approximation, with just one current element in the center of each leg of the antenna, compares well with the radiation resistance as determined by a continuous current distribution.

Computed Results

The initial calculations considered the self- and mutual-resistance terms for the current elements of the antenna alone. This effectively represented the isolated V far removed from ground, and afforded an immediate check on the

[3] *The ARRL Antenna Book.*

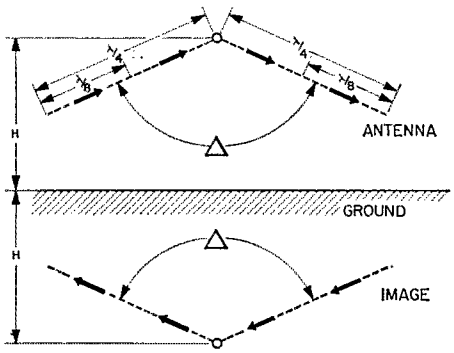


Fig. 1—Mathematical model used for the calculation of radiation resistance of the inverted V antenna and its image in perfectly conducting ground.

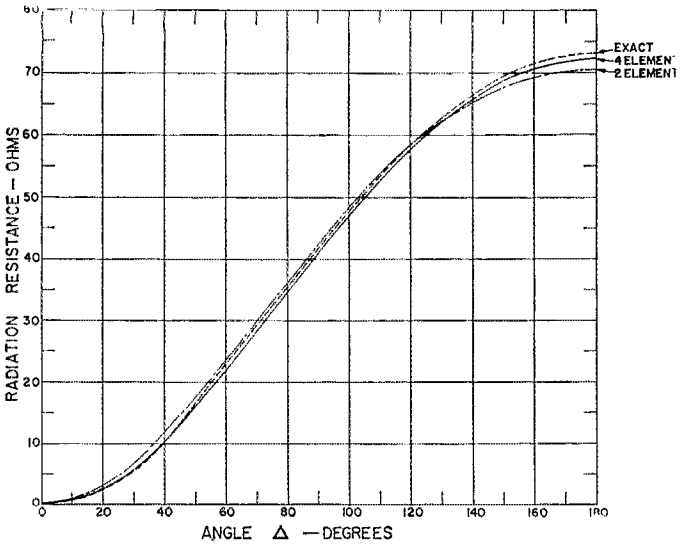


Fig. 2—Calculated free-space radiation resistance as a function of delta. Solid curve—model using four current elements as in Fig. 1; Dot-dash curve—model using two current elements; dotted curve—continuous current distribution.

accuracy of the model. A plot of the radiation resistance versus V angle is given in Fig. 2. The solid line and the broken line correspond to the four- and two-current-element models respectively. The dotted line is taken from King's results for a continuous current distribution. Agreement between the three cases is good. Note the rapid and almost uniform 0.6 ohm per degree decrease in radiation resistance as the V angle sharpens from 130 to 30 degrees. The radiation resistances at the extreme values of delta are intuitively correct; namely, 73 ohms for delta of 180 degrees and zero when the legs of the antenna are parallel.

The image antenna was introduced in the second set of calculations. Fig. 3 portrays the dependence of the radiation resistance upon the apex height above perfect ground. Again a reference benchmark was available for delta equal to 180 degrees. The dotted line in Fig. 3 indicates the influence of ground on the horizontal dipole radiation resistance.[3,4] As delta decreases, the radiation resistance initially begins decreasing rather slowly, but for angles smaller than 120 degrees the radiation resistance quickly falls to fairly low values. In fact, for delta much smaller than 90 degrees some form of step-up transformer would be required for best matching to 52-ohm coax. Interestingly enough, 73-ohm coax suitably coupled to the balanced antenna appears to be a good feed-line choice for a wide range of delta at heights near one-half wavelength. Increasing the apex height finds the radiation resistance for a particular delta indeed oscillating about the corresponding isolated antenna values given in Fig. 2.

Like most theoretical curves based on simple models, the curves of Fig .3 must be evaluated with a grain of salt when compared to the real antenna world. It will be useful to draw upon past experience with horizontal dipoles to define the character of the approximations involved in the results of Fig. 3. First, an element of approximation is introduced by equating the antenna resistance measured at resonance to the radiation resistance, particularly as the antenna deviates from the thin-wire type. When the perfect ground of the model is replaced by actual ground with finite conductivity, the magnitude and phase of the image-current elements must be suitably altered in accord with the

[4] Kraus, *Antennas*, McGraw Hill, New York, 1950, p. 305

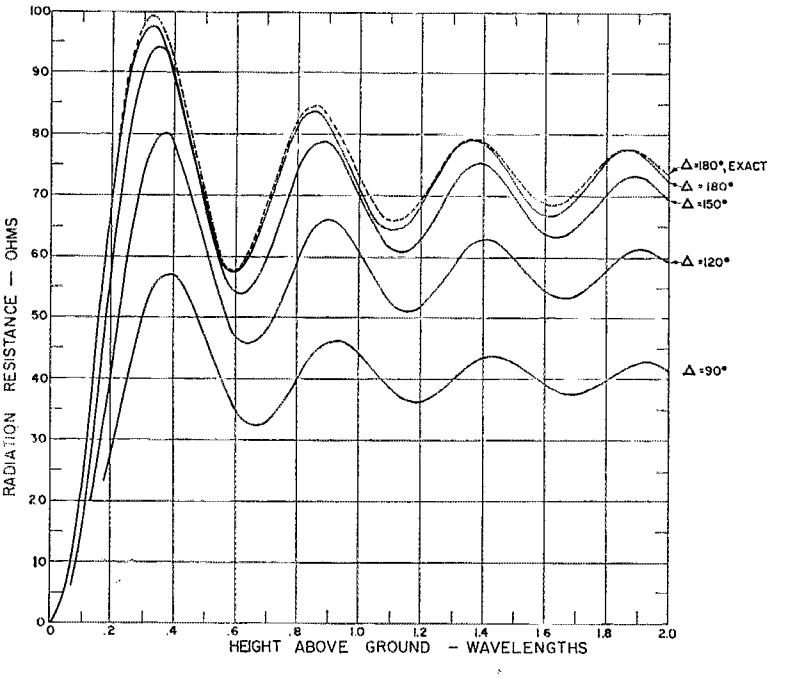


Fig. 3—Radiation resistance vs. height above perfectly-conducting ground for representative values of delta. Dotted curve is the variation in radiation resistance of a horizontal half-wave dipole as usually given in texts.

ground reflection coefficients. Real ground has the effect for horizontal dipoles of shifting the entire curve slightly to the left and reducing the amplitude of its oscillations.[5] Finite ground conductivity also causes the radiation resistance to increase instead of dropping to zero as the dipole height falls below 0.2 wavelength.[6] Perhaps this is the explanation for Johnson's figure of 82 ohms for a 145-degree V at a height of 0.114 wavelength.[7] No increase was observed experimentally for the sharper V's described in this note.

Measured Data

It seemed appropriate to press beyond the computed curves of the model into some actual experimental results. Measurement of the radiation resistance of an 80-40 meter cage V[8] using a homemade bridge [9] yielded the values shown below.

Ant.	Angle Δ	Height	R_{RAD}
80 m.	110°	.17λ	38 ohms
40 m.	95°	.32λ	54 ohms

To check the resistance variation over ground, an inverted V with delta of 105 degrees was constructed for 20 meters using ⅞-inch aluminum tubing. This gave an L/D ratio that was similar to the cage antenna. A G3HZP balun [10] was inserted between the RG-58 feed line and the antenna terminals. Fig. 4 contains both the experimental 20-meter data and the curves for a 105-degree V computed from the 2- and 4-current-element models. Certainly at the higher elevations these curves should bracket the radiation resistance as determined by a continuous current on the antenna. The points denoted by triangles were measured on the homemade bridge and the circled points were obtained using a u.h.f. GR Type 1602 bridge. While the experimental points do not fall on the computed curves, they do cluster in a range of values consistent with the previous observations on antennas in theory and in practice.

Length of the Inverted V

The pruning necessary to tune out the reactance of the half-wave antenna can be estimated by introducing a variable K into the half-wavelength formula.

$$Length\ (feet) = \frac{492 \times K}{f\ (Mc.)}$$

Into K has been lumped information on the influence of the conductor diameter, loading by end insulators, height above ground of arbitrary conductivity, feed-line effects, etc. Normally, a representative value of 0.95 is assigned to K, which immediately leads to the familiar formula

[5] Jordan, *Electromagnetic Waves and Radiating Systems*, Prentice-Hall, Inc., Englewood Cliffs, N. J., 1950, p. 524.

[6] Proctor, "Input Impedance of Horizontal Dipole Aerials at Low Heights Above the Ground", *Proc. I.E.E.*, 97, part II, 1950, p. 188.

[7] Johnson, "Antenna Feedpoint Investigation", *CQ*, March 1968, p. 36.

[8] Covington, "Inverted V Radiation Patterns", *QST*, May 1965, p. 81.

[9] Strandlund, "Amateur Measurement of R + jX", *QST*, June 1965, p. 25.

[10] James, "The G3HZP Balun", *RSGB Bulletin*, July 1966, p. 459.

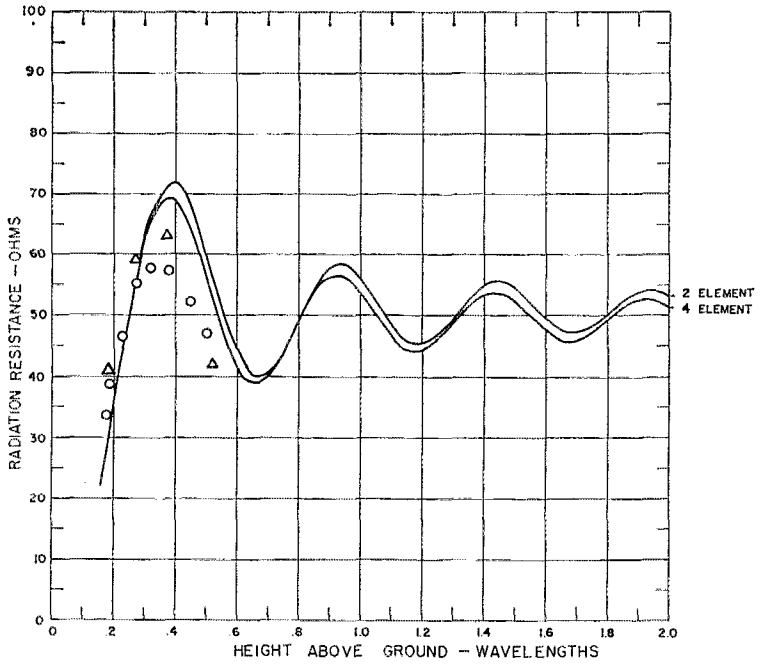


Fig. 4—The triangles and circles represent measured values of radiation resistance of an experimental inverted V having an included angle, delta, of 105 degrees. Curves based on two mathematical models are shown for comparison.

for the length of the horizontal resonant half wavelength antenna.

$$Length\ (feet) = \frac{468}{f\ (Mc.)}$$

The very geometry of the inverted V indicates that some limitations must be accepted in assuming a single, universal number for K. Moreover this is confirmed by the maze of conflicting values for resonant lengths of inverted Vs reported in the literature. Some of these reports can be untangled by focusing attention on K in relation to the antenna height.

A 10-meter balun-fed inverted V was built with delta of 105 degrees and an L/D ratio of 230. The resonant frequency was determined from the minimum of the s.w.r. plots taken as the antenna was raised to various heights above ground. This data was then used to compute K as given by the first formula. The results are shown in Fig. 5. Perhaps the most surprising aspect of Fig. 5 was the discovery that, given the antenna height, the value of K read from the curve predicted (using the first formula) the resonant lengths of both the 80- and 40-meter cage Vs to within 1.6 feet. Several tentative conclusions are suggested by the figure. The initial rise followed by an oscillatory behavior is similar to that noted for horizontal dipoles.[6] Larger angles of delta should witness a steeper decline in K at the lower heights. As the distance above ground increases, K assumes a value that is slightly larger than the corresponding value for a dipole. This lends weight to the argument that the dipole has the larger reactive component. Using a d.c. three-ground-rod technique, the local ground conductivity was found to be 2.7 millimhos/meter under the antenna. Since the conductivity over much of the U.S. is several times greater than this [11] it would be reasonable to expect, in general, values of K which move into the 0.95 region more quickly than Fig. 5 indicates. A larger L/D ratio should increase K slightly.

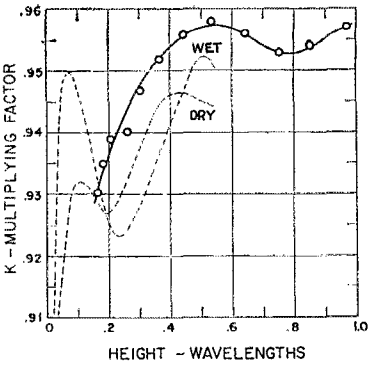


Fig. 5—Experimentally determined values of K at various heights above ground. The circled points were measured for a 10-meter, 105-degree inverted V with L/D of 230 and ground conductivity of 2.7 millimhos/meter. The dotted lines were taken from Proctor's 6-meter, horizontal-dipole results (L/D of 390) over wet and dry ground.[6]

Summary

Basically, this study has examined two questions:

1) What is the most efficient way of feeding an inverted V given an arbitrary V height and angle? Fig. 3 supplies an approximate answer in the case of a thin-filament V and perfect ground. Practically speaking, the framework of the idealized curves was confirmed experimentally. A more exact confirmation would require a better mathematical model of the physical antenna and ground. Nevertheless Fig. 3 does suggest some guidelines for feeding inverted Vs. The simplest approach, particularly for multiband operation, is to use tuned feeders and not really worry about the antenna impedance. But tuned feeders do not offer the convenience and portability of coaxial or Twin-Lead feed. In this case the best match will depend on height and V angle. With 73-ohm coax or 75-ohm Twin Lead an s.w.r. of 1.7 or better at resonance is predicted for any height above 0.25 wavelength and delta greater than 120 degrees. Roughly the same could be said for a 300-ohm folded-dipole inverted V. Feeding with 52 ohm-coax requires judicious selection of height and delta if the lowest s.w.r. is to be maintained. The standard deviation of the s.w.r. about 52 ohms for heights from 0.2 to 1 wavelength is minimum for delta near 110 degrees. This would represent a good compromise for a multiband trap inverted V. The purist approach to the feed problem would be to select the antenna height that optimizes the radiated power for a given set of angles of elevation, then to match the antenna impedance at that height to the coax using a balun transformer.

2) Given a frequency, how long is a corresponding inverted V antenna? With much sagacity comes the three-word reply, "cut and try." While an inverted V installed high and in the clear can be longer than a horizontal dipole, especially if delta is less than 90 degrees, the cramped conditions prevailing for the usual 80/40-meter antenna will cause lengths computed by the $468/f$ formula to be too long. The author has found Fig. 5 to be a useful supplemental guide in zeroing in on the resonant frequency for Vs near 100 degrees.

Correspondence with G3HZP has been especially valuable and much of the prerequisite enthusiasm and elbow grease in all phases of the experimental measurements came from W4LKB. Special thanks go to both amateurs for their help in the presentation of the above ideas on inverted Vs. QST

[11] *FCC Rules and Regulations*, Section 73, p. 107.

IVI

Transceive With Instantaneous Voice Interruption

BY H. ROMMEL HILDRETH,* M.D., WØIP

In his original article, the author mentioned that there were still a few bugs to be eliminated for satisfactory transceive operation. These problems have now been solved. The small changes involved also result in tune-up and mode-switching procedures essentially the same as normally followed with unmodified equipment. The author also discusses operation without an electronic t.r. switch.

PUBLICATION of the author's original article on an instantaneous voice-interruption (break-in) system[1] aroused considerable interest, made evident by the volume of mail that has been received since the appearance of the article. One of the things that this correspondence revealed is that familiarity with the electronic t.r. switch is not as widespread among voice operators as it is among c.w. operators. This is probably natural, since rapid antenna switching alone does not speed up the other switching operations usually required in conventional voice change-over systems.

Electronic t.r. switches are available on the market, or one can be made quite simply.[2] However, let the author hasten to say that such a device is not at all necessary to try the system out, nor is it necessary for a considerable amount of practical operation on the air. For some time before the acquisition of a t.r. switch, the author used a 12-foot length of wire running along the baseboard of the operating room as a separate receiving antenna. This antenna gave entirely satisfactory results in working from one end of the country to the other. The noise from such an antenna is usually quite low, so the receiver gain control can be run up to compensate largely for any reduction in antenna pickup. If the system proves to be attractive, which the author feels sure it will, a t.r. switch can be added later.

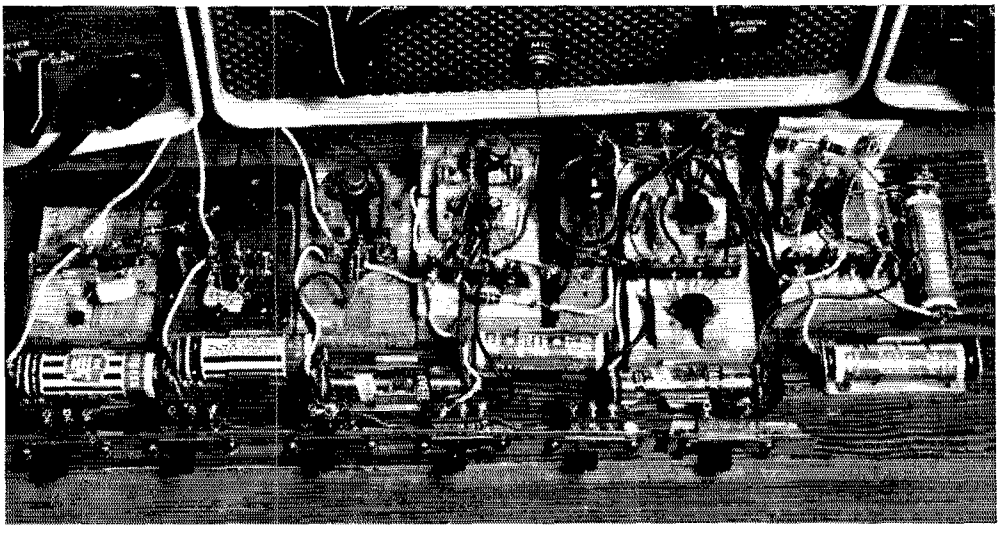
Control Simplification

Further work with the system, as applied to the Collins 32S-3 exciter and 75S-3 receiver, has solved the problems that were mentioned in the previous article in reference to transceive

* 18 Brighton Way, Clayton, Missouri 63105.

[1] Hildreth, "An Experimental All-Electronic VOX System for S.S.B.," *QST*, March, 1968.

[2] McCoy, "Antenna Switching for Beginners," *QST*, October, 1967.



The author's experimental setup. The two boards at the left contain the Q_4 and Q_5 controls for the first mixer. In succession to the right are the control units for V6 (Q_{10}), and the 6146 screens (Q_3), the 12AT7, and the control unit for the master control transistor (Q_2) and the receiver muter (Q_1). The last board to the right contains the control unit for the linear amplifier (Q_7, Q_8, Q_9). The slide switch at the extreme left (first-mixer control) is turned off for c.w. spotting, and the one at the extreme right (linear amplifier control) is turned off during c.w. operation. At all other times, all switches are left closed during normal operation. The units partially visible in the background are the 32S-3 at left, 312B control at center, and 75S-3 receiver at right.

operation. Also, the control system is now arranged so that it requires no adjustment or plug shifting, either for tuning or for changing modes, so the control circuitry can be left permanently installed. By applying the Q_4 and Q_5 controls to the first mixer, V_4, instead of to the second mixer, as was done originally, the system works for both c.w. and s.s.b. without change. Furthermore, the audio control, Q_6, described in the original article is no longer needed. Thus, all one needs to do to operate is to turn on the battery circuits of the control unit, and proceed to tune up and operate in the usual manner, regardless of the mode selected.

With the original arrangement, there were annoying clicks from the speaker when operating on s.s.b. with a t.r. switch. (This did not occur with c.w. operation, nor on s.s.b. if a separate receiving antenna was used.) The clicks were eliminated by applying a switch control, Q_{10}, to the screen of the 32S-3 r.f. amplifier, V_6, as shown in Fig. 1.

An attempt to introduce this switch through a tube-socket adapter, as described in the earlier article,[1] was not successful at frequencies above 7 Mc. However, it is necessary only to unsolder the 100K screen resistor, R_{38}, from Pin 6 of the 6AH6 amplifier-tube socket to avoid this difficulty. To get at this connection it is necessary to disconnect L_7 (a small coil the size of a 2-watt resistor) temporarily from the near-by terminal strip, and bend it upward. The switch leads are then connected between the resistor and Pin 6, after which L_7 is replaced. The original connections are easily restored, of course, should this become desirable.

C.W. Operation

As already stated, the changes described above render the unit suitable for either c.w. or s.s.b. operation. The panel controls of the Collins units are used in conventional manner in either case, but for one exception. The CAL button normally introduces a carrier for zeroing in on another station. With the control circuit in operation, the circuit controlled by the CAL button is inoperative. However, the same effect is obtained by turning off the battery of the Q_5 switch. If one forgets to switch the battery on again before transmitting, the carrier will be heard as a back wave in the receiver, but the transmitted signal is unaffected. The microphone gain control should be set so that the meter deflection, in the

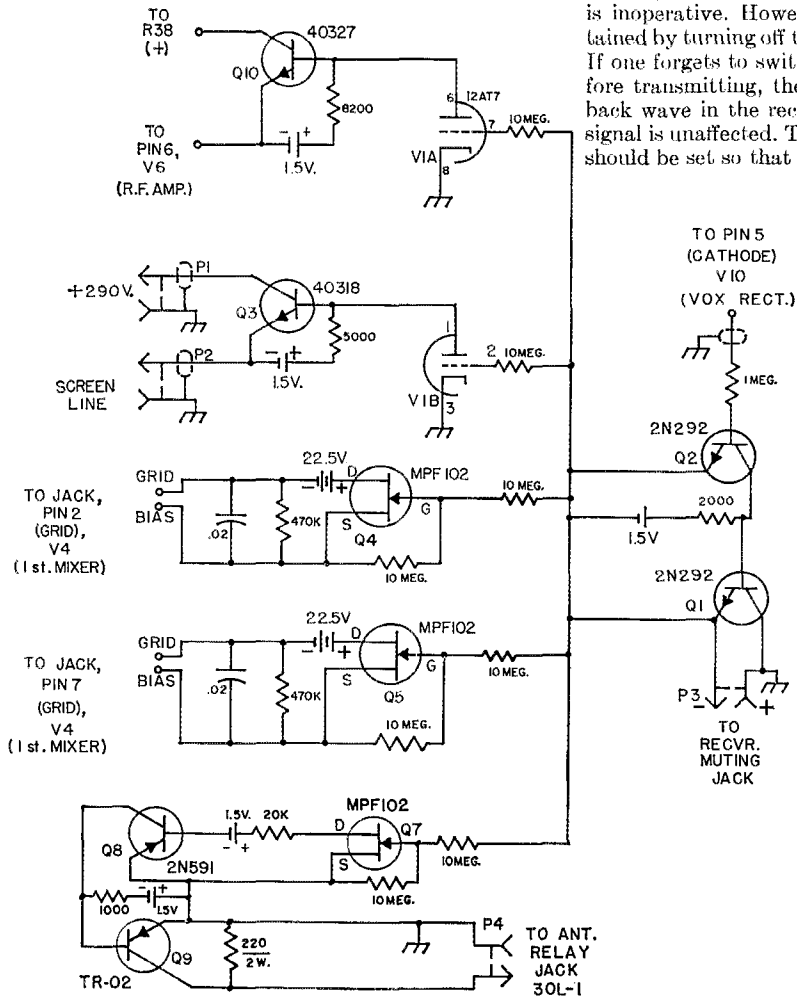


Fig. 1—Complete revised circuit of KØHZF's all-electronic IVI system for Collins 75S-3 receiver, 32S-3 exciter, and 30L-1 linear amplifier. Unless indicated otherwise, capacitances are in μf., and resistances are in ohms (K = 1000). Capacitors may be any type, 150 volts or more. Resistors are ½-watt. P_1, P_2, P_3 and P_4 are phono plugs. Q_1 and Q_2 are G.E.; Q_3, Q_8 and Q_{10} are R.C.A.; Q_4, Q_5 and Q_7 are Motorola; Q_9 is International.

Connections to V_4, and to the 6146 screen circuit are made as described in the original article. Connections to V_6 are described in this article. The Q_{10} circuit is required only for s.s.b. operation with a t.r. switch (see text). The $Q_7/Q_8/Q_9$ circuit is needed only if the 30L-1 linear is used on s.s.b. (The original Q_6 circuit has been eliminated.)

P.A. GRID position, is one third to one half of full scale.

C.w. transceive operation was not feasible earlier because of the strong beat that was present until the crystal-oscillator cable was moved to the "silent" jack, and the exciter oscillator used. With V_4 cut off, there is no signal to mix in V_5 with the receiver crystal-oscillator output, hence the undesirable beat is eliminated, and the receiver oscillator may be used at all times.

In transceive c.w. operation, it should be remembered that the carrier is placed 20 db. down on the skirt of the filter, so if two Collins-equipped stations are working each other, it is necessary that they work on slightly different frequencies. This might be important to remember if the two operators decide to switch from s.s.b. to c.w. when conditions deteriorate. To operate on the same frequency, it is necessary to turn off the Q_5 battery, so that the exciter signal can be heard, and then to turn on the exciter v.f.o. and tune until the carrier beat matches that of the received signal. This places both carriers precisely on the same frequency. Then, Q_5 is turned back on to operate. For c.w. operation, with the 30L-1 amplifier, it is not necessary to turn on the amplifier control described in the earlier article since, for this mode, the amplifier will work at least as well, if not better, if the bias is left at cutoff.

Construction

No constructional details were given in the original article, since there is nothing particularly critical about the layout. In the experimental setup, the author assembled each of the switch circuits shown in Fig. 1 on a separate small circuit board, as shown in the photograph. A terminal strip was mounted on each of these for making the necessary external connections. The boards were then mounted on a baseboard large enough to hold all of them, as well as the batteries which are mounted in clips. The battery switches were mounted on a strip running across the front of the baseboard.

It was found that only the lead to the cathode of V_{10} required shielding. However, to avoid hand-capacitance effects, leads between the control unit and the transmitter should be no longer than necessary, and should be kept away from the front panel of the transmitter by dressing them along the end of the cabinet and passing them into the interior through ventilation holes in the cabinet.

In the permanent installation, the author did not use the probes mentioned in the first article in making connections to the adapter jacks. Instead, a control lead was soldered to each side of the jack, and the jack held open by inserting a thin piece of plastic material between the lips.

Tuning and Operating

Before turning on either the Collins equipment or the control-unit switches, the VOX gain control and the time-constant control should both be set to about "11 o'clock," and the anti-VOX control set fully clockwise. A shorted plug should be inserted in the p.t.t. jack. If the 312B-4 station control is used, remember to have the FUNCTION switch at NORMAL. Then turn on all control-unit switches, and the power switches of the receiver and exciter. As soon as the tubes warm up, the VOX relay should be heard as it closes. From then on, the exciter may be tuned up in the usual fashion. The only time that the control unit has to be touched is when Q_5 is turned off momentarily to permit c.w. "zeroing," as described earlier. The a.g.c. switch is at OFF.

In tuning up with the 30L-1 linear (meter switch in the TUNE position), it might be well to remove the control-unit plug at the ANT. RELAY jack and substitute a shorted plug, at least until the operator becomes familiar with the operation of the system. After tuning, the control plug can be replaced.

Batteries

The battery voltages in the control unit should be checked occasionally. Failure of a battery will cause no damage to equipment; it will simply mean that the stage controlled by the switching having the defective battery will not be turned on fully. In over a year of operation with the system, only the 1.5-volt battery supplying Q_1 and Q_2 has required replacement. When the voltage of this battery dropped to 1.3 volts, neighboring operators reported that the voice was "chopped," indicating that the switch was not operating reliably.[3] A falling off of the battery voltage in the 30L-1 control would eventually cause the linear-amplifier bias to increase. This would increase distortion, but it is probable that the reduced battery voltage would be indicated earlier by a decrease in power output. Failure of the battery in the Q_{10} switch would have a similar effect.

Occasionally, the author has reverted to conventional operation and has rediscovered how decidedly unnatural it is to communicate in this fashion. With the improvements in the system described here, and the realization that an electronic t.r. switch is not necessary to try the system out, it is hoped that more operators will make use of it. Its greatest value is probably in net operation and ragchewing, for it puts an end to "doubling" and does away with a good bit of unnecessary interference. QST

[3] Since writing the article, the author has replaced the 1 megohm resistor in series with the base of Q_2 with a 2-megohm variable. This permits adjustment to compensate for a decrease in battery voltage. He also suggests replacing the 2N292 at Q_2 with a type GE-7.

Strays

VE/W CONTEST REMINDER

Starts: 2300 GMT Saturday, September 28, 1968.
Ends: 0200 GMT Monday, September 30, 1968.
Additional rules appear on p. 63, Sept. *QST*.

Technical Correspondence

ANTENNA TYPE *VS.* DISTANCE

Technical Editor, *QST:*

The table below, which condenses results of experiments conducted over a period of about six months with three types of simple 7-MHz. antennas, may be of interest. Four basic items become apparent when the table is reviewed. These are:

1) Vertical antennas are very ineffective for short-skip operation.

2) Little real-life difference exists between coverage obtained with a low quarter-wave horizontal antenna and that obtained with a low half wave horizontal antenna.

3) Simple polarization diversity assists long-haul communications in cases of bad QSB.

4) The best simple all-around antenna for 7-MHz., giving coverage for both long-haul and short-haul communications, appears to be a half-wave inverted L antenna.

All ½-watt contacts were made with only the ½-watt transmitter on line. None were made first with higher power. On this basis, contacts could not be made over more than 150 nautical miles with *E*-layer skip, nor less than 150 nautical miles with F_2-layer skip.

Apparently these two limitations reflect the angular points where high *E*- and F_2-layer attenuation occur, except at certain short time periods which I never happened to operate in. — *Dave Hardacker, W6IT, 1547 Wellesley Ave., Los Angeles, California 90035.*

NOISE STORY — HAPPY ENDING

Technical Editor, *QST:*

For several years, I had been plagued by a strong noise source located to the southwest of my QTH. This noise was on 24 hours a day, 7 days a week, and was very severe on 7, 14, and 21 Mc. I live in an industrial area; right across the street from me is a steel castings company, and to the N.E. is the main manufacturing plant of Scott Paper Company (1000 feet away). In front of my house is a 22,000-volt hi-line. A railroad spur line runs 30 feet in front of my house. Starting from my house and running S.W. along the Delaware River are chemical plants, cement manufacturing, textile plants, sheet-metal fabrication, welding shops, an oil refinery and numerous other huge industrial concerns.

When this noise started, about three years ago, I was unconcerned about ever locating it among the

(Continued on page 154)

A cross-reference guide to various simple 7-MHz. antennas with consideration given to distance between stations, polarization of signals, angle of radiation and polarization diversity. Maximum antenna height ¼ wave.

Type antenna	*Polarization*	*Vertical Angle of radiation*	*Ground wave propagation*	*E (probable) layer short skip propagation (to 150 n.m.)*		*F2 (probable) layer short skip propagation (150 to 500 n.m.)*		*Long skip (500 to 2500 n.m.) and multiple skip (to 7000 n.m.)*	
				No QSB	Bad QSB	No QSB	Bad QSB	No QSB	Bad QSB
¼ wave vertical, ground rods and no counterpoise	vertical	low	excellent	poor	poor	fair	poor	satisfactory to excellent (better at longer ranges)	satisfactory
½ wave horizontal dipole, ¼ wave above earth.*	horizontal	high	poor**	excellent	excellent	excellent	excellent	fair to good (better at shorter ranges)	poor
½ wave inverted "L" ¼ wave ver. ½ wave hor.	horizontal and vertical	high and low	excellent	good	good	good	excellent	good to excellent (better at longer ranges)	excellent

Ratings: 1. Excellent
2. Good
3. Satisfactory
4. Fair
5. Poor

* No appreciable directional effects were noted. This is because of the low antenna height.

** No "end-on" vertically polarized ground or sky wave propagation was noted. This effect generally occurs when the horizontal antenna is less than $\frac{3}{16}$ wave above ground.

Comments: Ground wave and short skip ratings were made with ½ watt d.c. input to a c.w. transmitter.

Long skip and multiple skip ratings were made with 100 watts d.c. input to a c.w. transmitter.

The same antenna was used in receiving and transmitting. The signal-to-noise ratio was higher in receiving when the ½-wave horizontal antenna was used. There were fewer "lost" contacts with the inverted L antenna than with the vertical or horizontal antennas in conditions of severe fading.

References: "Performance of Diversity Receiving Systems", *Proceedings of the IRE*, March 1951.

"Polarization Diversity Reception of High Frequency Signals", *Granger Associates Technical Bulletin* No. 4, 1964. (Copyright)

"300 KHz — 30 MHz MF/HF", *IEEE Transactions on Communication Technology*, December 1966.

Hints and Kinks For the Experimenter

RETURNING A CAR USED FOR MOBILE OPERATION TO ITS ORIGINAL CONDITION

RECENTLY I was about to trade automobiles, when the car appraiser stated he would have to deduct $10 for filling in the holes on the rear deck where my antenna was mounted and painting the refilled area. Having on hand part of a can of touch-up paint as well as a good sized junk box, I went to work. First I removed the antenna and used the base as a pattern for a backup plate, which I cut from a piece of 24-gauge galvanized steel. Next I beveled the large center hole in the body with a half-round file, and countersunk the three mounting holes so that 10-32 flathead machine screws would drop in slightly below the body surface. After mounting the plate, I put a couple of coats of spot putty (available in automotive stores) over the indentations, sanded and painted the area, and proceeded with the trade. — *Gene Halvorson, WA9UAU*

ICE PERMITS FORMING OF DIFFICULT BENDS IN COPPER TUBING

AN idea recently published in a National Aeronautics and Space Administration document[1] should be of interest to radio amateurs who make coils of copper tubing.

"In the forming of very sharp bends in metal tubing it is standard practice to fill the tube with some material that prevents collapse of the walls. Water, frozen to ice, is a very good filler material for forming difficult tube bends. One end of the tube is crimped to make it watertight, and the tube is filled with water. The open end is then sealed by crimping, and the water-filled tube is cooled to about −30 degrees F in a freezer. While the tubing contains ice, it can be bent into very tight configurations with practically no reduction of the internal area. After the tubing is formed, the ends of the tubing are removed, and the water is poured out.

"This method has been tested using ¼-inch copper tubing. It is necessary to use tubing that has sufficient ductility to withstand the stress imposed by the expansion of the water during freezing."

For additional information about this idea, inquiries may be directed to the Technology Utilization Officer, Ames Research Center, Moffet Field, California 94035, Reference: ARC-90043.

[1] *Metal Fabrication, A Compilation*, Technology Utilization Division, Office of Technology Utilization, National Aeronautics and Space Administration, Washington, D. C. 20546.

ELIMINATING FREQUENCY MODULATION IN THE LINEAR MASTER OSCILLATOR OF THE SB-301

I recently built a Heathkit SB-301 receiver, but was somewhat disappointed with the clarity of reception. When the set was tuned to the slope of the crystal calibrator signal, there was a distinct 60-Hertz roughness in the note. S.s.b. signals were difficult to tune, with exact tuning being seemingly "blurred." After a few checks it was determined that the trouble was due to 60-Hertz modulation of the linear master oscillator (LMO).

The problem was easily solved by applying d.c. to the filament of the LMO. As shown in Fig. 1, a diode, a resistor and a filter capacitor were inserted between the set's filament supply and the filament circuit of the LMO. The parts were placed directly under the LMO on a terminal strip, and the d.c. filament supply lead was run through a hole in the r.f. circuit board to the filament terminal on the back side of the LMO.

After the modification was made, the receiver was tested in all of its modes. Good c.w. signals sounded absolutely clean as they were tuned through the receiver passband, and s.s.b. signals exhibited clear audio with a definite exact tuning characteristic.—*Orlando O. Oklesheu, W9EXE*

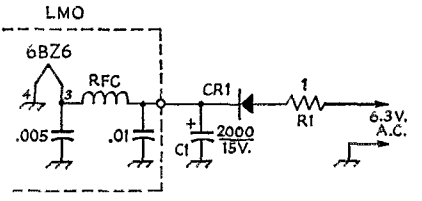


Fig. 1—Modified LMO filament supply circuit for the SB-301. Capacitances are in μf.; resistance is in ohms.
C_1—Electrolytic.
CR_1—Silicon, 200 p.i.v., 750 ma. (1N2069).
R_1—1-watt composition.

ETCH-RESISTANT MATERIAL

IT is not necessary to buy special etch-resistant paint or applicators when making home-brew etched circuit boards. Ordinary house paint (not the water base variety), when thinned to the approximate consistency of ink, makes an excellent etch-resistant material. It may be applied with a pen nib or with an old fiber-tip pen, and is easily removed with benzene or similar solvents.—*Bill Clements, K4GMR*

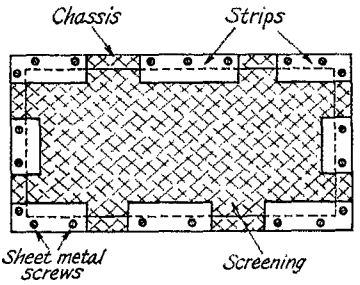


Fig. 2—A chassis bottom plate made from aluminum screening and small strips of aluminum.

ADAPTING THE SB-101 FOR USE WITH THE SB-640 WITHOUT LOSING CRYSTAL-CONTROLLED OPERATION OF THE TRANSCEIVER WHEN THE SB-101 IS USED INDEPENDENTLY

SHORTLY after I had bought a crystal for operation of my SB-101 in a mobile net, the Heath SB-640 external linear master oscillator (LMO) arrived that I had ordered for home station use with the transceiver. To my dismay I found that installation of the LMO entailed disabling the transceiver's 6EA8 auxiliary crystal oscillator, V_{5B}, by removing R_{220}, L_{202} and C_{222}. In addition a 56-ohm resistor was supposed to be installed in the transceiver.

Considerable head-scratching and some experimentation resulted in the following entirely satisfactory solution. Do *not* interfere with R_{220}, L_{202} or C_{222} in any way. Instead, disable the triode section of a spare 6EA8 by removing pins 1, 8 and 9 with sidecutters. Do *not* install the 56-ohm resistor in the SB-101. If you do, it will degrade the performance of V_{5B}. Instead, connect the 56-ohm resistor from lug 2 of the LMO-XTAL switch at W (see Pictoral 6 of the SB-640 manual) to solder lug P.

Now to operate mobile with your favorite crystal, unplug the SB-640 and leave it at home. Remove the crystal from the external LMO, plug it into its socket in the SB-101, and insert a complete 6EA8 in V_5. To operate at home, plug in the SB-640 and transfer the crystal to it if you wish to use the crystal at home as well as in your car. In place of the complete tube, insert the modified 6EA8 in V_5, but take care that you correctly plug it in, as the guide pins will be missing.—*R. T. Woodfield, ZL2VN*

HANGING QSL CARDS

I had found it difficult to hang QSL cards on the shack walls until I remembered that my wife had a sewing machine. Using the wide setting, she zigzag stitches my cards together. If I ever wish to remove the cards, they can easily be folded for storage.—*Edgar Von Trotha, WA5TXH*

BOTTOM PLATE SOURCE

A good material for making chassis bottom plates is ordinary household aluminum screening. It is inexpensive, easy to obtain, and can be cut to shape with scissors. Besides providing r.f. shielding, the screening permits the ventilation of the enclosed components. Other uses include making ventilation holes in equipment cabinets r.f. tight, and acting as grills to protect speakers.

If a small area is to be covered, only screws, washers and nuts need be used to secure the screening. For covering larger areas the screening should be held to the chassis lip with metal strips and sheet metal screws as shown in Fig. 2. This results in a better mechanical connection and more complete r.f. shielding than hardware alone.—*Mal Crawford, WA2IPC*

CABLE FOR REMOTE PICKUP

LONG extension cords used with electric hedge trimmers, lawn mowers, and snow blowers are just dandy for remote reading of field-strength meters or other instruments.—*W. P. Munro, W2HCP*

PREVENTING THE HA-1 KEYER FROM GENERATING SPURIOUS DOTS

MANY users of the Hallicrafters HA-1 tube-type keyer (9TO) have eventually encountered trouble in making characters that start with a dash. Investigation has shown that any resistance of more than about 800 ohms in series with the lead to the dash contact of the paddle will cause an unwanted dot to precede an initial dash. The discharge of the 0.02-μf. capacitor shunting the dash-lever contacts results in pitting of the contacts, and the contact resistance usually becomes high enough to cause spurious dots unless the contacts are cleaned frequently. A way to avoid this difficulty is to use a transistor switch, actuated by the dash-lever contacts, as shown in Fig. 3. The switch should be enclosed in a metal box to avoid r.f. pickup.—*Harold P. Mierop, K2ANW*

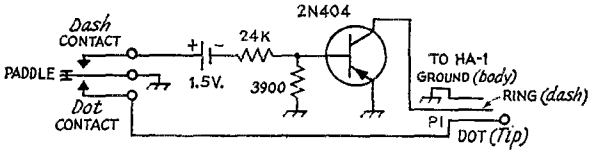


Fig. 3—Diagram of a transistor switch that overcomes the undesirable effects of excessive contact resistance in paddles used to key the HA-1. Resistance is in ohms; K = 1000. Resistors are ¼-watt composition. P_1 is a standard ¼-inch, 3-conductor phone plug.

Matching with Homemade Baluns

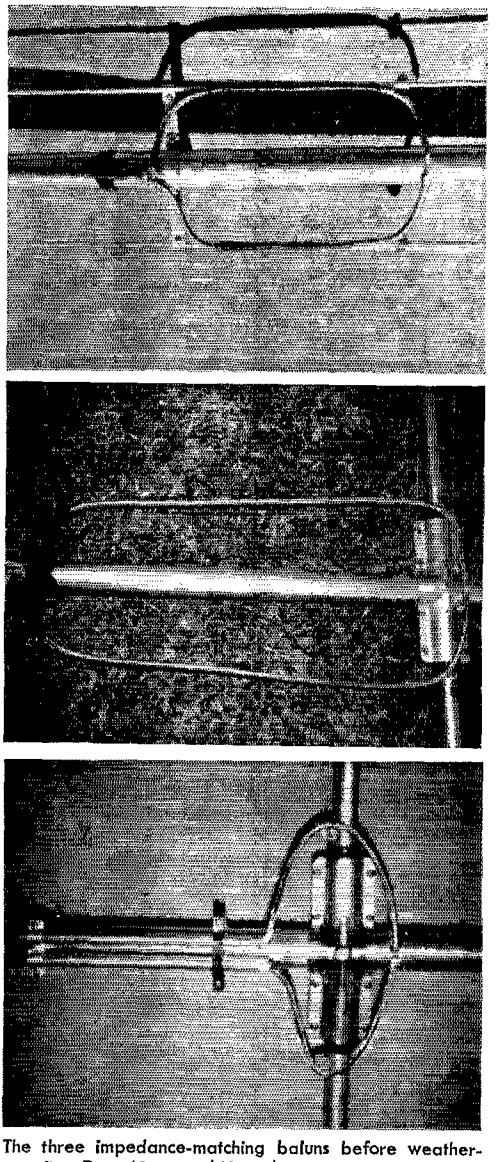
Simple Balun Adaption for Hy-Gain Beams

BY RICHARD C. FENWICK,* W5KTR

A balun between a coax feeder and the driven element is one of those things that, while it may not be necessary under all circumstances, will make the difference between good and poor performance when it is needed. If your antenna is one using the matching system variously known as the "beta match" or "hairpin," the system described here is so simple and inexpensive that, as the author says, there's no point in arguing whether or not to use it.

Most Hy-Gain beam antennas use a "Beta Match" matching arrangement, which is an inductive stub across the feed point, used to resonate a shorter-than-resonant driven element. A balun is not supplied with the beams, and probably more often than not is not needed. However, it is possible to replace the "Beta Match" with a loop of coaxial cable which serves both as a balun and as the matching stub, with so little effort and cost that the question of the need for a balun becomes not worth debating. A balun of this type is well known,[1] and will not be explained further here.

The author recently used this type of balun on antennas in a new installation consisting of a 402BA 40-meter beam, a 204BA 20-meter beam, and a DB-1015 10- and 15-meter beam. The modifications required to the "Beta Match" were different in each case, so they will be discussed individually. What changes the modifications may have made in the v.s.w.r. of the beams is not known, since the beams were never used without the built-in baluns. Stacking may have affected v.s.w.r.s also — the beams are stacked 10 feet apart, in the order listed, with the 40-meter beam at the top at a height of 92 feet. Only the 40-meter beam was tested without the others present; no change in v.s.w.r. was observed.



The three impedance-matching baluns before weatherproofing. Top, 40-meter (402BA) balun; center, 20-meter (204BA) balun; bottom, 10-15 (DB-1015).

*1601 Provincetown Lane, Richardson, Texas 75080.

[1] *ARRL Antenna Book*, ninth or tenth edition, page 110.

402BA Balun

In the case of the 40-meter beam the "Beta Match" was retained in its entirety, and the balun, made of RG-8/U coax with the jacket removed, was electrically paralleled with it, as shown in Fig. 1. The coax was taped to the "Beta Match" but otherwise no connection was made between the two except at the feed point and at the boom as shown. The distance from the feed point to the shorting bar was increased from the original 11 inches to $11\frac{1}{2}$ inches, to compensate for the decreased inductance per unit length of the inductive stub conductor. The extensions of the "Beta Match" rods past the shorting bar were left as is, although they appear to serve no purpose.

After assembly, the coax braid and connections should be weatherproofed — for example, by wrapping with Scotch Type 33 electrical tape and coating that with clear Krylon spray. Silicone rubber sealants, such as "RTV" or "Silastic", are useful for sealing connections. "Dow Corning Silicone Rubber Bathtub Caulk", available at Sears, Roebuck stores, seems to be the same material but for some reason, perhaps a good one, outdoor uses are not mentioned on the package. Weatherproofing remarks apply to the 204BA balun and the DB-1015 balun as well.

The antenna v.s.w.r. as measured at the end of a 135-foot piece of foam-type RG-8/U cable is shown in Fig. 2. (The v.s.w.r. is, of course, somewhat higher at the beam itself.) The minimum v.s.w.r. occurred at about 7.2 MHz., although the element lengths were adjusted to instruction-book lengths for 7.15-MHz. resonance. Whether or not the shift in resonant frequency is due to the addition of the balun is not known, but the author was happy with the results, so no further experimentation was done. Of course, modifications to the matching network can have no effect on the radiation patterns of the beam, so long as balance is maintained.

204BA Balun

In the case of the 20-meter beam the "Beta Match" was discarded and replaced with a loop of RG-8/U coax, as shown in Fig. 3. Again a longer stub was used to compensate for the larger diameter of the coax outer conductor relative to the diameter of the "Beta Rod" supplied with the beam. A section of the "Beta Rod" was cut to serve as a stiff spreader at the end of the coaxial loop, as shown in Fig. 3.

Fig. 4 shows the measured v.s.w.r. of the beam at the end of a 125-foot piece of foam-type RG-8/U cable. ("Phone" element-length settings were used.) It is probably worthy of mention that this is by far the lowest v.s.w.r. across the band that the author has ever seen in a 20-meter beam, and is surprising for a close-spaced 4-element beam. The explanation seems to be that director lengths are recommended which are shorter than that which give maximum gain. However, this is not to say that the beam gain is low, since its performance seems to be com-

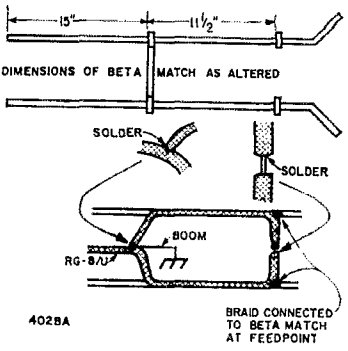


Fig. 1—Altered dimensions of the 40-meter Beta Match (above) and construction of the balun arrangement which parallels it.

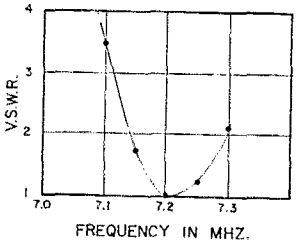


Fig. 2—Measured standing-wave ratio on the 40-meter beam.

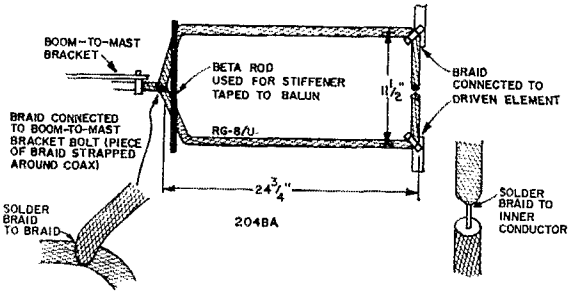


Fig. 3—Dimensions of the 20-meter balun which replaces the original Beta Match.

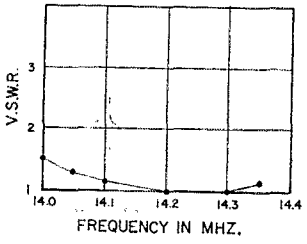


Fig. 4—Measured standing-wave ratio on the 20-meter beam.

parable to that of other beams of comparable size (boom length).

DB-1015 Balun

The "Beta Tubes" for the DB-1015 beam were retained, as shown in Fig. 5, but moved one inch farther away from the driven element to compensate for the larger diameter of the coax relative to the discarded pigtails that normally connect the driven element to the "Beta Tubes." The coax is run through one of the "Beta Tubes."

Fig. 6 shows the v.s.w.r. as measured at the end of 115 feet of foam-type RG-8/U coax, and the v.s.w.r. curves from the instruction book. ("Low phone" element and "Beta Match" settings were used.) As in the case of the 40-meter beam, the v.s.w.r. did not turn out quite as expected, but the author was quite pleased with the results, so that no further experimentation was done.

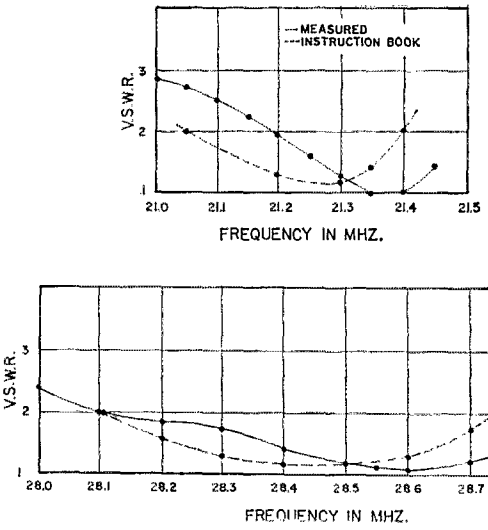


Fig. 6—Measured standing-wave ratios on 10 and 15 meters with the balun installed.

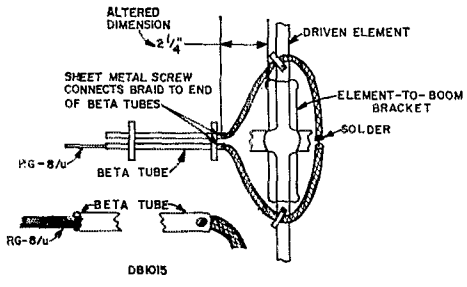


Fig. 5—Construction of the 10-15-meter balun.

Conclusions

For very little cost and effort, homemade baluns can be made from short pieces of coax cable for Hy-Gain 402BA, 204BA, and DB-1015 beams. Although the author is not familiar with other Hy-Gain beams, except through brochures, it appears that the techniques illustrated above are applicable to all Hy-Gain beams using the "Beta Match." Baluns of this type should be more effective than the coax-cable chokes recommended in the instruction books. They should be at least as effective as commercial baluns, either of the ferrite-core or air-wound type, and are likely to be both more efficient and more immune to damage from operating at excessive v.s.w.r. QST

Strays

Feedback

Because of some incorrect figuring on our part, several V.H.F. QSO Party scores were wrongly revised downward in the September writeup of the June contest. In some cases the corrected score will result in a change in section standing.

W3CCX/3 (Eastern Pennsylvania, multioperator): correct score 67,896; correct multiplier 82. **W9YT** (Wisconsin, multioperator): correct score 9945, correct multiplier 51; leads section (multioperator category). **W1QVF/1** (Connecticut, single operator), correct score 48, correct multiplier 4. **WA1IOX** (Connecticut, multioperator), correct score 33,660, correct multiplier 66; wins section award (multioperator category). **K7AUO/7** (Oregon, multioperator): correct score 7285, correct multiplier 31. **WB6NDJ/6** (East Bay, multioperator): correct score 8064, correct multiplier 28. **W6ASH/6** (Santa Clara Valley, single operator), correct score 65, correct multiplier 5. In addition, **W9YT** and **WA1IOX** are division leaders in the multiop category for the Central and New England Divisions, respectively. Our apologies to all concerned.

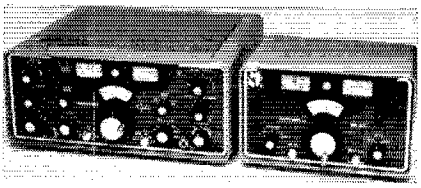
Even after we corrected it on two consecutive sets of proofs, the call in the caption to the picture of **W7VDZ** still was printed as W7VDA. Vy sri, Jim.

The single-operator section award for Northern New Jersey is being withheld pending conclusion of an inquiry.

Recent Equipment

To acquaint you with the technical features of current amateur gear.

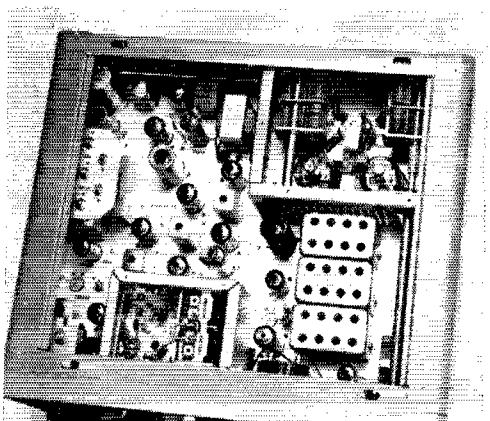
Hallicrafters SR-400 Transceiver and HA-20 Adapter



IT would be easy to call the SR-400 transceiver a "baby brother" of the SR-2000[1] because in many ways it is identical with the latter. Aside from the final amplifier and power supply, the transmitting sections of the transceivers are the same. In the receiver line-up, the similarity is there but in the SR-400 additional selectivity for c.w. operation has been added, plus a "notch"-type filter. All in all, the SR-400 is designed with both the sideband *and c.w.* man in mind.

Frequency coverage of the transceiver takes in all of the 3.5-Mc. through 28.0-Mc. amateur bands in 500-kc. segments. The 28-Mc. band is covered in four sections of 500 kc. each. One rotation of the tuning knob covers 25 kilocycles and the tuning dial is calibrated in 1-kc. divisions with a total of 100 kc. for the dial. The 1-kc. divisions are ⅛ inch wide. This dial drives a second dial which is calibrated in 50-kc. steps starting either from 0 or 500. For a band starting at a multiple of 1000 kc. the 0 is used, and for ones beginning at a 500-kc. point the dial starting at 500 would be used. A 100-kc. standard is supplied and a variable panel-mounted control is provided in order to set the band edges precisely. Fig. 1 is the block diagram of the transceiver as given in the SR-400 instruction manual.

[1] "Recent Equipment," *QST*, May 1967.



Covers for the v.f.o., lower left, and amplifier compartment, upper right, have been removed in this top view of the SR-400. The two dual variables in the amplifier compartment are the plate tuning and loading units. A screw-down perforated cover for the amplifier provides tight shielding of the circuit for TVI suppression.

The large shield cans contain the r.f., mixer and driver tuned coils. The ganged tuning capacitor for these circuits is mounted below deck, along with the band switch.

The receiver is a dual-conversion unit, with the first i.f. tunable over 6.0 to 6.5 Mc. Incoming signals are amplified and then converted to the first-i.f. range using a crystal-controlled high-frequency oscillator. The signals are then converted down to 1650 kc. after being mixed with the v.f.o. output. The v.f.o. range is 4350 to 4850 kc.

Preceding the high-selectivity section of the i.f. there is a noise blanker to remove interfering noise of the "ignition" type. The first i.f. tube at 1650 kc., a 6GX6, is a combination noise blanker and i.f. amplifier stage. The signal is applied to grid No. 1 and the noise blanking pulses to grid No. 3. These pulses are formed by amplifying noise "spikes" in a 7059 pentode stage at the 6.0-Mc. i.f. The noise output from this stage is rectified and then applied to another 7059 for additional amplification before being fed to the noise blanker at 1650 kc. The noise blanker should prove of great value to any amateur using the SR-400 in a mobile installation or in a noisy location. In one test we tuned in a weak c.w. signal, about an S3, and then fed the hashy noise from the brush sparking of an electric drill into the receiver at an S9 noise level. When the noise blanker control was then adjusted, the noise was reduced to a point where the c.w. signal was 100 percent copy. Without the blanker it was impossible to copy any part of the c.w. signal.

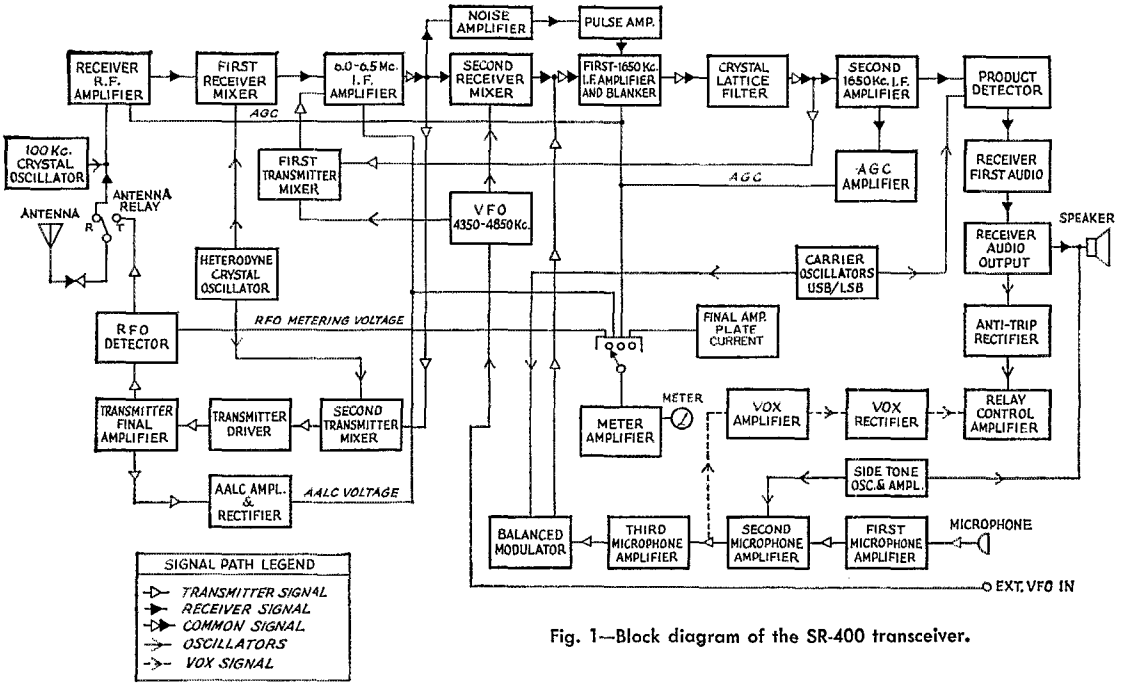
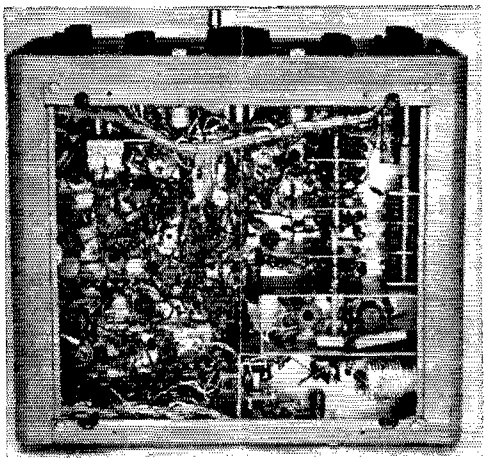


Fig. 1—Block diagram of the SR-400 transceiver.

After the noise blanker, the signal goes through a set of crystal filters as shown in Fig. 2. There are two degrees of selectivity available, one using a six-crystal lattice filter for s.s.b. reception. The second is a sharp c.w. position in which the signal goes through a single crystal at 1652.2 kc. The manufacturer rates the sharp selectivity at 200 cycles at the 6-db. points, and the s.s.b. position at 2.1 kc. 3-db. bandwidth.



As evidenced by this view, it takes a lot of parts to put together a transceiver! The amplifier bottom compartment consists of two sections, visible at the lower right-hand corner. The upper section contains the bases of the 6HF5 amplifier tubes and the lower section the pi-network tank coil and the antenna changeover relay.

After the signal passes through the lattice network it is fed to the grid of the second i.f. amplifier. Connected in series from this grid to ground is a 1651-kc. crystal and a Varicap. Changing the bias on the Varicap changes the series-resonance frequency of the crystal, permitting the frequency to be moved across the i.f. passband. This provides a "notch" for reducing undesired heterodyne interference.

After the filter network, the signal is fed to a product detector and then into two audio amplifier stages. The audio output transformer has two output impedances available, 500 ohms for headphones and 3 ohms for a speaker.

In addition to the features outlined above, the SR-400 also has RIT, "receiver incremental tuning," which has been available on earlier Hallicrafter transceivers. RIT permits you to tune about 3 kc. either side of the transmitting frequency, a very handy feature if you are working c.w., or if a received signal tends to drift off the transceive frequency. When the RIT control is switched on, a red panel indicator light comes on, as a reminder that you are operating RIT. The RIT only works on receiving, as the transmitting frequency is controlled by the setting of the main tuning knob.

Transmitting Line-Up

Fig. 1 shows the line-up on transmitting. For voice operation, the microphone signal is amplified in three audio stages, the output being fed to the balanced modulator. Also coming into the balanced modulator is a carrier from

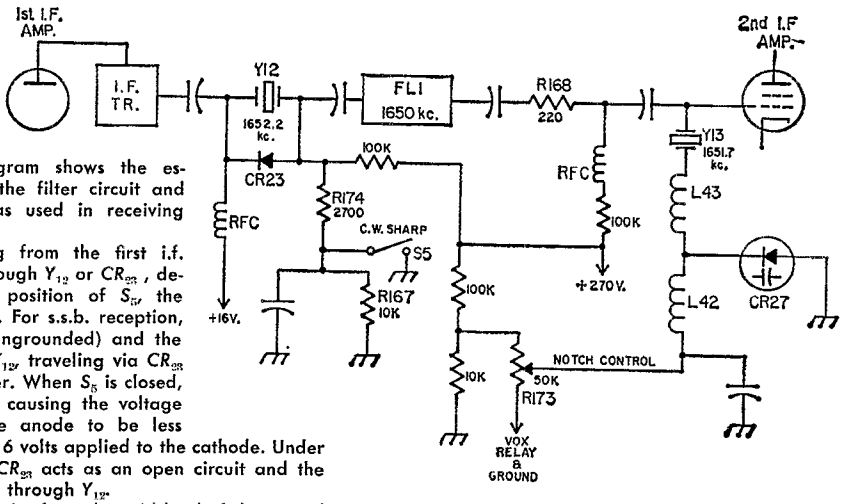


Fig. 2—This diagram shows the essential parts of the filter circuit and rejection notch as used in receiving with the SR-400.

Signals coming from the first i.f. stage are fed through Y_{12} or CR_{23}, depending on the position of S_5, the *c.w. sharp switch*. For s.s.b. reception, S_5 is left open (ungrounded) and the signal bypasses Y_{12}, traveling via CR_{23} to the 2.1-kc. filter. When S_5 is closed, R_{174} is grounded, causing the voltage appearing at the anode to be less positive than the 16 volts applied to the cathode. Under these conditions, CR_{23} acts as an open circuit and the signals are routed through Y_{12}.

Connected in series from the grid lead of the second i.f. to ground is the notch circuit, Y_{13} and the Varicap, CR_{27}. When the notch control R_{173} is adjusted, the bias voltage on CR_{27} is varied. This changes the capacitance of the unit sufficiently to change the series resonance of Y_{13}, moving the resonance across the i.f. passband. The circuit is capable of up to 30-db. notch rejection.

the carrier-oscillator stage, carrier frequencies being provided for either upper or lower sideband, as desired. Output from the balanced modulator is directed to the 1650-kc. first i.f. amplifier and then through the 2.1-kc. lattice filter. From there, the signal is fed to the first transmitter mixer, a 7059 pentode section, along with a signal from the v.f.o. The signal is mixed with the v.f.o. frequency and converted to the 6-Mc. range. It is next amplified, and then in the second transmitter mixer it is combined with the output of one h.f. crystal oscillator for conversion to the desired amateur band. From there the signal is fed to the driver stage, a 12BY7A, amplified, and then to the final amplifier, a pair of 6HF5s.

The tank circuit for the 6HF5s is a conventional pi-network arrangement designed to work into a 50-ohm load. The manufacturer specifies that the tank circuit will handle nonreactive loads in the 40- to 70-ohm range.

For c.w., the transmitter second mixer and driver stages are keyed. Grid-block keying is used. Also keyed is a neon side-tone oscillator and amplifier. The side-tone signal is fed to the receiver audio stages and the speaker or headphones for monitoring purposes, and also to the second microphone-amplifier stage, the output of which operates the VOX circuits and antenna relay. The VOX circuit can be adjusted for hold-in periods for either phone or c.w. operation.

The rated power input of the transmitter is 400 watts p.e.p. for s.s.b. and 360 watts for c.w. In the metering setup, a single meter is used. When receiving, it is an S meter. On transmit, it can be used either to read relative r.f. output, a.a.l.c. (amplified automatic level control) voltage, or amplifier plate current.

Power Supplies

If you could obtain the transformers, it would be possible to build your own power supplies for the SR-400, since the power supply is a separate unit. The transceiver requires 750 volts d.c. at 500 ma., 280 volts d.c. at 100 ma., 12.6 volts a.c. at 5.0 amp., and a bias voltage of —80 to —135 volts. The PS-500A-AC supply designed for the SR-400 also includes a speaker.

The d.c.-to-d.c. converter for mobile operation (12.6 volts d.c. input) is designated the PS-500-DC. Output voltages and currents are

(*Continued on page 156*)

Hallicrafters SR-400 Transceiver

Height: 6½ inches.
Width: 15 inches.
Depth: 13 inches.
Weight: 18 pounds.
Price Class: $799.

PS-500A-AC Power Supply

Price Class: $119.

PS-500-DC Power Supply

Price Class: $149.

HA-20 V.F.O. and S.W.R. Bridge

Height: 7 inches.
Width: 10 inches.
Depth: 7 inches.
Manufacturer: The Hallicrafters Co., 600 Hicks Road, Rolling Meadows, Illinois 60008.

The ARRL Museum of Amateur Radio

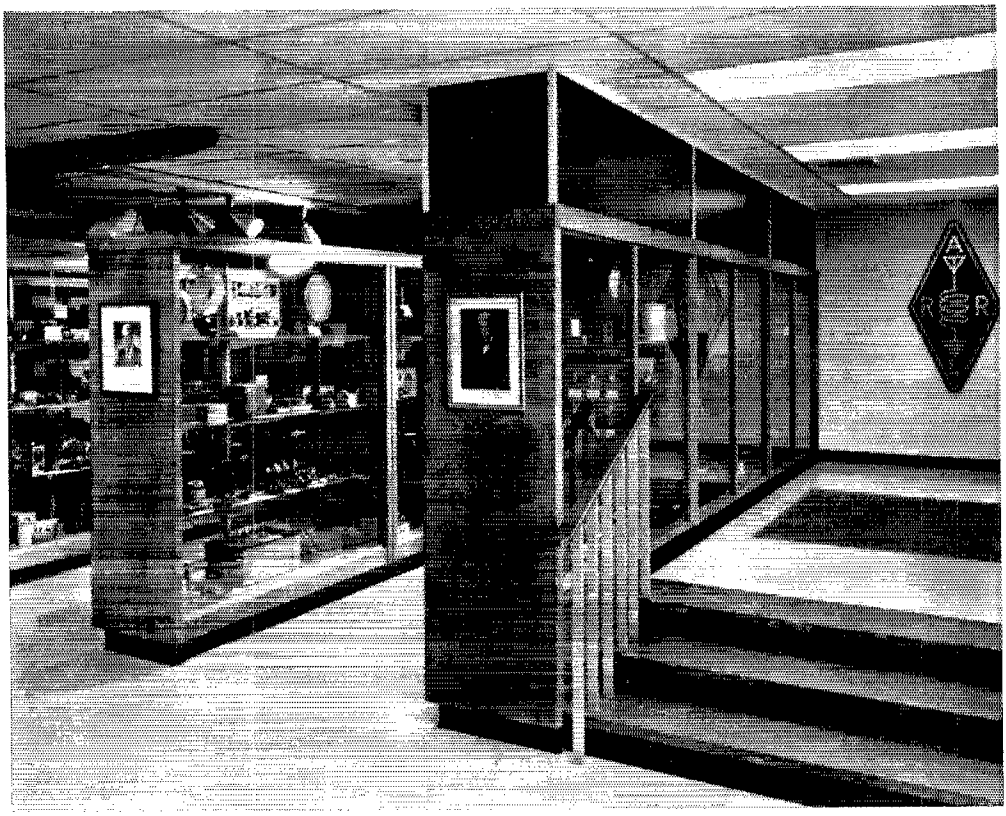
JUST when the Museum started is uncertain. Doubtless there were a few pieces of old gear around earlier, but in the late twenties and early thirties, there appear to have been enough items to put all in one place and call it a Museum. Some of the League employees brought in their choice pieces; cabinets were made and a permanent display was an accomplished fact.

. . . From then on, the number of items grew steadily and soon additional cabinets were installed, and wall space both on the main floor at 38 La Salle Road, W. Hartford, as well as on the second floor was pretty well filled. Descriptive cards with the name of the donor gave a running account and of course, one can read all the cards and get a very good idea of early amateur radio.

. . . In 1963, upon completion of our present building, the Museum was afforded considerable space in the lobby. Beautiful new cabinets having about 1400 sq. ft. of shelf area were installed and the Museum commenced to take on a mature aspect. With very few exceptions, all the pieces were refinished but not necessarily put in working order. About four hundred items have been restored. Some required as much as fifty hours work; others were just cleaned or dusted.

. . . The photo below shows the entrance to the lobby and some of the cabinets. On the ends are photographs of Clarence D. Tuska and Hiram Percy Maxim, co-founders of the ARRL. Most of the items in the first case are better viewed from the inside, since it has been found that most visitors pay little attention to this first cabinet upon first entering. It does contain the original copy of the *N.Y. Journal* describing the first wireless reception across the Atlantic by Marconi in 1901. This old newspaper is permanently preserved between heavy plastic sheet. There is some very interesting reading on the back of it, as well. Other items in the cabinet will be described in a later issue.

. . . Going to the second bay, at the left and referring also to the photo on the next page, there are four shelves displaying the collection of the late Edwin H. Armstrong. On the top shelf are some loud speakers, including a mutilated early cone speaker which figured prominently in a patent suit. The vertical panel shows a number of old tubes, including three DeForest round audions. More tubes are mounted on the rear of the panel. The second shelf shows the famous DeForest Audion box which was so popular with amateurs. It is serial number 41. To its right is one of the gems in our collection. It is a hand-made super-regenerative "squelch" oscillator, strictly breadboard and unrestored. It is almost certainly the first super-regen made by Armstrong. Other items on this shelf are an experi-



mental magnetic modulator, a Manhattan interstage transformer housed in their 1-inch spark-coil box and miscellaneous transformers and condensers.

. . . On the third shelf are a number of large variocouplers of several types including pancakes, single and in multiple. Also, there is a De Forest three-coil honeycoil mount and coils, a pair of Baldwin phones and some crystal detectors. The bottom shelf houses a partially completed superheterodyne receiver, believed to have been made by Armstrong and Houck as their No. 3. An E. I. Co. sliding plate variable condenser which figured in a Patent Office interference suit, a W. E. Type 3-A audio amplifier and a Chaffee quenched gap are at the lower right.

. . . The second bay features a number of receivers including an I.P. 501-A, Schnell's receiver used on his history-making trip on NRRL to Australia, a Paragon RA 10, Mignon, Sodion, Tuska 225, Pilot SuperWasp, Hallicrafter S-2, Hallicrafter HT 1 and a British shortwave receiver of 1918 calibrated down to 50 meters.

. . . The shelf space is pretty well used up at present without serious crowding, but room can always be made for choice items. The League favors material which is truly amateur, especially if described in *QST*. Large home-built transmitters cannot be accommodated at present.

. . . This series will continue in an early issue.

W1AW.1, Curator

Announcing the 35th ARRL November Sweepstakes

You can always tell when those mid-November weekends have arrived: football dominates the TV screen—and "CQ SS" dominates the ham-bands. Our tremendously popular Sweepstakes is back again for the 35th time; and, to celebrate the joyous event, we've devised new, improved 8½x11 log-sheets and a separate summary-sheet. Samples can be found on this page.

The *basic* SS rules are unchanged from last year, but please note carefully the following:

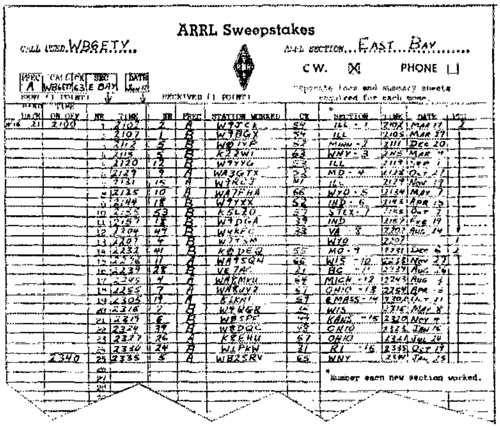
> **1.25 low-power multiplier for BOTH modes**
>
> **New precedences (A and B) based on power input**
>
> **Minimum criteria for section award**
>
> ***Dupe-check sheets (Op Aid 6 or similar)* REQUIRED with log of 200 QSOs or more**
>
> **Incomplete entries processed as check-logs**

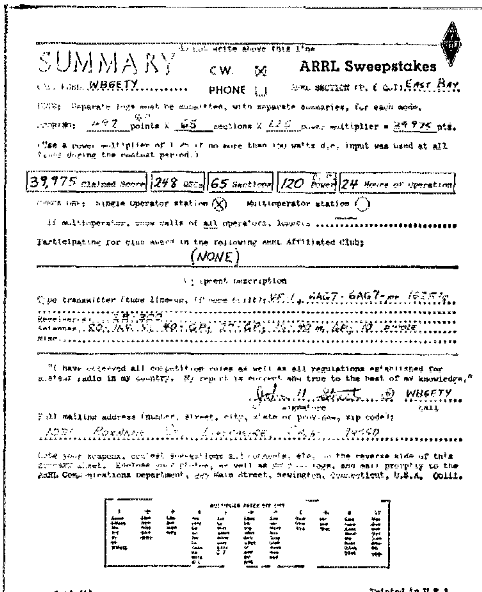
These changes have been prompted by a combination of popular sentiment from the field, a desire to endow the section award with more meaning, and the necessity of cutting down on excessive Contest-Branch paperwork so that we can spend the time more productively on crosschecking logs and preparing the contest writeup for *QST*. We think the changes will make for a better SS all around.

Otherwise, you'll observe that the format is familiar. You may operate 24 hours out of the total 30; your times-off must encompass at least 30 minutes; ARRL-affiliated clubs are eligible to compete for that handsome coco-bolo gavel.

Read the rules thoroughly, then send for our "SS Package": log-sheets, summary-sheet, Op Aid 6. (Be sure to specify approximately *how many* log-sheets you'll need.) **Your entry (and, for clubs, the secretary's letter) must be postmarked no later than December 15, 1968.**

Minus one month—and *counting* . . .





These new log-sheets and summary sheets are now available without charge from your ARRL Headquarters. (Ask for Op. Aid 6, too.)

EXPLANATION OF "SS" CONTEST EXCHANGES

	Nr	*Precedence*	*Call*	*CK*	*Place*	*Time*	*Date*
Exchanges	Consecutive Serial Number	Power input less than 150 watts d.c.	Send your station call	CK (Last two digits of year first licensed)	Your ARRL section	Send GMT time of transmitting	Send month and day of birth (not year)
Sample	NR 1	A	WA3FHB	65	MDC	2101	Nov. 15

Rules

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

2) *Time:* All contacts must be made during the contest period indicated elsewhere in this announcement and between amateurs in (or officially attached to) the 74 sections. Yukon-N.W.T. (VE8) counts as a separate multiplier, for a possible total of 75 multipliers. Time spent in listening counts as operating time. No more than 24 hours of operation are permitted during the 30-hour period. "Off" periods may not be less than one half-hour at a time. Times on and off must be entered in your log.

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

4) *Scoring:* Each preamble sent and acknowledged counts one point. Each preamble received counts one point. Only two points can be earned by contacting any one station, regardless of the frequency band. The total number of ARRL sections (plus VE8) worked during the contest is the "section multiplier." It is not necessary for preambles to be sent both ways before a contact may count, but one must be received, or sent and acknowledged, before credit is claimed for either point(s) or multiplier. Apply a "power multiplier" of 1.25, **regardless of mode,** if the d.c. input to the transmitter output stage is 150 watts or less at all times during contest operation. If your power is 150 watts or less, send "A" as your precedence; otherwise, send "B."

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

5) *Reporting:* Contest forms (log-sheets, summary-sheets, Operating Aid 6) are available free from ARRL Hq., or you may use forms of your own design provided they follow the indicated format. Every competing entry claiming 200 or more QSOs must have cross-check sheets (Op Aid 6 or similar) attached. **ANY LOG OMITTING TIMES ON AND OFF, OR OMITTING CROSS-CHECK SHEETS (WHEN REQUIRED), OR OMITTING A SUMMARY-SHEET OR ANY INFORMATION REQUESTED THEREIN (see sample), WILL NOT BE CONSIDERED FOR COMPETITIVE QST LISTINGS OR AWARDS.** Such logs will be classified as "check-logs" and processed accordingly. Entries must be postmarked no later than December 15, 1968, to insure eligibility for *QST* listings and awards. All entries become the property of ARRL, and none can be returned.

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

A single-operator station is one manned by an individual amateur who receives no assistance from other persons during the contest periods. He may not have assistance in any manner in keeping the station log and records, or in spotting stations during a contest period. The operation of two or more transmitters simultaneously, whether by single-operator or multioperator entrants, is not allowed.

A transmitter used to contact one or more stations may not subsequently be used under any other call during the contest period (with the exception of family stations where more than one call is assigned to one location by FCC/DOT).

6) *Awards:* Certificates will be awarded to the highest-scoring c.w. entrant and to the highest-scoring phone entrant in each ARRL section, provided that *either* (1) there are at least three single-operator competing entrants from that section, *or* (2) the top single-operator score is 10,000 points or more. Similarly, a certificate will be awarded to the highest-scoring Novice or Technician licensee in a section if (1) there are at least three single-operator competing entrants of that license class in that section, or (2) if, in the opinion of the Awards Committee, the entrant displayed exceptional effort. Multiple-operator entries, regardless of license class of operators, are not eligible for certificate awards and will be listed separately in the final results in *QST*.

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

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

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

CONTEST PERIODS

Starts		*Ends*
Saturday, Nov. 9 2100 GMT	PHONE	Monday, Nov. 11 0300 GMT
Saturday, Nov. 16 2100 GMT	C.W.	Monday, Nov. 18 0300 GMT

Message Credit

Put all that preamble-exchange experience to work and earn 1000 extra points by the following:

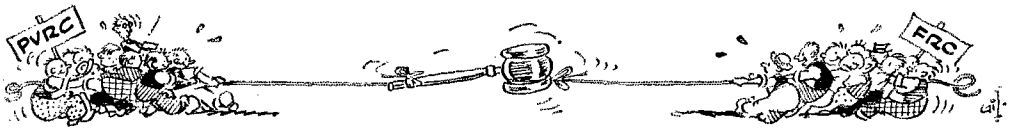
1. Within 5 days following the end of each of the SS weekends, check into a net at local or section level [1] and send a message to your SCM (p. 6, *QST*). SCMs may send their message to ARRL Headquarters. The message must be in proper form.[2] To earn this credit for your phone and your c.w. entry you must originate such a message following the corresponding SS periods.
2. An example of a message in proper form[2] appeared in the Operating Aid 9A [3] enclosure in August 1965 *QST*. The message text (in not more than 20 words) should report claimed contacts, sections, mode, power and claimed score. An exact copy (showing station receipting for the radiogram and time-date sent) *must* be **attached** to your SS entry for any credit.
3. It's all or nothing. If all the rules are complied with to the letter, the procedure will net you a stock of 1000 points.
4. The bonus points will be added to your score at Headquarters. QST

[1] If there's difficulty reaching a traffic net in your section, it may be sent to a netter in the region.

[2] Time Filed and Handling Instructions are *optional*, i.e. not a "requirement" for crediting the message started, but all other message parts as shown in 9A are necessary.

[3] Copies available without charge from ARRL Hq., 225 Main St., Newington, Conn. 06111.

34th ARRL DX



C.W. COMPETITION Phone

February 3-4 and 17-18, March 2-3 and 16-17, 1968

REPORTED BY BOB HILL,* W1ARR

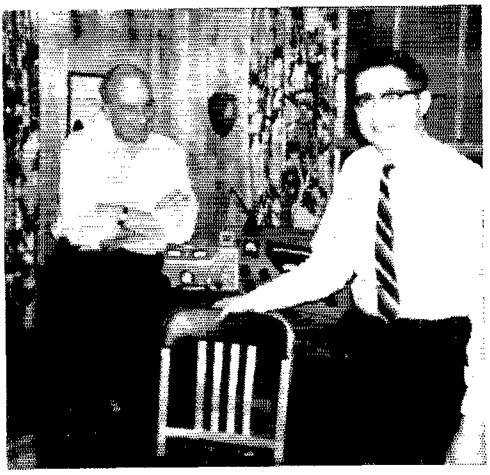
JUST to confirm the validity of that ancient Aristotelian axiom "What goes up must come down" (except for the cost of living, of course), we hereby restore gravity to its rightful place in the scheme of things by offering Exhibit A: the 1968 DX Competition. Dizzy from soaring to the rapturous record heights of 2427 logs in '67, the Hq. Contest Branch feels relatively earthbound after a mere 2225 from this year's Test. Yet even a near-10-percent dive in altitude still leaves us high enough so that we have to fumble for the oxygen masks. Decrease and all, it is nevertheless the all-time *second-highest* number of entries, comfortably exceeding 1959's figure of just under 2000. Any more "flops" like this one and we may need to vanish into a complete vacuum somewhere for a couple of weeks.

Scores, in general, were also also down. We're not really sure why, though the demise of ten meters the second c.w. weekend was one noticeable factor. Even more puzzling was the drop in number of countries reporting: only 116 this year *vs.* 135 for the previous affair.

This was our second year of experience with the new format (no quotas; states and provinces as multipliers for DX; KH6 and KL7 counting as DX), and nearly everyone considers it a vast improvement over previous systems. There was no decrease in one category: the number of comments to the effect that the ARRL DX Competition is still the King of Contests! There were scattered complaints that the Test is too long and should be reduced to one weekend per mode; a few QRPers wistfully longed for a low-power multiplier—but the vast majority now seems content. So don't expect any startling changes for the 1969 fracas (except in your station, of course, which you're going to improve so that you can beat that so-and-so in the next county).

Your reporter gratefully acknowledges the help of K1ZND and W1DGL, who patiently plowed through stacks and stacks of logs and typed most of the scores. Processing this contest is no one-man job.

* Assistant Communications Manager, ARRL



Two merry gentlemen are **W1AX** *(left)* and **K1DIR** *(right)*, as they reminisce about their exploits in the Test. Bob and Roger ran one-two in EMass, pouring 5½ million points into 128 Contest Club coffers. (Or it could be that they're thinking about *next* year . . .)

Clubs

Twenty-seven ARRL-affiliated clubs rang up 133 million points this year, compared to 25 clubs and 147 million points the year before. Faithful readers will not be astonished to learn that the **Potomac Valley Radio Club** juggernaut continues to flatten everything in its path. (We'd tell you who topped PVRC both modes, but we swore this would be one writeup in which W4KFC wouldn't get mentioned.) What a bunch of Gavel Gerties! Perennial rival **Frankford Radio Club** had to settle for the Avis spot again in 1968, with W3WJD heading the gang on both c.w. and phone. The **Southern California DX Club** again was third, and again was chased hard by that enemy to the north, the **Northern California DX Club.** With only ten entrants (but *what* ten entrants!), the **128 Contest Club** ground out almost seven million points and took the 5th niche. New York's **Order of Boiled Owls** flew out of the cauldron and roosted in 6th, not

"The ecstasy and the the agony — with the latter predominant!" — W4KFC

Two famous G-men pose for a snap. That's **G2RO** on the left; Bob had no trouble looking happy after rolling up Europe's second-high c.w. score after a tough battle with G4CP. Al, **G3FXB,** took third place; no doubt you've worked him on 40 meters at one time or another.

far behind. Organized after two of the four weekends were already over, the Connecticut-West-Mass **Murphy's Marauders** aggregation stormed to a 7th-place finish—what a demonstration of enthusiasm! what a formidable foe for future Tests! (What a coincidence that your reporter started the club!) The **Northern Illinois DX Assn.** needed just 13 entries to go over the 4-meg mark and capture 8th position. The new **Laurentian DX Club** of Quebec showed that it must be taken very seriously in years to come. And the **Connecticut Wireless Assn.** rounds out the top ten.

It's always interesting, and often revealing, to break down the club scores by mode—not many clubs can boast of having equal versatility on both phone and c.w. Here's how they stack up when reckoned in this manner:

C.W.	*Position*	PHONE
Potomac Valley RC	1	Potomac Valley RC
Frankford RC	2	So. Calif. DX Club
So. Calif. DX Club	3	Frankford RC
No. Calif. DX Club	4	No. Calif. DX Club
Order of Boiled Owls	5	128 Contest Club
128 Contest Club	6	No. Illinois DX Assn.
Conn. Wireless Assn.	7	Laurentian DX Club
Murphy's Marauders	8	Murphy's Marauders
Niagara Frontier DX Assn.	9	Central Mich. ARC
Laurentian DX Club	10	Golden Triangle DX Club

Disqualifications

The calls listed in this paragraph are all deemed ineligible for score listings or awards. In each case, disqualification was under Contest Rule #14 in view of non-adherence to FCC rules as reported by at least two accredited Official Observers, or by a single FCC citation or advisory notice. Such violations as out-of-band operation (carrier or sidebands), spurious emissions, etc., were the basis for these disqualifications. *C.w.*: W1BPW, W2CP, W2CGL, W2WZ, W3YUW (K3s FGO FPY, W3s BGN YUW, oprs.), WA3ATX/3, WA5LUM, K6MIG, W6SRF, W9LKJ. *Phone*: WB2YPM, K3AIG, K3HTZ, K3NXD, W3BGN, W3EVW (W3EVW, WA3-EPB, oprs.), W3HHK (WB2APG, W3HHK, oprs.), K4OSE (K4ZLE, WA6KHA, W7ZUX, WA0CWA, oprs.), K4YYL, W4BVV (W1DYE, K3NPV, W3BQV, W4BVV, oprs.), WA4IKU, W5KTW, K6NA, W6EWN/3, W6UUT (DL7JY, W6BXL, WB6s AWS FID, oprs.), WB6MPP, K7ADD/3, WA7FAB (KL7FSJ, W7BDR, WA7FAB, *oprs.*), K8CGD, K8HZU, W8UM (WB2FTT, W8CQN, WA8s HHO LYF RQT ROJ, oprs.), W8-WPC, WA8OSE, WA8PWZ, WØKHL (WØs KHL LDB, oprs.)

AFFILIATED CLUB SCORES

	Aggregate	*Entries*	*C.W. Winner*	*Phone Winner*
Potomac Valley Radio Club	30,256,682	57	W1KFC	W1KFC
Frankford Radio Club	24,520,145	78	W3WJD	W3WJD
Southern California DX Club	16,825,739	55	K6NA	W6RR
Northern California DX Club	13,699,205	65	K6OIJ (W6BHY, opr.)	W6WX
128 Contest Club (Mass.)	6,897,164	10	K1DIR	K1DIR
Order of Boiled Owls of New York	6,440,644	16	WB2CKS	W2CP
Murphy's Marauders (Conn.)	4,118,477	48	WA1DJG	WA1DJG
Northern Illinois DX Assn.	4,083,164	13	W9QQN	W9BZW
Laurentian DX Club	3,549,435	13	VE2YU	VE2NY
Connecticut Wireless Assn.	3,379,484	11	W1BGD/2	W1BIH
Niagara Frontier DX Assn. (N.Y.)	2,954,163	12	K2KNV	K2DJD
Central Michigan Amateur Radio Club	2,808,625	10	W8SH (K1ZND, opr.)	W8SH (K1ZND, opr.)
Golden Triangle DX Club (Fla.)	2,438,162	5	.....	W4QBK
South Jersey Radio Assn.	2,174,361	33	W2GGT	W2CME
Miami Valley Amateur Radio Contest Society (Ohio)	1,952,401	10	W8ZJM	W8LXU
West Park Radiops (Ohio)	1,649,082	22	K8CFH	K8CFH
Arine Amateur Radio Club (Md.)	1,149,921	5	.....	W3BQN
Ohio Valley Amateur Radio Assn.	1,094,073	11	W8BVF	W8HBR
Suffolk County Radio Club (N.Y.)	921,567	4	W2ZV	WB2FON
Order of Boiled Owls of Ohio	893,536	4	K8EHU	.....
Grumman Amateur Radio Club (N.Y.)	656,743	6	W2DKM	.....
Westchester Amateur Radio Assn. (N.Y.)	512,571	4	.....	WB2ZMK
Delta Radio Club (Penn.)	181,311	4	.....	WA5RCM
Four Lakes Amateur Radio Club (Wis.)	157,701	4	W9SCZ	.....
Springfield Amateur Radio Club (Ohio)	105,672	7	WA8ZGC	W8OG
Oak Park Amateur Radio Club (Mich.)	63,959	4	.....	W8DQL
Irving Amateur Radio Club (Tex.)	38,340	3	.....	W5TTY

TOP TEN

Single Operator

C.W.				Phone			
W/VE		*DX*		*W/VE*		*DX*	
W9WNV/2	1,833,352	ZD8J	3,277,116	K1DIR	1,145,715	KH6IJ	3,799,962
W3WJD	1,526,220	HK3RQ	3,230,166	W7ESK	1,413,666	HK3RQ	3,755,000
K1DIR	1,477,350	VP2VL	3,084,300	W6RR	1,374,078	YS1XEE	2,721,888
W4KFC	1,420,650	KH6IJ	3,051,270	W3WJD	1,326,150	CE6EZ	2,451,456
W1AX	1,396,850	PY2SO	2,809,131	W4QBK	1,125,884	EA3JE	2,052,819
W2VJN	1,395,240	HK3BAE	2,638,725	W1AX	1,125,408	8R1G	2,050,428
W3GM	1,350,734	PY2BGL	2,603,259	W8SH	1,079,154	XE1AE	2,039,688
W3MVB	1,254,176	PZ1AH	2,074,698	W9AQW	979,209	DJ6QT	1,872,000
K4BAI	1,156,872	VK2EO	1,962,900	W5KTR	946,158	KH6BZF	1,651,209
W9AQW	1,091,232	GI3OQR	1,746,528	K8YBU	933,660	PY7AKQ	1,640,520

Manners & Morals

(A Play in Three Acts and Too Many Performances)

As the curtain rises, the Chorus intones: "Nothing in life is certain except death and taxes —and plenty of Rotten Operating in the DX Contest. Excessive duplicates; calling DX stations in pileups without knowing their calls; barging in on call-area CQs when another call area has been specified; improper signing (or no signing at all); calling banned countries . . . Old soldiers just fade away; old habits apparently don't."

Act I: The Persistence of (Poor) Memory; or, Unpack Your Troubles From That Old Duplikit Bag. In this Act, we proffer the suggestion that, while it is laudable to renew old friendships, there *is* a limit. Here is a sample of the dialogue: "I thought *QST* was quite clear about avoiding duplicates and was sure surprised when so many fellows couldn't keep track of their VQ9s! Words cannot fully express my venomous thoughts over those duplicates—snarl!"—*VQ9B*. How true, but words are the only vehicle we have right now. Let's tune in on a few from *ZD8J*, who, as might be expected, comes through loud and clear: "Clearing my log of duplicates this year required between 20 and 30 hours. In another contest, if I am again in the DX position, and not sufficiently cooled off over all this, I plan to delete *completely* from my log all stations having duplicate contacts. Instead, they will be specially listed as stations with which I was definitely *not* in contact: no credit allowable." Hw cpy, OMs? And *KL7IR*, tongue lodged firmly in cheek, offers words of "praise": "To the lads that I worked twice (and sometimes thrice) on each band, I can only say 'thanks.' But to the rest of the gang that I worked only once on each band, I can only marvel. They must have access to UNIVAC for instant elimination of duplicate Test contacts!" In the former category are those who think Op Aid 6 is some kind of soft drink. . . . "I still burn at the thought of jerks who jump first and find out who they've worked after I've logged the (usually) duplicate," fumes *K2SIL/KH6* (now KH6GNE). But wait! *W1s BDI BGD1S* and *W5BUK*, to mention a few, have just rushed onstage carrying a sword that cuts both ways, and protesting, "Why don't some of these DX stations ever sign their calls?" For sure that's one reason for much of the inadvertent reworking, no? At any rate, the fences on both sides could use a little mending.

Act II: The Identity Crisis; or, Who Was That Masked Man Anyway? We present a sensible soliloquy by *W9GFF*: "There shouldn't be a very long list of acceptable W/K scores to print in *QST* if failure to observe regulations causes disqualifications. 97.87 is a sadly neglected or misunderstood regulation. Almost no one transmitted the other guy's call even once, and very rare to find anyone signing even his own call at the end of QSO as the new, simplified(?) regs require." . . . "Super break-in" is *ZD8J's* wry appellation for this ploy of dubious legality. Man, these guys are as elusive as Howard Hughes.

Act III: Forbidden Fruit; or, Strike Out the Banned. Another entrant from Nine-Land has the floor: "I heard stations calling HS and XV5. Remind the boys that the multiplier is band-countries, not banned-countries!" Yes indeed, and three of the boys (1) called K8NHW/XV5, (2) worked him, and (3) blithely put him in their Test logs. Ecech!

Epilogue: Brickbats and Bouquets; or, Virtue, Though Battered and Bleeding, Is Triumphant, Sort Of. *WA9NSR* complains that too many WB6s were S9 plus 20—20 kHz., that is. . . . *WA1IGF, WA4IKU, W5BUK, K8OUA*, and a cast of thousands, all wonder why W/VE stations persistently bray CQ TEST, thereby effectively clobbering four AC5s, three 4S7s, two 9M8s, one VR6, and a partridge in a pear-tree. . . . While most of the participants agreed that the call-area CQs by DX work nicely on phone, *WØBWJ* stipulates that it ain't so hot if the DX station absent-mindedly skips a district. And *WA3EFH* vents a bit of wrath on the ones who specify the district they want, then proceed to work anybody that calls, regardless of whether or not they happen to be in that district. . . . South of the border, down South America way, a couple of the top scorers blended pats on the back with pats lower and harder: "Activity showed to be improved this year, with the same good ops as ever and a few not so good—as the W2 who gave us 599 on 80, then asked five times repetition of serial number. Or W4—, who need a memory tonic, for he repeated four times his QSO on 20."—*LU8DLK, opr. at LU8DQ*. . . . "Operating practices were superb from *almost* all the participants. The 'almost' means a few guys still insisting, in the middle of the contest, in passing their names, QTHs, power, kind of transmitter and receiver, mikes, aerials, and almost the brand and color of their refrigerators and typewriters. On 10 meters a 9-plus-40 very persistent fellow, after the few words contest QSO, insisted more than six consecutive times, when I said QRZ, in asking my name and QTH. With such a big signal the QRM was tremendous and I couldn't copy anybody, so I finally came back and told him my QTH is OK in the *Callbook* and my name is NABUCODONOSOR. He came back very fast and begged, 'Please, how do you spell it?' Of course, I moved to 15 meters."—*HK3RQ*.

Our grim drama has a happy ending, however. *W5QHD, opr. at ET3USA*, "would like to compliment the Stateside boys on their courteous operation." . . "Was fun to hear 7P8AR and KH6BZF handle the pileups—they blended a little humor and common sense into what otherwise would have turned into nasty fights."—*K1GUD*. . . . "Thanks to W6QFU, who sent me an airmail *letter* apologizing for a duplicate QSO." —*ZL1HW*. And so, as the curtain falls and the setting sun sinks slowly into the east, we can hear only a confused babble of voices angrily muttering, "The DX Test is *fun!* The DX Test is *fun!!* The DX Test is FUN!!!" . . . *EXEUNT OMINES.*

—···—

Doodles

Scramble Two (or More): *5H3KJ* wound up in several dozen c.w. logs as "HH3KJ." Anybody seen a whole batch of missing dits? . . . *HB9UB's* distinctive Swiss swing resulted in many loggings of "VS9UB" and, even more improbably, "4S9UB." One W8 worked *two* 4S9s. . . . Phone men were not exempt from the alphabet-soup syndrome, either: "CR8RA" appeared more than once, while 8P6 QSOs seemed scarcer than "HP6s" and "XP6s." Our favorite comment, even though it left us totally bewildered, came from a W3: "My biggest thrill was working XP6AY *long-path!*" . . . Sore-fingered but still smiling, *PY2SO* admits: "Among the exotic calls heard during the last hours of each c.w. weekend, JY2SO, PK2SO and WY2SO were all me." . . . *KOUJN* strongly suspects that the "OU1JA" he worked on phone may not have been entirely genuine.

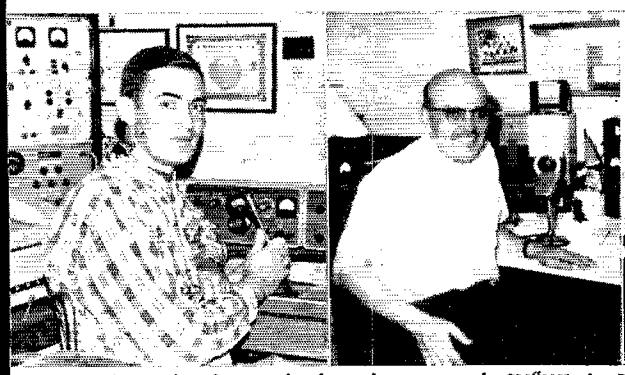
A superb score and a flawlessly-typed log were the contributions of CR6CK. With this modest but attractive layout, Tony sent code to over 2100 W/VE contesters; his 1.1 meg was a solid top for mainland Africa, second only to ZD8J for plaque honors.

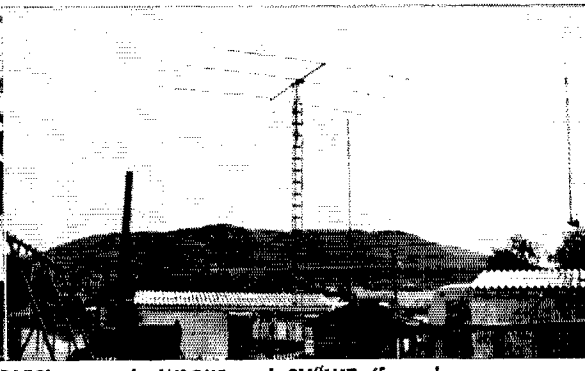
The World Below 14 MHz.: "Six new countries on 40 in this contest make 182 on 7-MHz. phone: CR4BC, DU1FH, SVØWL, VK9GN, VU2MSK, 7P8AR."—*K2GXI*. . . . "40-meter phone U.S. were terrific on longpath."—*VU2MSK*. . . . "5W1AT was my #141 on 3.5 MHz. I'm still stuck at 245 countries on 7 MHz.," announced *W3MFW*, for whom we can work up only limited sympathy. Russ uses a 3-element switched array on 80 and a 2-element whirly on 40. . . . "Heard many W1s and W3s on 3.8-plus during second weekend, but unfortunately I did not break through despite much calling on 3.799. I guess I picked a bad channel."—*ZD7KH*. . . . "This year KAs were authorized on 80 meters for the first time and this was a great help in the multiplier department. All my phone QSOs with the East Coast were first-time contacts between there and Japan. The highlight of the phone portion was working Sam, W1FZJ/KP4, even though it didn't count for the contest."—*KA7AB* (now back at K1KTH). . . . "Three new ones on 80: 5W1AT, W6GEB/KS4, KG6-ALV. Missed VS6DD, the one I needed most. Best 80-meter sigs were JA1BRK, VQ9JW/P, G3LP, OA4PF, FP8DZ and VK2EO for contest WAC."—*W1SWX*. . . . "I did not hear one W/VE signal on 1.8 MHz., although I QSOd JA2CLI and JA4IO for their first VK 'top-band'."—*VK5KO*. "We beg the pardon of W9YB, W4-BVV, and W6RW, but their sigs failed to reach Buenos Aires on 160, being the band very noisy."—*LU8DQ*.

Triumphs and Tragedies: With ten meters completely dead between the East Coast and Europe the second c.w. weekend, W6s got an unexpected dividend: a fantastic opening to Eu between 1700-1900Z on Sunday. . . . "I am very sorry that I was just *one* QSO short of one million points."—*5H3KJ*. . . . "20M s.s.b. netted 102 countries in the first 24 hours." *W3ZKH/3*. . . . "Why do the G/VK/ZL boys wait till the contest to comment on my call?"—*WA9RAT*. . . . "Thought the world ended at W6 for a long time but eventually got through the W6 curtain."—*VK5FH*. . . . "Many CQs were needed to entice the DX to tune above 21.1 MHz."—*WN1ION*. . . . "Sure needed YO for my broom! (I drank some later.)"—*VR3DV*. . . . Then you could have had a call like *KH6GIZ/W6* to sign. . . . "Yahoo! The one-million goal is reached!"—*UA3KBO*. . . . "I operated from an apartment house which I own and had lots of interference from my tenants paying rent, etc.". *WØACT*. What a nuisance all those people shoving all that money at you. . . . "We probably had the youngest operator. Our logger, WNØTSI, is only ten years old."—*WAØEMS, opr. at KØBXI*. Don't the child-labor laws cover this sort of thing? . . . "A 10-minute ragchew with PX1PA was required to get his power."—*W9BGX*. . . . "I am receiving many QSL cards from the contest QSOs and they are leaving off the 'G' in HP1XHG, so they automatically go into the circular file."—*HP1XHG*. . . . Much confusion during the second weekends as Stateside entrants with their new twenty-buck two-letter calls had to struggle to avoid duplicate QSOs with DX stations they'd worked the previous weekend under the old calls. . . . "Noticed activity to be down considerably from last year."—*W3TMZ*. . . . "Once again another vy FB contest bites the dust. Several of our ops also bit quite a lot of dust, fighting with the antennas in an 80-m.p.h. wind during the second leg."—*G3SXZ, opr. at G6VC*. . . . "Two weekends in contest and two weekends making a clear log."—*XE2AAG*. . . . "My low power, low antenna and low operating skill didn't hinder me at all—I still did terrible."—*WA7JCB*. . . . "It's necessary to be a Hercules to do the contest, hi."—*CT1AMW*. Or a *PZ1AH*—check out Andre's last name in the *Callbook*. . . . "So *vy* tired." *JA1CG*. . . . "Sure is tough trying to work into W/VE with an American accent, low power and poorly-placed antennas. To make it worse, many W/VE stations thought FO was a pirate call."—*FO0A*. . . . "Four out of seven straight weekends is just too much to ask the XYL to tolerate! The first weekend she was very pleasant, the second weekend she made facetious remarks about my steadfastness to get a good score, by the third weekend the flavor of her comments was sarcastic; when the fourth weekend arrived, her sarcastic attitude changed to downright vicious anger!" *-K4WUM*. . . . "Had to QRT during an 80-contact-an-hour session on 10 meters the first weekend when the next-door neighbor banged on the door, pushed past my pregnant wife almost knocking her down, stomped into the radio shack, tore the earphones off my head and flung them on the floor, announced I was interfering with *Daktari* on his TV, and stomped out before I had a chance to get out of my chair. The XYL got hysterical and would not let me continue despite the fact that our own TV in the next room was not affected in the slightest!"—*LAØAD*.

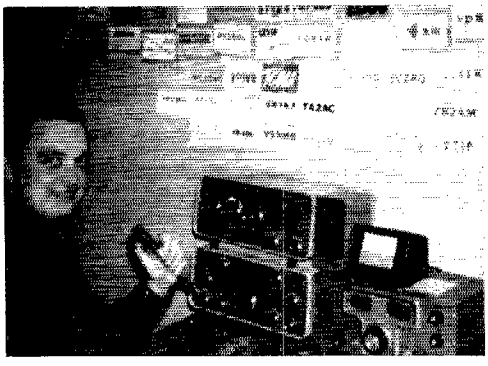
Californiornia: "First in war, first in peace, and last in Santa Clara Valley?"—*WA6QQI*. Nope, Doug, not even close to last, but it was a good line anyway. . . .

Knocking them off faster than a speeding bullet—a 75-watt Ranger signal more powerful than a locomotive—able to leap huge pileups in a single bound—it was PZ1AH gathering in more than 2 million points via the code route. Andre knocked off 6-band exchanges with WA3EPT, W3MFW, W3TMZ and W4BVV.

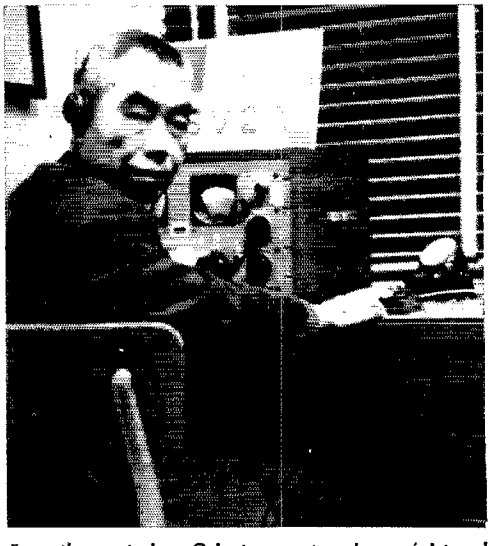




A couple of SVs who have been around: **SVØWL** (ex-DL5CL, currently W3CJK) and **SVØWP** (formerly W2EYQ, KH6HAA, K4HAA, now W6CMH), both hotly pursued by eager W/VEs in the Test. Some of the Cretan Mediterrain at SVØWL is visible at right. SVØWP thought the contest was terrific except for marginal 10-meter conditions.



Shown here holding a microphone, **VO1HH** keyed his way to nearly 300 thou in the c.w. portion of the Test. Max advocates one weekend per mode, says it would increase the number of DXpeditions.



From the mysterious Orient, operators James (pictured here) and Tim of **BV2A** inscrutably doled out a 20-meter Taiwan multiplier to 53 panting W/VE combatants and softly, enigmatically padded away . . .

"Durocher was right: nice guys never win," says W6KJS, who won. . . . Some of the NCDXC boys still resent the fact that use of a spotting-net puts the user in the multioperator category. Come on, fellas: what's the difference between having a friend feeding you multiplier information over the air and feeding you multiplier information from a second receiver right in your shack? . . . There's QRM and there's QRM, 'twould seem. San Francisco's K6KQN found his hearing hindered by firecrackers going off in the street during Chinese New Year.

Barbed Wireless: Candidates are now being considered for the Contest Branch's "Schlump-of-the-Month Club." To be nominated for this award, you must have committed one or more of the following atrocities in connection with your DX Test log: (1) Pounded no less than 38 staples into the log, stickling them in randomly so that we would have the maximum amount of trouble removing them and reassembling the log after inspecting it. Bonus points awarded if you inserted at least one staple in such a way that it severely gouged a thumb or other digital extremity of the log-checker. (2) Entered your section as N.Y., Cal., Fla., Tex., if you happened to live in one of those states. This enabled us to spend many happy hours looking you up in the Section Finder so that we could list your score under the proper section heading. (3) Sent us a card or radiogram—preferably at the very last minute before the start of the contest—asking for "some" (*sic*) log-sheets (being careful not in any way to indicate how many sheets you wanted or how many QSOs you expected to make)—then (and this is important) scrawling a sarcastic note on your log something like this: "Thanks a lot for the three log-sheets—they were only 25 less than I needed!" This gives us a warm feeling, because obviously you credit us with extra-sensory perception; we should have *known* how many you were going to use. . . . Okay, now we feel better. Guess what we're trying to say is this: (1) Go easy on the staples—one or two is perfectly adequate. (2) Put your *section*, not your state, on the log-sheets. (3) Don't wait till the last minute to request log-sheets—and please specify how many you want. It's 100 two-ways per sheet (50 to a side).

Stuff Left Over: In the Who-Was-Who Dep't., you might have run across such ex-DX as W4SYL (ex-KP4AOO), VE7YB (ex-DL2DMD), W4SKW (ex-KZ5-GN), WA6BOU (ex-VP5AR/VQ9AR), W9EXE (ex-VR5AR), and W6CYZ (ex-KP4UB). . . . Another ex is Fred, formerly HI8XAL, who, as HI8AL, is now QRL trying to unThai that knotty ITU ban. . . . "Everyone wanted to know why the tour letters: in Mexico, 'P' is used for portable," *WB6KGJ, opr. at XE2-PTBC*. . . . What better way to end things than with this little note from OT *W2NO*: "I wonder how many contestants remember the first ARRL DX Contest—little 'canned' messages, etc.? Like the world itself, this contest was more hectic than the first—but, like the world, still a lot of fun."

Thirty-Fourth ARRL

International DX Competition

W/VE scores are listed by ARRL division and section; DX scores are listed by continent and country-prefix. Multioperator scores follow single-operator scores within each section- or country-grouping.

Awards: The operator of the first-listed *single-operator* station in each section or country is the winner for that area and receives a certificate award. In a section or country from which at least three valid *multioperator* entries were received, the top-scoring station in that category receives a certificate award. (Awards are scheduled for October 15 mailing.) The top-scoring single-operator DX entrant for each *continent*, each mode, receives an engraved plaque. *Affiliated-club* awards are shown elsewhere in this article.

Scores: In the listing to follow, read (from left to right): *call* of entrant, final *score*, *multiplier* (total countries per band for W/VE; total states and Canadian call-areas per band for DX), *contacts*, approximate d.c. *power* input (*A* represents power up to and including 150 watts; *B*, over 150 and up to and including 500; *C*, over 500), total *time* of operation (to the nearest hour). Example: W3DRD 166,668-172-323- C-38 indicates final score 166,668, multiplier 172, contacts 323, power over 500 watts, operating time 38 hours.

A single *asterisk* following the call of a multioperator entry denotes the use of a spotting-net. A double asterisk denotes an ARRL Hq. staff member, ineligible for an award.

C. W. SCORES

ATLANTIC DIVISION

Delaware

W3DRD 166,668-172-323- C-38
W3TGF 70,092- 99-236- C-28
W3IYE (W3s IYE TGF)
660,528-278-792- C-70

Eastern Pennsylvania

W3WJD
1,526,220-366-1391- C-81
W3GM 1,350,734-343-1319- C-80
W3MFW
1,047,812-323-1082-AC-78
W3NOH 757,857-281-899- C-44
W3MWC 726,726-286-847- C-64
W3WPG 715,626-249-958- C-
W3HHK 671,370-278-805- C-40
K3HTZ 586,332-267-732- C-78
W3HP 342,540-220-519- C-51
WB2MZJ/3
301,938-182-553- B-64
W3DBX 299,637-197-507- C-71
W3GHM 242,004-172-469- C-38
K3AIG 227,010-161-470- C-40
W3GRS 221,880-215-344- C-20
W3ISE 213,921-171-417- B-40
W3CGS 204,435-177-385- C-38
K3EUR 195,888-154-424- A-65
W3KV 180,960-145-416- C-40
W3KVW 175,794-166-353- C-
W3ALB 162,855-165-329- C-26
W3KDF 160,272-159-336- C-40
K3BNS 154,800-129-404- C-50
W3QOR 152,760-134-380- A-28
W3BYX 130,824-138-316- C-
W3EQA 121,992-138-299- C-23
W3EOP 112,860-132-285- C-33
W3INH 95,040-120-264- C-15
W3CAA 82,497-107-257- C-20
W3PN 78,207-131-199- C-
W3QLW 39,096- 72-181- B-20
W3JET 39,060- 84-155- A-41
WA3FFR 34,611- 83-139- A-37
W3EAN 34,389- 69-191- C-14
K3MNT 33,136- 68-124- C-17
W3EER 22,311- 67-111- A-
W3GHD 16,920- 60- 94- C-
K3RFB 14,994- 51- 98- B-28
WA3GUL 9348- 41- 76- A-16
W3CBF 8109- 51- 53- B- 9
K3NPC 3567- 29- 41- A- 8
W3NCW 3534- 31- 38- A- 8
W3IPS 840- 15- 20- A- 4
K3JH (K3s JH JLI)
1,072,904-322-1112- C-82
W3ECR (4 oprs.)
810,492-274-986-AC-62
W3GHS (3 oprs.)
652,380-262-830- C-81
W3KT (K3MCO, W3KT)
595,920-260-764- C-

Maryland-D. C.

W3MVB
1,254,176-352-1189- C-79
W3GN 649,740-238-910-AC-76
W3EYF 536,549-277-647-AC-
W3MFJ 416,658-214-660- C-62
W3BQN 412,074-234-587- C-73
W3QQL 307,458-186-551- B-54
W3AXW 295,431-213-463-AC-69
W3HQU 269,325-189-475- B-50
W3AYD 199,698-166-401- C-36
WA3GTX 188,309-187-336- A-
W3AFM 136,875-125-365- C-40
W1QMM/3
104,139-133-261- B-50
WA3DSD 80,649-103-261- A-40
W3KA 66,048- 86-256- C-31
W3RNY 54,684- 98-186- C-17
W3HVM 45,600- 95-160- C-40
W3CSZ 39,150- 87-150- B-18
W3FSP 37,062- 87-142-AB-34
W3AEL 26,649- 63-141- C-14
W3EPR 25,650- 75-114- C-21
WA3GZM 14,268- 58- 82- A-
W3CRE 12,750- 50- 85- B-15
W3LMZ 12,744- 54- 79- A-20
W3FX 4386- 34- 43- C-14
WA3DYW 2574- 26- 33- A- 5
W3ML 396- 11- 12- A-
W3TMZ (10 oprs.)
4,716,630-486-3235-AC-96
WA3EPT (11 oprs.)
1,376,690-355-1295-ABC-96
K3JYZ (K3JYZ, WA3HTQ)
625,300-260-802- C-93
W3FA/3 (W3s FA GRF)
500,422-247-676- C-40
WA3GLP/3 (WA3s GDB GLP)
8160- 40- 68- B-30

Southern New Jersey

K2QIL 451,329-211-713- C-65
W2GGT 446,880-224-665- C-80
W2HDW 250,056-151-552- A-37
K2CPR 204,561-191-357- B-
W2FYS/2 185,265-179-345- A-55
WA2IZS 184,800-176-350- B-
WB2EUU 109,620-126-290- B-26
W2BQF 91,872-132-232- C-20
W2QDY 63,891- 93-229- B-
K2DCA 51,510-101-170- C-12
W2SDB 34,080- 71-160- C-22
K2BG 32,631- 73-149- B-30
W2DT 29,475- 75-131- C-30
WA2BZV 23,064- 62-124- B-20
W2QKJ 12,696- 46- 92- C-28
W2FHY 11,607- 53- 73- B-37
W2FBW 11,340- 42- 90- B-22
W2SDO (W2SDB, oprs.)
11,070- 41- 90- C- 7
WB2NBL 10,140- 52- 65- A-
K2SQM 4620- 28- 55- B-15

1969 ARRL DX COMPETITION

Phone: February 1–2, March 1–2

C.W.: February 15–16, March 15–16

WB2BYF 3906- 31- 42- B- 7
WB2UVB 3483- 27- 43- A- 5
W2DAJ 2376- 18- 44- B- 2
K2OEA 2160- 24- 30- A- 2
W2HAZ 264- 8- 11- A- 2
K2VU 240- 8- 10- B-14
K2IEO 168- 7- 8- A- 2
WA2BLV (WA2BLV, WB2s APG MOQ)
1,535,100-350-1462- C-80
WB2TEN (WB2s TEN VHU)
326,304-206-528- C-80
W2PAU (W2s ESX PAU)
300,490-199-506- C-58

Western New York

K2KNV 667,317-301-739- C-66
K2DJD 528,273-237-744- C-70
W2FXA (WB2YQH, opr.)
380,184-217-584- C-60
W2FR 156,800-175-299- C-48
W2SSC 121,737-119-341- C-23
W2CUI 50,024-104-161- B-33
WB2YVP 28,260- 60-157- A-
W2FUI 19,824- 56-118- A-52
WA2VSO 12,567- 59- 71- C-22
W2VXA 11,900- 50- 85-AB-37
W2ICO 11,868- 46- 86- A-17
W2EJ 11,040- 46- 80- C- 8
WA2BPH 8880- 37- 80- A-12
WA2OIL 3045- 29- 35- A-20
WB2EDW 510- 10- 17- B- 5
WA2BEX (WA2s BEX CYQ)
313,038-186-561- B-72

Western Pennsylvania

W6EWN/3
598,306-293-682- C-59
K7ADD/3 405,072-232-585- C-74
K3VXV 76,050- 90-283- A-40
WA3IXN 32,994- 78-141- A-12
K3PZU 30,186- 78-129- C-17
WA3ENR 29,082- 74-131- B-35
WA3AWR 16,616- 62- 90- A-48
K3HKK (K3AHT, opr.)
15,660- 60- 87- C- 4
W3VK 12,168- 52- 78- C- 6
WA3EFH 6840- 38- 60- C- 7
K3KMO 4224- 32- 44- C- 7
W3CTE 2871- 29- 33- B-12
W3VKD (4 oprs.)
1,199,577-303-1321- C-68

CENTRAL DIVISION

Illinois

W9QQN 287,046-222-431- C-60
W9BZW 276,016-208-443- C-44
W9YYG 156,006-162-321- C-30
W9DWQ 138,853-143-327- C-25

W9GFF 113,399-143-265-AC-32
W9KMN 112,812-119-316- C-27
W9YVM 105,270-121-290- B-42
W9UX 70,560-112-210- B-
WA9RAT 47,250- 90-175- B-40
W9WYB 34,164- 78-146- C-
WA9TFM 31,740- 92-115- B-25
WA9HJM 28,542- 71-134- A-29
K9UCR 24,453- 57-143- C-
W9QWM 23,391- 69-113- A-49
WA9EKJ 19,110- 65- 98- -23
K9MDK 7938- 49- 54- A-22
W9VBV 7548- 37- 68- B- 7
W9EVX 5499- 39- 47- A-10
WA9RFF 4410- 30- 49- A- 9
K9UQN 2079- 21- 33- B- 9
W9FIU 1500- 20- 25- C- 7
W9TCU 810- 15- 18- A-
K9MNT 714- 14- 17- A- 7
K9YRA 270- 9- 10- B-12
W9EXE (K9YOE, W9EXE)*
923,788-314-982- C-92

Indiana

W9AQW
1,091,232-324-1123- C-88
K9CUY 585,312-268-735- C-88
K9FAP 218,124-166-438- C-
K9DWK 162,582-158-343- C-45
K9IHG 140,238-159-294- C-59
W9HDR 121,401-141-287- A-40
W9LKI 70,452-103-228- C-22
K9VQK 19,404- 66- 98- A-28
W9VDB 14,448- 56- 86- B-24

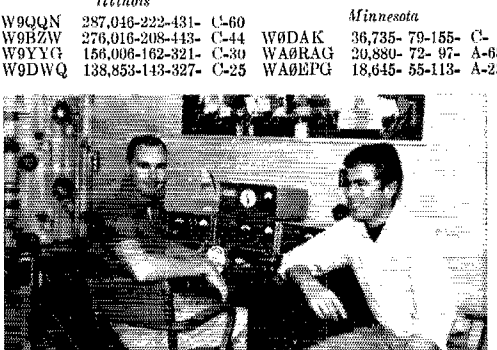
Wisconsin

W9GIL 478,626-241-662- C-
W9VZP 466,572-236-659- C-75
W9RQM 348,348-203-572- C-62
W9IHN 289,836-194-498- C-
WA9OTH 70,110-114-205-AC-
W9AEM 60,816-112-181-AB-
W9SCZ 56,334- 82-229-AC-52
W9OW 50,220- 93-180- C-26
WA9UVP 12,075- 85-165-BC-70
W9RKP 36,750- 70-175- C-23
WA9NSR 20,370- 70- 97- A-24
W9WEN 17,280- 60- 96- B-24
W9CIA 11,550- 50- 77- B-
W9LJR 9072- 42- 72- B-13
W9YT (8 oprs.)
1,383,048-337-1368-AC-64
W9ODD (5 oprs.)
208,791-171-407- C-85

DAKOTA DIVISION

Minnesota

WØDAK 36,735- 79-155- C-
WAØRAG 20,880- 72- 97- A-68
WAØEPG 18,645- 55-113- A-23



From a QTH on top of a 600-foot hill overlooking San Francisco Bay, **K6OHJ** was multiopped on phone by K6OHJ *(left)*, W6BHY *(right)*, and K6ERV, to become the first NCDXC entry to crack the one-meg mark. W6BHY currently holds forth at ZD8Z.

KØCNC	8400-	40-	70-	C- 9
WØPAN	462-	11-	14-	B- 4
WAØCJU (7 oprs.)	298,258-	197-	506-	C-83
WØAIH (KØs IJL ZXE, WØAIH)	281,664-	192-	489-	C-39

North Dakota

WAØOVW	20,100-	67-	100-	A- 9
WAØELO	546-	13-	14-	B- 4

South Dakota

WØBLZ	107,448-	121-	296-	C-
WAØCPX	16,362-	54-	101-	C-

DELTA DIVISION

Arkansas

WA5RTG	75,240-	120-	209-	C-46
K5TYW	24,090-	73-	110-	C-12
K5BLV	585-	13-	15-	A-12

Louisiana

W5IOU	582,900-	268-	727-	C-68
W5KC	331,785-	219-	505-	C-60
W5BUK	242,379-	191-	423-	C-64
W5ERR	29,925-	75-	133-	C-31

Mississippi

K5RFJ	522,870-	290-	601-	C-58
W5AO	82,698-	154-	179-	C-38
W5MUG	52,221-	103-	169-	-
WA5OYU	1650-	22-	25-	B- 9
WA5SKI	630-	14-	15-	A- 2

Tennessee

W4NBV	356,694-	221-	538-	C-60
W4ZWZ	14,127-	51-	93-	B-60
W4RKV	12,054-	49-	82-	C-11
W4OGG	6264-	36-	58-	B-10

GREAT LAKES DIVISION

Kentucky

W4LW	255,420-	172-	495-	C-36
W4CVI	127,920-	164-	260-	A-50
W4JBQ	28,350-	70-	135-	C-22
WA4UAZ	12,087-	51-	79-	C-
W4ZXR	5904-	36-	55-	-
W4FIN	624-	13-	16-	C- 3
WA4SMS	429-	11-	13-	B- 3
W4JKC	27-	3-	3-	B-

Michigan

W8SH (K1ZND, oprs.)	1,037,658-	326-	1061-	C-82
WA8LYF	644,613-	263-	817-	C-60
W8UCI	395,514-	219-	602-	BC-55
W8DUS	364,968-	222-	548-	-75
K8HZU	240,534-	166-	483-	C-51
W8KSR	99,750-	125-	266-	C-44
W8SCU	85,320-	120-	237-	C-25
W8VPC	76,560-	110-	232-	C-30
W8PBO	65,952-	96-	229-	C-43
K8CGD	61,800-	103-	200-	BC-57
W8RVD	47,151-	93-	169-	C-25
W8EEZ	28,917-	63-	153-	C-33
W8DQL	22,440-	68-	110-	C-12
W8TJQ	17,298-	62-	93-	A-25
W8HXZ	9450-	45-	70-	B-25
WA8USU	7832-	44-	60-	A-39
W8EXP	6912-	48-	69-	B-15
WA8VJT	4500-	30-	50-	A-16
W8WVU	2025-	25-	27-	A- 3
WA8OFW	1134-	18-	21-	C- 4
WA8VRB	147-	7-	7-	A-
WA8GGN	48-	4-	4-	B- 2
W8DOI (W8s DOI TJQ)	42,579-	83-	171-	C-27

Ohio

W8ZJM	531,202-	266-	667-	C-58
W8ZCT	507,936-	264-	642-	C-53
K8CFH	421,590-	230-	611-	AC-
K8EHU	415,224-	219-	632-	C-70
W8QXQ	407,700-	225-	604-	A-65
W8ZCQ	278,778-	194-	479-	C-60
WA8FDL	212,433-	169-	419-	B-52
W8BVF	207,009-	153-	451-	C-45
WA8NYB	203,580-	180-	377-	BC-43
WA8KPO	141,984-	144-	329-	C-
W8NPF	117,786-	134-	293-	C-54
W8LHV	107,019-	141-	253-	BC-40
W8AJW	106,335-	139-	255-	A-
W8KMD	97,104-	119-	272-	C-47
W8RSW	79,905-	115-	229-	B-26
WA8CIA	66,834-	79-	283-	C-63
W8YGR	64,125-	125-	171-	B-17
WA8TYF	54,735-	89-	205-	C-16
WA8ZGC	38,880-	90-	144-	C-
WA8SRQ	34,272-	84-	136-	B-24
W8IPA	29,889-	81-	123-	C-48
WA8RCN	28,782-	82-	117-	A-30
W8JAQ	27,027-	63-	143-	B-19
W8NHO	17,490-	53-	110-	B-40
W8GMX	14,544-	48-	101-	A-28
W8ICF	13,920-	58-	80-	B-27
W8POS	13,629-	59-	77-	B-10
W8GMK	13,398-	58-	77-	B-17
K8GVK	12,672-	48-	88-	C-
W8IBX	12,430-	55-	76-	B- 4
W8DWP	11,457-	57-	67-	B-18
W8AQZ	9546-	37-	86-	B-24
W8CSK	8442-	42-	67-	A-28
W8VZE	6372-	36-	59-	A- 9
W8WPC (W8GFH, opr.)	5814-	38-	51-	B- 4
WA8SLL	5661-	37-	51-	B- 8
K8BSM	4830-	35-	46-	C- 3
WA8FCH	4725-	35-	45-	A- 7
WA8LVT	4608-	32-	48-	A- 7
W8DZG	3384-	24-	47-	B-12
WA8IGD	1914-	22-	20-	B- 5
W8BUM	1872-	24-	26-	A-

Minimum Number of Countries	30	50	80	70	40
Band	80	40	20	15	10
W1AX	45	66	98	83	58
W1AXA					40
W1BIH	31	56	90	79	62
WA1BLC				76	
W1CW			127		
K1DIR	49	63	98	81	59
W1DIT	30				
WA1DJG			84	75	58
W1ECH	31				
W1EHT					40
WA1FHU	33				
W1SWX	63				
W1TS			99		47
K1YKT	39	63		70	
W1BGD/2	47	56	88	80	58
K2AHQ*	30				
WA2BEX*				82	
WA2BLV*	53	68	95	73	61
WB2CKS	38	59	83	75	46
K2DCA					42
K2DJD			83	70	
W2DKM					46
W2FR	39	61			
W2FXA			80	74	
W2FYS/2		52			
W2GGE		50	88		58
W2GGT					48
W2GKZ					43
W2HO			80		
K2KNV	31		106	77	41
W2LXK		67			51
W2PAU*					44
W2PCJ	34	53	91		43
K2QIL					51
W2QKJ					46
W2SSC			119		
W2SUC			84		
WB2TEN*					48
W2VJN	50	79	95	88	73
W9WNV/2	51	75	104	93	73
W3AFM			125		
W3BQN					46
W3ECR*		54		70	53
W3EOP	60	72			
WA3EPT*	41	69	108	77	55

Minimum Number of Countries	30	50	80	70	40
Band	80	40	20	15	10
W3EYF		53	83		50
W3FA/3*					45
W3GHS*	31	51			49
W3GM	39	67	98	88	51
W3GN			81		
W3GRS			90	72	53
WA3GTX					57
W3HHK		50	80		58
K3HTZ	34	50			48
W3IYE*		60			50
K3JH*		66	92	74	62
K3JYZ*		56		72	
W3KDF					40
K3KMO	32				
W3KT*		58			46
W3MFJ				72	
W3MFW	48	61		74	56
K3MNT	39				
W3MVB	47			80	66
W3MWC			86		47
W3NOH	36			77	60
W3QQL					46
W3TMZ*	59	9		103	6
W3VKD*		61	85	74	63
W3WJD	45	74	101	82	64
W3WPG	33	50			
WCEWN/3	32		94	78	40
K7ADD/3					45
K4BAI	33	64	93	84	69
W4BRB					60
W4BVV*	62	79	127	107	89
W4BYB			88		
K4CG*			54	84	75 58
K4CL			52		
W4CRW			50		
WB4DJT				75	
W4DXI				71	
W4EEO				72	
K4EZ	31				49
W4GRG			85	76	53
W4HOS					43
WA4IKU	30		89	79	55
W4JK	36	54			41
W4KFC	36	63	97	83	71
W4KVC					41

Minimum Number of Countries	30	50	80	70	40
Band	80	40	20	15	10
WA4LCO	30				
W4LCP		65	86		68
W4LVV		50			42
W4LW				62	43
W4OMW		50			
W4QQ	46				
K4YFQ					52
K4ZA/4*	40	61	100	80	53
W4ZXI*	44	65	113	88	71
K2EIU/5	35	50			41
W5AO		71			
W5BRR				71	63
W5BUK					43
W5DWT			86		53
W5EQT		55	82		61
W5IOU		53	86		49
W5JAW		50	98	83	60
5			80		40
				78	60
			85		58
					44
					51
			88		57
K5RFJ			84	84	59
K5STL			84		
W5WZQ		64	86		62
W6ANN*		52	96	70	50
K6DXM*			86	76	45
W6ERS					44
K6ERT			81		
W6EVR			88	72	
W6FSJ			89		
W6GBI					40
W6GQK*			83	71	47
W6HOC			84		
W6HVN			90		
W6ISQ				74	
W6ITY					45
WA6IVN*				77	47
W6LCX					42
K6NA					44
W6RGG*				70	
W6RW*	40	86	115	85	64
W6TZD					51
W6WB					41

Minimum Number of Countries	30	50	80	70	40
Band	80	40	20	15	10
W6WX*				76	43
W7AYY					42
W7EKE		50	86	71	
W7SFA*		66	91		
W8AJW					45
W8BQH*		53	103		
W8BVF			100		
K8CFH					43
W8DUS					45
W8EEZ		63			
K8EHU			83		
K8HZU				74	
W8JAQ					50
WA8LYF				87	44
WA8MCR*			82	75	41
W8NPF					40
W8QXQ				74	41
W8SH	39	69	100	73	45
W8UCI			85	67	45
W8ZCQ			88		
W8ZCT	30				50
W8ZJM		50	80	70	
W9AQW	33	68	101	78	44
W9BZW				70	40
K9CUY		60			44
K9DWK					42
W9EXE*		62	95	81	53
W9GIL			82		52
W9HIN				71	
W9QQN			82		42
W9SCZ			82		
W9VZP				75	45
W9YT*		60	99	96	52
WØBX					43
WØCQC					44
WAØCVS					41
KØLXD					42
WØTDR				70	
VE2BV					42
VE2NV			80		
VE2WA			86		
VE2YU			87		
VO1AW					44

* Multioperator Station

W8YPT 1818- 22- 28- A- 4
K8AMZ/8 1104- 16- 23- B-12
W8NBQ 1026- 18- 19- B- 7
K8OUA 714- 14- 17- A-10
W8BSR 672- 14- 16- A- 7
WA8MGD 360- 10- 12- A- 2
K8PYD 36- 3- 4- C- 1
WA8MCR (K8BPX, WA8MCR)
499,593-241-691- C-63
W8BQH (4 oprs.)
247,044-173-476- B-96
W8EDU (WA3BGE, W8AZA, WA8MGI)
111,456-129-289- C-43

HUDSON DIVISION

Eastern New York

W9WNV/2
1,833,352-404-1512-AC-93
W1BGD/2
1,022,532-329-1036- C-
W2HO 572,136-248-769- C-65
W2KFB 80,145-117-229- C-
W2AWF 40,836- 83-164-BC-20
WB2YPM 26,499- 73-121- A-26
WB2CSY 21,417- 59-121- A-21
WB2ZPW 5568- 32- 58- A-21
W2IP 300- 10- 10- A-
K2AHQ (6 oprs.)
494,013-239-689-BC-91

N. Y. C.-L. I.

WB2CKS
1,016,477-301-1128- C-79
W2GGE 890,561-287-1037- C-74
W2PCJ 799,008-287-928- C-80
W2SUC 589,053-239-809- C-70
W2LXK 490,032-246-664- B-60
WA2UWA 446,265-211-705- B-60
W2IRV 415,374-214-647- B-56
W2DKM 250,860-185-452- A-58
W2RDD 150,688-144-349- C-20
WB2RNL 125,664-136-308- A-38
W2YCW 121,824-144-282- C-24
W2AZS 117,150-142-275- C-35
W2MT 114,021-123-310-BC-35
W2ZV 100,233-129-259- A-55
W2MN 98,889-119-277- C-25
W2GKZ 78,300-145-180- C-13
K2DDK 68,730-145-158- C-51
WA2KSD 57,706- 86-224- C-28
W2HAE 29,016- 78-124- B-12
K2MFY 28,350- 75-126- A-20
W2AFM 20,340- 60-113-AB-34
K2LTC 13,260- 52- 85- B-
W2TVT 12,960- 48- 90- B-35
W2MYK 7080- 40- 59- B-18
WB2WAD 3480- 29- 40- B-11
W2CKR 2112- 22- 32- B- 6
WB2YKU 2112- 22- 32- A- 5
W2JB 2070- 23- 30- A- 9
WB2WXR 540- 12- 15- A- 8
WB2YKL 144- 6- 8- B- 1
WA2LQO (4 oprs.)
100,825-109-309- C-35

Northern New Jersey

W2VJN 1,395,240-385-1210- C-78
W2HUG 281,184-202-464- A-60
K2BMI 233,872-188-415- B-65
K2DNL 219,674-182-403- C-50
WB2RKK 208,824-154-452- A-56
W2HL 204,102-174-391- C-48
WA2VSQ 91,884-124-247- B-40
K2EAC 75,864-109-232- B-28
W2EHN 64,980- 95-228- B-30
W2NEP 30,744- 84-122- A-12
W2MB 28,203- 79-119- B-
W2NUS 25,600- 64-135- A-57
W2CIY 24,624- 72-114- B-19
W2MNW 1560- 20- 26- B-11
WB2EES 1296- 18- 24- A- 9
W2GTF (WA2IRS, WB2s JXE MIC) 212,433-169-419- B-43
WB2NZU (WB2s NZU QZZ)
62,160-112-185- A-15
WB2AMV (WB2s AMV W1D)
22,770- 66-115- A-16

MIDWEST DIVISION

Iowa

W0BX 360,904-220-528- C-63
W0KHL 276,000-184-500- C-70
W0CQC 146,349-161-303- B-56
K0IIR 129,630-145-298- C-57
W0BSY 57,000- 95-200- C-31

Kansas

W0WPL 73,590-110-223- B-76
K0BYC 36,984- 92-134- A-77

Missouri

W0TDR 369,792-214-576- C-68
W0OAW 332,556-214-519- C-70
W0LQN 187,938-159-394- C-32
WA0FVI 43,452-102-142- A-49
K0JPL 32,148- 76-141- B-10
K0GSV 21,828- 68-107- C-15

Nebraska

K0LXD 131,652-138-318- C-
W0WLO 9954- 42- 80- A-14

NEW ENGLAND DIVISION

Connecticut

W1BIH 1,006,470-318-1056- C-68
WA1DJG 483,230-253-638- B-64
W1TS** 437,400-225-648- B-60
W1ECH 295,035-221-445-AB-23
W1CW** 236,601-127-621- C-70
K1JHX 228,084-166-458- B-35
W1TX 208,464-172-404-BC-

PHONE

Band	75	40	20	15	10
Minimum Number of Countries	15	30	80	70	60
K1AJQ					71
W1AX	15	30	92	82	85
W1BIH				90	85
W1CW			101		
K1DIR	26	44	96	96	81
W1DIT	20				
WA1DJG				81	80
W1FJJ	15				
WA1IHN					69
K1IKN				75	
W1OKG		30	89	83	79
W1ORV					73
W1UOP				81	
K1VTM				71	61
W1YRC					63
W2BHK		32			
WA2CFD			81	70	60
WB2CKS*	15			82	77
W2CME				80	70
W2CP				75	71
WA2CYQ				79	
K2DJD				70	
W2DKM					68
WB2FON	17				
W2FZJ	21	31		71	61
K2GXI		82			
W2HXF					84
WA2IFS					79
W2JSX			97	83	85
K2PZF		30			
K2QIL					65
WB2SQN				78	
WA2UWA	23				
WB2ZMK				72	
K3BNS*					74
W3BQN				82	80
W3FYS				72	
W3GHS*					71
WA3GJU					64
W3GM	16	30		81	78
K3JH		32		82	75
W3KDD				94	
W3KT*		31	81	80	60
W3MWC				70	
W3OJW				81	

Band	75	40	20	15	10
Minimum Number of Countries	15	30	80	70	60
K3PSW					75
K3QDV			83		
W3WJD	18	52	96	98	86
W3ZKH/3*	46	82	142	126	108
K1CAU/4					65
K4BAI	20			77	91
W4BYB		64			
K4CG*	23	43	101	89	84
WB4DJQ					75
WB4DJT				86	
W4DQD					83
K4EZ			89		66
W4EZ				70	
WA4HTR*	29	46	101	93	91
W4KFC			85	70	78
WA4KQO					67
W4KXV*					68
[illegible]				[illegible]	
[illegible]		[illegible]	[illegible]		69
[illegible]					75
[illegible]					78
[illegible]					[illegible]
[illegible]		[illegible]			
W4QBK	21	39	104	94	88
W4SYL			81	77	86
WA4UXU	20			82	
K4WUY					60
K4YFQ			90		88
W4YWV					76
W4ZNI					68
K2EIU/5		30			
W5AC					86
W5AJY					61
K5BOC				71	
W5DWT					66
W5EQT					61
W5JAW			90	78	95
W5KC					67
W5KTR		38	91	76	97
W5LDH					80
WA5LOB				72	64
WA5LUM					87
W5NMA				67	79
W5TKB					74
W5TKS					85

Band	75	40	20	15	10
Minimum Number of Countries	15	30	80	70	60
W5TMZ					62
W5ULN					61
W6CCP*		35		76	
K6DXM*				76	
WA6EKL			82		82
K6EVR*				113	
W6ISQ					66
WA6IVN*				76	69
WB6KRW 6			81		
K6OHJ*	15	35	87	78	69
W6QJW			90		62
K6QVT				79	72
W6RR		35	89	83	81
W6SIA					60
K6SVL				77	
W6UED*				112	
WA6[illegible]			[illegible]		
W7C[illegible]					
W7E[illegible]			[illegible]	79	71
W7S[illegible]	17				65
K8A[illegible]					65
W8B[illegible]					72
K8CFH			89		
W8ECA				76	66
W8EEZ		42			
K8GVK					67
W8GXR				74	
W8HYV				71	
W8JAQ					81
W8LXU					61
WA8MCR					63
W8NGO*			92	92	75
W8OKF			90		
W8SH	15	39	95	95	90
W8TWA/8				78	69
K8YBU			121		61
W8YGR					62
W9AQW			92	90	82
W9ARV			81		
W9BGX*	15	40	102	92	89
K9BJM					66
W9BZW				91	82
K9CUY	16	40	85	72	71
K9DTZ					60

Band	75	40	20	15	10
Minimum Number of Countries	15	30	80	70	60
W9DUB					77
W9EWC	22	48		70	79
W9EXE*		34	93	87	98
W9GIL					71
W9JQD				106	65
W9LKI				71	80
W9QLD			84		
W9QQN				94	83
W9RQM				71	61
K9TZH		31	85	85	77
W9YT*		33		89	71
W9ZRX			89	85	78
W9ECV/0					95
W0ASU*					80
W0BAA*				79	68
WA0CJU*		34			68
WA0CPX					67
K0CVA			81	71	71
WA0GCP					63
W0ICH*					68
W0IEM					62
WA0IRP					66
WA0KDI			82	73	
W0LBB					70
W0LBS				79	85
W0LOL*		40		82	76
WA0NOJ*				71	
W0SEA					64
W0TYK*					62
K0UKN			94		
W0YUQ					77
VE2BV					65
VE2DCW/2*					65
VE2NV			94		68
VE2WA			89		
VE2WY			85		
VE2YU*			92	72	
VE3BHS			91	64	
VE3FHO*			125	90	
VE7NW			89		
VE7YB			87		

* Multioperator Station

W1DIT 188,945-157-395- C-48
K1GUD 151,053-129-391- C-39
K1PNS 115,584-128-301-BC-70
WA1GYP 98,768-126-256- A-40
K1THQ 80,253-111-241- A-25
K1HTV 77,469-119-217- A-
K9CVO/1 75,684-119-212- A-40
K1UDD 72,885-113-215- B-22
W1CNU 72,261-111-217- B-18
WA1FJU 54,570- 85-214- A-20
WA1HNR 39,600- 99-134- B-13
W1LVQ** 33,210- 82-135- B-
WA1CJE 30,480- 80-127- A-10
W1BDI 26,532- 67-133-BC-15
W1ICP** 22,275- 55-135- C-15
W1YYM** 19,494- 54-114- C- 5
W4NQA/1**
18,600- 62-100- A-
W1FTX 16,932- 68- 83- A- 8
WA1IGF 13,671- 49- 93- B-18
W1OPB 11,088- 48- 77- A-21
W1IKE** 9933- 43- 77- C-
WA1IED 8100- 15- 24- A-26
W1EEN** 6327- 37- 57- B-
K1TFA 3105- 23- 45- A- 5
WA1CQW 2277- 23- 33- A-13
K1TKS 798- 14- 19- B- 4
W1WCG 612- 12- 17- A- 2
WA1IUL 561- 11- 17- B- 7
WA1CYT 363- 11- 11- A- 2
K1CEC 216- 8- 9- C- 1
WA1JCX 12- 2- 2- A- 6
W1EJL (W1s ARR EJL)
27,324- 69-132- B-

Eastern Massachusetts

K1DIR 1,477,350-359-1407- C-80
W1AX 1,398,855-357-1331- C-68
K1YKT 478,263-237-675-AB-52
W1AXA 440,142-218-673-BC-54
WA1FHU 406,875-217-625- C-
W1FJJ 182,160-176-345- C-19
W1N1Y 158,034-154-342- C-34
W1MO 108,069-163-221-AB-25
W1BQL 90 768-122-248-BC-32
W1EHT 76,608-133-192- B-28
W1DAL 40,959- 91-150- A-
K4LAY/1 38,986-101-129- A-48
W1ESN 20,160- 60-112- C-20
W1PLJ 3321- 27- 41- B-12
W1EQY 1425- 19- 25- A-15
W1BB 630- 10- 21- A-
WN1ION 304- 8- 16- A- 5
W1WMH 6- 1- 2- A- 1
W1MX (WAs 2KZV 4TTG
8ENO) 329,088-192-574- C-

Maine

K8GHE/1 9102- 37- 82- B-16

New Hampshire

W1DXB 215,712-168-428- A-57
W1FZ 36,168- 88-137- C-
W1SWX 27,783- 63-147- B-

Rhode Island

WA1BLC 62,415- 95-221- A-
W1AWE 30,015- 69-145- A-
W1GOG 1410- 35- 42- B- 4

Vermont

W1ETV 145,580-145-337- A-56
W1AYK 47,310- 83-190-BC-15
WA1HXU 26,520- 61-148- B-
W1PEG 21,780- 55-132- B-40

Western Massachusetts

W1EZD 345,482-206-559- C-36
WA1ABW 21,306- 67-106- A-12
W1YK (K1TKS, WA1ABW)
1122- 17- 22- A- 2

NORTHWESTERN DIVISION

Idaho

W7DV 141,480-120-393- C-61
W7UO 13,455- 45-100- A-70

Montana

K7CTI 46,158- 98-157-AB-19
K7QCO 14,280- 82-180- B-60
K7ABV 39,312- 78-168- C-20

Oregon

W8BUM/7 3828- 29- 44- A-

Washington

W7GYF 47,175- 85-185- A-13
WA7JCB 17,784- 38-156- B-22
W7IEU 13,776- 41-112- A-53
WA7BDF 10,626- 46- 77- A-27
K7INE 8919- 33- 81- C-10
K8ALJ/7 168- 7- 8- B- 2
W7SFA (7 oprs.)
1,065,296-278-1278- C-96

PACIFIC DIVISION

East Bay

W6KJS 328,005-185-591-BC-50
WB6TOJ (WB6HDH opr.)
281,250-150-625- C-82
W6FLT 22,356- 54-138-BC-30
K6BXI 3045- 21- 49- C-12
W6EJA 1938- 18- 37- C- 8
WA61VN* 514,848-248-711- C-61
W6RGG (K6s ALH EBB,
W6RGG)*
W6LDD* 184,599-159-387- C-
WA6UFW (K6AUC, WA6UFW)
63,840- 95-224- C-23

Nevada

WA7GES 74,493- 93-267- A-35
W7CRT 60,900-105-193- C-36
W7TVF 16,335- 55- 99- B-18
W7VIU 6327- 37- 57- A-10

Sacramento Valley

W6EOU 220,941-147-501- C-65
W6NKR 199,227-179-371- C-61
W6BIL 19,008- 66- 96-BC-54
WA6JDT 18,468- 54-114- A-23
K6TWE 9072- 36- 84- B-20

San Francisco

W6ERS 415,864-229-606-AC-80
W6WB 305,520-190-536- C-
W6BIP 136 458-126-361- C-22
WA6DJI 26,970- 62-145- B-36
WB6UGA 264- 4- 22- A- 7

San Joaquin Valley

WA6BOU 310,752-208-498- C-48
K6RTK 195,300-150-434- C-53
W6KTW 34,632- 74-156- C-22
K6OZL 12,780- 60- 71- B-21
W6MMH 2205- 15- 49- B-11

Santa Clara Valley

W6HVN (WA6VAT opr.)
598,509-243-821- C-90
K6OHJ (W6BHY opr.)
420,204-194-723- C-50
W6HOC 415,380-230-602- C-51
W6CYX 353,340-195-604- C-75
WB6KBK 327,183-191-571- C-
W6ISQ 232,752-208-373- C-30
W6EJ 177,498-132-448- C-46
W6ZO 171,787-161-356- C-40
W6ATO 115,116-106-362- C-58
W6CBE 67,032- 76-204- C-31
K6EBB 58,080-110-176- C-21
K6COD 53,328- 88-202- A-38
K6ERT 48,600- 81-200- C-49
W6VG 28 881- 58-166- C-20
WA6QQI 17,385- 61- 95- B-
W6YLL 17,160- 60- 96-BC-22
W6CLM 10,260- 38- 90- C-35
W6VVR 9600- 40- 80- C-20
K6TZX 7548- 37- 68- A- 7
WB6KRW/6 6534- 33- 66-BC-10
W6PLS 5568- 32- 58- C- 6
KH6GIZ/6
2964- 26- 38- B-14
W6KNM 1344- 16- 28- A-
K6DXM (W6CUF opr.)*
788,580-260-1011- C-61
W6WX* 711,633-257-923- C-77
W6GQK (K6OZL, W6s GQK SR)
566,784-246-768- C-76
K6CQF (K6CQF, VE3DXV)
330,770-194-571- C-64
W6JKJ* 158,319-147-359- C-34
WB6KIG* 43,065- 87-165- C-10
WØDAD/6* 14,418- 54- 89- C-

ROANOKE DIVISION

North Carolina

W4OMW 204,756-151-452- C-42
WA4UXU 74,592- 96-259- B-56
K4ADT 10,350- 46- 75- B-
W4VON 3120- 30- 36- C-10
W4OVQ 3042- 26- 39- B- 5

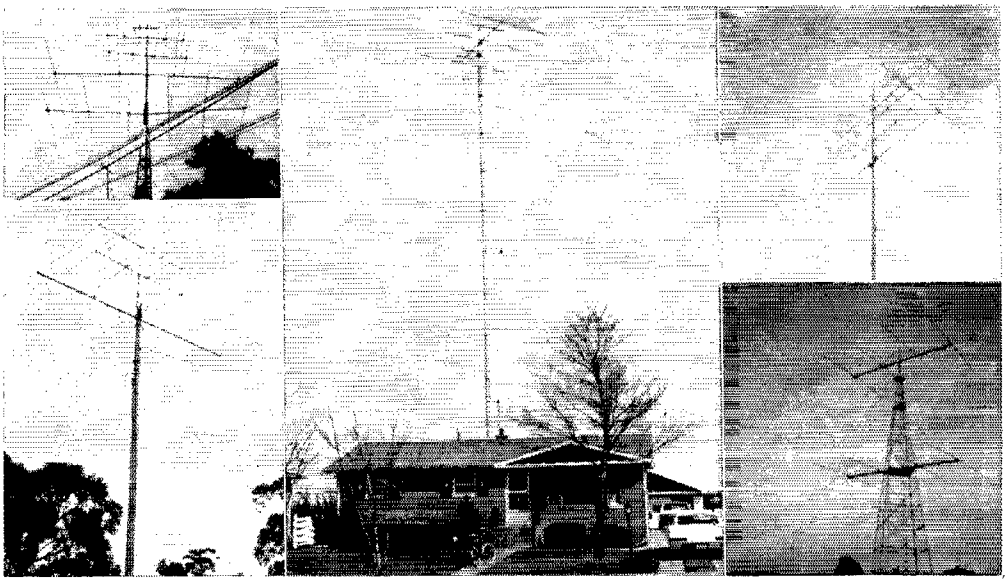
South Carolina

WA4IKU 683,571-301-757- C-38
WB4CPE 91,461-129-237- B-26

Virginia

W4KFC
1,420,650-350-1357-ABC-70
W4UQ 375,342-242-517- C-57
W4DM 333,732-203-548- C-
W4GF 303,873-199-509- C-37
W4CRW 285,600-200-476- A-84
W4NH 245,490-167-490- C-33
W4EZ 239,144-179-446- C-33
W4ZSH 223,689-173-431- C-50
W4ZM 211,650-166-425- C-27
W4HM 205,140-160-429- B-33
W4WBC 144,060-140-343- C-29
W4TKN 120,324-148-271- A-56
W4CQI 96,558-121-266- B-20
W4NO 43,134- 91-158- C-12
K4ORQ 27,720- 70-132- C-10
K4WUM 22,464- 72-104- B-
W4VC 17,784- 57-105- B-19
W4KMS 16,128- 64- 84- B-20
W4NM 12,936- 49- 88- A-16
W4SYL 3978- 34- 39- C-
W4NXE 585- 13- 15- B- 3
W4BVV (7 oprs.)
4,173,162-469-2970-AC-96

Let's peruse Peru's one-two punch in the A3 set-to. At left is Eduardo, **OA4JR,** who logged 2356 two-ways and was particularly pleased by the number of QSOs on 40. On the right we spy **OA6BU** (Edward is a Jesuit missionary, back home signs W9IBT), who got into the Test to work "one or two of the boys" and wound up working 1660 of them.



These browny aerial arrangements are likely to make you even more dissatisfied with your feeble dipoles. *Upper left,* the fine homebrew lashup of **JA1NDO:** the 45′ tower (not counting mast extension) supports 6L for 15 at 49′, 4L for 20 at 50′, 4L for 10 at 65′, 6L for 6 at 68′, 5L for 2 at 71′. *Lower left,* using a 100-foot unguyed mast as superstructure, **VK2FU** has a 40-meter two-element fixed quad at 55′, 75-meter dipole at 75′, 20-meter 5L at 81′, 15-meter 4L at 92′, 10-meter 5L at 100′. A super structure indeed! *Upper right,* the Big Bertha at **K3JH** manufactures some authoritative signals. What it is, exactly, is 3L on 40 at 77′, 6L on 10 at 86′, 5L on 15 at 96′, 5L on 20 at 104′, 15L on 2 at 109′, 6L on 6 at 113′. K3JH has been known to be S9. *Lower right,* **W9DUB** himself tells it best: "All elements driven; top stack turns; bottom stack fixed on Europe; each stack has 8 elements, voltage-fed at center for 10 and 15 meters, and 4 elements for 20 meters current-fed; stacking spacing 36′; tower height 70′, L-networks for matching each or both at base of tower." *Center,* right in the middle of suburbia grows this 120-foot tower at **W9EXE,** no doubt startling unwary visitors in the neighborhood. At the top is a TH6DX for 10-15-20; at the 100-foot point is a ½-wave 40-meter dipole fixed at 60/240 degrees; a 4-over-4 array for 2 meters roosts at 110′; and an 80-meter slanted vertical (erected for contests only) runs to the tree in front of the house. The black spot in the center is a plastic-bottle balun.

K4ZA/4 (5 oprs.)
1,511,895-357-1413-AC-50
W4KXV (7 oprs.)
1,415,232-336-1408-AC-48
K4CG (K3WUW, WA4WJJ, W4TFX)
868,296-299-968- C-96
W4JK (4 oprs.)
658,208-268-822- C-91

West Virginia

W8AZD 100,068-124-269- B-33
WA3HAN/8
67,912-104-218- -
K8MYU 54,999- 97-189- B-18
W8BJ 1662- 37- 42- A-20
WA8TYF/8 429- 11- 13- A- 2
WA8VLM 210- 7- 10- B- 5

ROCKY MOUNTAIN DIVISION

Colorado

WAØCVS 400,428-227-590- C-59
WAØNBZ 17,304- 56-103-AB-30
KØJJB 1980- 20- 33- A-12

New Mexico

W5ODJ 260,370-165-526- C-96
K5STL 21,420- 84- 85- C-23
K5MAT 972- 18- 18- A- 6
W5QNQ 12- 2- 2- A- 1

Utah

W7NPU 247,923-169-489- C-61
K7RAJ 61,740-105-196- C-19

Wyoming

K7AYF (K6QPH, opr.)
24,975- 75-111- B-

SOUTHEASTERN DIVISION

Alabama

W4GRG 658,944-256-858- C-71
W4KVC 213,120-185-384- C-65
W4USM 14,220- 60- 79- A- 9

Eastern Florida

W4LCP 963,072-304-1056- C-79
W4BRB 695,156-259-902- A-85
W4FY 227,130-190-399- C-53
W4HOS 226,995-185-409-AB-57
K4YFQ 225,624-158-476- C-30
K4CL 194,220-166-390- C-72
W4LVV 189,805-187-339- C-36
W4WYJ 139,932-156-300- A-29
W4CHA 134,994-149-302- C-38
K4DSN 93,366-126-247- B-22
W1AGP/4 82,026-126-217- A-28
WB4DJT 49,875- 75-222- B-
W4RTX 40,020- 92-145- B-18
WA4LCO 39,015- 85-153-AC-39
WA4SDK 35,721- 81-147- A-34
W4BYB 34,320- 88-130- C-
K4ZD 31 920- 89-133- C-27
W4FFF 20,130- 61-110- C-11
W4EEO 15,552- 72- 72- B-30
W4LE 9030- 43- 70- C- 6
WB4IGL 7308- 42- 58- B-14
K4ZRU 6993- 37- 63- C-16
W4UF 6750- 45- 50- C-11
K4EJ 4830- 35- 46- A-20
W4DJ 546- 13- 14- A-
W4LEP 198- 6- 11- B- 2
W4ZXI (6 oprs.)
2,229,993-381-1951- C-96

Georgia

K4BAI 1,156,872-344-1121-AC-90
K4EZ 437,644-268-547-BC-45
W4DXI 116,976-238-587-AC-72

Western Florida

K4OA 199,950-155-430- C-50

SOUTHWESTERN DIVISION

Arizona

W7EKE 612,300-260-785- C-80
W7AYY 326,550-175-622- C-60
W7ATV 218,370-174-419- C-53
K7TVS 6572- 31- 71- A-27
W7UUU 918- 17- 18- A-14
K7HQN 675- 15- 15- B- 4

Los Angeles

K6NA 678,249-221-1023- C-
W6TZD 539,136-216-832- C-59
K6EVR 408,030-160-850- C-
W6GEN 311,298-169-614- A-90
W6FSJ 301,806-162-621- C-50
W6VNJ 258,570-169-510- C-
W6AM 256,224-157-544- C-61
W6EJI 176,580-135-436- C-64
WB6SKJ 118,080-123-320- C-51
WB6HDG 97,308-102-318- C-56
W6BUD 81 096-109-248- C-40
W6JKR 80,250-107-250- B-39
W6APH 66,126-103-214- C-56
K6YFZ 55,890- 90-207- B-30
W6WWQ 50,880-106-169- C-
W6ONG 25,893- 63-137- A-
K6CNV 22,500- 60-125- A-23
K6BEP 20,022- 47-142- B-25
W6LWY 14,256- 48- 99- C-35
W6LDA 13,536- 47- 96- C-11
DL7JY/K6 4935- 35- 47-BC-11
WA6KHK 4464- 31- 48- A-19
W6FW 4050- 30- 45- C-12
WB6RXE 3750- 25- 50- -
WB6YCT 2574- 22- 30- B-20
W6HS 1650- 11- 50- C- 4
W6RW (7 oprs.)
2,563,146-393-2174-AC-96
W6NJU (W6NJU, WB6HGU)
268,752-176-509- C-
W6UUI (4 oprs.)
235,620-165-476- C-

Orange

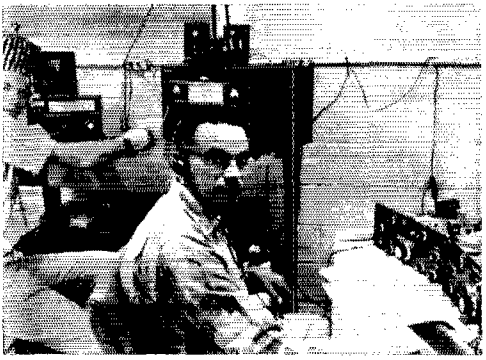
W6DFY 579,510-235-822- C-84
W6LCX 252,252-156-539- C-62
WA6TLL 124,992-124-336- A-53
W6QFU 65,160- 90-242- C-39
WA7FHD/6
53,172- 84-211- A-51
WB6RTJ 15,360- 40-128- C-16
W6LHZ 5508- 27- 68- B-22
W6ANN (4 oprs.)
1,068,210-286-1215-BC-92
W6CCP (W6s AOA CCP)
375,060-188-665- C-65
WB6CWD (WB6s CWD WEG)
189,700-140-452- C-37

San Diego

W6GBT 350,811-183-639- C-51
K6SDR 318,648-187-568- C-
W6BS 276,108-173-532- C-39
WB6OLR 106,227-111-319-BC-15
WA6DMN 13,728- 44-104- B-23
W6ITY (W6ITY, WA6ZQU)
628,560-240-873-AC-
WB6LFR(WA6s CZR LBP, WB6LFR)
106,704-117-304- C-

Santa Barbara

W6GRX 309,672-187-552- C-68
W6GEB 16,650- 50-111- A-20
WB6DPV 13,440- 40-112- A-21



ET3FMA, wheeled around by K4FMA *(left)* and W6HOH *(right),* took multioperator honors from the Dark Continent on c.w.; in fact, only LU8DQ had a higher score in that category from anywhere outside W/VE. Don, K4FMA, has returned to the States; Charlie, W6HOH, now languishes in Ethiopia in SWL status.

WEST GULF DIVISION

Northern Texas

W5DWT	656,820-267-821-	C-55
W5LGG	597,840-265-752-	C-56
W5OGS	579,510-282-685-	C-80
K5QMC	69,216-103-224-BC	C-65
WA5RQA	65,076-116-187-	C-43
W5PQY	13,230- 42-105-	C-21
WA5QEZ	6732- 33- 68-	C-
W5QGZ	5250- 35- 50-	B- 5
W5MSG	240- 8- 10-AB-	5
W5EQT (W5s EQT OBS TKB)	796,073-281-945-	C-88

Oklahoma

K5BOC	361,335-221-545-	C-68
W5SIH	107,640-138-260-	C-47
W5PWG	2079- 21- 33-	B-10
K5CYK	462- 11- 14-	B- 8

Southern Texas

W5JAW	999,192-316-1054-	C-82
W5BRR	674,262-282-797-	C-58
W5WZQ	515,916-306-562-	C-55
K2EIU/5	304,416-224-453-	C-42
W5LJT	178,017-173-343-	C-30
W5MCO	146,475-155-315-	B-56
K5YUR	15,138- 58- 87-	C-27
W5QNY	9682- 47- 69-	A-45
W5ACL	864- 16- 18-	C- 8
W5KFL (K5LZO, W5KFL, WA5LES)	697,788-284-819-	C-90

CANADIAN DIVISION

Maritime

VO1AW	342,633-181-631-	C-45
VO1HH	290,079-167-590-	C-49
VE1EK	52,800- 88-200-	A-26
VE1AE	20,250- 45-150-	A-
VE1AJJ	14,448- 56- 86-	A-31
VE1DB	8568- 34- 85-	B-10
VE1WP	5046- 29- 58-	A- 7

Quebec

VE2YU	508,326-247-686-	C-64
VE2WA	379,992-223-568-	C-
VE2NV	361,020-220-547-	A-70
VE2BV	303,952-176-578-	B-72
VE2DCW	180,885-155-389-	A-51
VE2AYU	113,283-123-307-	A-69
VE2BGJ	62,856-108-194-	A-
VE2BFS	22,680- 56-135-	B-17

Ontario

VE3BMB	158,064-148-356-	B-52
VE3DBB	125,244-142-294-	B-65
VE3BWA	64,260-102-210-	B-34
VE3ES	62,376- 92-226-	B-29
VE3WB	48,510- 98-165-	B-49

Over 300 QSO's/Band — DX

	80	40	20	15	10
CR6CK			535	714	761
CR6EI					359
EL2Y			303	346	
ET3FMA*			1198	742	541
ET3USA*			748	488	
TJ1QQ			344		301
ZD8J		680	1113	1522	1111
ZS6BMD					384
5H3KJ			661	742	791
9G1HM			473		
9J2MX					417
EP3AM			690		
JA1BRK			516	763	
JA1CWZ		303	509	667	
JA2JAA			443	505	
JA3LGG				352	
KA2NY*			428		
KA7AB			404	946	
UAØAG			542		
UAØKCO*			421	362	
UAØKEG*			631	663	
UAØKZB*			484		
UW9OA			713		
VU2KV			432		
DJ5BV			705	774	
DJ3WU			412	474	
DL1VU*		303	520	718	
DL4EG			481	686	
DL5JX				458	
DL6WD			464	611	
DL7GK				311	
EA2DT				322	
EI9J			485	540	
F8VJ			354		
F8ZF			320		
G2DC			448	306	
G2RO			754	404	47
G3APN			323		
G3FXB			516	517	
G4CP			656	487	310
G6VC*		328	634	304	319
GC3IEW			410	548	359
GI3OQR		438	825	645	435
GM5AII				386	
GW3ITZ*			475	444	305
HA5KDQ			427	352	
HA8UD			372		
HB9DX				315	
HB9MG			429	721	
HB9UB		373	563	1102	
HB9Z			522	651	
HAMO			357	562	
HASE				419	
HBLF				432	
LAØAD			520	467	
OE4SZW			306	737	
OH2TI*			849	663	
OK1AHZ				417	
OK1AOX				301	
OK1ARN				313	
OK1GT				554	769
OK1KTL*			383	514	657
OK1VB					334
OK2RZ					436
OK3CEG			327		426
ON4NG				378	419
OZ1LO				572	538
OZ5DX					429
OZ7BG				509	493
OZ7OF				540	420
PAØLOU			320	643	385
SM6CKV			356	1000	565
SVØWP				770	697
UA1IA				331	
UA2KAP*				368	
UA3KBO*				705	561
UA4KHW*				609	
UB5KKA				777	
UQ2KCR*				323	
YU1BCD*			385	601	919
HI8HBC				533	
HI8LC				457	
HI8RV			366	902	380
HP1BR				318	
HP1XHG			326	893	593
KL7IR				421	689
XE2AAG			361	537	722
KH6LJ			586	758	1067
K2SIL/KH6			432	353	452
VK2EO			363	1063	679
K3APJ			320	1243	
K3AXK				474	
K4QM					
K5FH				620	
K5FM				375	
LIAFW				365	
LIAMQ				612	
LIHW				404	
CX1BBV					332
HK3BAE			394	1219	1059
HK3RQ			494	1236	1254
KC4USM				433	614
LU8DQ*				1070	875
OA4PF				420	600
PY1BCA					345
PY1NO				312	446
PY2BBO				300	
PY2BGL				1045	1069
PY2SO				1407	1099
PZ1AH				841	739
YV1DP/5				419	493
YV1OB			307	348	403
YV5BOA				648	429
9Y4LA					337

* Multioperator station.

VE3LJ 11,868- 46- 86- C-20
VE3CAZ 1738- 22- 27- C- 5
VE3DEI 1539- 19- 27- A-11
VE3FGV 1344- 16- 28- A-11
VE3BS 507- 13- 13- B- 2

Manitoba

VE4FQ 105- 5- 7- A- 2

Saskatchewan

VE5PM 15,219- 57- 89- B-
VE5DP 2277- 23- 33- B- 7
VE5DZ 1488- 16- 31- A-11

Alberta

VE6LU 136,188-117-388- C-50
VE6AVR 9600- 40- 80- A-27

British Columbia

VE7EH 207,636-143-484-AC-60
VE7BDM 15,390- 38-135- A-22
VE7IQ 12,426- 38-109- A-
VE7HQ 4752- 24- 66- A-22

Yukon-N. W. T.

VE8BB 52,875- 75-235- B-38

AFRICA

Morocco

CN8FV 5425- 25- 73- A-

Portuguese Guinea

CR3AD 8820- 35- 84- A-

Angola

CR6CK 1,137,780-180-2107- A-
CR6EI 340,224-128-886- A-61
CR6AI 263,712-134-657- B-21

Mozambique

CR7IZ 156,465- 95-549- A-45

Canary Islands

EA8FJ 56,280- 70-268- A-

Liberia

EL2Y 350,142-134-871- B-

Ethiopia

ET3FMA (K4FMA, W6HOH) 1,513,920-190-2656- A-
ET3USA (W5QHD, WAØTIX) 613,785-145-1411- A-85

Cameroun

TJ1QQ 222,099-101-733- B-18

Seychelles

VQ9B 165,240-102-540- A-

Ascension Island

ZD8J 3,277,116-258-4234- A-96

Rhodesia

ZE1CY 24,570- 35-234- A-33

South Africa

ZS6FN 240,030-127-630- A-
ZS6BMD 151,620- 95-532- A-
ZS1O 11,037- 39- 99- A-34
ZS6BT 7560- 42- 60- A-

Tanganyika

5H3KJ 999,540-162-2210- A-

Senegal Republic

6W8BF 8550- 30- 95- A- 8

Ghana

9G1HM 201,495-101-665- A-27

Zambia

9J2MX 266,784-112-794- A-44

Sierra Leone

9L1TL 332,442-138-811- A-

ASIA

Formosa

BV2A (2 oprs.) 3287- 19- 58- B-

DX CONTINENTAL CHAMPIONS

CW			Phone	
Single Operator	*Multioperator*		*Single Operator*	*Multioperator*
ZD8J	ET3FMA	*Africa*	ZS6DW	ET3USA
KA7AB	UAØKFG	*Asia*	KA7AB	KA9MF
GI3OQR	SM6CKV	*Europe*	EA3JE	DLØWR
VP2VL	PJ5MJ	*N. America*	YS1XEE	XE2PTBC
KH6IJ	VK3APN	*Oceania*	KH6IJ	VK2FU
HK3RQ	LU8DQ	*S. America*	HK3RQ	CEØAE

(Single-operator continental DX champions win the plaque)

Iran

EP3AM 359,775-123-975- B-

Japan

KA7AB 1,157,760-201-1920- B-
JA1BRK 1,150,817-199-1928- B-68
JA1CWZ 1,007,304-188-1786- A-
JA2JAA 544,872-146-1244- C-
JA3LGG 249,090-115-722- A-31
JA7FC 163,590- 95-575- A-
JA2IPE 55,770- 66-282- A-
JA1LXE 40,434- 46-294- A-
JA7JW 36,672- 48-263- A-
JA2LA 33,360- 48-232- A-
JA7ERJ 30,015- 45-224- A-
JA8BYP 25,110- 45-186- A-
JA2FCR 15,768- 36-146- A-13
JA4AEZ 15,674- 34-156- A-
JA2ITH 14,550- 30-164- A-
JA2DXZ 12,093- 29-140- A-
JA1SMA 8613- 27-109- A-29
JA8CCZ 7566- 26- 97- A-19
JA1VTT 6042- 19-106- A-18
JA6GPR 5454- 18-101- A-22
JA4SZ 5280- 22- 80- A-
JA7CQB 4977- 21- 81- A- 7
JA1BNW 4820- 20- 81- A-
JA1SKE 3468- 17- 68- A-
JAØDJE 3240- 18- 60- A-
JA1WWY 3159- 13- 81- A-
JA3LOK 2520- 14- 60- A-49
JA1XRH 2196- 12- 64- A- 6
JA1LGH 550- 5- 37- A-10
JA4FQZ 384- 4- 32- A-
JA1VDA 356- 4- 30- A- 9
JA3LRR 300- 5- 20- A-
JA1BZM 180- 5- 12- A- 2
JA8GR 180- 4- 15- A-
JA2BSD/2 54- 2- 9- A-
KA2NY (K6ZBV, WB6QVS, K9ZYS) 227,520- 96-790- C-80
JA7YAF (5 oprs.) 60,062- 59-342- A-96
JAØYAN (JAs 2DHL 3KUD ØCHI) 16,490- 34-163- A-21

Lebanon

OD5LX 12,300- 41-100- A-

Asiatic Russian S. F. S. R.

UW9OA 152,559- 67-759- B-
UAØLH 89,631- 69-433- A-
UAØAG 86,178- 53-542- B-23
UA9FN 32,292- 46-234- A-
UAØTD 22,002- 38-193- A-
UA9HM 17,353- 37-123- A-
UAØTR 11,362- 26-154- A-15
UAØLS 11,107- 29-128- A-17
UA9BZ 9396- 29-112- B- 8
UA9CC 8568- 28-102- B-
UAØDV 7176- 26- 92- A-
UW9PT 6048- 28- 72- A-
UA9KHA 3312- 24- 46- B-
UAØKCA 3300- 11-100- B-
UAØMD 1584- 11- 48- A-
UWØBA 1554- 14- 37- A- 3
UAØSA 168- 7- 8- A-
UAØKCS 12- 2- 2- A- 1
UAØKFG (6 oprs.) 1,088,256-192-1907- B-
UAØKCO (3 oprs.) 393 822-117-1124- B-
KZB (5 oprs.) 343,710-114-1005- B-96

Turkoman

UH8BO 7482- 29- 86- B-

Uzbek

UI8CD 14,625- 39-125- B-
UI8AI 9828- 39- 84- A-
UI8LL 8004- 29- 75- A-

Tadzhik

UJ8AB 4452- 28- 53- B-

Kazakh

UL7GW 11,349- 39- 97- A-
UL7GR 2016- 21- 32- A-

India

VU2KV 142,434- 82-597- A-
VU2MSK 38,802- 58-223- A-

Ceylon

4S7DA 9472- 32- 99- A-

Israel

4Z4AG 51,408- 51-336- A-
4X4YY 27,615- 35-263- A-
W2PDG/4X 20,511- 43-159- B-18

West Malaysia

9M2LN 51,092- 53-322- A-

EUROPE

Portugal

CT1OI 22,416- 48-168- A-

Germany

DJ5BV 1,160,352-204-2055- B-61
DL6WD 877,965-187-1565- B-
DL4EG 861,300-174-1650- B-53
DJ3WU 515,319-159-1153- A-
DL5JX 265,965-119-745- B-
DL7GK 171,093-107-535- A-
DL8AM 152,562- 94-541- B
DL4AP 127,500- 85-502-AB-30
DJ4UF 96,135- 87-376- B-
DL3CM 79,376- 88-302- B-
DL7NS 73,278- 46-531- A-
DL8CM 71 136- 76-314- A-
DL9EM 70,766- 82-291-AB-
DM3YPD 61,337- 83-249- A-
DJ6OM 41,968- 61-230- A-
DL9YP 37,737- 63-210- A-
DL7NP 34,594- 49-236- B-
DJ2YE 31,824- 51-208- B-
DM3LOG 26,112- 51-173- B-
DJ8SG 24,381- 63-129- B-
DL1JC 18,668- 52-127- A-34
DM3MSF 17,292- 44-132- A-
DM3PA 13,600- 40-117- A-
DJ1LD 10,185- 35- 77- A-
DM3BE 8015- 35- 79- A-
DJ8VG 6237- 21- 99- A-
DM4SBO 2600- 13- 73- C-
DL9PO 1904- 17- 38- A-
DM2CPL 1740- 20- 29- A-
DM3ZIC 1536- 16- 33- B-
DM2CUO 1133- 11- 36- A-
DL7BO 432- 8- 18- A-
DM2CLM 297- 9- 11- A-
DM4WKL 27- 3- 3- A- 1
DL1VU (DL1s KN VU) 1,026,162-186-1839- B-96
DM3GO (2 oprs.) 43 710- 62-238- A-

Spain

EA2DT 248,292-121-684- A-
EA3KT 38,220- 70-182- A-24
EA3NA 19,530- 30-222- A-
EA2CR 12,408- 44- 94- A-
EA2HW 10,125- 25-135- A-
EA2HR 2850- 25- 38- A-13

Republic of Ireland

EI9J 716,047-173-1387- A-

France

F8VJ 530,376-164-1079- A-45
F8ZF 320,634-141-758- A-
F2PO 301,740-141-716- A-40
F8TQ 211,344-112-629- A-20
F8TM 86,130- 99-290- A-
F9RM 41,072- 68-202- A-
F8VO 6003- 29- 69- A-
F9BB 4140- 30- 46- A-

Corsica

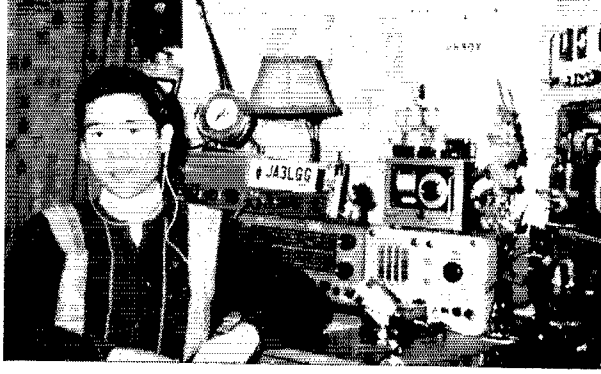
F9VN/FC 94,770- 81-390- A-

England

G2RO 1,362,561-213-2134- A-
G4CP 1,235,406-218-1889- A-
G3FXB 971,319-199-1627- A-
G2DC 502,560-160-1047- A-
G3KMA 342,015-151-755- A-
G3VNR 322,326-141-762- A-
G3ESF 283,290-133-710- A-
G3APN 190,848-112-572- A-80
G3HZL 20,022- 47-142- A
G3RJB 12,180- 35-116- A-17
G6VC (6 oprs.) 1,103,436-204-1803- A-

Famed literary figure W6ISQ searches for buried treasure at **K6DXM.** The phone operation placed second to K6OHJ for NCDXC laurels.

Seems like nobody can make more noise with less power than a JA. Versatile **JA3LGG**, for example, ran 20 watts on phone to amass 203K, then fired up the linear to run 30 watts on c.w. for 249K. Cake was helped by a TA-33 and an inverted Vee.



Guernsey

GC3IEW 957,972-194-1646- A-71

Isle of Man

GD3AIM 35,802- 54-221- A-

Northern Ireland

GI3OQR 1,746,528-226-2576- A-

Scotland

GM5AII 177,840- 95-624- A-
GM5AIW 124,845- 87-480- A-

Wales

GW3JI 139,680- 97-480- A-
GW3ITZ (7 oprs.) 805,680-180-1511- A-

Hungary

HA8UD 148,764- 77-644- A-
HA3GF 127,218- 91-466- A-
HA8UH 58,944- 64-307-AB-
HA8UF 28,590- 50-190- A-
HA3MB 22,230- 57-130- A-
HA8KCC 19,090- 46-139- A-
HA7KPH 9639- 21-153- B-
HA3GA 8418- 32- 88- A-
HA1ZH 8118- 33- 82- A-
HA7LO 2086- 14- 50- A-
HAØLL 297- 9- 11- A- 2
HA5KDQ (6 oprs.) 467-040-139-1120- B-
HA1KSA (multiopr.) 220,476-114-646- B-
HA3KNA (HA3s NB NC) 7,650- 34- 75- B-
HA3KGC (multiopr.) 2,448- 16- 51- A-
HA7KLB (multiopr.) 12- 2- 2- A- 1

Switzerland

HB9UB 1,023,640-163-2167-AB-
HB9JG 900,900-182-1653- B-
HB9DX 307,428-137-748- B-
HB9KC 142,590- 98-485-AB-
HB9AGK 25,112- 43-195- A-12
HB9Z (HB9s AGH AFG QH) 819,156-178-1534- B-

Italy

IIAMO 626,652-156-1347- B-62
IIASE 370,830-141-877- B-63
IIBLF 262,737-111-789- A-
IIPER 105,084- 84-417- B-25

Norway

LAØAD 820,416-192-1426- A-80
LA6U 52,316- 82-213- A-
LA2Q 6480- 27- 80- A-16
LA1P 1953- 21- 31- A- 6

Bulgaria

LZ2KKZ 38,304- 48-266- B-
LZ1YW 25,920- 54-161- A-
LZ2RF 4047- 19- 71- B-
LZ1KSA (2 oprs.) 22,278- 47-158- B-
LZ2KDO (2 oprs.) 21,996- 39-188- A-

Austria

OE4SZW 417,756-124-1124- B-
OE2EGL 47,475- 75-211- B-

Finland

OH3MK 35,319- 61-193- B-
OH6VP 15,255- 45-113- B-
OH3NY 12,558- 46- 91- B-
OH5AA 5363- 31- 58- B-
OH5VT 5166- 21- 84- B-
OH4RH 4956- 28- 59- A-
OH2YL 3042- 26- 39- B-
OH3XZ 3013- 23- 44- B-
OH3MU 1260- 15- 28- B-
OH5QV 714- 14- 17- A-
OH3MM 396- 11- 12- A-
OH2TI (8 oprs.) 1,094,238,186-1961- B-

Czechoslovakia

OK1GT 922,376-182-1691- B-
OK1ARN 208,060-101-693- A-
OK3CEC 189,840- 84-770- A-39
OK1AHZ 173,700-100-582- B-
OK1AOX 133,164- 81-548- A-
OK2QX 127,200-106-400- A-33
OK3CCC 111,930- 91-424- A-
OK2RZ 104,328- 63-552- A-
OK3ER 91,920- 80-383- A-
OK2YF 75,740- 70-394- A-
OK1XW 66,597- 79-293- A-
OK1VB 55,600- 50-371- A-
OK1VK 45,717- 49-311- B-
OK2BHX 30,096- 38-264- A-
OK1TA 16,575- 51-109- A-
OK2BMF 15,372- 42-122- A-
OK2BPF 9486- 31-102- A-
OK1BV 8580- 20-143- B-
OK2BHV 7872- 32- 82- A-
OK1KWR 5616- 24- 78- A-
OK3BT 4221- 21- 67- A-
OK1CIJ 3510- 18- 65- A-
OK1ZQ 2784- 16- 58- B-
OK2KGP 1596- 14- 38- A-
OK1AMI 2451- 19- 43- A-
OK2BIH 1680- 16- 35- A-
OK1EP 897- 13- 23- A-
OK2BFX 384- 8- 16- B-
OK3CDF 379- 9- 14- A-
OK1AKW 210- 7- 10- A-
OK1AVG 3- 1- 1- A-
OK1KTL (multiopr.) 871,401-173-1682- C-

OK3KAP (2 oprs.) 33,966 - 51-222- A-

Belgium

ON4XG 618,168-172-1198- A-41
ON4NM 49,680- 60-276 - A-
ON5TO 8550- 38 - 75- A-

Denmark

OZ1LO 887,184-183-1616- B-
OZ7OF 716,566-173-1383- B-
OZ7BG 575,586-153-1254- B-39
OZ5DX 501,837-161-1039 - B-
OZ7X 180,840-120-505- A-
OZ1W 169,635-129-440- A-40
OZ3PO 105,999 - 89-406- A-
OZ4H 10,656- 32-111- A-22
OZ2UA 1640- 20 - 79- A-
OZ7G 3780- 20- 63- A-

Netherlands

PAØLOU 684,520-157-1499- B-
1,009,428-197-1750- A-58
PAØFLX 45,276- 49-312- A-
PAØVB 27,360- 60-152 - A-
PAØAAC 21,828- 34-214- A-
PAØLO 13,455- 39-115- A-21
PAØJR 3960- 24- 55- A- 6
PAØTA 2346- 17- 46- A-
PAØPT 448- 8- 19 - A-

Sweden

SM5UU 80,631- 93-289- B-57
SM7BKZ 50,292- 66-254- B-
SM5ZZ 46,176- 74-208- B-
SM3CXS 28,800- 48-200- B-
SM6CER 18,564- 42-148- B-
SM5BNX 17,550- 39-150- B- 8
SM5BDS 13,248 - 46- 96- B-19
SM5XX 7140- 35- 68-AB-
SM7BBV 5394 - 29- 62- B-
SM1CJV 5049- 33 - 51- B-
SM1CXE 324- 9- 12 - A-
SM6CKV (7 oprs.) 1,351,560-210-2327- B-68

Poland

SP3AIJ 182,834-113-540- A-
SP8AG 97,632 - 72-459- B-
SP8BAJ 12,804- 58-246- A-
SP6AEG 13,923- 39-120- B-
SP8MJ 5880- 28 - 70 - B-
SP7GH 4212- 26 - 54- B- 5
SP9NH 2952- 24 - 41- A- 7
SP6BAA 2040- 17- 40- B-
SP2PI 1596- 14- 39- A- 3
SP9AGS 924- 14- 22- A-
SP3BES 36- 3 - 4- A-
SP9AQY 60 - 4- 5- A -
SP9DH (2 oprs.) 38,999- 59-221- A -

Greece

SVØWP 518,190-115-1502- C-

Iceland

TF2WKS 17,556- 44-133 - A-

European Russian S.F.S.R.

UA1ZL 84,660- 68-415- A-
UA1KUZ 64,386- 73-294- A-
UA1IA 63,216- 48-439- A-
UA1KUA 43,719- 59-250- B-
UA1DH 33,516- 57-196-AB-
UA1ZW 27,648- 48-192 - B -
UA4SG 13,578- 31-146- B-
UA1ZX 12,834- 46- 93 - A-
UA1KMF 10,647 - 39- 94- B-
UW3HV 8466 - 34- 83- A-
UW3CM 4929 - 31- 53- B-
UA1TL 4788 - 28- 57- B-
UA1TQ 4125 - 25- 55- B-
UA3TA 3885 - 21- 62- A-16
UA6KLA 2394 - 19- 42- A-
UA4QQ 1260 - 10- 42 - A-
UA3BK 1254 - 11- 38- A-
UW6AO 828- 12- 23- A-
UA3FK 720- 12- 20- A-
UA3MV 693- 11- 21- A-
UA3CO 120- 5- 8- B-
UA4HA 30- 2- 5- A- 1
UA6ACA 45- 3- 5- A-
UA4ZA 3- 1- 1- A- 1
UA3KBO (2 oprs.) 166,050- 82-675- B-37
UA4KHW (2 oprs.) 103,194- 91-378- B-
UA1KAG (3 oprs.) 73,125 - 75-326- B-
UA1KAC (3 oprs.) 68,112- 66-344- A-
UA1KFT (3 oprs.) 21,543- 43-167 - B -
UA6KOE (2 oprs.) 17,325 - 35-165- A -
UA6KBS (3 oprs.) 11,232- 36-107- A-
UA1KCU (3 oprs.) 3243- 23 - 47- A-
UA3K1B (2 oprs.)

Kaliningradsk

UA2CA 65,475- 75-291- A-
UA2DM 54,621- 63-289- A-
UA2WO 5382- 26- 69- B-
UA2KAP (2 oprs.) 54,096- 49-368- B-

Ukraine

UB5TR 45,225- 67-228- B-
UB5MZ 10,902- 23-158- A-
UB5DW 6400- 25- 86 - B-
UB5KNF (UY5RV, opr.) 576- 8- 24- A-
UB5UR 84- 4- 7- B- 1
UB5KBA (3 oprs.) 288,214-106-907- B-
UB5KKA (2 oprs.) 146,034- 63-827- B -
UB5KED (3 oprs.) 126,132- 92-457 - B-96
UB5KFF (3 oprs.) 119,000- 85-467-AB-
UB5KAW (multiopr.) 34,968- 47-248- B-
UT5KDP (3 oprs.) 7800- 26-100 - A-

White Russian S.S.R.

UC2KSB 96,120- 89-360- B-
UC2SE 36,018- 58-207- A-
UC2WY 6831- 33- 69- A-
UC2DN 360- 8 - 15- A-
UC2CY 54- 3- 6- A- 1

Second place among Italy's mikesmen went to **IICAQ**, whose 41-hour stint resulted in 1405 log entries. To cut down on the "marathon" aspect of the brawl, Al would like to see a limit of two QSOs per multiplier per band.

UC2KMZ (3 oprs.)
14,070- 35-134 - A-

Azerbaijan

UD6AX 1540 - 14- 37- B-
UD6BW 120- 5- 8- A- 2

Armenia

UG6EA 1998- 18- 37- A-
UG6JJ 756- 12- 21- A-

Lithuania

UP2KBA 22,002- 38-193- B-
UP2BU 36- 3- 4- A- 1

Latvia

UQ2KBC 1620 - 18- 30- A-
UQ2PM 420 - 10- 14- A-
UQ2KBE 162- 6- 9- A-
UQ2KCR (3 oprs.)
164,739- 89-617- B-

Rumania

YO3RF 13,717- 29-158 - B-15
YO2AFB 2640- 16- 55- A-
YO8GP 288- 8- 12- A-
YO9HI 27- 3- 3- A- 1

Yugoslavia

YU1SF 27,507- 53-174 - A-50

YU1KO 6003- 29- 69- A-
YU1BCD (YU1s HQW PCF QBC) 1,061,226-174-2035- B-76

I.T.U. Geneva

4U1ITU (DJ2SL, WØAV)
60,102- 53-378 - C-

NORTH AMERICA

Dominican Republic

HI8RV 853,142-163-1802- A-
HI8LC 542,358-174-1041- B-
HI8IBC 365,562-138-887- A-
HI7JMP 106,425- 75-473 - A-

Panama

HP1XHG
1,662,336-234-2368-BC-64
HP1BR 320,640-128-835 - B-
HP1LR (4 oprs.)
351,120-154-760- A-

Alaska

KL7IR 1,154,592-228-1688-AC-46
KL7FRZ 210,273-119-589- B-

Virgin Islands

KV4AM 60,630- 86-235- C- 5

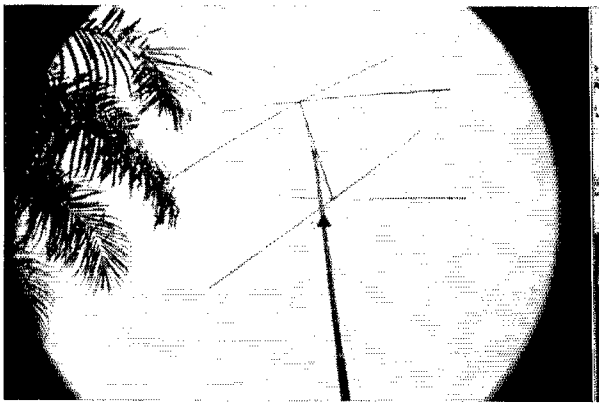
Canal Zone

KZ5GN 280,407-151-619- A-

Over 300 QSOs/band—DX

	80	40	20	15	10
CN8FV			363	1163	
CR6GM				556	
CR6GS				524	721
CR7DS				388	443
EL2E			433	411	423
ET3FMA*			355	448	
ET3USA*			690	692	
ZD8HAL			463	685	416
ZE8JY				319	484
ZS6BMD					592
ZS6DW			678	682	1155
ZS6RM			418		388
5H3KJ			370	563	486
5N2AAF				397	721
7P8AR			781	843	483
EP3AM			906	410	333
JA1BAR				301	349
JA1CG				308	
JA1DXE			401		
JA1NDO				369	460
JA2JAA			385	360	379
JA3CXN					374
JA3GZN					360
JA3LGG					440
JA6ATY				368	429
KA2JP					416
KA5MC				847	
KA7AB				1046	640
KA9MF*			640	611	787
VU2DKZ			378		
ZC4CN			555	349	1224
4Z4HF			770	300	
CT1BH			446	745	81
CT1LN			338		68
CT1MW			385	887	74
DJ5BV			558	1014	95
DJ5GI				507	334
DJ5IH				563	
DJ6QT			550	1120	1126
DL1LK					542
DL4AP*			575	635	318
DL4DK				399	
DL4EG			463	1032	698
DL4RAI*			545	1345	490
DL5JX				315	
DL9KM					499
DLØWR			1189	1459	146
EA3JE			1270	1105	65
EA3QW				706	1170
F2SI			407	689	860
F5OJ*				442	558
G3IAR			419	697	662
G3KMA					681
G3SMF*			540	814	840
G3WWO*			751	1394	779
G4JZ			370	737	886
G6LK					762
GB2SM*			868	1220	631
GW3NWV					467
HG2KRD					1003
HB9AF				881	1037	396
HB9BZ					341
HC1AQ			463	550	390
HC2W*			492	500	654
HI1AG				368	
HI1RIZ				385	
LAØAD				685	734	633
OE2EGL				636	781	727
OH2BH				939		
OH5SM*				1763	1413	765
OK1MP					375	
ON4XG					421	452
ON4ZU				350	493	483
ON5GF					591	358
OZ1LO					691	480	573
OZ1RH							479
OZ2KT							446
OZ5JT					565	555	
OZ7DH*					526	566	820
PAØXPQ					458	660	616
SM4CMG					553		403
SM5EAC					678	391	443
SM5ZZ							427
SM6AEK					587	305	354
SM6CAS*					1814	1071	986
SM7CRW					511		
SP5AKG						386	
SVØWL					546	568	620
UA2KBD*					448		
UA3HO					529	438	
UA3KBO*					1320	689	308
UA4KHW*					483		
UB5WF						833	
UP2OV							439
YO8RA							598	
YU1LC					757	436	
YU1JC					407	768	629
KL7AIZ*					418	858	1073
KL7EFR							496
KP4CSW					820		
KP4DBJ						401	632
KP4DBU*					470		
KV4AM					699	742	1165
KV4EY					430	307	
KZ5EH					492		
KZ5NF					379	1035	511
TG9UZ					939		
VP2AC						554	452
VP7NA					455		
WE1AC*					905	1008	1531
WE1AE					476	777	1151
WE2PTBC*			449	783	1454	1555	1629
YN1TP							423
YS1XEE					1005	1687	1584
DU1FH					843	385	481
KG6AAY*							416
KØLI/KG6						783	685
KH6BZF					455	501	1690
KH6GCF*							390
KH6GJW							626
KH6GLJ						363	371
KH6IJ					1057	1256	2422
VK2APK					944		702
VK2FU*				333	1368	626	1100
VK3ATN					674	325	487
VK3AXK					368		
VK4JE							563
VK9GN							655
VR3DY					601	572	579
ZL1AGO					843	470	529
5W1AS					311	450	892
5W1AT					859		451
CE6EZ					1084	944	1239
CEØAE*					575	672	
HC1PC					409	577	747
HC4TB					465	517	1195
HK3RQ					1297	1403	1875
HK5BDS					596	531	
KC4USM					792	732	
LU3EX							1060
OA4JR					723	635	845
OA6BU					360	495	751
PY1CK					326		
PY7AKQ					677	712	971
8R1G					570	556	1316
9Y4LA						506	385
9Y4LO					479	607	

*Multioperator station.



TJ1AL was a popular item on 21-MHz. phone with a homebrew 3L quad 35′ skyward; Gerard and friend are at right. S.s.b. and a triband quad arrived too late for Test purposes.

Sint Maarten

PJ5MJ (PJ2ME, W2BBK) 560,205-177-1055- A-

British Virgin Islands

VP2VL 3,084,300-298-3450- B-

Bahama Islands

VP7DX 1,263,339-231-1823- A-32

Mexico

XE2AAG 1,655,698-233-2370- A-

El Salvador

YS1O 10,800- 48- 75- C- 3

OCEANIA

Guam

KØLLI/KG6 49,104- 66-248- C-11

KG6AAY (K8RXD, W6EIF) 58,536- 72-271- C-11

Hawaiian Islands

KH6IJ 3,051,270-270-3767- C-69

K2SIL/KH6 1,401,048-244-1914- C-27

KH6AA 4500- 25- 60- A- 9

Australia

VK2EO 1,962,900-225-2908- A-73

VK3APJ 1,271,411-199-2133- A-83

VK3AXK 528,372-156-1129- A-42

VK5FM 274,701-127-721- A-

VK4FH 223,587-117-637- A-48

VK2VN 140,784-112-419- A- 9

VK5FH 100,332- 54-620- A-

VK4QM 68,100- 50-454- A-

VK2AND 30,912- 56-186- A-

VK5KO 4950- 33- 50- A- 3

VK3QV 3940- 20- 66- A- 5

VK3APN (VK3s APN OP QK) 179,760-105-571- A-

Territory of New Guinea

VK9GN 233,376-136-572- A-

Fanning & Christmas Is.

VR3DY 37,620- 57-220- A-

New Zealand

ZL1AFW 519,048-162-1068- A-45

ZL1HW 514,608-142-1208- A-

ZL1AMQ 334,995-115-971- A-55

Samoa

5W1AT 1909- 23- 28- A-

SOUTH AMERICA

Chile

CE2CR 143,397-113-430- A-

Uruguay

CX1OP 48,960- 72-227- A-

CX1BBV 39,840- 40-332- A-

Colombia

HK3RQ 3,230,166-263-4095- C-

HK3BAE 2,638,725-233-3775- B-58

HK3ASJ 25,772- 34-253- A-

Antarctica

KC4USM 467,775-135-1155- C-49

Argentina

LU8DQ (4 oprs.) 2,210,264-232-3200- C-86

Peru

OA4PF 1,163,076-206-1882-BC-

Brazil

PY2SO 2,809,131-247-3956- C-70

PY2BGL 2,603,259-243-3598- C-

PY1NO 638,608-167-1278- A-

PY1BCA 171,304- 92-622- B-

PY2BBO 170,046- 94-603- A-

PY1CKV 6642- 27- 82- A-

Surinam

PZ1AH 2,074,698-237-2921- A-

Venezuela

YV1OB 999,775-203-1643- B-61

YV5AGD 779,259-169-1537- B-

YV1DP/5 608,130-145-1398- B-28

YV5BOA 480,187-127-1261- C-

Trinidad & Tobago

9Y4LA 315,248-136-778- A-

QRP CHAMPS

(150 Watts or Less at All Times)

C.W.		Phone	
W4BRB	695,156	WA1DJG	434,340
W8QXQ	407,700	VE2NV	373,434
VE2NV	361,020	W8ECA	344,925
W6GEN	311,298	K4OLC	310,128
W4CRW	285,600	VE2BV	300,300
W2HUG	281,184	W4DQD	287,532
W2DKM	250,860	W2DKM	262,980
W2HDW	250,056	K1THQ	252,480
W1DXB	215,712	WA1ANR	249,948
WB2RKK	208,824	WA4UXU	237,357

PHONE SCORES

ATLANTIC DIVISION

Delaware

W3DRD 75,327-119-211- C-33

WA3HD 1296- 18- 24- B-12

WA3GSM 1170- 15- 26- A- 6

W3IYE (K3KOZ, W3IYE) 203,940-165-412- C-50

Eastern Pennsylvania

W3WJD 1,326,150-350-1263- C-83

W3GM 655,134-274-797- C-50

K3JH (K3JLI, opr.) 601,398-258-777- C-80

W3MWC 386,529-221-583- C-48

K3FGO 256,680-155-552- C-24

W3BYX 251,991-183-459- C-47

K3QDV 216,630-145-498-AC-68

W3GHM 187,014-142-439- C-32

K3PSW 186,588-146-426- C-44

WA3ATX/3 167,400-150-372- A-62

W3GRS 150,804-177-284- C-14

W3CGS 150,150-154-325- C-42

W3EQA 127,463-139-307- B-31

W3ALB 121,764-139-292- C-31

W3NOH 81,144- 98-276-AC-16

W3KDF 72,750- 97-250- C-25

W3AFC 70,296-101-232- C-25

W3WPG 63,933-101-211- -

W3ECR 61,200-102-200- A-31

W3CAA 56,682- 94-201- C-20

W3VHV 56,430- 99-190- C-12

WA3FQJ 50,912- 86-198- -24

W3INH 43,011- 81-177- C-15

W3GHD 29,520- 82-120- C-

WA3GUL 20,400- 50-136- A-27

W3YUW 20,130- 61-110- C-

WA3GLI 15,141- 49-103- A-30

W3NM 15,066- 54- 93- C- 8

W3EAD 8064- 32- 84- A- 9

W3CBF 2871- 29- 33- A- 4

K3MNT 975- 13- 25- C- 2

K3EUR 900- 15- 20- A- 7

K3GYS 576- 12- 16- A- 2

W3EAN 351- 9- 13- C- 2

W3KT (K3MCO, W3KT) 526,176-252-696- C-

W3GHS (K3YOV, W3GHS) 451,143-217-693- C-64

K3BNS (K3BNS, W3DHM) 327,698-178-615- C-53

Maryland-D.C.

W3BQN 682,722-269-846- C-88

W3FYS 293,763-181-541- B-

W3BWZ 279,600-200-466- B-42

W3GRF 186,372-167-372- C-30

W3AXW 185,562-183-338- C-69

W3AYD 164,754-162-339- C-33

WA3GTX 156,372-157-332- A-

W3KDD 148,050- 94-525- C-33

K3VAB 104,949-117-299- C-65

W3HVM 101,106-123-274- B-50

WA3DCG 80,250-161-166- C-33

K3AHB 62,916-107-196- C-28

WA3JEA 30,750- 82-125- C-12

W3PWO 22,791- 71-107- C-14

WA3GLP 19,314- 58-111- A-30

W3FX 14,706- 57- 86- C-13

K3CBW 3600- 30- 40- C- 6

W3CSZ 1767- 19- 31- A- 4

W3AWN 1584- 22- 24- C- 8

W3RNY 1350- 18- 25- C- 3

W3ZKH/3 (9 oprs.) 4,841,424-504-3202-C-96

W3MVB (W3s FA MVB) 357,600-200-596- C-51

W3GN (W3s GN KMV) 341,496-216-527- C-73

WA3EPT (6 oprs.) 237,120-190-416-AC-67

K3JYZ (K3LCH, W3DVA) 126,630-134-315- C-43

Southern New Jersey

K2QIL 353,832-184-641- C-65

W2CME 280,419-211-443- C-70

W2QKJ 260,610-170-511- C-

W2BHK 246,627-201-409- C-50

K2PZF 228,126-193-394- C-63

W3UNJ/2 105,000-125-280- C-42

WA2IZS 83,187-117-237- B-

W2QDY 80,256- 88-304- B-

WB2SCK 77,256-111-232-AC-28

WB2BYF 76,612-107-239- C-25

W2DMR 70,596-106-222- C-30

W2HXF 59,724- 84-237- B-63

W2SDO 40,689- 99-137- C-60

W2ZUL 31,374- 63-166- C-35

W2PJC 25,740- 65-132- C-14

K2CPR 25,200- 70-120- A-

WB2EUH 21,450- 55-130- A-

W2ORA 21,240- 59-120- A-17

WB2RVX 15,582- 53- 98- C-12

W2FHY 13,311- 51- 87- B-56

K2SQM 11,562- 47- 82- B-12

WB2MNM 7068- 38- 62- A- 5

K2AA (W2FYS, opr.) 6150- 41- 50- A-18

WA2BZV 6090- 29- 70- B-12

W2PFQ 3810- 32- 40- B-14

W2OWA 3120- 26- 40- C-14

WB2UVB 2520- 21- 40- A- 5

W2HDW 1836- 18- 34- A- 4

K2MKD 900- 15- 20- A- 3

W2PAU (W2s ESX PAU) 160,054-158-338- B-49

WB2ZJR (WB2s WRP ZJR) 19,215- 61-105-AB-30

W2GGT (W2s GGT SDB) 9504- 44- 72- C- 4

Western New York

W2FZJ 348,153-237-510- C-50
K2DJD 332,904-194-572- C-62
WB2YQH 301,800-200-503- C-51
K2KNV 95,760-133-240- C-28
W2SSC 85,068-102-278- C-20
K2GXI 70,455-105-224- C-42
WA2CYQ 54,747- 79-231- B-22
WA2BEX 50,007- 79-211- B-17
W2FXA 23,328- 72-108- C- 8
WB2WSP 21,825- 75- 97- A-
W2EJ 20,160- 60-112- C-15
WB2SJT 2412- 22- 37- A- 9
WA2OIL 867- 17- 17- A-15
WB2HZG (WB2s ERE HZG) 155,820-140-371- C-37

Western Pennsylvania

W3BVP 273,513-173-527- B-44
WA3GJU 102,555-129-265- A-26
W3QZH 92,520-120-257- C-49
W3OJW 45,465-105-149- A-
WA3ENR 45,408- 86-176- A-40
K3AKR 23,184- 69-112- C-44
K3PZU 14,396- 59- 82- C-16
WA3EJG 11,742- 38-103- A-46
K3HKK (K3AHT, opr.) 11,610- 43- 90- B- 4
W3KVS 9288- 43- 72- A-30
W3VK 7236- 36- 67- -
WA3EFH 3645- 27- 45- C-15

CENTRAL DIVISION

Illinois

W9BZW 556,920-255-728- C-65
W9QQN 444,744-261-568- C-60
W9JJV 186,465-155-401- C-65
W9DWQ 159,390-161-330- C-26
K9ZJV 166,848-158-352- C-53
K9BJM 132,132-143-308- B-57
WA9TFM 105,570-138-255- A-
W9QLD 88,059-149-197- C-36
W9FIU 81,153-127-213- C-37
K9DTZ 80,496-129-208- C-38
WA9HJM 68,355-105-217- A-51
W9GFF 64,092-109-196- C-42
W9ARV 58,500-100-195-AC-32
WA9NFL 52,143- 91-191- A-34
K9QFR 48,654-102-159- B-18
K9KOD 41,496- 91-152- C-26
W9WYB 34,800- 80-145- C-
K9KDI 33,150- 78-142- A-
WA9NJB 27,537- 67-137-AB-24
WA9TUM 26,130- 67-130- A-12
W9JJT 19,764- 61-108- C-20
K9IDQ 19 404- 66- 98- B-
W9CRN 18,156- 68- 89- B-
K9UCR 16,611- 49-113- -
W9WKU 11,076- 52- 71- B-10
W9EVX 8772- 43- 68- A-14
K9MNT 5850- 39- 50- A-19
WA9UHD 585- 13- 15- A-15
W9BGX (K4HNA, K9WEH, W9ICE) 1,033,604-338-1020-C-96
W9EXE (K9YOE, W9EXE, WA9RAT) 991,452-319-1036-C-92

DIVISION LEADERS

	C.W.		Phone	
Single Operator	*Multioperator*		*Single Operator*	*Multioperator*
W3WJD	W3TMZ	*Atlantic*	W3WJD	W3ZKH/3
W9AQW	W9YT	*Central*	W9AQW	W9BGX
WØBLZ	WAØCJU	*Dakota*	WAØCPX	WØLOL
W5IOU	.....	*Delta*	W4NBV	WA5RMC
W8SH	WA8MCR	*Great Lakes*	W8SH	W8NGO
W9WNV/2	K2AHQ	*Hudson*	W2JSX	WB2CKS
WØTDR	.....	*Midwest*	WØLBS	WØBAA
K1DIR	W1MX	*New England*	K1DIR	WA1DCE
W7DV	W7SFA	*Northwestern*	W7ESK	W7SFA
W6HVN	K6DXM	*Pacific*	W6WX	K6OHJ
W4KFC	W4BVV	*Roanoke*	K8YBU	WA4HTR
WAØCVS	.....	*Rocky Mountain*	K7RAJ	WØICH
K4BAI	W4ZXI	*Southeastern*	W4QBK	WA4QPL
K6NA	W6RW	*Southwestern*	W6RR	W6CCP
W5JAW	W5EQT	*West Gulf*	W8KTR	W5AC
VE2YU	.....	*Canadian*	VE3BHS	VE3FHO

K9PPJ (K9PPJ, WA9UFV) 118,011-139-283- C-30
W9YYG (W9YYG, WA9s NVF QNU) 15,552- 54- 96- C-14
K9QFZ (K9S QFZ RJP) 7385- 35- 71- A-20

Indiana

W9AQW 979,209-297-1099-C-79
K9TZH 760,674-291-872- B-80
W9ZRX 711,072-288-823-BC-79
K9CUY 705,740-284-829- C-87
W9LKI 355,506-193-614- C-57
W9JQD 295,236-236-417- B-36
K9FAP 237,354-179-442- C-
W8CPO/9 51,000-100-170- A-45
W9MUR 33,465- 97-115- C-
K9BUG 33,352- 88-127- B-22
W9UEM 31,833- 81-131- A-19
K9ODF 10,395- 55- 63- A-27
K9VQK 7695- 45- 57- A-32
WA9TJK (K9DVZ, WA9s ONZ TJK) 131,672-133-330- A-34
WA9SXR (WA9s RLM SXR VXT) 40,545- 85-159- A-

Wisconsin

W9EWC 896,148-292-1023- C-72
W9DUB 639,132-241-884- C-90
W9RQM 221,160-152-485- B-40
W9GIL 199,800-150-444- C-
WA9JDT 67,035-109-205- C-28
WA9ETL 35,421- 82-144- A-33
W9ODD (W8APN, opr.) 23,424- 64-122- C- 9
W9GMV 10,972- 52- 71- B-10
WA9NSR 2088- 24- 29- A- 8
W9CIA 1764- 21- 28- A-
WA9JDK 630- 14- 15- B- 4
W9WEN 231- 7- 11- A- 4
W9YT (4 oprs.) 679,758-277-818- C-68

DAKOTA DIVISION

Minnesota

WAØKDI 232,800-194-400- C-62
WAØGCP 216,300-175-412- C-45
WAØLDK 142,884-147-324- C-42
WØIJM 140,220-164-285- C-41
WAØOZB 18,048- 64- 94- B-24
WAØEPG 13,959- 47- 99- A-20
WØAA (WAØSEN, opr.) 5856- 32- 61- C-10
WAØRUE 1848- 22- 28- A-25
WØLOL (WØs LOL PAN) 715,680-284-840- C-
WAØCJU (9 oprs.) 450,288-236-636- C-
WAØNOJ (4 oprs.) 118,706-122-343- B-55

North Dakota

WAØPPK 1008- 16- 21- A- 4

South Dakota

WAØCPX 288,768-188-512- C-
WØACT 61,380- 99-208-AC-64

DELTA DIVISION

Arkansas

WA5LLX 92,907-111-279- B-88
WA5RTG 90,171-129-233- C-42
WA5SDT 89,010-129-230- A-51
K5BLV 297- 9- 11- A- 7

Louisiana

W5KC 319,815-207-515- C-60
W5AJY 310,635-195-531- C-55
W5LDH 91,575-111-275- C-
WA5RMC (WA5s OZH RMC) 45,675- 87-175-AB-25

Mississippi

WA5RCM 112,464-132-284- B-40
W5MUG 54,609-109-167- -
K5EXW 43,992- 94-156- C-40
K5MDX 38,880- 90-144- A-14
WA5OYU 37,224- 88-141- B-38

Tennessee

W4NBV 619,776-269-768-BC-80
W4PEW 277,500-185-500- C-34
W4OGG 60,075- 75-267- B-28
W4ZFJ 2538- 18- 47- B- 4

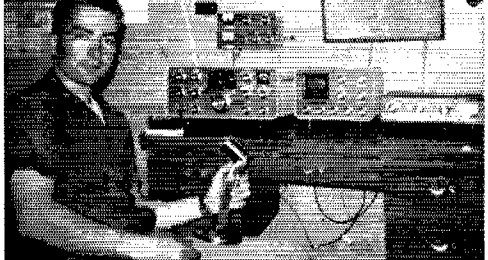
GREAT LAKES DIVISION

Kentucky

WA4LMD 539,358-241-746- C-59
W4CVT 29,484- 91-108- A-21
W4FIN 23,400- 65-120- C-12
W4ZXR 17,136- 68- 84- B-
K4ZQR 168- 7- 8- C- 2
W4BCV 6- 1- 2- C- 1

Michigan

W8SH (K1ZND, opr.) 1,079,154-334-1077- C-75
W8TWA/8 444,465-249-595- C-87
K8BGZ 155,811-167-311- C-
W8RXY 153,117-159-321- C-
W8KSR 76,398-107-238- C-30
W8QQL 70,305-109-215- C-
W8RVD 62,274- 97-214- C-
WA8OSL 51,894- 93-186- B-18
W8HXZ 33,726- 77-146- A-40
W3TBF/8 31,098- 73-142- C-16
W8DQL 23,010- 65-118- C-11
WA8CGN 18,900- 63-100- B-30
W8FRJ 12,936- 49- 88- C-15
W8EEZ 12,561- 53- 79- C-24



Alaska's top dogs (huskies, of course) were phone op **KL7GAC** *(left)*, who QSOd 1194 people in 45 hours, and Morse whiz **KL7IR** *(right)*, with 1688 contacts in 46 hours. GAC has been transferred to North Carolina, will be on the wrong end of pileups next year. IR built W1CER's "Softenboomer 160" (August 1966 *QST*) but had to listen to KH6IJ working multipliers on 1.8 MHz. that Marty couldn't even hear.

W8TWJ 11,664- 18- 81- C- 9
W8JAE 6825- 35- 65- C-10
WA8MGO 3192- 28- 38- A-30
W8MNR 2115- 23- 35- B- 9
W8EXP 693- 11- 21- A- 5
W8NGO (4 oprs.)
957,177-303-1057- B-
K8HPS (9 oprs.)
22,374- 66-113- -
W8NDM (W8NDM, WN8YHB)
510- 9- 20- A- 4

Ohio

W8LXU 374,976-217-576-AB-60
W8ECA 344,925-219-525- A-63
K8AXG 342,042-218-523- B-70
WA8MCR 319,032-211-504- C-51
K8CFH 303,195-205-493-AC-
W8DKI 276,450-191-475- C-69
W8BF 241,686-174-463- C-43
W8HYV 230,850-190-405- C-79
W8CXR 201,372-173-388- C-71
W8GKA 155,124-124-417- B-16
W8HBR 120,096-144-278- C-22
W8WUO 115,920-120-322- C-30
WA8NYB 88,893-119-249- B-44
K8GVK 85,365-105-271- B-43
W8YGR 80,010-127-210- A-20
W8OKF 77,556- 92-281- C-55
WA8KPO 76,002-106-239- C-22
W8NPF 71,190-113-210- C-37
W8TQL 54,810-105-174- B-36
W8JAQ 51,759- 81-213- C-26
W8OG 41,124- 92-149- B-12
K8BSM 40,020- 92-145- C-15
W8IJZ 37,908- 81-156- A-10
W8QXQ 34,365- 79-145- A-14
W8BVF 31,968- 72-148- C-16
WA8TYF 30,660- 70-146-AC-11
W8AJW 29,502- 66-149- A-21
W8IPA 23,328- 72-108- C-48
WA8SLW 20,790- 66-105- A-18
W8PCS 20,679- 61-113- A-11
W8NHO 18,144- 56-108- B-47
WA8RXU 17,484- 62- 91- B-21
W8VZE 14,952- 56- 89- A-15
W8DZG 12,726- 42-101- A-20
WA8TKM 10,716- 42- 76- A-17
WA8WHN 9516- 52- 61- A-29
W8AQZ 9159- 43- 71- A-14
W8GMK 8526- 42- 58- B- 8
W8DWP 7344- 48- 51- A-17
W8RZG 6588- 36- 61-AC-
WA8SLL 3510- 30- 39- A-11
K8MMH 1953- 21- 31- A-12
WA8LVT 1890- 21- 30- A- 5
W8SZF 1836- 17- 36- B- 5
K8BPX 1800- 20- 30- C- 2
WA8ZGC 1800- 20- 30- B-
W8NBQ 1404- 18- 26- A- 7
K8PYD 816- 16- 17-AC- 3
W8HQX 630- 14- 15- A- 6
K8PXD 75- 5- 5- A-
K8KKF 72- 4- 6- B- 1
W8ZJM (K8JYP, W8ZJM)
120,324-148-271- B-22
W8EDU (WA3BGE, W8AZA, WA8MGI)
69,930-111-211- C-20

HUDSON DIVISION

Eastern New York

WB2ZMK 302,304-188-536- B-60
WB2PPP 263,760-157-560- C-36
W2AMK 114,210- 94-105- A-
WB2MOI 61,677- 89-231- C-
W2AH 34,380- 60-191- C- 8
W2GTQ 7488- 32- 78- B-11
W1BGD/2 5100- 34- 50- C- 5

N.Y.C.-L.I.

WA2CFD 407,904-224-667- C-49
WB2FON 370,266-202-611- B-42
W2CP 311,085-223-465- C-54
W2DKM 262,980-180-487- A-58
W2FSK 232,128-156-496- C-60
WB2UZU 226,320-164-460- A-40
WB2ZTQ 213,192-189-376- B-42
W2WZ 190,560-160-397- C-56
W2GKW 150,837-137-367- B-15
W2LEJ 150,672-146-344- B-75
WB2ZTH 146,316-137-356- A-63
W2GKZ 97,020-147-220- C-16
W2YCW 85,680-119-240- C-26
W2AZS 51,840- 96-180- C-34
WB2OBO 28,050- 85-112- A-20
WB2YKL 26,112- 68-128- A-12
WA2UWA 22,113- 63-117- B-20
W2ZV 20,412- 51-126- A-35
WB2ZBM 18,468- 54-114- C-14
WB2ZIN 12,375- 45- 92- B-20
W2TUK 11,664- 48- 81- A- 6
W2RDD 8100- 36- 75- C- 7
W2KGN 7938- 42- 63-BC-10
WB2VBQ 4928- 32- 52- B-10
W2CKR 4620- 28- 55- A-11
WA2JKT 3393- 29- 39- A- 6
WA2LQO (WA2JKT, opr.)
468- 12- 13- C- 3
WA2KSD 294- 7- 14- C- 3
W2JB 30- 2- 5- A- 1
WB2CKS (WB2s CKS VBT)
830,636-281-986- C-70
WB2ZYY (7 oprs.)
189,805-145-438- B-96

Northern New Jersey

W2JSX 665,847-271-819- C-75
W2JKH 383,130-215-594- C-
W2FFQ 161,553-157-343-BC-48
WA2VSQ 122,112-128-318- B-48
K2DNL 120,414-141-286- C-42
WA2IFS 69,915- 79-295- A-49
W2FCR 56,448- 98-192-AC-35
WB2OUZ 54,600- 91-200-BC-30
W2IUV 32,706- 79-138- C-23
W2CTY 28,350- 70-135- B-19
WB2WID 24,705- 61-135-AB- 8
W2MNW 9102- 41- 74- A-20
WB2YBA 8127- 13- 63- B- 7
WB2AMV 6270- 38- 78- A-12
WB2YJS 6156- 38- 54- B- 5
F3VN/W2 3432- 26- 44- B- 9
WB2RKK 675- 9- 25- A- 1
WB2ZKD 75- 5- 5- A- 2
WB2SQN (6 oprs.)
176,748-228-697- B-72
K2BPP (5 oprs.)
178,670-170-351- C-32

MIDWEST DIVISION

Iowa

WØLBS 523,776-256-682- C-62
KØUKN 329,511-221-497- C-60
KØYVU 188,082-162-387- A-58
WAØIRP 110,160-135-272- C-42
WØBVR 26,566- 74-120- B-22
WAØJOK 13,110- 46- 95- A-17
KØIIR 1296- 16- 27- -
WØASU (WØs KBG PKH)
136,770-211-690- C-90
WØTYK (4 oprs.)
304,500-203-500- C-96

Kansas

WØYUQ 480,690-218-735- C-
WØSEA 288,204-188-511- C-58
WØIEM 256,224-157-544- B-62
W9ECV/Ø 111,245- 95-395- C-40
WØPAH 70,914-106-223- C-36
WØBAA (WØBAA, WAØMSD)
528,759-231-763- C-63

Missouri

WØLBB 300,696-187-536- C-72
WØCNX 271,281-188-481- B-58
WØLQN 77,871-101-257- C-48
KØJPL 61,812-102-202- B-15
KØYIP 41,322- 97-142- A-26
WAØELM 24,552- 66-124- A-12
KØGSV 21,528- 69-104- C-18
WØDSW 5508- 36- 51- A- 8
WØUCK 2310- 22- 35- C- 6
WAØSXV/Ø 1404- 18- 26- C- 2
KØBXI (4 oprs.)
55,890- 81-230-AC-42
WAØEMS (WAØEMS, WNØTSI)
31,236- 76-137- C-10

Nebraska

WAØLXD 62,208- 96-216- A-40
KØLFA 19,872- 46-144- C-
WAØOVL 741- 13- 19- C- 6
KØCVA (KØs BLT CVA, WAØMOB)
512,568-252-678-C-

NEW ENGLAND DIVISION

Connecticut

W1OKG 840,924-284-987- C-86
W1BIH 676,736-272-870- C-58
WA1DJG 434,310-228-635- A-59
K1VTM 362,388-202-568- C-65
K1THQ 252,480-160-526- A-50
K1GUD 222,762-137-542- C-30
K1JHX 167,400-155-360- B-20
K1DPB 87,756-103-284- A-
W1CW** 76,053-101-251- C-30
W1CNU 67,803- 97-233-AB-18
WA1IED 57,459-107-179- A-23
K1CEC 51,300- 90-190- C-20
W1QV 34,020- 70-162-AC- 9
W1DIT 31,374- 83-126- C-32
WA1EJU 30,102- 58-173- A-10
K1HTV 23,718- 59-134- A-
W1ICP** 22,815- 65-117- C-15
W1ECH 20,496- 56-122- A- 8
W1UKE** 17,820- 60- 99- C-
K1TKS 14,628- 46-107- A-16
W1ARR/1**
14,100- 47-100- C- 7
W1LVQ** 9600- 16- 70- A-10
WA1CJE 7788- 44- 59- A- 5
W1AYR 4698- 27- 58- - 3
WA1CYT 4450- 25- 60- A- 4
WA1HNR 2625- 25- 35- B- 3
WA1CJE/1 1725- 23- 25- A- 2
W4NQA/1** 1566- 18- 29- A- 4
W1EEN** 351- 9- 13- A-
W1EJL 312- 8- 13- A-
W1YYM** 6- 1- 2- C-

Eastern Massachusetts

K1DIR 1,445,745-343-1405- C-77
W1AX 1,125,408-304-1234- C-65
W1UOP 359,358-202-593- B-33
W1ORV 319,362-202-527- C-50
W9MIJ/1 286,117-169-565- C-
WA1ANR 249,948-159-524- A-60
W1FJJ 235,224-198-396- C-24
K1KNI 111,891-151-247- A-32
K1YRG 79,866-102-261- A-26
W1MO 44,838- 94-159- A-17
W1EHT 39,483-107-123- B-30
W1EJE 35,490- 91-130- A-15
W1UYU 35,112- 77-152- A-
W1BZT 24,924- 67-124- C-20
W1BPW 4128- 32- 43- C- 3
W1PLJ 1800- 20- 30- B-10

Maine

W1PCD 124,131-161-257- C-54

New Hampshire

K1OBT 323,361-183-589- B-19
WA1DZX 276,762-193-478- C-80
W1FZ 112,718-120-308- C-
WA1DCE (WA1s COH EAH HXH) 115,560-120-321-AC-45

Rhode Island

W1YRC 331,335-199-555- C-29
K1VSJ 205,128-148-462- C-52
W1BFB 175,950-150-391- B-60
K1IKN 162,960-140-388- A-67
K1AJQ 58,077- 81-239- A-31
K1UJX 18,135- 65- 93- A-24
W1AWE 13,083- 49- 89- A-

Vermont

WA1HIN 382,302-201-634- B-64
WA1HXU 86,718- 97-298- B-30

Western Massachusetts

K1KNQ 227,385-163-465-ABC-30
K1DKX 169,290-114-495- C-42

NORTHWESTERN DIVISION

Idaho

WA7IUR 136,275-115-395- A-41
W7IY 27- 3- 3- A- 3

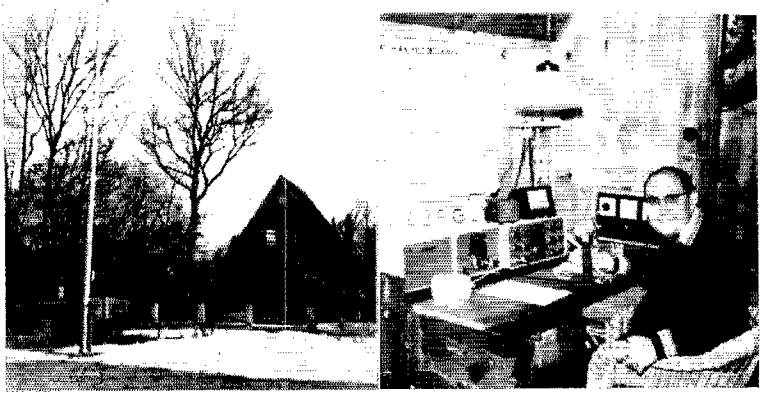
Montana

W7EOI 44,109- 87-169- C-32
W7FIN 4020- 20- 67- A-30
K7CTI 1173- 17- 23-AB- 5

Oregon

W7YFX 172,638-138-417-BC-55
K7VYU 75,684-106-238- C-30

From the land of Mozart, **OE2EGL** composed a phone symphony in the key of 1.3 megapoints, orchestrated with 2262 QSOs, 191 mults. At left we note a 3L quad at a height of 60 feet; at right, operator Gene appears very *gemütlich* over the results.



W7HIA 51,336- 92-186- B-40
K7RLS 40,680- 60-226-AB-45
W7AGQ 31,050- 69-150- B-48
K7WWG (5 oprs.)
280,308-142-658- C-
K7WWR (K7s IFG WWR, WA7GFE)
190,494-129-492- A-73
W7YG (4 oprs.)
65,844- 93-236- B-60

Washington

W7ESK 1,413,666-282-1671- C-
W7BJ 139,776-104-448- C-60
W7MSI 100,548- 98-342- C-53
WA7JCB 10,080- 32-105- A-14
W7GYF 1470- 14- 35- A- 2
K7INE 75- 5- 5- C- 1
W7SFA (5 oprs.)
1,178,190-265-1482- C-96

PACIFIC DIVISION

East Bay

W6KJS 213,780-170-478-BC-30
W6VNH 81,432-104-261- C-21
W6EJA 108- 4- 9- C- 1
WA61VN* 630,894-242-869- C-49
WA6AHF* 121,905-135-301- C-24
W6LDD* 100,035-117-285- C-20
W6RGG (W6RGG, WA61VN)*
96,012-126-254- B-30
WA6UFW* 68,310- 90-253- C-23

Nevada

W7CRT 432,755-205-705- C-81
WA7GES 42,735- 77-185- A-25
W7TVF 19,260- 60-107- B-25
W7TZL 6475- 35- 62- -

Sacramento Valley

W6SIA 205,827-157-437- C-41
WA6JDT 5046- 29- 58- A-18
W6NKR 3105- 23- 45- C- 7

San Francisco

K6KQN 212,148-166-426- C-80
WB6UJO 459- 9- 17- -
W6ERS* 85,140-120-238- C-40

San Joaquin Valley

WA6BOU 199,815-173-385- C-48
W6KTW 13,677- 47- 97- C-16
W6MMH 528- 11- 16- B- 5

Santa Clara Valley

W6WX 484,512-196-824- C-76
WB6KRW/6
421,470-210-669-AC-63
W6ZKM 250,368-163-512- B-50
WB6THT 243,774-174-467- C-77
W6LSQ 220,284-174-422- C-28
K6PIH 156,087-123-423- B-45
W6NTQ 153,090-126-405- C-39
W6ZBS 73,248-112-218- B-39
W6CBE 62,250- 83-250- C-30
W6AOI 26,070- 55-158- B-18
K6UXV 20,862- 57-122- B-25
W6VG 14,157- 39-121- C-
K6MG 13,764- 37-124- A-
W6EJ 13,674- 43-106- C-17
W6HVN 13,161- 41-107- C-15
WB6KIG 8712- 24-121- B- 4
W6PLS 3510- 26- 45- B- 5
K6OHJ (K6 sERV OHJ, W6BHY)
1,028,364-284-1207- C-96
K6DXM (7 oprs.)
609,522-226-899- C-96
W6JKJ (W6JKJ, K6YGS)*
286,572-167-572- C-58
K6CQF* 249,872-184-453- C-40
WB6UKO (WB6s QYL UKO)
171,696-112-511-AB-20
WB6CCV (WB6s ABL CCV)*
136,500-140-325- C-41
WØDAD/6*
116,022-122-317- C-40
W6GQK* 57,312- 96-199- B-30
W6CUF* 46,800- 78-200- C-17

ROANOKE DIVISION

North Carolina

WA4UXU 237,357-177-447- A-80
W4OMW 20,352- 64-106- C-18
W4OVQ 8415- 45- 63- C- 7
W4VON 280- 10- 10- C- 6
W4OLX (K4PRJ, WA4ULE)
100,548-114-294- C-

South Carolina

WB4CPE 6480- 40- 54- A-6

Virginia

W4SYL 532,656-274-648- C-61
W4KFC 499,872-254-656- C-44
K4WUY 358,800-200-598- C-57
W4VAN 285,441-169-563- C-65
W4EZ 230,112-188-408- C-50
WA4KQO 188,209-161-390- C-59
W4WBC 128,169-141-303- C-41
WB4AMT 109,134-129-282- C-48
W4DM 95,232-124-256- C-
K4WUM 51,798- 97-178- A-32
W4GF 49,608-104-159- B-
K4PCL 35,280- 80-147- C-19
W4ZM 34,383- 73-157- C-11
K1CAU/4 30,810- 65-158- B-15
WB4HNV 30,702- 86-119- C-
K4ZA 12,408- 47- 88- A-13
K4PRT 9243- 39- 79- C-18
K4ORQ 6630- 34- 65- C- 6
W4KMS 3690- 30- 41- B-10
W4PHL 2925- 25- 39- A-14
W4TKN 1056- 16- 22- A- 8
WA4HTR (10 oprs.)
1,494,000-360-1386-BC-96
K4CG (K3WUW, W3JPT)
1,079,391-331-1087- C-96
W4KXV (K4ZA, W4KXV, WA4GHV)
199,398-167-398-AC-29

SOUTHEASTERN DIVISION

Alabama

W4ZNI 230,472-194-396- C-64
W4GRG 83,790-114-245- C-24
WB4ENX 69,120- 96-240- A-36
W4DS 51,207-101-169- C-28
W4USM 11,178- 54- 69- C- 7

Eastern Florida

W4QBK
1,125,884-346-1088- C-84
K4YFQ 791,268-283-932- C-
W4HOS 211,464-178-401-AB-49
W4SD 208,590-170-409- C-40
W4LCP 149,472-173-288- B-25
WB4DJT 93,826- 86-364- A-60
WA4PXP 64,740- 83-260- C-
WB4DJQ 56,250- 75-250- A-
W4BYB 28,800- 64-150- B-
W4UF 26,676- 78-114- C-16
W4FFF 21,504- 64-112- C-14
K4EJ 9900- 50- 66-AC-30
WA4VPP (W1AGP, opr.)
8970- 46- 65- C- 8
WB4CVU 3666- 26- 47- A-11
W4ILE 663- 13- 17- C- 2

Georgia

K4BAI 791,934-286-923- C-78
K4EZ 476,532-244-659-BC-53
W4DQD 287,532-196-489- A-45
W4DXI 277,440-204-454- C-70
WB4EEM 208,800-174-400-AC-60
WA4QPL (9 oprs.)
49,305- 95-173- A-48

Shown holding each other up after a grueling grind, W2BBK *(left)* and PJ2ME *(right)* racked up 1055 QSOs from **PJ5MJ** the first c.w. weekend. Theirs was the first DX log to hit the Hq. Contest Branch.

West Virginia

K8YBU 933,660-260-1197- C-90
K8QYG 13,936- 52- 90- B-24
WA3HAN/8 1152- 16- 24-

ROCKY MOUNTAIN DIVISION

Colorado

W0GAA 198,450-175-378- C-
WØLPH 21,924- 58-126- B-16
WAØNBZ 20,700- 60-115-AB-30
WØBWJ 3960- 30- 44- A- 9
WAØNOS 3192- 28- 38- B-11
WØICH (KØVVV, WØICH)
577,437-217-887- C-93

New Mexico

W5ODJ 257,526-171-502- C-96
K5STL 67,596-131-172- B-32

Utah

K7RAJ 323,532-209-516- C-60
W7NPU 184,128-137-448- C-46
WA7DTG 16,560- 46-120- A-28

Wyoming

K7AYF (K6QPH, opr.)
3444- 28- 41- A-
WAØPFC/7 180- 5- 12- A-

Western Florida

W4YWV 313,740-210-498- C-80
K4OLC 310,128-182-568- A-63
WA4VIY 213,435-155-459- B-96
W9WKU/4 1500- 20- 25- A- 7

SOUTHWESTERN DIVISION

Arizona

W7AYY 225,882-141-534- C-45
K7NEQ 168,324-166-338- C-53
K7PXI 103,659-109-317- A-32
W7ATV 35,964-108-111- C-30
K7RDH 34,932- 71-164- A-32
W7CFD 12,558- 42-100- A-14

Los Angeles

W6RR 1,374,078-298-1537- C-88
K6QVT (WB6HGU, opr.)
789,888-242-1088- C-78
WA6EKL 728,884-262-928- C-64
WB6RZH (WB6NWK, opr.)
546,840-210-868- C-76
K6SVL 357,840-168-710- B-71
W6LDA 227,643-169-449- C-47
WB6UHJ 214,461-141-507- C-
W6VNJ 178,044-148-401- C-
WA6ZCO 163,047-139-391- C-69
W6TZD 136,836-126-362- C-33
K6IPV 100,344-113-296- B-71
W6EJJ 68,094- 97-234- C-50
W6AM 66,348- 97-228- C-53
K6EID 63,063- 91-231- C-31
W6QNA 52,416- 84-208- B-16
W6GEN 48,216- 82-196- C-35
WA6GLD 44,625- 85-175- A-
W6BUD 39,564- 84-157- C-25
K6YRA 37,536- 68-184- C-18
W6FW 18,711- 63- 99- C-14
K6BEP 13,860- 42-110- B-25
W6DGH 13,803- 43-107-BC- 8
K6YFZ 13,248- 48- 92- A-17
W6HS 9504- 36- 88- C-16
W6EHA 7326- 37- 66- B-
W6APH 4860- 30- 54- A-30
WB6KIL 4860- 30- 54- C-
W6WWQ 504- 12- 14- C-
WB6YCT 462- 11- 14- B- 7
K6EVR (K6s EVR SEN)
423,720-132-1070- C-
W6UED (W6s UED VPH)
377,328-112-1123- C-
W6NJU (WB6s IQI UBH YKA)
111,201-101-367- C-30
WB6KPN (WB6s KPN UHF)
77,847- 77-337- A-58
WB6RXE (WB6s QLM RXE)
9324- 37- 84- A-48

Orange

W6SRF 247,680-172-480- C-55
W6YMV 150,192-149-336- C-55
WB6CWD 61,560- 95-216- C-18
W6QFU 18,000- 50-120- C-27
W6IWU 168- 6- 12- A-40
W6CCP (K6YNB, W6CCP, WB6SFA)
677,565-239-945- C-70
WB6YPX (W6s DLE HXW, WB6WRX)
127,890- 98-437- C-44

San Diego

WA6ZQU 640,740-236-905- C-74
WB6LFR 490,155-205-797- -
WB6KFA 453,288-187-808- C-
W6QJW 151,914-218-691- C-74
WB6GGI 80,640- 96-280- C-55
K6AVF 59,760- 83-240- C-40
K6SDR 34,776- 72-161- C-
WB6OLR 2106- 18- 39-BC-

Santa Barbara

W6GFB 384- 8- 16- A-2

WEST GULF DIVISION

Northern Texas

W5KTR 946,158-309-1021- C-79
W5TKB 452,991-259-583- C-72
W5EQT 340,956-198-574- C-46
WA5LUM 204,828-169-404- A-56
W5DWT 145,431-143-339- C-21
W5TMZ 128,754-138-311- C-25
WA5RQA 127,032-158-268- B-43
K5QMC 109,000-125-292- C-74
K5MFA 67,260-118-190- C-60
W5OBS 40,348- 86-156- C-22
W5TTY 38,106- 73-174- C-29
W5QGZ 765- 15- 17- A- 5
W5MSG 324- 9- 12- A- 7
K5AVT 216- 6- 12- B- 2
WA5QEZ 105- 5- 7- C-
K5ZSB 18- 2- 3- B- 3

Oklahoma

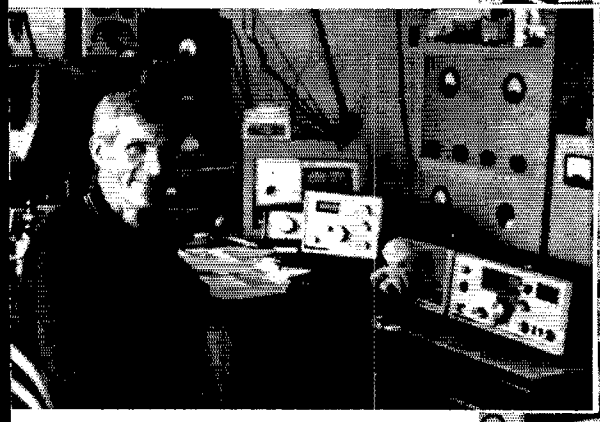
WA5LOB 384,039-213-601- C-50
K5BOC 157,191-151-347- C-56
W5TKS 92,394- 87-354- C-31
W5PWG 8820- 42- 70- B-16

Southern Texas

W5JAW 722,982-299-806- C-59
W5NMA 565,503-251-751- C-76
K2EIU/5 175,062-179-326- B-32
W5MHV 92,208-113-272- C-55
W5LJT 67,461-113-199- C-22
W5ULN 44,109- 87-169- B-31
W5LZZ 38,916- 92-141- B-14
W5RO 12,255- 43- 95-AC-
W5ZVU 8742- 47- 62- A-12
W5FDX 507- 13- 13- A-12
W5AC (WB2HEY, WA4ARV)
623,475-255-815- C-93
WA5DOS (6 oprs.)
105,672-136-259- C-92

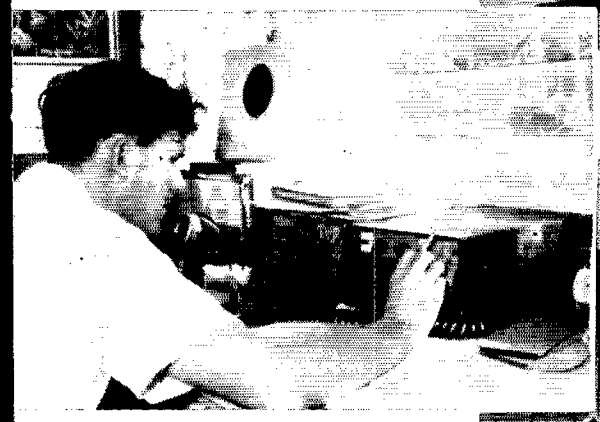
VP2AC says "Chasing DX is my line," but Jerry buys the groceries by working for the Antigua *Star* as a photo-journalist; he wrung ten meters dry during the phone Test.

From Tokyo, **JA1BAR** rang up 265K with 777 exchanges on 10-15-20; XYL JH1GMZ chipped in another 13 grand.



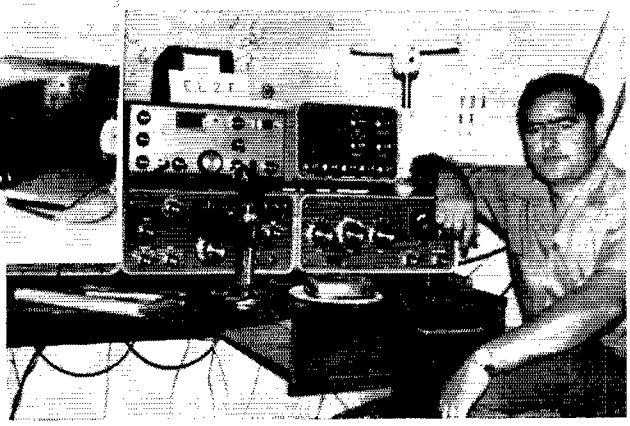
EA3JE paced Europe on voice by socking it to 'em with 2-million-plus points and the 5th-highest DX score worldwide.

CE6EZ used a 2L quad and inverted Vees to accumulate 2.45 meg and the No. 2 spot in the South America listings.



5W1AS, a visitor to Hq. this summer, had to struggle with a 26-foot-high beam surrounded by towering palm-trees; Ron had words to say about sleazy W/VE operating techniques.

Employed by the Voice of America in Monrovia, **EL2E** played Voice of Liberia in the Test and woundup with 500K



CANADIAN DIVISION

Maritime

VE1NV 324,819-193-561- C-51
VE1ANT 27,939- 67-139- A-32
VO1DC 24,360- 58-140- B-19
VO2AB 18,792- 58-108- A-28
VO2AC 14,180- 40-121- B-18

Quebec

VE2NV 373,434-218-571- A-53
VE2WA 303,888-208-487-AC-52
VE2BV 300,390-190-527- A-72
VE2WY 278,628-214-434- C-68
VE2AK 147,576-143-344- B-44
VE2AYU 72,114-101-238- A-38
VE2AJ 37,800- 84-150- B-20
VE2BUW 35,856- 83-144- A-24
VE2ALA 20,352- 53-128-AB-28
VE2YU (VE2s DCX YU)
406,980-228-595-AC-64
VE2DCW/2 (VE2s BGJ DCW)
51,285- 65-263- A-32

Ontario

VE3BHS 424,296-212-666-AB-46
VE3BS 199,815-165-404- A-
VE3BMB 142,788-146-326- B-46
VE3ES 40,545- 85-159- A-28
VE3CU 17,298- 62- 93- A-40
VE3HJ 26,013- 69-127- C-
VE3DYB 7680- 40- 64- A-13
VE3SH 507- 13- 13- A- 4
VE3FHO (VE3s FHO CCO)
841,635-295-951- C-88
VE3CSN (VE3s CSN CTR)
18,650- 50-125- C-64
VE3CFP (2 oprs.)
3024- 24- 42- A-13

Manitoba

VE4SD 75,319-109-231- C-48
VE4RP 22,320- 60-124- C-58

Saskatchewan

VE5GF 30,420- 78-130-AC-21
VE5DP 26,418- 74-119-AB-25

Alberta

VE6LU 104,013-127-273- C-46
VE6AP 63,336- 91-232- A-50
VE6MC 18,414- 62- 99- A-20
VE6TK 15,444- 52- 98- B-25
VE6TP 13,530- 55- 82- C- 6
VE6AKV 1200- 16- 25- A-12
VE6IN 240- 8- 10- C- 1
VE6ANR (VE6s AJT ASJ AVF)
215,040-160-452- C-96

British Columbia

VE7EH 115,290-126-305- C-46
VE7NW 67,158- 91-246- C-49
VE7BQF 63,756- 77-276- C-35
VE7YB 57,312- 96-199- B-96
VE7AXM 7134- 41- 58- A-20
VE7VP 1314- 18- 25- C-12
VE7IQ 720- 10- 24- A-

Yukon N.W.T.

VE8BB 63,000- 84-250- B-36

AFRICA

Morocco

CN8FV 913,275-165-1845- A-70

Angola

CR6GS 458,430-118-1295- B-
CR6GM 451,044-132-1139- A-30

Mozambique

CR7DS 425,040-132-1075- A-

Liberia

EL2E 197,931-131-1267- C-

Ethiopia

ET3USA (W5QHD, WA8TIX)
817,236-161-1692- A-80
ET3FMA (K4FMA, W6HOH)
132,888-136-1061- A-25

Cameroun

TJ1AL 29,748- 37-268- A-
TJ1QQ 2100- 20- 35- B-

St. Helena

ZD7KH 728,502-138-1760- B-

Ascension Island

ZD8HAL 836,703-171-1631- B-32

Rhodesia

ZE8JY 394,196-124-1060- A-

South Africa

ZS6DW 1,439,670-185-2594- B-
ZS6RM 291,060-105-924- A-
ZS6FN 133,560-105-424- A-
ZS6BMD 88,800- 50-592- A-

Tanganyika

5H3KJ 593,020-149-1367- A-

Nigeria

5N2AAF 476,898-122-1303- A-
5N2ABK 63,552- 64-332- A-

Niger Republic

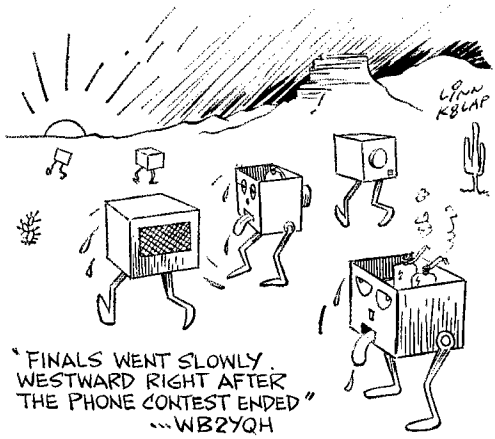
5U7AL 149,682-101-494- B-

Lesotho

7P8AR 1,005,993-159-2109- A-

Ghana

9G1KT 21,978- 54-136- A-11



ASIA

Iran

EP3AM 700,560-140-1668- B-

Japan

KA7AB 1,295,364-196-2203- B-
JA2JAA 476,136-136-1167-AC-
JA1NDO 401,220-135-993- A-26
JA1CG 356,451-131-907- A-
KA2JP 297,540-114-870- B-19
JA1DXE 274,833-117-783- A-
JA1BAR 265,734-114-777- C-
JA6ATY 212,872- 88-809- A-
JA3LGG 203,391- 93-729- A-35
JA1MML 152,500-100-510- A-
KA5MC 137,214- 54-847- C-11
JA3ERN 117,087- 93-422- A-31
KA2HC 72,171- 81-297- C-
JA3CXN 56,791- 49-387- A-
JA6AFL 50,976- 59-288- A-73
JA3GZN 13,120- 40-360- B-
JA1BAL 23,127- 39-198- A-
JA8AHM 17,424- 44-132- A-
JH1GMZ 13,311- 29-153- A-
JA4ERX 6780- 20-113- A-18
JA1DFQ 3600- 15- 80- A-
JA5CBI 528- 8- 22- A-
JH1DYL 504- 8- 21- A- 5
JA3OUV 264- 6- 15- A- 4
JA2DCI 255- 5- 17- A-
JA1AAT 231- 7- 11- A-
JA2ITH 190- 5- 13- A-
JA3ADW 108- 3- 12- A-
JA4YBV 18- 2- 3- A-
KA9MF (6 oprs.)
1,190,700-180-2205-AC-80

Asiatic Russian S.F.S.R.

UA9FU 20,790- 42-167- B-
UA9KHA 1008- 14- 24- B-

Turkoman

UH8BO 3060- 15- 68- B- 2

Uzbek

UI8AG 1989- 13- 51- B-

Tadzhik

UJ8KAA (3 oprs.)
432- 9- 16- B-

Hong Kong

VS6AJ 32,800- 50-221- B-

India

VU2DKZ 146,664- 84-582- A-96
VU2MSK 46,359- 51-303- A-

Cyprus

ZC4CN 236,208-111-710- B-

Israel

4Z4HF 414,597-113-1223- B-
W2PDG/4X 1414- 14- 35- B- 6

West Malaysia

9M2PO 66,864- 56-398- A-

EUROPE

Portugal

CT1BH 1,039,248-168-2062- C-
CT1MW 864,149-143-2017- A-44
CT1LN 726,773-173-1401- A-

Germany

DJ6QT 1,872,000-208-3000- B-55
DJ5BV 1,613,040-208-2585- B-67
DL4EG 1,129,089-169-2227- B-53
DJ5GI 379,730-127-997- C-
DL1LK 355,272-131-904- B-
DL4DK 278,103-119-779- B-11
DJ9LI 235,872-112-702- B-
DL6WE 154,300-100-517- A-
DJ5TH 145,425- 75-649- B-
DL5JX 137,100-100-458- B-
DL1DH 111,909- 73-511- B-
DL9EM 75,735- 51-499- A-
DJ8EM 36,855- 65-189- B-
DJ1IP 22,680- 42-180- B-
DJ4UF 15,435- 35-147- A-
DL2ZS 1104- 24- 57- C-
DL0WR (DJs 4AX 8SW 9YT)
2,577,222-201-4274- B-90
DL4RM (6 oprs.)
1,292,994-174-2477- B-
DL4AP (DL4s AP ZI)
670,761-147-1528- B-49

Spain

EA3JE 2,052,819-214-3243- A-
EA3QW 192,045- 93-701- A-
EA2EL 67,230- 83-270- B-

France

F3KW 1,382,400-180-2560- B-
F2SI 915,705-153-1995- A-
F8UM 172,530- 90-639- A-
F9NL 34,404- 47-244- A-
F2JE 31,443- 47-223- A-
F9RM 24,957- 59-141- A-
FØDA 13,386- 46- 97- A-35
F9KF 12,210- 37-110- B-
F3IJ 3864- 28- 46- A-
F5BV/P 3360- 28- 40- B-
F9FC 2451- 19- 43- A- 5
F5OJ (4 oprs.)
581,018-151-1285- A-

England

G4JZ 1,107,540-180-2051- B-45
G3IAR 981,948-172-1903- B-58
G6LK 471,546-138-1139- B-
G3KMA 336,720-115-976- A-
G5AGN/A
101,979- 81-420-AB-
G2NH 8787- 29-101- A-
GB2SM (16 oprs.)
1,839,786-206-2977- A-96
G3WWO (G3s JOC MPN)
1,595,700-180-2965- B-76
G3SME (G3s SME UQR)
1,285,438-187-2292- B-87
G3VZT/A (7 oprs.)
1,090,890-170-2139- B-

Scotland

GM5AIW 197,085-105-626- A-25
GM3CSM 6696- 36- 62- A-

Wales

GW3NWV 298,584-132-754- B-

Switzerland

HB9UD 54,656- 64-285- B-
HB9DX 19,458- 47-138- B-

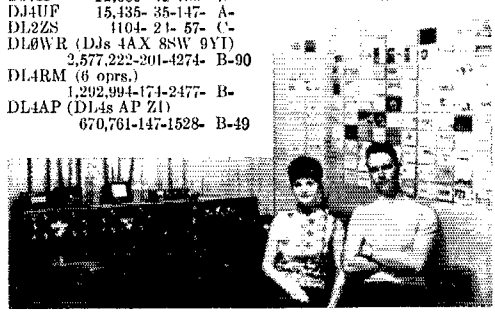
Hungary

HG2KRD
156,468- 52-1003- C-

Italy

I1BAF 1,598,148-206-2586- B-49
I1CAQ 572,560-136-1405- B-41
I1RIZ 148,148- 91-545- A-30
I1BBZ 138,942- 93-499- A-
I1LAG 95,634- 69-462- B-10
I1VIH 3294- 18- 61- A- 1
I1CZW (I1s AJ CZW KBY)
728,091-147-1651- B-40

His initials are JAP, his XYL's name is JAN, and he's JAW—**W5JAW,** that is, and a potent performer on both modes. After almost ten years of inactivity, Jim salted away STex honors on A1 (999K) and A3 (723K), and was West Gulf Division champ on c.w.



Participating for the first time in an ARRL DX Test, **WA4LMD** scored 539K in 59 hours of phonesmanship. Antennas were as spiffy as this console: a 4L quad up 75' and a 300-feet-per-leg rhombic. Fred got kind of pooped during the brawl, would like to see a compulsory rest-period added to the rules.

Norway

LAØAD	1,151,280-180-2132-	A-80
LA3QG	113,004- 86-438-	A-
LA4ZB	28,560- 34-280-	A-16
LA3K	8700- 29-100-	A-40
LA4LG	5880- 28- 70-	A- 4
LA6U	3402- 27- 42-	A-
LA4AF	3000- 25- 40-	A-

Bulgaria

LZ2KKZ	5475- 25- 73-	B-
LZ1KSA	3- 1- 1-	B- 1

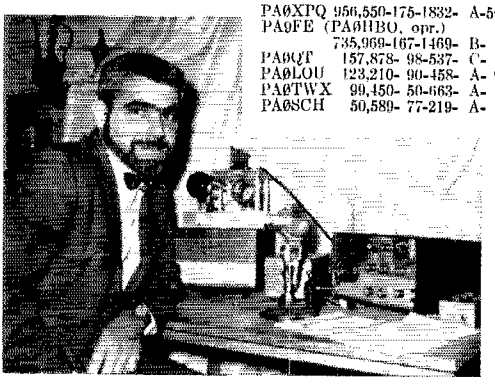
Austria

OE2EGL	1,296,126-191-2262-	A-
OE3GSA	390,439-119-1094-	B-

Finland

OH2BH	504,444-127-1324-	B-
OH1VR	83,781- 87-321-	B-
OH2BAQ	19,305- 55-117-	B-
OH3SN	14,060- 38-124-	A-

Haifa's **W2PDG/4X** faced the perennial problem of W/VE ops trying to gain the attention of Statesiders with their slant-DX callsigns. Barry doesn't look too disturbed, however.



OH5VT	7998- 31- 87-	B-
OH3NY	7068- 31- 76-	B-
OH3XZ	5382- 26- 69-	AB-
OH5UX	3036- 22- 46-	B-
OH5SM (7 oprs.)	2,259,912-191-3944-	B-

Czechoslovakia

OK1MP	197,094-107-614-	B-
OK1AHZ	40,002- 59-230-	B-
OK2BEN	20,202- 37-182-	B-
OK2ABU	7922- 34- 81-	B-
OK2WCG	7425- 25- 99-	A-
OK2DB	2160- 16- 45-	B-

Belgium

ON4ZU	541,008-136-1326-	B-
ON4XG	401,625-125-1071-	B-32
ON5GF	271,795- 95-954-	B-
ON4NM	23,520- 35-224-	A-

Denmark

OZ1LO	878,625-165-1775-	B-
OZ1RH	408,534-137-1001-	A-
OZ2KT	135,954- 83-546-	A-
OZ3Y	89,262- 87-344-	A-
OZ7BG	60,912- 72-282-	B- 4
OZ7DX	8184- 31- 88-	A-
OZ7HM	1848- 14- 44-	A-
OZ2CE	459- 9- 17-	A-
OZ7DH (4 oprs.)	923,949-159-1937-	A-
OZ5JT (OZs 4RT 5JT)	528,756-139-1268-	A-

Netherlands

PAØXPQ	956,550-175-1832-	A-50
PA9FE (PAØHBO, opr.)	735,969-167-1469-	B-
PAØQF	157,878- 98-537-	C-
PAØLOU	123,210- 90-458-	A- 9
PAØTWX	99,450- 50-663-	A-
PAØSCH	50,589- 77-219-	A-

Sweden

SM5EAC	681,750-150-1515-	B-
SM6AEK	579,348-154-1254-	B-34
SM4CMG	511,188-148-1152-	B-25
SM7CRW	447,678-154-969-	B-
SM5ZZ	172,563- 97-593-	B-
SM7BKZ	90,210- 97-310-	B-
SM6CMK	56,880- 80-237-	B-
SM6CKU	51,192- 72-238-	B- 6
SM5BPJ	39,336- 44-298-	B-
SM1CJV	18,240- 48-127-	B-
SM4DPB	11,340- 45- 84-	B-
SM0CER	7560- 24-105-	B-
SM5BKY	192- 8- 8-	B-
SM6CAS (9 oprs.)	2,091,300-190-3670-	B-96
SM5DTM (SMs 5FC ØDLL)	34,344- 53-216-	B-

Poland

SP5AKG	158,166-101-522-	B-

Crete

SVØWL	798,790-151-1767-	C-

Iceland

TF2WKS	2628- 18- 49-	A-

European Russian S.F.S.R.

UA3HO	258,000-100-860-	B-29
UA1CS	25,398- 51-166-	B-
UV3TP	6786- 26- 87-	A-
UA3KBO (UA3-27308, DM2BOG)	1,091,840-160-2275-	B-
UA4KHW (2 oprs.)	113,022- 69-551-	B-31
UA3KND (3 oprs.)	30,960- 60-172-	B-
UA1KBB (2 oprs.)	6,840- 20-119-	B- 6

Rumania

YO3ZM	108- 3- 12-	A-

I.T.U. Geneva

4U1ITU (4 oprs.)	859,908-174-1652-	C-

NORTH AMERICA

Cuba

CO8RA	534,534-154-1157-	A-

Dominican Republic

HI8LC	703,890-165-1422-	B-
HI8IBC	31,270- 53- 198-	A-

Panama

HP1JC	1,362,753-223-2037-	AB-

Alaska

KL7GAC	562,374-157-1194-	BC-45
KL7EFR	88,578- 57- 518-	A-12
KL7AIZ (multiopr.)	1,437,450-185-2590-	AC-

Puerto Rico

KP4DBJ	429,312-128-1118-	B-13
KP4CSW	318,340-110- 966-	C-28
KP4DBU (2 oprs.)	60,544- 43- 470-	A-18

Virgin Islands

KV4AM	1,420,440-178-2661-	C-60
KV4EY	539,856-163-1104-	C-31

Canal Zone

KZ5NF	1,037,160-172-2010-	C-41
KZ5EH	75,276- 51- 492-	A- 8

Guatemala

TG9UZ	157,752- 56- 939-	B-16

YLs and New Hampshire stations are about equally scarce in a DX contest. We present both in one package: Mary, **WA1DZX**, active in the phone section. A phased vertical on 40 and a 60-foot shunt-fed tower on 80 helped low-band radiation immensely.

Kaliningradsk

UA2KBD (6 oprs.)	213,303- 97-733-	B-

Ukraine

UB5WF	124,950- 50-833-	B-
UB5KAW	33,825- 55-205-	B-
UB5FG	6864- 22-104-	A-
UB5SJ	3078- 19- 54-	A-
UB5KTF (2 oprs.)	11,259- 27-139-	A-

White Russian S.S.R.

UC2BF	9758- 34- 96-	B-

Azerbaijan

UD6CC	6402- 22- 97-	A-

Lithuania

UP2OV	50,046- 38-439-	A-

Estonia

UR2KBG	11,004- 28-131-	A-

Antigua

VP2AC	579,912-146-1324-	B-28

Bahama Islands

VP7NA (K4IIF, opr.)	577,638-171-1126-	A-

Bermuda Islands

VP9GB	2067- 13- 54-	-

Mexico

XE1AE	2,039,688-252-2698-	C-
XEØLDD	43,542- 59- 246-	A-12
XE2PTBC (15 oprs.)	4,701,870-267-5870-	C-96
XE1AC (XE1s AC GGW OOL)	2,994,179-251-3977-	B-

Nicaragua

YN1TP	107,019- 69- 517-	A-40

Salvador

YS1XEE	2,721,888-208-4362-	B-44

(*Continued on page 173*)

AMATEUR RADIO PUBLIC SERVICE CORPS

CONDUCTED BY GEORGE HART,* W1NIM

Signal Quality of Traffic Stations

SOMEONE recently commented that the quality of the signals of some of our traffic regulars is not all it might be. A little listening around will show that there is something to this. Some of the signals on nets leave a lot to be desired. Of course this can be said of all amateur signals in general, and it is to be doubted that netters' signals are worse than the average; but the average can stand a lot of improvement, and traffic netters should set the example.

Several theories have been advanced to explain why signal quality on traffic nets might be bad, once in a while. One is that traffic is an operating, not a technical, game, and consequently the traffic man doesn't have the technical expertise to keep his signal clean. Another is that in the rapid shuttling back and forth from one frequency to another in order to meet his commitments, the average traffic man's rig becomes detuned. Still another refuge is that since traffic handling is a public service, *so what* if one of the signals is not quite a T9, or has clicks, or is distorted? We ought to be lenient with these people; after all, they are doing something for the benefit both of the public and of amateur radio.

But the good amateur PICON enthusiast does not go along with any of these. Having a good signal is even more important, from a regulatory standpoint, than observing good operating procedure. From an operating standpoint, having a high quality signal is the mark of the "compleat" traffic man.

So let's keep those signals clean on the traffic nets. If Average Joe Amateur comes along with a not-so-hot signal, that's one thing. When Joe Traffic puts one such on the bands, this is more noticed; he is an amateur with some experience and should know better. Once in a while you will hear it said that some individual "is a good operator, but his signal is lousy." In a way, this is a contradiction in terms, because your signal quality is a part of your on-the-air operation and is your responsibility as an operator. Therefore, if the signal is bad, how can the operating be good? Shall we go to work on those signals, gang?

The 1968 SET

What does SET mean? The Simulated Emergency Test, we thought everybody knew that. No doubt many old timers are still looking for the announcement of it in this October issue, because for years it was traditional to hold the SET in October. Last year we changed that, held the 1967 SET in January, 1968.

It appears that the January dates were an improvement over the October dates, and so the dates for the next SET are *January 25-26, 1969*. Please make a note of this, and don't say you were not notified of it. It will also start appearing in the Operating Events calendar, in *Operating News*, November *QST*. It's going to be tough getting the bulletin out very much in advance, but no drastic changes in the procedure are envisioned (although some have been proposed) for this year. Start now getting your AREC or RACES group in shape for the 1968/9 SET.—*W1NJM*.

Diary of the AREC and RACES

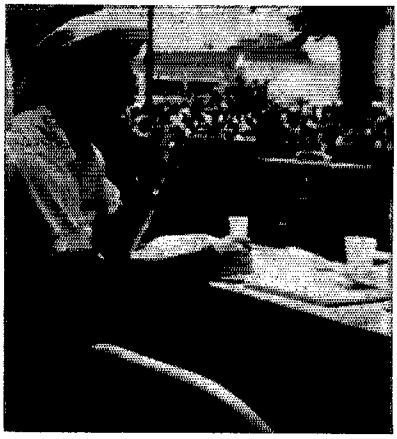
As promised, our SET report in July *QST* fell somewhat short of perfection here and there. A couple of these reports mentioned below never reached us, however

Kentucky: SEC W4OYI notes that District 4 (WA4FMY reporting) should have been credited with 354 scoring-points, not 234. *Louisiana:* Via EC W5SKW we learn that the report for Calcasieu Parish, totaling 284 scoring-points, was inadvertently omitted from the section list. Our goof, Roger.

WA7AEL, right, receives an award for "extreme competence" in his emergency operation to provide the only link with flood-stricken Fairbanks, Alaska, in August of '67. The award was presented by an official of the HEW Department, Philip Lee (l.) at a ceremony in Bethesda, Md. *(Official Photo, U.S. Public Health Dept.)*

* Communications Manager, ARRL.

A crew of amateurs provided communications during the annual Redwood City (Calif.) Fourth of July Parade. That's RO K6ANN at the mike, with assistant K6DRN looking over the crowd. Call used was W6WWJ.



Michigan: Kalamazoo County RO W8NWW advises that their local SET was very successful, with fine participation by the Red Cross, Civil Defense Reserve Police, CD Medical Unit (including both Kalamazoo hospitals and ambulances), Area 5 RACES Net, Kalamazoo County RACES Net, County CD Field Hq. van, and Texas Corners Township Fire Department, Zone 5. *Missouri:* SEC W0BUL wants it known that he submitted a detailed report covering many aspects of the Test in his section.

Our fault, your fault, or somebody else's fault — regardless of who drops the ball, we sincerely regret any inaccuracies in the writeup. You can be sure that all concerned deeply appreciate the hard work that went into the preparation of your reports.

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On May 5 the AREC in Portland (Ore.) was requested by the Mountain Rescue Service to provide communication for a rescue effort of a party of people lost on Mt. Hood. Contact was established between Timberline Lodge on Mt. Hood and Portland, which was the main control point. Both 2 and 75 meters were used, the latter as a statewide net to contact members of the rescue organization. Throughout the day (May 6) much traffic was handled on behalf of the several searching parties, and by noon the word was passed over these amateur facilities that the missing party had been found, frostbitten but for the most part unharmed. Had it not been for the availability of rapid communications it is a certainty that the search would have required much more time, so it is likely that the efforts of the amateurs were instrumental in saving lives. Principles in the operation were *K7s* MMK BYH ZQU, *W7s* DDH CMR MCQ, *WA7s* DCC FVK DVJ. The Oregon AREC Net on 3875 kc. and the Portland 2-Meter AREC Net were the principal organized facilities used. — *K7WWR, SCM Oregon.*

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Again on May 19 amateurs of the Oregon AREC participated in communications for Mountain Rescue, this time on Mt. St. Helens. Contact was established between the mountain and Portland on 75 meters. The operation lasted from 1 to 10 P.M. when the rescuers reached the fallen climber and brought him down off the mountain. On the air were *K7s* MMK ZQU RQZ, PHP, W7HUY and WA7BOO, with many other stations "on frequency" (3875 kc.) to help if needed. — *K7WWR, SCM Oregon.*

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The following is a resume of activities of the West Coast Amateur Radio Service on 7255 kc.

May 27: KC4USP in Antarctica called in with traffic. NCS WA7HHY arranged to handle it off frequency.

June 2–3: WB6WST requested help for an injured person in a remote mountainous area of San Diego County. The County Sheriff's Rescue Squadron was called and contact maintained by amateur radio until the rescue was complete. Stations known to have helped include *W6s* YSP FJT, *WB6s* THL MDN, WA7HHY.

June 23: W6SGW/mm on a tanker northwest of Seattle requested help contacting San Pedro for communications between the captain and his headquarters following an explosion aboard the ship. The facility was set up with the aid of NCS W6KZI, W7MKW and a multitude of stations who stood by.

June 23: Request for WCARS assistance in the search for a lost plane north of Ventura, Calif. A number of mobiles and base stations maintained communications liaison for two days between CAP, Forest Service, private search parties and relatives. The frequency of 7255 kc. was primary, 3952 secondary. The plane was found totally demolished. Participants included sixteen amateurs.

July 22: WB6UUR/6 at a camp in the Sierras requested assistance in getting help to a camper who had been seriously cut. NCS WA6BWD designated WA6GQJ to call the Forest Service to get help.

In addition to the above, in the period from April 26 to July 25 fifteen highway accidents with injuries were known to have been reported, along with four unreported fires and at least 30 incidents involving freeway obstructions, cars needing assistance and other miscellaneous incidents. Publicity Chairman WB6IZF lists 73 amateurs as having been mainstays in these operations. The total membership of WCARS is now 570.

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Quebec SEC VE2ALE reports three car accidents in the Montreal area in which amateurs were able to be of assistance in summoning aid. The first was on June 4 when VE2AUD/mobile called via the VE2RM repeater about an accident on the Trans-Canada Highway. VE2AVP answered the call and relayed it to the provincial police in Montreal, who then dispatched a vehicle. On June 18 VE2AVP/-mobile was engaged in a routine schedule with his XYL, VE2DGD, when he came upon an accident in the Montreal area. VE2DGD immediately telephoned Montreal Police. On July 8, VE3GKR/-mobile en route from Ottawa to Montreal came upon an accident at the Ile Au Tort Bridge. He was in contact at the time with VE2DFE on the VE2MT repeater, with VE2DEA on standby. All units shifted to the VE2RM repeater and VE3GKR passed all information to VE2DFE who called the Montreal office of Quebec Provincial Police who relayed the information to their Dorion office and a cruiser was dispatched.

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AREC members of the Genesee County (Mich.) unit and members of the Genesee County Radio club assisted police, on July 10, in apprehending armed holdup men who took $15,000 from a jewelry store in Flint. Walkie-talkies built by the GCRC and mobile units were used on the ten-meter fre-

quency. W8CO set up a portable station at work to establish contact with Flint. The men were captured after a three-hour hunt. Also taking part were W8JAC, WA8TCY, WB8BCF and W8VGC. — *W8JAC, EC Genesee County, Mich.*

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On Aug. 1, K7TAQ, EC of Casper, Wyo., was the relay to the highway patrol to obtain assistance for a very serious auto accident. W9KRV/mobile reported the accident from the scene and with the help of K7YDO, W9TLU and WA6KXL to relay, assistance was obtained promptly. — *W7CQL, SCM Wyoming.*

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On Aug. 1 WA6VMD heard a "Mayday" call from K2GYY/mobile at Marker 244 on the Alcan Highway in northeastern B.C. There was an accident involving a pickup truck loaded with live ammunition, with two people seriously burned. WA6VMD contacted the Coast Guard at San Francisco and the Royal Canadian Mounted Police were notified. Within ten minutes of the first call, an RCMP vehicle with assistance was on the way. — *WA6VMD.*

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On Mar. 11 WA8NDY, EC for Upshur County, W.Va., was notified by a local BC station that AREC assistance was needed in a search for a missing light plane. Ten minutes later assistant EC W8WVM and part of the local AREC were activated, with mobile and fixed stations on 75 and 2 meters. Monongalia County EC W8GUL at Morgantown established operations under club call WA8BCP and maintained contact with the CAP center. Relay service was provided by W8EEO and W8KBM. Within the hour, this intercounty net had contact among all stations and remained on duty until the afternoon when the missing plane was found smashed with the pilot dead. — *WA8NDY, EC Upshur County, W.Va.*

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On April 27 an official of the Johnson City (Tenn.) Rescue Squad requested AREC assistance in obtaining information with regard to a rescue mission being conducted in Clay County, to determine whether or not the Johnson City group's assistance was still needed. K4UWH was alerted and later joined by *WB4s* EHK and CXM in efforts to contact someone in Clay County. WA4YBT in Crossville was finally contacted and made inquiries. Later, WA4YBT advised WB4CXM that assistance was no longer needed in Clay County. WB4CXM relayed the information via the 2-meter net to WB4EHK and the Rescue Squad official informed. Although not really an emergency operation, the communications could not have been handled in any other way. — *WB4EHK, EC Johnson City, Tenn.*

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On May 8 VE2BU received information that a search was in progress for a missing youngster in the Pencourt Ile Perrot area of Quebec. He made calls on VE2RM and VE2MT for mobile units to assist in the search. VE2AGQ and VE2ALE responded and reported to the scene while many others stood by on the repeater frequencies. However, shortly after their arrival the boy was found. The three mobiles then deployed to encircle the search area and advise searchers that all was well. VE2ADE served as NCS on VE2RM. — *VE2ALE, SEC Quebec.*

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A tornado alert covert most of Ohio on June 11, and the Ohio Emergency Net on 3972.5 kc. was alerted. Weather conditions were reported to NCS W5ED/8 and relayed to the Weather Bureau. The Weather Bureau in Mansfield was particularly pleased to have the information supplied by WA8MHO. Eighteen stations were active. — *W8OUU, SEC Ohio.*

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The Queen City Emergency Net (Cincinnati area) was alerted on June 11 and 15 for weather watches, at the request of the Cincinnati Chapter, American Red Cross. Local conditions were reported periodically to the NCS by each station and relayed to the Red Cross disaster chairman for possible action. Several storm cells were monitored passing through the area, but no severe storms developed. — *W8OUU, SEC Ohio.*

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The Passaic Valley Traffic and Emergency Net (N.J.) was alerted on June 12 for possible flooding conditions. K2KDQ (EC) at his place of business received reports from 1900 to 2100 (local), then reported to the emergency center at K2DEL. Contact and liaison were made and maintained with Oakland C.D., Wanaque Reservoir, Wanaque C.D., Passaic River Bridge Master at Passaic, Passaic County RACES and Bergen County RACES. Both

The Montgomery County, Md., RACES took part in a children's fund telethon on Feb. 17. Here are Montgomery County RO W3YAG (l.) and W3NME (r.) manning two of the operating positions.

the Passaic and Bergen County ROs checked into the net, and preparations were made for full activation of all amateur facilities if needed. Eight 2-meter units were on standby, liaison to long haul nets was available, and everything was in readiness. All facilities stood by pending clarification of reports that the dam at Wanaque reservoir was weakening, and the operation was secured at 2300 local time, four hours after the initial alert. — *K2KDQ, EC Passaic, N.J.*

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The Central Kansas Amateur Radio Club activated its 2-meter emergency net on June 18 at 11:15 P.M. at the request of the Salina Police Department. Pending severe weather conditions were the reason. The net was set up and in operation fifteen minutes after the initial call and was secured at 12:30. — *W.1ØPSF.*

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At 2330Z on July 16 the RO (WB2HXZ) of Dutchess County, N.Y., was notified that supplemental communications were needed between the

Some of the "brass" at a meeting of ECs and RACES officers in Southern Texas are, from left, SCM W5AIR, Asst. SEC W5YCK, Cameron County EC W5KR, Dist. 20 RO K5YLO. SEC K5QQG was also present, but someone had to take the picture.

sheriff's office and police agencies surrounding Poughkeepsie to aid auxiliary police in the search for a criminal. At 2300Z WESUI opened the net under the RACES-authorized call of W2RTE from the Sheriff's office and by 2340Z all police stations were manned and on the 2-meter net with additional c.d. stations monitoring 145.23 Mc. The search was called off at 0100Z because of darkness. Five additional amateurs participated. — *WB2HXZ, RO Dutchess County C.D.*

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We are so far behind with reporting of non-emergencies that we will have to summarize, then hope space will permit more details in the future.

Feb. 12: The East San Gabriel Valley (Calif.) AREC provided school bond election return communications from the polls to the school district office, under the leadership of Acting EC WA6JXG.

Feb. 22: Amateurs set up to supply communications with the Plaisted Polar Expedition to the North Pole over the ice cap on Ski-doos. VE8YL was the station on the ice, while WA4UTV handled the contact from the Eureka Weather Station. *VE2s* AUU FY and AWY handled the Montreal end, on frequencies of 14,193 and 14,245 kc.

Feb. 22: Amateurs provided communications for a sports car rally in Montreal under the leadership of VE2BML.

Mar. 2–3: Amateurs in Quebec turned out to assist in supplying communications for the Annual Dog Sled Races in Hudson, Que., under the leadership of VE2DEK.

Mar. 17: Members of the Western Penna. Mobileers, under W3MIF, provided communications for the Annual St. Patrick's Day Econo-Run. Seven amateurs took part.

Apr. 18–19: Amateurs of Northeast Louisiana and Southeast Arkansas furnished communications for a telethon benefitting the Cerebral Palsy Fund. — *WA5QVN, EC Ouachita Parish, La.*

April 25: From 0830 to 1400 hours members of the Kings and Queens County (N.Y.) ARPSC nets supplied communications for the "Salute to Israel Day" parade in New York City.

May 4: Orange County AREC provided communications, as it has each year for many years, for the annual tennis tournament matching high school players from a wide section of Southern California. SEC WB6RVM did the coordinating.

May 4–5: AREC members of the Glens Falls (N.Y.) area provided timing and communications for the White Water Derby Slalom Kayak and Canoe races on the Hudson River near North Creek, N.Y.

May 16–18: The Spokane AREC and the Inland Empire VHF Club provided communications facilities for the annual Lilac Parade in Spokane, under the leadership of EC K7LRD.

May 11: The Edison Amateur Radio Net joined forces with the East San Gabriel Valley AREC to provide communications for the Third Annual Edison Golf Classic in Palm Springs, Calif. Sixteen amateurs participated.

May 18: The East San Gabriel Valley AREC provided communications for the Western Days parade of the Monrovia Day Association in Monrovia, Calif.

May 18: Another parade, this one in Berrien County, Michigan, where AREC and RACES amateurs utilized their 2-meter f.m. gear to link positions throughout the parade route with ambulance services. EC was W8LUH.

May 25: A Boy Scout canoe race down the Raisin River from Dundee to Monroe, Mich., brought out assistant EC WA8EFK and four others to serve as a surveillance team, and later to set up an exhibit station.

May 25: Kansas was visited by a simulated tornado as part of a four-county test. Called Mo-Kan II, the test was supplied with communications by Clay County EC WA0FLL and his crew.

May 25-26: A group of amateurs operated an exhibit station at the North Orange Council Scout-O-Rama at La Palma Stadium in Anaheim, Calif., under the leadership of WB6TYZ and WB6RJX.

May 26: Glens Falls (N.Y.) AREC provided communications for the Little League Parade in Glens Falls. EC K2AYQ was the ramrod.

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We have *forty* SEC reports for June activities, representing 14,502 AREC members. This is two reports up but about 1500 AREC members down from June of 1967. Sections reporting: Ga., Mo., Alberta, Ind., E.Mass., W.Fla., Del., Nebr., Wash., Que., Okla., E.Fla., Ohio, S.C.V., Ala., La., San F., San D., Colo., S.N.J., W.N.Y., Conn., Orange, Kans., Tenn., Utah, S.Dak., S.Tex., Ark., Nevada, N.N.J., Mont., W.Va., Ky., N.C., Va., N.H., NYC-LI, Mar., Sask.

This brings us to the mid-year point, and we find we have received 251 (249 last year) reports from 50 (52 last year) different sections. So, we gained two reports but lost two sections, and this should make things pretty even. The following sections have 100% reporting records so far in 1968: Okla., Que., W.Fla., Mo., Colo. Alberta, S.N.J., S.Dak., N.C., Utah, S.Tex., N.N.J., Conn., La., Tenn., Wash., E. Fla., W.Va., Ala., Mont., S.C.V., N.H., Nev., Nebr., Orange, Maritime, Del., NYC-LI. Let's keep going, gang!

National Traffic System

One of the basic principles of NTS has always been that no one man (or woman) is indispensible. Every participant has a definite and specific function to perform on a certain night or nights of the week. If he cannot perform that function, someone else will do it. If a NCS or liaison fails to show (doesn't happen very often), someone will QNG within the set three minute limit. If a net manager finds he

can no longer do the job, someone will take his place.

Time was when our traffic activities were built around the "iron man" tradition. If a fellow couldn't be on deck every night to handle his schedules, he didn't amount to beans as a traffic man. He couldn't even hold status as a Trunk Line Station. But the inexorable march of time and the concomitant diversification of amateur interest changed all that, and NTS was built to accommodate the occasional traffic man as well as the every-day enthusiast. Many of the latter have felt that NTS is not sufficient challenge to their talents and have taken their business into independent channels utilized by others such as themselves. Thus, we now find ourselves with two kinds of traffic facilities in the amateur bands — the NTS facility, which operates according to a set schedule and through which traffic flows in a set way, and independent facilities through which traffic can often flow speedily from point to point but on pretty much of a catch-as-catch-can basis.

As an example, a message from Gardiner, Calif., to Jibib, Vt. by NTS would flow from the Northern Calif. Net through RN6 to PAN, thence via TCC to the East Coast, then either direct to the Vt.-N.H. Net to a delivery point, or down through EAN-1RN-VTHN. It's a set pattern. If, however, the originating station in Gardiner happened to be an independent, he might get on 40 or 20 meters with the message, find someone among his circle of fellow traffic-handlers who would take it, and that would be that. The station he gives it to might be also on the west coast, in the midwest or on the east coast; it would all depend on who is around and who is willing. The big difference between the two is that the former can be described in terms of net or station functions, while the latter must be described in terms of individuals.

Understand, we are not running down the independent facilities. They claim that their traffic gets through quicker than NTS traffic and they are hard-working zealots who are dedicated to traffic work. Most of them are ARRL members. Their work is recognized in the BPL, in SCM reports, through the awarding of official appointments, and their nets are listed in the net directory. When they perform during an emergency operation they get full credit and Public Service Awards if indicated. If they prefer their method of traffic handling to participating in the ARRL-sponsored system, this is their privilege and prerogative.

At a recent meeting of the Brookings Amateur Radio Club, three South Dakota officials got together for a picture. Left right are KØTXW (SCM), WAØCPX (SEC) and WAØCWW (PAM).

Which method is the better is strictly a matter of opinion. Traffic originating on NTS would, assuming nets function normally, reach its destination the same day as originated if in the same time zone or going from east to west, one day later if going the opposite direction into another time zone. By the independent route a particular message might reach its destination and be delivered within five minutes, if lucky, or it might bounce around for several days and finally land in a section or local NTS net for delivery. Each has the possibility of breakdown, each its advantages and disadvantages. The so-called independent facilities are concerned only with getting the traffic quickly to its destination, and many of them do an admirable job of this. NTS goes a little deeper into basics in that it provides participation for amateurs at nearly all ability and availability levels, and stresses training as an essential part of traffic handling — training in message format, message-handling and net procedures, orderliness and discipline.

So whether you participate in NTS or an independent facility, you are performing a public service, and the decision as to which one you are most interested in is entirely yours. Did someone say the League favors NTS over the independent facilities? You bet it does; NTS is the official ARRL-sponsored traffic system. But this isn't the same thing as discriminating against the independents. This magazine is also an officially-sponsored ARRL function, and the League favors it over other amateur publications, but it doesn't discriminate against the latter. Get the parallel? — *W1NJM.*

July reports:

Nets	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation (%)*
EAN	31	1458	1.020	47.0	98.4
CAN	31	1056	.782	33.8	98.9
PAN	31	1260	.889	40.6	97.8
1RN	62	494	.357	8.0	93.9
2RN	62	546	.628	8.8	97.1
3RN	62	507	.369	8.2	98.1
4RN	51	400	.364	7.4	76.2
RN5	62	575	.310	9.3	90.9
RN6	62	1193	.888	19.2	90.2
RN7	61	552	.321	9.1	48.9
8RN	62	462	.346	7.5	91.5
9RN	62	540	.448	8.7	91.9
TEN	62	364	.422	5.8	52.3
ECN	54	193	.198	3.6	66.2
TWN	47	193	.207	4.1	60.3
Sections[1]	1823	11316			
TCC Eastern	124[2]	779			
TCC Central	93[2]	543			
TCC Pacific	124[2]	941			
Summary	2625	23372	EAN	8.9	—
Record	2890	21814	1.267	15.2	—

[1] Section nets reporting (59): VEN, FMTN, GN, TPTN (Fla.); Falls City, KTN (Ky.); NCN, SCN (Calif.); NCNE, NCNL (N. C.); BUN (Utah); ILN (Ill.); MD-DC, MDD, MDDS (Md.-Del.-D. C.); Badger, WSBN, WSSN, WIN (Wisc.); OSN, OSBN, BN (Ohio); Mich 6 Meter, QMN (Mich.); QIN (Ind.); VSBN, VN, VSN (Va.); OZK (Ark.); TTN, TEX (Tex.); Passaic Valley, NJEPTN, NJN (N. J.); EPAPTN, PFN, E. Pa., PTTN (Pa.); AENB, AENH, AENM, AENR, AENT (Ala.); NYS (N. Y.); PTN (Me.); SSZ, OLZ (Okla.); Color. HN (Colo.); MNN (Mo.); WSN (Wash.); GSN (Ga.); OQN, GBN (Ont.); MSN, MJN (Minn.); WMN (Man.); CPN (Conn.); RISPN (R. I.)

[2] TCC functions, not counted as net sessions.

K2KIR feels more traffic could be handled on EAN. W9DYG reports worst QRN ever and asks to be relieved of CAN managership after eight years. W6VNQ says rate is up 50 percent from same time last year and issues PAN certificate to WA7DMA. W1EFW sends special commendation to W1BTV for his representation of Rhode Island.

(*Continued on page 152*)

COMING A.R.R.L. CONVENTIONS

October 12–13 — Hudson Division, Tarrytown, N.Y.

January 17, 1969 — Southeastern Division, Miami, Florida.

June 20–22, 1969 — NATIONAL, Des Moines, Iowa.

NOTE: Sponsors of large ham gatherings should check with League headquarters for an advisory on possible date conflicts before contracting for meeting space. Dates may be recorded at ARRL for up to two years in advance.

California—7th Greater Bay Area Hamfest, Thunderbolt Motel, Millbrae, Calif., October 19, 20. Just south of San Francisco International Airport on Bayshore Highway. Technical discussions, contests, etc. Information from Box 545, Hayward, California 94543.

Connecticut—The Tri-City Radio Club, Inc. 21st Annual Hamfest will be held on October 19, at the Crocker House Hotel, State St., New London, Conn. Tickets are $6.99 each which includes a steak dinner and registration. Activities include technical talks, swap and shop table, and visits to local military activities. Registration and information available from General Chairman Robert York Chapman. W1QV, 28 South Road, Groton, Conn. 06340.

Indiana—The Hoosier Hills Ham Club is holding its seventh annual Hamfest at Spring Mill State Park near Mitchell, Indiana, October 13. Contact the club at P.O. Box 375, Bedford, Indiana 47421 for further information.

New Jersey—The Irvington Radio Amateur Club will hold their Annual Club Dinner on October 19. For more information write David Rettig, K2VOB, 240 W. Kinney St., Newark, N.J.

New York—The 21st Annual Dinner-Meeting of the Quarter Century Wireless Association, Inc. will be held Friday evening, October 25, at the Statler-Hilton Hotel, New York City. Mr. W. Walter Watts, W4VI, Senior Executive Vice-President of Radio Corp. of America, will be the Banquet Speaker. Tickets at $8.75 each may be procured from QCWA General Manager, A. J. Goronda, W2JE, 1417 Stonybrook Ave., Mamaroneck, N.Y. 10543. QCWA members, their ladies and guests are invited.

Ontario—The Radio Society of Ontario annual Amatuur Radio Conference will be held in Branford, November 1, 2, and 3. On Friday, Nov. 1, there will be a sumptuous smorgasbord and a dance ($3.75 per person). Saturday morning will start with a breakfast and speaker ($1.50) followed Saturday evening with the banquet, speaker and dance ($4.75). The farewell breakfast is Sunday morning. Advance registration is $3.50 single, $6.00 a couple. After October 18, registration will be $5.00 and $8.00 respectively. For more information write the Branford ARC, P.O. Box 756, Branford, *Ontario, Canada.*

Pennsylvania—The Reading Radio Club is holding its annual banquet on Saturday, October 26, starting at 6:45 P.M. at the Reading Motor Inn on the Warren Street Bypass. For more information contact R. E. Ahrens, W3WJC, 3404 Reading Crest Avenue, Reading, Penn. 19607.

Texas—The Brownfield Free Swapfest will be held October 26 and 27 at the National Guard Armory in Brownfield, Texas. Everyone is invited to attend. There will be meetings for ARRL, MARS, RACES, Nets, and demonstrations and displays. Free coffee. Bring your own gear to swap. A noon lunch will be served at a reasonable cost. More information from *E. C. Pool, W5NFO, 1003 East Buckley St., Brownfield,* Texas 79316.

Texas—The Houston ARC will hold their 10th Annual Hamfest and celebrate their 50th Anniversary as an ARC at their club house on November 2, and at Apring Creek Park near Tomball, Texas on November 3. For more information write Houston ARC, 7011 Lozier, Houston, Texas 77020. QST

October 1943

. . . Editorially, K. B. Warner philosophizes on the coming of Autumn, with its clear crisp nights, cessation of static and DX perking up. He points out, though, that there are many returning veterans, some disabled, disfigured and at loose ends, finding it difficult to get adjusted to an entirely new way of life. Ham radio offers great possibilities in rehabilitation and local hams are enjoined to do all possible, for there will surely come a day when the bands are re-activated.

. . . The use of Supersonics for Communication is discussed by S. Jonathan Weitzer, ex-W2FSP. Several sources of sound waves of from 10,000 cycles to 20,000 cycles per second are described. They range from open spark gaps to high powered magneto-striction oscillators. A 500 watt job could be "heard" up to two miles. For receiving these inaudible frequencies, a scope may be used, thus reading code by sight. An interesting article and it might provoke some experimenting even today.

. . . There appear to be some 225 CD-WERS organizations in the country and the most comprehensive of them all is the one in New York City. Frederick A. Long, ex-W8BSL and Vincent T. Kenney, W2BGO co-author an article describing this system. After considerable floundering around, the organization was finally set up, together with assigned frequencies and operating procedures. The organization charts look and are somewhat complicated, but they are necessarily so in a city of several million people.

. . . Edward M. Noll, ex W3FQJ, gives us a nice bit of math. The title is "Meet Mr. j!" Whether we understand just what the square root of minus one means or not, it is with us all the time. Called an imaginary quantity, it is simply a mathematical operator and indicates a rotation of phase of ninety degrees. A complex quantity does not necessarily mean that it is complicated. It is just an association between a real quantity and another real quantity 90 degrees ahead or behind it in angular rotation — vectors. Have at it. It's fun.

. . . The Japanese Morse Radiotelegraph Code is amply discussed by James E. Holden, a recognized authority on the Japanese language. This article follows an introductory article which appeared in *QST* in September 1942. So much interest in the original article was manifest that a more comprehensive treatment was indicated. I don't think I'll go in for this one!

. . . Paul J. Palmer, W8UGR describes a WERS Hand set for WERS. He calls it "Handy Andy." A photo of it in use appears on the front cover of this issue. It uses 6V6GT tubes and is reasonably compact, although the power pack has to be in a separate case which one ordinarily rests on the ground. — *W1ANA*

THE MILLER SUIT: A SPECIAL REPORT

THE W9WNV lawsuit against the League, freely discussed in DX circles but only briefly reported in *QST* for May (p. 81) and August (p. 10), has been resolved without going to trial under the terms of an agreement signed by Dr. Donald A. Miller, W9WNV, and ratified by the Board of Directors. Under this agreement, he has withdrawn his suit, dropping his charges and his claims for damages. During formal testimony in June in Hartford, Dr. Miller conceded under oath he was not in fact at one location (St. Peter and Paul's Rocks) claimed earlier, and that some of his statements to the Awards Committee (which administers DXCC), to League Directors, and in various published statements and documents, were untrue.

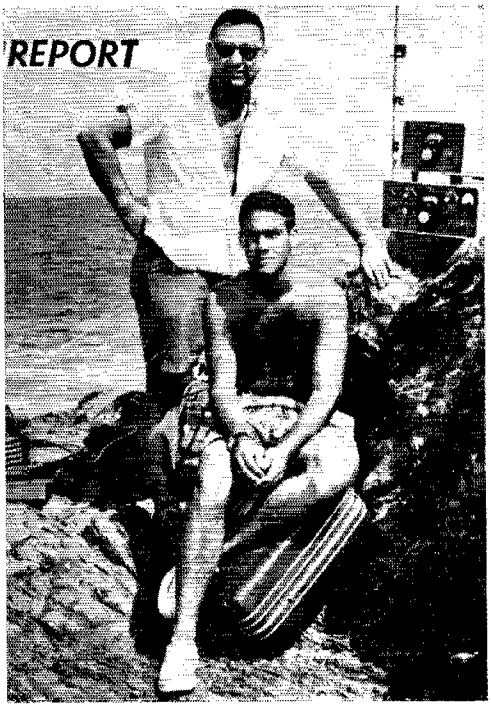
Dr. Miller first threatened suit in early 1967, shortly after the Awards Committee began its investigation of many complaints and charges of irregularities in Dr. Miller's DX operations. This did not deter the Awards Committee from taking action, appropriate in its judgement, to protect the integrity of DXCC. However, on advice of the League's General Counsel, *QST* refrained from publishing any details while the suit was imminent or in process. It was frustrating not to be able to counter the many misconceptions, inaccuracies and downright distortions which flew about on the air and in other publications during this period. Here at last is the story.

DXpeditioner W9WNV's lawsuit was filed in February 1968 against the League and against John Huntoon personally, alleging defamation and seeking $550,000 damages. In essence the suit revolved around the Awards Committee's refusal to allow DXCC credit for certain of his claimed operations, as outlined in a series of bulletin announcements of such actions which were sent to DX clubs, bulletin editors, IARU societies and others having a primary interest in DX. Specifically, the Awards Committee had, during 1967, refused DXCC credits (or withdrawn credits previously granted in good faith) for operations claimed by the doctor at Chagos, Heard Island, Laccadive Islands, Navassa, and St. Peter & Paul's Rocks. These actions had been taken because in the investigation of complaints concerning a number of his DXpedition operations, documentary evidence (including correspondence from several governments) submitted to the Committee strongly suggested either insufficient license or other authorization — or that he was never, in fact, actually at the locations claimed. He was unable, in the Committee's judgement, to refute such evidence satisfactorily, despite much correspondence, a personal meeting with the Committee (March 1967), and the unprecedented opportunity to present his case to the League directors (May 1967).

There follows a tabulation of the DXpedition activities for which DXCC credit was withdrawn (or withheld), along with a summary of the reasons for action:

Navassa Island

This was an operation in the autumn of 1966 by Dr. Miller and Herb Kline, K1IMP, under the latter's call/KC4. Cards received at Hq. were originally granted full DXCC credit, in good faith on the assumption the required Coast Guard permission had been obtained. (Miller later denied any advance knowledge of the need for CG permission.) Acting on queries from other amateurs who had recently applied for Navassa operation and been turned down, the Awards Committee determined from the Coast Guard that the necessary permission had *not* been obtained, and that it was still CG policy to allow only government employees on official business on the island. Dr. Miller was aware of this investigation as early as October 1966, and the Committee was subsequently in receipt of voluminous correspondence and documents from him on this and other subjects. He took the position that the legality of his presence on the island was "none of the ARRL's damned business." Nevertheless, in mid-January Hq. informed Mr. Kline and Dr. Miller that DXCC credit would have to be withdrawn because the League could not be a party to an activity labeled by an agency of the U.S. government as unauthorized. Dr. Miller countered with a demand that no discreditation take place or he would file a "major lawsuit" against the League; the Committee nevertheless acted to withdraw the credits. The Committee was somewhat startled a few days later to receive from Dr. Miller (in Africa) a photocopy of a letter on Coast Guard stationery from "Vice Admiral R. C. McCleary, Acting Commandant," stating the Coast Guard had no objection to his activity on Navassa; however, it was later discovered that there is no such person in the Coast Guard and no such letter had been written. Dr. Miller challenged the CG's



One of several photographs submitted in the autumn of 1966 by W9WNV of his and K1IMP's "St. Peter & Paul DXpedition" PYØXA. This picture and others were published by CQ and *73* Magazines (December 1966). Under oath, Dr. Miller later admitted he had not been on the Rocks and these pictures are of some entirely different area.

jurisdiction over the island and its right to deny him permission to land; at one point he threatened to "take the matter up in person in Washington with the Departments of State, Interior and Treasury" if the Coast Guard again attempted to deny any amateur permission to land at Navassa. The Commandant of the Coast Guard replied that his visit was a trespass upon Government property, and that "any further unauthorized visits may result in a referral of the matter for appropriate action by the Department of Justice".

St. Peter & Paul Rocks

This was an activity in late August, 1966, again with K1IMP as a companion. Once again cards received at Hq. were granted full DXCC credit, in good faith. However, word shortly reached Hq. that Dr. Miller had been in Caracas, Venezuela, "within hours" of the claimed PY0XA operation and thus could not possibly have reached the Rocks some 2000 miles away. Accordingly, the Awards Committee in early October 1966 requested both him and Mr. Kline to furnish information on the journey — name of vessel, itinerary, etc. Mr. Kline responded, simply deferring to W9WNV. The latter wrote in late October (from the Indian Ocean) saying he was "not going into details on transportation, visas, passports, port clearances, etc. — that's my business and not the ARRL's." (In the same letter he did say, however, that this and the Navassa operation were "two of the best and most legal DX operations I've ever been connected with.") Later he agreed to furnish such documentation as was feasible; but little of substance was ever received. He told the Awards Committee in Newington in person on March 3, 1967, ". . . there can't be any evidence that anything was wrong with the St. Peter & St. Paul because that expedition was 100% okay licensewise and everywise." He told the ARRL directors in Hartford on May 4, 1967, ". . . Herb Kline and I are both willing to sign affidavits that we were on St. Peter and Paul Rocks . . . We were there and the pictures we took were from there. It couldn't have been anywhere else . . . I was there and I won't have anyone saying I wasn't there . . ." Nevertheless the Awards Committee was not convinced and so acted in July to withdraw DXCC credits for the PY0XA operation, despite continuing threats of a lawsuit. The suit was actually filed, in February, 1968, in the federal district court of San Francisco. To make a long story short, during Dr. Miller's deposition in Hartford in June, 1968, under oath he admitted that the PY0XA operation actually took place from a vessel in sight of the South American coast in the vicinity of Trinidad or Tobago, some 1800 miles from St. Peter & Paul's Rocks.[1]

Laccadive Islands

This was an operation in late January, 1967. In early February the League received an appeal from the Amateur Radio Society of India to warn Dr. Miller that his operation from the Laccadives was unauthorized, since no amateur operation was permitted there, and it would certainly cause difficulty in amateur/government relations. Dr. Miller had been granted a license, VU2WNV — in fact the first to any U.S. citizen under the reciprocal agreement. He claimed it authorized Laccadives operation (although he never actually saw the license); the government said it was good only for Bombay. By a statement dated February 20, 1967, the League announced (among other things) suspension of any DXCC credits for the VU2WNV operation until further notice. The Awards Committee was somewhat startled a few days later to receive from Dr. Miller (in Africa) a photocopy of a letter to him on Indian government stationery dated January 3, 1967, granting him authorization to operate on the Laccadives (and thus disputing the ARSI statement)! This and other material was furnished ARSI, who in turn forwarded it to their government. After an intensive investigation, the Department of Communications of the Government of India informed the League: "The letter of January 3, 1967 . . . has not been issued under the authority of the Govt. of India . . . Amateur licenses/permits are never issued by us in this form and the letter head of the forged document is an old one which was in use in 1963 . . . It has been confirmed by the authorities in India that Dr. Miller never landed in any of the islands in Laccadives during the period . . ." The Awards Committee thus rejected Dr. Miller's appeals to credit the VU2WNV operation.

Chagos

This was part of the January 1967 itinerary which was claimed to include the Laccadives, being a stop enroute from the Seychelles. Several amateurs in Mahe (Seychelles) expressed to the League strong opinions that Dr. Miller did not actually go to the Chagos, as their direction-finding activities on his VQ9AA/C signals showed them coming from the west, rather than the east as would be expected from any Chagos operation; and the signals were consistently strong around the clock, not showing any day-night variation as would be expected from a transmitter 1,000 miles away. It was also asserted that the trimaran on which Dr. Miller departed from Mahe was much too slow to have made the voyage in the time claimed. This evidence the Awards Committee found significant but not conclusive. The subject was discussed in considerable detail, along with the Laccadives, at the meeting with directors in May 1967. Dr. Miller at that time described his trip as by trimaran only for a few miles from Mahe, then transferred next day to a "fast yacht" which took him to Chagos, Blenheim Reef and Laccadives, then re-transferred him to the trimaran for the return to Mahe. Neither in the meeting with directors, nor in the depositions under oath, could Dr. Miller recall for certain the exact name of the "fast" boat, its country of registry, its last port of departure, its size or color, names of captain or any of the crew. He "thought" it was Dutch-owned and might have one of two names — the "Viana Princess" (which the League found on investigation was a vessel in the Pacific Ocean at the time) or the "Voyageur," (the League could locate only one vessel of that name, in the Mediterranean at the time). Taken together with the information obtained on the Laccadives, the Awards Committee found the explanation unacceptable and so acted in July 1967 to withdraw credits for VQ9AA/C.

Heard Island

This was an activity in July 1966 under the call sign VK2ADY/0. Reports received by Headquarters that the operation had not actually been conducted at Heard prompted questions concerning the operation during the meeting of directors in Hartford in May 1967. Dr. Miller identified the "S. Capetown" as the ship which took him from Durban (he

[1] A point noticeably absent from the April 1968 "Don Miller Rebuts Fraud Charges" instalment of the DXpedition series by W9WNV in *CQ* Magazine.

thought) to Heard; he claimed it was a rescue vessel, but was not registered in South Africa (he didn't know where). Hq. investigations located several vessels with the name "Capetown," none in the service claimed. Checks with the Postmaster General's Department of Australia indicated Dr. Miller was issued a license but it was valid only in New South Wales (he claimed otherwise). Investigating at ARRL's request, the Wireless Institute of Australia (which took no position in the matter other than obtaining information) received a response from the Australian Department of External Affairs as follows:

In reply to your letter of 11th May, our department was approached first by Mr. Charles N. Swain, on 10th January 1966, and later by Dr. Miller on 21st February 1966, who sought permission to visit Heard Island to establish an amateur radio station there.

Early in March the Department advised that they were not able to approve the request because of their inability to demonstrate to us that the arrangements they proposed to adopt would be adequate to cope with the very severe weather conditions likely to be experienced at the island.

Incidentally, in making his representations, Dr. Miller advised our department that the French authorities had approved his visit to Kerguelen near Heard Island, subject to their accepting no responsibility for the safety of the party. However, the French authorities advised that they had had no such request. . . .

In the circumstances, there seems reason to doubt whether Dr. Miller did, in fact, visit Heard Island in July 1966. The Island is very exposed and the anchorage at Atlas Cove is extremely treacherous. In July the weather is particularly violent and would be very dangerous in a small ship. *Yours sincerely, D. F. Styles, Acting Director.*

Under the circumstances the Awards Committee felt it had no choice but to withdraw credits for the operation, and did so in July 1967.

Case Settled

Before the taking of depositions was even completed, attorneys reached the stage of specific proposals for settlement of the case. After many hours of consultation among and between the attorneys for both sides and discussion by telephone among the League's officers, an Agreement was signed by Dr. Miller and Mr. Huntoon as League Secretary (subject to ratification by the League's Board of Directors) and in his own behalf. The full text of the Agreement follows:

WHEREAS, the Awards Committee of the American Radio Relay League, Incorporated, reported in statements dated February 20, 1967, March 10, 1967, May 4, 1967, and July 6, 1967, certain decisions and actions taken by it concerning certain amateur radio activities and operations of Doctor Donald A. Miller, W9WNV; and

WHEREAS, Dr. Miller instituted suit against the League and its Secretary and General Manager, John Huntoon, in the United States District Court for the Northern District of California on February 19, 1968, Civil Action File No. 48726, alleging that the statements and actions of the Awards Committee and certain related statements and actions of Mr. Huntoon were malicious and libelous and requesting judgement in the maximum amount of five hundred fifty thousand dollars ($550,000.00); and

WHEREAS, service has been obtained on the League but not on Mr. Huntoon; and

WHEREAS, the League, in an answer to Dr. Miller's complaint, filed on May 7, 1968, denied each and every allegation of said complaint of which it had knowledge; and

WHEREAS, Dr. Miller, the League's Secretary, the League's General Counsel, and California Counsel for both parties to the action have met in Hartford, Connecticut, for five (5) days, beginning June 11, 1968, to prepare for trial of the action; and

WHEREAS, the parties recognize that this and similar actions and controversies are not conducive to the advancement and enhancement of amateur radio in the United States and throughout the world; and

WHEREAS, the parties, being desirous of terminating, once and for all, their differences and the related controversies, have explored at length during the said five day period the manner in which this action and their differences and related controversies may be resolved by mutual agreement; and

WHEREAS, there are no unresolved complaints concerning any of Dr. Miller's operations now pending before or known to the League's Awards Committee;

NOW THEREFORE, in consideration of their mutual promises and other valuable consideration, the parties hereby agree as follows:

1. Dr. Miller shall dismiss with prejudice his suit against the League and Mr. Huntoon within ten (10) days after the conditions precedent hereinafter contemplated have occurred; and

2. Dr. Miller shall not institute any suits or other litigation in any other jurisdictions against the League or any of its Officers, Directors, Employees, or Agents based upon any of the actions or matters which were the basis for or subject of the instant suit; and

3. The parties hereto shall execute appropriate releases to carry forth the intent of this agreement; and

4. Except for certain expenses incurred in connection with or related to the said meetings, which shall be the subject of separate agreement between counsel, each of the parties shall bear and pay its own costs, including attorneys' fees; and

5. Copies or reports of this agreement may be published in the League's official journal, *QST*, and/or in any other publications should either Dr. Miller or the League so desire; and

6. This agreement shall not be binding upon any of the parties hereto unless and until the following conditions precedent have occurred:

(a) The Awards Committee has approved as separate country credits for the D.X. Century Club the 1968 operations of Dr. Miller from Blenheim Reef, Geyser Reef, and Chagos Is. (Nelson's Island); and

(b) Ratification and approval of this agreement within forty-five (45) days of the date of this agreement by either or both the League's Executive Committee or Board of Directors.

This agreement, entered into this 15th day of June, 1968, at Hartford, Connecticut, by the following:

DONALD A. MILLER, M.D.: THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED by Its Secretary JOHN HUNTOON: JOHN HUNTOON.

By way of explanatory comment, it should perhaps be noted that the legal language of Items 1 and 2 in the Agreement ("with prejudice") preclude Dr. Miller from at any future time reinstituting suit against the League or any of its personnel for any actions or statements prior to execution of the Agreement. Item 4 provides that each party shall bear its own costs except that the League agreed separately to underwrite the costs incident to the taking of the depositions in Hartford solely as a concession to avoid dragging out the litigation into even more extended time and expense. This concession was made upon the strong advice of ARRL counsel and after thorough discussion among the Executive Committee and the Board. No money was paid to Dr. Miller in settlement. Items 6 covers Awards Committee approval of 1968 (actually year-end 1967) operations by Dr. Miller at three locations for which he had earlier supplied complete documentation and against which no complaints had been received. The Awards Committee's 1967 actions in withdrawing credits for the locations described earlier still stand of course.

The agreement became effective with (1) the release of Awards Committee action on the three most recent DXpeditions (See p. 108, September *QST*; and (2) ratification by the Board of Directors, in a mail vote — which incidentally, was 11 in favor to 5 opposed. Those in opposition, it should be mentioned, were mostly against the League's underwriting any deposition costs.

QST

Happenings of the Month

EXAM CREDITS DENIED

FCC has rejected three petitions for rule-making which asked for credit toward higher classes of license based on past records.

W8ZHB, in RM-1252, urged that Conditionals and Generals who once held Class B and Class C licenses be granted Advanced Class without further examination. W8DBK wanted the same privileges (via RM-1256) for former holders of Advanced, Class A or Amateur Extra First who now hold only General because of a lapse in license-holding. RM-1251, submitted by W3EIQ, sought automatic General Class licenses for those who had held Conditional for ten years continuously without receiving a "pink ticket" (Official Notice of Violation) in that time.

In denying the petitions, FCC said that the various proposals were either largely repetitive of matters recently considered and resolved in Docket 15928, or were inconsistent with the decisions of that docket.

STAFF NOTES

Sharp-eyed readers of page 3 may already have noted the name of our new advertising manager, Robert J. Rinaldi, W1CNY/K1AFC, on the masthead for September. Bob came to Hq. in June, 1965, as purchasing agent and assistant circulation manager, and joined the advertising department in March 1968. He has a bachelor's degree in economics from Fairfield University, and spent six years in the Naval Reserve, two of them on active duty. As a carry-over into ham radio, Bob holds Navy MARS call N0ZVK; is a past Connecticut area n.c.s, and former area editor of *The Kilowatt*. A past secretary of the Connecticut Wireless Association, he uses c.w., s.s.b and RTTY on 80 through 10, and holds appointment as an ARRL official bulletin station. He started as a Novice in Waterbury, Conn., twelve years ago.

A new communications assistant at Hq. is William O. Reichert, WA9HHH, of Dupo, Illinois. Bill was first licensed in 1963 while a sophomore in high school. He's been net control station on the Illinois c.w. net and Ninth Regional Net; operates in Central Area Net and has filled in as the Transcontinental Corps liaison to Eastern Area Net. He runs a home-brew linear to a pair of 6094s, gets in most of the contests and is getting gear ready for RTTY. He'll be assisting Communications Manager George Hart with public service matters.

FCC DENIES STAY ON 50.1 MHZ.

The Federal Communications Commission has turned down a petition filed by Robert B. Cooper, Jr., K6EDX and Robert D. Grimm, K6RNQ which requested continuation of Technician, Conditional and General Class operations in 50.0-50.1 MHz. after the present cutoff date of November 22, 1968 and in 50.0-50.25 MHz., after November 22, 1969.

The League, incidentally, at its 1965 and 1968 Board meetings favored continuation of these privileges for these licensees; the Board did not feel that subdivision of the bands by class would work on v.h.f.

The Commission, in denying the petition, reiterated its intention of sticking with incentive licensing as announced a year ago, until practical experience dictates a change. Even in the face of two FCC rejections, the League will continue to seek maintenance of the Technician privileges by filing a petition for reconsideration of the ruling.

The text of the Order follows:

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of Amendment of Section 97.7(a) of the Amateur Radio Service rules relating to operation in the 50–50.25 MHz. frequency band.	RM-1287

ORDER

Adopted: August 9, 1968 Released: August 13, 1968

1. A petition for the institution of rule making in the Amateur Radio Service has been filed by Robert B. Cooper, Jr. (K6EDX), Fresno, California, and Robert D. Grimm (K6RNQ), Pleasant Hill, California, proposing that Technician, Conditional and General Class licensees be permitted to operate in the 50–50.25 MHz frequency band.

2. Petitioners' proposal would require amendment of a portion of Section 97.7(a) of the Commission's Rules which was revised on August 24, 1967, in Docket 15928 (FCC 67-978) as part of the Amateur Radio Service "incentive licensing" program. Section 97.7(a) now provides that, effective November 22, 1968, operation in the 50–50.1 MHz band and, effective November 22, 1969, operation in the 50.1–50.25 MHz band will be limited to the Advanced and Amateur Extra Classes of licenses as reserved privileges for these higher licensee classes.

3. To support their proposal, petitioners state that they "are wholly in accord with the principles set forth in Docket 15928," but that they believe that the reservation of the 50–50.25 MHz band

Behind the Diamond

Number 9 of a Series

Is there "magic" in pipe smoke? We've noticed that George Grammer, W1DF, is seldom without his pipe—and seldom without a good clear explanation of whatever technical problem is at hand! Our photo, while far from recent, is typically George checking on an antenna experiment.

For those who came in late, we'll say that George is technical editor of *QST* and technical director of the League. He's author of two publications, *A Course in Radio Fundamentals* and *Understanding Amateur Radio*, wrote the March-to-August *QST* series, "Those Higher Class Examinations," and has a hand in most other technical writing or editing chores at hq.

GG was first licensed as a teenager in Philadelphia with the call 3AIH. He graduated from Drexel Institute in 1926 and went to work for a transit company as an engineer. In 1929 he took over the Technical Information Service at ARRL. His first article for *QST*, in December, was "A Single Control Transmitter," widely built by beginners of that day. By May of 1930 GG was assistant technical editor, acting t.e. in 1938 and t.e. in 1939. After wartime leave for classified technical work, George resumed the t.e. job, but with the additional title of technical director.

Not long thereafter, George testified at an FCC hearing on television: channel 1 vs. channel 2, TVI potential and so on. At the completion, the audience broke into applause in appreciation of his lucidity, a virtually unheard-of reaction in the decorous atmosphere of a hearing chamber!

About this time, under his perceptive direction, *QST* began intensive exploration of new modulation techniques including narrow-band f.m. and s.s.b. In recognition particularly of the latter, George was elected a Fellow of the Institute of Radio Engineers (now IEEE) in 1959. GG has also belonged to a couple of more exotic organizations, The South Lyme Beer, Chowder and Propagation Society (actually a Field Day club) and the JERKS, which backforms into something like Junior Engineering Radio Knowledge Seekers. But contemplative pastimes are attractive, too; with Mrs. Grammer and often the grandchildren, George attends many of the symphonies, ballets and other musical performances. He's also doing some amateur astronomy these days.

And on October 5, W1DF will receive the Amateur of the Year plaque of the Antique Wireless Association during its convention at the Smithsonian Institution—a well-deserved recognition from hams who know.

"will result in serious and irrepairable (sic) consequences to the amateurs."

4. It is difficult to reconcile the petitioners' contention that they adhere to the principles of incentive licensing with their proposal. The particular change to which they object reserves a very small segment in the 50 MHz frequency band to the highest classes of amateur licensees. This segment, which is only about 2% of the VHF frequencies available to Technician, Conditional, and General Class licensees, was deleted in order to provide an incentive for lower class licensees to "upgrade" their license status. Petitioners do not discuss these considerations, nor do they clearly indicate the nature of the undesirable consequences which they maintain results from this provision. They do present comments to show the desirability of this reserved frequency segment for a number of purposes, and the relationship of the 50 MHz band to television interference (TVI). However, similar comments were carefully considered in the Docket 15928 proceeding and were not found to require a different determination. Moreover, the Commission stated in Docket 15928 that it is its intention to review the extent to which the reserved frequencies are occupied, and to make necessary changes if the effective utilization of the frequencies involved is threatened. Initial implementation of these frequency reservations is scheduled for November 22, 1968, with full implementation one year later. So that Commission review may be meaningful, it is planned to gauge the results following each stage of implementation.

5. As can be seen from the foregoing, petitioners' proposal is repetitive of a matter which has been recently fully considered and resolved. It is concluded, therefore, that the institution of rule making is not warranted. Accordingly, the Chief, Safety and Special Radio Services Bureau, under delegated authority set forth in Section 0.332(m) of the Commission's Rules, ORDERS that the petition filed by Robert B. Cooper and Robert D. Grimm is DENIED.

FEDERAL COMMUNICATIONS COMMISSION

EPISTLE TO A QRM-MAKER

Here's a copy of a letter sent by FCC some time ago to an amateur who had been accused of intentional interference. Some mighty good advice for all of us is included therein. (Thanks to the Amateur Radio News Service and Boeing Employees' ARS for bringing the letter to light).

Interference to Other Stations—An F.C.C. Letter

Interference involving the operation of your amateur radio station has been reported to the Commission. Accordingly, this letter will advise you of the Commission's rules and policies applicable to general interference between stations licensed to operate in the amateur service.

As you are undoubtedly aware, frequencies allocated to the Amateur Radio Service must be shared by all licensees. Consequently, interference between stations is most likely to occur during periods of heavy activity on, and occupancy of, an amateur frequency band. Experienced amateur operators are expected to anticipate and minimize this interference. Their failure to do so indicates either ignorance of the practical realities of amateur communications or a selfish lack of consideration for others. Assuming that it is your desire to alleviate interference between amateur stations, the following guidelines and considerations are presented.

Licensees of stations which are already in operation should remember that no amateur licensee, group or network has a right to the priority or exclusive use of a given frequency nor may freedom from interference be expected (exception is provided under the emergency provisions of rule Section 97.107). In addition, common courtesy, as well as good amateur practice, dictates that incessant or continuous non-emergency operation so as to preclude others from operating is highly undesirable and unwarranted, and if willful or malicious, could result in the imposition of punitive measures.

Licensees of stations who are attempting to utilize an occupied frequency should note that Section 97.125 of the rules provide that: "No licensed radio operator shall willfully or maliciously interfere with or cause interference to any radio communication or signal." Moreover, observance of good amateur practice requires the avoidance of attempting operation of a frequency where it is obvious or likely that such operation will result in harmful interference.

All licensees should avoid the following frequently observed improper practices, some of which constitute willful interference for which severe penalty is provided:

A. Knowing and repeated operation on, or unreasonably close to, a net frequency at times when the net is obviously active.
B. Requesting or demanding protection of a net frequency at times when the net is inactive.
C. Requesting or demanding protection of a net frequency over a long period of time in the absence of an emergency situation.
D. Calling, testing or tuning on a frequency without first determining that the frequency is not already being used.
E. Carrying on an exchange of communications on two (or more) separate frequencies when there is no technical or operational necessity for such multi-frequency usage.

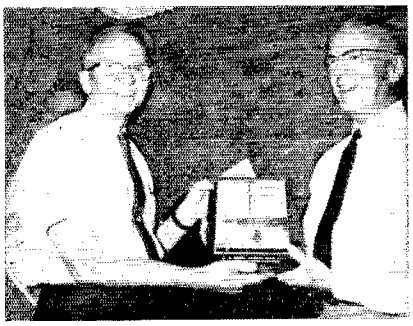
As noted, the foregoing is furnished for your guidance. From long experience, the Commission has found in most instances neither party to an incident of alleged deliberate interference in the use of frequencies is entirely blameless. The keynote to resolution of these interference problems, therefore, is cooperation and consideration by all persons involved.

You are permitted and encouraged to read and discuss this letter via your amateur radio station. You may be assured that any effort on your part to contribute to better amateur radio practices and operations will be greatly appreciated.

BEN F. WAPLE, *Secretary*
Federal Communications Commission

One of several ways Illinois hams celebrated the sesquicentennial of their state was by sponsoring a Central Division convention in Springfield. Posing for a photo are: ARRL General Manager W1LVQ, Illinois S.C.M. W9PRN, ARRL President WØDX, Acting Mayor James A. Dunham, Central Division Director W9HPG and Indiana S.C.M. W9BUQ.

Strays



The QST article, "An Experimental All-Electronic VOX System for S.S.B." won for its author, H. Rommel Hildreth, M.D., KØHZF the Cover Plaque Award for March, 1968. The plaque was presented to KØHZF, right, by Raymond L. Keller, WØDU. The winner is picked each month by a mail vote of directors as to the best article.

The St. Louis Amateur Radio Club presented its Amateur of the Year 1968 plaque to Kenneth Lohmeyer, WAØERG; club prexy WAØEFB does the honors.

W4FUM has put into action his ideas on "house-breaking" the ham shack. As shown above, John has done a good job making his rig blend with the contemporary decor—or, as he says, giving it wife-appeal.

Scouts On The Air. The 11th Jamboree-on-the-Air of the worldwide Scouting movement will be held from 0001 GMT October 19 to 2359 GMT October 20, 1968. Object is for hams to invite local Scouts into the shack and let them talk to their fellow Scouts elsewhere. It's not a contest, but an outline of activity should be sent to: B.S.A., New Brunswick, N. J. 08903.

WHO THE DEVIL IS WHO?

Fourth in a Series of Call Conversion Charts

Here are additional calls of amateurs taking advantage of new rules which allow Extra Class licensees licensed 25 years ago or longer to acquire two-letter calls. If you should be listed here, let us know by post card right away.

Now	*Was*	*Now*	*Was*	*Now*	*Was*	*Now*	*Was*
W1CH	W1JJL	W2TV	W2MEK	W5GV	K5MAZ	K6JA	WA6VTY
W1GL	K1YRO	W2ZZ	W2LQP	W5HS	W5PHJ	W6RM	W6AUQ
W1JE	W1IKU	**W3**NU	W6EWN	W5IB	W7FTU	W6TB	W6CTO
W2GX	WB2BLI*	W3PG	W3HEC	W5IK	K5CWE	**W7**KF	W7RJA
W2JA	WA2MMY	W3QD	W3JVA	**K6**BR	WØWSM	W7KS	W7ATV
W2LA	W2PXR	**K4**DF	WA4STD	W6DR	W6HMP	W7LJ	W7HIA
W2PM	K2RNA	K4FU	W4CVI	K6FO	W6WLJ	**W8**DI	W8GKX
W2PV	WA2SFP	K4HJ	W4GGX	K6GG	W6ZJW	W8FE	WA3HAN
W2QK	W2CZF	K4II	W1RCQ	K6HN	W6GBI	**W9**BL	W9CJC
W2SN	W2FCQ	W4NW	K4AEV	W6HN	WB6NCD	W9CU	W9GPZ
W2SX	W2PBQ	W4VZ	W2LFR*	K6IM	WB6LDC	**WØ**II	WØRRS
W2TD	W2NOS	**W5**DM	W5GGV	K6IR	K6BNJ	WØIJ	WØVBK
W2TS	WB2QCO	W5GO	W5BRR	W6IT	W6PIZ	* Correction from Sept.	

I.A.R.U. News

INTERNATIONAL AMATEUR RADIO UNION

IARU REGION II CONTEST

The first annual IARU Region II Contest will be held October 12 and 13, starting at 0001 GMT on Saturday, and ending 2359 GMT on Sunday. Participating stations should call "CQ Region II Contest" on phone, and "CQ 2 Contest" on c.w. Exchanges for both modes shall consist of the signal report followed by serial contact number.

The contest is open to world-wide amateurs. Operation is permitted on any band using any mode. Cross-band, cross-mode, and contacts with stations located in the same country as the participant are not valid. Stations within Region II (Western Hemisphere) may count one point for each contact made with other Region II stations, and 6 points for contacts made with stations outside of Region II. Stations located in Regions I and III receive credit only for contacts with Region II stations for which they count 6 points per contact. Total score is obtained by multiplying the total number of points by the number of countries worked.

Entries will be accepted from single- and multi-operator stations. Separate logs should be kept for phone and c.w. and submitted before the last day of the year to the Secretary of IARU Region II, Box 4097 Lima, Peru. A summary sheet should be included with all scoring information, category (multi- or single-operator), and the name and address of the participant. Awards will go to highest scorer in Region II, outside of Region II, and in each country for each kind of participation.

Here delegates to the recent IARU Region III inaugural Congress are shown being greeted by then Wireless Institute of Australia President VK3ZS at WIA headquarters.

WA3HXR is congratulated by Dr. Angel Landaeta, chief of the Radio Broadcasting Department of the Ministry of Communications on receiving the first permit under the U.S.-Venezuelan reciprocal operating agreement signed September 18, 1967. Also shown in the picture are Menotti Fraino, YV5AMF, and Eduardo Cabrera, YV5AXU, Vice-President and President respectively of the Venezuela Radio Club, and Miss Marie Richardson, First Secretary of the American Embassy, Caracas.

INDONESIA

A new national organization of amateur radio operators has been formed, with the approval of the Indonesian Telecommunication Council —the *Organisasi Radio Amatir Republik Indonesi* (ORARI). We hope that with this official authorization of amateur radio in Indonesia we will soon have another member of the IARU.

Three prefixes will be heard being used by Indonesian amateurs—YB (high-class certificate), YC (mid-class certificate, and YD (lower-class certificate). Only the holder of the high-class certificate will be allowed to make contact with radio amateurs outside of Indonesia—thus, only the YB Indonesian call signs will be working DX. The holders of YC call signs are permitted to QSO other Indonesian amateurs, while the YD prefix is only for local work. No PK prefix is now legal.

The call sign areas are: 0—Djakarta; 1—West Java; 2—Central Java; 3—East Java.

Amateurs are warned that the government of Indonesia has not yet removed their notice filed with the International Telecommunications Union which gives objection to Indonesian amateurs contacting amateurs of other countries. Such communications, therefore, are still illegal for both parties involved. A list of DX restrictions appears on page 91.

AMATEUR RADIO BOOKLET

A booklet entitled Amateur Radio, explaining the "reasons for the continuation and expansion of amateur radio as a service of self-training, intercommunication and technical investigations," contributed by G6CL has been published by IARU Region I Division. Distribution will be to international telecommunications officials to acquaint them with the history and accomplishments of the amateur radio service.

The idea of producing the booklet arose at the IARU Region II meeting at Opatija, Yugoslavia, May, 1966. The result of the effort is a well-organized, well-illustrated booklet which should do an effective job for amateur radio.

EXHIBIT IN IVORY COAST

The *Association des Radio-Amateurs Ivoiriens* reports that during American Week in Abidjan, November 18-24, 1968, they will sponsor an amateur radio exhibit at the Hotel Ivoire. American Week is sponsored by the American Business Club of the Ivory Coast. Through this exhibit, *ARAI* hopes to acquaint many people with amateur radio.

QSL BUREAU CHANGES

The following are new QSL bureau addresses; a complete bureau list will appear in the December issue. Algeria: (7X2, 7X3 and 7XØ) ARA QSL Service, P.O. Box 2, Algiers. Trinidad and Tobago: (9Y4) Trinidad and Tobago Amateur Radio Society, P.O. Box 1167, Port of Spain, Trinidad. American Samoa: Utulei High School Amateur Radio Club, Department of Education, ETV, Pago Pago, American Samoa 96920.

NOTES

Hiroshi Murai, JA1AC has been elected President of the Japan Amateur Radio League, succeeding Kenichi Kajii, JA1FG who has served as President since 1953. Roy is ex-J2MI and has been an active radio amateur for more than 34 years.

In July, 1968, this column announced that visitor licenses are now available for operation in Ireland. Application forms for such may be obtained by writing the Secretary, Radio Section, Department of Posts and Telegraphs, Hamman Buildings, O'Connell Street, Dublin.

DX OPERATING NOTES

Reciprocal Operating

United States Reciprocal Operating Agreements currently exist *only* with: Argentina, Australia, Austria, Belgium, Bolivia, Canada, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Finland, France, Germany, Guyana, Honduras, India, Israel, Kuwait, Luxembourg, Netherlands, New Zealand, Nicaragua, Norway, Panama, Paraguay, Peru, Portugal, Sierra Leone, Switzerland, Trinidad and Tobago, United Kingdom and Venezuela. Several other foreign countries grant FCC licensees amateur radio operating privileges on a courtesy basis; write headquarters for details.

Canada has reciprocity with: Bermuda, France, Germany, Israel, Luxembourg, the Netherlands, Senegal, Switzerland, United Kingdom and U.S.

Third-Party Restrictions

Messages and other communications — and then only if not important enough to justify use of the regular international communications facilities — may be handled by U.S. radio amateurs on behalf of third parties *only* with amateurs in the following countries: Argentina, Barbados (only U.S. stations/-8P) Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Greenland (XP calls only), Haiti, Honduras, Israel, Liberia, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela. Permissible prefixes: CE CM CO CP CX EL HC HH HI HK HP HR LU OA PY TI VE VO W or K/8P XE XP YN YS YV ZP 4X and 4Z. Canadian hams may handle these same type third-party messages with amateurs in Bolivia, Chile, Costa Rica, El Salvador, Honduras, Israel, Mexico, Peru, U.S. and Venezuela. Permissible prefixes are: CE CP HR K OA TI W XE YS YV 4X and 4Z.

DX Restrictions

U. S. amateurs licensees are warned that international communications are limited by the following notifications of foreign countries made to the ITU under the provisions in Article 41 of the Geneva (1959) conference.

Cambodia, Indonesia (including West New Guinea), Thailand and Vietnam forbid radio communication between their amateur stations and such of other countries. U.S. amateurs should not work HS XU XV 3W8 or 8F. Canadian amateurs may not communicate with Cambodia, Indonesia, Laos, Thailand, Vietnam and Jordan. Prefixes to be avoided are HS JY XU XV XW8 3W8 and 8F.

Correspondence From Members-

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

GETTING THE WORLD IN TUNE

¶ Just read the August *QST* article by Ambassador Meyer, W3ACE/EP2AM. This is an in-depth report, an excellent writing. In my opinion this address will be remembered for many years.

Seems to me that the inscription on those certificates which are issued for copying the "Armed Forces Day Message" by the Secretary of Defense each May are saying the same thing: "Power for Peace."

The message I get from this article is that we should cultivate the art of listening. Not to just so much sound, but to the full meaning of what the other person is saying.

W3ACE seems to be speaking in parables: "The world in which we live is a world of diversity and change, requiring v.f.o. techniques rather than a fixed crystal frequency." And, the quotation from Kipling at the end puts the whole address in capital letters.

I am thankful that you as an Editor saw the beauty of this writing and published it. It is truly a masterpiece. — *Joe Rice, W4RHZ, Florence, Ky.*

AN ARRL WORKING FREQUENCY?

¶ The idea expressed by Mr. Hart, W1NJM, in Operating News in the August *QST*, is worthy of the consideration by all hams. Such a frequency would help world, as well as national communications along the lines of Mr. Meyer's Banquet Address as printed in the same *QST* on page 62. A roundtable having no membership requirements other than being a ham would also help those who are having trouble making contacts or who would like to make friends with a wide range of people of this country and others. It will also "apease" those who are irate about "hello-goodbye" DX contacts. I am definitely in favor of this proposal and feel that it is a true service to both the public and hamdom the world over. It goes without saying that the frequencies chosen will be in the General sub-band so that the greatest number of hams as possible are attracted. — *Carey Heckman, WA3HSU, Bethesda, Md.*

¶ I whole heartedly agree that we should have an ARRL working frequency. It would be good to know that someone could be contacted at anytime of the day or night on a particular frequency for any reason whatever, emergency, rig testing, message relay, or just plain wanting to talk.

Such a plan could possibly encourage more mobile operation because traveling amateur operators would know that they could work someone in the locality they happen to be in at the time.

Amateurs in general were criticized recently, by a local CB group that had banded together for mutual assistance, as being primarily talkers. There could be a grain of truth in this if we take a hard look at ourselves, especially in our day-to-day activities.

Why the working frequency plan has not been established before this is a bit of a puzzle; the sooner we get on with it the better. — *Calvin S. Bryant, W4FQZ, Miami Shores, Fla.*

¶ I heartily endorse the idea. May I suggest a c.w. and s.s.b. frequency on 75–80, 40 and 20 meters. Too many frequencies set up will only defeat the purpose of having an instant response to a call for assistance. — *Joe Lynch, K9IFE, Northlake, Ill.*

LET'S UNIFY!

¶ Ham radio is a hobby with multiple facets — each of which is sufficient to absorb the full interest of a particular individual. This is clear from the letters in *QST* which repeatedly extol the singular virtues of one aspect of ham radio.

Rather than attempt to move everyone to one of these aspects I propose that every individual try, or be shown the different aspects and be allowed to decide which is the most interesting for himself. I believe that *QST* should present a fair view of the various ham subcultures and provide sufficient support, or events, on a published basis to permit folks to sample each. This activity cannot be limited to the League but should be carried out vigorously by clubs to emphasize these various aspects.

I suggest that *QST* continue to devote one or two pages each issue to brief notes and significant events concerning each aspect of the hobby, as reported by a ham who is qualified in that field. Topics could be contests, traffic, v.h.f., construction and all the rest we know about. Only items of significance should be reported however; activities of a detailed nature would be better left to specific columns. I have had a chance to investigate many of these subcultures while operating as a KX6. They have included traffic handling, DXing, rag chewing, net operations and even some tinkering. The thing that has amazed me is the challenge and pleasure available from each.

Rather than tear each other apart, why not recognize these different hobbies, unified by the common title ham radio and the need for an FCC ticket. This realization, coupled with concerted League action could unify the hobby on a sound basis. — *Stanley Fierston, KX6FJ/W1BRJ, Box 1554, APO San Francisco.*

OPEN-BOOK EXAM?

¶ Years ago, old timers tell me, all amateur tests were extremely hard and maybe then this would have had some justification. Now, except for the Extra, the tests are so basic and simple if you can't pass it without another source besides your head, you don't deserve to be a ham. Especially with the ARRL *License Manual* and other study guides it almost all is memorization.

With an open-book test the only preparation needed would be to know where to look in the book for the answers. — *Doug Kay, WN2EMP, Bellerose, N. Y.*

¶ My compliments to WB2MCP for finally suggesting *open book exams for ham licenses. This is something* that the FCC should have tried long ago.

The exam should not be a test of how much one can memorize, but of how well and with how much skill one can use information that he has made available to himself. This, I think, is easily supported by the fact that a ham will soon forget the mountain of facts he's memorized for the test and will, by necessity, build up a library of needed info; or, he will still have the sources from which he studied for the test in the first place. — *Daniel S. Klein, WN2GJH, Yonkers, N. Y.*

¶ WB2MCP does not know what he is asking for when he wants the ARRL to petition the Federal Communications Commission to give open-book examinations. Speaking as one who has lived with open-book exams, as well as closed-book exams, not only through a Master's Degree, but also in courses towards a Doctor of Philosophy degree, I know open-book examinations can be rough and tough and it is not unusual for the failure rate to be higher than for closed-book exams.

I have passed the State Board examinations for Registered Professional Engineer. Even though I was permitted to take all of the texts, notes, and other aids into the examining room, and was well prepared, it was the hardest examination of all.

Therefore, speaking from a wide range of experience over many years, at different universities, before the Federal Communications Commission and the Federal Aviation Agency, I would rather take a closed book examination. They are easier to pass. My eighth grade teacher once wrote the spelling examination on the blackboard. Many of us failed it. Yes, even an open-book spelling examination may be dangerous. — *Lester C. Harlow, P. E., WB6ZNW/W4CVO, San Diego, California.*

¶ A recent correspondent has suggested open-book amateur exams. As one justification for his stand he says, "Professional engineering examinations are conducted in the manner suggested." As a registered P. E. in Ohio and Kentucky, I wish to point out that this is only partially true. While the Ohio P.E. examination does include two 4 hour open-book examinations, it also includes two 4 hour closed-book examinations. I might also add that open-book examinations are almost always much more difficult than closed book examinations. — *John R. Truitt, P.E., W8RTH, Cincinnati, Ohio.*

APPLIANCE OPERATORS

After reading the correspondence pages in August *QST*, I would like to know more about appliance operators.

Is this a new class of license?

I've looked through all the tech. manuals. I see spark, continuous wave, amplitude modulation and single sideband, but nothing on appliance operations.

I can get r.f. to the telephone, radio, stereo and the television set, but son-of-agun if I can get the stove, electric iron, refrigerator or can opener to show any signs of r.f.

How about a *QST* article on this mode? — *Howard McCall, W8TNF, Canton, Ohio.*

DELIBERATE JAMMING

¶ Am not an amateur — plan to go to Dallas FCC soon. However, just as a citizen I am puzzled and a little disturbed about this interference and what seems to me deliberate jamming of an educational *thing like your code practice transmissions. Am* not angry at anyone, or trying to raise hell with any one about anything, and surely do not want to be quoted on something I really don't know anything about, but it does make one wonder what the devil is going on and why it is allowed to continue. Are some of the amateurs upset with you — jamming your transmissions surely does not bother that machine you transmit with — jamming could only harm or discourage some kid without equipment and the experience to cope with trouble. It all seems a bit cowardly to me.

Don't know how large a segment of the amateurs you represent but amateurs had better have a strong, effective spokesman for a united group of voters. I do not mean to imply that anyone has to agree with you on everything, or any thing for that matter, but in these days you surely do need influence at the right places. — *Tom Winston, Abilene, Texas.*

ANTENNA LENGTH

¶ I disagree! (August *QST*, p. 41.)

With an antenna, it's how long you make it, not how you make it long. — *Martin E. Berman, K3IZQ, Pittsburgh, Pa.*

QSO MANAGERS—Continued

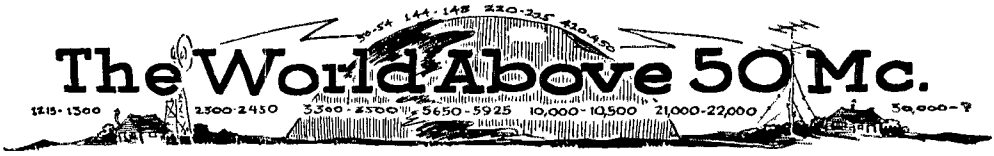
¶ W9EXE may have a point in his letter re QSO Managers but has he offered a better scheme? Has he ever operated from the DX side of the fence with a transceiver? Has he ever tried to untangle a pile-up on his transmitting frequency from away out yonder? Or does he have the super-set-up which pierces the pile-ups and always is heard?

The QSO Manager is a FB scheme if it is worked correctly and equitably. It gives the DX station a chance to hear a station rather than be interrupted constantly by "eager beavers" trying to tail-end. If the DX station desires to carry on longer with the U.S. operator with whom he is in contact at the moment he is able to do so. He can then go on to the *next fellow on the list. Is it much different than* writing for a schedule? Furthermore, it certainly gives the "little" fellow a chance to make a QSO with a rare DX when he otherwise would be snowed under. — *Gay E. Milius, Jr. W4NJF, Norfolk, Va.*

¶ This new method seems fair to me. All have a chance to work the QSO manager by chance not power of equipment. If the DX can not hear him on schedule, he will go to the next. Seems to me it puts more hams on an equal footing. Seems like it must be agreeable to the DX station or he would not do it. I like it. — *R. J. Almeida, WA3HBI, Cornwell Heights, Pa.*

¶ Bob Stark, W5OLG has just such an arrangement with Tom Christian, VR6TC, Pitcairn Island, for quite some time with few if any complaints. Hams write Bob or get in touch with him on the air and ask to work Tom. Once a week, after a short chat, Bob gives Tom a list of possible QSOs and Tom works them systematically.

To say that this system avoids pileups is only a small part of the story. Incidentally, it's a sad commentary on the future of c.w. to note that these sessions used to be conducted exclusively via c.w. Now it's strictly s.s.b. because c.w. requests to work VR6TC dropped to zero. — *Sam LeBow, WB6FJZ, Long Beach, California.* QST



CONDUCTED BY BILL SMITH,* WB4HIP

Cayman On Six

Most of us are dreamers at times, and I'm no exception. The thought of a 50-MHz. DXpedition outside the United States had long intrigued me. Finding the right location to visit and then the time to do so was not easy.

I had planned a trip to Grand Cayman Island in the British West Indies, 500 miles south of Miami, during the June contest. There had been no previous 50-MHz. operation from this small island, and Cayman is fair DX, even on 14 MHz. The Grand Cayman Government, through its Postmaster Wentworth Bodden, has issued a few licenses to Canadians and Americans. I mailed my application several weeks before the contest, but nothing was heard in time, so I abandoned my plans temporarily. A month later a letter arrived from Mr. Bodden. My application had been misplaced among requests for Cayman postage stamps. (The Cayman government derives considerable revenue from the sale of its colorful stamps to collectors.) My license was now ready for issue, I began planning an early fall Cayman trip. Then I thought, perhaps even a late July venture might be worth the gamble for *Es*. I wasn't sure, but then if the band didn't open I would still enjoy being away from television news for three days. I told my wife it was "go." She telephoned British West Indian Airways, $59 roundtrip from Miami was reasonable and a cottage at the Beach Club Colony was only $12.50 per day with two meals. July 19th was selected as the departure date. I began searching for someone to accompany me. No one in Miami was free, but K4OCK, president of International Electronics Systems Incorporated, offered a fresh Swan 250 and arranged for the loan of a portable beam and mast from WA4RRP. I was all set, except for a last evening stop for a smallpox vaccination.

Friday, July 19th, I arrived at Miami International Airport two hours ahead of flight time, 40 pounds over my allowed luggage weight. I hid the power supply, wattmeter and a can of insect repellent in a locker while I checked another grip

*Send reports and correspondence to Bill Smith WB4HIP, ARRL, 225 Main St., Newington, Conn. 06111.

220-MHz. M.S. First

The first recorded 220-MHz. meteor scatter contact has been made. And the second. And the third.

On August 9, after two months of daily schedules, Mel Baer, W6WSQ, and Don Hilliard, W0EYE, completed the first 220 m.s. contact on record. The contact was made between 1130 and 1315 GMT. They began scheduling on June 10 hearing pings and bursts of up to 12 seconds on nearly every day. The distance is approximately 825 miles. Signal levels were typically 10 to 15 db. above the noise and the maximum burst duration was about 15 seconds.

K4IXC and K2CBA made the second 220 m.s. contact two days later, August 11 at 1600 GMT, on several similar bursts. Their exchange establishes the 220 m.s. distance record at approximately 1090 miles. On August 12, W6WSQ and W0EYE worked for the second time, between 1130 and 1430 GMT.

W6WSQ also scheduled W7JRG August 11 through 13. No contact was completed, but W6WSQ received three bursts from the Montana station on the 12th and W7JRG heard W6WSQ briefly on the 13th.

Power input at the successful stations varied from 400 to 1000 watts, antennas were Yagis. W0EYE, at Boulder, Colorado, used 400-watts input, a single 13-element Yagi and a Nuvistor converter. W6WSQ, near Los Angeles, was running a pair of 4CX250Bs at a kw., a single 13-element Yagi 45 feet high and a 417A converter. K4IXC, Melbourne, Florida, runs a kw. and a pair of 17 foot long 12-element Yagis stacked 3 wave-lengths at 100 feet. K2CBA, near Albany, New York, has a pair of 4CX300s at a kw., a single 13-element Yagi 110 feet high and a 417A converter. While high power was used by those making contacts, we also note that K4IXC heard WA1HHK, near Boston, running approximately 15 watts output.

Says W0EYE, "220 m.s. is not easy." But it has been done. We salute these four operators for yet another in the long series of amateur radio "firsts."

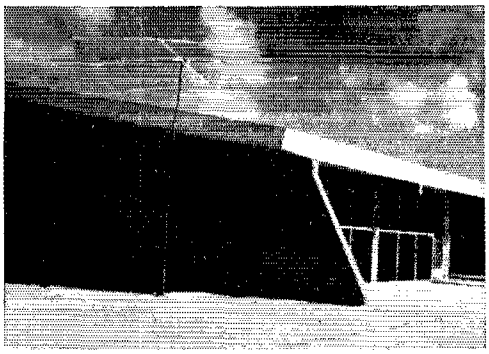
containing the 250, a swim suit, coax and connectors, and a package holding the 3-element Yagi and mast. I was still 12 pounds heavy on the scales, but the agent said nothing. I retrieved the other 25 pounds from the locker and walked to the boarding area. One hour later the 727 rose over Miami and turned south.

Fidel Castro allows no American planes to overfly his communist Cuba, but BWIA is of foreign registry and over Havana we flew. Those who fly are accustomed to picking out objects on the ground, such as cars or other signs of life. Over Havana I saw nothing. There was a city, streets and a harbor, but nothing was moving, not even a whisper of smoke. One would think Havana was a dead city, but living in Miami I know it is only sleeping. The 300,000 Cuban refugees in southern Florida have not forgotten their homeland.

The 727 covered the 500 miles to Grand Cayman in one hour — and a glass of island fruit punch. We flopped, literally, onto the short Cayman runway at 1600 GMT. Many bronze faces with wide smiles awaited the new arrivals. These are genuinely friendly and honest people. A policeman, one of the five or six on the island of nine thousand persons, asked what I was carrying. I handed him an itemized list and the letter from Postmaster Bodden. He read them and handed both back, calling a taxi driver to assist me. I cleared customs without an inspection or having to post a bond assuring I'd not sell the radio equipment on Cayman.

The airport is three miles south of the capital city, George Town, and seven miles from the cottage I had rented. I stopped first at the post office to get my license, but Mr. Bodden was not there. We drove on to the cottage where I received a warm welcome. Thirty minutes later the beam was pointed stateside overlooking the clearest blue water I've ever seen. I turned on the 250; no TV birdies, ignition or power line noise, nothing, not even a signal. But I didn't have the license yet, either.

I telephoned the post office; yes, the Postmaster was there. Into town I went, arriving just as he drove off. Someone waved at him and he turned around. He remembered my letters and asked that I come with him to the power station near the airport. The utilities advisor has to approve anything electrical on Cayman, but he was gone and an assistant didn't know when he would return. You have to know these people to accept their informality. Nothing bothers them and they know everything will take care of itself. I returned to George Town with Postmaster Bodden, a most cordial gentleman. He drove about the small town and then offered to take me back to the cottage. On the way he apologized for the original application being misplaced and for the present problems. "Go ahead and use ZF1DT. We can do the paper-work tomorrow," he said. ZF1DT went on the air at 1730 GMT, with a quiet band and optimistic CQ. Nothing. There was still nothing when I retired at 0230. Saturday morning wasn't much better, except for

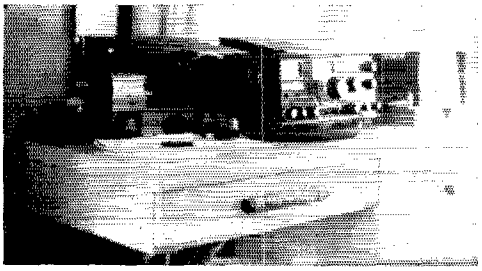


A 3-element portable Yagi 2 feet above sea level was used at ZF1DT. The beam and cottage overlooked the Caribbean Sea.

some meteor scatter which satisfied me that the receiver was working even though line voltage changes caused the transmitter output to vary between 70 and 130 watts. At 1400 GMT I flagged a taxi for town and found Postmaster Bodden. The license was waiting. I paid the $12 fee, thanked him and went for a four-hour taxi ride about the island.

Cayman is a lovely Caribbean island still unspoiled by American influence and money, but that will change in the next few years because land speculators are already at work plying their trade. The Caymanians welcome the American dollar because they know it will help develop their roads, fresh water supply (collected rain water is now used domestically) and other needed utilities. But they are *not* greedy, not in the least, and they *do not* take advantage of a visitor. They are fair, honest and courteous, and a verbal deal is a deal, no haggling later. My driver, a 51-year old man who came to Cayman as a lad of three, gave me *the* tour and helped select some prized shells on the beach for my five-year old daughter. While we drove he fiddled with an old shortwave converter which he said had been in four cars. The ignition noise was so bad it almost drowned out even HCJB in Quito. I'm told there is a radio station on Cayman that broadcasts deaths, births and fishing results on an irregular schedule, but I didn't see it. The nearest television is in Cuba and the driver was proud that he had one of the half dozen or so TV sets on the island. It, too, is old, but a 13-element Yagi 80 feet in the air brings in Cuban channels 4 and 6 fairly well. They're showing old, old British movies! Claude told me that he sees American TV quite often during May, June and early July, especially Houston and Cincinnati. Love 'em *Es!*

Returning to the Colony, he said he'd be pleased to drive me to the airport the next night. I accepted and went to my cottage to check 50 MHz. Still nothing doing and even the meteor scatter had disappeared. At 2137 I briefly heard a station on 50.110 calling "CQ DX the Caribbean." He faded before I could get an identification but I believe it was W3KWH, at least it sounded like Gary. (After I returned to the states



Compact and simple, ZF1DT used a Swan 250 from Grand Cayman Island. Erratic line voltage caused r.f. output to vary considerably, but caused no rig damage.

I learned that hundreds had been calling me blind all day after hearing from K4RNG, W5SFW and others that I was on Cayman.) A few minutes later I heard another W3 call CQ, I got his call and replied, "W3—— this is ZF1DT on Grand Cayman calling." Back he came, "who are *you* kidding?" He refused to work me! Nuts! At least there was finally *Es*, now to find someone who would believe there really is a ZF1 on six. W4HJZ, a North Carolina two-meter man, took the bait at 2155 with S9 signals. Carl became the first to work ZF1 on six. I'm sure he wasn't impressed, but I was — buck fever struck like when I worked my first G as KNØCER quite a few years ago. Then WB4HHH called, we worked, but business wasn't brisk. It was the dinner hour on the east coast and W4HJZ stuck with me sending "QST, QST, ZF1DT is on the frequency." Business started to improve with more contacts in North Carolina, Georgia and Florida. Suddenly VE1AFB, another two-meter buff, in Nova Scota called faintly from beneath the strong 4s. My request for the 4s to cool it was honored and I worked Charlie for a nice 2000-mile contact. Back to the 4s, then W9YT in Wisconsin followed by the only 2 I worked, W2CNS in western New York. More 4s called from along the Gulf Coast and then Grid, W4GJO, over a 650-mile path. The skip shortened more and I worked a handful of my Miami friends, 500 miles, but I could hear 9s calling also. For the next two hours I worked 4s and a few 5s as the band faded in and out. Signals would come roaring through in typical *Es* style and then disappear in less than five seconds. It was frustrating, and I know how the fellows stateside felt. At 0150, KØGHC in Colorado appeared from beneath a pile of 4s, and we worked. I worked more 4s for 10 minutes and then another Colorado station, WØAJY, was contacted. A good pileup was beginning, all s.s.b. except for one c.w. signal. I dug through the layers and identified W7FN in Tacoma, Washington, but it took more than five valuable minutes to work him because many 4s and 5s kept calling each time I'd stand by for the seven. I wanted that 3200-mile contact in the log, I finally got my S2 report from him. Then I worked more 4s and 5s including another station in Miami, five minutes after working Washington. Very erratic conditions and *most* frustrating. This lasted for 20 more minutes before the band became quiet except for W5SFW calling CQ DX on c.w. I answered, but he didn't hear me. I wanted to work Phil who had done so much publicizing my weekend jaunt. A few minutes later conditions improved somewhat and we worked. After that I chatted with W5RAG and WA5TXI for 30 minutes, but nothing else was heard. I crawled into the sack at 0500 GMT, tired, hoarse and hoping Sunday would be better.

It was worse. I was up early — good m.s. activity, but not sufficient to make random contacts. By 1600 GMT the meteors quit and until I lowered the beam at 0100 GMT Monday I heard no more signals, even though I checked constantly except for eating and a skin-diving exploration of two coral reefs about 200 yards off shore from my cottage. W5QQY, who along with his family, occupied the cottage next door, loaned me fins and mask and gave me a five-minute course on how to not swallow the salty Caribbean Sea. But that's another story. W5QQY operates only 20 meters nowadays, but recounted his days of cross-town contacts on the old 5-meter band.

I was eating a fine steak at 0200 when Claude appeared, ready to drive me to the airport. All along the road we passed Caymanians riding bicycles or walking toward the airport. Claude told me the biggest attraction for the natives was the arrival and departure of airplanes. The Sunday night affair was the largest of the week. He was right. Young Caymanian boys surrounded the taxi as we stopped. One lad, about 12, asked to carry my bags and was off with them before I could answer. At the scales I gave him the remaining shillings I had in my pocket, some 72c American. I'll never forget the look on his face. These people don't expect tips, but do things for you because they want to. Claude didn't want anything for driving me the seven miles to the airport. He just smiled, and then helped me purchase a quart of rum for $2. That and the shells were the only things I brought back to the states, except a deep respect — yes, even love — for the Caymanians. The island-hopping plane from Trinidad to Miami was late arriving on Cayman. I spent the time talking with Claude and watching the hundreds of Caymanians who had come to the airport to see the airplane. An hour later, as I parted, I told Claude I hoped his people never let the Americans spoil the jungle beauty of Cayman. He nodded and said, "you're the second American to tell me that today."

I've never enjoyed three days more in my life. It is hard to believe such a place exists a mere 500 miles from Miami, but it does, believe me! One hour later, after again flying over the still sleeping Havana, I landed at Miami International. I was greeted by a health officer who told me my 5-day old smallpox vaccination was no good because the certificate wasn't stamped by the Dade County Health Department. I showed him my now itching vaccination, he mumbled something and waved me through. The customs officers wanted to see the Oceanside, California stamp on

the Swan 250 to make sure I was bringing American-made products into the states. It was under my still wet swim trunks. He shook my quart of rum and I was free. Into a cab and then the seven-mile ride to my home in north Miami with the driver telling me what a big shot he used to be in South American business. His cigar smelled cheap. We pulled up in front of my house at 3:30 A.M. Miami time. "That'll be six bucks." I was home in Big City, U.S.A. But I'm going back to Cayman and present plans call for another trip yet this fall and next June for the contest.

I have sent Claude a set of noise suppressors for his Chevy.

50-MHz. Petition Denied

FCC, on August 9, denied a petition requesting the exclusion of the 50-MHz. band from the original so-called incentive licensing Docket 15928. See page 86 for details.

Stage one of Docket 15928, affecting 50 MHz., becomes effective November 22, 1968 when 50.00 to 50.10 is reserved only for holders of Advanced and Extra Class licenses. After November 22, 1969, the 50.00 to 50.25 segment becomes reserved for Advanced and Extra Class licensees.

1296 MHz. E.M.E. Test

The Crawford Hill V.h.f. Club, W2NFA, has scheduled another in its series of moonbounce tests. The dates and operating times are 0100 to 0600, October 12 and 0600 to 1400, October 13. The alternate test periods will be 0100 to 0600, November 9 and 0600 to 1400, November 10. All times are GMT.

W2NFA will run 400 watts into a 60-foot dish having a gain of 44 db., over isotropic. The mode of transmission will be f.s.k.; 1296.00 plus or minus 2 kHz., key down, or 1296.02 plus or minus 2 kHz., key up.

All correspondence should be addressed to Dick Turrin, W2IMU, Box 45, R.R. 2, Colts Neck, New Jersey 07722. WB2NDH is the test liaison station: 14.235, 21.385 or 28.690 MHz.

2304-MHz. Harmonic Generator

Paul Wilson, W4HHK, designed and built this signal source for the 2300-MHz. band. A 2 5/16-inch length of 4 GHz. copper waveguide houses the two tank circuits. The waveguide is 1 1/8 by 2 9/32 inches inside. A partition of 1/16 inch thick brass separates cavities L_1 and L_3. A 5/16 inch diameter hole in the partition permits connecting diode 1N82A between L_2 and L_3 with minimum lead length. The inside dimensions of cavities L_1 and L_2 are 1 1/8 by 1 1/8 by 2 9/32 inches. Cavities L_1 and L_3 are centered in their respective cavities. End plates of 1/16 inch thick brass are soldered in place at the open ends of the waveguide stock. J_1 and J_2 mount on the end plates. C_2 mounts in the center of the 2304-MHz. cavity end plate. A 1 3/4 by 1 3/4 inch opening cut in one of the larger waveguide walls allows access to both cavities. A cover plate of 2 5/16 by 2 15/16 by 1/16 inch brass is attached to the remaining flange with 6-32 machine screws.

Two milliwatts of crystal-controlled 153.6-MHz. r.f. are fed at J_1. 2304-MHz. output at J_2 is approximately 500 millivolts (−52 dbm) into a 50-ohm load. The generator, a simple waveguide antenna and an 18-foot dish on a crystal-controlled converter with a 1N21F mixer front end and 3 kHz. selectivity produces a signal over a half mile line-of-sight path.

2300-MHz. Record Returns to U. S. A.

Things are happening on 2300 Mc. There was talk of moonbounce prospects for this band at the Central States V.h.f. Conference at Osage Beach, Mo., Aug. 16–18, and now we have a new record for the band. On Aug. 30, W2BVU/1, operating on Mt. Wachuset, Princeton, Mass., worked K1DRB/1 on Cadillac Mountain, Acadia National Park, Maine, on 2415 Mc. Equipment used was the pulse gear described by W2BVU and W1QMN in *QST* for February through May, 1963. This equipment is also in both editions of *The Radio Amateur's V.h.f. Manual*, Chapter 10. More on this work next month. The new record is 225 miles, more than 100 miles beyond line of sight from the two ends of the path.

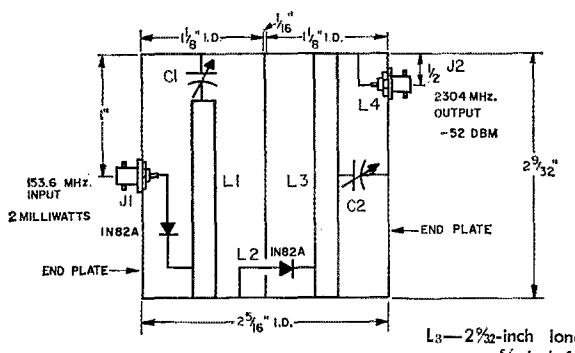


Fig. 1—Schematic diagram of the W4HHK 2304-MHz. harmonic generator.

L_1—1 5/8-inch long 5/16-inch diameter brass rod, connected diode 1/2-inch from ground end. L_1 is connected to C_1 by copper strap 1 1/4-inch long by 1/4-inch wide bent in the shape of a "U." Tune this circuit to 768 MHz.

L_2—1-inch long 1/4-inch wide copper strap spaced 1/8-inch from L_1 and parallel to L_1 for 1/2-inch. Bent in shape of "J."

L_3—2 9/32-inch long 5/16-inch brass rod, connect diode 5/16-inch from ground end of L_3 adjacent to partition access hole for L_2. Tune circuit to 2304 MHz.

L_4—3/4-inch long 1/4-inch wide copper strap spaced 1/8-inch from L_3 and parallel to L_3 for about 1/2 inch.

J_1, J_2—BNC chassis mounting connectors.

C_1—0.5 to 5.0 pf piston trimmer, mounted in line with L_1, Johnson or equivalent.

C_2—No. 10-32 brass machine screw with locking nut on outside of cavity wall. End of screw projects into cavity at mid-point of L_3.

Mr. Moonbounce, Sam, W1FZJ/KP4, frequently heard on 50 MHz., will soon offer Puerto Rico to 432 moonbouncers with his recently completed 100-foot dish antenna. *(VK3ATN photo)*

Moonbounce Times

The fixed-window e.m.e. (moonbounce) antenna proposed in the August column by VK3ATN is receiving much support. Apparently antenna position and moon times are the most perplexing problems to would-be moonbouncers. Fixed windows of 37, 157 and 277 degrees west longitude were suggested by VK3ATN. Here are the October, November and December window times for those three positions, compliments of WØDET.

Crossing times for window at longitude 37° west between 20° and 28° declination

Date	*GMT*	*Declination*
10 Oct.	0454	23.7
11 Oct.	0543	26.6
14 Oct.	0817	27.3
15 Oct.	0907	24.7
16 Oct.	0957	20.9
6 Nov.	0249	22.3
7 Nov.	0337	25.6
8 Nov.	0427	27.7
10 Nov.	0610	27.8
11 Nov.	0700	25.8
12 Nov.	0749	22.5
3 Dec.	0046	21.0
4 Dec.	0133	24.6
5 Dec.	0223	27.1
8 Dec.	0456	26.4
9 Dec.	0545	23.5
30 Dec.	2330	23.7

Crossing times for window at longitude 157° west between 20° and 28° declination

Date	*GMT*	*Declination*
9 Oct.	1223	21.1
10 Oct.	1310	24.7
11 Oct.	1400	27.2
14 Oct.	1634	26.6
15 Oct.	1724	23.6
6 Nov.	1105	23.4
7 Nov.	1154	26.4
10 Nov.	1427	27.2
11 Nov.	1517	24.8
12 Nov.	1605	22.1
3 Dec.	0902	22.2
4 Dec.	0950	25.5
5 Dec.	1040	27.5
7 Dec.	1222	27.6
8 Dec.	1312	25.6
9 Dec.	1401	22.3
30 Dec.	0659	21.1
31 Dec.	0746	24.6

Crossing Times for window at longitude 277° west between 20° and 28° declination

Date	*GMT*	*Declination*
9 Oct.	2039	22.5
10 Oct.	2126	25.8
11 Oct.	2216	27.9
13 Oct.	2400	28.0
15 Oct.	0051	25.8
16 Oct.	0141	22.4
5 Nov.	1834	20.9
6 Nov.	1921	24.6
7 Nov.	2010	27.1
10 Nov.	2244	26.7
11 Nov.	2333	23.8
3 Dec.	1718	23.4
4 Dec.	1806	26.3
5 Dec.	1856	28.0
7 Dec.	2039	27.1
8 Dec.	2129	24.7
9 Dec.	2217	21.0
30 Dec.	1515	22.4
31 Dec.	1602	25.6

Rob Larson, WØDET, has offered to make these computations available for column publication every three months. They will appear as long as there is evidence of their usefulness.

WAØEKO and K8MWA have pointed out a positioning error in the August antenna suggestion. As presented, the antenna would face the moon only if the array was located at 26° north latitude. At that location the antenna would be exactly horizontal. To determine the correct inclination you subtract the moon's 26° declination from your latitude. Example: if you live in Memphis, Tennessee at a latitude of approximately 35° the array inclination would be 35° minus 26° or 9°. The north end of the array would be elevated 9° higher than the south end.

WAØEKO further states that the 26° north declination selection is alright for this year, but that in about four years the declination range of the moon will be plus or minus 23½° and in nine years, the range will be at its minimum of plus or minus 18 degrees. The fixed array at 26° would be reasonably accurate for the next two or three years. After 1970 a suitable adjustment would be necessary, but then you'll probably have developed a better system yourself.

OVS and Operating News

Because of the column length this month, OVS reports will highlight activity during the past reporting period. The states worked boxes will appear next month after the Perseids reports are received.

50-MHz. Es continued to be excellent with almost daily openings until late August. KV4FU, Virgin Islands, reports working dozens of stations particularly in the southern tier of the United States. He says the double-hop signals from Texas and Louisiana are always strongest. Three reports were received from Alaska. K8SBN has moved to Sitka, about 550 miles closer to the "lower 48" than is Anchorage. He probably has his KL7 call now and has crystals for 50.1, 50.15, 50.22 and 50.4 c.w. or a.m. For those who might wish schedules, write

Gene Buck, Box 479, Sitka, Alaska 99835. W8KNC/KL7 reports poor *Es* from Fairbanks, his only contact in July being K7SVI, Seattle. And KL7FNL, whose wife is KL7FNM, writes they have a 6-element Yagi fed with RG-17/U at 60 feet. Says Bob, "everyday is Field Day here, we run our own generator!"

Three notes of interest to 50-MHz. DXers: W4ZXI has shipped a HA-6 and 4-element Yagi to 5W1AR on Samoa in the South Pacific. The Samoan will be operating in the lower portion of the W/K phone band. W4ZXI will handle the QSLs. John Patrick, ZB2BO, on the island of Gibraltar, says he and ZB2BC will be looking stateside beginning October first. Both stations are running 50 watts of c.w.

ZF1DT will be active again October 25–27. WB4HIP will be accompanied by KØGJX.

There was much activity from the Caribbean during July and August. CO2QR, 50.012 with chirpy c.w. note, and CO5CN provided Cuban contacts, Puerto Rican stations W1HOY/KP4, KP4s AHI, AIS, and of course KV4FU, were in much demand. The period of July 27 through the 30th was excellent, and it was on the 30th that W8GZ worked LU8AY in Argentina. August 15 found *Es* between the Caribbean and Gulf states exceptional. KV4FU watched TV channel 5, Palm Beach, Florida, for 30 minutes and then worked dozens of 4s and 5s for the next 2½ hours. KP4s BOY, CPR and W1HOY/KP4 were also active that evening.

Does anyone know where stations HLM and SZNG are located? Either their fundamental or harmonic frequencies have been appearing on 50.144, 50.168, and 50.280 (HLM) and 50.158 (SZNG).

Thanks to WA1DPX, WB2RBG, K3HKK, W3KWH, K4GL, K7RWT, K8TOW, W8NOR, WAØJYK and others for their *Es* reports.

144-MHz. activity is highlighted by the July Aquarids and August Perseids meteor showers. I don't have a complete tally at this writing, but meteor activity was exceptional the last week of July and first two weeks of August. Here are the reported contacts.

K1ABR:	WØDRL (first Rhode Island/Kansas 2-meter contact), W5ORH (1478 miles), W9MAL, WØLFE.
WA1GMN:	W5UGO, KØMQS.
K1HTV:	WØDRL, WA9DOT, WØLFE, W4WDH, W4WSR, WØRLI, W5RCI, W5UGO, W9UNN.
K1UGO:	W4CKB, W5RCI, W4WDH, W8AEC, WØLER, K4GL, WØLFE.
K1WHS:	WØLER, WA4CGA, K4GL, W4WDH, WØDRL, W5RCI.
K1WHT:	WØLER, WA4CGA, K4GL, W5RCI, WØDRL.
K1MTJ:	W9MAL.
W3KWH:	W5WAX, WØDRL, K5WXZ, VE1AFB, WØLFE, W5UGO, KØMQS, WØENC, W4WDH. (34 states during 1968!)
VE3EZC:	WØDRL, WØNXF, WØENC, W5GVE.

VE7BQH has some suggestions for those wishing to work British Columbia on 2-meters. He has a kw., a 32-element collinear and 13-element Yagi on 144.110. VE7BBG has a kw. and stacked 8-element Yagis, and VE7BBA runs 700 watts to stacked 8-element Yagis.

KØMQS, Iowa, has completed a copy of the VK3ATN rhombic with the top rhombic at 50 feet. The array is bi-directional, east and west. He is using it for meteor scatter schedules and is also attempting moonbounce with K6MYC. K6MYC says he and W6DNG are scheduling SM7BAE, Sweden, on e.m.e. with some success. SM7BAE has sixteen 10-element Yagis and 1500 watts input. SV1AB, Greece, has diverted his e.m.e. interests towards meteor scatter and has been quite successful working Europeans by meteors.

220-MHz. news is topped-off with the first three m.s. contacts on this band. 220 may well be the highest frequency where amateur meteor scatter is possible. A study of radio echoes from meteors done at the Massachusetts Institute of Technology indicates m.s. signals at 432 would be some 18 db. below the 144 return. This is not to say we shouldn't try, but those of us with less than the absolute optimum in 432 equipment might as well stay in bed. Who is going to prove me wrong? K4IXC and VE3EZC may be scheduling by now.

After several weeks of schedules, K4IXC and K4GL worked by tropo on August 24, 500 miles. WØDRL, Kansas, has 300 watts output, and is ready for schedules. A detailed letter received from George Kass, 7–17 Parsons Blvd., Malba, New York 11357, described his station built around a kw. and 13-element Yagi. George forgot to give his call, but says he will accept 220 m.s. schedules.

420-MHz. schedules and random operating have been rewarded handsomely the past several months. W8FWF at Garden City, Michigan runs 300 watts into a 64-element collinear. He reports numerous 200-mile plus contacts with W9BTI, W9WCD, W9PBP, WA9HUV, and VE3EZC. K4QIF, Virginia, and K8DEO, Ohio, worked on July 24 over a 460-mile path, a new state for each. W4FJ, also Virginia, continues his assault on 432 having worked 15 states in the past year. Ted's latest successes were W1CAN, Massachusetts, July 27; W9JIY, Indiana, August 11; and WA9HUV, W9WCD and W9ZIH, all Illinois, on August 12. The maximum path distance was 665 miles! WA9HUV also worked K4EJQ, Tennessee. And K8REG caught the August 11–12 tropo, working K4EJQ, W9ZIH, W4FJ and KØDOK in Missouri. K8REG says his experience shows morning tropo 20 db. or more better than night. He suggests more random operating Saturday mornings.

Moonbounce news from the west coast includes a joint project by K6HCP and K6MYC. Mike, K6MYC, says the Siliconix 2N5397 and 2N4416 look good on 432 in both gain and noise figure. Data are available from Siliconix, Sunnyvale, California. W6FZJ and W6CCS are working towards a contact with VK3ATN. They have a 256-element extended collinear.

1215-MHz. and Up interest continues to grow. ZL2CD writes W1DTY, of *Ham Radio*, of his interest in 1296 moonbounce. W9JIY, Indiana, worked W9ZIH, Illinois, over a 160-mile path July 30th. W9WCD, also Illinois, heard W9JIY, a 225-mile path. W9JIY uses a 5894 at 20 watts output driving a varactor tripling from 432. His antenna is a 64-element extended collinear. He says lightening causes momentary signal increases of about one "S" unit over the path to W9WCD. WB2VQK and WB2WVY have converted APX-6s following the data given by WØPFP in the February column. They say the conversion works fine, giving an output more than double that using the feedback loop conversion.

K2GRI continues work to improve his 2400 MHz. transmitter, now running 12 to 15 watts output. The final is a 7289 doubler with three-quarter wave coaxial line input and output. His antenna is a dipole-fed 6-foot dish mounted at 30 feet. QST

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Whereon:

Five-band ARRL DX Century Club possibilities serve to remind many a DX hound that there *are* amateur frequencies below 14,000.00 kiloHertzes. The standard triband beam, heretofore so entirely sufficient for a hotshot DX man's arsenal, may gain more mature status as top-loading material for 7- and 3.5-MHz. verticals.

Plenty of DX chasers long ago discovered the lower-frequency challenge of DX sport, learning that a G3 on 80 c.w. can carry more punch than a batch of 9K2s on 20. Their contributions bulk large in each month's "How's" mailbag. For example, here's a fresh dispatch on the subject from OA8V whose picture graced page 101, April '68 *QST*. . . .

> This is the first year I have attempted much operating during our jungle "winter" season. I'm really surprised at conditions on 75 meters. On July 3rd I worked four continents within an hour. First came DL5XU with a 5/4 report at 0315 followed by CP5CS, VE3OE and KC4USP, all Q5 on two-way s.s.b.
>
> During the next week or so I worked ten VE3s, six W1s, three W2s, six W4s, two W5s, six W6s, an Oregon seven, four W8s, four W9s and WØEHE in Denver. At about 1115 I find good openings into New Zealand and Australia. I've worked seven VK2s, eleven VK3s, two VK4s, a VK5, three VK7s and VK9GN, as well as eighteen ZL1s, thirteen ZL2s, six ZL3s, five ZL4s and ZL5AA. On July 8th I QSOd a ZL who was running five watts p.e.p. to a Class-A 6BQ5.
>
> I plan to concentrate on 80 during the next year, adding to my total of 63 countries. Hope to improve my 60-foot vertical. With a new 220-volt line I can now run a full gallon from Peru on 75. I'm especially interested in QSOs with Asia, Africa and the Pacific.

Good going, Paul. Oh, sure—it's easy when you have a fancy call, you say. Well, OM Jack Lyon is an ordinary U.S. eight. Let's see what W8YGR has to say about another "d.c. band." . . .

> I've just discovered a whole new world with a ten-cent 40-meter dipole. On July 5th I heard and worked VK3HW for the first time, and have since spoken with him five times. He had a beam at first, then lost it in an 80-m.p.h. gale. Now, dipole to dipole, he's S8-9 and I'm S6-8 with my wire only 25 feet above ground. I've also been QSOing VKs 2FU 3ZL and ZL1AGO, all two-way s.s.b. Jaded Jack really enjoys his new world of 40-meter DX!

WB4GTI, writer of our August guest editorial, rather sums it up. John says, "There's something very special about low-frequency DX. For one thing, you get to *know* your DX. And, since it doesn't come so easily, the sense of accomplishment is far greater than in routine high-frequency DXing." Those long quiet autumn nights are here again. Got *your* long-wires and/or verticals set for the 40, 80- and 160-meter DX fun ahead?

What:

Can't pass up the other end of our h.f. DX circus, either, with ten meters snapping back to life for the day shift. Paraphrasing Stevenson, "DX is so filled with a number of things, I'm sure we should all be as happy as kings." Twenty c.w. is still around, too, as this month's activity analysis plainly shows. Those numbers in parentheses go for kHz. above bandbottom, the other digits for Greenwich whole hours. Let's spin the dial. . . .

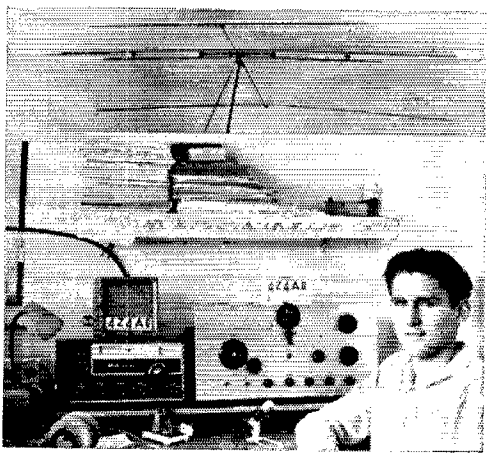
20 c.w., happy DX hunting ground for **Ws** 1AYK 1DAL 2ECO 2ICO 3HMR 3HNK 4YOK 6EAY 7BE 7ZC 8IBX 8YGR 9LNQ, **Ks** 4CFB 4IEX 8BCK, **WAs** 1CJE 1DJG 1GHU 1HVL 1ION 2APG 3GVP 3HRV 3IID 5MIN 5PPZ 5PUQ 5SOX 6JDT 8MCQ 8NGD 8QJK 8VBY 9MQI 9TFM, **WBs** 2BCI 2UHZ 2ZNZ 4GSS 6VVS, **KP4**DBJ, **VE3**GTW, **IIs** DFE and ER, sparkles with the presence of **AP5**HQ (16) 17-18, **BV2A** (36) 11, **CEs** 2PN (15) 6, 3ZK (4) 23, 3ZW (86), 4AA (12) 23, 4AD (14) 0, 6GS (39) 6LF 9AA 9AT (56) 16, ØAJ (48) 6, **CM3**HA (67), **CN8s** BK (75) 23, FV (19), MI (60) 9, **COs** 2FA (30) 5, 2FC 2LD (50), 2XX (20) 1, 6AH (35) 23, 6PP, (50) 22, 6RM (49) 22, **CRs** 3KD (60) 23, 4AR (40) 1, 6AR (55) 23, 6BX (51) 18, 6CA (53) 23, 6EI (42) 6, 6CK 6 CN (74) 20, **CTs** 1AA 1EE 1IT (66), 1TT (16) 22, 2AA (53) 1, 2AH (28) 9, 2BG (8) 23, 2BO (21) 1, 3AS (10) 22, 3AV, **CXs** 1BBG 1 DZ (62) 23, 1JM 2AZ 5PV 4, **DMs** 2ADC 2ATD 2AVG 2BGI 2BOB, 2BPB 2CUL 2DDN 3CK 3LOG 3YVL 3XI 3ZZC 4PJJ 4PQL 4SJJ 4YEL 9ADL, **DUs** 1CE (51) 53, 1OR (30) 19-23, 9JO 15, **EAs** 6BD (72) 21, 6BH (72) 7, 8EJ (11) 7, 8EO (50) 0, 8FB 8FE (28) 22, 8FF 8FG (20) 7, 8FJ (15) 16, 9EO (45) 6, **EIs** 5BV 7AB 8BF 8BS 9BG 9J 9KA 9Q 9, **EL2s** R (14), Y, **EPs** 2EE 3AM, **ET3s** FMA (63) 2, USA (23) 3, **Fs** 8TT/**FC** (50) 10-23, 9VN/**FC** (25) 22, **FB8s** WW (37) 12-13, XX (20) 4, ZZ (5) 11-15, **FG7s** TD 17, TE (19) 2, TG (20) 11, XF (15) 22, XJ (35) 21, XL XX (30) 21, **FK8**BG 7, **FM7s** WD (21) 11, WH 20, **FO8s** BG 5, BQ (84) 5-10, BV 3, **FP8s** CS 11, GT (20) 22-23 DY (56), DZ, **FR7s** ZD (42) 12, ZF (25) 14, ZS (20) 13, **FW8**RC

KS6CQ looks comfortable in his lava-lava, the Samoan *garment for all seasons.* An HT-41, HT-37 and 45-foot-high TA-33 have accounted for eight kiloQSOs from Pago Pago since last October. (Photo via W1APU)

QST for

*7862-B West Lawrence Ave., Chicago, Ill. 60656

(66) 8, FY7, many GB specials, **GC**3s AAU (68), EML (9) 6, 1EW, **GD**3s AIM FBS (60) 15, HQR VWN (15), **HA**s 1KSA 1SB 1SX 1VB 1VI 2MU 3KGC 3MB 3MJ 4KYB 5AK 5AT 5AW 5DA 5DI 5DH 5FE 5HI 5KBM 5KDQ 6VE 6VK 7LF 7LO 7LP 7PS 8UD 8UN 8UU ØHN, **HC**s 1MF 1RR 2RZ (4) 2, 2SB (72), **HI**s 3PC (36) 10, 3ELJ 7JMP (30) 3, 8IBC 4, 8RV 8XPM (41) 23, **HK**s 3AVK 3CEI (33), 3RQ (32), 4AOY 5CH 5MO 6, 5MO 6, 5RQ (17) 23, 7UL 7XS 18, **ØA**I (30) 15, ØBKW, **HL9**s KA (6) 12, KK (52) 12-18, KQ (22) 20, US 10, **HM**1AJ, **HP**1s AC (10) 0, BR EE IE (10) 12, JC XHG (4) 23, XYZ (50) 0, **HR**2VEB, taboo **HS**1TM (5) 14, **IS**1s PEM (15) 22, PPB (35) 0, **IT**1s AGA (19), AI AUA (75), 8BT, **JA**s ICIB ICWZ 1FI 1FQW 1KRV 1NRE 1QFX 1RSM 1UDP 2HTI 2LC 2YEK 3BIP 3BN 3IG 3KEM 4EFG 5AWT 5LI 6APA 6GV 6PN 6TL 7BVS 7ND 8BKW 8CYU 8MS 8QA ØCZC, **JI**s 1AB 17, 1AD 1AE 1AG 16-17, 1KAA, 2AB 17, **JW2AP** (6) 12, Ks 1FNA/**KG6** (32) 10. ØTFP/**KS6** (54) 5, **KA2**sJP (40) 5, NY (58), **KC4**USM, **KG**s 4AM 4CX (27), 4DK (30) 2, 4DO 6ALV (20) 12, 6AQI (38) 10, 6NAC (56) 3, **KL7**s CVX (14) 12, CZ 6, FRX GDS (20) 6-7, GFN (15) 10, **KM6**BI (40) 10, **KR**s 6EA (25) 16, 6KQ 6OD (51) 11, 8BY 8CY (25) 11, 8DE 8DK (25) 10-11, 8EA 8ED 18, **KS**s 4CG (15) 7, 4CR, 6AX 6CG (25) 6, 6CQ (60) 10-11, 6CU 6CV, **KV4**s AA (79) 23, AM EU (68) 22-23, **KW6**s EK 2, GH, **KX6**s ER (49) 10-14, FN/**KC6** 14, GD, BU, **KZ5**s AH (70) 23, GI 6, HC (50), JQ **LA**ØAD, **LG**5LG (20) 17, **LU**s 1SE ØAA and others, **LX**s 1RG (12) 13, 2BQ (50) 20, **LZ**s 1BK 1FJ 1HJ 1KAA 1KSD 1KSF 1VM 1ZX 2DC 2GW 2IM 2KAF 2KIF 2KKZ 2KPD 2KRO 2KSF 2LU 2RC 2RN 2XX, **M1B** (19) 6, **MP4**s BEU (10 7, BGU (33) 3, DAT (5) 22, TCD, **OA**s 4BR (21) 5, 4FW 6, 4JR (14) 22, 4UZ (47), 4XN 4ZS (39) 23, 7B1, **OD5**s BZ (20) 15-16, EJ (27) 22, LX (12) 4, **OE**s 1HGW (6), 1KRW 3CN 3JBW (29), 3PWW (12), 4SZW (40), 5PHL (70), 5PWL (35), 6KSG (52), 7OY (7), **OX**s 3DX (46) 23, 3MB (42) 23, 3SA (38), 3UD (1) 1, 3ZO 4AB 5AY, **OY**s 1R (4) 20, 2EL (66) 20, 2IE 6FRA (25) 22, 9IM, **PA**6AA, **PI1**LC/mm (20), **PJ**s 2MA 18, 2MI (54) 10, 2ME (70) 11, 3CC (72) 4, 3CJ, **PY**4s UG (20) 21, ZG ZR and others, **PZ1**s AH (6) 6, AV 23-0, BL (20) 10-22, BW (5) 5, CQ (13), **SK**s 4AV (20), 5AA (29), 6AB (8), **SL7**AZ (16), **SM2**XA (45) 7, dozens of SPs, **ST2**SA (64) 22, **SV**s 1BX (68) 23, 1BZ (57) 5, 1CA ØWB (33) 6, ØWN (34) 23, ØWP (4) 1, **TA**s 1AV (57) 19-20, 1HY 1KT (1) 0-23, 1QR (12) 3, 2BK (30) 22, 2EA (10) 0, 2FM (18) 22, 2SC (50), 0, 3AR (30) 20, **TF**s 2WIC (84) 18, 2WKI 2WKM (63), 2WLK (16) 17, 3AB (50) 23-0, **TG**s 4SR (31) 23, 8RL 9EP, **TI2**s AB DO WR 14, **TJ1**s AS (4) 22, QQ (3) 23, **TT8**AN (70) 14-23, **U5**ARTEK (77) 13, **UA1**KAE/1 (5) 14 of antarctica, **UA2**s AB (35) 16-17, AC (1), DL (25), DO (26), KAP (5) 21, KAQ (56), KAS (43) 2, KAT KAW LC (30) 16, WO, **UA9**s CM (68) 5, ES (62) 1, FN (8) 3, GE (39), KCA (16), KDA (57), VQ, **UAØ**s AB (40), AI CF (30) 15, EF (30) 5, EI 5, EQ (11), EU (22) 11, EW (15) 7, FC (45) 4-5, IW 2, KAE 21-22, KCA (30) 3, KFG KFS (5) 4, KQU MO (22) 4, MX (10) 15, NR PJ SA WF YT (52) 23, ZB (21) 12, **UB5**s AJ CU DV EC EM HA JW KAA KAW KBA KBV KDS KEP KKA KKM KLD KQV LR RS SK TZ WF VY YD, **UC2**s AB (79), DN (34), KAA KBC (30), KKU KSB (48) 22, LM (35) 7, OC (70) 5, OR (20) 3, SE TA WP, **UD6**s AM (12) 2, AR AX (64) 2-3, BQ (22), DX (9) 2, KAB (60) 1-3 **UF6**s AD (40) 4, AM (17), AS (40) 2, CX KAR (40) 7, LA (17) 7, PK, **UG6**s AD EA JJ (45), KAO LK, **UH8**s BO CS (83) 22, DC (15) 23, DT (3) 12, **UI8**s AB (38) 7, AI 2, AM AQ (54) 12, CX IZ (3) 13-23, KAB (17) 6, KAD (43) 7, KBA (50) 19, KBF (40) 16, KDA (11), MU UG (20) 19, **UJ8**s AB (37) 1, AC (69) 3, AZ KAA, **UL7**s AM (66) 5-6, GW (46) 3, KAA 2, KBA KKB (60) 13-14, OA (14) 19, OE (12) 14, PJ (30), RL 3, XG (5) 6, YP (71), **UM8**KAA (29) 3-6, **UN1**s AB BR, **UO5**s AP (38), PK (41), UPOL-15 and 16, **UP2**s AE AY (6), BV DX (57) 6, KAB (60), KAG (38) 1-2, KBA (44), KBF KBI KBC (45) 5, KMU (8), KPA (55), KTU NA (40), **UQ2**s HT (20) 5, GW (40), KBC KCS (5) 0, KBP KDM (57) 7, LL (20), NW NX (72), **UR2**s AT FR (34), FU KAD KAW (55) 12, **UT5**s AQ (33), BQ BX FE HF KSA KTH PK QE, **UV**s 9CO (55) 8, **9CU** 9OV (14), **ØB**K (25) 12, **UW**s 9AA (15) 3, 9DR (13) 1, 9GU (27) 1, 9EA 9OH (61) 2, **ØA**J (7), **ØA**P (11), **ØB**Q **ØB**X (9) **ØF**I 5, **UY5**s AJ (30) 7, OP XB XH XO (6), ZI (21) 5, ZM (20), ZX, **UZØ**EA (49) 9, **VE**8s CR (3) 1, GC 7 MK (35), RCS RE YB (58), YM (40), YP **VK**s 1EK 6-7, 1GD 13, 1RY 12-13, 8HA (4) 7, 9GN (18) 10, 9RJ (33) 7, ØJW (40) 10-12, **VO1**GX (63), **VP**s 1GB (4) 9, 1WEB 1XY (36) 0, 2AR 2AZ (23) 22, 2GL (80) 22, 2MF (65) 3, 2MQ (17), 2VL 7DL 7DX 0, 7NA (40), 7NF (30) 23, 7NP (57) 5, 8DJ (19) 13, 8JH (26) 12, 8JX, 9BY (30) 3, 9ED (48) 0, 9EC 9FW 9GC (10) 17-22, **VQ**s 8CC (30) 12, 8CJ (50) 12, 9B (63) 15-20, **VR**s 2DK (30) 6, 4CR (17) 7, 6TC, **VS**s 6AA (1) 10-14, 6AD (81) 18, 6FX (25) 12, 9MB (34) 11, **VU2**s FR (15),



4Z4AG finds his uncommon Israeli prefix in considerable DX demand. Aron is a high school senior in Tel-Aviv. (Photo via WB4FJO)

GW JA (66) 12, JN (28) 1, KZ (25) 18, KV (20) 2, LE (10) 0.1, LN LOZ (3) 12 LW 17, QB (50) 6, QV (44) 1, RQ (38) 1-2, SR (42) 6, SV (41) 19, TAU (40) 16, TS (15) 12, VZ (20) 1, W2PDG/**4X**, a dozen XEs, **VP1**s AA AB, **XW8**s BP 14, Cal (40) 15, **YA**s 3TNC (1) 13, 5RG, **YN1**s AA (22) 12, GLB, **YO**s 2BV 2IR 2JF 3RF 3YZ 6AW 7DL 7KAJ 8KA 8MF 8NB 80K 9AFE, **YS1**AG (69) 23, two dozen YUs, **YV**s 1AB 3, 4BE (13), 4OE 8AS and a dozen fives, **ZB2**s A AP (25) 23, BO (2) 6, **ZD**s 5M (30) 12-13, 5X (15) 15-21, 7DI (23) 23-0, 7GS (23) 7, 8CC (23) 22, 8J (26) 3, 8Z (34) 21, **ZC4**JM 7, **ZE**s 1 CU (20) 6, ICY 1JU (83) 12, 4JS (40) 18, 8JV (30) 15, 8JW (43) 13, **ZL5**AA of Ross, **ZP5**s OE (47) 23, KA (41) 23, JB OG (37) 22, **ZS3**XQ (50) 18, **3A2**s CP (15) 14, EM (23) 22, MJC (80) 19, **4A1**s EK RM WS, **4L1**A (25) 5, **4S7**s DA (68) 13, EC (21) 17-18, NE, **4U1**ITU (43) 6, **4X4**s PF (72) 23, QA (60), so ve yl (45) 2, YY, **4Z4**s BG (59) 21, DL HF, **5H3**KJ (50) 1-5, **5M1**A 2, **5R8**s AF (90) 17-18, BB 18, **5U7**AL, **5Z4**s LE (18) 22, SS (72) 5, **6W8**s DQ (15) 0, DT DY XX (5) 22, **6Y5**s GB JB SR, **7G1**IX (14) 18, **7P8**s AB (60) 18, AR (45) 18, **7Q7**AM (75) 23, **7X**ØAP (47) 23, **8P6**s AO (30) 2, AY BU (30) 12, CU (20) 21, **8R1**S, **9G1**s DY GC GI (68) 12, KT 8, **9H1**s AE (21), AG (20) 16, AZ BB (63) 22, 1 T (80) 23, **9J2**s CL (30) 4-5, HZ (28), MX (25) 22, **9K2**CD (37) 7, **9L1**TL (33) 5, **9M2**s CL LN (51) 17, OV (15) 16, US (64) 15-16, YL (90) 14, **9Q5**s EH SS, **9V1**s MK (40) 15, OC (25) 10, OK OS (20) 16-18, OV OY (40) 14, **9Y4**s AT (48) 22, BS (20) 10, DS (31) 2 and RA. Must be the Extra's incentive or something—c.w. reports all over the place this month.

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Tentatively we'll scrutinize the phone segments next month, skipping 20 which was investigated in the previous column, with the assistance of (15 phone) **W**s 2DY 4AJJ 4GTS 4YOK 8YGR 9LNQ, **K**9CSM, **WA**s 1CJE 1DJG 3GVP 3HRV 3IID 5MIN 5PPZ 6JDT 8QJK 9MQI 9TFM ØFRM, **WB**4GSS, **KP4**DBJ, **F3**VN/W2; (10 phone) **W**s 2VOZ 4YOK 8YGR, **K**s 4TWJ 8BCK, **WA**s 1IED 3HRV 8MCQ 8MGD 9TFM; (40 phone) **W8**YGR, **K4**FCB; (75 phone) **K4**IEX and **OA**8V. Later we'll do more c.w. bands thanks to (15 c.w.) **W**s 1DAL 3HMR 4YOK 7BE 8YGR 9GXR 9LNQ, **K**s 4FCB 8BCK, **WA**s 1CJE 1DJG 1FHU 1IDP 2APG 3GVP 5PPZ 5SOX 8MCQ 8VBY, **WB**s 2BCI 4GSS 6VVS, **WN**s 2REH 4IIF 4IYX **KP4**BBJ, **I**1s DFE ER; (10 c.w.) **K**s 1HDO 8BCK, **WA**s 1DJG 8MGD, **KP4**DBJ, **I1**DFE; (40 c.w.) **W3**HNK, **K4**FCB, **WA**s 1DJG 1FHU 2APG 3IYS 5SOX 8MCQ; (80 c.w.) **W1**SWX, **K4**IEX; and (160 c.w.) **W1**BB & Co. Later than that we'll be back on the 14-MHz. voice subject with **W**s 2DY 3HNK 8YGR, **WA**s 3IID 5PUQ, **WB**4GSS, P. Kilroy and other "How's" correspondents to file. Next month, by the way, FCC sponsors its Advanced/Extra Round-up. Should be v-e-r-y interesting.

Where:

HEREABOUTS — "It has come to my attention that the call sign KZ5BBN or KZ5BB is being used by a station operating in the maritime mobile service,"

writes C.Z. Coordinator KZ5FX. "This is to notify all concerned that Canal Zone amateur radio licenses are valid for use only within the Panama Canal Zone. The call sign KZ5BBN has been invalid since April, 1967, and neither KZ5BBN nor KZ5BB will be reissued until March, 1970." . . . . . NCDXC's *DXer* indicates that WA2JUW took a turn at PJ3CC in late July . . . . . "No word from my QSL manager since January," deplores WA3DVO/8P6, "so there must be a lot of lost cards floating around. I now request that all QSLs be sent to [the address in the list to follow]. Because I average almost 200 QSOs daily I must insist on self-addressed stamped envelopes." . . . . . "I really appreciate the role played by QSL managers, XYLs, etc., who confirm so many QSOs for stations who just never would find time to QSL otherwise," writes K8-MMH to WA6MWG. WA8TYF completes the cycle: "I'm prompted to ask you to give more recognition to stations who handle their own QSLs. In my experience I have had better results sending QSLs via bureaus to stations who do not have managers." Timothy credits many QSL tenders with fine records but encounters those who don't even keep up with their own station's QSL obligations . . . . . "I now have authorization to sign 4AØFCR," notifies WB6FCR, planning much fall contest action south of the border . . . . . Your "QSLers of the Month" this month are CT3AS, DU1FH, FG7XX, FR7ZG, HBØADP, HKØBKW, HP1XYZ, HAMO, KC4USM, LX1CF, PZ1AH, TF2WKR, TJ1AL, VKs 4ZK/VK9 9KS, VP8JX, ZL2ANX, 5R8BA, 5U7AN and 9Y4CR, plus QSL aides Ws 1YRC 2CTN 2GHK 2MES 4DQS 4WHF ØBN, Ks ITWK 6UJW and GD3-HQR, all applauded by "How's" correspondents W8-YGR, WAs IISH 2BPL 5PPZ 5SXC 8TYF and P. Kilroy for unusually rapid transmissals. Any commendable quickies over your way? . . . . . *Help!* These italicized brethren seek hints toward running down pasteboards from holdouts mentioned: *W1APU*, 9M2CL; *K4HNA*, HC1s SS '63, WW '64, Ron of KH6WW '56, KJ6CC '64, KZ5KK '64, VP7CC '65, 5A3TT '67; *K9-CSM*, 5V4EG; *WA8TYF*, VQ8CC, VS6EY; *WA8WSI*, OY1Z, SP8CA '67, 8R1G '67; and WB6PGK, VP2VL Clews? . . . . . G. Funk, 3508 Elliott St., Baltimore, Md., 21224, would like to tackle some DX op's pressing QSL problems.

OCEANIA — "I will be QSL manager for KX6s DC and DR as of August 1, 1968," announces WB6THT . . . . . "Since coming out here last October I have confirmed more than 8000 QSOs," figures KS6CQ. "It's very much of a full-time job to answer each and every request." . . . . . WA6MWG observes, "KG6IG's Bonins operation ended June 23, 1968, with a W6NUK QSO at 0237 GMT. I have all logs and QSLs are up to date. W6BCT, bound for Israel, turned over to me logs and QSL responsibility for VK7SM and VU2LE." Pete stresses that QSL managers who perform for several stations can get your card back faster if QSO data also appear on the outer envelope of each submitted s.a.s.e. set . . . . . K8WXV tells KH6BZF, "Those who did not receive KG6IG QSLs for contacts from October 1, 1967, to June 26, 1968, and KA1IJ cards for QSOs from June 26 to August 22, 1968, should send s.a.s.e. to my home address." . . . . . *DX News-Sheet* notes that ex-PK1s SH TA and HN now respectively sign YBOs AB AC and AD. 9V1NR is said to be printing up 3000 QSLs for future VE7IR/YB1 (9V1OQ) operations but W/Ks still need the green light from ITU/FCC for communication with Indonesians.

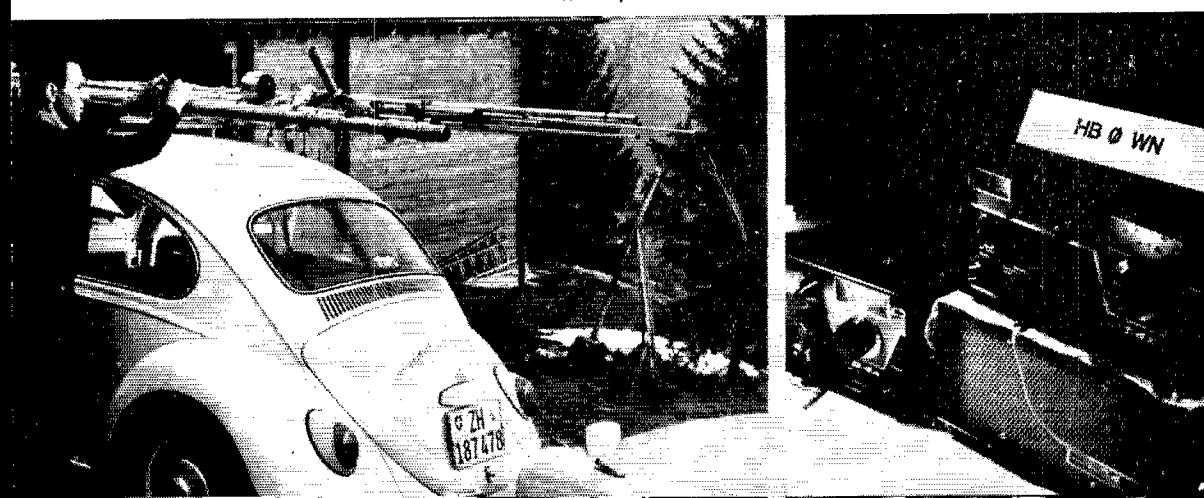
EUROPE — PX1BW, due for multiband action this month, declares, "I will answer all QSLs received. Those arriving without s.a.s.e. or International Reply Coupons will get replies via bureaus." Jim is regularly active as DL5NJ and signs KØBWN when back home . . . . . DL4FS finds G3KMA busy with QSL honors for July's ZB2BQ DXpeditionary do . . . . . G3SEA iterates his lack of CT2AY QSL connections . . . . . QSOers desiring direct cards from FOCV can mail s.a.s.e. to the address in the listings to follow. Others may use Dan's WA9FZQ address . . . . . G. Watt's *DX News-Sheet* suggests DK1KH as a QSL source for 3AØEJ's April c.w. operation, and DL2WB for cards confirming April 3AØEK s.a.b. QSOs . . . . . The same periodical points out that SM5WLOY promises 100-per-cent QSL, and that DL3SA had a hand in OY6FRA output over August 14-21, 1968 . . . . . West Coast *DX Bulletin* lists DL7FT's QSL managerial clients as EA6AR, HBØLL, KL7EBK, M1FT, TG9EP, W4UAF/KH6, XE2YP, 3AØCU, 3V8BZ and 4A2YP . . . . . LA5HE acknowledges, "I operated as JW5HE from Svalbard in April for two days. Cards are on the way through bureaus." . . . . . "Still have QSLs left for my DJ0GB operating in '62," invites K4HNA.

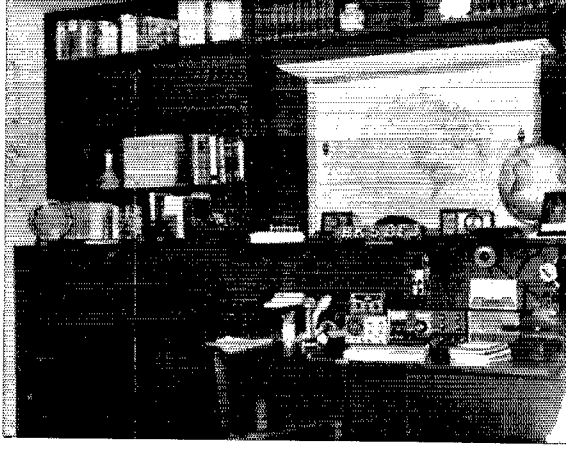
SOUTH AMERICA — From WA1FHU: "PZ1CQ, due to leave Surinam in the near future, will expedite QSLs for all QSOs." . . . . . WB2MTP, emphasizing the need for s.a.s.e., took over PZ1BI QSL duties in July . . . . . "I am no longer QSL manager for CE0-AE," reminds WA5PUQ. "They now QSL all first contacts via bureau. I sent out some 3000 cards while I had the job." In similar vein WA9MQI writes, "I must discontinue QSLing for CE3s ACV OE OF and ZK. It has been impossible to get logs from Orlando and sons. All unanswerable QSLs are being returned to senders." . . . . . 9Y4MM (ex-VE4SK) of Trinidad & Tobago Amateur Radio Society hears that 9Y4RA's call has been used for more than a year without authorization by licensee Lt. R. Archbald. "He personally has not been on the air during the period and is therefore unable to reply to QSLs received." . . . . . K2JXY may be of some assistance toward QSLs from VP8s KD and KQ, according to Northern California DX Club's *DXer*.

AFRICA — "I have 9Q5EB QSLs for U.S. eights and nines," notifies WA8PWZ, "for QSOs from November 8, 1967, to March 10, 1968. Self-addressed stamped envelopes, please." Jim has contracted to handle future 9Q5EB contacts as well . . . . . W3HNK writes, "Former 5A3TX now is W4VOH in Hampton, Va. Both of us can confirm his 1964-'65 Libya contacts." . . . . . "FR7ZG states there is no Reunion QSL bureau," relays W3FIU. "QSLs for all FR7s should be sent direct or via REF, France." . . . . . According to 5U7AL, Niger and Upper Volta authorities find no record of any XT2A, 5U2s AB or WS . . . . . Now let's check individual recommendations in the mailsack, remembering that each specification is necessarily neither "official", complete nor accurate. . . .

CE3s ACV OE OF ZK (see text)
CT1RS, P.O. Box 210, Coimbra, Portugal
DJs 2IB/CT3 5JK/CT3 (via DJ2IW)
DL1SU/YB, Box 2469, Djakarta, Indonesia (or to DL1-SU, or via DL3AR)
DL4FS, B. Welch, CMR Box 4488, APO, New York, N.Y., 09057
DL4QP, Sgt. C. Carter, Box 388, 1946th Comm. Sqdn., APO, New York, 09611
DL5NJ, J. McVay, Box 5034, 23rd TFS, APO, New York, N.Y., 09132; or Box 5034, Flugplatz, 552 Bitburg, W. Germany
DU1AT, P.O. Box 4083, Manila, P.I.

HB9WN joined the annual Swiss stampede to Liechtenstein this year as HBØWN. With return of Alpine snows the country becomes a DX rarity once more, represented only by resident HBØs AG and LS. (Photo via W1CW)





HK5BFJ's interesting decor, with comfortable yet fold-away operating position, is "How's" Hamshack of the Month. It's the pride of a prominent YL/OM DX duo in colorful Cali.

FØCV, D. Weinstein (WA9FZQ), c/o Year-in-France Program, 14 rue du Quatre-Septembre, 13-aix-en-Provence, France (or to WA9FZQ)
JTIs AG KAA, c/o V. Kaploon, P.O. Box 2, GPO, Lemngrad, U.S.S.R.
JX4EJ, c/o Norwegian Embassy, Reykjavik, Iceland
KØTFP/KS6, Box 788, Pago Pago, U.S. Samoa, 96920
KH6CXP/YØ1 (to KH6CXP)
KH6BZF/KM6/Kure (to KH6BZF)
KR6BU, Box 164, Koza, Okmawa
KX6s DC DR (via WB6THT: see text)
KX6FN/KC6 (via W2GHK)
KX6GT, P.O. Box 8515, APO, San Francisco, Calif., 96555
OH3UQ/W6, T. Kuokkanen, 1205 Washington Av., Santa Monica, Calif., 90403
OY4HQ, Box 217, Torshavn, Faroes
PZ1BX, P.O. Box 2003, Paramaribo, Surinam
TAs 1KT 1HY 2ZZ, TRAC, Box 699, Karakoy, Istanbul, Turkey
TL8GL, P.O. Box 872, Bangui, C.A.R. (or via VE2-DCY)
VP1GB, 151 New Road, Belize, British Honduras
VP2s DAL DOC MF/d (via VE3GCO)
VS6DR, P.O. Box 4083, Hong Kong, Asia
WA6AHF/HKØ (to WA6AHF)
WA8KOO/HC1 (to WA8KOO)
WFØITU, ESSA, Boulder, Colo., 80302
ZB2BQ (via G3KMA: see text)
ZD9BK, J. Bothma, Dunwoodie Av., 30 Waverley, Pretoria, South Africa
ZF1DT, Bill Smith (WB4HIP), 68 NE 87th St., Miami, Fla., 33138
3A0s EJ EK (see text)
6W8XX, J.-C. Jupin (F2XX), B.P. 3013, Dakar, Senegal
9K2CB, W. DeLong, c/o ConCo, Box 509, Kuwait
9Q5BY, Y. Bondroit, P.O. Box 1459, Kinshasa, R.C.
9Q5EB (via WA8PWZ; see text)

CEØAE (see text)
CR6CK (via WB2UHZ)
CT2BG (via DJ1QP)
EI2VAL/p (via G3VPQ)
F5LQ (via WB6TEE)
FØCH/FC (to HB9TL)
FØFV/FC (to DL7BV)
FØHI/FC (to G3KFT)
FPØEB (via VE2AFC)
FS7RT (to W6ITH)
G5AJR (to SM5CKL)
GB2LO (via RSGB)
GB2NI (via G3UGF)
GB3NEW (via GW3VKL)
GC3KNZ (to G3KNZ)
GC3LDH (to GW3LDH)
GC3TTN (to G3TTN)
GC3XJN (to G3XJN)
GW3GIZ/p (to G3GIZ)
HPØA (to HP1AC)
IP1BPD (to I1BPD)
JW2AP (via NRRL)
KA1IJ (see text)
KA2BZF (to KH6BZF)
ex-KA2CN (to DL4QP)
ex-KG6IC (see text)
KS4CG (via W4ZXI)
LG5LG (via NRRL)
OK8AAA (to G3LQB)
ON8IV (via G3PWV)
OZ2X (via WB6TEE)
OZ8RO (to LA5HE)
PA9BZ (to ON4QV)
PX1BW (to DL5NJ)
PX1UP (to HB9UP)
PY7QBG (to K8WNU)
PZ1BI (via WB2MTP)
SM5WI/OY (to SM5WI)
TAØA (via DJ2PJ)
TG4TL (via CRAG)
TJ1AL (via W2MES)
VK7SM (via WA6MWG)
VP2DAI (via KP4DBU)
VP8KE (via W4NJF)
VP8KF (via G3TWV)
VU2LE (via WA6MWG)
W4LFF/mm (to W4LFF)
WB4IBA/mm (to WB4IBA)
XEØEFN (to WA2EFN)
YU7LDB (to OK2DB)
YV5CIL (via WB6TEE)
ZD8GA (via WA6AHF)
ex-5A3TX (see text)
9K2CC (via K9CSM)
9M2AH (via MARTS)
ex-9M8RS (to 6Y5RR)

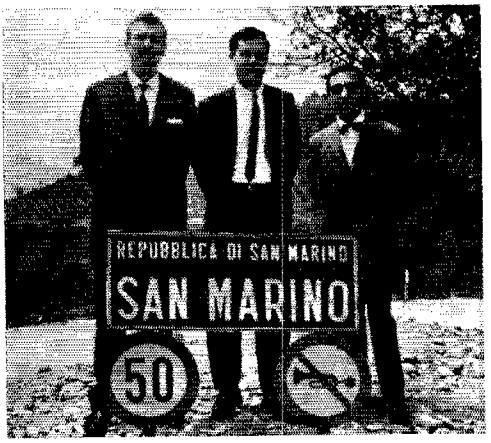
For the preceding glossary we thank **Ws** 1CW 3FIU 3HMR 8IBX 8YGR 9DY 9GFF, **K2**YJL, **WAs** 1FHU 5PPZ 5SXC, **WB2**UHZ, **DL4**FS, **KH6**BZF, **5U7**AL, Canadian DX Association *Long Skip* (VE3DLC), Columbus Amateur Radio Association *CARAscope* (W8-ZCQ), DARC's *DX-MB* (DL3RK), *DX News-Sheet* (G. Watts, 62 Belmore Rd., Norwich, Nor.72.T., England), Far East Auxiliary Radio League (M) *News* (KA2LL), Florida DX Club *DX Report* (W4BRB), International Short Wave League *Monitor* (A. Miller, 62 Warward Ln., Selly Oak, Birmingham, 30, England), Japan DX Radio Club *Bulletin* (JA1DM), Long Island DX Association *DX Bulletin* (W2GKZ), Newark News Radio Club *Bulletin* (L. Waite, 39 Hannum St., Ballston Spa, N. Y., 12020), North Eastern DX Association *DX Bulletin* (K1HMP), Northern California DX Club *DXer* (Box 608, Menlo Park, Calif., 94025; attn, K6CQF), Southern California DX Club *Bulletin* (WA6GLD), Utah DX Association *Bulletin* (W7LEB), VERON's *DXpress* (PAOs FX LOU TO WWP) and West Coast *DX Bulletin* (WA6AUD).

Whence:

ASIA — From 0000 GMT November 2nd to 2359 the 3rd, OARC (Okinawa) invites DXers world wide to frolic in its KR6 DX Contest, c.w. and phone. The usual RST001, RST002, etc. (no "P" on voice, of course) serials will be exchanged with KR6s at 4, 3, 1, 1 and 2 points per QSO on 80, 40, 20, 15 and 10 meters respectively, final score equivalent to total QSO points. For possible certificate recognition ship your log accompanied by a signed summary sheet showing each station worked, bands and modes used, QSO points as claimed, total claimed score, whether single-op, multi-op, multiband or monoband entry is desired, and transmitter description including power input, to Contest Committee, Okmawa Amateur Radio Club, APO, San Francisco, Calif., 96331, postmarked no later than November 15, 1968 . . . . . "My next unit will be in Portland, Maine," discloses K8WXV of KG6IC-KA1IJ. "Keep an ear open for me as I expect to operate there as K8WXV/1 for a year or so." . . . . . "EP2KB's 30L-1 is checked out and his quad is pointed Statesward," remarks W3HNK. "He's WA5VEJ back home." . . . . . Via aforementioned clubs and groups: KA1s IJ and MI plug away from Iwo and Marcus on 15 and 20 s.s.b. . . . 4W1ADO's shutdown leaves the Yemen too rare for comfort. . . . 9K2s BG and BV want to stir up more 9K3 DXcitement. . . . W4UDF will be signing a Pakistan call around 14,332 kHz. if plans click. . . . 4Z4HF may soon show from the Sinai as a 4X9. . . . Ex-KA2CN scans the kHz. for old buddies as DL4QP. In a few months Curt's Germany DX total already exceeds the 119 countries he worked during four years in Japan. KA2JC is another recent departure from FEARL ranks. KA9AK and neighbors plan furiously for the 1968-'69 160-meter DX season and Transpacific Tests, details upcoming here shortly.

EUROPE — Czechoslovakia's Central Radio Club offers its International OK DX Contest, a c.w.-only affair, on the second Sunday in November, 0000-2400 GMT, 160 through 10 meters. Everybody works everybody outside one's own country in this one, swapping serials consisting of RST plus two digits equal to the number of years the sender has been licensed; e.g., 56909 for a fellow licensed in '59. Each QSO with an OK counts 3 points, others count one point each, and this point total is multiplied by the number of world-wide prefixes accumulated—G2 G3 OK1 OK2 would be four—for final score. There are categories for multiop, single-op, multiband and single-band. Ship your entry, a separate sheet for each band, listing GMD, GMT, station worked, serials sent and received, points

claimed, and each new multiplier claimed, to CRC, Post Box 69, Prague, Czechoslovakia, postmarked no later than December 31, 1968, for possible certification of meritorious performance. At the same time you might make inquiry re CRC's 100-OK and S6S certifications, worthy sheepskins of long standing . . . . As detailed here last month, RDDR (E. Germany) flings its annual WADM affair on October's third week end. Set? . . . . "My operations from Andorra will begin the evening of the 22nd of October or the morning of the 23rd and continue through the 28th or 29th," warns PX1BW (DL5NJ-KØBWN) . . . DM3CK/HA1SY, 14.005 kHz., is an example of reciprocal licensing in the U.S.S.R. orbit, according to WA1FHU. HA1SY is temporarily employed in the G.D.R. WA1FHU also notes



M1B, WB6JKQ and M1H consider interesting aspects of European geography on a rare hillside. M1B is frequently workable on 10-, 15- and 20-meter sideband and c.w., WB6JKQ is with the I1DFE staff, and M1H is a c.w.-forever type.

that YO2JF, another 20-c.w. fan, is ex-YR5BF of the 1930s . . . . W3HNK comments, "GW3DZJ is now so busy with an antenna manufacturing venture he's getting behind on QSOs." . . . . WB6JKQ of I1DFE understands that San Marino licensing of noncitizens may be liberalized after the next M1 elections in April . . . . "I plan to operate mostly 10 and 15 s.s.b.," alerts FØCV (WA9FZQ), preparing to spend a year in the south of France . . . . LA5HE says, "The LG5-LG working from a strange 'country' between Sweden and Norway is genuine. The location is Morokulien, a border area considered as a kind of fairyland commemorating the long peace and brotherhood between LA- and SM-lands." LG5LG was put into operation by Norway's NRRL, and qualified guest operators are welcomed. LA5HE, incidentally, now holds the call OZ8RO, the first LA reciprocal in Denmark . . . . FØ reciprocals hit Corsica hard this season as the "Where" QTH list shows. The G and GM gang invaded GC-land in similar numbers, and Italian DXers converged on such Mediterranean islets as Pantelleria where I1BPD picknicked as 1P1BPD.

SOUTH AMERICA — LCRA (Columbia) hosts an International Amateur Radio Union Region II Contest slated to run from 0001 GMT on the 12th of this month to 2359 the 13th. Stations outside our hemisphere work North and South Americans at six points each; we work stations outside Region II at 3 points each, stations inside at 1 point each (no intracountry QSOs) exchanging the customary RS- or RST001, RST002, etc., serials via any mode on any band. Total score obtains from multiplying QSO points by the number of band-countries collected. Logs, separate entries for phone and c.w., should be postmarked before 1969 and addressed to the Secretary, IARU Region II, Box 4097, Lima, Peru, indicating single- or multioperator entry. Argentina will sponsor next year's affair, and our turn will come later . . . . OA8V testifies, "K1-GZL puts one of the loudest 75-meter phone signals down this way with his wire beam. K4UCQ also has a nice one with his 70-ft. vertical. I copy VE3OE's ARRL Bulletins solid frequently at 0330 GMT." . . . . From WB2MTP we hear that PZ1BI, an electrical supervisor in the aluminum industry, uses an SR-150, SX-117 and homespun linear near 14,150 and 21,200 kHz., mostly week ends at 2000-2300 GMT. Willy's ten children may occasionally trip the VOX . . . . W8-IBX figures WA8KOO/HC1 should be back home by now after summering at Quito's HCJB where antenna heights are some 10,000 feet a.s.l. . . . . PY7QBG is said to be K8WNU on a year-long Fernando de Noronha assignment, single-sidebanding on 15 and 20, 2000-2400 GMT.

AFRICA — 5U7AL gives us his viewpoint: Licensed Niger stations include 5U7s AC AK AL AN and XYL, the latter inactive. Fred holds the call TL8AL for future C.A.R. action, TY6ATE for Dahomey, and has a TT8 license pending. "At present there are no amateur operations authorized in Upper Volta despite the appearance of XT2A." . . . . DJs 2IB and 5JK employed an FL-100B, 75S-1, inverted Vee and 2-element quad during their April CT3 sortie . . . . "9Q5EB is finishing a three-month U.S.A. leave," reports WA8PWZ . . . . "CR6s KT and LF hunt Stateside on 14,332 kHz. beginning at 2100 GMT," reveals W3HNK. "ZE4JS has a new 4-el. quad in Salisbury on 14,060 or 21,060 kHz." . . . . African addenda courtesy the clubs press: FL8AO (F3AO) resumes 21,180-kHz. a.m. action around 1000 GMT with a TR-3 and TA-33. . . . 3T5AD pops up now and again near 14,250 kHz. . . . 5As 1TG 2TR 2TS 3TW 5TE and 5TP bring forth Libya again on several bands, phone and code. . . . ZD9BK, 14,180-kHz. non-s.s.b., 1500 daily, is expected to be available till next July. Neighbor ZD9BE continues sideband and c.w. schedules on 7040, 7070, 14,260, 21,260, 21,380 and 28,550 kHz.

OCEANIA — "I do about as much c.w. as s.s.b.," estimates KS6CQ in lines to W1APU, "maintaining regular schedules and network traffic. I also hold the MARS call AI9CQ and instruct regular radio classes. Samoan nationals are learning the use of c.w. equipment, some of the boys now approaching capability of becoming amateurs. High heat and humidity are problems here. The desk encasing my equipment is equipped with lamps to help keep the gear from rusting; the lamps come on when the rig goes off." . . . . ARRL's Hawaii SCM intends to radiate as KH6BZF/-KM6 and KH6BZF/Kure later this month . . . . Don't forget that October's first two week ends are reserved for the gala annual VK/ZL/Oceania DX dance, details last issue . . . . Pacific patter via club newshawks: VE7IR/YB (9V1OQ) should be in the Indonesia area for a year or so but YB QSOs are still on the ITU/FCC no-workee list for W/Ks as of this writing. Monitor W1AW! . . . KH6EDY/Kure's new op will be there a few more months, 14,230-14,240 kHz. at 0500-1200, possibly also 21,300 and 7240 kHz. . . . FW8-RC still likes 14,245-14,265 kHz. around 0500, Thursdays and Fridays. . . . WB6KRW has been sampling the DX end from DU1FH. . . . VK8AV still is determined to make Timor glimmer. . . . FK8BB brings a 350 and vertical back from France for 14,160-kHz. sport. . . . VK9s DJ GN HR KS NM RH RJ VM and others can sew up half a dozen DXCC entities for you with heavy phone and code activity on 15 and 20.

HEREABOUTS — "I operate c.w. around 14,055 kHz, between 2300 and 0400 GMT," informs WA3DVO/-8P6. "I'm also net control for the Maritime Mobile Service Net on Mondays." . . . . ARRL v.h.f. scribe WB4HIP-KØCER-W1DVE gets in DX licks as ZF1DT, naturally concentrating on 50 MHz. "Cayman is only an hour and fifty-nine dollars away." . . . . D. Heil of Kentucky, awaiting his General call, goes into the USAF with a DX-60 and R-100 plus hopes of semi-rare DX status when the shipping papers come through. "I'll be using c.w. on 20 and 15." . . . . WA1FHU enjoyed his recent rendezvous with W7s AUK CBE DQH KH PHO, K7DSA and other northwest DX guns at their traditional Doghouse luncheon in Seattle . . . . Judging from DM3IGY's 10-meter beacon signals, WA8-TYF feels that many U.S.A.-Europe openings were missed this summer due to inactivity . . . . "HP1-RC shuts down this month for a year of schooling in the States," learns DL4FS . . . . "I'm quite active on 20 meters," notifies visitor OH3UQ/W6 . . . . "What a ball I'm having with DX on 15 meters these days," exclaims WN2FEH. "It's really fantastic what you can work with 50 watts, a house-mounted vertical, two crystals and an 11-year-old receiver!" WA1DP feels the same way about 21 MHz. after his first 25-watt CQ brought back G3IDG, and WB4GSS finds enough a.m. DX on 15 to keep his non-s.s.b. 30-watter busy . . . . HPØA was a multiband project of HPs 1AC 1XEC 3MC and 5MV from Coiba isle . . . . WØVXO is mentioned in connection with an early VP2-type 160-meter-oriented DXpedition, and W4BPD of *DX Magazine* is said to be mulling over 1969 DX-peditionary possibilities. Gus-hunters, as ever, are QRV!

YL news and views

CONDUCTED BY LOUISE RAMSEY MOREAU,* WB6BBO

The Floridora Girls

"Goldwyn Girls," "Ziegfield Girls," "Powers Girls," and the "Floradora Girls," all connote femininity, but of all the glittering symbolic names that automatically spell out YL when they are mentioned, none is more adaptable for a YL amateur radio club than the one given to the gals in Florida by W6FE, now a "silent key," — Floridoras.

This very active group started as an informal, on-the-air net made up of W4WPD, Shirley, W4BWR, Ruth; W4BIL, Fran; all on 3.850 MHz. Later Blanche, W4GXZ, (now K1IZT) and "Little Bo," W4HRC, joined them. From this nucleus of an idle gettogether the club has expanded into a membership of 60 to 75 members. They have recently received the YLRL Associate Club Certificate.

Originally, the Floridora Club Call was WA4RXP, but when W4FE the "godfather" of the group became a "silent key" they were able to secure his call to perpetuate the memory of the man who gave them their distinctive name.

Because it is statewide in scope the Floridoras are not a club with a meeting room, but a Net that meets every Tuesday morning at 1300 GMT, on 3933 kHz. Most of the membership operate s.s.b., but all modes of emission are used and the net is open to all YLs who wish to join with the group. But this net is not limited to voice operation, when there are enough interested Novice members of the Floridoras they activate their c.w. Novice net on 7185 kHz. Something for everyone who is interested is their by-word.

*YL Editor *QST*, Please send all news notes to WB6BBO's home address; 1036 East Boston St, Altadena, Calif 91001.

1968 Floridora Officers: W4EHN, Betty; K4WXS, Lee; W4BAV, Cathy. Vice president, WA4BMC missing when the picture was taken.

Floridora YL Certificate.

We have all sorts of "months" and "weeks" set aside for special purposes, so these gals have set October as "Floridora Month." This is when the membership are encouraged to be active on all bands to give contacts towards the Floridora Certificate, and to keep these club members on the air it is also a within-the-club contest.

The club certificate with the graceful, frilly, feminine emblem is copyrighted and was designed for the Floridoras by Dot Davison, K4LFA. It is available to anyone who submits proof of contact with ten members in good standing, *who are in Florida at time of contact.* A gold sticker is issued for each additional contact. To obtain the certificate mail either QSLs or a list of QSLs that has been notarized and

Floridoras at their 11th Anniversary Party at the Orlando Hamfest. Front row: W4IUR, W4BAV, W4WPD, W4HRC, K4RNS in back of W4HRC. Second row: W4EHN, K4WXS, W4FSF, K4RHL, W4CWV, K4UIZ. Back row: W4BWR, WA4YNX, W4BIL, WB4GZN, WA4SII, WB4FVN, W4KZT, K4ZXS, W4WYR, WB4FYD.

witnessed, with 15 cents to cover postage, to the custodian: Marge Campbell, K4RNS, 1700 Nova Road, Ormond Beach, Florida, 32074. This certificate is available to OMs as well as YLs; so far over 300 have been issued in this country, as well as around the world.

In April 1968, the Floridora YLs celebrated their eleventh anniversary at the Orlando Hamfest. The following gals have served as president over the past eleven years: W4BIL, Fran, two terms; W4UF; K4RNS, Marge; K4RED, Lucy; W4HRC, Florence; K4RDX, Ann; K4RHL, Ellie, now the Club Trustee; K4UIZ, Evalyn; WA4FJF, Ellen; W4WPD, Shirley; and the present president is Cathy, W4BAV.

Marge Campbell, K4RNS

Nothing can lure us into amateur radio so easily as an enthusiastic friend who is obviously having a wonderful time on the air. Marge, K4RNS, and OM Jim, K4RNR, (who became a "Silent Key" in July of this year) were infected with the radio "virus" through an active friend, and the result in 1957, was call letters for both.

Marge is extremely active on the nets because her "number one love" is meeting and talking to YLs. She is busy on Tangle Net, YL Open House, and of course the Floridora Net each Tuesday morning. A Charter member of CHC, she is number

K4RNS, Marge Campbell.

34 and holds 200 awards from that group. Marge is also Charter member #6 of ISSB, and the auditor of that club.

She is a past president of Floridora YL Club, and has been their certificate custodian since 1962. She is also YLRL Membership Chairman, and is a former DC for the 4th YLRL District. Marge holds the 10-year YLRL membership certificate, is a member of ARRL, and A-1 Operator Club. Some of her awards include YLCC-950 and DXCC, in addition to her CHC awards.

When she isn't up to her ears in Howdy Days, AP, nets, traffic, talking to YLs, Marge is busy: keeping in touch with her Navy son and his family in Hawaii, whom she hasn't seen for four years; with her daughter and her children, working in the garden, knitting, and trying out new dishes. But if it is amateur radio, you'll find K4RNS right there in the front. The enthusiasm of a friend not only rubbed off on her, it has become incurable and is one thing she would never care to cure.

Barbara Delhotal, WAØPYP, Hi-Plains Amateur Radio Club Hamfest Queen. Barbara was crowned in recognition of the part the ladies play in amateur radio activities. *(Photo courtesy KØCJL.)*

29th YLRL Anniversary Party

C.w.
Start: October 16, 1968 1800 GMT (Wednesday)
End: October 17, 1968 1800 GMT (Thursday)
Phone
Start: November 6, 1968 1800 GMT (Wednesday)
End: November 7, 1968 1800 GMT (Thursday)
Eligibility: All licensed women operators throughout the world are invited to participate. YLRL members *only* are eligible for the cup awards. Non-members will receive certificates. Only YLRL members are eligible for the Corcoran Award. Contacts with OMs will *not* count. Contacts on nets do *not* count.
Procedure: Call "CQ YL."

Operation: All bands may be used. Cross band operation is *not* permitted. Only one contact with each station will be counted in each contest.

Exchange: Station worked, QSO number, RS or RST, ARRL Section or Country. Entries in logs should show time, date, band, transmitter and power. All logs must be signed.

Scoring: A. C.w. and phone sections will be scored as separate contests. Submit separate logs for each contest.

B. All YLs within an ARRL Section score one (1) for each QSO with another station located within an ARRL Section. Score two (2) points for each contact with a station not located within an ARRL Section (i.e. DX) Definition of DX is all stations not located within an ARRL Section. DX YLs shall score two (2) points for each contact with a station located in an ARRL Section. Score one (1) point for each contact with another DX station. (Note ARRL Section lists are available from the YLRL vice president, or located on page 6, *QST*.) Multiply number of contact points by total number of different ARRL Sections and/or Countries worked.

C. Contestants running 150 watts d.c. input at all times may multiply the results of (B) by 1.25 (low power multiplier.)

D. S.s.b. contestants running 300 watts p.e.p. or less at all times may use the low-power multiplier (results of B, by 1.25.)

Awards: Highest c.w. score
Gold Cup (YLRL member only)
Highest phone score
Gold Cup (YLRL member only)
Highest c.w. and highest phone logs from each District and Country will receive a certificate.

Corcoran Award: Highest combined c.w. and phone score (YLRL member only.)

DX only: Highest combined c.w. and phone scores from North and Central America, including the Greater and Lesser Antilles, will receive an Award from Arlie Hager, W4HLF. Highest combined score from any other part of the world will also receive this Award.

Logs: Copies of all logs must show claimed score, and be signed by the operator, and postmarked *not later* than November 20, 1968. Mail copies to: Claire E. Bardon, W4TVT, 2238 Morgan Lane, Dunn Loring, Virginia, 22027.

Annual Floridora Contest

For the entire month of October YLs in Florida will be competing in the Annual Floridora Contest. Contacts are YL to YL, and not necessarily Floridora members, but both operators MUST be located in the State of Florida at the time of contact. All bands may be used. So, if you are on vacation and using the mobile, or operating portable, so long as you're within the boundaries of Florida you may have a ball in the contest.

Logs should be sent to the Floridora vice president Bertha Eggert, WA4BMC, 1510 17th Avenue, Lake Worth, Florida, 33460. Deadline for logs is ovember 15, 1968.

TOT Net Changes

Effective September 28, 1968, the Ontario Trilliums have made two changes in net schedules.

40 meter net will change to Wednesdays 7:30 P.M. on 7.115 MHz.

20 meter net will meet ONLY on the last Saturday of each month on 14.210 MHz. No time change.

And don't forget these changes during the Trillium Memorial Week coming up November 23-25, 1968. Start planning now, and see November YL News and Views for full details.

Like all YLRL Members QRV means WA8ARJ is ready to serve.

One morning last March a woman called WA8ARJ and asked if she were still working with her radio. The woman's son had been home in August, 1967. After a tour in Vietnam, he was sent on to train others for service in Vietnam and had gone on a three day pass in October and hadn't been heard from since. Needless to say, with the State Police, Army, and FBI looking for him, the parents were frantic.

A friend suggested that they get in touch with an amateur radio operator, and although the FBI seemed to think that this wouldn't do much good, the woman was willing to try anything. She called Bobbie, WA8ARJ, whom she knew from having delivered traffic to her. She explained the situation and although Bobbie wasn't too sure it would be of much help she decided to try.

At one P.M., the same day she received the request, Bobbie put a bulletin on the North Central Phone Net with all details, as well as the parents' name, address, and telephone number. Later her OM, Bob, put the same bulletin on the Breakfast Club Net the next morning. It was a long shot, but amateurs don't know how to say "no." Well, about noon the next day the woman called Bobbie that she had definite information on her son. He was working in a town in a nearby state, and was now back in the Army undergoing treatment for what was suspected to be partial amnesia. He had been located from the description picked up by a local amateur.

We gals in YLRL may wonder why we have that International Abbreviation "QRV" for a motto, but when the chips are down, and someone needs the assistance of our facilities and skills there we are ready, and willing to help. QST

Strays

Doing some work on the DX Contest Result our Bob Hill, W1ARR, found the log of IICAQ full of handwritten comments . . . in Italian. Bob checked the entire office crew for someone to translate, with no luck. Back at his desk, up walked a tour guide and introduced a visitor, IIMY — who graciously offered to make the translation.

Feedback

W4TVT, YLRL vice president, advises that an error was made in the YL-OM Contest listings of the OM c.w. winners. W9LNQ with a score of 3,919* was third place in the OM c.w. contest and not W1PYM as listed in *QST*, July 1968.

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Referring to the V.H.F. Sweepstakes writeup in June *QST*. WA8REM, top scorer in Michigan with 3458 points, was inadvertently listed in Ohio as placing fifth in that section.

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Footnote 3 in the article "Try The FMT" in *QST* for July 1968 refers to an article by Lange in July 1967. It should read July 1966.

Operating News

GEORGE HART, W1NJM, Communications Manager
ELLEN WHITE, W1YYM, Deputy Comms. Mgr.
Administration: LILLIAN M. SALTER, W1ZJE
Contests: ROBERT HILL, W1ARR
DXCC: ROBERT L. WHITE, W1CW
Training Aids: GERALD PINARD

The Five-Band DXCC. A brand new challenge for avid Dxers comes into being officially on January 1, 1969 with the inauguration of the *Five-Band DXCC* award. This new award has been created in response to many requests at the direction of the Board of Directors in its May 1968 meeting.

This is a start-from-scratch achievement. You can't use any of your present DX cards. You can't use contest logs. You can't use active repeaters, either on the ground or in space, to reach the goal on the v.h.f. or u.h.f. What you do is start all over to "make DXCC" *on each* and every band, 80 through 10 meters, or any other five amateur bands.

The rules (see box elsewhere in this column) make use of the present DXCC rules and are tied closely to them. The Official "countries" list (Operating Aid No. 7) will be used. The big difference between DXCC and 5BDXCC is that for the latter you have to do on each of five different bands what for the former you need do only once on all amateur bands.

Note that in the ARRL Field Organization (U.S. and possessions, Puerto Rico and Canada) the applicant must be a full ARRL member. The cost of processing applications (plenty) is born by the League for your benefit. The $10 charge for application forms covers the cost of returning your 500 cards by first-class registered mail and having made, especially for you, a handsome engraved plaque to attest your outstanding achievement. Your Board of Directors, by authorizing the Communications Department to make this award available, thus recognizes DX operating achievement and presents a new challenge especially to those DX men who are getting so close to having "done it all."

Those interested, please read the rules carefully. No doubt it will be several months before even the most energetic DXer, even with the assistance of the early-1969 ARRL DX competition, will have acquired the necessary 500 cards to qualify for the award. We suggest you wait until you are well under way before sending for the application form, which in any case will not be available for some time to come, at least not until after the first of the year.

Okay, DXers? Let's get those antennas up for 80 and 40 meters, and maybe also that ten-meter beam, so you'll be ready to dive into this grind come the first of the year. Making the contacts will be hard enough; getting the cards to confirm them will be something else!

New RCC Policy. Throughout the years, the headquarters has received many times the suggestion that RCC be dropped, because it really doesn't mean anything and is so easy to obtain. Compared to the above 5BDXCC, for example, it's ridiculously simple. All you have to do is chew the rag with another ham for a half hour or more, report it to headquarters and back comes your RCC certificate. Over 6000 of these were issued in 1967.

But now comes the complaint that there is duplication and waste. Some amateurs are getting two or more certificates, some don't want the one they get (we got one back all torn into little pieces, with no comment!), others have asked why they received one or who nominated them. The procedure of granting an RCC certificate to anyone asking for it, either for himself or a friend, has had this result, as might have been expected.

A familiar call on an unfamiliar mode: that was K7RAJ, scoring a hefty 105K in his first phone CD Party. Jim becomes the second CD appointee from the 7th call-area to exceed that magic hundred-grand total, and one of only seven Partyers ever to surpass that figure on voice. His DX-Contest tallies are chronicled elsewhere in this issue.

Hence, the new procedure. If you want to nominate someone for RCC, send the nomination information (date and time of QSO and length of chew) *to him*, instead of to headquarters. If he wants the certificate, he can send in the nomination. This way, no one gets a certificate he doesn't want and confirmed ragchewers can still nominate those they think qualified. A s.a.s.e. with your application will be appreciated.

FMT Honor Roll. It has been called to our attention that a supplementary list of amateurs who qualified for the list of leaders in last February's FMT (see p. 95, June '68 *QST*) has never been printed. We're mighty sorry about that, OMs! It represents a double goof—first in omitting the calls, then in omitting correcting the omission. Therefore, let it be known that the following measured W1AW, last Feb. 10, to an accuracy of .4 parts per million (.00004%). W1PLJ, W2JQJ, WA2WOM, W3WXB, W4ZGR, W5LNL, W6AXV, K6MZN. That's mighty close measuring!

Miscellany. Quite a few have asked that the boundaries of some of our "split" sections be defined, presumably for CD contest purposes. This information is now printed in the booklet *Operating an Amateur Radio Station*, free to ARRL members. Send 12¢ postage if you want it first class.

Staff Note: Your newest CD staffer is William O. Reichert, WA9HHH, who started his indoctrination in the Public Service Branch Aug. 15. Bill is a high speed c.w. man and has been active on ILN, 9RN and CAN, so he has a head start on NTS matters.

All you other aspirants for jobs at headquarters, don't give up. There are still three other vacancies right in this department.—*W1NJM*.

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for July Traffic:

Call	*Orig.*	*Rec'd.*	*Rel.*	*Del.*	*Total*
W3CUL	319	2169	2146	133	4767
K5TEY	13	1952	1902	5	3872
W7BA	17	1138	1009	124	2288
K0ONK	184	1020	995	67	2266
WA9CNV	1	920	917	3	1841
W6GYH	57	621	538	6	1222
W0LCX	17	453	358	23	851
W3VR	109	347	384	3	843
K5BNH	7	421	339	38	805
W6RSY	7	372	262	104	745
WA2UWA	15	360	350	3	728
WA5TYH	5	382	273	35	695
WB6BBO	13	339	338	1	691
K3MYS	36	331	302	15	684
WB2RKK	49	308	254	17	628
W8UPH	13	307	257	46	623
WB2FUW	187	237	185	8	617
W6MLF	396	110	98	0	604
WA9QKP	28	288	261	1	578
WA9MHU	30	275	163	101	569
W3EML	34	312	216	2	564
W8GAI	10	271	238	29	548
W0LXA	34	251	231	28	544
WA7DZL	8	249	237	12	506
WB4GTG	21	242	233	6	502
K7RQZ	33	235	188	44	500
Late Reports:					
KH6GHZ (June)	128	237	185	46	596
K9FZX (June)	3	3	249	256	511

BPL for 100 or more *originations-plus deliveries*

K3NSN 184	WA3AOJ 111	WA6BYZ 104
WA9QNI 175	W3TN 111	WA1DFL 103
KH6GHZ 147	K4YZU 110	W9ESJ 102
K5GDH 142	WA6AUD 109	W4FP 101
WA1GGN 137	W6KVQ 107	W8MO 100
WB6HVA 128	WA7JBM 107	Late Reports:
WA8MCQ 128	WB2UVB 104	WA5BQI (May) 107
WA2GPT 122	WA3IYS 104	WA2ZDA (June) 103

More-Than-One-Operator-Stations

KØWBD 336	K6MCA 233	WAØHQR/Ø 114

BPL Medallions (see July, 1968 QST, p. 99) have been awarded to the following amateurs since last month's listing: WB2FUW, WA3AFI, K3WEU, WB4DXX, WB4FDT, WB6SQZ, WB6UMT, WA7BDD, WA9QNI

The BPL is open to all amateurs in the United States, Canada and U.S. Possessions who report to their SCM a message total of 500 or a sum origination and delivery points of 100 or more for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt in standard ARRL form.

Note: Rules for the new Five-Band DXCC Award appear on the following page.

OPERATING EVENTS (Dates in GMT)

ARRL-IARU-SCM-Affiliated Club-Operating Events

October

2 **Qualifying Run, W6OWP**

5–6 Massachusetts QSO Party (p. 122, Sept. *QST*).
VK/ZL/Oceania DX Contest, phone (p. 105, Sept. *QST*).

5–7 California QSO Party (p. 130, Sept. *QST*).
RTTY SS (p. 70, Sept. *QST*).

12–13 VK/ZL/Oceania DX Contest, c.w. (p. 105, Sept. *QST*).
IARU Region II Contest (p. 90, this issue).

12–14 **CD Party** (phone)*

16 **Qualifying Run, W1AW**

16–17 YL/AP c.w. (p. 87, Aug. *QST*).

19–20 Boy Scout Jamboree WADM Contest

19–21 **CD Party** (c.w.)*

* League Officials and Communications Dept. Appointees, only.

November

2–3 KR6 DX Contest (p. 103, this issue).

3 OK DX Contest (p. 103, this issue).

6–7 YL/AP, phone (p. 87, Aug. *QST*).

7 **Qualifying Run, W6OWP**

9 **Frequency Measuring Test,** OOs only.

9–11 **SS**, phone (p. 54, this issue).

10 International OK DX Contest

14 **Qualifying Run, W1AW**

16–18 **SS**, c.w. (p. 54, this issue).

December

4 **Qualifying Run, W6OWP**

13 **Qualifying Run, W1AW**

1969

Jan. 4–5 VHF SS
25–26 SET

Feb. 1–2 DX, phone
15–16 DX, c.w.

Mar. 1–2 DX, phone
15–16 DX, c.w.

The purpose of the 5BDXCC Award is to encourage more uniform DX activity throughout the amateur bands, encourage the development of more versatile antenna systems and equipment, and provide a new challenge for old timers as well as newcomers to DXing. The award does *not* supersede the basic DXCC award, but is in addition to it.

1) The 5BDXCC Award is available to all licensed amateurs, except that in Canada, the United States and possessions, and Puerto Rico the applicant must be a full member of ARRL.
2) DXCC Rules 6, 7, 8, 9, 11, 12, 15 and 16 (see attached) shall apply to 5BDXCC; DXCC Rule 10, with substitution of a date of Jan. 1, 1969, shall also apply. Anyone disqualified from 5BDXCC under DXCC Rule 11 shall automatically be disqualified from DXCC. Anyone disqualified from DXCC is not eligible for 5BDXCC.
3) The 5BDXCC Award will be issued after checking submission of a minimum of 500 different confirmations *representing two-way communication with 100 different* "countries" (per the ARRL Countries List in effect at the time of application) on each of five amateur radio bands. Phone and c.w. segments of the band do not count as separate bands for this award.
4) Confirmations showing contacts by any legal mode will be accepted. However, no contacts made by cross-mode or cross-band are acceptable, nor will endorsement for mode be given or indicated. Contacts using repeaters or repeater satellites are not acceptable.
5) Application for 5BDXCC will be accepted only if submitted completely on a standard form supplied by ARRL headquarters. A charge of $10.00 (U.S.) will be made for each such form. This charge will cover cost of return of cards by first class registered mail and purchase and forwarding of a personalized plaque commensurate with the difficulty and effort required to achieve this award.
6) Only QSL card confirmations will be accepted. No credits will be given for confirmations via DX contest or other logs.
7) Only confirmations showing a contact date of Jan. 1, 1969, *or later will be accepted for credit for this award.*

DX CENTURY CLUB AWARDS

From July 1, through July 31, 1968, DXCC certificates based on contacts with 100-or-more countries have beenissued by the ARRL Communications Department to the Amateurs listed below.

New Members

I1LAG....260	W6HPQ....134	W3LB.....110	DL2FY.....103	WA4KQO...102	KG6AQI....100
OL8NU....225	WA5REM...129	W8MXO....110	K2QMF.....103	W6BB.....102	LA3K.....100
HI8XAL....225	DL1CP.....126	HM1AJ.....109	WB6RAW...103	WA8GTG...102	LA9OI.....100
W9ZRX....191	W1AYK.....119	W6ZGM....109	DL1QY.....102	JA1JXU....101	WB2BMQ....100
W4RQR....189	DL6OL.....117	K6YRD.....107	DM2BDD...102	K7ADD/3...101	WB2RBG....100
W2YA.....186	OK2ABU....117	I1AKJ.....106	HB9ABO...102	K7AXF.....101	W3NLU.....100
W6KJS....162	4X4KM.....116	K3MZV.....106	K2IEF.....102	VE2BFS....101	W3RRV.....100
W6RFF.....162	YU1NAJ....115	WA3DCM...106	K1OCE.....102	W9GIM....101	WA3EFH...100
WB2WOW..157	K9DWK.....114	W4CHC.....105	K6MGF.....102	W9YDQ....101	W4NXE.....100
JH1ANB....139	DM3LOG....111	HB9AAX...104	W2OVX.....102	W0AGK....101	W4OWE....100
W8UWN....137	G3TZU.....110	JA3BSD....104	WB2WAS...102	DL5AO.....100	WA6KHK...100
DL9WX....134	PY4ALC....110	WB2VYA...104	W3FBE.....102	K1GXU....100	WA0OMN..100
				K5MBB....100	YO8OP.....100

Radiotelephone

DL8NU.....221	W6HPQ....134	W6DYJ.....110	I1AKJ.....105	K6RXZ.....102	G3XBR.....100
K5LNN....205	W8CGQ....121	W7SFA.....110	W4CHC.....105	W2LCW....102	I1HBP.....100
HI8XAL....183	PA0WOR....118	DM2BEA....109	IS1EP.....104	W3AYS....102	KG6AQI....100
W9ZRX....178	WA5REM...115	WA9UGI...108	WB4HNV...103	W9EHW...102	VK3AMK...100
K6CWS....149	VE1US.....112	HM1AJ.....106	W5LVQ.....103	K7RDH....101	W1LFE.....100
WB2WOW..147	DJ3ILJ.....111	WA1FNS...106	YV1EC.....103	W2HXF....101	W1MDO....100
K1ODJC....145	DL7HJ.....111	WB2YRU...106	4X4KM.....103	WA2VSQ...101	WB2RKU...100
KH6BVS....140	I1TUS.....110	WA5RTD...106	K4KMX....102	W3KVS.....101	ZD8HAL....100
				WA8GBE...101	ZL1AAP...100

Endorsements

Endorsements issued for confirmations credited from July 1, 1968 through July 31, 1968, are listed below. Endorsement listings through the 300 level are given in increments of 20, above the 300 level they are given in increments of 5. The totals shown do not necessarily represent the exact credits given but only that the participant has reached the endorsement group indicated.

345	**315**	**300**	K7CHT	W3EYF	W0AO	**180**	W8GGQ	WA9UFR	W0EXS
W1GKK	LA5HE	DJ7ZG	VE3WT	WA3ATP	WB2PWU	JA2TH			WA4EKF
	W8CUT	K4TWK	W2LJF			K4CFB	**160**	**140**	ZD8HAL
330	W9TKV	VE7CE	W0WRO	**240**	**200**	OH2SF	DJ9SB	G3JFF	
W9FKC		W2PZI		K1JHX	K6CWS	SM5FC	DL1FL	HB9AGO	**120**
	310	W4UKA	**260**	K5LNN	K9WEH	SM7ANE	G3JBR	K1KNQ	DJ5HL
325	I1KDB	W6RGG	K4YFQ		PA0OI	VE5JI	I1BLF	K1ZND	K2YEK
W1JNV	K7ADL	ZS6YQ	K6ALH	**220**	W2IP	VK3BG	W1ODI	K3CNZ	K4DSN
W6DZZ	OE1FF		K6HOR	OH5UQ	W3IOP	W1JVZ	WA3GTX	K4ZYU	K9GZS
	W4BFR	**280**	LA1K	W4RLJ	WA3CGE	W2MB	W6FXB	W4WSF	W6CLZ
320	W6GRX	HB9PL	PA0FAB	W5DMR	W4DVT	W4CRW	W7CRT	W6OJW	WA8RXU
W9TKD	**305**	K4YYL	VE3NE	W6ABJ	W4GF	W6QB	WA9LMY	W7FT	WA8TYF
	WB2HXD			W6PTS	W5TKB			W8OG	

Radiotelephone

325	**310**	**280**	WA3ATP	**200**	W6ZBS	WA5REU	WA1IHN	K8BIT	K2HER
W5KBU	EA7ID	G3WW	WA5IEV	JA8ADQ	ZL3RP	W6FXB	W4MLF	K0YIP	K9WEH
	I1KDB	OE1FF	W6DZZ	K4RQZ		W8CFG	W4RJL	W4DQD	WA2JYA
320	**305**	ZS6YQ	W0NCG	OA8V	**180**	W9GAI	W5TBH	WA4GUZ	WB2UZU
W1MMV	W6VUW			TN8AA	W2LJF		W0YZQ	W8PQD	W4WSF
ZL1KG		**260**	**220**	VE3NE	WB2RLK	**160**	YV4QG	W9CCK	WA4EKF
	300	W8GMF	I1ANE	WB2BBZ	WB2VZW	DJ3CN		YA5RG	W7CRT
315	OT1PK		K7CHT	WB2PWU	WA3CGE	K4SDW	**140**		W9DRL
W1CLX	DJ7ZG	**240**	VE5JV	W4SPX	W5DMR	K4YFQ	K5TGJ	**120**	W9FPM
	LA5HE	K4YYL	W6ABJ	WA4WTG			K6PIH	DL4QG	W9PWQ

ELECTION NOTICE

To all ARRL members in the Sections listed below:

You are hereby notified that an election for Section Communications Manager is about to be held in your respective sections. This notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are *required* on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must meet the following requirements prior to deadline date listed below: (1) Holder of amateur Conditional Class license or higher. (2) A licensed amateur for at least two years immediately prior to nomination. (3) An ARRL full member for at least one year immediately prior to nomination. Petitions must be received on or before 4:30 P.M. on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, *zip code* and station call of the candidate and signers should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reasons of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence names of all eligible candidates.

The following nominating form is suggested. (Signers should be sure to give city, street address and zip code.)

Communications Manager, ARRL [Place and date]
225 Main St., Newington, Conn. 06111

We, the undersigned full members of the.....
.....ARRL Section of the.....
Division, hereby nominate.....
as candidate for Section Communications Manager for this Section for the next two-year-term of office.

You are urged to take the initiative and file nominating petitions immediately.

— George Hart, W1NJM, Communications Manager

Section	*Closing Date*	*SCM*	*Present Tern Ends*
Santa Barbara	Oct. 10, 1968	Cecil D. Hinson	Aug. 10, 1969
West Indies	Oct. 10, 1968	Albert R. Crumley, Jr.	Jan. 10, 1968
East Bay	Oct. 10, 1968	Richard Wilson	Feb. 10, 1968
New Hampshire	Oct. 10, 1968	Robert C. Mitchell	Oct. 26, 1968
Southern Texas	Oct. 10, 1968	G. D. Jerry Sears	Dec. 10, 1968
Mississippi	Oct. 10, 1968	S. H. Hairston	Dec. 15, 1968
Maryland-D.C.	Oct. 10, 1968	Carl E. Andersen	Dec. 19, 1968
Alabama	Oct. 10, 1968	Edward L. Stone	Dec. 26, 1968
Kentucky	Nov. 12, 1968	Lawrence F. Jeffrey	Deceased
Arkansas	Nov. 12, 1968	Curtis R. Williams	Resigned
Colorado	Dec. 10, 1968	Richard Hoppe	Feb. 14, 1969
Eastern Florida	Dec. 10, 1968	Jesse H. Morris	Feb. 25, 1969
Sacramento Valley	Dec. 10, 1968	John F. Minke, III	Feb. 25, 1969
Orange	Dec. 10, 1968	Roy R. Maxson	Mar. 1, 1969
North Dakota	Jan. 10, 1969	Harold L. Sheets	Mar. 8, 1969
Missouri	Jan. 10, 1969	Alfred E. Schwancke	Mar. 11, 1969
Minnesota	Jan. 10, 1969	Herman A. Kopischke, Jr.	Mar. 15, 1969

ELECTION RESULTS

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

Maritime	William J. Gillis, VE1NR	Mar. 11, 1968
Alaska	Albert F. Weber, KL7AEQ	July 10, 1968
Iowa	Wayne L. Johnson, KØMHX	Aug. 17, 1968
Idaho	Donald A. Crisp, W7ZNN	Aug. 17, 1968
Montana	Joseph A. D'Arcy, W7TYN	Sept. 9, 1968
Northern Texas	L. E. Harrison, W5LR	Sept. 12, 1968
Nevada	Leonard M. Norman, W7PBV	Oct. 22, 1968

In the Arizona Section of the Southwestern Division, Mr. Gary M. Hamman, W7CAF, and Maxwell G. Smith, W7CAL, were nominated. Mr. Hamman received 204 votes and Mr. Smith received 134 votes. Mr. Hamman's term of office began Aug. 9, 1968.

In the Western Pennsylvania Section of the Atlantic Division, Mr. John F. Wojtkiewicz, W3GJY, and Mr. Robert E. Gawryla, W3NEM, were nominated. Mr. Wojtkiewicz received 351 votes and Mr. Gawryla received 257 votes. Mr. Wojtkiewicz's term of office began Aug. 13, 1968.

In the San Joaquin Valley Section of the Pacific Division Mr. Ralph Saroyan, W6JPU, and Stanley R. Babcock, WB6HVA, were nominated. Mr. Saroyan received 203 votes and Mr. Babcock received 82 votes. Mr. Saroyan's term of office began Aug. 20, 1968.

JULY CD PARTIES

Hey, guess what, gang! You know that swell VE4ZZ that gave you a Manitoba CD QSO for the first time in umpteen years? Well, it would have been even better if he had had an appointment! Scratch one. Oh, and you say you also landed VE5OA for rare Saskatchewan? Forget it: SCM VE5HP says he's as piratical as Bluebeard.

Just to keep pace with K2KIR, K2EIU/5 missed three active sections on both c.w. and phone. WA9ITB prepared for a hitch in the Navy by aweighing anchors for big scores on both modes. K2KIR fell asleep at the key Saturday night so decided to put in ten hours for 200K.

It's astonishing how phone scores have zoomed in the last few years. *Four* CDers over 100 thou in a July Party? Who'd have ever thunk it? And K2EIU/5 is already daydreaming about *200K* this winter! Wasn't too long ago that 5000 points was good enough to make the high-claimed listing.

Three entries (two c.w., one phone) have been omitted from our tabulation because of massive logging "irregularities." We can only pity anyone who would resort to such tactics just to run up an impressive score, especially in a purely fraternal contest such as this. What a waste of time — ours and theirs.

The following are high *claimed* scores (VE4ZZ and all); read, from left to right: appointee, total score, number of QSOs, number of sections, number of hours of operation. Final adjusted scores will appear in the October *CD Bulletin.* — *W1ARR*

C.W.

K2EIU/5	258,400-753-68-20
WA9ITB	242,640-717-67-19
W6RW (W6DQX, opr.)	234,600-680-69-18
WA9AUM	207,900-624-66-16
K2KIR	207,365-612-67-11
K4RIN/5	202,950-611-66-19
K3HKK (K3AHT, opr.)	202,300-588-68-16
WA6SDC	191,730-575-66-14
W6DGH	187,340-544-68-19
K2LWR	182,000-560-65-15
VE7BDJ	179,520-521-68-20
WB2RKK	173,195-510-67-18
WB2UHZ	167,210-500-66-20
W3GN	162,825-501-65-13
W2FR	151,420-445-67-16
K4FU	146,560-451-64-13
W8GAI	145,390-469-62-19
W3IN	144,000-444-64-11
W5BUK	139,520-429-64-16
W4BZE	136,407-428-63-12
W2GKZ	131,520-404-64-12
K1THQ	129,015-418-61-17
W8QXQ	128,205-400-63-10
KØAZJ (WAØMLE, opr.)	126,575-411-61-11
WA8OCG	126,555-423-59-15
K8DDG	124,620-395-62-16
WA5IIS	124,200-408-60-13
K1TKS	123,830-400-61-17
W6ISQ	123,200-378-64-11
W2PU (K8JLF, opr.)	122,850-383-63-16
WØINH	122,140-387-62- 9
W6GEN/6	121,075-390-62-19
WA3CFK	119,700-414-57-20
K8HKM	118,300-360-65-17
WB4GTG	116,815-381-61-17
W8LT (WA8AJZ, opr.)	115,500-378-60- 6
WA1ABW	114,600-376-60-17
WB2OHK	113,400-371-60-18
KH6GNE	112,960-346-64-14
KZ5FX	109,740-365-59-11
K3EXE	109,440-342-64-20
W1MX (K3QDD, opr.)	107,360-354-61- 7
K3WWP	106,305-366-57-16
W4KFC	105,400-333-62- 4
W8RYP	104,780-331-62-13
WA1GYP/5	104,400-348-60-19
K4PUZ	104,220-379-54- 8
K2KNV	103,395-333-61- 7
WA8ZGC	100,005-332-59- 7
WB4AIN/4 (WA4WWT, WB4AIN)	178,425-543-65-17
W1AW (K1ZND, W1ARR, WA1IUL)	169,920-528-64- 9

PHONE

K2EIU/5	129,015-416-61-18
W1BGD/2	122,450-388-62-12
W9AQW	115,345-387-59-20
K7RAJ	105,525-335-63-18
WA9ITB	99,120-329-59-15
K1CEC	94,400-315-59-15
K1THQ	82,350-300-54-14
K4FU	66,825-236-55-11
K3HKK (K3AKR, opr.)	61,020-222-54-19
WAØOTE	60,950-225-53-15
W6DGH	60,200-208-56- 8
VE3OE	55,275-201-55-10
WA4UAZ	53,350-189-55- 8
WAØMLE/Ø	47,520-194-48- 5
W8LT (WA8AJZ, opr.)	41,520-166-48- 6
K1TKS	39,270-181-42-14
K7WWR	37,200-150-48-15
WAØSDC/5	36,015-141-49- 5
W8NOH	35,500-137-50- 5
W3GN	34,650-147-45- 6
K4TTN	34,350-145-46-13
WA8UPI	33,525-146-45- 8
W1ETU	31,320-174-36- 7
W4KFC	30,825-130-45- 3
WB2DRW/2	30,525-160-37-14
K3WUW	28,350-126-45- 5
W5PWG	27,300-125-42- 8

W1AW SCHEDULE, OCTOBER ** 1968

The ARRL Maxim Memorial Station welcomes visitors. Operating-visiting hours are Monday through Friday 1 P.M.–1 A.M. EDST, Saturday 7 P.M.–2:30 A.M. EDST and Sunday 3 P.M.–10:30 P.M. EDST. The station address is 225 Main Street, Newington, Conn., about 7 miles south of Hartford. A map showing local street detail will be sent upon request.

GMT*	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0000	.....	CW-OBS[1]	CW-OBS[1]	CW-OBS[1]	CW-OBS[1]	CW-OBS[1]	CW-OBS[1]
0020–0100[4]	.....	.....	3.555[6]	14.1	1.805	7.08[6]	14.1
0100	.....	Phone-OBS[2]	Phone-OBS[2]	Phone-OBS[2]	Phone-OBS[2]	Phone-OBS[2]	Phone-OBS[2]
0105–0130[4]	.....	145.6	3.945	145.6	50.7	1.82	21.41
0130	**Code Practice Daily[1] 15-35 w.p.m. TThSat., 5-25 w.p.m. MWFSun.**						
0230–0300[4]	.....	.....	3.555	7.08	1.805	7.08	3.555
0300	RTTY-OBS[3]	.....	RTTY-OBS[3]	RTTY-OBS[3]	RTTY-OBS[3]	RTTY-OBS[3]	RTTY-OBS[3]
0310–0330[4]	.....	.....	3.625	14.095	3.625	14.095	3.625
0330	Phone-OBS[2]	.....	Phone-OBS[2]	Phone-OBS[2]	Phone-OBS[2]	Phone-OBS[2]	Phone-OBS[2]
0335–0400[4]	.....	.....	7.255	3.945	7.255	3.945	7.255
0400	CW-OBS[1]	.....	CW-OBS[1]	CW-OBS[1]	CW-OBS[1]	CW-OBS[1]	CW-OBS[1]
0420–0500[4]	.....	.....	3.555[6]	7.08	3.945	7.08[6]	3.555
1700–1800	.....	21/28[5]	21/28[5]	21/28[5]	21/28[5]	21/28[5]	.....
1900–2000	.....	14.28	7.255	14.28	7.255	14.28	.....
2000–2100	.....	14.1	14.28	14.095	21/28[5]	7.08	.....
2200–2300	.....	21/28[5]	21.075[6]	21/28[5]	7.255	14.28	.....
2330	.....	.....	.....	RTTY-OBS[3,7]	.....	.....	.....
2330	**Code Practice Daily 10, 13 and 15 w.p.m.**						

[1] C.W.OBS (bulletins, 18 w.p.m.) and code practice on 1.805, 3.555, 7.08, 14.1, 21.075, 28.08, 50.7 and 145.6 MHz.
[2] Phone OBS (bulletins) on 1.82, 3.945, 7.255, 14.28, 21.41, 28.7, 50.7 and 145.6 MHz.
[3] RTTY OBS (bulletins) on 3.625, 7.045, 14.095 and 21.095 and 29.015 MHz. 170/850 cycle shift optional in RTTY general operation.
[4] Starting time approximate. Operating period follows conclusion of bulletin or code practice.
[5] Operation will be on one of the following frequencies: 21.075, 21.1, 21.41, 28.08 or 28.7 MHz.
[6] W1AW will listen in the novice segments for Novices on band indicated before looking for other contacts.
[7] Bulletin sent with 170-cycle shift, repeated with 850-cycle shift.

Maintenance Staff: W1QIS W1WPR.

* All times/days in GMT, general operating frequencies are approximate.

** November *QST* will carry the W1AW fall-winter schedule, which will become effective October 27, 1968.

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 Oct. 16 at 0130 GMT. Identical texts will be sent simultaneously by transmitters on c.w. listed frequencies. The next qualifying run from W6OWP only will be transmitted Oct. 2 at 0400 Greenwich Mean Time on 3590 and 7129 kHz. *CAUTION!* Note that since the dates are given per Greenwich Mean Time, Code Proficiency Qualifying Runs in the United States and Canada actually fall on the evening previous to the date given. *Example*: In converting, 0130 GMT Oct. 16 becomes 2130 EDST Oct. 15. Each month the ARRL Activities Calendar notes the qualifying run dates for W1AW and W6OWP for the coming 3-month period.

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 qualificatioon is for a speed below 35 w.p.m. you may try later for endorsement stickers.

Code practice is sent daily by W1AW at 2330 and 0130 GMT, simultaneously on listed c.w. frequencies. At 0130 GMT Tuesday, Thursday and Saturday, speeds are 15 20 25 30 and 35 w.p.m.; on Monday, Wednesday, Friday and Sundays, speeds are 5 7½ 10 13 20 and 25 w.p.m. For practice purposes, the order of words in each line may be reversed during the 5 through 13 w.p.m. tests. At 2330 GMT daily, *speeds are* 10 13 and 15 w.p.m. The 0130-0220 GMT runs are omitted four times each year, on designated nights when Frequency Measuring Tests are made in this period. To permit improving your fist by sending *in step with W1AW* (but not on the air!) and to allow checking strict accuracy of your copy on certain tapes note the GMT dates and texts to be sent in the 0130-0220 GMT practice on those dates:

Date Subject of Practice Text August *QST*.
Oct. 18: *It Seems to Us*, p. 9
Oct. 22: *A 65-Foot Crank-Up*,* p. 18
Oct. 23: *An FET Preselector For 20, 15 and 10*, p. 42
Oct. 31: *Amateur Radio Public Service Corps*,* p. 57
Date Subject of Practice Text from *Understanding Amateur Radio*, First Edition
Nov. 4: *Frequency Modulation*, p. 92
Nov. 6: *Phase Modulation*, p. 94

* Speeds will be sent in reverse order, highest speed first.

Strays

QST Congratulates . . .

Henry H. Cannon, W4BAC, who received the U.S. Forest Service "Cooperative Forest Fire Control Outstanding Service Award."

Mark Hansen, WNØRXR, a finalist in the National Merit Scholarship Examination.

— • • • —

The recently-organized "Society of Wireless Pioneers" invites those who have held commercial radio operator's licenses and who, at one time or another, made their living handling commercial traffic, to join the organization. The group publishes a newspaper chronicling the news of members, ships and radio gear, both old and modern, and anecdotes and memorabilia of by-gone days. For more information write Frank Geisel, Society of Wireless Pioneers, P.O. Box 530, Santa Rosa, California 95402.

K4GOP—or "How to Succeed in Politics Without Getting Involved"

As most everyone knows, South Florida—and Miami Beach in particular—has become a mecca for conventions. Until this year major political parties had given it the brushoff. Political conventions are held in the summer, and who wants to go to Miami in the summer? It's so HOT! Apparently someone checked the weather reports and discovered that this is another myth. Miami is likely to have fewer days in the 90's than many northern cities! So here we were with the Republican National Convention right in our backyard—what a chance to show off ham radio to people from all over the country!

The idea was born in the shack of W4IYT, Eastern Florida Section Emergency Coordinator. Members of the Dade County ARPSC went for the plan wholeheartedly and started rounding up equipment and potential operators. At the outset, there was some thought of locating the station at one of the Convention hotels, possibly in a small van. There was a slight let-down in morale when the group discovered that one of the broadcasting networks was paying a four figure rental for the kind of space needed for the ham station. Some thirty or forty phone calls later, the "hotel QTH" thinking was abandoned. Fortunately, there are hams in many, many occupations. Thanks to K4ONY of the Miami Beach Police Department, who knew just about all the hams in various businesses in that city, and K4BNZ, a Miami Beach businessman, the station was finally located right on Lincoln Road Mall. With a QTH only a block from the Convention Hall, no automobile traffic to cause ignition noise, maximum exposure to all pedestrian traffic and a three element beam within reasonable coax distance, success was assured—so long as outlets for message traffic held up. Forever reliable W3CUL agreed to be on hand to take the bulk of the traffic load. Eastern Florida RM, W4ILE, alerted the Section Nets. Copies of "standard form" messages with related numbers were distributed to key stations and the station was effectively ready for business.

Special Call Sign

Somewhere along the way there was a discussion of what call to be used. W4LVV, Division Director, had been called on to arrange for a W1AW bulletin about the station and the thought occurred that the call should be indicative of the event. A check of the *Callbook* showed K4GOP to be open for assignment. With fingers crossed, authority for use of the call for a limited period, under the "special event station" paragraph of Part 97, was requested and granted.

K4GOP was in operation Monday through Thursday from about 1800 GMT until 0100 GMT. Since the station was set up on the sidewalk, it had to be dismantled each night. Baron's Slack Bar, which provided the base for the three-element beam as well as the display space for the station signs, again came to the rescue with overnight storage space for the tables, chairs and station accessories.

How many thousands of people who saw an amateur station in operation for the first time is anyone's guess. 847 messages were filed, 468 of which were transmitted through K4GOP. The balance was moved through the operators' home stations during the hours when K4GOP was not in operation. It usually required two to four of the staff to assist the visitors with message writing or to explain just what was going on. It was most difficult to make the visitors believe that there was absolutely no charge for messages—particularly in Miami Beach at Convention time!

The operating staff believes this may have been a "first"—first amateur radio station designated as the "Official Convention Amateur Radio Station" by a major political party!

All of this could not have occurred without the helping hands of many. A K3 visitor filled in at the message desk for two evenings during the "rush period." Some have no doubt been missed but the recorded list shows the following: W4EHW, WA4PWF, WB4RRB, WB4HIS, K4KIC, W4ILE, K4FMA, WA4BAW, K4BNZ, K4TCV, WB4JDG, WB4EIZ, WA4DHU, WA4TWD, WN4JFA, W4IKG, W4YP, K4ONY, W4LVV and W4IYT.

Roughly 250 stations were contacted and a special QSL will be available to these stations upon receipt of their card at Convention, P.O. Box 501, Miami Springs, Fla. 33166.—*W4LVV*

Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

DELAWARE—SCM, John L. Penrod, K3NYG—SEC/PAM: W3DKX. RM: W3EEB. WA3DUM requests that anyone with knowledge of use of s.s.b. in broadcasting write him. WA3DYG has added 2 meters to his many mobile frequencies. WA3GSM is in Columbia, South America, visiting HK3AIR. Ex-K3UON, from the Dover area, is now operating from Florida as W4WVB. W3BDP added state No. 24 to his list on 2 meters. K3NYG vacationed at his Kansas home. W3RDZ reports a very busy summer and hopes to be observing again soon. K3NVV has moved from the Harrington area and will be active soon from a new QTH somewhere in Delaware. DEPN: QN1 59, QTC 11. Traffic: W3DKX 33, WA3GSM 8, WA3DUM 7, K3NYG 4.

EASTERN PENNSYLVANIA—SCM, George S. Van Dyke, Jr., W3HK—SEC: W3AES. RMs: W3EML, K3-MVO, K3YVG, W3MPX. PAMs: K3MYS, K3WAJ. V.H.F. PAM: W3FGQ. OBS reports were received from WA3AFI, WA3EEC, W3CBH, WA3INC, K3RDM and WA3HDI; OVS reports from K3WEU, WA3BJQ, WA3-EEC, WA3HDI and WA3IAZ; OO reports from W3-KEK, K3WEU, W3NNC, K3MYS, W3ID.

Net	*Freq.*	*Operates*		*QNI*	*QTC*	*RM/PAM*
EPA	3610	Daily	6:45 P.M.	269	235	K3YVG
PTTN	3610	Daily	6:00 P.M.		205	W3MPX
PFN	3960	Mon.-Fri.	5:30 P.M.	400	506	K3MYS
EPEPTN	3917	Daily	6:00 P.M.	583	207	K3WAJ
VHF (6)	50.25	Mon.-Fri.	7:00 P.M.			W3FGQ
VHF (2)	145.6	Mon.-Fri.	8:00 P.M.			W3FGQ

W3CUL reports heavy convention traffic. W3VR says he is all set for the winter blows. W3EML went on vacation and nearly forgot the code. WA3INC needs 3 states for WAS. W3MPX is invading the 2-meter band. WA3IUV got his A ticket and a new T4XB. WA3ATQ still is busy with her eye bank and personal assistance type nets. W3HNK adds EP2KB to his growing list of DX. W3CID is back on at a new QTH. WN3JCJ got his big G and is going for the A next. K3WEU is back from Maine and getting ready for the fall season on the Book Review Net. W3AES still is begging for ECs. WA3CFU now is mobile on 6 meters. WA3GUL got a new HW-100. WA3AXU got his 2nd-class commercial ticket at 16 years! K3KXJ got a new Clegg 22er. W3KEK has a new boomless quad operating. WA3EWY is visiting CB clubs and giving instructions to convert to hams. WA3EEC says work is interfering with his hamming. WA3HEU got his CP-15. W3KQE popped up at the bullet factory, Frankford Arsenal, where W3HK works. The fall EPA Dinner Meeting will be held Sat. Oct. 26 at the Towne & Country Supper Club, Scranton, Pa., near Exit 52 on Route 81. Time 7 P.M., donation four (4) pesos. Please let WA3-FCP know of your intentions as early as possible. Traffic: (July) W3CUL 4767, W3VR 843, K3MYS 684, W3EML 564, WA3CTP 329, WA3INC 316, K3NSN 313, WA3AOJ 217, W3MPX 138, WA3IUV 113, WA3ATQ 100, W3KJJ 86, K3YVG 86, W3HNK 75, W3CID/3 58, K3-WAJ 57, W3HK 54, WA3AFI 50, WN3JCJ 41, W3AIZ 39,WA3HIT 36, W3KQE 36, W3CBH 35, W3FPC 35, WA3HDI 33, K3WEU 26, K3MDG 20, K3FOB 16, W3-NNL 15, W3VAP 15, W3AES 10, WA3CFU 8, WA3EEC 8, WA3IOB 8, W3OML 7, WA3HEU 5, WN3JRD 3, K3KXJ 2, W3OY 2, W3ADE 1, WA3AIZ 1, WA3BJQ 1, WA3BSV 1, W3EU 1, WA3EWY 1, W3FAF 1, W3ID 1, W3KEK 1, K3NPC 1, W3YPF 1. (June) K3WAJ 138, WA3EEC 34, WA3EXB 17, W3NNL 12. (May) WA3AOJ 134.

MARYLAND-DISTRICT OF COLUMBIA—SCM, Carl E. Andersen, K3JYZ—SEC: W3LDD.

Net	*Freq.*	*Time*	*Days*	*Sess.*	*QTC*	*QNI Ave.*	*Mgr.*
MDD	3643	2300Z	Daily	31	278	13.8	WA3HTQ, RM
MDDS	3643	0030Z	Daily	31	73	8.9	W3CBG, RM
MDCTN	3920	2200Z	S-T-T-S	17	43	11.8	W3SRC, PAM
MEPN	3920	2200Z	M-W-F	22	49		K3IAG
		1700Z	S-S				
MTMTN	145.206	0100Z	M thru S	22	12	8.8	W3IFW
CVTN	145.620	0200Z	Th.-Sa.	6	45	4.7	WA3CFK

W3OBC, of Baltimore, became a Silent Key July 19 because of a plane crash in N.Y. New appointees: WA3IRQ as ORS. Endorsed appointments: W3GN as OVS and OO, Class I; K3LFN as OPS. W3TN and WA3IYS earned BPL certificates via the originations and deliveries route in July. W3FA has the holes dug for planting antenna towers. W3GRF has mounted a small 10-meter beam (ten elements) 150 feet in the air. A Section Traffic Men's Picnic was held at Patapsco State Park with members of MDD, MDDS and MDCTN in attendance. The common theme was traffic and how the phone and c.w. nets can work together to get traffic delivered promptly. A new liaison system was worked out between the managers of the three nets. Each of the three managers took their turn in the barrel to make comments and answer questions. The low-light of the picnic was a taped replay of MDD in operation. The Anne Arundel County AREC drill must have been a success, as W3LQY reported handling 24 messages during the drill. W3GEB and WA3IRQ have found the droop-in dipole antenna a real signal booster. WA3GAU stepped up to Extra Class only 732 days after getting his General Class. WA3HEN reports handling 54 messages in 3 hours in the AA County AREC drill. W3DPJ has a new R-4B and T-4XB. WA3JBY defeated Murphy and now has his keyer working. Good luck to WN3KQV on his try for General Class. K3LFD reports the addition of SP-600 and HA500 receivers. K3FQF has overcome school and a new XYL and has returned to the traffic nets. The Springbrook High ARC has a new station call, WA3-KOQ. WA3DYW has departed the MDC area for California as WB6OJG. W3ZNW is traveling through W7- and W6-Land on an Aug. vacation. WA3IRQ is a new Advanced Class licensee. W3GKP is so QRL with his 2304.000-Mc. operation that he hardly has time to report activities. W3LDD reports W3SNC as another Silent Key. Traffic: (July) WA3IYS 227, W3TN 189, WA3HTQ 149, WA3CFK 101, W3ATQ 86, W3CBG 86, K3GZK 61, WA3JBY 57, WA3HEN 54, K3FQF 46, W3PRC 30, WA3ERL 29, WA3IRQ 26, W3LQY 24, K3-JYZ 21, K3LFD 21, W3GEB 16, W3FA 13, K3LFN 13, W3ECP 10, K3QDC 10, WØUCE/3 7, WA3DYW 5, WA3IAQ 1, W4TFX/3 1. (June) W3ZNW 22, WA3IAQ 17, K3LFN 16, W3FA 11.

SOUTHERN NEW JERSEY—SCM, Edward G. Raser, W2ZI—Asst. SCM: Charles E. Travers, W2YPZ. SEC: W2LVW. RMs: WA2KIP, WA2BLV. PAM and NJPN Net Mgr.: W2ZI. NJN reports a total of 354 messages with a QNI of 427. NJPN reports 137 traffic

(*Continued on page 117*)

ARE YOU LICENSED?

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

EIMAC zeroed in on some grid problems so you can get higher power gain.

Want up to 20 times power gain in a cathode driven circuit? Try one of the tubes in our complete zero-bias power triode line. While you're solving problems, throw out the bias power supply. Forget some of the associated circuitry. And don't worry about destroying the tubes if you lose grid voltage. They don't need any.

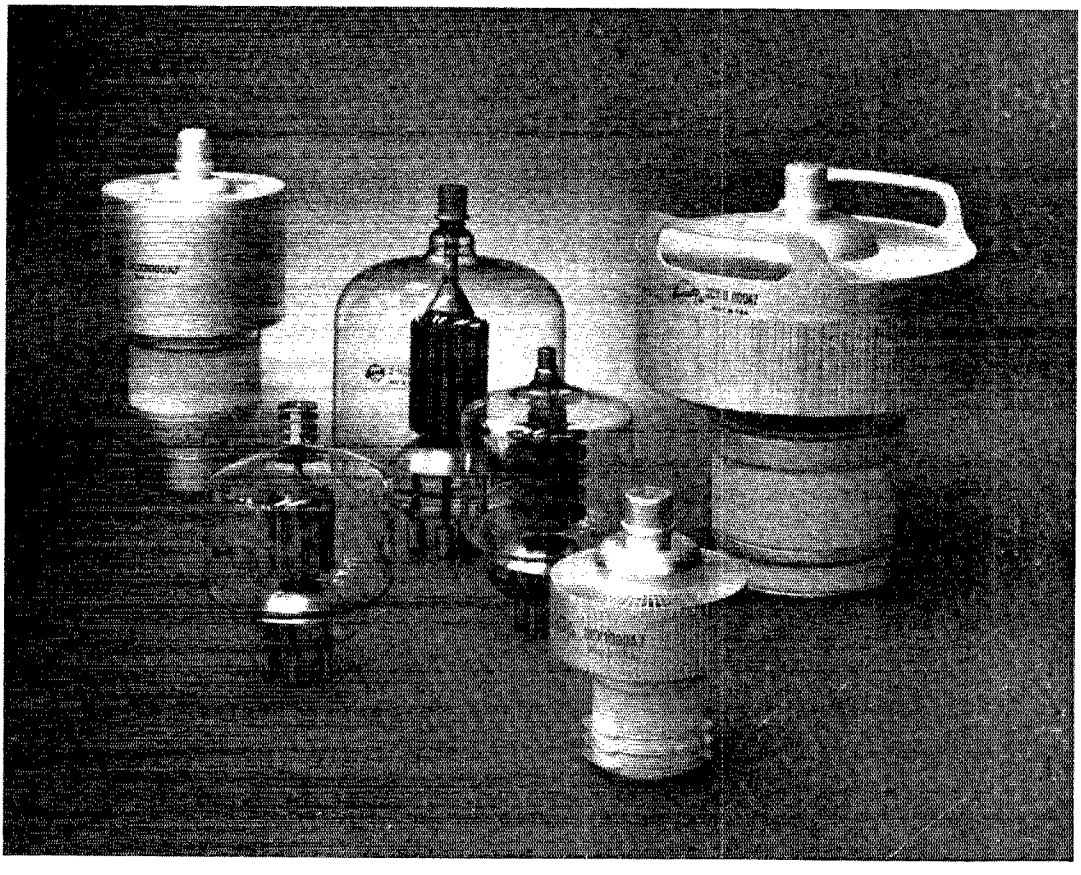
These triodes are designed for use as Class B or C amplifiers in audio or radio-frequency applications. We've got zero-bias triodes ranging from 400 watts to 10,000 watts—the most complete range of zero-bias triodes available.

For more information on EIMAC's line of zero-bias power triodes, write Amateur Services Department, or contact your nearest EIMAC distributor.

TYPICAL OPERATION
CLASS B RF LINEAR POWER AMPLIFIER, GROUNDED GRID

	GLASS			CERAMIC		
	3-400Z	3-500Z	3-1000Z	3CX1000A7	3CX3000A7	3CX10000A7
Plate Voltage, Vdc	3000	3000	3500	2500	5000	7000
Max Signal Plate Current, A	0.333	0.333	0.75	0.800	1.56	5.0
Drive Power, W	32	35	85	60	215	1540
Output Power, W	655	644	1770	1170	5500	24,200
Filament Voltage, V	5.0	5.0	5.	5.0	7.5	7.5
Filament Current, A	14.5	14.5	21.5 23.0	28/33	51	94/104

EIMAC
Division of Varian
San Carlos, California 94070



EIMAC new 3-500Z offers high power gain, less circuitry.

EIMAC's new 3-500Z is a compact, heavy-duty power triode with 500 W plate dissipation, designed for operation in zero-bias Class B r-f or audio amplifiers. The tube can be used as a cathode driven (grounded grid) linear amplifier where low distortion, high plate dissipation, and great thermal anode reserve are desired. The 3-500Z may be operated at plate potentials up to 3000 Vdc, and eliminates expensive, bulky screen and bias supplies. The 3-500Z will replace EIMAC's 3-400Z where additional plate dissipation or greater reserve is desired. Forced-air requirement is approximately equal to that of the 3-400Z, and a blower capacity of only 13 cfm at a back pressure of 0.2 inch is satisfactory for a single tube. The 3-500Z's zero-single plate current is somewhat higher than that of the 3-400Z. When used as a replacement for the latter tube, the 3-500Z's zero-signal plate current can be reduced by addition of a simple zener diode in the cathode return. This technique is particularly suggested if plate potentials over 3000 Vdc are contemplated, or if the tube is used in equipment that is power supply limited.

3-500Z TYPICAL OPERATION*
(Minimum Distortion Products at 1 kW PEP Input)

DC Plate Voltage	2500 V
Zero-Sig DC Plate Current**	130 mA
Single-Tone DC Plate Current	400 mA
Single-Tone DC Grid Current	120 mA
Two-Tone DC Plate Current	280 mA
Two-Tone DC Grid Current	70 mA
Peak Envelope Useful Output Power	500 W
Resonant Load Impedance	3450 ohms
Intermodulation Distortion Products	−33 dB

*Measured data from a single tube
**Approximate

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San Carlos, California 94070

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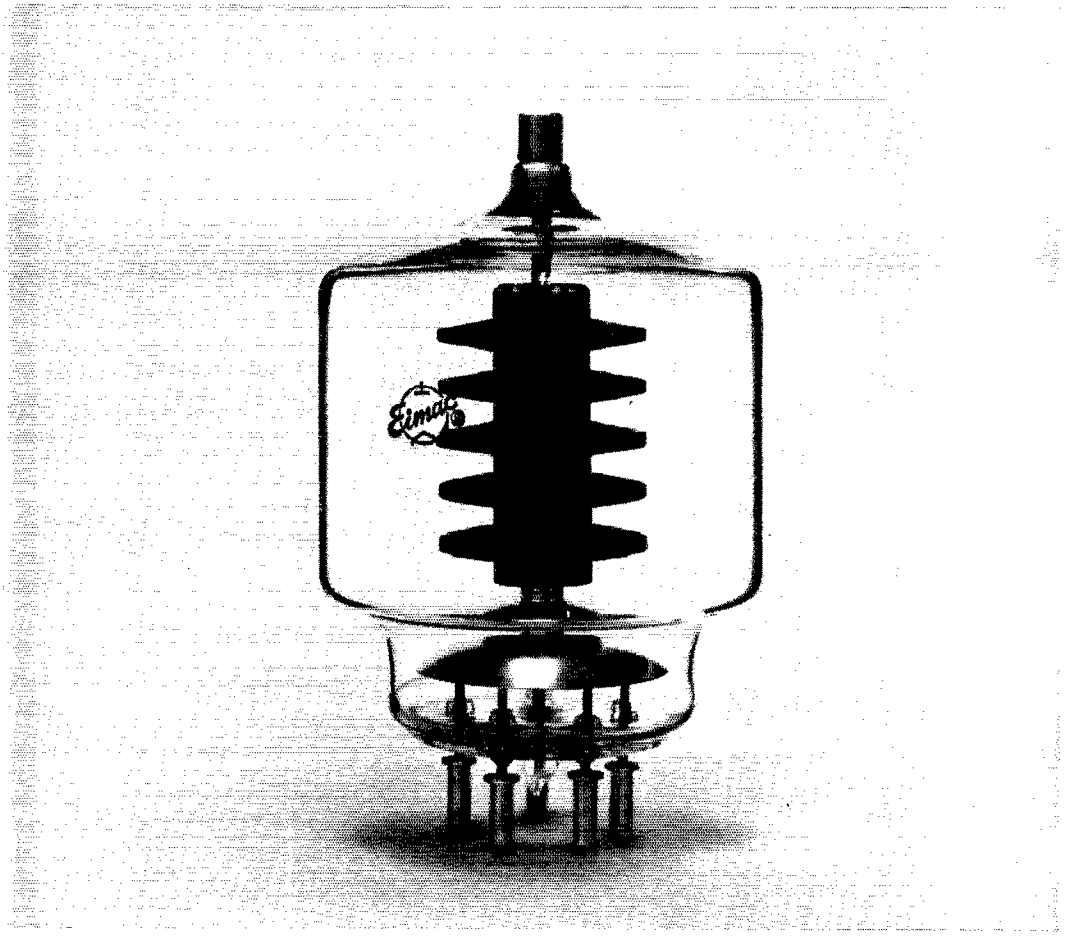
For additional information, write Amateur Services Department or contact your nearest EIMAC distributor.



and 448 QNI. Call letter license plates became a reality in New Jersey effective July 1. Send for application to Courtesy Plate Unit, Motor Vehicle Dept., 427 North Montgomery St., Trenton. WB2CHO was elected pres. of the Princeton U. Radio Club, W2PU. Dave Tyon is secy. W2FK was in the hospital with a heart attack. WB2VEJ is a new OPS, 81 years young and a crack operator. W2ZHN received his Extra Class ticket. K2BG resigned from ARRL after many years. The DVRA held its Annual Picnic July 17. W2IU was heard on NJN, at last! The SJRA Annual Picnic will be held at Molia Farms Sept. 8, rain date Sept. 22. W2VX is chairman. W2ORS has a new SB-301. WA2GAA is interested in AREC. W2PU was high man in the April CD Party, with W2ZVW tops on phone. WB2MRD graduated from college. W2CUC, secy. of the Burlington Co. RC, is doing a good job on the Intruder Watch. Congrats to Dave, of W2PU, who was married July 20. WB2FJE is working all bands with a home-brew 813 linear. WB2MNF will enter Lehigh U. this fall. The West Jersey Radio Amateurs is a new repeater on the air. WN2CIF is now WA2CIF. WN2CHY took the Tech. Class exam. W2ZI made a trip aboard WMDT, S.S. *Brasil* to ports in Iceland, North Cape (450 miles above the Arctic Circle) Norway, Sweden, Denmark, Finland, Germany, Holland Russia. Traffic: WA2BLV 280, WB2UVB 155, W2PU 86, WA2KIP 67, W2YPZ 58, WB2BGH 55, W2ZI 46, WB2VEJ 39, WA2-ANL 24, W2ORS 21, W2IU 16, K2SHE 15, WB2SFX 9, WB2MRD 8, WA2HJF 7, K2MBW 5, W3FK 4, WB2-MNF 2.

WESTERN NEW YORK—SCM, Richard M. Pitzer-use, K2KTK—SEC: W2RUF. PAM: W2PVI. RMs: W2MTA, W2RUF, K2KIR, W2FR. NYS C.W. Net meets on 3675 kc. at 7 P.M. local time; ESS on 3590 kc. at 6 P.M. local; NYSPTEN on 3925 kc. at 2200 GMT; NYS C.D. on 3510.5 and 3993 kc. at 0900 Sun. and 3510 kc. at 1930 Wed.; TCPN 2nd Call Area on 3970 kc. at 0045 and 2345 GMT on Mon. Thanks from all of W.N.Y. certainly goes out to K2HUK, who served as SCM for six terms. Chuck did an exceptional job during that time. The W.N.Y. column did not appear last month because of the transfer of materials from Chuck to me. Our congratulations go to K2SJN, the new SCM of E.N.Y. WB2RHF, recuperating from 2 weeks in the hospital, wishes to thank all who sent cards. K2TXB is working on a remote control v.h.f. station to help him work out of his valley. W2FR reports 2RN operating successfully on its new time schedule. WA2AEZ is active on RTTY. The GASSERS Net had 55 hams attend its picnic. WB2OYE reports that he is settled in his new QTH. The Ithaca crew is waiting for FCC action before going ahead with its repeater plans. Congrats to WB2FPG on his Advanced Class license. W2CFP attended the ARRL National Convention in San Antonio. WA2PZD is the new pres. of the RIT Amateur Radio Association, with WB2PNN the new secy. K2EE is 85 years young and back on the air from a no-antenna apartment. W2RKI has built a new SB-200. The Glens Falls Area AREC Net elected WB2PBP net mgr. and WB2YMY asst. net. mgr. WB2-ZTP is a new Warren County Asst. EC. W2AFB has been touring England and Ireland. K2BKU also just returned from a European tour. K2KIR, mgr. of EAN, and W2FR, mgr. of 2RN, have been appointed RMs. Congratulations to W2OE on making the BPL in May, June and July. Traffic: (July) W2OE 325, W2FR 269, WB2OYE 217, WB2SMD 199, W2RUF 198, W2QC 178, W2MTA 136, WA2CAL 102, W2FEB 101, K2DNN 50, W2HYM 45, K2KIR 45, W2AFB 25, K2OFV 19, WA2-ANE 17, K2IMI 15, WB2RWR 13, W2PVI 9, W2PNW 8, WA2GLA 4, WB2NNA 2. (June) W2FR 402, W2MTA 345, W2OE 338, WB2OYE 224, W2QC 212, WB2SMD 128, W2FEB 81, WB2YUT 80, W2HYM 67, W2RUF 61, WB2VND 59, WB2RHF 29, K2OFV 22, K2IMI 17, WA2ANE 16, W2PVI 12, WA2VFX 10, W2PZL 8, W2-PNW 6, K2DNN 5, WB2RWR 3, W2BLO 2, WB2NZA 2, K2TXB 2. (May) W2OE 306.

WESTERN PENNSYLVANIA—SCM, Robert E. Gawryla, W3NEM—SEC: W3KPJ. PAM: K3VPI (v.h.f.). RMs: W3KUN, W3MFB, W3UHN, K3SOH. Traffic nets: WPA, 3585 kc. daily at 7 P.M. local time. KSSN, 3585 kc. Mon. through Fri. at 6:30 P.M. local time. K3AHT finally broke the 200K barrier during the July C.W. CD Party. He ran up 203K in 16½ hours at K3HKK. The following week K3AKR managed to run up 61K in the July Phone CD Party, also from the facilities of K3HKK. The Two Rivers ARC reports via the *Spark Gap* that WA3IMV is a new Advanced Class licensee; WA3HQM, WA3HMV, WA3FLB and WA3HAE operated portable from WA3PIC, Boy Scout Camp, Aliquippa, near Champion, Pa., during the summer. K3RZE has transferred back to Eastern Pennsylvania after two years of operating as a W. Pa. ORS from Altoona. W3KNQ finally made the change and is now W3SN. A reminder to all club stations: After November 22, 1968, all members of the club are limited to the operation of the club station at the class of license held by club station trustee plus your own license limitations. Tell your trustees to up-date their classifications so full capabilities may be realized. News and traffic hit a hot summer low during July. Traffic: (July) W3NEM 169, WA3IPU 124, W3KUN 107, W3LOS 65, WA3AKH 63, K3HKK 59 (W2KAT/3, K3AHT/3, W3-NEM ops.), K3SOH 50, W3KPJ 30, WA3HSI 25, K3ASI 20, K3SMB 12, W2KAT/3 7, W3KNQ (W3SN) 6, K3SJN 6, W3YA 6, W3GJY 4, W3LOD 2, K3RZE 1. (June) WA3BLE 66, K3SMB 9.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—SEC: W9RYU. RM: WA9OTD. PAMs: WA9CCP and WA9RLA (v.h.f.). Cook County EC: W9HPG. Net reports:

Net	*Freq.*	*Times*	*Days*	*Tfc.*
IEN	3940 kc.	1400Z	Sun.	7
ILN	3760 kc.	0000Z	Daily	238
NCPN	3915 kc.	1200Z	Mon.-Sat.	340
NCPN	3915 kc.	1700Z	Mon.-Sat.	
Ill. PON	3915 kc.	1615 CDT	Mon.-Fri.	700
Ill. PON	3915 kc.	1645 CDT	Mon.-Fri.	
Ill. PON	3915 kc.	0830 LDT	Sun.	
Ill. PON	145.5 Mc.	0200Z	MWF	0

New Novices heard on the band are WN9YLE, WN9-YXZ, WN9YZN, WN9ZBJ, WN9ZDM and WN9ZGN. WA9ZEZ is a new call on 2 meters from Palos Heights. WA9WLM is a new Technician Class licensee. W9NAG and W9BLB are the new pres. and secy. of the Illinois Emergency Net. WA9OTD has been appointed RM of the Illinois section, succeeding retiring RM W9EVJ. Thanks, Lloyd, for a job well done and hope to see you on the bands from time to time. The Hamfesters (Chicago) held its 34th hamfest Sun., Aug. 11, at Santa Fe Park with the usual fine attendance and with many an eyeball QSO. WA9WPF has temporarily QRT since he was inducted into the Armed Forces. WA9TCW has the new Drake R-4B, T-4XB, MS-4 and AC-4. WA9-QZE also is using new Drake R-4B and MS-4. WA9-WNH passed the Advanced Class exam. K9KZB reports that the North American Net had a traffic count of 275 during July. W9LNQ is now the proud grandfather of his 6th grandson. K9IFE suffered a heart attack on July 6 but says that he is feeling fine and will be back on the airways with limited activity. WA9FZR had his equipment stolen from his car while vacationing. The Six Meter Club of Chicago, Inc., held its Annual Picnic Aug. 4 and a good time was had by all attending. The Chicago Area Two-Meter Nightly Traffic Net had a traffic count of 163, as reported by K9-BAO. K9RZP has a new HW-100 on s.s.b. WA9CNV and WA9MHU are BPL certificate recipients for traffic handled in July. Traffic: (July) WA9CNV 1841, WA9-MHU 569, K9KZB 289, WA9OTD 267, W9EVJ 173, K9AUD 167, W9NXG 163, W9HOT 115, WA9TUM/WA9VYO 89, W9DOQ 79, WA9TUN 69, WA9WNH 59, W9LDU 46, W9JXV 43, K9FRZ 41, WA9QVU 36, WA9-LDC 28, W9PRN 12, WA9SPA 12, K9HSK 9, K9TXJ 9, W9LNQ 6, WA9VLK 6, K9HRC 5, W9IDY 1, WA9-POZ 1. (June) WA9POZ 1.

INDIANA—SCM, William C. Johnson, W9BUQ—Asst. SCM: Mrs. M. Roberta Kroulik, K9IVG. SEC: WA9-KWH.

Net	*Freq.*	*Time*	*Tfc.*	*Mgr.*
IFN	3910	1330Z Daily 2300Z M-F	249	K9IVG
ISN	3910	0000Z M-F 2300Z Sat.-Sun. 2130Z M-S	484	K9CRS
QIN	3656	0000Z Daily	186	W9HRY
IPON	3910	1250Z Sun.	75	K9EFY
IPON VHF	50.7	0200Z Mon.-Thurs.		WA9NLE
Indiana V.H.F. Nets			32	W9PMT

All V.H.F. nets should report traffic to W9PMT, 1225 Wall St., Fort Wayne, Ind. 46804. Lake County ARC's new officers are K9KFM, pres.; K9ULU, vice-pres.; WA9RMT, secy.; WA9PZY, treas.; WA9SSV, editor. W9EGQ has ordered a new keyer. WA9RMT has a new jr. operator. K9LPZ has 42 states on 6-meter phone. New officers of the Purdue ARC, W9YB, are WA9FGT, pres.; W9JXT, vice-pres.; WN9VZQ, treas. W9YB would like to receive some QSL cards. The club has a new SR-150. W9HRY QIN 100% both May and June. W9HRY and W9QLW headed up the traffic program at

(*Continued on page 120*)

Some Hams Still Prefer A Separate Receiver

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The HEATHKIT® SB-301 amateur band receiver

Performance-Plus Features, Top Dollar Value And Sophisticated, Quality Engineering Have Made The SB-301 The World's Largest Selling Receiver

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• RTTY position on mode switch — SB-301 is a fully capable RTTY receiver • 15 to 15.3 MHz coverage for WWV reception • Built-in 100 kHz crystal calibrator • Built-in switch selected ANL — a real help if your QTH is in a high noise location • Front panel switching for control of optional 6 and 2 meter plug-in converters — enables complete 80 through 2 meter amateur band coverage • Front panel switch selection of optional AM and CW crystal filters • Circuit board, wiring harness construction make assembly fast and simple

Kit SB-301, Amateur Band Receiver, less speaker, 23 lbs.....**$260.00**
SBA-301-1, Optional AM crystal filter (3.75 kHz), 1 lb. **$20.95**
SBA-301-2, Optional CW crystal filter (400 Hz), 1 lb...**$20.95**
Kit SBA-300-3, 6-Meter Plug-in Converter, 2 lbs.....**$19.95**
Kit SBA-300-4, 2-Meter Plug-in Converter, 2 lbs.....**$19.95**
Kit SB-600, Communications Speaker, 5 lbs.....**$18.95**

Look over the specs and find out why thousands of hams have chosen the SB-301 for their shack!

SB-301 PARTIAL SPECIFICATIONS — Frequency range (megahertz): 3.5 to 4.0, 7.0 to 7.5, 14.0 to 14.5, 15.0 to 15.3, 21.0 to 21.5, 28.0 to 28.5, 28.5 to 29.0, 29.0 to 29.5, 29.5 to 30. **Intermediate frequency:** 3.395 megahertz. **Frequency stability:** Less than 100 Hz per hour after 20 min. warmup under normal ambient conditions. Less than 100 Hz for ±10% line voltage variation. **Visual dial accuracy:** Within 200 Hz on all bands. **Electric dial accuracy:** Within 400 Hz on all bands after calibration at nearest 100 kHz point. **Backlash:** No more than 50 Hz. **Sensitivity:** Less than 0.3 microvolt for 10 db signal-plus-noise to noise ratio for SSB operation. **Modes of operation:** Switch selected; LSB, USB, CW, AM, RTTY. **Selectivity:** RTTY; 2.1 kHz at 6 db down, 5.0 kHz at 60 db down (crystal filter supplied). SSB; 2.1 kHz at 6 db down, 5.0 kHz at 60 db down (crystal filter supplied). AM; 3.75 kHz at 6 db down, 10 kHz at 60 db down (crystal filter available as accessory). CW; 400 Hz at 6 db down, 2.0 kHz at 60 db down (crystal filter available as accessory). **Spurious response:** Image and IF rejection better than 50 db. Internal spurious signals below equivalent antenna input of 1 microvolt. **Audio response:** SSB; 350 to 2450 Hz nominal at 6 db. AM; 200 to 3500 Hz nominal at 6 db. CW; 800 to 1200 Hz nominal at 6 db. **Audio output impedance:** Unbalanced nominal 8 ohm speaker and high impedance headphone. **Audio output power:** ½ watt with less than 8% distortion. **Antenna input impedance:** 50 ohms nominal. **Muting:** Open external ground at Mute socket. **Crystal calibrator:** 100 kHz crystal. **Power supply:** Transformer operated with silicon diode rectifiers. **Power requirements:** 120/240 V AC, 50/60 Hz, 50 watts. **Dimensions:** 14⅞" W x 6⅝" H x 13⅜" D.

The HEATHKIT® SB-401 5-Band SSB Transmitter

Imaginative Engineering and Rugged, Reliable Performance Capabilities Have Made The SB-401 The World's Largest Selling Transmitter

• Ideal power level for barefoot operation — 180 watts PEP SSB, 170 watts CW • Makes a perfect driver for any linear, like the SB-200 • Built-in power supply and small, compact size make it an excellent self-contained desk top transmitter • Famous Heath pre-built & aligned LMO for rock solid frequency control — less than 100 Hz drift per hour after warm-up • ALC for more talk power means better DXing through QRM • Crystal filter sideband generation • Built-in antenna change-over relay • Operates upper or lower sideband • VOX and PTT control • 1 kHz dial calibration — 100 kHz per dial revolution • 500 kHz per band switch position • Maximum TVI protection from completely shielded and isolated circuits • Relative power meter • Clean signal characteristics — carrier and unwanted sideband suppression of 55 dB

The Versatility You Need For DXing, Round Tables, Nets Or Rag-Chews

• Just a flick of a switch to select transceive or independent operation of the SB-401 and SB-301 (or SB-300) combination — no troublesome, time consuming cable changing . . . ideal for cross band work • Can be operated as an independent transmitter with any receiver when the SBA-401-1 crystal group is installed • Fast, clean break-in CW keying • Meter checks grid current, final plate current, ALC maximum modulation, final plate voltage and relative power, all at the flick of a switch.

Kit SB-401, 34 lbs.....**$285.00**
SBA-401-1, Crystal Pack, 1 lb.....**$29.95**

Check the specs and see the many reasons why you hear the SB-401 on the air more often than any other transmitter!

SB-401 SPECIFICATIONS — Emission: SSB (upper or lower sideband) and CW. **Power input:** 170 watts CW, 180 watts P.E.P. SSB. **Power output:** 100 watts (80-15 meters), 80 watts (10 meters). **Output impedance:** 50 to 75 ohm — less than 2:1 SWR. **Frequency range:** (MHz) 3.5 — 4.0; 7.0 — 7.5; 14.0 — 14.5; 21.0 — 21.5; 28.0 — 28.5; 28.5 — 29.0; 29.0 — 29.5; 29.5 — 30.0. **Frequency stability:** Less than 100 Hz per hr. after 20 min. warmup. **Carrier suppression:** 55 db below peak output. **Unwanted sideband suppression:** 55 db @ 1 kHz. **Intermodulation distortion:** 30 db below peak output (two-tone test). **Keying characteristics:** Break-in CW provided by operating VOX from a keyed tone (Grid block keying). **CW sidetone:** 1000 Hz. **ALC characteristics:** 10 db or greater @ 0.2 ma final grid current. **Noise level:** 40 db below rated carrier. **Visual dial accuracy:** Within 200 Hz (all bands). **Electrical dial accuracy:** Within 400 Hz after calibration at nearest 100 kHz point (all bands). **Backlash:** Less than 50 Hz. **Oscillator feedthrough or mixer products:** 55 db below rated output (except 3910 kHz crossover which is 45 db). **Harmonic radiation:** 35 db below rated output. **Audio input:** High impedance microphone. **Audio frequency response:** 350-2450 Hz ±3 db. **Power requirements:** 80 watts STBY, 260 watts key down @ 120/240 V AC, 50/60 Hz. **Dimensions:** 14⅞" W x 6⅝" H x 13⅜" D.

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Springfield. WA9MTY has been handling both phone and c.w. traffic. The Outstanding Amateur Award went to W9JBQ, of Jeffersonville. K9HYV reports a 6-meter AREC net for La Porte County. The Central Division Convention at Springfield was very good. The ARRL officials present were WØDX, pres.; W1LVQ, secy. & Gen. Mgr.; W1CP, ARRL Staff; W2TUK, Hudson Division Director; W3YA, Atlantic Division Director; W9HPG, Central Division Director; W9PRN, Central Division Vice-Dir.; W6KW, Southwestern Division Director. QIN Honor Roll: W9BDP 30, W9QLW 26, K9-VHY 26, WA9FDQ 25, WA9MXG 24, WA9MTY 24, K9HYV 17, WA9KAG 16, W9UQP 16, K9FZU has a TA-33 up and is running a new Drake line. K9IVG is in the hospital, and the IFN net report will be partial. Endorsements due in Oct.: PAM W9PMT; ORSs W9-BPP, WA9FDS, W9PMT; OPSs WA9FDQ, W9PMT, K9DHN, WA9VDC, WA9RBQ/9, W9YYX; OVS WA9-QMW. W9ILU, mgr. of the Great Lakes Emergency Net, reports May traffic as 68, June traffic as 96. W9-PMT, mgr. of the Hoosier v.h.f. nets, reports July traffic as 32. *Amateur Radio exists because of the service it renders.* Traffic: (July) WA9LTI-WA9MTY 275, W9MM 201, W9HRY 186, WA9MXG 157, K9HYV 89, W9BUQ 79, K9QVT 72, W9PMT 71, K9CRS 67, W9-UEM 50, K9KYB 46, K9RWQ 35, K9CBY 33, WA9-MFY 26, K9JQY 25, W9EQO 24, W9CMT 23, K9VHY 22, K9HZY 19, WA9BHG 18, WA9KYG 18, W9YYX 18, WA9VZM 16, W9SNQ 15, W9DOK 13, K9ILK 13, K9-EFT 12, W9CUC 9, W9FJI 9, K9WGN 9, W9FWH 8, WA9ITB 8, WA9IPS 7, WA9WAE 7, WA9AXF 6, WA9-BDP 6, W9DGA 4, WA9AUM 3, W9AQW 1. (June) K9FZX 511, WA9FDQ 200, K9QVT 32, WA9ITB 30, W9QUH 11.

WISCONSIN—SCM, Kenneth A. Ebneter, K9GSC—SEC: W9NGT. PAMs: W9NRP, WA9QNI, WA9IZK and K9DBR. RMs: K9KSA, W9CBE and W9DND.

Net	*Freq.*	*Time*	*Days*	*QNI*	*QTC*	*Mgr.*
BWN	3985 kc.	1200Z	Mon.-Sat.	404	229	W9NRP
BEN	3985 kc.	1700Z	Daily	671	117	
WSBN	3985 kc.	2200Z	Daily	1254	376	WA9QNI
WIN	3662 kc.	0015Z	Daily	224	90	W9DND
WSSN	3780 kc.	2330Z	Daily	140	22	K9KSA
WRN	3625 kc.	0030Z	Sun.			W9CBE
SWRN	50.4 Mc.	0200Z	Mon.-Sat.			K9DBR
SW2RN	145.35 Mc.	0130Z	Daily	247	33	WA9LZK

Net certificates went to: WA9TXT for WIN; WA9-UMT, WA9VIV, and WA9NZB for WSBN; WA9UMT and WA9FFV for BWN; WA9UMT for BEN. New appointments: WA9WOC and K9KSA as ORSs. Renewed appointments: K9FPM as OVS; K9GSC as OO; WA9GJU as OBS; WA9QNI as PAM; K9GSC, K9-ZMS, W9CXY and WA9MIO as ORSs; W9NRP, WA9-QNI and WA9MIO as OPSs; W9ULM, K9OSK, K9FHI, W9BCH and WA9LIJ as ECs. Winners of the Wisconsin QSO Party: WA9GJU-phone, W9NUW-c.w. and WA9PKM-v.h.f. WA9AQE passed the Extra Class exam. WA9VCK and WA9WMW just received their General Class tickets at the ages of 11 and 12. K9IHN has moved to Beloit. WA9NBU has a new HW-12 mobile. WA9VNJ reports his QSL card won first prize at the Belgium Hamfest. BPL for July traffic went to WA9QKP, WA9QNI and W9ESJ. Traffic: (July) WA9-QKP 578, WA9QNI 360, W9CXY 223, W9ESJ 207, K9CPM 182, WA9UMT 130, W9DND 116, W9DYG 103, WA9RAK 101, K9FHI 47, K9JPS 47, W9AYK 46, W9PKM 45, W9NRP 43, K9TBY 37, K9KSA 34, WA9NDV 32, W9GXU 31, WA9NBU 24, K9DHN 23, WA9EAN 21, K9GSC 21, WA9OFF 20, W9AOW 19, W9BCH 19, W9DM 19, W9IRZ 8, WA9TXN 8, WA9LRW 7, W9CBE 2. (June) K9LGU 22, WA9LRW 7, WA9VNJ 7. (May) WA9LRW 23.

DAKOTA DIVISION

MINNESOTA—SCM, Herman R. Kopischke, Jr., WØTCK—SEC: WAØIEF. RMs: KØORK, WAØEPX. PAMs: WAØMMV, WAØHRM. MSN meets daily on 3685 kc. at 2330Z. MJN meets Tue.-Sun. on 3685 kc. at 0000Z. Noon MSPN meets Mon.-Sat. on 3945 kc. at 1705Z. Sun. and holidays at 1400Z. Evening MSPN meets daily on 3945 kc. at 2315Z. Congrats to WAØ-UNS, newly appointed EC for Yellow Medicine Co. KØFLT renewed his OPS appointment. It is with deep regret we report the passing of WAØIYM on July 18. WAØDOT has acquired an Apache and an SB-10. WAØKFJ will be operating WA9RYN from Wisconsin State University until May '69. KØSNC has moved from Duluth to Chicago. WØDFT has gone mobile with an HW-12A. The annual Piconet Picnic at Rochester was attended by 103 amateurs and their families. The Piconet Handi-ham System, which was organized to assist handicapped people to get an amateur license and then help them get on the air, recently held a successful "white elephant sale" to raise funds for equipment. Traffic: WAØOEJ 280, KØZRD 103, WAØMMV 61, KØZBI 57, WAØEPX 54, WØBUC 47, KØORK 42, WØUMX 38, WØTCK 36, WAØHRM 33, KØZXE 29, WØBE 20, WAØODB 18, WØFDK 16, WØATO 15, WØAZR 15, WAØSEN 13, WAØNQH 12, WØHEN 11, WØKLG 10, WØBUO 9, WAØDOT 9, KØFLT 9, WAØSSN 9, WØFHO 8, WØKNR 8, WAØJPR 6, WAØPMM 6, WA9YRN 5, KØZWG 4, WAØDFT 2.

NORTH DAKOTA—SCM, Harold L. Sheets, WØDM—SEC: WAØAYL. OBS: KØSPH. PAM: WØCAQ. RM: WAØOEL. The International Hamfest held July 20-21 was well attended with 125 registrations. The Brandon Radio Club sponsored the social gathering and dancing on Sat. evening. WAØKRI and KØRSA are co-chairmen for next year's to be held July 12-13 on the Canadian side. K7BAG and XYL K7KHU read of the hamfest in *QST* and came from Washington to be there. Also W6UKR was the guest of WAØTBR for the event. KØOVE won the mobile installation prize and also won the hidden transmitter hunt. WØGB and XYL WAØGRX spent five days camping at the Gardens and worked mobile while there. WAØSDQ has gone mobile with an NCX-3. WAØAYA is grandpa again, while WØAYJ acquired a new son July 5. WA7GVT/Ø will be in Texas during the school year with an SB-101 on all bands. WAØBIT recently was married. WØBHT is busy as the new pastor at Rolla. WAØTBR took a 3-week trip in Aug. while KØSPH makes it out to the lake quite often. WØZRT, the Bismarck Club station, is active again. WØGNS has returned from an electronics training school in Texas. W9QNL/Ø has been transferred to the Kansas City area. KØOVE and XYL WAØPPK have transferred to El Centro, Calif. Be looking for them on 20 meters. WØEUQ did a bit of trading and came up with a Viking 500 and a tower and then added a new HW-12A. WØMQA is on with a Twoer now. WØDM spent a month in Oregon visiting with his family and W7NQI in Eugene as well as other ham friends. WNØUSU is a new call in Grand Forks. Three new Conditionals have been added. WAØTXZ. WAØTYA and WAØRWB. WAØOVW rebuilt the quad and is DXing again. N.D. RACES Net reports 19 sessions, 398 stations, 54 traffic. NCSs, KØSPH, WØGFE, WØHJU, KØPZK. Traffic: KØSPH 29, WAØHUD 19, WAØJPT 8, WØDM 6, WAØTBR 6.

SOUTH DAKOTA—SCM, Seward P. Holt, KØTXW—SEC: WAØCPX. RM: WØIPF. PAM: WAØCWW. A well-deserved award goes to KØVYY as "Ham of the Month." Section Net certificates have been earned by 85 net members in the c.w. and phone nets of our section. Your continued participation through the summer is appreciated by the net managers. The emergency test conducted by your SEC with the aid of the ECs and NCS made a very good showing with 114 stations participating from all parts of the section, many with auxilliary or mobile stations. WØAEN has our sympathy on his recent bereavement. Net reports: WAØPNB, Late Phone Net, 1070 and 58; WAØLLG, NJQ Net, 472 and 239; WAØRIQ, Early Phone Net, 310 and 14; WØHOJ, Morning Net, 405 and 14. Traffic: WAØPNB 466, WAØMYS 52, WAØRIQ 43, WAØLLG 24, KØVYY 19, WAØCKH 12, WAØFUZ 10, WAØPBL 6, WAØFUZ 4, WAØBMG 3.

DELTA DIVISION

ARKANSAS—SCM, Curtis R. Williams, W5DTR—SEC: WA5HS, PAM: WA5PPD, RM: W5NND. This is my last report as SCM. I have resigned effective Aug. 15 to attend school in Colorado this fall. I would like to thank all appointees for their help and all League members for their cooperation. I have recommended Dennis Schaefer, WA5HS, of Brinkley, as Acting SCM until an election can be held. The Central Arkansas ARC held a very successful Ham Picnic in North Little Rock July 27. K5ZQT, WA5DMT, W5MJO and WA5KUD have been endorsed as ECs. W5DRW and WA5PKO have been endorsed as ORSs. The North Arkansas ARS has produced an excellent bulletin with W5WEE as editor. Net reports for July:

Net	*Freq.*	*Time**	*Sess.*	*Tfc.*	*Stations*	*Mgr.*
OZK	3790	0900Z	31	57	224	W5NND
RN	3815	2330Z	31	77	659	WA5PPD
APN	3885	1100Z	(no report)			K5ABE
APON	3925	2130Z	23	135	305	W5MJO

RACES 3990 and 50.5 During severe weather alerts K5YTR

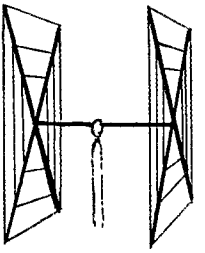
*Nets will meet one hour later in GMT after Daylight Saving Time ends. Top stations on OZK in July were W5QOO 29, W5NND 25, WA5NOC 22, and W5MYZ 20.

GOTHAM ANTENNAS ARE MUCH BETTER! OF COURSE YOU PAY MUCH LESS

How did Gotham drastically cut antenna prices? Mass purchases, mass production, product specialization, and 15 years of antenna manufacturing experience. The result: The kind of antennas you want, at the right price! In QST since '53.

QUADS

Worked 42 countries in two weeks with my Gotham Quad and only 75 watts . . . W3---



CUBICAL QUAD ANTENNAS — these two element beams have a full wavelength driven element and a reflector; the gain is equal to that of a three element beam and the directivity appears to us to be exceptional! ALL METAL (except the insulators) — absolutely no bamboo. Complete with boom, aluminum alloy spreaders; sturdy, universal-type beam mount; uses single 52 ohm coaxial feed; no stubs or matching devices needed; full instruction for the simple one-man assembly and installation are included; this is a foolproof beam that always works with exceptional results. The cubical quad is the antenna used by the DX champs, and it will do a wonderful job for you!

10/15/20 CUBICAL QUAD SPECIFICATIONS

Elements: A full wavelength driven element and reflector for each band.

Frequencies: 14-14.4 Mc.; 21-21.45 Mc., 28-29.7 Mc.

Dimensions: About 16′ square.

Power Rating: 5 KW.

Operation Mode: All.

SWR: 1.05:1 at resonance.

Boom: 10′ × 1¼″ OD, 18 gauge steel, double plated, gold color.

Beam Mount: Square aluminum alloy plate, with four steel U-bolt assemblies. Will support 100 lbs.; universal polarization.

Radiating elements: Steel wire, tempered and plated, .064″ diameter.

X Frameworks: Two 12′ × 1″ OD aluminum 'hi-strength' alloy tubing, with telescoping ⅞″ OD tubing and dowel insulator. Plated hose clamps on telescoping sections.

Radiator Terminals: Cinch-Jones two-terminal fittings.

Feedline: (not furnished) Single 52 ohm coaxial cable.

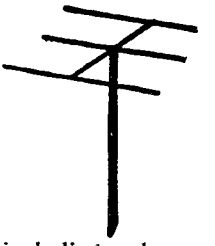
Now check these startling prices — note that they are *much lower* than even the bamboo-type:

10-15-20 CUBICAL QUAD	$35.00
10-15 CUBICAL QUAD	30.00
15-20 CUBICAL QUAD	32.00
TWENTY METER CUBICAL QUAD	25.00
FIFTEEN METER CUBICAL QUAD	24.00
TEN METER CUBICAL QUAD	23.00

(all use single coax feedline)

BEAMS

The first morning I put up my 3 element Gotham beam (20 ft) I worked YO4CT, ON5LW, SP9ADQ, and 4U1ITU. THAT ANTENNA WORKS! WN4DYN



Compare the performance, value, and price of the following beams and you will see that this offer is unprecedented in radio history! Each beam is brand new! full size (36′ of tubing for *each* 20 meter element, for instance); absolutely complete including a boom and all hardware; uses a single 52 or 72 ohm coaxial feedline; the SWR is 1:1; easily handles 5 KW; ⅞″ and 1″ aluminum alloy tubing is employed for maximum strength and low wind loading; all beams are adjustable to any frequency in the band.

2 El 20	$16	4 El 10	$18
3 El 20	22*	7 El 10	32*
4 El 20	32*	4 El 6	15
2 El 15	12	8 El 6	28*
3 El 15	16	12 El 2	25*
4 El 15	25*	*20′ boom	
5 El 15	28*		

ALL-BAND VERTICALS

"All band vertical!" asked one skeptic. "Twenty meters is murder these days. Let's see you make a contact on twenty meter phone with low power!" So K4KXR switched to twenty, using a V80 antenna and 35 watts AM. Here is a small portion of the stations he worked: VE3FAZ, T12FGS, W5KYJ, W1WOZ, W2ODH, WA3DJT, WB2FCB, W2YHH, VE3FOB, WA8CZE, K1SYB, K2RDJ, K1MVV, K8HGY, K3UTL, W8QJC, WA2LVE, YS1MAM, WA8ATS, K2PGS, W2QJP, W4JWJ, K2PSK, WA8CGA, WB2KWY, W2IWJ, VE3KT. Moral: It's the antenna that counts!

FLASH! Switched to 15 c.w. and worked KZ5IKN, KZ5OWN, HC1LC, PY5ASN, FG7XT, XE2I, KP4AQL, SM5BGK, G2AOB, YV5CLK, OZ4H, and over a thousand other stations!

V40 vertical for 40, 20, 15, 10, 6 meters $14.95

V80 vertical for 80, 75, 40, 20, 15, 10, 6 meters $16.95

V160 vertical for 160, 80, 75, 40, 20, 15, 10, 6 meters . . . $18.95

How to order: Send check or money order. We ship immediately upon receipt of order by railway express, shipping charges collect.

GOTHAM, 1805 Purdy Ave, Miami Beach, Fla. 33139

Traffic: (July) W5NND 214, K5AJM 146, WA5PPD 66, W5MJO 52, W5MYZ 47, WA5IIS 45, W5DTR 42, WA5-KEF 36, WA5QMQ 20, W5ELF 10, WA5LYA 7, WA5-QPI 1. (June) WA5BQI 1. (May) WA5BQI 294.

LOUISIANA—SCM, J. Allen Swanson, Jr., W5PM—SEC: W5BUK. RM: K5ANS/5. V.H.F. PAMs: WA5-DXA, W5UQR. All of you, I know, join with me in expressing our sympathy to W5CEW on the recent passing of his XYL. We also wish the XYL of W5BUK a rapid recovery. W5JYA works 2 meters. WA5LGO has joined the ranks of the Extras. W5CEZ has had a busy summer what with attending the National, Boy Scout Camp work and ramrodding a Zone Army MARS meeting. WA5NYY has been appointed OPS. WA5EID is another who has joined the Extra ranks. WN5UUM and WN5VOE are new to our hobby and public service work. K5ANS/5 has been busy this summer with the LAN Bulletin. The GNOARC is now working with state and local c.d., Red Cross and NOPD. Its 6-meter net meets Wed. at 8 p.m. CDST on 50.25 Mc. W5JFB reports tremendous activity on 2! W5SKW had a ball working W5SKW/LX from Luxembourg this past summer but worked only five of the gang from La! W5PWX is winding up his rig for some great activity this fall. WA5GVB spent his vacation in our Nation's Capital. The gang up at Bastrop made headlines in the recent KTVE-TV Cerebral Palsy Telethon. W5MXQ says the Jefferson Club will be on 2 meters shortly. Welcome to K5BLV, on 80 and 10, who has returned to Louisiana after a couple of years in Ark.! Another reminder that the Louisiana QSO Party will be held Jan. 18 and 19. A trophy to the Louisiana winner! W5GZR operated for LARC on FD and did an outstanding job according to the LARC gang. The CLARC gang was especially busy during FD and chalked up over 1000 contacts on phone/c.w. WA5OIH is working with a new beam and tower. WA5BIM spends his air hours rugchewing. I have just returned from a two-months tour of Maine, Canada, Lake George, etc. The only mobiling was to N.O. each Sun. on 14 Mc. A reminder—check the regulations going into effect in Nov. as regards frequencies! Traffic: WA5GVB 154, W5-CEZ 146, W5MXQ 107, WA5EID 25, WA5NYY 22, WA5EA 4, WA5LGO 2, WA5OJG 1.

MISSISSIPPI—SCM, S. H. Hairston, W5EMM—I was sorry to miss the Jackson Hamfest, but the XYL and I were on a 3000-mile 12-state trip. W5-CUU said he had a big time seeing all of his and my friends. W5MUG still is working lots of DX. Everyone was very sorry to hear that W5BW lost his XYL. Tom is one of the most faithful of the traffic-handlers in Mississippi, along with W5WZ. WA5JWD now is in Indianaola with a good signal. WA8WNK/5 is using a Heath HW-100 fixed and mobile on 80, 40, 20, 15 on s.s.b. and c.w. with RTTY on 80 meters. Mississippi can be proud to have the following: Novices—WN5VME, WN5VDG, WN5VBD, WN5VBN, WV5VBO, WN5VBS, WN5UYW, WN5UUZ. Technicians—WA5VGG, WA5VFF, WA5-VAX. Generals—WA5VHF, WA5VAY, WA5RTY. Mississippi Sideband Net report: 31 sessions, 931 checking in, 102 formals completed, 38 minutes average time. We are proud that WA5NLO has received an appointment to the Naval Academy and the Meridian group really will miss him.

TENNESSEE—SCM, Harry A. Phillips, K4RCT—Asst. SCM: Lloyd Shelton, WA4YDT. SEC: W4WJH. RM: WA4YEM. PAMs: WA4CGK, W4PFP, WA4EWW, WA4CRU.

Net	*Freq.*	*Days*	*Time*	*Sess.*	*QNI*	*QTC*	*Mgr*
TSSB	3980	M-Sat.	2330Z	27	1272	228	WA4CGK
TPN	3980	M-Sat.	1145	31	1033	152	W4PFP
		Sun.	1300				
ETPN	3980	M-F	1040	23	542	99	WA4EWW
TCN	3980	Thurs.	0100	5	(Wed. night	CDT)	W4TYV
TPO	3980	Sun.	2330	4	69	19	W4AST
TN	3635	Daily	0000	31	184	162	WA4YEM
TTN	7290	Daily	2100	31	117	24	WA4CRU
ETVHF	50.4	M-W-F	2300	13	242		WA4TJJ
ETVHF	145.2	Tue.&Th	2300	9			K4FKO

All EC reports and AREC information should be sent to W4WJH, our new SEC, at 200 Old Fort St, Tullahoma, Tn. 37388. The Tennessee Council of ARC "Outstanding Amateur Award" was presented to WB4CXL, of Greenville. The annual meeting of the Tennessee Council was held July 20, at Cookville. The new officers are W4TYV, chmn.; WA4BSL, vice-chmn.; WA4NEC, secy.-treas. Thanks for a fine job to outgoing officers, W4OGG, W4PHQ and W4PRY. The Council presented the 1967 1st-place Field Day award to the Kingsport ARC. Oak Ridge placed second. Thanks to W4WHN for serving as FD award chairman. All ECs are requested to contact the rescue squad in your area and work out a plan to assist them. For information contact W4TYV. K4RCT won the Twin-City award while visiting in Bristol. W4-BfV and WB4HPO got their Advanced Class tickets. Please note my new address on page 6 of *QST*. Traffic: W4FX 354, W4OGG 266, WA4YEM 177, WA4YDT 136, K4AT 125, W4SQE 92, WA4ZBC 88, WA4WVW 58, WB4GTI 56, K4AMC 41, WA4GLS 41, K4MQI 36, W4PRY 36, WB4ANX 32, W4WBK 31, WA4YSX 30, WA4TWL 26, W4PFP 25, K4RTA 25, WA4CRU 23, WA4CGK 22, WA4NEC 22, WB4HYY 20, WA4YHO 20, WB4EHD 12, WA4EWW 12, K4LTA 12, K4PUZ 8, W4TYV 8, WB4EHK 6, W4SGI 6, K4FKO 4, W4WJH 4, WA4YFG 2.

GREAT LAKES DIVISION

KENTUCKY—Acting SCM/SEC: George S. Wilson, III, W4OYI—

Lawrence F. Jeffrey, K4HY

Kentucky amateurs and amateurs everywhere mourn the passing of our beloved SCM Jeff, K4HY, in August. He was elected SCM in 1965 and was serving his second term. A most popular leader, Jeff will be sorely missed by all his friends and colleagues.

I have accepted the job of Acting SCM until an election can be held. *QST* will announce the election shortly. The following reports were received by me or picked up from Jeff's XYL. If yours isn't here, I'm sorry. It got lost:

MKPN	31 sess.	394 QNI	75 QTC
KRN	23	448	38
KTN	31	842	416
KYN	62	384	538
FCAT	14	95	41

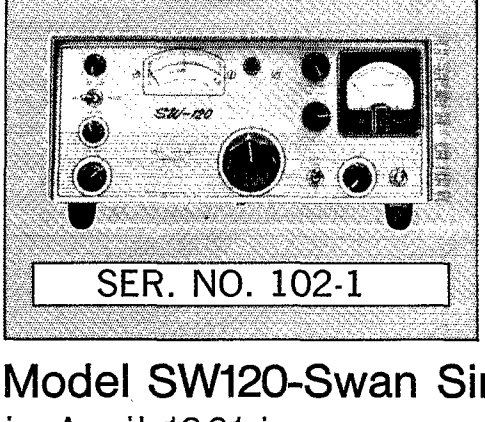
Traffic: WA4DYL 434, WA4UAZ 411, W4BAZ 399, K4YZU 205, WA4AGH 79, WB4AIN 48, K4TRT 41, WA4WSW 40, W4EON 38, W4OYI 32, WA4VZZ 32, WB4BKG 30, WB4IOU 25, WB4EOR 23, W4SZB 22, W4YOK 22, W4UK 19, W4KJP 17, WA4GMA 15, WA4EQY 14, K4AVX 13, K4VDO 11, W4KKG 8, W4CDA 7, K4HOE 7, K4MPT 4, WA4ZXT 2.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: W8MPD. RMs: W8FWQ, W8RTN, WA8OGR, K8KMQ. PAMs: K8GOU, K8JED. V.H.F. PAMs: W8CVQ, W8YAN. Appointments: W8BEZ, W8JAC, W8NOH as ECs; K8ETU as OBS; WA8KRH as OVS. K8HKM, as prexy, and K8ETU, as secy., are sparkplugging the Mich. Council of Clubs and will bring this organization bunch to life, provided Michigan clubs will cooperate. Send K8ETU your list of officers and suggestions.

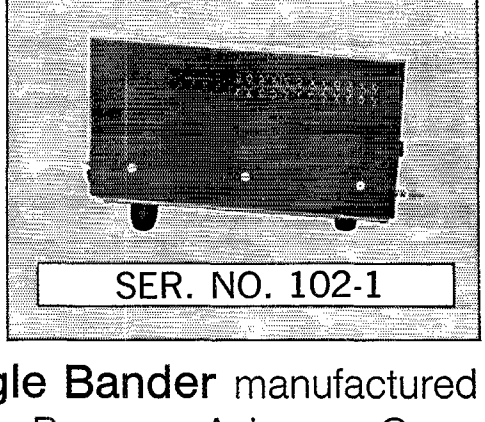
Net	*Freq.*	*Time*	*Days*	*QNI*	*QTC*	*Sess.*	*Mgr.*
QMN	3663	2200	Dy	452	406	31	W8FWQ
WSSB	3935	2300	Dy	397	244	31	K8WRJ
B/R-MEN	3930	2130	M-Fri.	950	105	27	W8OWG
PON-DAY	3935	1600	M-Sat.	381	90	27	WA8OGR
M8MTN	50.7	2400	M-Sat.	235	34	27	WA8LRC

New officers: Pictured Rocks RC—W8ZDF, pres.; W8CQU, secy.-treas. Catalpa ARS—WA8VHA, pres.; W8CJT, vice-pres.; WA8OXL, treas.; K8IIN, corr. secy.; K8EHD, rec. secy. The U.P. gang had a fine Hamfest at the Soo, Aug. 3 and 4; and the S.W. Mich. V.H.F. group had a nice Picnic Swap & Shop at Allegan West Side Park on Aug. 4. WA8OXF is up in Iceland and K8CBK is back from Europe. K8MFO finished basic and will be in California. The CMARC handled communications for the Spartan Water Ski Tournament, Aug. 3 and 4. W8IWG bought a new home in Roseville. WA8NYK sold his transistorized dipper to FX, and both are satisfied! WA8IIV, WA8NYK, W8PPY, K8QDZ and WA8VAR all joined the "160 M Kite Flyers Club." WA8BHW and W8IWG both had their mobile rigs stolen. WA8-RXI came down along with his 35-ft. wooden tower, but is able to walk again. Don't forget the N.E. Mich. 4th Annual Hamfest, Oct. 4, 5 and 6, at Tawas City, sponsored by the Oscoda Area A.M. Club. Silent Keys: W8BSG, WA8RSL. Traffic: (July) W8-GAI 548, W8LXJ 211, K8KMQ 206, W8MO 199, WA8MCQ 136, K8ZJU 99, W8DET 79, K8MXC 79,

WANTED



SER. NO. 102-1



SER. NO. 102-1

Model SW120-Swan Single Bander manufactured in April, 1961 in a garage in Benson, Arizona. Grey, enameled cabinet, clear, anodized panel. Known to frequent the 20 meter band, probably working DX. Height: 5 1/2 inches. Weight: 14 lbs.

REWARD: One new Swan 500C Transceiver with 117-XC power supply.

Swan Electronics began some 7 years ago as a one-man operation with Herb Johnson, then W7GRA, building the first 10 single band Swans. At that time the only other SSB Transceiver on the market was the well known Collins KWM-2, selling, of course, for considerably more money. During the intervening years Swan has consistently offered top quality products at the lowest possible cost and backed them up with customer service that is unparalleled in the industry. As a result, Swan is now a team of 160 skilled craftsmen who are justly proud of their position of leadership in the sale of single sideband Transceivers to the Amateur Radio Service.

The first ten transceivers were serial numbered from 101-1 to 110-1, with the first nine being SW-120's operating on 20 meters, and the tenth, 110-1, being the first SW-140 operating on 40 meters. The company retrieved Serial No. 101-1 about 5 years ago from the original Ohio owner, and have it in our display case. Unfortunately, we have lost the name and call of the original owner of this one. We're wondering now where the other 9 are, and will offer the following rewards for news of them:

(A) A new 500C Transceiver with 117-XC power supply in exchange for the lowest serial number identified by Nov. 1, 1968. This number must be one of the nine from 102-1 to 110-1. We reserve the right to make positive identification before making the exchange.

(B) A new 117-XC power supply will be shipped to each of the other eight early series owners who write in with positive identification by Nov. 1, 1968. If there is any question concerning serial number verification, Swan will pay shipping costs to the factory and return.

You may be interested to know that not only will the current 117-XC power supply run the early model Swan, but the cabinet on the current 500C Transceiver is interchangeable with the one on the earliest models. You might call this being consistent.

SWAN **ELECTRONICS**
Oceanside, California
A Subsidiary of Cubic Corporation

W8QQK 74, W8JTQ 73, W8IWF 72, K8JED 66, W8NOH 53, WA8OGR 47, WA8LRC 45, W8RTN 39, W8XAN 31, W8FX 25, W8IUC 19, K8LNE 19, W8UFS 19, W8CUP 18, W8FWQ 16, WA8YOQ 14, WA8KRH 12, WA8VBL 12, W8ZBT 12, W8BW 10, K8VDA 10, WA8MGM 9, W8BEZ 8, WA8VGQ 8, W8OWG 7, WA8PZT 5, W8TBP 5, W8HKT 4, W8SCW 4, WA8SQC 1. (June) W8IUC 87, W8QQK 37, WA8KME 7, WA8PZT 7, WA8MCQ 5.

OHIO—SCM, Richard A. Egbert, W8ETU—Asst. SCM: Roger Barnett, K8DDG. SEC: W8OUU. RM: W8IMI. PAM: W8UBK. V.H.F. PAM: WA8ADU.

Net	*QNI*	*QTC*	*Sess.*	*Fr.q.*	*Time*	*Mgr.*
BN	597	374	61	3589	2300 & 0200Z	W8IMI
OSSSN	1473	749	58	3942.5	2245Z	K8UBK
OSMTN	157	55	30	3986	2300Z	WA8ADU
OSN	177	75	30	3580	2225Z	WA8VNU

Additional FD messages were received from WN8ACF, K8UZW, W8LT and K8AFF. The Joint Section Nets Picnic on July 27 was a big success. Represented were the Buckeye, Ohio Single Sideband, Ohio Slow, Ohio Six Meter and the Apricot Nets. W8RYP is putting together a revised issue of a Traffic Delivery Directory which lists locations to which traffic can be delivered toll-free by regulars in the traffic nets. All traffickers are urged to advise W8RYP of their area of free telephone delivery. The Ohio Six-Meter Net still needs check-ins. K8VWZ reports hearing KH6 and KL7 signals on 6 June 22. WA8LOW worked KL7FAL on 50 Mc. for state No. 49. WA8TYF's activities on 2 included QSOs with W5MCC (740 miles), KH6EE/4 and W4CAB (both 790 miles) on June 21. Congratulations to new Extras W8WCW, WA8DUL and W8MAE, and to Advanced WA8IMU. WA8VCV has departed the section for a master's degree at Indiana U. K8HOH is leaving to work in West Va. ORS WA8GYT goes to N.Y. for studies at Cornell. July appointments: WA8CXV as OVS, WA8FSX, W8FGD and WA8CXV as OPSs, WA8UTX as ORS. Net certificates (Buckeye Net) went to WA8ULF, W8QXQ, K8LGA, K8DMZ, W8DH and K8DHJ. The Piqua RC is starting a code and theory class. Greater Cincinnati ARC reports graduating a whopping 53 students from its code and theory class! Massillon ARC's new officers are W8MND, pres.; K8EKG, vice-pres.; W8YHU, secy.-treas. Copies of a taped ham beginner course for blind aspirants are available free of charge. Details from WA8HBX. K8ONA is the new awards chairman for the OCARC. The next meeting of the Ohio Council of Amateur Clubs takes place Sat., Oct. 5 at the YMCA, Front and Long Sts., Columbus, at 10 A.M. All clubs and nets in the section should belong to the OCARC. It costs only five cents per member per year. Contact W8OUU, secy. The Second Annual Amateur Radio Public Service Corps Forum will convene Oct. 19 in the Toledo area. This important meeting of AREC/RACES/NTS groups in joint sessions is a must for all ARPSC-minded amateurs. It will include traffic and emergency personnel from Ohio, Mich. and W. Va. and is hosted by the Lucas Co. AREC. Details from K8LFI, W8CHT or W8RYP. The 1968 SET report indicates that the section still maintains the lead. It's not too early to have the 1969 SET planning under way right now. I attended the July meeting of the Lancaster and Fairfield Co. ARC as the guest speaker. This active affiliated club conducts annual code and theory classes for beginners, is active in Field Day and other club operating activities, operate its club station, K8QIK, and enjoys good attendance at its meetings. I attended the Van Wert Hamfest and enjoyed gabbing with a number of old and new friends. Parma RC reports the start of another code and theory class this fall. W8TNF got the Merit Certificate for the Armed Forces Day message via NSS. Traffic: (July) W8UPH 623, W8QZK 373, W8RYP 210, W8IMI 198, WA8TYF 194, WA8UPI 171, WA8VNU 171, W8SUS 140, WA8MTS 131, K8ONA 116, WA8TWC 100, WA8FSX 98, W8GVX 95, WA8OCG 90, W8QCU 90, W8ERD 87, K8UBK 80, W8QXQ 78, K8WUZ 78, WA8ADU 77, K8WKS 74, W8FGD 67, W8UDG 65, WA8ETV 57, K8DDG 54, W8PMJ 54, WA8LAM 53, W8HNP 49, WA8UTX 49, W8OE 47, WA8PPK 42, W8CHT 41, W8GOE 39, WA8QFK 37, K8VMT 37, W8LRE 35, W8WDU 33, WA8AJZ 29, W8DAE 26, WA8MHO 25, WA8NTA 24, K8WZI 23, W8ELE 22, WA8CXV 21, WA8WJR 20, K8BYR 18, WA8SXI 18, K8CKY 16, W8WEG 12, WA8KPN 11, K8EKG 10, WA8LVT 10, WA8SHP 10, W8ETU 7, W8LZE 7, W8TV 7, WA8CFJ 6, W8CXM 6, W8EEQ 5, W8OUU 5, W8YDR 5, WA8MGD 4, WA8ZNC 3, K8DHJ 2, W8IBX 1. (June) WA8OCG 76, WA8SED 69, W8DAE 65, K8LXA 38, WA8AJZ 23, WA8ZGC 23, K8DHJ 9, K8WKS 9, W8LT 5, K8PJH 2, W8LZE 1.

HUDSON DIVISION

EASTERN NEW YORK—SCM, Graham G. Berry, K2SJN—Asst. SCM and RM: Ruth Rice, WA2VYS. SEC: W2KGC. PAM: WB2VJB. Section nets: NYS, 3675 kc. nightly at 2400Z; ESS, 3590 kc. nightly at 2300Z; NYSPT&EN, 3925 kc. nightly at 3925Z. Appointments and renewals: WA2FYE as OBS, K2RDS as OBS, W2CRS as OVS, W2ANV as ORS, W2TPV as ORS, WA2JWL as OPS. W2EAF as ORS/OPS, WB2FOA as OVS, W2WFR as OBS, K2YJL as OVS. WA2VQZ, editor of the Albany Cy. *ARPSC Bulletin*, reports WA2BAH is EC for the County, WB2PZL is chairman of membership and NCS WB2RBG hosted a fine picnic at Thatcher State Park. Congrats to the Albany group, and W2CRS in particular, for the plans to introduce amateur radio to underprivileged children in the Capitol City area. WB2AAX, his XYL, also plans to take an active part of this FB activity. WA2CKW now is Acting N.Y. State Radio Officer. The N.Y. State 600-yard and NRA-sanctioned 1000-yard rifle matches used 2-meter communications from pit to firing line supplied by WA2KUL, WB2NSC, WA2UWM, W2CQD and K2YDP. New tickets: WB2YEM as Extra Class, WA2NRJ as Advanced Class, WB2UEQ as Extra Class. There seems to be some confusion in the E.N.Y. section as to which counties are included. See ARRL by-laws or the latest *Operating an Amateur Radio Station* manual for the list of eleven—from Schenectady down to Westchester on the map. Asst. SCM WA2VYS has a new tower and K2SJN a new low-band setup complete. WB2AEK, secy. of NYSPT&EN reports 1319 check-ins, 203 traffic passed, average session attendance 44.8 in June. The net can use more E.N.Y. checker-inners. Late news: W2EAF received a 100% copy (c.w.) certificate from Armed Forces Day DOD. Hudson Division Director W2TUK attended a Taconic ARC meeting and will be at Harmonic Hills in Sept. and the Communications Club of New Rochelle in Oct. If your club plans classes, let Hq. and your E.N.Y. staff know. There are lots of inquiries about Novice and higher class license training. Don't forget the Hudson Division Convention in Tarrytown Oct. 12-13. Traffic: (July) WA2BHN 363, WA2VYS 270, W2EAF 152, WA2VYT 92, WA2UHZ 87, WB2VVS 69, WB2FOA 51, K2SJN 50, WB2VJB 46, W2TPV 21, W2ANV 19, WA2CRW 9. (May) W2EAF 190.

NEW YORK CITY AND LONG ISLAND—SCM, Blaine S. Johnson, K2IDB—Asst. SCM: Fred J. Brunjes, K2DGI. SEC: K2OVN. PAM: W2EW.

NLI*	3630 kc.	1915/2200 Nightly	WA2UWA	RM
NLIVHF*	145.8 Mc.	1930 MTWTF	WB2RQF	PAM
NLIPHONE*	3932 kc.	1600 Daily	WB2ZET	PAM
NLS (Slo)*	3715 kc.	1845 Nightly	WB2UQP	RM
Clear Hse	3925 kc.	1100 Daily	WA2GPT	Mgr
Mic Farad	3925 kc.	1300 Ex. Sun.	K2UBG	Mgr
East U.S.	3683 kc.	0001 Nightly	K2UBG	Mgr
All Svc	3925 kc.	1300 Sun.	K2AAS	Mgr
NYSPTEN	3925 kc.	1800 Daily	K2AAS	Mgr

*Section nets. All times shown above are local. *Listen*, you haven't forgotten the Hudson Division Convention over there in Tarrytown, New York, on good old Oct. 12 and 13 have you? Those HARC rascals who have been breaking their whatchacallits all year long to make it a fun week end will sure be disappointed if *you* don't come! W2BCB, revered NYCLI Official Observer, is back home after a vacation of fun and frolic way up there in the Adirondacks, where he learned it requires a bodacious effort to get a message off the ground in the height of a hectic CD Party. K2UBG went the other way and romped through the Blue Ridges of Virginia with the NCX-3 type mobile and the XYL. On the other hand, it was FB fishing down in Maine Country, according to W2UAL. WA2PMW reports that the Tu-Boro RC over in the Flushing area is looking for new members so if you're interested, contact WB2IPO. WB2DRW has now completed his good old integrated circuit keyer and can't wait for the next c.w.-type CD Party. WB2DXM, the one with that distinctive mike switch sound, jumped back into the traffic fray for one more fling before skipping off to college up there in Albany. WB2UQP, 5th PAM of NYCLIPN, has followed WA2QJU, 1st PAM, to Columbia University. WB2JJW won his Advanced Class license and is now hot on the trail of the Extra Class. WB2QIL completed his summer courses at C.W. Post and reports the club has received the call WA2GRJ. W2GP allows that he enjoyed Field Day with those Sperry guys up at the NYU Planting Fields Campus in Upper Brookville. The new QCWA *Year Book* lists more than 4400 active members with

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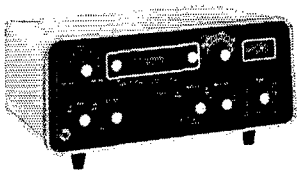
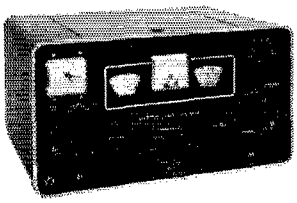


HQ-215

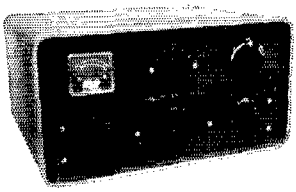
Newest member of the family, *solid state*, solid copy, in the best SUPER-PRO tradition.

Take 5 and prove it!



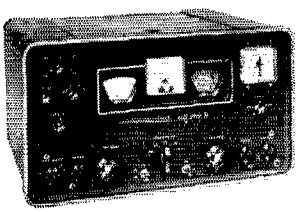
HQ-180-A

Versatile, general coverage receiver 0.5—30.0 MHZ full amateur bandspread has attained world recognition by creating new standards of performance.



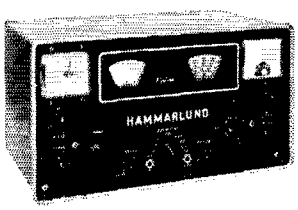
HXL-1

The rugged one! 2KW PIP self-contained desk-top linear, 80 through 10 meters.



HQ-145A

This dual conversion general coverage receiver has *more* new features to provide even *better* operating efficiency.



HQ-110A-VHF

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over 25 years as licensed amateurs, according to W2PF, and 275 of them have been licensed for 50 years or so. W2AXL boned up on things during his vacation and came out with an Extra Class ticket. WB2ZZB is using a new R4A nowadays. The Larkfield RC's winter class produced four new Novices. W2HAE finally got the junk box moved to the new QTH and scraped enough together to come up on 2 meters right away. Fourteen-year-old WB2TBP of Stuyvesant H.S. has passed the Extra Class exam and is working toward an active year for the school club. W2KTG/K4DJN has set up an HW-100 down at Cape Kennedy and plans to operate on 20 meters from there. Traffic: WA2UWA 728, WA2GPT 384, K2UBG 220, WB2AEK 151, WB2DRW 93, W2EW 45, WB2DXM 44, WB2UQP 42, WA2QJU 40, WB2JJW 26, WB2RQF 20, WB2QIL 15, W2GP 12, W2EC 9, WA2LJS 9, W2PF 8, W2DBQ 7, WB2YKL 7, W2TUK 6, WA2GRJ 5, WB2RWD 2.

NORTHERN NEW JERSEY—SCM, Louis J. Amoroso, W2LQP—Asst. SCM: Edward F. Erickson, W2CVW. SEC: WA2ASM.

ARPSC Section Net Schedules.

Net	*Freq.*	*Time*	*Days*	*Sess.*	*QNI*	*Tfc.*	*Mgr.*
NJN	3695 kc.	7:00 P.M.	Dy	31	427	354	WA2KIP
NJSN	3740 kc.	8:00 P.M.	Dy	31	165	80	WB2KKK
NJEPTN	3728 kc.	6:00 P.M.	M-Sat.	31	448	137	W2ZI
NJPON	3728 kc.	6:00 P.M.	Sun.	—	—	—	WA2TEK
NJAN	50,300 kc.	8:00 P.M.	M-F	23	256	57	WA2KZF
PVETN	145,710 kc.	7:30 P.M.	Dy	31	256	111	K2KDQ
ECTN	146,700 kc.	9:00 P.M.	Dy	31	265	131	WA2TBS

RMs: W2BVE and WB2RKK. PAMs: W2PEV, K2KDQ, WA2KZF, WA2TBS and WA2TEK. New appointments. K2DQT as OVS; WA2TBS as PAM for the ECTN. WB2IYO was forced to resign because of the work load at the salt mine. We all thank him for an FB job on 2 meters. Endorsements: WA2TBS as OPS, WB2UIR as ORS, WB2VFX and WB2VFW as OVSs. K2KDQ made the A-1 Operators Club. WB2CWP is chasing DX on 20. WA2EZG added a Communicator 3 to his shack. W2LWP is planning a four-element quad for 20. The Knight Raiders V.H.F. Club has a new QTH at the Salvation Army Office, 15 River Drive, Passaic, and will meet the 3rd Thurs. of each month. WN2GHM is a new ham in Bergenfield and WN2GKI is new in Passaic. WN2CTN and WN2DRJ passed the General Class exam. WB2UIR passed the Advanced Class exam and is now studying for the Extra. WA2ASM is now Advanced Class, traveling to Boston for the exam. K2SUX and K2AX passed the Extra Class exam. WN2DNB and WN2DNY passed both the General and the Advanced Class exams. WB2OZW reports enjoying his first trip to ARRL Hq. WA2CRF has a new TH-3. K2KDQ is looking for Hudson and Essex County stations for his PVETN. WB2ZCI is attending Monmouth College majoring in E.E. WB2VUJ is joining WB2JWB and WB2RIG at Stevens. We wish to thank everyone in the N.N.J. ARPSC for the third place finish in the SET (results in Aug. *QST*). It was a real FB effort. Again congratulations to all the ECs and Net Mgrs. Traffic: (July) WB2RKK 628, WB2FUW 617, WA2IGQ 399, WA2TBS 123, WB2DDQ 116, WB2NSV 111, K2AGZ 82, WA2ACJ 73, K2KDQ 61, W2LQP 47, W2CVW 40, WB2ZCI 40, K2DQT 35, WB2IYO 34, WA2CCF 25, WA2NJB 24, WA2KZF 22, WB2NZU 21, WB2BXK 20, WA2GLI 17, WB2CGI 16, WN2DQE 16, WB2YPQ 15, WA2CLO 14, K2DEL 14, WB2VFX 11, K2ZFI 10, W2EWZ 9, WB2WNZ 8, WN2DRJ 7, WB2ZWU 7, W2TFM 6, K2ITY 3, W2JDH 3, WB2UIR 3. (June) WA2ZDA 115, WB2ZCI 8.

MIDWEST DIVISION

IOWA—SCM, Owen G. Hill, WØBDZ—Asst. SCM: Bertha V. Willits, WØLOG. SEC: KØBRE. RM: WØTIU. PAM: WØNGS. This will be the last report written by WØBDZ, as on Aug. 17 Wayne Johnson, KØMHX, became your new SCM. His address is RFD 1, Kellerton, Iowa. I have enjoyed being your SCM, but business and other commitments will not allow me to continue. The new SEC is Greg Miller, KØLVB, Marshalltown. KØGEY has a homebrew rig running 2 watts on 432 Mc., with an eleven-element beam, 90 feet in the air. He reports working WA9NKT, WA9HUV and W9WLD. He also has a new SB-301 receiver. WAØOTE has a new Extra Class ticket, and a 25-w.p.m. CP endorsement. Carl Madsen, a long-time Sioux City amateur, became a Silent Key Aug. 1. Many appointees have been lax in sending their certificates in for endorsement. This should be done *now*. Your appointment may be cancelled.

Iowa	75	Meter	Net	QNI	1381	QTC	142	27	Sess
Iowa	160	Meter	Net	QNI	515	QTC	6	31	Sess

Traffic: (July) WØLCX 851, WØCZ 89, WAØMLE 59, WØLGG 35, KØQKD 18, WAØBZF 16, WAØOTE 12, KØTDO 12, KØTFT 6. (June) WAØMLE 28.

KANSAS—SCM, Robert M. Summers, KØBXF—SEC: KØEMB. RMs: WAØMLE, WAØJFV. PAM: KØJMF. Our sincere sympathy to the family of KØEGZ, who became a Silent Key July 7. WØCGZ now is using SB-301, SB-401, Drake MN-4 and SB-610. WAØJYK is working on a "tone code" telemetry system for one of the v.h.f. F.M. repeaters. WAØAGI is running an NCX-3, both fixed and mobile. QKN, the Kansas Novice C.W. Net, has been meeting Sun. at 1600 local time on 3735 kc. Conditions have not been too good for full coverage of the state and changes are being considered. Hope more of you will entice a Novice to contact WAØJFV, Mullinvale, Kans. 67109, net mgr., so this net can again reach its peak of several years ago. QKS still could use your help also on 3610 kc. daily at 7 and 10 P.M. KØJDD, Dodge City, recently was awarded the R.E. Baker Memorial Trophy for being the Kansas Amateur of the Year. The award was made by KØLPE, Concordia, at the hamfest Aug. 4. Harold is on the air as EC for S.W. Kansas Zone 11. July reports: KSBN, QNI 624, QTC 212; KPN Sun., QNI 98, QTC 3, sessions 4, WØORB NCS; weekdays, QNI 87, QTC 15, sessions 13; KWN, QNI 696, QTC 89, sessions 30; KPON, QNI 904, QTC 1254; Kans. EC Net, QNI 39, QTC 7; Kans. PI (2-meter net), QNI 47, QTC 3; QKN, QNI 13, QTC 6; Zone 7 AREC, sessions 4, QNI 23; Zone 13 AREC, sessions 4, QNI 37; Zone 9 AREC 10 meter, sessions 4, QNI 23; Zone 15 AREC, sessions 4, QNI 40; Zone 11 2-meter AREC, QNI 36, QTC 10. Traffic: WØLXA 544, WAØNFP 147, KØEMB 132, KØJMF 100, KØBXF 98, KØHGI 91, WAØLLC 90, WØINH 79, WØPSN 58, WAØJOG 34, KØGZP 33, KØLPE 19, KØGII 17, WAØJQV 16, WØCGZ 15, WAØOZP 15, WAØCCW 13, WØLQK 13, WØFII 11, KØUVH 8, WAØJFV 6, WØHI 4, WAØRQG 3, WNØRTK 2, WAØKHN 1.

MISSOURI—SCM, Alfred E. Schwaneke, WØGS—SEC: WØBUL. Appointments renewed: WAØKUH as PAM, KØDEQ as ORS and WØKY as OBS. WAØERG received the St. Louis Amateur of the Year Award at the Zero-Beaters Hamfest. The annual Mo. MARS meeting was also held at the hamfest with 23 members present. WAØITU is pres. of the KC FM Club, which was formed to operate a 6-meter repeater under the call KØFRA. Input is 52.7 Mc. and output is 52.525, 20 hours daily at present. The club net meets every Sun. at 1900 CDST on both frequencies with WAØITU as NCS. WAØQIA and WAØQLO were guests on the WHB (KC) Nightbeat talk show to present ham radio to the public. WØVFI and WAØPUL were among the hams who called in to the show. Officers of HARC (KC) are WAØAPG, pres.; KØGTJ, vice-pres.; WAØABO, secy.; KØSPE, treas.; WØUHJ, sgt. at arms; WAØOPF, editor of *HARK*, the club newspaper. WAØDGG, after finishing boot camp at Ft. Wood, was assigned to operate KØWBD. KØWBD has received appointments as OBS, OVS, OPS and ORS. WAØQOI is a new Gen. Cl. licensee in Kirkwood. WAØTFB is a new Gen. Cl. licensee in Ferguson. WAØURJ (ex-WNØNDQ) is a new Tech. Cl. in Aurora. KØONK is a new CHC-FHC member. WAØHQR/Ø finished another successful summer at the H. Roe Bartle Scout Reservation. WAØEMX, WAØQIA, WAØQLO and WØSOZ receive special thanks from WAØHQR for help in the Scout Camp traffic. Net reports for July:

Net	*Freq.*	*Time*	*Days*	*Sess.*	*QNI*	*QTC*	*Mgr.*
MEN	3885	2230Z	M-W-F	14	122	33	WØBUL
MON	3585	2400Z	Daily	31	161	156	KØYBD
MNN	7063	1800Z	M-Sat.	27	84	28	WØOUD
MoSSB	3963	2300Z	M-Sat.	27	679	377	WØRTO
MoPON	3933	2100Z	M-F	22	212	203	WØHVJ
QMO	3580	2200Z	Sun.	3	4	—	WAØFKD
PHD	50.4	2430Z	Mon.	5	130	18	WAØKUH

Traffic: KØONK 2266, KØWBD 373, KØYBD 192, WAØHTN 173, WAØHQR/Ø 163, WØHVJ 146, WØBV 118, WØOUD 68, WAØQXG 49, WØRTO 43, WAØFMD 20, WØGS 17, WØBUL 15, WAØKUH 11, KØDEQ 10, WAØRMW 2.

NEBRASKA—SCM, V. A. Cashon, KØOAL—SEC: KØODF. Monthly net reports for July: Nebr. Emergency Phone Net, WAØGHZ, QNI 1085, QTC 372. West Nebr. Phone Net, WØNIK, QNI 611, QTC 20. Nebr. Morning Phone Net, WAØJUF, QNI 968, QTC 77. Nebr. C.W. Net, WAØQMZ, 0000Z and 0300Z sessions, total QNI 31, QTC 18. AREC C.W. Net, WAØEEI, QNI 12. Nebr. Storm Net, WAØLOY, first session, QNI 767, QTC 19; second session, QNI 778, QTC 35. AREC Phone Net WØIRZ, QNI 169. Corn-

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husker Teenage Net, WAØOCW, QNI 221, QTC 33. The Central Nebr. ARC Steak-fry was successful with approximately 95 registered amateurs in attendance. OAL and ODF attended. Net comparisons: 1967 total QNI 4977, QTC 495; 1968 total QNI 4642, QTC 574. Many appointments are open as OO, ORS, OPS, OBS, OVS and EC. If interested, make your wishes known. Traffic: WAØIBB 220, WAØTID 194, WAØORO 178, KØUWK 175, WØLOD 102, WAØGHZ 96, KØJTW 28, WAØGVJ 20, WØBFV 17, WØHTA 16, KØIXY 16, KØJFN 16, WAØRBR 16, WAØPIF 13, WAØSCS 12, WAØIXD 10, WAØPCC 10, KØDGW 9, WAØJUF 9, WØATU 7, WAØBOK 6, WAØOQX 6, WØPQP 6, WAØEEI 5, KØFRU 5, WAØSRN 4, WØCNI 3, KØOAL 3, KØODF 3, KØSFA 3, WØLSI 2, WØRJA 2, WAØRPB 2, WØSWG 2, KØUDW 2, WØWZR 2, WAØDGJ 1, WØPHA 1, WAØPSN 1.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, John McNassor, W1GVT—SEC: W1PRT. RM: WA1HSN. PAM: W1YBH. V.H.F. PAM: K1SXF. Net reports for July:

	Freq.	*Days*	*Time*	*Sess.*	*QNI*	*QTC*
CN	3640	Daily	1845	31	257	289
CPN	3880 M-S	1800 Sun.	1000	30	412	177
VHF 2	146.98	M-S	2200	23	143	60
VHF 6	50.6	M-S	2100	23	248	54

High QNI: CN—K1TKS, WA1HSN, K1EIR and WA1GGN. CPN—K1SXF 27, K1EIC 26, W1YBH 25, K1CEC 23, WA1EXS 23, W1GVT 23, WA1IWN 23, WA1IEG 18, WA1HEK 16. SEC W1PRT is looking for stations with 2-meter f.m. gear willing to help develop a state-wide communications network that could also assist the Red Cross. If interested, contact W1PRT. W1ZFM has resigned as Route Manager. My sincere thanks for his outstanding work and the high standards he has maintained. Thank you, Tuck. WA1HSN will take over as RM. Bob, well known on CN and also CPN, is a very capable operator and well qualified to be our new Route Manager. Plan now to attend the Tri-City Hamfest in New London Oct. 19. Shoreline ARC's new officers are K1ILJ, pres.; WA1FOK, vice-pres.; WA1EFY, jr., vice-pres.; WA1EDJ, secy. Picnic season: Murphy's Marauders had one; so did the Nutmeg V.H.F. 6 and 2 Nets. The Candlewood ARA provided communications for the Danbury Golf Tournament. K1YON and group originated G.I. traffic at the Hartland Fireman's Carnival. Clubs should provide some form of Public Service, not only because it's a requirement for the existence of amateur radio but also it's fun! Congratulations to: W1GVZ who has been presented the OOTC award, WA1HLP on the Advanced Class ticket; WA1GGN on making the BPL in July, WN1-JGA on receiving a CP-10 sticker and W1ZZK/4 on the new XYL! Traffic: (July) W1EFW 363, WA1GGN 230, WA1HSN 211, K1TKS 163, W1WCG 160, K1SXF 143, WA1IWN 100, W1BDI 62, W1GVT 48, WA1IEG 40, WA1GLX 36, K1YON 34, W1AW 32, WA1GLS 29, W1YBH 18, W1CUH 16, W1ARR 14, W1CTI 14, W1QV 14, W1BNB 8, WA1GEK 5, K1YGS 5, K1CEC 4, W1BGD/2 2. (June) W1OBR 9, WN1IQJ 2.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, Jr., W1ALP—W1AOG, our SEC, received reports from these ECs: W1s RPF, ZMO, UJF, JSM, K1s DZG, PNB, WA1DXI. The New England Emergency Phone Net meets Sun. at 1230 GMT on 3945 kc. W1AOG, the net mgr., would like check-ins from all of the New England states. The New England Chapter of the OOTC held a meeting at Valles Steak House in Portland, Me., with about 30 members and XYLs attending. W1AOG visited the old Marconi station at Wellfleet. Many towns need ECs. Write to me or W1AOG. WA1ANK/K1ZPC is a Silent Key. K1BJZ is a new OBS. W1JSM is moving to N.H. W1KSI is the new Waltham EC. WA1CFQ is on many bands. W1ALP attended the Whitman Club banquet, and presented the Charter of Affiliation. WA1JUY is the call of the Lowell Tech. ARC. Bedford RC held its Field Day at W1YYI's QTH. New YLs: WA1s JVT, JWF, WN1s JTP, JVI. These YLs are active in traffic-handling: WA1FSI, WA1DED, WA1AJN and K1BJZ, in Army MARS. WA1BFD has his Advanced Class ticket. WA1IFN has General, WA1CRA has Advanced Class. W1FJI got married. W1RST has been on TV and radio. K1CLM is looking for a new QTH. WA1DFL made the BPL. W1MX will have new kws. on 2 and 20. WA1HHK has 75 watts and a 22-element beam on 2. WA1FHU is a member of FOC. K1UGQ is on 2 from Biddeford Pool, Me. WA1DPX is on 6/2 with a.f.s.k./RTTY. W1MX is providing contacts between fellows out in the South Atlantic for summer research and local staff. The Massasoit ARA held its Annual Picnic in Carver. K1QDR and W1MX are new OVSs. Appointments endorsed: W1UE and K1CLM as ORSs, W1s DFS, THT and AYG as OOs. W1UE and W1YYI as ECs. The Capeway RC met at K1NFZ's QTH. K1KNM is over in Germany. The 6-Meter Crossband Net had 22 sessions, 75 QNIs, 1 traffic. W1ILE is in Navy MARS. W1SMO visited W1AW. WN1ICH is studying for the General Class license. The Avon AREC Net meets Wed. nights on 147.6 Mc. The EMNN had 13 sessions, 49 QNIs, 25 traffic. The East Mass. Phone Net had 7 sessions. 30 QNIs, 7 traffic. W1VAH is moving to So. Acton. New stations in our EMNN: WA1EYG, W1MTQ, WA1JCF, WN1-GJT, WN1JCM, WA1IYG, WN1IFN, WN1IHH, WN1-HYI. W1FJJ operated /2 from Camp Drum when he was there with the National Guard. W1TZ and K1AXB are spending their time on a boat down in Hyannis. W1BSG is now the State Radio Officer, Eugene Gilbert is his alternate. W1TZ has been endorsed as OO/OBS. New Novices: WNs JWL, JVX, JVY, JWC, JVK, JVL, JVM, JVN, JVH, JVJ, JUV, JGI, JUQ, JTV, JTO. Other new hams: WA1s JWN, JWD, GMC, JVU, JUX, JUF, JUZ, JTZ, JUA, JUB, JTY, JTW. Traffic: (July) WA1EYY 473, W1DOM 233, W1PEX 198, WA1FAD 176, W1EMG 145, K1CLM 132, WA1DFL 115, K1KBO 91, W1MX 76, WA1FSI 64, W1DAL 53, WA1DPX 41, WA1DED 34, WA1DEC 32, W1AOG 26, W1CTR 26, WA1HHK 20, K1LCQ 19, WN1IRQ 18, W1DKD 14, WA1AJN 11, WA1FHU 11, W1SMO 8, K1OKE 2, W1LE 1. (June) W1SMO 14, K1LCQ 12. WN1IRV 4. (May) K1LCQ 11.

MAINE—SCM, Herbert A. Davis, K1DYG—SEC: K1CLF. RM: W1BJG. PAM: WA1FLG. Traffic nets: The Sea Gull Net meets Mon. through Sat. on 3940 kc. at 1900. The Pine Tree Net meets daily on 3596 kc. c.w. at 1900. It is with deep regret that we report K1VHT and WA1CBM as Silent Keys. Ted was very active on the nets and c.d. and Parker was active on the nets and in QSO, also on most of the bands. They will be sadly missed by all who knew them along the way. WA1FCM has a Valiant I for c.w. and the NCX-3 for s.s.b. and mobile. Traffic: WA1FCM 66.

NEW HAMPSHIRE—SCM, Robert C. Mitchell, W1-SWX/K1DSA—SEC: K1QES. RM: K1BCS. PAM: K1APQ. The GSPN reports 916 check-ins and 50 traffic, plus a late report for June of 1181/58. The NHAREC Net had 133 check-ins and 10 traffic. WA1IIH hopes to hear more check-ins on the VTNH Net. This would be a good idea for you folks needing c.w. practice for that new Extra Class ticket. W1HPM and crew of the Manchester Radio Club operated portable at the Canterbury Fair with lots of traffic and goodwill for amateur radio. WA1EUJ is working in Franklin again this summer. Welcome to new hams: WN1JTN, WN1JUG, WN1JUH, WN1JUM, WN1JUN, WN1JUO, WN1JUP, WN1JVC and WA1-JWH. The W1HPM gang reports the 2-meter f.m. repeater completed and awaiting a license for the 432-Mc. control link. W1YWC has his new HW-100 and is busy assembling same. W1KOC was host to the Laconia gang on his boat. There were some pretty good fish stories resulting from George's mobile off the coast. Traffic: WA1IIH 156, K1PQV 39, WA1-EUJ/1 10, K1QES 4.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: K1LII. PAM: W1TXL. V.H.F. PAM: K1TPK. RM: W1BTV. RISPN report: 31 sessions, 326 QNI, 58 traffic. Traffic during July was very slow and with so many away on vacations activity is down. W1BTV has completed over 45 consecutive sessions on the 1RN because of the lack of traffic men. The W1AQ Club held a successful picnic at Lincoln Woods and another picnic is planned before the fall season. The club's 6-meter antenna has been replaced with a 6- and 2-meter combination. A tri-band will be replaced by a new tri-band and the tower will be converted into a vertical for 80 meters. This will allow all members to operate on all bands. I would ask all club secretaries to send to SCM information so that it can be published in this column. K1HMO caught the largest fish in a recent fishing party held by the W1AQ Club. It seems that the rest of the party caught nothing except mosquitoes. K1AGA watched his lighted flashlight fall into the deep water to become a beacon for all fish. Traffic: W1TXL 127, W1BTV 78, WA1EEJ 69, K1VYC 31, K1TPK 12.

VERMONT—SCM, E. Reginald Murray, K1MPN—Now that summer is nearly over we hope you will be getting those nets and traffic reports in by the 6th of each month. Welcome to new Novices WN1JUL (Greensboro), WN1JVP (Chester) and WN1JYR (Wil-

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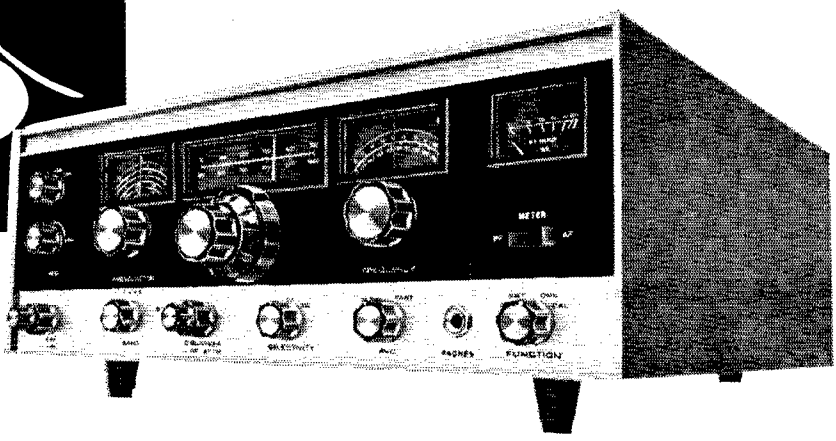

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der). Congrats to new Conditional WA1JWI (Danville). All who hold EC, ORS, OPS, OVS, OBS and OO certificates, please check the dates. If appointments have expired please advise me if you wish reappointment. Anyone interested in these appointments, let me know because we will be more than glad to have you. This is time to review appointments and if we don't hear from you we'll assume you're not interested. W1MRW was first in the R.I. QSO Party. W4SCY/4, Bart #2, has been a welcome voice this summer but where is K1IJJ, Bart #1? W1JLF had considerable electronic damage from lightning. Traffic: K1BQB 288, K1MPN 19, WA1GKS 13.

WESTERN MASSACHUSETTS—SCM, Norman P. Forest, W1STR—W1DVW, new Route Manager for WMN (c.w.) 3560 kc., has taken over from W1DWA, who has done a commendable job since 1966. Stations calling in order of activity were W1WZY, W1DVW, K1AEC, W1ZPB, W1BVR, W1STR, WA1ABW, K1-IJV, W1MNG, W1AMI, WA1AMD, WA1ISJ, W1HRC, W1EOB and K1SSH. We need more stations to obtain better coverage of the different sections. Total traffic for July was 126. The VARC announces a new SEC, WA1HYI. The new editor of *The Oscillator* is W1NPL. WA1BRU had to step aside for college plans after giving an excellent account of himself. The VARC also announces that Dr. Miemann, of NASA, will speak on "Communications in Space" at its Oct. 13 meeting. The HCRAI has a new editor, WA1IUI, taking over from K1FUA, who received an OTC award at Swampscott for outstanding work as editor of *Zero Beat*. The CMARAI has a new club call, W1-BIM. Its f.m. group is slowly progressing with plans for an f.m. repeater. *Congratulations to* K1ANF *on* his top score in WM during the Jan. V.H.F. Contest. Former W1HDM is now with FCC in the Washington office. WA1FKE is busy with the foreign mission amateur radio program. W1ZPB is now on RTTY and has been scheduling Germany in conjunction with *the Mt. Hermon School's German program.* Traffic: W1DVW 117, W1EOB 102, W1BVR 86, W1IC 58, WB2-PGH/1 53, W1ZPB 43, K1AEC 37, K1WZY 33, W1STR 14, WA1ABW 10.

NORTHWESTERN DIVISION

IDAHO—SCM, Donald A. Crisp, W7ZNN—SEC: K7-THX. The FARM Net convenes on 3935 kc., week days at 0200 GMT. The Idaho C.D. Net convenes week days at 1415 GMT on 3991 kc. K7UAE will be W1MU pres. for 1969. W7AOO is sporting a new Swan 350. W7IUO has been appointed EC for Franklin County and received OO endorsement. WA7EWV received endorsement as EC for Nez Perce County. W7GHT is now handling traffic for RN7 into Southern Idaho. WA7ETO has been appointed state coordinator for Navy MARS. K7TGA is back on the air after a stint in the hospital. K7KRO and K7ZSW both lost beams in a wind storm. W7ZEK is recuperating from a heart attack. WA7GPO is a new ham in Boise. K7BRO is providing communications for the Treasure Mountain Scout Camp using an HW-12 and a generator for power. K7NNX is a new ham in Kamiah. W7IWU reports good results on 160-meter mobile. FARM Net report for July: 19 sessions, 577 check-ins, 30 formal traffic handled. Traffic: WA7BDD 152, W7GHT 16, W7ZNN 10, K7CSL 6, K7OAB 5.

MONTANA—SCM, Joseph A. D'Arcy, W7TYN—SEC: W7RZY. RM: WA7DMA. PAM: W7ROE. Section nets:

Montana Traffic Net	3910 kc.	0000Z	M-F
Montana Section Net	3950 kc.	1700Z	Sun.
Montana PON	3950 kc.	1515Z	Sun.
Montana RACES	3996.5 kc.	1600Z	1-3 Sun.

W7TYN was elected to the SCM position for another two years. K7ABV sends along some information on his DX activity. He has worked 273 countries and has 264 confirmed. Eric is a teacher in Livingston. W7WYG, president of this year's W1MU Hamfest, did a very excellent job. K7DCH and K7DCI are going to sponsor next year's *Glacier Hamfest.* W7ROE, our PAM, will be the new director of the Montana Traffic Net for the next year. The Montana Net will now be an NTS outlet. The Butte and Billings groups still are running tests to locate repeaters in their areas.

OREGON—SCM, *Dale T. Justice*, K7WWR—RM: W7ZFH. PAM: K7RQZ. Section nets:

Net	*Freq.*	*Time*	*Days*	*Mgr.*
AREC	145.35 Mc.	0400Z	Tue.-Sat.	WA7DLE
AREC	3875 kc.	0300Z	Daily	WA7AHW
BSN	3875 kc.	0130Z-2000Z	Daily	K7IFG
OSN	3585 kc.	0230Z	Tue.-Sat.	W7ZFH

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THE ELEMENTS ABOVE COMPRISE A COMPLETE 150 WATT 10 CHANNEL 2.0 TO 30.0 MHZ TRANSCEIVER CAPABLE OF BEING OPERATED FROM MULTI-CONDUCTOR CABLE OR STANDARD TWO WIRE TELEPHONE—WITH OR WITHOUT SUPERVISORY SYSTEM.

THE TRANSCEIVER—The new RF-201B with RC-1611 Motor Control Unit • Frequency Range: 2.0 to 30.0 MHZ • Number of channels: 10, crystal controlled with frequency stability of 1 pp 10^6 • Power Output: 150 watts P.E.P., 100 watts average CCS rating • Transistorized—rugged and reliable.

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TONE TERMINALS—RF-1630 Remote Tone Terminal and RF-1632 Local Tone Terminal permits control over standard telephone pairs. Tone relays generate and decode the control information. A unique AGC in decoder circuits provides high reliability.

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W7ZFH reports for the OSN for July, sessions 22, check-ins 116, traffic 39. WA7AHW reports for the AREC Net, sessions 31, maximum number of counties 21, traffic 38, contacts 117. QSTs 6, check-ins 894. K7RQZ reports that 55 licensed hams with their families showed up for the Bend campout. The Central Oregon area is planning an f.m. relay on 2 meters to the Williamette Valley and Portland area. Recent Extra Class licensees include WA7ASP and WA7BYP. The 7-P.M. session of the Oregon Emergency Net now meets on 3980 kc. The Klamath Basin ARA provided communications for a fly-in July 20, during which an unexpected crash occurred. The club then provided the necessary communications for the police, fire and ambulance services. Those participating were WA7HKV, WA7AMZ and W7IEO. A new call in Glendale is WN7KOL. WA7FTN ran 62 telephone relays to S.E. Asia during July. K7RQZ made her third BPL and now gets the coveted medallion. 3875 kc. is the Oregon calling and QSO frequency. Traffic: (July) K7RQZ 500, WA7BYP 191, K7NTS 82, K7OUF 77, WA7DPK 74, WA7HKV 74, W7ZFH 52, K7WWR 42, WA7AHW 25, W7BNS 16, K7ADR 14. WA7DOX 8, W7MLJ 8, W7DEM 7, WA7GFP 2. (June) WA7EZJ 13.

WASHINGTON—SCM, Willam R. Watson, W7BQ—SEC: W7UWT. RM: K7CTP. PAM: W7BUN.

WSN	3590 kc.	Daily 0145Z	QNI	322	QTC 370	Sess. 31
NTN	3970 kc.	Daily 1830Z	QNI	765	QTC 325	Sess. 29
WARTS	3970 kc.	Daily 0100Z	QNI	730	QTC 176	Sess. 16
NSN	3700 kc.	Daily 0300Z	QNI	252	QTC 114	Sess. 31

Congrats to our AREC teams on the leap from 57th to 5th place in the 1968 SET. Meetings were held of all LOs, net managers and ECs at the Washington State Hamfest at Yakima. W1NJM joined with us in numerous discussions of League policy. The Radio Club of Tacoma got the vote for the 1969 sponsorship in a continuing program of rotation around the state. In the first meeting of the State Council of Clubs, now in the organizing stage, W7CJL, W7FNY and WA7FIC were elected to the constitution and by-laws committee. Awards were presented by SCM W7BQ to W7AMC, W7HDL, K7CTP and the Yakima Amateur Radio Club. W7AMC received an FB write-up in the Bremerton paper. New oppointments: WA7DZL as OPS, K7MWC as OVS, K7UDG, W7OEB, K7UIC, W7GVC and K7NKZ as ECs. The new manager of NTN is WA7HKR, NSN is W7IEU and WARTS is W7JWJ. The Seattle and Spokane V.H.F. Nets will now be listed in the Net Directory with both tied into AREC operations. OVS W7PUL reports good success on 2 meters using FET loops. W7AXT carried off the c.w. prize at Yakima. The Skagit Club reports a continuing activity of outdoor activities. WA7HSJ hosted 11 teenagers at Yakima. W7OEB reports the new tri-cities directory, produced by WA7ITL, WA7-IFF and WN7IXT, is available. OO W7EXM is active in the Intruder Watch. W7BUN now produces the WARTS *Parasite* from a new QTH. Our thanks to the State OCD for its display of the emergency mobile unit at Yakima. ARRL reports nominating petitions have been received for W7BQ as Northwestern Division Director and K7CTP as Vice-Director. We regret the passing of W7TH and W7ZBA to Silent Keys. The new pres. of the North Seattle Club is K7CFC with WA7GRN as secy. Traffic: (July) W7BA 2288, WA7DZL 506, WA7DXI 483, W7KZ 466, WA7EYN 395, W7ZIW 339, W7PI 322, WA7HSJ 300, W7JEY 190, W7TEU 182, W7AXT 136, W7BQ 129, WA7-JBM 110, W7MCW 95, W7APS 93, W7AAO 88, K7CTP 82, WA7EDQ 81, WA7HPK 71, W7DZX 51, K7KPA 49, WA7HKR 46, WA7GVB 39, W7GVC 28, W7BTB 24, K7THG 24, WA7ILC 21, W7FHN 19, WA7BDB 16, WA7GHC 13, WA7ACQ 12, W7CJL 11, W7AIB 10, K7EFB 9, W7OEB 9, K7OXL 9, WA7HMC 7, W7UU 7, WA7FKM 6, W7UWT 6, W7ZHZ 6. (June) W7DZX 442.

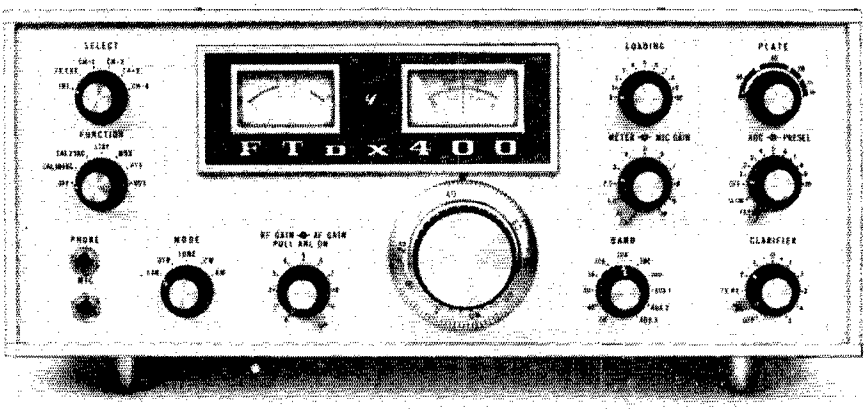
PACIFIC DIVISION

HAWAII—SCM, Lee R. Wical, KH6BZF—SEC: KH6-GHZ. PAM: W4UAF/KH6. RM: KH6AD. V.H.F. PAM: KH6EEM. RACES NETS (40, 10, 6 and 2 meters). Coordinate with KH6AIN.

Net	*Freq.*	*Time (GMT)*	*Days*
League Appointees	7.290 Mc.	0700Z	Wed.
Friendly Net	7.290 Mc.	2030Z	M-F
Pacific Interisland Net	14.330 Mc.	0830Z	M-W-F

May I extend a warm welcome to RM KH6AD, of 808 Murray Drive, Honolulu, 96818. KH6GJC is Bill Cagney, the top Pacific Manager for Collins Radio here. WH6GPC is a U. of Hawaii student and is working 15 meters with his gamma-matched three-element yagi. KH6NS is a new OVS. KH6GHZ made QCWA and is No. 5875. KH6CBS is back on the air

NOT FOR THE NOVICE



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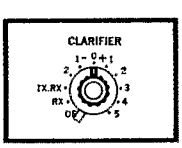
FEATURES: Built-in power supply • Built-in VOX • Built-in dual calibrators (25 and 100 KHz) • Built-in Clarifier (off-set tuning) • All crystals furnished 80 through the complete 10 meter band • Provision for 4 crystal-controlled channels within the amateur bands • Provision for 3 additional receive bands • Break-in CW with sidetone • Automatic dual acting noise limited • and a sharp 2.3 KHz Crystal lattice filter with an optimum SSB shape factor of 1.66 to 1.

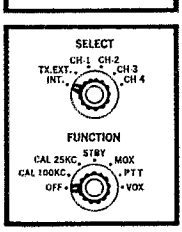
Design features include double conversion system for both transmit and receive functions resulting in, drift free operation, high sensitivity and image rejection • Switch selected metering • The FT dx 400 utilizes 18 tubes and 42 silicon semi-conductors in hybrid circuits designed to optimize the natural advantages of both tubes and transistors • Planetary gear tuning dial cover 500 KHz in 1 KHz increments • Glass-epoxy circuit boards • Final amplifier uses the popular 6KD6 tubes.

This imported desk top transceiver is beautifully styled with non-specular chrome front panel, back lighted dials, and heavy steel cabinet finished in functional blue-gray. The low cost, matching SP-400 Speaker is all that is needed to complete that professional station look.

SPECIFICATIONS: **Maximum input:** 500 W PEP SSB, 440 W CW, 125 W AM. **Sensitivity:** 0.5 uv, S/N 20 db. **Selectivity:** 2.3 KHz (6 db down), 3.7 KHz (55 db down). **Carrier suppression:** more than 40 db down. **Sideband suppression:** more than 50 db down at 1 KHz. **Frequency range:** 3.5 to 4, 7 to 7.5, 14 to 14.5, 21 to 21.5, 28 to 30 (megahertz). **Frequency stability:** Less than 100 Hz drift in any 30 minute period after warm up.



CLARIFIER CONTROL — Does the work of an external VFO — allows operator to vary receive frequency 10KHZ from transmit frequency, or may be used as an extra VFO combining transmit and receive functions.



SELECT CONTROL — Offers option of internal or outboard VFO and crystal positions for convenient preset channel operation.

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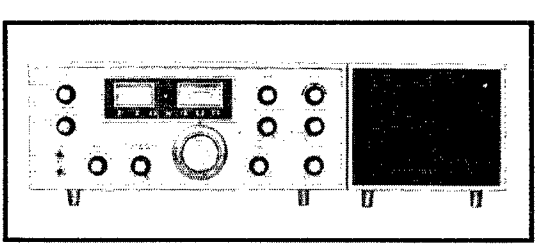

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— PROFESSIONAL EQUIPMENT FOR THE AMATEUR —

after 5 years of silence, KH6GHC and KH6FNB keeps activity going at KH6EBQ for the Honolulu ARC. KG6AIG has rejoined us for an OBS appointment for Guam Island. W7QXA was in the islands recently. KH6GKI has taken over the Honolulu ARC's QSL situation. Seen at the HARC Field Day site looking on were HB9VP and G3KCM. In for some surf and sand recently was W8PCA, Dearborn, Mich. Heard on from Koror Island was KC6CK. K3OUL/KH6 and WB6FJY/KH6 recently joined the Defense Communications Agency-Pacific Area in Hawaii. W3-YVJ/KH6, will be setting up his rig from his new home in Foster Village. KH6EEM should be moving into his new DX/V.H.F.-DX home in Hauula. KG6APJ has moved from Apra Hts., Guam, to his new assignment in the Philippines. KH6IJ returned from Japan where he operated as KA2IJ. KH6BYS returned from military service. KH6CXP has departed for YB1-Land. Traffic: (July) KH6GHZ 320, KH6BZF 16, W4UAF/KH6 8, WØPAN/KH6 3, W5QFO/KH6 1, KH6AD 1. (June) KH6GHZ 596.

NEVADA—SCM, Leonard M. Norman, W7PBV—SEC: WA7BEU. W7DDB, the Southern Nevada FM Association Repeater is on 146.34 in, 146.94 out. Trustee W7AKE received his Extra Class license. W7FJM is attending FAA Advance Radar School. W7JLV needs more in the state RACES program. WA7BGA, NCS of the Nevada Emergency Net, 3996.5 kc., Mon. and Thurs. 1900 local, is doing an FB job with all sections represented. W7EBP attended a medical convention in Denver. W7PRM is vacationing in VE7-Land. The Reno gang has been working hard for a successful Sierra Hamfest. W7CSB wants to form a Nevada chapter of the QCWA. If you belong to QCWA give Mac a call. K7RKH has some new 2-meter gear. W7TVF will schedule anyone needing a Nevada QSL, DX or stateside. WA7IRC and WA7-JGV are now Extra Class, WA7JIG General. W7DIM is doing an outstanding job of teaching amateur radio to some of the sightless. OM W7AKE, XYL W7CDH and Son WA7KOQ comprise a new all-ham family. K7OHX is busy handling traffic. K7ZAU and family visited in Boulder City en route to XE-Land for a vacation. K7ICW, KØLES/7, K8YWT/7, K7ZOK, WAØCAG, WA7DSP, WA7IER and WA7JTH are all active on 6 meters. W7DGR and WA7IGN are new stations on 2-meter f.m. Traffic: K7OHZ 38, WA7BEU 4, W7PBV 2.

SACRAMENTO VALLEY—SCM, John F. Minke, III, WA6JDT—ECs: WB6MXD, K6RHW, WB6RSY, W6SMU, WA6TQJ. RMs: W6LNZ, WB2YTX.

Net	*Freq.*	*Time*	*Days*	*Mgr. or NCS*
NCN	3630	0200Z	Daily	WB6HVA
NCN/2	3630	0330Z	Daily	WB6YTX
Nevada Co. Slow	3749	0300Z	Fri.	K6RHW
SCEN	146.25	0500Z	Wed.	K6IKV
Yolo Co. C.D.	146.94	0200Z	Tue.	WA6TQJ

WB6YTX has been appointed RM to supplement his asst. mgr. of NCN/2. WA6CXB reports that SCEN is in the usual summer slump, with K6IKV and K6GUC sharing NCS duties. WB6WJO has a second call of WA6HZS at Camp Harvey West, a B.S.A. camp up in the high country of El Dorado Co. W6DLB is giving up ham radio after being interested since 1915. Girls? Interested in radio clubs? Consider the RAMS which has room for all members of the family, radio amateur or not. The North Hills Radio Club, sponsor of the California QSO Party to be held Oct. 5 through 7, is looking for additional membership. W6BIL worked 5U7AN for DXCC No. 277 with 276 confirmed. W6DOR just got back from Anchorage where he operated as KL7GKW. Ev also holds the call W7BYF. WB6EAG finally got into a CD Party. The Nevada County ARC reports the Grand Pappy's Net is on 1990 at 5 A.M. local time. QNIs are from Trinity Co., Lake Tahoe, Santa Cruz, etc. There you are. 160 meter fans. Traffic: (July) WB6YTX 93, W6LNZ 86, WB6MAE/6 32, WB6QZZ 19, W6NKR 12, W6VUZ 3. (June) K6KRL 19.

SAN FRANCISCO—SCM, Hugh Cassidy, WA6AUD—SEC: W6WLV. W6KVQ received the MORAN Awards for general excellence in net duties during the Annual Roundup of the Mission Trail Net. W6-FAX is a new check-in with the Northern California Net. WA6BYZ made the BPL again in July. W6ARQ has moved to Novato and is trying 2-meter s.s.b. WB2JQP is home from the Far East and up in the mountains trying the fishing. W6DTV spent the summer at Old Station on the slope of Mt. Lassen operating portable but is now home for the fall school session. The Marin Club participated in the Greater Bay Area Hamfest in July. W6WLV con-

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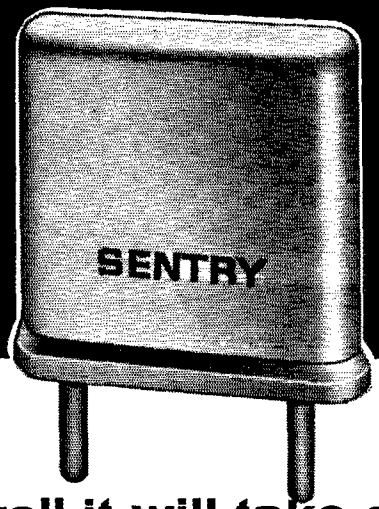

24

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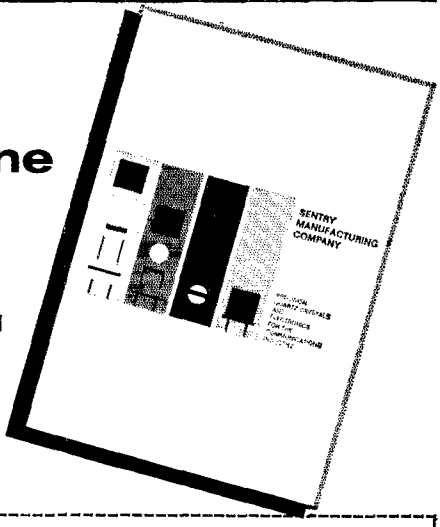

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tinues to shake the ECs up to get their organizations ready for the coming wet season. WB6UJO has put up a mono-bander for 20 meters for some DXing. WA6IVM has returned from a long trip to Japan and much visiting with the JA DXers. The San Francisco Radio Club held its July meeting at the Burgermeister Brewery. W6SR has been in the Kaiser Hospital in San Francisco with a heart condition. W6ZC has returned from a long trip in Europe. WB6CIE has swapped the vertical for a tri-bander beam. W6BIP is being sent by his firm on a trip which will take him through Europe and down into the Indian Ocean. WB6OGF has a new Swan 350. W6JSY is an Asst. EC in the Eureka area. W6CYO made it over to the FCC office for the first time in 39 years to get his Advanced Class license. K6KEW has returned to Marin County after an absence of several years and is planning a DX-pedition to Rat Island. W6FAX is a new ORS. Traffic: (July) WA6-BYZ 295, W6KVQ 214, WA6AUD 187, WB6LFT 81, WB6JQP 80, W6BWV 34, W6FAX 18, K6TZN 16, W6BIP 11, WB6OGF 9, W6PZE 2. (June) W6FAX 5.

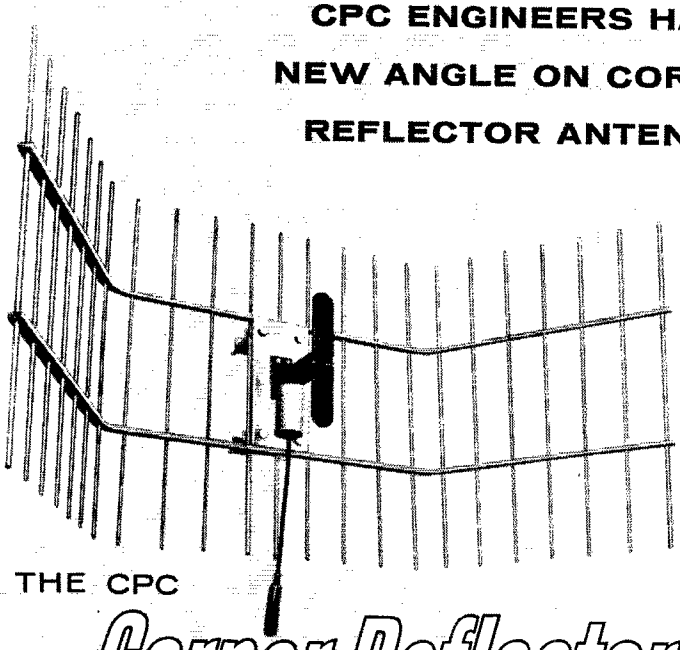
SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—The new officers of the Tulare County Amateur Radio Club are K6RGZ, pres.; W6NKJ, vice-pres.; WA6CUZ, secy. The Boner Award was won by W6ARE. The TCARC held its Annual Breakfast in Tulare at the Pancake House with 36 in attendance. WB6-SUP has a new Hi-Gain vertical antenna. W6COB is on 2 meters and seems to be working out. W6IPC is getting his RTTY equipment working for traffic. W6RRN is working 6-meter DX. WB6VYM worked a VE7 on 2 meters. WB6QDH is on 2 with a Sidwinder with 2 eight-element beams up 50 ft. W6YKS is building a 6- and 2-meter rig. W6NKJ has a 6-meter s.s.b. converter. K6RGZ has a Swan 250. W6ARE and WA6CUZ have worked up an identification system for the 2-meter f.m. repeater of the TCARC. W6BYY is moving down to L.A. from Visalia and, as time permits, he will be chasing DX from down there. W6TRP is operating portable from Camp Nelson. WB6OHB has a new Galaxy. WA6URV has a new Galaxy also. K6KOL is on 2-meter s.s.b. with ½ watts. W6JPS is operating fixed and portable with an NCX-3 s.s.b., no less. WB6UHB couldn't raise anything on 6 and found out, no modulator. WN6HIU is a new Novice in Modesto. W6DPD has 2 eleven-element 2-meter antennas. Traffic: (July) W6ADB 359, WB6HVA 247, WA6SCE 201, K6KOL 179. (June) W6IPC 326.

SANTA CLARA VLLEY—SCM, Edward T. Turner, W6NVO—SEC: W6VZE. RM: W6LFA. The Bay Area AREC Net meets on 3900 kc. at 1830G Sun. Nets: NCN, 3635 kc. 7 P.M.; RN6, 3655 kc., 7:45 P.M.; PAN, 7135 kc. (will return to 3675 kc. in the fall); RN6, 3655 kc. 9:30 P.M. Correction: The May report from W6YBV should have read that he is starting as liaison PAN-2 from RN-6 on Sun. Sorry about the misunderstanding, Lee. W6DEF activities would about fill up the report and he would like to see c.w. check-ins for traffic to the Salinas/Monterey Bay area. W6RFF is building a new final. W6AUC also is QRL with traffic, telephone relaying and skeds. K6DYX reports July was a slow traffic month on TCC. W6VK went to the CHC-FHC Convention in Boston. W6BVB had visitors from home, his dad, W9ADO. W6RSY is on vacation now and despite many heavy traffic skeds manages to hold a number of private skeds. WB6IZF, mobile in a rented car, checks into the WCARS 7255, WX Net and WPSS Nets. WB6LYD, OBS is on 2 meter RTTY at 8 P.M. local time. W6MMG is building a 2-meter v.f.o. and checks into PCN while on vacation. WA6LFA is just back from a trip around the country. W6BPT has a 700 watt linear but not much traffic. W6ZRJ was on vacation and almost too late with his traffic report via radio. Visit the ARRL-SCM booth at the Greater Bay Area Hamfest Oct. 19-20, Thunderbolt Motel, Milbrae. Help keep the net channels clear. Listen first. Traffic: W6-RSY 745, W6YBV 364, W6DEF 121, K6DYX 99, WA6-LFA 56, W6AUC 40, W6VK 30, W6ZRJ 17, K6HGV 16, W6RFF 6, W6BVB 4, W6BPT 2.

ROANOKE DIVISION

NORTH CAROLINA—SCM, Barnett S. Dodd, W4-BNU—Asst. SCM: James O. Pullman, W4VTR. SEC: WA4LWE. RM: K4CWZ. PAM: W4AJT, V.H.F. PAM: W4HJZ. K4EO reports that eleven members of THEN recently received their Advanced Class amateur licenses, and there are others who will be trying for them soon. WB4IJH now has an EICO-753. W4NAP has been keeping weekly schedules with OA4ACF, keeping parents in Reidsville in touch with their daughter. WA4IXW has joined the Navy and is now in San Diego, Calif. The Annual NTS Picnic at Morrow Mountain was well attended with all N.C. nets represented. W4IRE is back in the saddle as NCN(E) manager after a six-months

CPC ENGINEERS HAD A NEW ANGLE ON CORNER REFLECTOR ANTENNAS

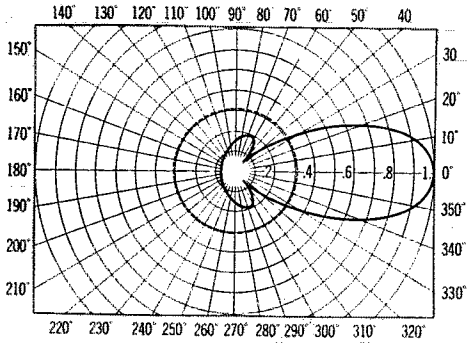


Combining maximum strength with optimum electrical performance, this 10.0 db gain antenna meets the increasing demand for rugged durability at minimum weight. Cat. No. 465-509, has a reflector 55 in. by 29 in., yet weighs only 20 lbs. Its rated wind velocity is 150 mph. The radiating element material is brass, reflector screen components are of high strength aluminum alloys, and mounting accessories are fabricated of hot galvanized steel. This CPC Corner Reflector Antenna is ideally suited for use in multiple corner arrays.

THE CPC *Corner Reflector Antenna*

Cat. No. 465-509

Frequency Range 406-470 Mc



Horizontal field strength pattern; a dipole pattern is shown for reference.

Note: dbd gain indicated as per EIA RS-329

Electrical Specifications

NOMINAL INPUT IMPEDANCE	50 ohms
FORWARD GAIN	10.0 db at 450 Mc
FRONT-TO-BACK RATIO	25.0 db
MAXIMUM POWER INPUT	250 watts
TERMINATION	Type N Female with metal weather shield and Type N Male with Neoprene housing
VSWR	1.5:1
BANDWIDTH	406-470 Mc
LIGHTNING PROTECTION	Direct Ground

Mechanical Specifications

REFLECTOR	55" wide by 29" high
REFLECTOR MATERIAL	6061-T6 aluminum
RADIATING ELEMENT MATERIAL	Brass
RADIATING ELEMENT SIZE	13-1/4" long by 2" wide
RATED WIND VELOCITY	in excess of 150 MPH with no ice 85 MPH with 1/2" radial ice
LATERAL THRUST AT RATED WIND	164 lbs. no ice 180 lbs. with rated ice load
WEIGHT	20 lbs.

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leave of absence for specialized training up "nawth" for Western Electric. WA4KWC says he is making better CD Party scores on c.w. than on phone now that he has a new "Match-Box."

Net	*Freq.*	*Time*	*Days*	*QTC*	*Mgr.*
NCN (E)	3573 kc.	2230Z	Daily	104	W4IRE
THEN	3923 kc.	0030Z	Daily	101	W4ZZC
NCN (L)	3573 kc.	0200Z	Daily	57	WA4CFN
Late (June) SSBN	3938 kc.	2330Z	Daily	36	WA4LWE

Traffic: (July) K4BUJ 418, W4EVN 205, W4IRE 104, W4FDV 58, W4ZZC 41, WB4JRG 36, K4EO 33, WA4VNV 33, WA4UQC 19, W4VTR 18, WA4GMC 17, WB4IJH 15, WA4AKX 13, K4ZKQ 12, WA4ZLK 11, WA4KWC 6, WA4RVI 5, KØJFJ/4 5, K4YCL 4. (June) WB4IJH 24. (May) WB4IJH 12.

SOUTH CAROLINA—SCM, Charles N. Wright, W4PED—SEC: WA4ECJ. RM: K4LND. PAM: WB4BZA.

SCPN	3930 kc.	0830 and 1530 EST Sun.		1200 Noon Daily
SCN	3795 kc.	2300Z	0200Z	Daily July Tfc. 50
SCSSBN	3915 kc.	2300Z		Daily July Tfc. 89

K6QPH/4 reports his first harmonic, a boy, checked in July 28. In Anderson WB4DOT, with a new T4X, skeds his son in Denver. WB4FAN is exercising a new ground plane on 10 and WB4EOC sports a new 4-400 linear. Best wishes go to W4PST, recovering from an auto accident. The Spartanburg club-house wall is now graced by the plaque won in the transmitter building contest at the Columbia Hamfest. A crowd of 65 enjoyed the good food, eyeball QSOs and joint RACES/AREC meeting at the annual Camden Picnic. K4GL, in Pickens, reports the 6-meter band has been good to him to *the tune of 35 states. He still keeps meteor scatter* skeds on 144 Mc. but has heard nothing on 220. See you all at the Rock Hill 'fest! Traffic: WB4DXX 139, K6QPH/4 44, WA4EPP 22, K4GRG 21, K4OCU 20, W4NTO 19, W4FVV 15, W4PED 14, WB4BZA 11, WA4HFA 8.

VIRGINIA—SCM, H. J. Hopkins, W4SHJ—SEC: K4LMB. RMs: K4MLC, WA4EUL. PAM: W4OKN. WA4WJJ has been transferred to California after a tour as chief operator at K4CG. W4QDY received a letter of appreciation from the Coast Guard for supplying morale communications to remote station ships. WA4EUL has new Collins equipment which will allow him to operate s.s.b. W4THV is a new OPS appointee. WB4GTS is now mobile on 80 meters. W4GR, W4KFC and others plan a second trip to PJ country for the fall DX contests. Watch for them. W4JUJ has received the YLCC/500 award. Manager WB4CVY has issued dozens of certificates to worthy members of the Northern Va. AREC Net. W4DM/W4PTR is building a solid state receiver. WA4PBG has been named AREA 4 EC after the resignation of K4DC. Section net members are reminded of the forthcoming shift to standard time and the one hour adjustment in GMT net meeting times which normally occur simultaneously. Traffic: (July) WB4GTG 502, K4KNP 202, WB4FDT 160, W4NLC 149, K4CG 137, W4RHA 136, W4UQ 133, WB4DRB 121, WA4EUL 113, WB4CVY 93, K4FSS 88, WB4FLT 67, K4MLC 67, W4TE 67, WB4DOY 56, W4OKN 51, WA4JJF 49, K4LMB 44, K4NDH 40, K4TSJ 39, W4YZC 37, WA4SJT 36, WB4BZE 20, WB4FUJ 20, WB4EAE 18, WN4HRA 18, WB4GTS 14, W4HE 14, W4THV 14, W4IA 13, W4SHJ 9, WA4FIJ 8, WA4PBG 8, K2USW/4 6, WB4JPX 5, W4LK 5, W4ZAU 5, K4GR 4, W4KFC 4, W4MK 4, W4KX 3, WB4GYP 1. (June) K4DC 45, WN4HRA 11.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—SEC: W8EV. RMs: K8MYU, K8TPF. PAMs: W8IYD, K8CHW. WVN Phone Net Mgr.: WA8YOF. WN8BGG is interested in a Novice Traffic Net. WA8WCK and WA8NDY very active in Upshur County AREC work. W8SQO has received an Extra Class ticket. K8BIT has been transferred to Pittsburgh and along with his wife, K8MQB regretfully leaves. W. Va. The fall meeting of the W. Va. Chapter of the QCWA is set for Charleston Oct. 12. K8VNL has moved back to West Va. WVN (c.w.) Net reports 22 sessions, 46 messages and WVN (phone) Net 31 sessions, 119 messages. W8DUV and W8DUW *now have linear for phone, c.w. and RTTY.* All clubs should be represented on the State Council. If your club is not on the mailing list, contact Council Secretary W8DUV. W8MIS and W8DAR are recovering from recent illnesses. WA8PFB constructs neat TU for RTTY operation. K8BIT has 140 DXCC confirmed. K8TPF held open house at his new home and radio shack. W8ESQ and W8TGF operate v.h.f. openings from 4000-ft. Rickle's Knob. W8BT has DXCC from Belgium. K8MYU elected MARA's delegate to the State Council. Traffic: WA8POS 125, W8SQO 100, WA8NDY

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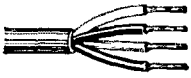

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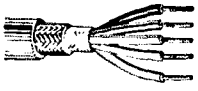
Sturdy, flexible, plastic insulated cable for rotor applications. Color coded. Chrome, vinyl plastic jacket resists sun and aging.



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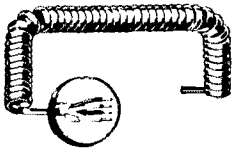

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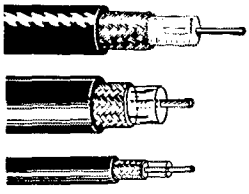

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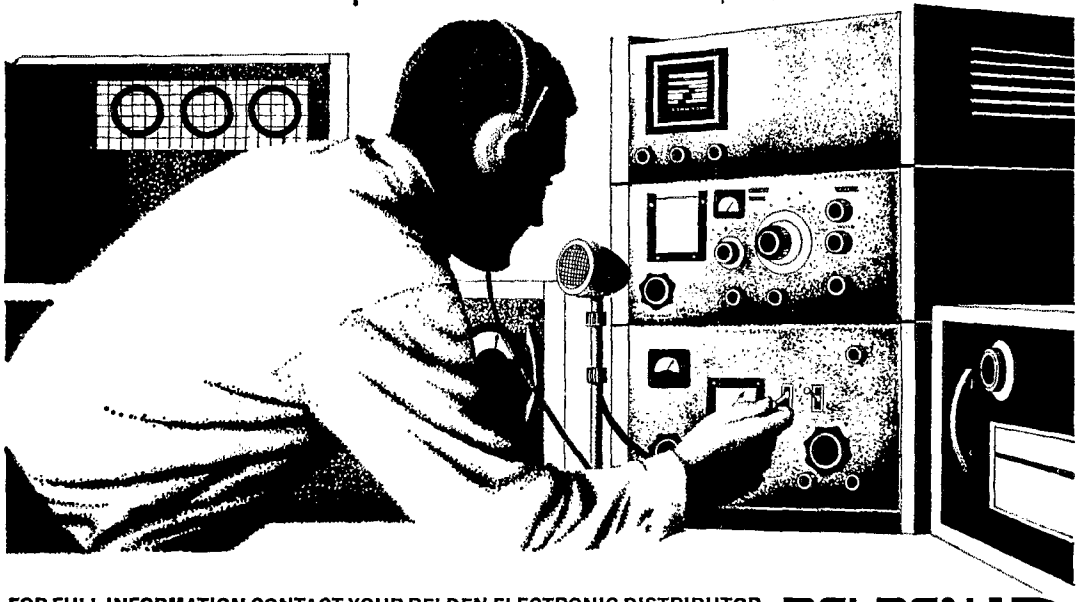

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70, WA8RQB 70, WA8WCK 40, WA8YSB 36, K8MYU 34, W8DUV 23, W8JM 22, WA8WIX 20, W8GUL 12, K8MQB 11, WA8YOF 11, WA8TWR 8, K8BIT 7, W8IYD 4, W8EV 3, W8WEJ 3, WA8CKN 2, K8CFT 1, W8GQE 1, W8GYU 1, W8IMX 1, K8JGY 1, WA8KGU 1, WA8KMZ 1, WA8LAL 1, W8LBT 1, WA8LFW 1, W8TQD 1, W8VOI 1.

ROCKY MOUNTAIN DIVISION

NEW MEXICO—SCM, Kenneth D. Mills, W5WZK—SEC: W5PNY. RM: WA5FJK. OO: K5EFW. PAMs: W5DMG, WA5FFL. Note the new net times and frequencies:

New Mexico Roadrunner Traffic,	M-F 3.915 Mc. 1800 MST,
New Mexico Breakfast Club,	3.915 Mc. 0630 MST, M-F
New Mexico Emergency Phone Net,	3.915 Mc. 0700 MST, Sat.-Sun.

W5HJ has announced his candidacy as vice-director of the Rocky Mountain Division. The V.H.F.-F.M. Society of New Mexico has been formed. The club's primary interest is in 2 meters and repeater systems. WA5JDZ was elected pres. and K5CQH secy.-treas. Membership will be open to all who have the same interest. WA5FPS reports K5GHS has moved to Iowa and W5LFL has been transferred to California. Les was the secy.-treas. of the Albuquerque V.H.F. Club. Your SCM has a supply of CD Operating Aids 9A, ARL7 or 71. Traffic: W4DMG 24, WA5MIY 11, WA5JNC 7, W5MYM 6, W5NON 5, W5PNY 4, WA5BLI 2.

UTAH—SCM, Thomas H. Miller, W7QWH—SEC: W7WKF. Thanks are extended to W7VSS for the fine job he did in handling the SCM job for the last two years. Early reports indicate that the Ogden ARC has scored a narrow victory in the Utah Section Annual Field Day competition over the Utah ARC. Congrats! W7SKB has been awarded a BUN certificate which represents a considerable effort in traffic-handling and net operation. BUN stations are up this month despite the usual poor summer conditions. All amateurs in the state are invited to submit monthly activity reports to the SCM for write-up in *QST*. *The Microvolt*, UARC's monthly publication, has won several awards given by the Amateur Radio News Service. The editor, K7HFV, has done a fine job. Traffic reports are down but totals are up. Traffic: K7HLR 178, W7OCX 143, K7SOT 57.

WYOMING—SCM, Wayne M. Moore, W7CQL—SEC: K7NQX. RM: WA7CLF. PAMs: W7TZK, K7SLM. OBSs: K7SLM, K7NQX. Nets: Pony Express, Sun. at 0800 on 3920; YO, daily at 1930 on 3610; Jackalope, Mon. through Sat. at 1215 on 7260; Wx Net, 0630 Mon. through Sat. on 3920. Note that the YO Net time is 0130 GMT, so don't forget the time change when we go off Daylight Saving Time. The hamfest went off very well and W7NKR went off to Washington to rest up. Also, K7AHO is out there doing some fishing. K7TAQ lived up to his EC job in Aug. in being the communications link with the Highway Patrol after a serious accident near Buffalo. WA7GYP is now on s.s.b. from Sheridan. W7HEB and WA7WRS visited K7VWA in July and brought some of her pet trout home. K7WUR is recuperating nicely from surgery. K7RFL and WA7HAB visited in Casper in Aug. Traffic: K7KSA 71, W7TZK 48, WA7EDC 19, K7VWA 17, W7HLA 15, WA7GYQ 12, W7OBE 10, WA7EWC 9, WA7GOV 6, K7OVD 4, K7OAF 2.

SOUTHEASTERN DIVISION

ALABAMA—SCM, Edward L. Stone, K4WHW—SEC: W4FPI. PAM: WA4EEC. RM: K4BSK, WA4AZC, WA4ROP, K4UEC, K4AOZ and WA4JSM have been doing excellent jobs as OBSs and have all been endorsed for another term. If you feel that you would like to help out with the section workload, the opportunity is ever present. Contact any one of the Alabama net managers, the PAM, RM or the SCM. We always need new control station trainees, Emergency Coordinators, liaison stations. The time is here again to elect an SCM for the section. Check with your friends and get the details for making a nomination. This is your chance to have a say in who will do the job. Details are printed in *QST*. WA4GNG is now putting fine signals out from his new QTH at Hartselle, 80 through 6. How about you traffic-handlers who did not report sending in your reports, either by mail or air? Traffic: (July) W4FYO 172, WA4AVM 148, WA4ROP 90, K4BSK 71, WA4JSM 65, W4FVY 49, WB4EKJ 46, K4AOZ 44, WA4VEK 44, K4WHW 39, K4WOP 27, WB4EYZ 26, WB4KDN 17, WA4EEC 16, WA4AZC 15, K4OAH 11, WA4WTX 10, K4UMD 7, W4DGH 4, K4UCC 4, WB4GZW 3, K4KJD 1. (June) K4OAH 2.

CANAL ZONE—SCM, Russell E. Oberholtzer, KZ5OB—Asst. SCM: John S. Catanzaro, KZ5JC. Howard

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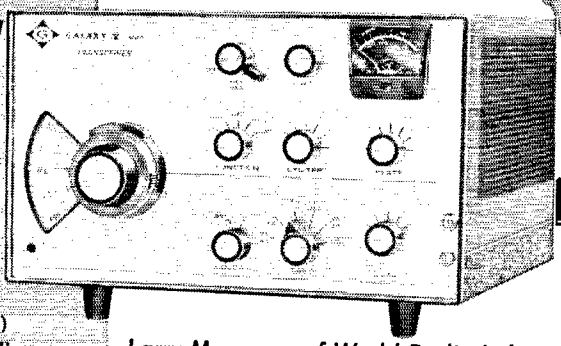

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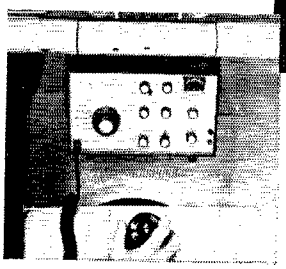

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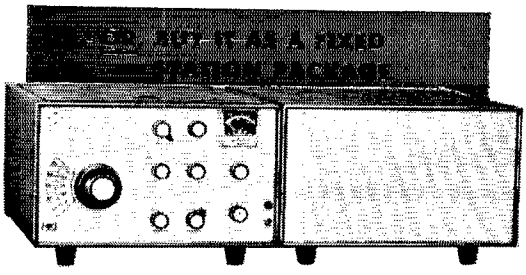

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Air Force MARS station is reactivating and looking for new members. Bob Hirsch, ex-KZ5UR, came up with the idea of forming an ex-KZ5 society. All displaced KZ5s interested may contact W5QEK, WA5NUR (ex-KZ5TT) or SCM KZ5OB. Further information will follow in this column as it develops. KZ5AJ and KZ5QA are rotating to Vietnam. A farewell party was held for them at the Elks Club. The C.Z. Emergency Net, on 7.090 kc. has been more active since the summer vacation period ended. Traffic: KZ5MV 126, KZ5AD 81, KZ5SA 66, KZ5JC 27, KZ5CT 18.

EASTERN FLORIDA—SCM, Jesse H. Morris, W4MVB—Asst. SCM: William J. Blasingame, Jr., W4ANEV. SEC: W4IYT. Asst. SEC: W4FP. RM C.W.: W4ILE. RM RTTY: W4RWM. PAM 75M: W4OGX. PAM 40M: W4SDR. V.H.F. PAM: WA4BMC. Well, here I am back in service again. At least I am nearly back in service. Bill still is doing most of the work until I get my feet back on the ground. My job has taken me away from home for the past five months and it is hard to get caught up after having been gone for that long. This was just about twice as long as I anticipated and things got a little behind schedule around the W4MVB QTH. I wish to thank Bill and all the other appointees in Eastern Florida for carrying on in my absence. As a matter of fact I note with some mixed feelings that things went about as well (or perhaps better) in my absence as when I was here. Bill has done an outstanding job and will continue to help me for the remainder of my term as my job again will take me away from home from time to time. Many, many reports were received about the fantastic 2-meter opening up the East Coast and into Canada during my absence. More news next month and by the time you read this I should have cleared away all the back correspondence. Thanks for your patience and efforts during the past five months. Traffic: (July) W4BKC 332, WB4AIW 319, WA4NEV 306, WA4SCK 279, K4EHY 258, W4FP 132, W4SDR 97, WB4EPD 85, WA4HED 81, K4LEC 80, WA4IJH 70, W4UQZ 67, WB4HJW 59, WB4DSP 53, K4COO 45, WB4FGW 44, W4SMK 40, W4VDC 39, W4NGR 35, W4AKB 34, WA4HDH 32, W4FHZ 28, W4OGX 28, K4LPS 26, WA4UFO 25, W4DVO 23, WA4CIQ 19, WA4EYU 18, K4BLM 17, W4GDK 16, K4SJH 16, WB4DDO 14, W4YPX 13, WB4FSF 8, K4EBE 7, W4ILE 7, WA4BGW 6, W4TJM 5, W4VPQ 5. (June) W4ILE 34, K4IEX 28, WN4JJH 2.

FLORIDA AUTOMOBILE INSPECTION REGULATIONS INDICATE THAT FLORIDA HAMS WITH CALL LETTER PLATES MUST HAVE THEIR VEHICLES INSPECTED DURING (OR BEFORE) THE MONTH OF NOVEMBER.

GEORGIA—SCM, Howard L. Schonher, W4RZL—SEC: WA4WQU. RM: W4FDN. PAMs: K4HQI, W4YDN. W4YDN is ex-K7GOK with a new call and Advanced Class ticket. W4LUA now has his Extra Class license. During the period July 6-10 WA4WQU, WB4DMO, WA4EHT and WA4OQQ provided communications in Savannah for the 22nd Annual Powder Puff Derby. W4KXM returned to Macon after a three-month computer course. K4HIA has a new NCL-2000. 50-Mc. activity remained good for the month of July. Numerous E openings and a few double hop signals were reported. There were band openings to California, Arizona, Nevada, Utah, Oregon, Washington and Montana with the following DX: CO5CN, FG7XT, ZF1DT, W1HOY/KP4 and T12NA. Two-meter activity still is on the increase with two new stations in the Athens area. GSN reports 371 QNI. 243 messages handled. K4UXJ has a new tower, WA4SKF has a tower, WN4GTB lost his tower and antenna during installation. W4OLC has a TR-108 on 2. WA5NCL/4 is on 6 s.s.b. in Athens. W4ARH QRD Thailand in Sept. I appreciate my XYL filing my report while I was hospitalized last month. The following June traffic was not late—I just wasn't here to take it. Traffic: (July) W4FOE 244, W4CZN 106, W4FDN 71, K4JFY 68, WA4WQU 48, W4RZL 39, WA4UQQ 37, W4DDY 25, WA4JES 12. (June) W4FOE 330, W4CZN 168, K4JFY 61, W4DDY 57, W4FDN 49, WA4JES 16.

WESTERN FLORIDA—SCM, Frank M. Butler, Jr., W4RKH—SEC: W4IKB. PAMs: H.F.—W7BNR/4. V.H.F.—W4UUF. RM: K4UBR. Section nets:

Net	*Freq.*	*Time*	*Days*	*Sess.*	*QNI*	*QTC*
WFPN	3957 kc.	2200Z	Daily	31	428	28
QFN	3651 kc.	2230/0200Z	Daily	62	...	..

Penscola: WA4WAR is the new EC for Escambia County. W4JV has completed his new antenna system and again is active on all h.f. Panama City: WA4ZGI and his XYL, WB4EZS, have moved to Lakeland. He is now with the Florida Highway Patrol. W7BNR/4 reports that the West Florida Phone Net Annual picnic was held at St. Andrews State Park Aug. 25. Fort

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The first SIGNAL/ONE production units will be in the hands of a few lucky amateurs in time for this winter's contest season . . . an appropriate initiation for gear designed to thrive on rugged competition. If you're a contest regular, write for information on special early delivery arrangements . . . if not . . . don't despair . . . additional quantities of superb new SIGNAL/ONE amateur equipment will be on the way to proud new owners even before the first contests are over.

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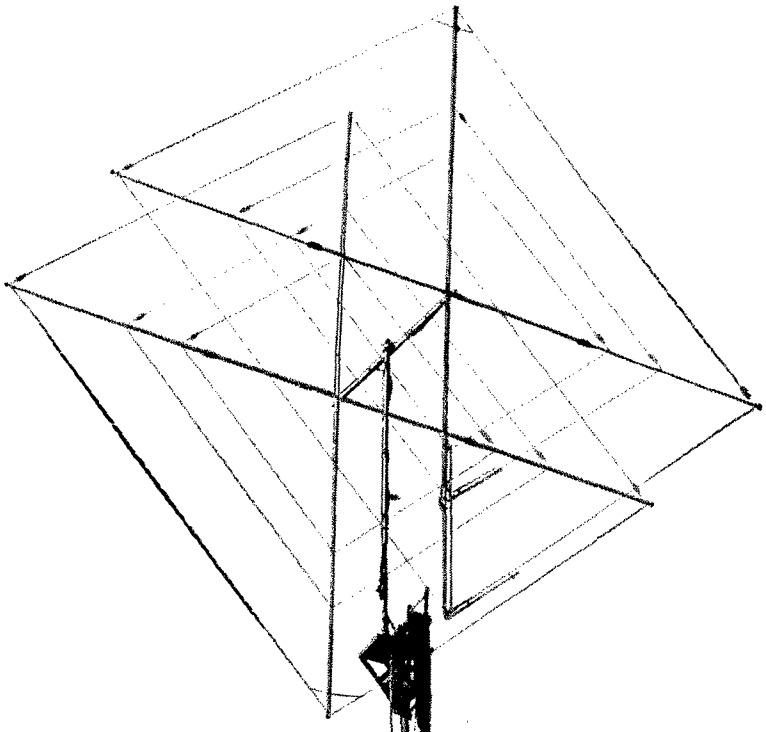
Walton Beach: W4RKH is T.D.Y. for approximately one month in Washington, D.C. EC WB4EER has revised the County Emergency Procedure Operating Manual for Okaloosa County. During the BEBA Net WB4EER came upon a highway accident and following a call on 146.94-Mc. f.m. within moments had an ambulance and county authorities on the spot. W4JNT and WA4DUF are now mobile on 146.94-Mc. f.m. Chipley: WA4ZFK is now mobile on 146.94-Mc. f.m. Madison: W4RCO is now active on 146.94-Mc. f.m., along with WA4GHE. W4WMA soon will have his 146.94-Mc. f.m. rig installed in his car.

SOUTHWESTERN DIVISION

ARIZONA—SCM, Floyd C. Colyar, W7FKK—PAM: W7CAF. RM: K7NHL. The Fort Tuthill Hamfest held in Flagstaff was a huge success and a fine time was had by all. K7GRH and WA7JRL passed the Advanced Class exams. W5EZQ/7 has a new Galaxy and is active on 2, 6, 10, 15, 20, 40 and 80. Your new SCM will need your support to increase activity and improve the organization of the section. You will be asked to help. Let's all resolve to improve our operations and be aware of opportunities to perform public service through amateur radio. Some ideas for self-improvement would be to join a traffic net, improve our c.w. speed, build some piece of equipment or get a higher class license. This is my last report as SCM. I would like to express my appreciation for the wonderful support given me during my four years of office. It would be impossible to name all who contributed toward making my terms both memorable and enjoyable ones. Thanks to all. Traffic: K7NHL 124, WA7IFD 65, W7FKK 11.

LOS ANGELES—SCM, Donald R. Etheredge, K6UMV—Asst. SCM: Harvy D. D. Hetland, WA6KZI. Acting SEC: K6AVQ. BPL was earned in July by W6GYH, WB6BBO and W6MLF. Just a few of the participants in the Powder Puff Derby included W6DDB, W6MLZ, WA6VTM, WB6PNY, WB6YVN, WB6ZXB, W6MWO/6, WN6ZAL, WN6ZAQ and Vice Director W6PIF and his XYL. V.h.f.er WB6TSM has erected a new 60-ft. tower. A new club, the 1TT (San Fernando) Radio Club, has elected its first officers in the form of W6IST, prexy; W6EWG, vice-pres.; WB6VVR, secy.; W6MIF, activities. A Silent Key in the San Gabriel Valley is W6MEG. While WB6WDS is working on a multiband dipole in his spare moments, WB6VZD is experimenting with 2 meters. W6CRQ has constructed a phase shifter for his OO work, and W6FTQ reports adding the final touches on a 40-meter c.w. rig that now works fine. WA6ODD, of the LERC RC group, was heard in the fourth district recently and W6RCV reports having a luncheon with ZL2AYI in July. The So. Cal. DX Club has a new slate of officers in W6FRZ, prexy; W6GEN, vice-pres.; W6DQX, secy.; W6EJJ, treas.; W6FW, W6NJU and WA6GLD, directors. OVS WB6GHB reports writing fiction and also notes for the ARRL *Hints and Kinks* booklet. The Paramount group is gathering portable transceivers for the club n.f.m. on the 50-Mc. band. WB6GGL reports long working hours cutting the traffic total down, and K6EA is jaunting in O-Land for a while. W6NSH is looking for hand keys (old explosion proof types that cannot "bite" the hand of blind operators if they touch the wrong spot) for his blind amateur radio class. WB6SXY, as well as many others, is active in the Intruder Watch program in the section. At the end of August the K6BPC crew handled communications for the Olympic Kayak Trials in Long Beach. K6LK is now involved in setting up a station with the aid of W6CAL for moonbounce with an 8-ft. polar mounted dish. A list of all clubs in the section is now compiled and is available for S.A.S.E. Club bulletins are solicited and welcomed via address on page 6. Traffic: (July) W6GYH 1222, WB6BBO 691, W6MLF 604, W6QAE 408. WA6KZI 207, K6CDW 154, WB6TQS 130, W6FD 102, W6MLZ 101. WP6GGL 40. WB6KGK 39, W6DQX 36, K6CL 33, WB6WDS 33, WB6TMC 28, WB6VZD 26, W6MN 20, K6ASK 19, W6USY 19, W6BHG 12, W6DGH 8, WB6AEL 7, WB6SXY 7, K6UMV 7, WB6OLD 5, K6EA 4, W6HUJ 4, W6TN 4, W6OEO 1, W6SRE 1.

ORANGE—SCM, Roy R. Maxson, W6DEY—WB6UCK now is on s.s.b. with an HT-37. The Chino HS ARC call is WA6DEH. OO W6VOZ has a 14-ft. runabout boat now for maritime mobile. WB6RJX, W6JF, WA6ROF, W6PQA, W6DNA and many others are checking in the AREC C.W. Net, 3790 kc. at 9:30 A.M. Sun. WB6RVM, Asst. SEC, has a Henry 2K, and recently was elected vice-pres. of the Golden Bear Net. The San Bernardino Microwave Society, Inc., now has a new meeting place, the second floor of the Security-Pacific National Bank, 204 E. Sixth St., Corona, entrance south side of the building. Meetings are held the first Thurs. of each month at 1930. W6FB's July visitor was WB6PGZ. ORS/OBS WB6UTC is leaving for W4-Land. Hurry back, Mike. ORS WB6AKR is back in Hemet, assisting WB6YXA in traffic. SEC WA6ROF ad-



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vises that all is well on RN6. W6BNX has an antenna farm on the roof of his QTH. Welcome to WA6ORJ/WØHAW, who moved to Tustin from Pomona. He is past-pres. of the Tri-County ARA. W6EIF is back from Florida. WA6MQL, WA6KRU, W6QAT, WB6IFV, WA6UBP, W6DEY and others now are on the RACES 6-meter repeater. WA1JHZ/6 is leaving for Westover AFB. Traffic: (July) WB6UTC 311, K6MCA 289, WA6ROF 259, WB6TYZ 249, W6BNX 126, WA1JHZ/6 108, WB6UCK 94, WB6RVM 69, K6IME 26, W6WRJ 26, WB6AKR 8. (June) WB6UCK 83.

SANTA BARBARA—SCM, Cecil D. Hinson, WA6OKN—SEC: K6GV. WB6BWZ is the active OO and EC in Santa Marie who reports that the tentative 75-meter Santa Maria AREC frequency is 3960 or 3965. The tentative 2-meter frequency will be 146.35. Those who are interested in AREC activities in the Santa Maria area should check with WB6BWZ, W6UJ reports that the Lompoc e.d. stations checks in on SCN on 3600 c.w. Complete emergency power is available. WB6WZ has a new 3-band quad to assist with his MARS activities. Let's hear it for W6DPV, who has just received that Beautiful Extra Class license. To go with the new license Jim has a Heath HW-100 on order. W6ORW is the active OPS in Simi as well as quite active in the Mission Trail Net at 7 P.M. on 3854 kc. K6GV has a new job and has been unable to check in as usual on 3895. Sorry to report that the XYL of K6AAK has been in the hospital but medical reports are favorable. The Channel Cities Net is an active traffic-handling net which meets weekdays at 1830 on 145.8 Mc. WA6WYD, in Port Hueneme, is Net Control. New appointment: W6ORW as EC for Simi Valley. Traffic: W6ORW 22, WB6DPV 15, W6UJ 3, WB6BWZ 1.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM: E. C. Pool, W5NFO. SEC: W5PYI. PAM: W5BOO. I guess this is my swan song since this will be my last report as your SCM and I want to thank the many amateurs who helped to make my job easy by their support and cooperation. I do not intend to retire from amateur radio as it has been my love since 1919 and I will continue to serve to the best of my ability. I hope that you will give your new SCM the same support and cooperation that I have received in the past ten years. W5LR has been RM for most of my term in office and has executed the duties of that appointment very well. Please remember that the SCM must file his report by the 7th of the month and your report on time will ease his job no end. Many clubs are holding weekly classes for Novice, General and Advanced instruction. K5BNH seems to be trying to establish a record for making BPL each month. Congratulations, Bea, on your efforts. WA5TYH is coming close to the medallion. Your attention is called to the Election Notice, page 64 Aug. *QST*, for Director of the West Gulf Division. Much thought should be given as to who you want to represent you in the operation of your League. Remember your Director is your representative. Nominate your choice, then work for his election. The following was written by W5LR, your new SCM: I want to take this opportunity to thank those devoted ARRL members who wished the originator to be your SCM. It is with regret that I relieve such a fine ARRL man as W5BNG, who has been around here for many years and is highly respected. The Garland Amateur Radio Club is active in civil defense work, thanks to W5RHI. As I prepare this news item the Rebel Radio Club, Arlington State University, will hold its Annual "Pow-Wow" and gathering. The East Texas Section of Navy MARS also will hold its Annual Picnic in Tyler State Park. I am indebted to K5ENL for information on Northern Texas nets. They are: Sun. NoTexas Emgcy Net, 3930 kc.; Sun., NoWest Texas Emgcy Net, 3950 kc.; Sun., Central Texas Emgcy Net, 3870 kc.; and Sun., East Texas Emgcy Net, 3970 kc. at 8:00 A.M. The Tarrant County Emergency Net meets Sun. at 1:00 P.M. on 3970 kc. The DARC Net meets Mon. nights on 10 meters. If any have been omitted please correct me. Net report follows: 7290, check-ins 1897, traffic 1522. Band conditions: 30 sessions good, 9 fair and 5 bad. Traffic: K5BNH 805, WA5TYH 695, WA5QQR 50, K5LZA 49, W5JSM 41, K7NCG/5 14, WA5NSJ 14, W5PBN 11, W5BNG 8, W5LR 6, WA5QQQ 4, WA5CTD 2.

OKLAHOMA—SCM, Cecil C. Cash, W5PML—SEC: WA5AOB. RM: W5QMJ. PAMs: W5MFX-75, K5TEY-40, WA5JGU-6, K5ZCJ-2. The Aeronautical Center Radio Club was blessed with a real fine program in July. W5GIQ, ex-7Q7EC, gave a talk and showed color slides of his work with the U.S. Department of Agriculture extension service in Africa. K5JZV, of Tulsa, is now operating KA2ZV. Thanks to WA5TSV, WA5TRM, WA5TRN and WA5VAQ for their fine work with the Boy Scouts. They took 37 boys of Troop 72, Oklahoma City, to summer camp at Grand Teton National For-

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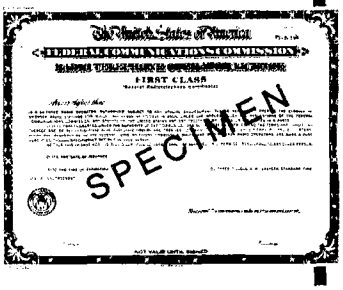

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est, Wyo., July 20 through 29. Operating a Swan 400 with inverted Vee strung up in the tall pines they were able to keep in communications with home during the week. Congratulations to the following up-graded or new licensees. Extra Class—W5WAX and W5VRV. Advanced Class—W5QGD, K5CAY, K5KOZ, WA5JGU, WA5KFT, WA5LDY, WA5OYY and W5UZX. General—WA5RQL, WA5UCK, WA5UUE, WA5VAO, WA5VAR, WA5VBA and WA5VAQ. Technician—WA5UJF. Novice—WN5UPE, WN5UMM, WN5UUT, WN5UTM, WN5UYU, WN5UYV, WN5UYF, WN5VDO, WN5VCQ, WN5VAA and WN5VEO. Following is the net schedule for this section:

Net	*Freq.*	*Time*	*Sess.*	*QNIs*	*QTCs*
OPEN	3850 kc.	1300Z	4	162	2
OPON	3920 kc.	2200Z	13	107	17
STN	3850 kc.	2230Z	25	572	174
OLZ	3682.5 kc.	0001Z	20	39	55
SSZ	3682.5 kc.	0245Z	14	33	48

Traffic: K5TEY 3872, WA5AOB 89, W5PML 59, WA5KFT 34, W5MFX 33, W5QBF 32, W5QMJ 26, WA5FSN 22 ,W5FKL 21, WA5IMO 21, WA5DZP 16, WA5KZA 16, K5CAY 14, WA5MDN 9, K5LUJ 5, K5OCX 2.

SOUTHERN TEXAS—SCM, G. D. Jerry Sears, W5AIR—SEC: K5QQG. PAM: W5KLV. RM: W5EZY. *Off Resonance*, the bulletin from Southmost Texas, reports the new antenna is about ready to go. W5HBL and EC W5KR are working on the project and indicate the Terminal Building will have to go before the antenna for the ESSA Weather Bureau Airport station. WA5PUQ reports new Generals in Corpus Christi are WA5SQD and WA5SSL. EC K5HZR has been busy checking our emergency power plant, which reminds us that all stations equipped with emergency power should be sure everything is working in good shape. See "the US News and World Report" article in the Aug. 5 issue. EC W5TFW reports K5WYJ, K5YLU, W5UVB, WA5DUG. W5TFW and W5APX participated in the Powder Puff Derby Network and says the 2-meter link from W5TFW to Airport worked out very well. EC WA5RXO reports the new Asst. EC of Brazos County is WA5GZX. EC K5HMF put up a new antenna at the KUHT TV transmitter site at 60 feet. Seems the one at 150 feet skips completely over South Texas at night. PAM W5KLV says the secretary's job for the South Texas Emergency Nets is keeping him busy. Old Timer "Sarge" Horn, ex-D4ARJ, 5A4TQ, KA2SH, SVØWZ and W7FTU, now is settled in San Antonio with the call W5IB and will be on 2 through 160 meters. The Houston Amateur Radio Club's Annual Hamfest will be held Nov. 3 at Spring Creek Park. See you all there. *TEX Bulletin* reports the TEX C.W. Traffic Net is doing well considering many are on vacation. Editor W5QJA also included some observed improper net operations and pointed them out for newcomers. New EC WA5KHE now has the daily Twin Cities Public Service Net on 3955 kc. 6:30 to 7 A.M., Nacogdoches and Angelina Counties. K2EIU/5 now is enjoying mobile with a new SB-101 and Hustler antenna. Traffic: (July) K5GDH 267, WA5QKE 156, W5EZY 110, W5QJA 91, W5BGE 85, WA5PUQ 76, K2EIU/5 73, W5AC 67, K5HZR 54, W5TFW 34, W5KLV 18, WA5RXO 8, K5WYN 8, K5HMF 7, W5AIR 6. (June) WA5MXY 88. WA5RXO 19.

CANADIAN DIVISION

MARITIME—SCM, William J. Gillis, VE1NR—Asst. SCM: R. P. Thorne, VO1EL. SEC: VE1HJ. Well, here we are back again after difficulties with the mail. The column is a bit thin because of the postal strike. By now all will have received the newsletter issued as a supplement to the column. If not please advise. VE1MO advises that he is posted to Ottawa. Harry was the EC for Prince Cty., P.E.I. Our thanks to Harry for a job well done. APN, 3653 kc. daily at 8 P.M. ATL is looking for additional stations. VE1AAX is net mgr. See the newsletter for details of the new W.A.P. award. We wish VE1RO a speedy recovery. Congrats to VO1BH, who recently celebrated his 70th birthday. The Labrador Net meets daily at 2315Z on 3785 kc. There are several new calls on the air, many through the excellent training programs conducted by many of the clubs. APN: QNI 181, QTC 31, sessions 31. Traffic: VE1AMR 54, VE1AUD 23, VE1ALV 20.

ONTARIO—SCM, Roy A. White, VE3BUX—AREC

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Asst. *National Coordinator*: VE3YC. PAMs: VE3ETM and VE3BLZ. RMs: VE3BZB, VE3DPO and VE3GI. We expect to announce the appointment of a new SEC and also an assistant within the next couple of weeks; also a new PAM to replace VE3ETM, who wishes to relinquish the position because of the pressure of other interests. I'd like to see more phone activity by Canadians *in the 7150 to 7200 segment. If we don't use it,* then somebody else will! The postal strike in Canada raised hob with business and the public in general but it's surprising what the average individual can get used to. Amateur radio (particularly the phone nets) experienced a decided boost in traffic activity and we hope it continues. Amateur radio lost an active and enthusiastic member in July when VE3BQI died at the age of 21. Our very sincere sympathy goes to his family. VE3-EGO, of Ottawa, his XYL and little girl are in Belleville General Hospital following a head-on collision in July on the first day of their annual holiday. Glad to say all are progressing favorably. VE3OE sold his rig and reverted to c.w. until the new one arrived. Welcome to VE3GMQ, VE3WT and VE3GKH, who have been appointed as ECs. Welcome, too, to VE3BZU, who has returned to the Ontario Phone Net as a controller. Don't miss out on the first Radio Society of Ontario Convention Nov. 1, 2 and 3 in Brantford at the Holiday Inn. ARRL will be holding a Forum. Quite a few Ontario hams attended the recent Soo (Michigan) Convention and I'm told "a good time was had by all." Traffic: (July) VE3GI 165, VE3GCE 66, VE3ATI 62, VE3-FGV 55, VE3AWE 44, VE3DV 34, VE3OE 34, VE3BUR 28, VE3EWD 24, VE3NO 24, VE3EHL 22, VE3DBG 19, VE3AUU 18, VE3EBC 10, VE3ETM 6, VE3DVE 3. (June) VE3BLZ 42, VE3BZB 42, VE3AUU 14, VE3GMQ 13.

QUEBEC—SCM, J. W. Ibey, VE2OJ—SEC: VE2-ALE. RM: VE2DR. PAM (v.h.f.): VE2AGQ. PAM (h.f.): VE2BWL. VE2DFW and VE2AKC have graduated to limited phone status. VE2DR has by now settled down on the c.w. nets after a good fishing summer. VE2BRD was married in Aug. His brother, VE2BRT, is well on his way to becoming an MD. We understand the conventional CD or EMO is looking for reorganization in some areas. Let us not miss the opportunity to assist in all ways. VE2AJD and VE2EC still are steadies for traffic from Three Rivers. There is almost a complete blackout from Quebec City for reports although it keeps on the map via the Quebec Phone Net. VE2-APT calls his XYL faithfully each night on mobile—to suggest dinner time. She is VE2DGV, perhaps the wittiest ham you'll hear, and is the sister of VE2DGD, who likewise is called each day by VE2AVP. Then there is VE2BWW, heard announcing his position and time of arrival for food from mobile to VE2DCB. During the summer we heard VE2CK, VE2GK, VE2FK, VE2BK and VE2DK, each an old-timer with a good letter ending. VE2BGJ operates portable from VE2DFO's QTH. VE2DCW now handles all bands, especially c.w. net frequencies, wonderfully. VE2ALE got his SEC report via special courier to Headquarters. Traffic: (July) VE2-OJ 138, VE2DR 86, VE2BRD 60, VE2ALE 54, VE2BVY 48, VE2DCW 45, VE2ADE 42, VE2AJD 29, VE2EC 24, VE2PJ 3. (June) VE2ADE 12.

SASKATCHEWAN—SCM, Gordon C. Pearce, VE5-HP—Activity on the bands has been sporadic with conditions at times good. Since our Field Day and hamfest, activity locally has been quiet, with farmers filling their pockets with imaginary dollars expected from a good harvest, and others wandering far and near on holidays. Mobile activity has been good with many visiting hams passing through and working the locals on 2 and 75 meters. One of the most enjoyable picnics in recent years was sponsored by the Wood River Amateur Radio Club, and held on the farm of VE5GU and VE5-GV. The setting was superb and the attention given to the 22 hams and their families who attended was out of this world. The thanks of all were heartily extended to these fine friends. Why not let this picnic be but a sample of what we can expect in the future from other districts? Just to remind you once more, the Saskatoon Amateur Radio Club still has copies of the history of ham radio entitled *"From Spark to Space."* Get in touch with VE5YY for your copy. Traffic: VE5RJ 11, VE5LQ 7, VE5HV 6, VE5OF 6, VE5OG 5, VE5CF 4, VE5YR 4, VE5BD 3.

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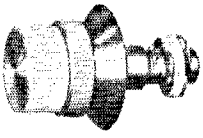

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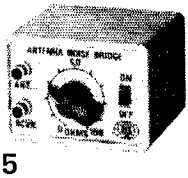

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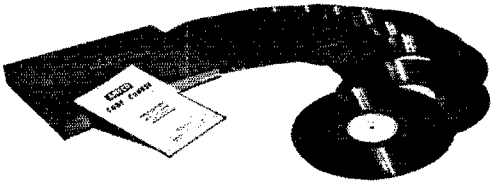

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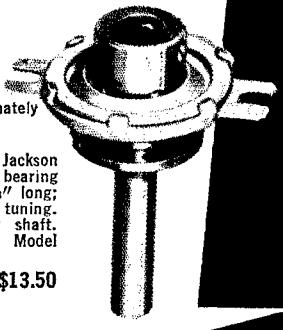

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Silent Keys

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

W1BCE, Cornelius Crowley, Norwich, Conn.
K1ENS, Kenneth Du Beau, North Billerica, Massachusetts.
K1QVE, Andrew Peterson, Gloucester, Mass.
W1UOC, Mahlon Smith, Winthrop, Mass.
K1VHT, Ted Ames, Millinocket, Maine.
K1ZPC, Hector Babin, Waltham, Mass.
K2IZI, Doug Frothingham, Smithtown, N. Y.
W2QDO, Willard Jones, Remsen, N. Y.
W2RV, James Candido, Martinez, Argentina.
W3CEU, Fred Bearinger, Denver, Penna.
K3HOS, George Wallace, Waynesboro, Penna.
W3IFJ, George Griffith, Reading, Penna.
W3SNC, Willard Swearingen, Edgewood, Maryland.
K3WWR, John Baustert, Apollo, Penna.
K4AYI, Lee Roberts, Blacksburg, S. C.
W4GSQ, Joe Gresham, Memphis, Tenn.
W4JM, Raymond Vermillion, Valparaiso, Fla.
WA4KFO, Lawrence Jeffery, Owenboro, Kentucky.
K4RRB, Bruce May, Miami Beach, Florida.
K4UEP, Amon Peters, Atlanta, Georgia.
W5JTK, Oran Roberts, Tyler, Texas.
WA5MEI, James Rouse, Crescent, Okla.
WA5NNP, Joe Rogers, Palacios, Texas.
WN5UAR, Sam Greer, Amarillo, Texas.
K5YSW, Lynwood Butler, Dallas, Texas.
W5ZLR, Maurice Evans, Lafayette, La.
W5ZZP, Jay Thompson, Sayre, Oklahoma.
W6CQV, May Dobson, Bridgeport, Calif.
W6FWA, Howell Axtell, Fallbrook, Calif.
K6IOV, Lester Via, Bellflower, Calif.
W6LVS, R. J. Woolum, Castro Valley, Calif.
W6NRY, Ivory Crites, Mammoth Lakes, Calif.
W6WHX, Robert Moser, Las Vegas, Nevada.
W7TH, Arthur Emigh, Walla Walla, Wash.
W7ZBA, Chet Hansen, Rainier, Wash.
W8BSG, Otto Wentzel, Detroit, Michigan.
W8BUY, Tom Smith, Conneaut, Ohio.
K8CXW, Lotus Benson, Cincinnati, Ohio.
W8MIP, Lee Williams, Clarksburg, W. Va.
W8WRY, Ladis Lisy, Cleveland Hgts., Ohio.
W9FK, Theodore Wetzel, Brookfield, Wisc.
WA9OBQ, Evelyn Spars, Chicago, Illinois.
WA9OVD, Wesley Harris, Chicago, Illinois.
WØGXP, Sam Woodson, Polo, Missouri.
WØHUH, Carl L. Madsen, Sioux City, Iowa.
WAØIYM, Gordon Mendenhall, Garden City, Minn.
HC2HI, Harry Crawford, Guayaquil, Ecuador.
VE7PO, Ernest Hawksworth, Duncan, British Columbia.

ARPSC

(*Continued from page 81*)

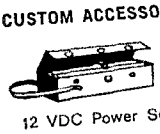
W2FRN has issued 2RN certificates to WA2BNN and WB2s DRW YBX, making a total of 25 issued this year. K3MVO has sent 3RN certificates to *W3s* AIZ AXA EEB EML KUN LOS NEM NNL *K3s* JYZ KTH YVG ZSK *WA3s* BLE HTQ. K5IBZ says vacations have hurt traffic

No, we're not lazy! It's just that "Popular Electronics" (Dec. 1967) tells the DX-150 story so well.

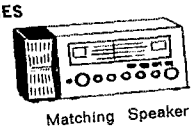
Reprinted Without Editing

"What may be the first really noteworthy advancement in communications receivers is wrapped up in the new Radio Shack imported DX-150. Featuring continuous coverage from the top of the AM broadcast band (535 kHz) to the bottom of the 10-meter band (30 MHz), the DX-150 is a single-conversion superhet with a tuned r.f. stage, two i.f. stages, full-wave product detector for SSB/CW reception — and it's 100% solid state. Selling at $119.95, the DX-150 has the flexibility of a communications receiver that a ham or SWL is used to buying for $175-plus. To rattle off a few more "features": there is a front panel antenna trimmer, fast or slow a.v.c. attack, a cleverly concealed built-in monitor speaker, plenty of calibrated bandspread, and noise limiting in both the i.f. and audio stages. Because of the solid state circuitry, the usual warm-up drift expected with a tube-type receiver is virtually absent here. And, although the DX-150 is primarily a base station receiver with a 117-volt a.c. power connection, it can be operated from an outboard d.c. power supply consisting of only 8 D-cells. Radio Shack claims that the receiver will operate for 100 hours — continuously — using only the d.c. supply. Ideal for Field Day and emergency work! The proof of the pudding so far as any communications receiver is concerned is how well it works "on the air" At POPULAR ELECTRONICS, the DX-150 was hooked up to a 125-foot long-wire antenna and tuned across the AM broadcast band. Needless to say, the S-meter was pinned on just about every single channel, and the audio quality with Radio Shack's voice-selective speaker (extra, $7.95) was crystal-clear. Tuning the band between 1.55 and 4.5 MHz, your reviewer got a chance to appreciate the comfortable handling on SSB reception. Going a little higher (4.5-13.0 MHz), the 25- and 31-meter bands were "alive" and signals appeared to leap out of the air — possibly due to the very quiet background of the DX-150. While quietness is usually regarded as a lack of sensitivity, that wasn't the case with the DX-150. On the top band (13-30 MHz), the sensitivity still seemed high; and on the CB frequencies, the DX-150 could hold its own against a dual-conversion receiver built just for CB work. **Summary:** Radio Shack has the Model DX-150 in most of its 160 retail outlets. Take a look at it, and get the "feel" of this unusual receiver."

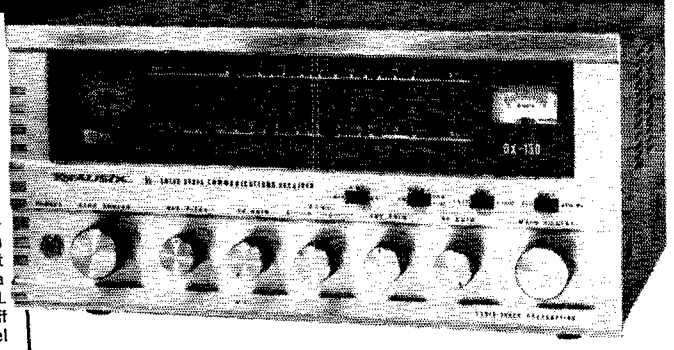
CUSTOM ACCESSORIES



12 VDC Power Set



Matching Speaker



And only Radio Shack has this 119.95 receiver!

Thousands of hams and swl's have discovered that Radio Shack's Realistic DX-150 is truly the "breakthrough" full coverage receiver of 1968. It's the 100% solid state receiver that *banishes forever* tube failure, tube heat, tube drift, and — thanks to its built-in 117V/12V supply — your dependence upon AC current when power fails or on field day. The brilliant DX-150 is NOW IN STOCK in every one of Radio Shack's over 300 stores.

CAVEAT EMPTOR

Since DX-150 is certain to be the world's most imitated communications product, we advise our readers that "solid state" on a receiver is not necessarily indicative of selectivity, sensitivity and "feel." The DX-150 is built to $200-$300 performance specifications; its modest $119.95 price tag simply designates the extent to which we have sacrificed traditional markup to establish REALISTIC as a quality line! P.S. — DX-150 is a hefty 14 lbs., with a 12¼" dial, extruded 11-control front panel, and 14¼x8¼x6½" in size. It's just the picture that's little! Our no money down policy makes the pain little, too!

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totals and representation. An 8th Regional conference will be held in Toledo, Ohio, Oct. 19, according to W8CHT.

Transcontinental Corps. WØLCX reports good nights are few and far between, with traffic on some functions up. A good month, says TCC-Pacific Director W7DZX.

July Summary:

Area	Functions	% Successful	Traffic	Out-of-Net Traffic
Eastern	124	89.5	2080	779
Central	93	90.3	1250	543
Pacific	124	93.5	1892	941
Summary	341	91.2	5222	2263

The TCC roster: Eastern Area (W3EML, dir.) — *W1s* BJG EFW EMG EOB NJM, *W2s* FR GKZ PU QC, K2RYH, *WA2s* BLV UWA, *WB2s* FIT RKK UHZ, W3EML, K3MVO, WA3CTP, *W4s* NLC UQ ZM, K4KNP, *W8s* CHT UM, K8KMQ, *WA8s* OCG POS ZGC. Central Area (WØLCX, dir.) — W4OGG, K4DZM, *WA4s* AVM WWT, WB4AIN/4, W5KRX, *W9s* CXY DND DYG VAY, *WA9s* OTD RAK VZM, *WØs* INH LCX, *KØs* AEM YBD, WAØs DOU MLE. Pacific Area (W7DZX, dir.) — *W6s* BGF EMS EOT IPC IPW TYM VNQ VZT, K6DYX, WA6ROF, WB6HVA, *W7s* KZ ZIW, K7HLR, WA7CLF, VE7ZK.

Miscellaneous Net Reports.

Net	Sessions	Check-ins	Traffic
Eastern Area Slow	31	191	105
Coast Guard	22	474	10
QTC	22	324	206
North American SSB	27	553	275
Clearing House	29	506	385
Mike Farad E & T	27	378	403
7290	44	1897	1522
20 Meter ISSB	31	484	5815
Interstate 75M SSB	31	1002	568
Hit & Bounce	31	424	554
20 Meter SSB	27	478	6329

QST

Technical Correspondence

(*Continued from page 43*)

industrial complex, so I did nothing. As time went on, the noise got more severe; at times it wiped out all three bands completely, being 20 over 9 off the *back* of my beams.

After the DX contest in 1968, I decided to do what I could to locate it since my score in that contest was hurt considerably by the interference.

I attempted to borrow a battery-operated receiver to cover the h.f. spectrum, to no avail. Cruising the area in my auto and listening on the b.c.-band car radio at first produced no conclusive results, but after several nights spent driving around, listening between the b.c. stations, it was noticed that the noise was audible, but rather weak. At a point about four city blocks south of my QTH, there was a definite peak for a distance of about 50 feet, directly in front of the Reynolds Aluminum Company wire and cable plant. I then intensified my effort to locate a battery-operated portable receiver. Within a few weeks, the company I am employed by decided to purchase a battery-operated Ferris model 32-B noise and field-strength meter (ahem). A few evenings spent with this thing revealed the following:

1) There were two broad peaks of noise, one from about 4 to 8 Mc., another from 8 to 16 Mc. (The unit tunes 130 kc. to 20 Mc.).

2) Carrying the Ferris around in the car established the fact that the noise did peak in front of the Reynolds Aluminum Company.

The next step was a visit to the Reynolds Company where I requested, and got, an interview with the plant manager, Mr. Funary, and Mr. William R. Smith, Chief Electrical Engineer. They were most cooperative. I gave them full details of my observa-

tions and measurements. They told me that they would contact me in a few days after they had made some investigations of their own.

A week later, I was invited to the Reynolds facility and brought the Ferris 32-B with me. Mr. Smith escorted me through the plant and told me that his people had found one area which, as he put it, "was under suspicion." The area turned out to be an outdoor cable test facility. At this area, cables are strung outdoors (lengths of 50 feet or so) and various potentials are applied to them. Some of the cables had been under continuous test, with 5 to 15 kv. applied, for several years. As we approached the area, you could hear the hiss of corona. I set up the Ferris at 7 Mc. and got a reading of about 10,000 μv./meter at a distance of about 100 feet from the test cage. Mr. Smith had an employee shut the line down and, as the man threw the switch off, the reading on the Ferris went from 10,000 μv. to 1.5 μv./meter! Mr. Smith told me that the test would be stopped immediately and steps would be taken to insure that they did not radiate noise in the future.

Needless to say, everyone was quite happy and the Reynolds people expressed some concern over the incident. Someone said, "This time, we interfered with a ham operator, but what could have happened if we had interfered with airport communications and the like?" (Philadelphia International Airport is about six miles northeast.)

And now, at my QTH, it is quiet as a graveyard. I can hear things over the long path again, and I will be breathing down the neck of W3WJD during the '69 ARRL DX smash. — *Harold C. Ritchey, W3WPG, 208 W. Front St., Chester, Penna. 19013.*

Recent Eqipment

(Continued from page 61

the same as from the a.c. supply, except that the heaters run off the 12-volt car battery.

The Model HA-20 Adapter

Available as an accessory is the HA-20, a separate v.f.o. Also included in this unit is an s.w.r. bridge which can be used either for monitoring the feed-line match or as an output indicator.

The HA-20 v.f.o. dial is exactly the same as the one in the SR-400. When the HA-20 is used it is possible to transmit and receive on frequencies as much as 500 kc. apart. Also—and this one is really weird—it is possible to receive on two different frequencies at the same time. In many instances a DX operator desires to monitor both his own transmitting frequency and that of the DX station he is trying to work. It takes a little getting used to, but the HA-20 does just that.

The s.w.r. bridge is of the Monimatch type, with the bridge itself a separate unit that can

be remotely mounted in the feed line. The H.A-20 has its own built-in power supply. The unit also can be used with the SR-2000.

General

In testing the SR-400 in the ARRL lab, we found that the transceiver met, or bettered, all of the manufacturer's specifications for performance. Hallicrafters rates the transceiver at 200 watts output on s.s.b. and c.w. on 80, 40 and 20, and slightly lower than that figure for 15 and 10 meters. In the unit we tested, output was about 190 watts on the two higher bands and slightly over 200 watts on the other bands. The c.w. note was perfectly free from any trace of click or chirp.—*W1ICP.*

Strays

Danger, High Voltage!

Another tragic story involving the danger of electricity. Here it is, as related by Lewis Kline, WN3KKB:

"My brother was erecting a vertical antenna and needed three guy wires to secure it to the house. Two of the Nylon guy wires were connected when a gust of wind blew the third guy onto a power line close by. My brother and a friend tried to reach the guy with a hammer handle to pull it free, but they still couldn't reach it. The friend was sent for a wooden broom handle but, in the meantime, my brother reached into the attic window and pulled out a metal curtain rod and told the friend to wait, that he had found something just as good. Thinking the Nylon guy was a non-conductor[1], my brother reached out with the metal curtain rod to knock the guy wire free of the power line; 4000 volts jumped to the rod and electrocuted him. Please convey to all of your readers this message: Please take your time and think things out when working near power lines and save yourself a terrible tragedy."

—···—

The second annual Old Old Timers Club QSO Party will be held on January 24, 25 and 26, 1969, with the New Orleans, La. chapter as sponsor. This affair is for members only and all are urged to make their plans to participate. Log sheets, rules, suggested frequencies and other information will be published in the *Spark Gap Times* or contact the party chairman, J. L. "Bob" Robertson, W5BUK, 2609 Halsey Avenue, New Orleans, La. 70114. S.a.s.e., please.

[1] EDITOR'S NOTE: Some Nylon line has a metal strand running down its center.

Increasing Frequency Measurement Accuracy

(Continued from page 15)

tool is "out"; the whole apparatus is hand-capacitance conscious, though this could be avoided by enclosing it in a cabinet. The room should be maintained at a set temperature for at least twenty-four hours before the test. With these precautions and use of the b.f.o. to detect the 'wah-wah-wah'[3] an exact beat can be obtained which should not vary through the duration of the test. Continue to make beat checks until 15 minutes before the test, then go for it.

When the beat between the 10-kc. signal and WWV on 10 Mc. is less than 1000 cycles you are within 0.01% of accuracy. It will be found that by the above procedure a 'wah-wah' (representing 2 cycles per second) can be sustained, which is 500 times more accurate, or within 0.00002%.

Miscellaneous

Other points to note are as follows: Some mush may be experienced in the receiver between the 10-kc. points. This comes from the harmonics of the 1-kc. divider tube. It is not normally annoying and does not affect operation, but some constructors may wonder from whence it comes.

Fig. 6, besides showing the Schmitt trigger, includes a negative-bias circuit which was added to the original gate circuit to make action more certain.

The original circuit of Skeen used eight counter flip-flops. It was found desirable to increase these to 13, the last one counting to 4096, since in the rush of an ARRL frequency-measuring test there is little time to spend checking the number of recycles taking place.

An annoying problem with home-built counters having no means of standardizing the amplitude of the incoming signal, as in this instance, is that if the circuit has lain idle for a minute or two, on the first attempt to make a count the first few pulses may not register, with the result that the count is low. This is because a capacitor in the input circuit is leaky, or its value is too high. Some of the first pulses fed to it are used up in recharging the capacitor. The answer is to use a good-quality smaller capacitor or take a second count immediately —which then comes out correctly.

On the first trial with this frequency standard, after some preliminaries to perfect operating techniques and debug the equipment, an accuracy of 0.8 parts per million was obtained in an ARRL FMT. All equipment used was home-brewed, or assembled from a kit, except the receiver. The author wishes to acknowledge the cooperation of the Hewlett-Packard company in supplying circuit information. QST

[3] Geiser, "A Zero-Beating Method", *QST*, February, 1968. An alternative method using the receiver b.f.o. is described in the chapter on measurements in *The Radio Amateur's Handbook*.

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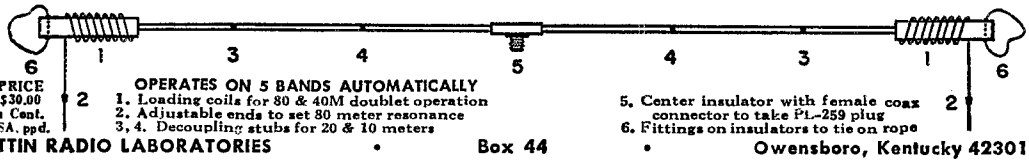

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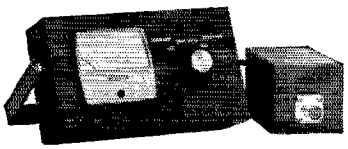

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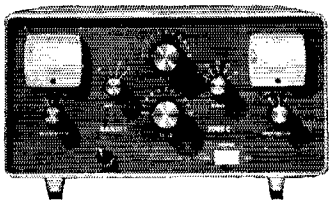

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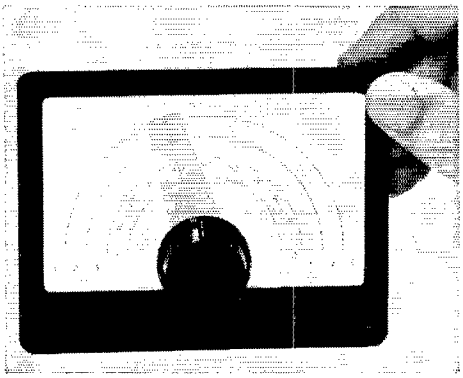

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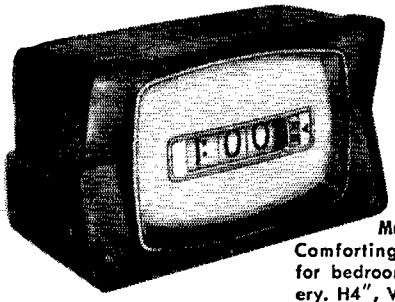

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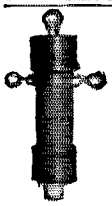


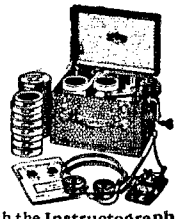
THE "MINI-BALUN"

Small — light — efficient — weather proofed — have your antenna radiate, not your feed line — use for dipoles, doublets, yagis, inverted "V" etc. — has ferrite core. Coax fitting — takes full legal power. 1 to 1 impedance ratio 3 to 30 mcs. Now with built-in lightning arrester. NET PPD in U.S.A.—**$9.00**

BILADA MFG. CO.
P.O. Box 263 Manasquan, N.J. 08736

EASY TO LEARN CODE

It is easy and pleasant to learn or increase speed the modern way — with an **Instructograph Code Teacher.** Excellent for the beginner or advanced student. A quick, practical and dependable method. Available tapes from beginner's alphabet to typical messages on all subjects. Speed range 5 to 40 WPM. Always ready. No QRM. Beats having someone send to you.



ENDORSED BY THOUSANDS!

The Instructograph Code Teacher literally takes the place of an operator-instructor and enables anyone to learn and master code without further assistance. Thousands of successful operators have "acquired the code" with the **Instructograph System.** Write today for full particulars and convenient rental plans

INSTRUCTOGRAPH COMPANY
5071-Q BROADWAY, CHICAGO, ILL. 60640
4700-Q. Crenshaw Blvd., Los Angeles, Calif. 90043

YOU BET!

I would like to become a member of ARRL and help support its many services to amateurs and amateur radio. Here's my $6.50 (in the U. S. and Canada, $7.00 elsewhere). Sign me up for a year's membership and twelve big issues of *QST!*

My name .....Call.....

Street .....

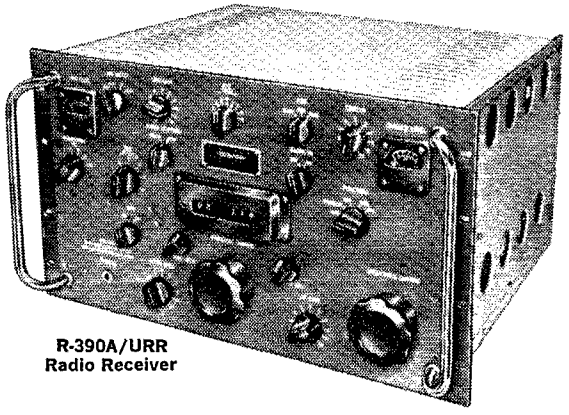
City .....State.....Zip.....

(Please see the other side of this page for a list of available League publications.)

THE AMERICAN RADIO RELAY LEAGUE, INC., NEWINGTON, CONN. 06111

QS 10-68

Unique opportunity to own one of the world's finest all-band receivers. 500 kc to 32 mc!



R-390A/URR
Radio Receiver

Limited quantity of famous R-390A/URR radio receivers . . . brand new. Original manufacture, 1968 production . . . fully tested to meet U.S. Government specifications. Range 500 kc to 32 mc, 30 1-mc bands, digital readouts. Original pack, includes two instruction books, complete set running spares. New low price $1,700* . . . fully guaranteed.

*A few new, but shelf-worn, units available at lower prices.

WRITE OR CALL FOR DETAILS

EAC Industries, Inc., 20 Bridge Avenue, Red Bank, N.J./201/747-5100, Ext. 51.

PICKERING RADIO CO.
Post Office Box 29
Portsmouth R.I. 02871

PICKERING

YOUR TAPE RECORDER IS READY TO TEACH CODE!

That's right! Your tape recorder is ready to help your code study. The CODEMASTER tapes give you professional instruction via your own tape machine. Now generated by digital computer, the CODEMASTER tapes are unsurpassed for timing accuracy. Whether you're just starting, going for your Amateur Extra, or somewhere in between, the CODEMASTER tapes are your best code-learning buy! Find your CODEMASTER tape below!

CM-1: For the beginner. A complete course of instruction is on the tape. Practice material at 5, 7, 9 WPM. Prepares you for Novice exam. Includes code groups and punctuation.

CM-1½: An intermediate tape, especially for General Class exam study. No instruction; just practice. ½ hr 11 WPM; 1 hr 14 WPM; ½ hr at 17 WPM. Includes coded groups and straight text.

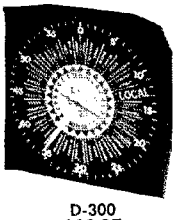
CM-2: For Extra-Class license study. Mostly straight text; some code groups. 1 hour at 20 WPM; ½ hour each at 25 and 30 WPM. For real QRQ, play this tape at twice speed!

CODEMASTER tapes are 2-track monaural; available in two sizes: 7-inch reel (3¾ IPS) and 3¼-inch reel (1⅞ IPS). Will play on any but full-track machine. **SPECIFY both type and size** of tape you want. Any tape, $5.95 postpaid USA 4th class. Any two tapes, $11.00; all three, $15.00 PPD. Immediate delivery. CODEMASTER tapes are made only by **Pickering Radio Company, P. O. Box 29, Portsmouth, R. I. 02871.** Satisfaction guaranteed. Dealers: inquire.

FARMERIE WORLD TIME-ZONE CLOCK

TWENTY-FOUR CLOCKS IN ONE

TIME *ANYWHERE AT A GLANCE!*

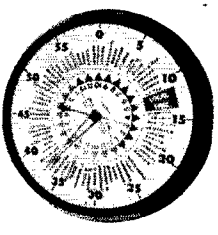


D-300
$12.95
CASE: wall or desk 22 ga. steel 8" x 8" x 2¾"
MOTOR: 110-volt, 60 cycle.
Other models available

When the clock is accurately set to the correct time in a local time zone, the correct time is automatically shown in each of the other 23 zones.

Shipped PPD U.S.A.

THE FARMERIE CORPORATION
114 Spencer Lane ■ Glenshaw, Penna. 15116



W-100
$29.00
Wall Model
CASE: 17" dia.
15" face

TRIGGER Electronics

7361 NORTH AVE. • RIVER FOREST, ILLINOIS 60305
(WEST SUBURBAN CHICAGO)

QUALITY MERCHANDISE — QUALITY SERVICE . . . SO WHY PAY MORE FOR THE BEST!

MERCHANDISE IN STOCK — PROMPT DELIVERY
NATIONALLY ADVERTISED BRANDS, THE LATEST MODELS

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INSTANT SHIPMENT on all cash orders of new equipment. **TRIGGER ELECTRONICS** has the most complete inventory of amateur radio equipment and accessories in stock, for your convenience. Shipment is usually made the same day your order is received!

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$5.00 DOWN STARTS ANY BUDGET TIME PAYMENT! Order your goodies from this ad!

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MIDWEST BANK CHARGE CARDS HONORED.

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TRIGGER ELECTRONICS is conveniently located near the west city limits of Chicago on the main street of North Avenue (State Route #64), 3 blocks west of Harlem Avenue (State Route #43). Just 10 miles due west of downtown Chicago, or 20 minutes southeast of O'Hare Airport. Plenty of free parking. Come in and browse. See the latest in ham gear attractively displayed.

LIKE-NEW BARGAIN SPECIALS FOR OCTOBER

DRAKE R4.....$279	HT44 & AC.....$329	HEATH HR20.....$ 99
DRAKE R4A..... 339	SR46A..... 139	HEATH HX20..... 149
DRAKE SW4A..... 229	SX110..... 97	HEATH HP13 DC.. 79
DRAKE RV4..... 79	N44 SPEAKER.... 10	HEATH HP20 AC.. 27
DRAKE TNX..... 539	JOHNSON RANGER. 89	HEATH HP23 AC.. 47
DRAKE AC4..... 79	GPR90..... 249	HW12 75 METERS. 79
DRAKE 2NT..... 117	NC125..... 79	HW16..... 87
SWAN 500 NEW... 375	GLOBE HG303.... 39	HW22A 20 METERS 109
SWAN 406B NEW.. 60	GONSET G50..... 189	HEATH DX60A.... 47
SBE 33..... 219	HO170A VHF..... 329	SB100 RECEIVER. 219
SBE 34..... 359	HO180AC..... 379	SB101 RECEIVER. 279
SB2 LA LINEAR.. 199	KNIGHT T60..... 47	SB401 XMTR..... 289
CLEGG 22ER NEW. 229	SPEECH COMP.... 14	HD11 Q MULT.... 14
THOR 66AC,DC... 259	HEATH HR10..... 77	HM15 SWR METER. 14
HA6SO 6MTR TSVR 79	HEATH HR10B..... 87	WATERS 369..... 99

SPECIAL SPECIAL

LIMITED QUANTITY	NEW	EICO	KITS
722 VFO W/AC SUPPLY $55			
723 60 WATT CW $40			
751 AC SUPPLY $60			

prices subject to change without notice

TRIGGER ELECTRONICS — Exclusive Ham store — is as near as your phone or mailbox!

another important TRIGGER service:

WE BUY USED HAM GEAR FOR CA$H

PROMPT SERVICE . . . PROMPT CASH!

ALL PHONES: (AREA 312) 771-8616

STORE HOURS
(CENTRAL TIME)

WEEKDAYS . . . 11:00 A.M. — 8:00 P.M.
SATURDAYS . . . 9:00 A.M. — 3:00 P.M.

WRITE TODAY! Send for free catalog.

TRIGGER Attn: W9IVJ Q1068
7361 North Avenue
River Forest, Illinois Amount
RUSH THE FOLLOWING: Enclosed

☐ **Send free catalog.**

NAME_____

ADDRESS_____

CITY_____ STATE_____ ZIP_____

HAM-ADS

(1) Advertising shall pertain to products and services which are related to amateur radio.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters. Ham-ads signed only with a box number without identifying signature cannot be accepted.

(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (6) below.

(4) **Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.**

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) **A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature.** Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Address and signatures are charged for, except there is **no charge for zipcode, which is essential you furnish. 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. No checking-copies can be supplied.**

(8) **No advertiser may use more than 100 words in any one advertisement, nor more than one ad in one issue.**

(9) Due to the tightness of production schedules, cancellation of a Ham-Ad already accepted cannot be guaranteed beyond the deadline noted in paragraph (5) above.

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.

'SAROC" Fourth Annual National Fun Convention hosted by Southern Nevada ARC January 8-12, 1969. Hotel Sahara's new space Convention Center. $12.00 Advance Registration accepted until January 1, 1969, regular registration at door. Ladies Program in Don the Beachcomber. Technical seminars: ATV, FM, MARS, RTTY, QCWA, WCARS-7255, WSSBA meetings. Golf and bridge Tournaments. "Saroc" registered participants entitled to special room rate $10.00, plus room tax per night single or double occupancy, admittance to cocktail parties, technical seminars, exhibit area, Hotel Sahara's late show, Sunday breakfast. Please send separate checks for accommodations and registration to W7PBV, c/o "Saroc", Hotel Sahara, Las Vegas, Nevada 89109.

INVITATION: New York Radio Club invites New York Area hams and SWLS to its regular monthly meetings, the second Monday of each month at the Hotel George Washington, Lexington Ave. and 23rd St. at 8 PM. W2ATT, New York Radio Club

QCWA—Quarter Century Wireless Association is a non-profit organization founded 1947. Any amateur radio operator licensed 25 or more years is eligible for membership. Write for information, A. J. Gironda, W2IE, 1417 Stonebrook Ave., Mamaroneck, N.Y. 10543.

A.W.A. Historical Radio Meet for old time amateur and commercial operators, historians and collector. Smithsonian, Washington, D.C. Oct. 5th. Write W2QY for details.

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 48104. Tel. NOrmandy 8-8262.

RTTY Channel filters, octal mounted, 2125/2975, $5.95 pair. Special filters for TT/L-2. SASE for information. 88 Mh. toroids, uncased, 5 for $2.50. Herman Zachry. WA6JGI, P.O. Box 845, Apple Valley, California 92307.

TR-4, $480.00; AC-4, $83.00; DC-3, $123.00; R4-B, $360.00; T4XB, $360.00; MS-4, $17.50; RV-4, $83.00; L-4B, $580.00; W-4 $43.00; factory-sealed boxes, fully guaranteed. Mel Palmer, K4LGR, Box 10021, Greensboro, N.C. 27404. Tel: 919-299-8767.

DAH-DITTER Keyer. Integrated circuit electronic keyer. Fully self-completing on both Dit and Dah with automatic spacing. Built-in AC pwr. supply, reed relay output, with sidetone monitor and speaker. Completely assembled and tested. Only $34.95. Dealer inquiries invited. Send your order to M & M Electronics, 6835 Sunnybrook, N.E., Atlanta, Georgia 30238.

WELCOME To Maritime Mobile service net. 14317 Khz. daily 2130Z. Amateur Radio's service to the Fleet. Vic Barry, RDC USS Corry, DD817 FPO, N.Y., N.Y. 0950.

SELL swap and buy ancient radio set and parts magazines. Laverty, 118 N. Wycomb, Landsdowne, Penna.

DUMMY Loads, 1 KW, all-band, $7.95; wired, $12.95. Ham Kits, P.O Box 175, Cranford, N.J. 07016.

WANTED: Military, commercial, surplus, airborne, ground, transmitters, receivers, test-sets, especially Collins Airborne. We pay cash, and freight. Ritco Electronics, Box 156-Q567, Annandale, Va. Phone: 703-560-5480 collect.

WANTED: 2 to 12 304TL tubes. Callanan. W9AU. 625 West Jackson Blvd., Chicago, Ill. 60606.

QSL Cards??? America's finest!!! Personalized made-to-order. Samples 25$. DeLuxe 35¢. Religious, 25¢ (refunded). Sakkers, W8DED, Box 218, Holland, Michigan 49423.

C. FRITZ—QSLs that you're proud to send, bring greater returns! Samples 25¢ deductible. Box 1684, Scottsdale, Arizona 85252.

QSLS "Brownie" W3CJI, 3111 Lehigh, Allentown, Penna. 18103. Samples 10¢. Catalog 25¢.

QSLS stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

QSLS—SMS. Samples 25¢. Malgo Press. Box 375, M.O., Toledo, Ohio 43601.

DELUXE QSLS Petty, W2HAZ, P.O. Box 5237, Trenton, N.J. 08638. Samples, 10¢.

10¢ Brings free samples, Harry R. Sims, 3227 Missouri Ave., St. Louis, Mo. 63118.

QSL, SWL, cards that are different. Quality Card stock. Samples 10¢. Home Print, 2416 Elmo Ave., Hamilton, Ohio 45015.

CREATIVE QSL Cards. Personal attention, Imaginative new designs. Send 25¢. Receive catalog, samples, and 50¢ refund coupon. Wilkins Printing, Box 787-1, Atascadero, Calif. 93422.

RUBBER Stamps $1.15 includes tax and postage. Clints' Radio, W2UDO, 32 Cumberland Ave., Verona, N.J. 07044.

QSLS. finest YLRL's. OMs samples 10¢. W2DJH Press, Warrensburg, N.Y. 12885.

3-D QSL cards, recognized leader among raised designs. Compliments aplenty! Prized collector's item. Samples 25¢ (refundable). 3-D QSL Co., Monson 2, Mass. 01057.

QSLS. Free samples, attractive designs. Fast return. W7IIZ Press, Box 2387, Eugene, Oregon 97402.

QSLS, SWLS, WPE. Samples 15¢ in adv. Nicholas & Son Printery, P.O. Box 11184, Phoenix, Ariz. 85017.

QSLS, samples, 10¢. Fred Leyden. W1NZJ, 454 Proctor Ave., Revere, Massachusetts 02151.

QSLS 300 for $4.35, samples 10¢. W9SKR. George Vesely, Rte #1, 100 Wilson Road, Ingleside, Ill. 60041.

QSLS 3-color glossy 100, $4.50. Rutgers Vari-Typing Service. Free samples. Thomas St., Riegel Ridge, Milford, N.J. 08848.

QSLS-100 3-color glossy $3.50; silver globe on front, report form on back. Free samples. Rusprint, Box 7575, Kansas City, Mo. 64116.

SHARP QSLs, 10¢. Filmcrafters. Box 304, Martins Ferry, Ohio 43935.

QUALITY QSLS: Samples 25¢ (Refundable) R. A. Larson Press, Box 45, Fairport, N.Y. 14450

ORIGINAL EZ-IN double holders display 20 cards each in plastic, 3 for $1.00 or 10 for $3.00 prepaid and guaranteed. Free sample to Dealers or Clubs. Tepabco, John, K4NMT, Box 198T, Gallatin, Tenn. 37066.

QSLS by K1FF, $2.00 for 100. Others at reasonable prices. Samples 25¢ deductible K1FF QSLS, Box 33, Melrose Highlands, Mass. 02177.

QSLS, Gorgeous rainbows, cartoons, etc. Top quality! Low prices! Samples 10¢ refundable. Joe Harms. WA4FJE/W3COP, 905 Fernald, Edgewater, Fla. 32032.

QSLS Kromkote glossy 2 & 3 colors, attractive, distinctive, different. Choice of colors 100-$3.00 up. Samples 15¢. Agent for Call-D-Cals. K2VOB Press, 240 West Kinney St., Newark, New Jersey 07103.

QSLS. WA6QAY Press, 15008 Orchid Ave., Poway, Calif. 92064.

RAISED Lettering QSLs. Ace Printing, 6801 Clark Ave., Cleveland, Ohio 44102.

QSL cards. Finest quality. Economical prices Fast service. Free samples. Little Print Shop, Drawer 9848, Austin, Texas 78757.

RUBBER Stamps. Return mail delivery, postpaid. Basic price, $1.00 first line, 50¢ each additional line. Request type style chart, Fulton Rubber Stamps, Route 216-A, Fulton, Maryland 20759.

QSLS. By Jansen. K2HVN. Samples. 25¢. 860 Atlantic St., Lindenhurst, N.Y. 11757.

BADGES. Engraved laminated plastic 1" x 3". Call and your first name, also for "XYL" and "Jr. Op" $1.25 each, prepaid. Club badges designed. K6PBE, Box 1307, Alhambra, Calif. 91802.

NAMEPLATES. Call Letters, wall pressure-sensitive, $2.00; desk type, $2.50. Kronenberg, 1492 High Ridge Road, Stamford, Conn. 06903.

ENVELOPES! Amateurized wid ur call, adr! $12.00 per 1000. K3ZWA Press, R. 1, Elizabethtown, Penna. 17022.

MANY Extras!! Free samples!! K.L.L. Press, Box 258, Martinsville, New Jersey 08836.

RUBBER Stamps. 3-line address $1.50. J. P. Maguire Company, 448 Proctor Avenue, Revere, Massachusetts 02151.

100 QSLs, $1.25 and up, postpaid. Samples, dime. Holland, R3, Box 649, Duluth, Minn. 558031

SUPERIOR QSLS. Glossy stock, best service, new owners. Samples 20¢. Ham Specialties Co., 402 E. Washington, Bloomington, Ill. 61701.

YOUR Call engraved White Plastic with Black letters or reverse. Choice lapel bar or tie-clasp. $1.45. Also 1½" x 6" wall signs, $2.95. E. W. Gorby, W2DF, Box 213, Farmingdale, N.Y. 11735

MANUALS for surplus electronics. List 15¢. S. Consalvo, 4905 Roanne Drive, Washington, D.C. 20021.

HAM'S Spanish-English manual $3.00 Ppd., Gabriel, K4BZY, 1329 N.E. 4th Ave., Fort Lauderdale, Florida 33304.

TUBES, test equipment, transmitters or receivers. Any and all types bought for cash or trade on new or used ham gear. Air Ground Electronics, 64 Grand Place, Kearny, New Jersey 07032.

1916 OSTS needed for personal collection. Price secondary, Ted Dames, W2KUW, 308 Hickory Street, Arlington, New Jersey.

FOR Sale: SB-101 and SB-200. Wanted, kits to wire. Heath preferred. 12% of cost, some in stock. Professionally wired. Lan Richter, K3SUN, 131 Florence Drive, Harrisburg, Penna. 17112.

WE buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., Box 516, Hempstead, N.Y.

JOYSTICK Variable frequency antenna systems, solve space problems. Available immediately. SWL Guide, 218-S Gifford, Syracuse, N.Y. 13202.

CASH Paid for your unused Tubes and good Ham and Commercial equipment. Send list to Barry, W2LNI, Barry Electronics, 512 Broadway, N.Y., N.Y. 10012, Tel. (212) WAlker 5-7003

WANTED: Tubes and all aircraft and ground radios. Units like 17L, 51X, 618T or S. R388, R390, GRC. Any 51 series Collins unit. Test equipment, everything. URM, ARM, GRM, etc. Best offer paid. 22 years of fair dealing. Ted Dames Co., 308 Hickory St., Arlington, New Jersey 07032.

INTERESTING Sample copy free. Write: "The Ham Trader," Sycamore, Illinois 60178.

WANTED: For personal collection: Learning the Radiotelegraph Code, Edition 4; How to Become a Radio Amateur, Edition 9; The Radio Amateur's License Manual Editions 11, 12. W1CUT, 18 Mohawk Dr., Unionville, Conn. 06085.

RTTY gear for sale. List issued monthly, 88 or 44 Mhy toroids, five for $1.50 postpaid, Elliott Buchanan & Assoc., Inc. Buck, W6PVC, 1057 Mandana Blvd., Oakland, Calif. 94610.

WE'RE Trying to complete our collection of Callbooks at Headquarters. Anyone have extra copies of Government Callbooks 1922-1925 and Radio Amateur Callbooks 1928-1934? ARRL, 225 Main St., Newington, Conn. 06111.

TUBES, test equipment, transmitters or receivers. Any and all types bought for cash or trade on new or used ham gear. Air Ground Electronics, 64 Grand Place, Kearny, New Jersey 07032.

WANTED: Model #28 Teletype equipment, R-388, R-390A. Cash or trade for new amateur equipment. Alltronics-Howard Co., Box 19, Boston, Mass. 02101.

NOVICE Crystals; 40-15M, $1.33, 80M, $1.83. Free list. Nat Stinnette, Umatilla, Fla. 32784.

TOROIDS, 88 mh uncased, 5/$2.50. Postpaid. Humphrey, WA6FKN, Box 34, Dixon, Calif.

WANTED: Military and commercial laboratory test equipment. Electronicraft, Box 13, Binghamton, N.Y. 13902.

SAVE. On all makes of new and used equipment. Write or call Bob Grimes, 89 Aspen Road, Swampscott, Massachusetts, 617-598-2530 for the gear u want at the prices u want to pay.

ESTATE Liquidation. SSAE brings list quality equipment. Paradd Engineering, 284 Route 10, Dover, N.J. 07801.

3000 V @ 3 mtf brand new GE Pyrano oil capacitors, $3.00 each. Can mail, 3-lbs. each shipping weight. FOB P. Wandelt, RD #1, Unadilla, New York 13849.

TELETYPE Gears, shifts, keytops, typebars, motors, forks, typeboxes, typewheels, punchlocks, nonoverliners, CR-LFs TRs, TDs, KSRs, ASRs, FSCs, toroids, fresh paper, testsets, SRT subchasses. Buy, too! Typetronics, Box 8873, Ft. Lauderdale, Fla. 33312.

TOOOBES—Tranzcesters; New, unused, 6146B, $4.00; 6CW4, $1.60; 811-A, $4.25; 417-A, $4.50; 6146-A, $2.95. Free catalog. Vanbar Distributors, P.O. Box 91z, Paramus, N.J. 0765.

1000 PIV 1.5 amp. epoxy diodes, includes by-pass capacitors and resistor. 10 for $3.75 ppd U.S.A. Fully guaranteed. East Coast Electronics, 123 St. Bonifice Road, Cheektowago, N.Y. 14225

NATIONAL Incentive Licensing poll results: 639 against and 178 for incentive licensing. Thank you. WB2NOD, SCCARC, Box 685, Moravia, N.Y. 13118.

MORE DX with a new QSO Phrase Book—Spanish, German, French, Russian, $3.00. M. Holubov, VE2BAG, 22 Vaudreuil, Baie Comeau, P.Q., Canada.

FREE Copy to hams (limited supply) National zipcode directory flyer. Send for your copy. E. McIvor, Box 8151, Rochester, N.Y. 14617.

A.W.A. Historical Radio Meet for old time amateur and commercial operators, historians and collectors, Smithsonian, Washington, D.C. Oct. 5th. See Hamfest Column for details.

OFFER $10 for May 1913 Elec. Experimenter, $3, Oct. 1914: $2 May 1919: $5 1919 issues Radio Amtr. News: $10 any 1908 Modern Electrics; $10 gov't, amtr. Callbooks 1922-26. Less for later dates, or poor condition. For historical library, none sold. Wayne Nelson, W4AA, Concord, North Carolina 28025.

YAESU FT-DX-400 transceiver for sale. W8AO, 2942 Riverview Blvd., Silver Lakes Village, Ohio 44224.

SALE: Heathkit DX-60, $50.00 Heathkit HG-10 VFO, $25.00. Both in excellent condition. Hal Kusner, WB2PHW, 21 Charles Court, Fair Haven, New Jersey 07701.

HALLICRAFTERS HT-37, perfect electrical condx. All new tubes, $200. No trades, please. L. E. Herring, Jr., WB4ARK, 2805 Glendale Rd., Charlotte, N.C. 28209.

WANTED Lampkin mod. 105B frequency meter and modulation meter model 205-A, XE2Q, J. R. Agraz, P.O. Box 554, Hermosillo, Sonora, Mexico, Tel: 3-54-46.

SELL Or trade: QST, CQ, Electrical Experimenter, Radio, Modern Electronics Wireless Age and Callbooks, any quantity. Wanted; Old radio gear, books and magazines, Erv Rasmussen, 164 Lowell, Redwood City, Cal. 94062.

FOR Sale: Thunderbolt. Complete with spare tubes. Will ship, $225.00. K6HLO, 511 Oak St., Roseville, Calif. 95678.

MUST Sell: SX-115, $350.00; HT-37, $300 (or both $610.00). Autronic Keyer with W8FYO paddle, $75.00; RME DB-23 preselector, $25.00; T-R switch, $15.00. All in perfect condx. C. Lachterman, 3 Archer Lane, Scarsdale, N.Y. 10583.

WANTED: Tuneable capacitively loaded coaxial cavity for 6M, 1 kw. rating. WA8VQS, 1792 East 32nd St., Cleveland, Ohio 44114.

WANTED: Comanche tuning scale. WA6QAY.

FOR Sale: SB-301, c.w. crystal, $265.00; HD-10 keyer $25.00; 14 AVQ antenna, $15.00; Knight SWR meter, $7.50; Grid dip meter, $10.00; 2" scope, $35.00. Elco VTVM, $20.00. C. D. Maserang, 3408-29th, Lubbock, Texas 79410, Tel: a.c. (806)-795-6788.

1000 PIV @ 1.5 amp. epoxy diodes includes disc bypass, caps and bridging resistors. 10 for $3.75. Postpaid USA. With diode purchase, 125 Mf. at 350 volt electrolytic capacitors, 50¢ each. Postpaid USA. no limit. East Coast Electronics, 123 St. Bonifice Rd., Cheektowaga, N.Y. 14225.

SELL, Hallicrafters HT-32, $220; SX-101A, 180; Hy-Gain 18AVQ, $35.00; Alliance rotor, $20; Knight-Kit SWR meter, $10. Must sell. Michael Prust, 514 North Washington, St. Peter, Minn. 56082.

WANTED: Microwave gear, waveguide, couplers, mounts, etc., for group starting experimental amateur work. Send list and prices to S. Daskam, K2OPI, RD #2, Box 360, Flemington, New Jersey 08822.

WANTED: Hallicrafters SX-28, SX-28A, SX-32 or SC-42 receivers. Howard Hoagland, Jr. 639 North Sierra Bonita Avenue, Los Angeles, Calif. 90036.

WRL's used gear has trial-terms-guarantee! G2-8, $129.95; Comm II, v meter, $89.95; SR-46, $94.50; HW12, $89.95; HW22 $89.95; SB33, $19.95; Galaxy III, $189.95; Galaxy V, $289.95; Galaxy V Mk II, $329.95; Galaxy 300, $159.95; AM68, $69.95; HX50, $199.95; RME6900, $149.95. Hundreds more. Free "Blue Book" list. Write WRL, Box 919, Council Bluffs, Iowa 51501.

SALE: Sony Micro TV and rechargeable batteries, $80.00; Zenith Royal 1000D Transoceanic, $70; Emerson Wondergram phono $15; Airline CB transceiver and case, $15; Kidde ultrasonic intrusion alarm, best offer; Tung-Sol proximity detector, $15; Simpson 262 VOM, $25.00; CIE course and Pickett circular rule and Geniac calculator, $10.00; CREI Engineering course, #200, $30; Sears citation 88 mill, best offer. B & K Dynaquick 500 tubetester, best offer. Witmer, 3122 N. Harding, Chicago, Illinois 60618.

MECHANICAL Filters from R-390A receiver, center frequency 455 Kc., bandwidths: 8 kc, 6 kc, 2 kc. $70 each. R. L. Cramer, 208 E. Lloyd St., Ebensburg, Penna. 15931.

FOR Sale: SR-150 AC supply, with mike, $275.00. HQ-170 clock-speaker, $165.00; HT-37 spare finals, $190.00. 6S10 linear, solid-state p.s., $125.00. All units in mint condx. Jack Marino, 503 Farm Ranch Rd. E., Bethpage, L.I., N.Y. 11714.

PRE WORLD WAR I licensees who are entitled to an Amateur "Extra" license but unable to prove it, will be glad to know the Old Old Timers Club has all the early Callbooks plus lots of other information to help you prove your case. No cost to members. Write to W5VA Secretary, Old Old Timers Club, P.O. Box 840, Corpus Christi, Texas 78403.

CHANGING Transmitters. Sell Apache with SB-10. Extra-stable VFO, FSK unit wired in, $100 or your best offer W4IRE, 2400 Hoyt St., Winston-Salem, N.C. 27103. Tel: (919)-725-3432 evenings.

SELL: Drake 2B, 2AQ, xtal cal. an HT-37 for $400 or best offer. Both excellent condx. Write S. W. Selfridge, Rte 2, Box 3435, Carmel, California 93921 or Tel: (408)-624-8813.

FOR Sale: SR-150 and p.s. $380.00; also SB-200, in excint condx, $190.00. Jim Wisneski, WA1DLM, 81 Hoover Avenue, Bristol, Conn. 06010.

DRAKE L-4, $500.00; T4X $300.00; R4-A, $300.00, P/S, $50.00. Package deal: $1100.00. HQ-170AC, $150.00; Z-Match, $50.00. Drake, in mint condx. Son's illness forces sale. Don Johnson, Wesson, Mass. 39191.

WANTED: TV Amateur transmitter, Linsmitter V-2050. State condition and price in letter. Walt Stock, W4IIS, 117 N. W. 100 Street, Miami Shores, Fla. 33150.

CHRISTIAN Ham Fellowship being organized for Christian fellowship and gospel tract efforts among licensed amateurs. Christian Ham Callbooks, $1 donation. For details write to Christian Ham Fellowship, 5857 Lakeshore Drive, Holland, Michigan.

SELL Model 19 teletype, excellent condition, $240.00. W2GJJ, C. Vinson, 2796 Larkspur St., Yorktown Heights, N.Y. 10598.

DRAKE 2NT, $85.00; Knight T50, needs work. In orig'nal carton: $15.00. Other Novice gear. Box 2134, Thibodaux, Louisiana, 70301.

HEATH HX20, HR20. ACPS, all band SSB c.w., $190.00. Sixer, mobile supply and strip line filter guaranteed Maximum TVI suppression, $50.00. WA3CDV, Tom Sullivan, 11 Monterry Dr., Newark, Delaware 19711.

FOR Sale: Heath HW-16 transceiver. In excint condx. Manual included, $90.00. WA5TTG, Owen Thornton, 5136 Kaywood Drive, Jackson, Miss. 39211.

SELL: Galaxy 2000 and linear, 54 ft. crank-up tower, TR-44 rotator, RCA AR-88 receiver, Heathkit HM-11 SWR Bridge, DK60-G2C Dow Relay, IT-30 Mic, VOX, low pass, and more. Make offer. WAØFNS, Starbuck, Minn. 56381.

SELL HQ-180AC receiver, $350.00 firm or trade for Heath SB-401. P. Herndon, 2212 NW 40th, Lawton, Okla. 73501.

WRITE, Phone or visit us for new or reconditioned Collins, Drake, Swan, National, Galaxy, Hallicrafters, Hammarlund, Hy-Gain, Mosley, Waters, Henry Linear, towers, rotators, other equipment. We try to give you the best service, best price, best terms, best trade-in. Write for price lists. Henry Radio, Butler, Missouri 64730.

SBE-33 Transceiver, like new, $160.00; Johnson Matchbox, $30.00. K2ZHH, Richard Gelman, 2196 Smith St., Merrick, N.Y. 11566. Tel: 516-378-0063.

HT-44, PS-150, $275.00; SX-117, $225.00. Buy both for $475.00 and get microphone and tubes. WB2QLU, 253-42 87th Drive, Bellerose, L.I., N.Y. 1426.

SELL: Heath HX-10 Marauder, $200. Hammarlund HQ-170C, $150.00. H. M. Sullivan, Box 312, Maple Shade, N.J. 08052.

HA-350 receiver and speaker. Like new condx. $110.00 or your best offer. W2WHK, 210 Utica St., Tonawanda, N.Y. 14150.

SELL: DX-100 (modified), $75.00, SX-100, $125.00. In excint condx. W9FWR, 55 Almeida Terr., Apt. 21, Portsmouth, Rhode Island 02871.

AMECO TX-62 transmitter, VFO-621, Waters Nuverter 6 and 2 converter; Hy-Ga'n 6 and 2 beam, plus Navigator transmitter, complete Hustler 6-band mobile antenna set. Bill Miller, WA4JAY, 6251 S.W. 44th Street, Miami, Florida 33155.

MILLEN Monitor Scope, Model 90932, $79.00; Heath Tunnel Dipper, $19.00; Joystick DeLuxe antenna, $16.00. All three: $100. F.o.b. Melrose, Mass. All mint condx with manuals. Richard Hardwick, W1FRX/WA4ND/1, 186 Lincoln St., Melrose, Mass. 02176.

HALLICRAFTERS HT-32B and SX-115 AM, CW, SSB, RTTY. Both are in A-1 mint condx electrically and physically. $700. Will sell separately! Mike Matich, WA9NVN, 11001 Ewing Ave., Chicago, Ill. 60617. Tel: (312)-768-3099.

FOR Sale: SX100, $180; DX60, $50; T150A, $80; BW381 electronic T-R switch, $40; EV-729 mike with stand, $10. All in mint condx, with manuals. Novice crystals and extra tubes. Complete package: $320. Carl Porter, W1ZLX, 19 Penniman, Braintree, Mass. 02184. Tel: 843-9418.

GOING To college! Must sell Thor VI, complete, in mint condx: $145.00; Heath Sixer, $25.00; Heath GR54 receiver, $45.00; Viking Valiant I, $120.00. Autronic Keyer, $38.00. List of others. Joanne Kakstys, WA2VHW, 18 Hillcrest Terrace, Linden, N.J., 07036. Tel: (201)-486-6917.

MOVING To mobilehome. Must sell treasured QSTs. Miscellaneous issues 1923 to 1935, and almost all 1935 to date. W6SI, 5430 Carlson Dr., Sacramento, Calif. 95819.

SELL: QSTs 1930-1960. Wireless Engineer July-Dec. 1930; Jan.-Dec. 1931 thru 1934. Any reasonable offer. John Glauber, 798 Appleby St., Boca Raton, Fla. 33432.

SELL: Heath TX-1 Apache and SB-10 Sideband Adaptor, manuals, both for $150.00. Mint HQ-170-AC, matching speaker, manual, original carton. $250.00. Will ship. Dave Chambers, K6DNY, 2941 Vassar Drive, Visalia, Calif. 93277. Tel: (209)-732-9239.

BRAND New factory-sealed cartons. Hallicrafters SR-160, $250.00; P-150-AC, $80.00. P-150-DC, $90.00. CDR antenna rotors, TR-44, $50.00. All above F.o.b., H D H Sales Co., 170 Lockwood Avenue, Stamford, Conn. 0902.

JOHNSON Invader for sale. Good SSB rig. Your best offer. No shipping, sry! W1FVU, 06074.

SELL: UTC CG 308 transformer, 110/220 prim. 3500-0-3500 at 500 Ma. Sry, can't ship. W2EZM, 431 Oakland, Maple Shade, N.J. 08052.

FOR Sale: Like new condx. SB-200, $195.00. You pay shipping. Robert Dukes, 834 Butler, Bolivar, Tennessee 38008.

WANTED: RME84 receiver in good operating condition. Blake, K1CPW, Summer St., Andover, Mass. 01810.

ELECTRONIC Keyer, Heath HD-10. Excellent condition, $27.50. William Cunningham, 2231 Hilton Avenue, Columbus, Georgia 31906.

NCX-5, NCX-A power supply, factory converted to Mark II, remote VFO. Like new, $575. You pay shipping. Ed Bude, 12830 Cold Springs Road, New Berlin, Wisconsin 53151 (Milwaukee area). Tel: 414-786-5461 after 6 PM my time.

COUNTY Hunters maps, 23" x 35", listing the 48 states and all counties, $1.50 postpaid. Cameradio Company, 2801 Liberty Ave., Pittsburgh, Penna. 15222.

SWAN 500 with 117XC A.C. p.s. In original cartons, used 5 hours. First $475.00 takes both. Johnson 275 watt Matchbox, $40.00. K6GXL/6, 15756 South Ryon, Bellflower, Cal. 90706. A.C. 213-925-0736.

JOHNSON 500, $190.00, NC-30, $120.00. WØEUQ, 1822 S. 17th St., Grand Forks, N. Dak. 58201.

RTTY Typewriter, late used. In gud condx. Underwood. All caps. $24.50 F.o.b. Hathorne, P. E. Boniface, 13 Hazen, Hathorne, Mass. 01937.

FOUR 4CX250R/7580 tubes. New unboxed. Also Heathkit SB10 SSB adapter. Offers?? Joe, WB6WLH/3, 12513 Summerwood Drive, Silver Spring, Maryland 20904.

COMPLETE Drake station, mint condx. R4, MS4, T4X, AC3 plus Shure 520SL mic, $700. Joe Heffler, WB2QFR, 2200 Morris, Bronx, N.Y. 10453. Tel: (ac..) 212-295-1694.

FOR Sale: Drake 2B with 2BQ in like-new condx, $100.00; DX-60, $45.00. Heath HG-10 VFO, $25.00. Robert Waugh, WA9JQM, 4660 Calumet Ave., Fort Wayne, Indiana 46806.

SELL: Collins 75S-3B with additional 500 Kc filter, $550; 32S-3 and 51F-2, $425.00; Henry 2K, $475.00; SBE-33 with SB-2 DC supply and carrying case, $245.00. All excellent with manuals and cartons. K6BYW, Dave Fulton, 4955 Palo Dr., Tarzana, Calif. 91356. Phone a.c. (213)]343-7641 evenings.

GROUNDED Grid filament chokes, 30 amps, $4.00; plate chokes 800 Ma., $2.00 pp. William Deane, 8831 Sovereign Road, San Diego, Calif. 92123.

MISC. gear of an ex-ham. Tubes, metal, glass, old, new; 1625, 803, 24G, 715A, 3AP1, 902, etc. Mostly 1930-1955 receiving types. Antique receiving gear. Variometer in carton, collapsible loop antenna, etc. Capacitors, transformers, dynamotor 6/12 v.-500 v. 160 ma. RG8-8/U 105 ft.; RG-11/U 4 pcs at 30 ft., 2 pcs at 31 ft, 28 ft 27 ft; 1 pc at 5½ ft, 12 ft., 17 ft., 24 ft., 25 ft. Offers accepted. J. Lee, Box 664, Plandome, L.I., N.Y. Tel: a.c. (516)-767-4422.

SALE: Palycomm-2 2 M xcvr 40 hours new (going transistor). Only $175.00 or best offer. Dan Winkler, WB6HBL, 633 West 171 #56 NY, N.Y. 10032.

SELL: HT-32, $220.00; SX-101A, $160.00. Best offer. Knight SWR meter, $10.00. 18 AVQ, $35.00, Alliance rotor, $20.00. Michael Prust, 514 North Washington, St. Peter, Minnesota 56082.

HALLICRAFTERS SR-150—mobile rack—A.C. and D.C. pwr. supplies, $400.00 plus shipping. In A-1 condx. R. Drobish, 1316 S. Fernandez, Arlington Hts., Ill. 60005.

WANTED: January 1961 issue of 73. Please state condition and price. W2DYY, Russ Schroeder, 469 Salt Road, Webster, N.Y. 14580.

HAMMARLUND 170 receiver, SSB, clock, lists $380. Selling for $140.00. Lafayette 90-watt transmitter, $35.00. Lafayette VFO, $20.00. WB2HXY, 684 Diellen Lane, Elmont, N.Y. Tel: 516-VA5-5342

QSTS, 1917 thru 1967. Complete, originals, mint condition. 1917-1950 run in binders. Price of QSTs includes all extra QSTs, CQs, Radio Magazines, Handbooks, Callbooks. Original copy 1908 *Modern Electrics*, like new, $15.00. B. Kurtz, 515 E. Grand Avenue, Springfield, Ohio 45505. Tel: 322-7464 after 6 PM.

FAMOUS-For-Reliability 2-meter station. Built for longevity! Rack mounted RF and modulator subassembly. Sep. audio and RF pwr. supplies. Relay controlled PTT, VFO. Operated at 30W, minor change will put in 50W. Commercial converter. Tuneable IF strip. Spare tubes incl. 5894, diagrams. Approx. $150.00. SX101/3, 20A, VFOs, 200W linear, T/R switch, spare tubes, approx. $275.00 plus spkr, mike and antenna and you're on the air! Budd Meyer, 6505 Yellowstone Blvd., Forest Hills, L.I., N.Y. 11375. Phone 726-2600/459-3491.

SELL Drake T-4X, R-4A, AC-4, MS-4, like-new, used only about ten hours, in original packing, with warranty cards: $695.00 Marvin Fein, W2AH, 151 Rock Creek Lane, Scarsdale, N.Y. 10583.

SELLING: Shawnee 6 meters. Ameco preamp ahead of receiver, $150.00. RCA 2-meter FM 146.94. Hybrid receiver and supply. Xmttr 50-60 watts, $175.00. WA9KJX, Howard Salzman, 3846 Birchwood Ave., Skokie, Ill. 60076.

WANTED: Navy R/C bridge tester. ZM-11/U. Also 50-0-50 DC Ma. meter. George Leininger, W8OZF, 16412 Marquis Ave., Cleveland, 11, Ohio.

OMS: Error in my August Ham-Ad. 75A3 item should have read 75A3 and vernier knob, $250.00. James W. Craig, 29 Sherburne Ave., Portsmouth, N.H. 03801.

SELL: Davco DR-30 receiver. Perfect condition. Used two months. $300. Will ship. Grant C. Schafer, WØDBO, Box 95A, Star Route, Littleton, Colorado 80120.

COLLINS KWM-2 serial 11947, Waters rejection tuning; PM-2 AC portable supply and CC-1 suitcase, $845.00. W2DFS, Ralph Amdursky, 45 Barry Road, Rochester, N.Y 14617. Phone 716-266-3312.

PREPARE For new FCC exams! You need Posi-Check. Multiple choice questions, diagrams, explained answers, IBM sheets for self-testing. Same form as FCC exams. General Class, $3.25; Advanced Class, $3.50; Extra Class, $3.75. 295 to 300 questions or diagrams in each. Each complete for a specific exam. Basic questions duplicated if they apply. Third class postage prepaid. Add 26¢ per copy, for first class mail, 54¢ for air mail. Send check or money order to Posi-Check, P.O. Box 3564, Urbandale Station, Des Moines, Iowa 50322.

FOR Sale: Complete 1-year old Drake station, low hours, no scratches, with cartons, T4-X, R-4A, MS4 speaker and AC4 supply EV-630 mike for only $675.00. Phone after 6 PM. C.D.T. 812-4259857. Porter Barnes, 2922 Muensterman Ave., Evansville, Indiana 47712. W9CKF.

MOHAWK Receiver, $115.00; Heath 2-12 wide band 5" 'scope, $45.00; Homebrew sweep generator, $23.00; Mosley TH-31, $20; W2AZL 2M converter, Dec. 1959 QST, $25.00; Sola 500VA constant volt xfrmr, $10.00. QSTs, 1940-1968. Write. WA2RKW, 1320 Abington, N. Tonawanda, N.Y. 14120.

SELL: R-388 (Collins) receiver, $200. B&W 5100B transmitter, $120.00. Both units are in excint condx in every way! J. R. Bergeron, W2YLG, 3731 Sweet Road, Jamesville, N.Y. 13078.

SX-100, $125.00. Good DX-100, $80.00. Will sell or trade for TR3-TR4 or Swan 350 and pay difference. W9ZMK 4526-13th Ave., Rock Island, Ill. 61201.

NEED Funds, Swan 250 and AC power supply with cabinet. $300. Joe Carter, WAØMFK, Room 423, Morgan Hall, W.P.I., Worcester, Mass. 01609.

HALLICRAFTERS SR-150 and matching power supply, $325.00. HA-6 transverter and power supply, $125.00. Both nice units. You pay shipping. Want: 32S-1 or 32S-3 with power supply. Larry Payne, 121 Pepperidge Lane, Battle Creek, Michigan 49015

HRO-60 with xtal calibrator, standard coils and 15 meter coil, $365.00. Central Electronics slicer with Q-multiplier, $65.00. Both for $400.00. Will deliver within 250 miles radius. Art Casler, 34 Mountainview Ave., Washington, N.J. 07882. Original owner.

SELL: HW-32, in excint condx, $70.00; also Novice receiver, SX-110, like-new, with 2nd set of tubes: $70.00. Paul Bowman, WA4QBM, 210 B Dehart Street, Blacksburg, Va. 24060.

CLEGG Zeus, Interceptor B, all-bander converter, in mint condx, used less than one year. Original factory cartons, all manuals. Will sell all or part first m.o. or certified check for $650.00. Best offer. K4KTP, James Maxwell, 1233 Leawood Street, Memphis, Tenn. 38122.

ANTENNA Security? Over 1200 highly corrosion-resistant threaded and washer items. June ad, page 159. We match samples. Quote your needs! Ham Hardware Headquarters, Walt Straesser, W8BLR, 29716 Briarbank, Southfield, Michigan 48075.

QSTS for sale: 1924-1949. Run is complete. $75.00 and shipping. W8INB, 9 Valley View, Vienna, W. Va. 26101.

BRAND New Ham-M, $95.00; like-new TH-4, $65.00. Brand new Hy-Gain 5BDQ 80-10 M. KW trap doublet, $25.00. WA2A5I/1, 48 Offutt Rd., Bedford, Mass. 01730.

TO Settle estate of W2ARW: Sell Collins KWS-1 with new 4CX250Bs, $550.00; Collins 310B-1, $75.00; Gonset 2 and 6 meter VFO, $30.00; Millen 2-6-10 meter transmitter and modulator, $65.00; Hallicrafters SX-101-111A, $150.00; SX-71, $100.00; SP-44, $50.00; Sonar SRT-120, $50.00; Heathkit HO-10 modulation monitor, new, $50.00. Send for list of other goodies. Will pack and ship collect. W2FNF, Mike Rosenberg, 35 Strawberry Lane, Roslyn Heights, N.Y. 11787. Tel: 516-MA1-4798.

THORDARSON Flexible 1 K.W. wireless transformers made in 1915. Must be in gud condx. R. K. Golka, 38 Park St., Brockton, Mass. Tel: 617-587-5594

COLLINS 75S-3B for sale, $400.00. New condition. Sam Davis, WA5DRS, 5766 St. Katherine Ave., Baton Rouge, La. 70805.

DOUBLE Birthday present: Sell brand new SWR bridge, Microwave devices Model 261 coupler, and 262 indicator, $30.00. Will ship. WA1CRS, 35 Sunnybrook, Waterbury, Conn. 06708.

FOR Sale: Complete Heathkit DX-100B xmtr and Heathkit SB-10 SSB adapter for c.w./a.m./s.s.b. operation. All conversions including grid block keying, solid state HV power supply, chrome knobs, complete conversion for s.s.b. using SB-10 with DX-100B. Runs 200 watts d.c. input. Manuals and connecting cables included. Will accept reasonable offer. WA3HJR, 1626 Moss St., Reading, Penna. 19604.

FOR Sale: HT-37, $225.00; SX-101 Mark III, $140.00, both are in excint condx. W8KYH, G. Reazer, 8354 Luster Dr., West Chester, Ohio 45069. Tel: 513-777-3756.

SELLING 2 meters: Ameco Nuvistor converter 7-11 Mc. out, p.s., used only 10 hours; 6360 Handbook exciter, p.s.; 829B Class C amplifier, p.s. Eico 730 modulator, also TX-86, 80-6M a.m.-c.w., p.s. Dow-Key. Make offers any piece or pieces. Howard Ball, WB2PUI, 2700 Grand Concourse, Bronx, N.Y. 10458. Tel: LU-4-0316.

SELL: 75A4 Ser. #2036, 2 filters, in mint condx, $400. Seneca, VHF-1, trans. $90; 12V G-E TPC, FE43JA6, 10w. w/acc., $175.00; Geiger counter, precision Model 1074. $20.00; new 813 tubes, $10.00; Hallicrafters SR-150 with a.c. and d.c. supplies, $350.00. RA-42, adjustable power supply, 0-300 v.d.c. $15.00. M. H. Klapp, W2EQV, 25 Gladwish Rd., Delmar, N.Y.

BIRD Wattmeter, $75.00; pair of new meters for #43 or #43 line sections, $15.00 ea., 59 megacycle meter, $95.00; Eldico transmitter SSB-100 Mil, $150.00. Clegg Zeus, $290.00; BC-221, $45.00; TS-323, $85.00; TS-186, $125.00; Heath 10-12, $50.00; 10-30, $39.00; 432 Mc. revr., $35.00; 6939, 7289, Communicator VFO, miscellaneous. List, stamp, W4API, Box 4095, Arlington, Va. 22204.

SB-34, HD-600 mike, mobile antennas, $325.00. RCA Radiola, Atwater Kent 55C, old books, $100. Gary Henman, Fairmount, Indiana 46928.

SELL: Receiver, Hallicrafters SX-111, good condition, $115.00. Ed Steeve, W9ZWC, 7122 N. Odell, Chicago, Illinois 60631.

COLLINS 32S-1 and 75S-1 for sale, $550.00. W. F. Hamilton, K5DFZ, 5505 Valerie Street, Houston, Texas 77036.

SALE: SX-140 receiver, Ameco TX-86 transmitter, M-1070 supply, V-10 VFO, converters, antennas. WAØNLR, 715 Tyler, Apt. # 36, Topeka, Kansas 66603.

SELL: 238 QSTs, from 1930: 132 CQs from 1946: miscellaneous Callbooks and Handbooks. Make offer for the lot; BC221 with book and 110 VAC p.s. $45.00. W2EXX, 58 Birch Place, Buffalo, N.Y. 14215.

SACRIFICE: NCX-5 transceiver with NCX-A a.c. power, and speaker; has solid state balanced modulator and crystal calibrator, manual and original cartons. Factory working condition and m.nt in appearance! First $460.00 gets it or will consider best offer. M. Eidson, W5AMK, Box 96, Temple, Texas 76501.

SALE: KWM2-A and 516F-2. P.s. Both two years old. Absolutely no scratches. Perfect mechanical and electrical condx. No modifications. Contact M. L. Williams, 1408 Quill Dr., Plano, Texas, 75074. Tel: 214-945-7309, K5UFL.

WANTED: Used radio correspondence course. For sale: Invader 200, excint condx, $285.00 W4TZY, 6985 Malaleuca Rd., Cocoa, Fla. 32922.

WANTED: Johnson Navigator. State price and condx. in your first letter. Will pay shipping. Pete Burbank, W4VCT, 409 Granite Circle, Lexington, Ky. 40503.

APACHE with manual, in excint condx, $100.00. Will crate, you pay freight. K3TDD, Dave Jones, Quevic Drive, RD #4, Ballston Spa, N.Y. 12020.

NOTICE To all amateurs! Novice to Extra Class! We will make you as good a deal, cash or trade, on your needs of new or reconditioned used gear. We also have demos at reduced prices. We have all leading lines of new amateur gear. Good reconditioned, used gear fully guaranteed. Factory reconditioned KWM2 with 516F-2 A.C./P.S., like new, $800.00. 30L-1, $350.00; Galaxy V Mk II, $365.00; Johnson Invader 2000, $350.00. Write or call for new listing of used gear at bargain prices. Bob's Amateur Electronics, 927 N.W. 1st, Oklahoma City, Oklahoma 73106. Tel: 405-CE5-6387.

SELL: Collins KWM-2 and matching a.c. power supply 516F-2. In perfect condx: $700. Tel: 419-293-3500. WA8GGC, John Breece, 295 S. Main, McComb, Ohio 45858.

B-24, all-band mini-beam, $20.00. B&W 600 grid dip meter, $18.00. Art Billington, W4UYH, 11421 SW 40 Ter., Miami, Florida 33165.

SB-100 Heathkit. Perfect shape, not a scratch, very little use. College expenses forces quick sale, $225.00 with a.c. power supply. WA3AOF, James Lunt, 8434 Ardleigh St., Philadelphia, Penna. 19118.

HEATHKIT Apache TX-1, 150-watt AM, CW, 80-10 meters, in excint condx. With manual, $50.00. Will demonstrate. Will not ship, sry. Keith Smith, W6JOM, 3849 Cedar Avenue, Long Beach, Calif. 90807. Tel: (213)-426-6098.

COLLINS 75S3B, $425.00; 75A4 with 6 kc. 2.1 and 800 cycle filters Serial #4606, $395. Money back guarantee. K1AGL, Stanley Partyka, 141 Waite Ave., Chicopee, Mass. 01020. Tel: 413-592-2952 person-to-person, please.

HEATHKIT SB Line: SB-100 transceiver, $320.00; HP-23 AC supply, $39.00; SB-600 speaker, $14.00; SB-610 'scope, $59.00; SB-630 console, $69; package deal: $450.00. Poly Tri-quad, complete with coax, copper wire, fibreglass spreaders, heavy duty aluminum boom and "X" mounts and 3 band remote switching unit, $79.00. All professionally wired, and in mint condition. WB2GND, 196 So. Hewlett Ave., Merrick, L.I., N.Y. 11566.

NATIONAL NC-300 receiver, in excellent condition, with crystal calibrator, speaker, headphones, manual, $175.00. 1227 Bay Park Place, Far Rockaway, N.Y. 11691.

SOUTHERN California. Communications receivers, transmitters and SSB transceivers repaired and realigned. Guaranteed work. Special problems invited. Eighteen years communitions experience. Gates Marine Electronics, 255-A Marina Dr., Long Beach, Calif. 90803, K6GOC, Roger.

THOUSANDS Sold worldwide! Genuine "3-D" raised relief map of the world. Giant 28" x 18" size, including woodgrain style molded frame! Free wall mounting kit! 8 rich colors on heavy vinyl. Mountains stand tall, actually feel height and depth! A prized addition to your shack, and fully guaranteed. Rush $5.95 for postpaid shipment. 3-D Map Co., Box 221, Lake Grove, N.Y. 11755.

WANTED: Electronic test equipment (military and commercial) made by companies such as Tektronix, Hewlett-Packard, General Radio, Measurements, Stoddart and others. Also technical manuals, airborne and ground communications equipment, tubes, accessories. Highest cash prices paid. Write for our offer. Tucker Electronics, P.O. Box 1050, Garland, Texas 75040.

CRYSTALS Airmailed: MARS, Nets, SSB, Marine, CD, etc. Novice .05% crystals $1.50. Custom finished etch stabilized FT-243 .01% any kilocycle or fraction 3500 to 8600 $1.90. (Five or more this range $1.75 each), (nets ten or more same frequency $1.45). 1700 to 3499 and 8601 to 20,000 $2.75, with overtones supplied above 10,000. 10,001 to 13,500 fundamentals $2.95. Add 50¢ each for .005%. Add 75¢ each for HC-6/u metal miniatures above 2000. OST, Handbook, SSB Manual and other ARRL builders crystals, groups and singles. Be specific. Write for order-bulletin. Crystals since 1933. Airmailing 10¢/crystal, surface 6¢. C-W Crystals, Marshfield, Missouri 65706.

"HOSS Trader" Ed says if you don't buy your ham gear from him you might pay too much. Write or telephone the "Hoss" for excellent cash quotes and trades anywhere in the U.S.A. New equipment with factory warranty: BTI LK-2000 linear, $649.00; SB-34, $349.00; Swan 500, $359.00; New Hammarlund HQ-215 receiver, regular price $529.50, cash price, $419.00; new L-4 linear, $479.00; new VX-501, National VFO, regular price, $249.95, cash price $129.00; new SR-400, $649.00; new Galaxy V, Mk II, $329.00; Rohn 50 ft. foldover tower, prepaid, $199.00; new Mosley Classic 33 and demo Ham-M rotor, $195.00. Used equipment: Drake 2-B, $189.00; HT-44, SX-117 and supply, $495.00; HW-12, $79.00; TR-4, $419.00; T4-XB, $329.00; R4-B, $319.00. Ed Moory Wholesale Radio Co., Box 506, DeWitt, Arkansas 72042. Tel: 946-2820

WANTED: ARRL Antenna Book, second edition; will pay any reasonable price or will swap edition 3, 5, 8, 9, or 10. Chappell, 22206 Del Valle St., Woodland Hills, California 91364.

HY-GAIN DB-10/15 in excellent condition, $49.50. Will deliver to within 100 mile radius. KØCKX, Tel: 319-338-1814.

HEATHKIT HW-16 c.w. transceiver, like new, $85.00. WB2-BOY, 624 E. Pine St., Millville, N.J. 08332. Tel: 609-825-3612.

SELL: Heath DX-100 xmtr, gud condx, $65.00, HM-15 SWR meter, excint condx. $10.00. Fred, WA1HKV, 92 Leonard Rd., Hamden, Conn. 06514.

SELL: Heath KW linear, Drake 2-A receiver, NCX-3 transceiver, 30L1 linear, TA-33 beam, Heath monitor 'scope. Leon Steinberger, W2EVV. Tel: (212)-672-2432.

SELL: HT44 and PS150, new finals, $225.00; HQ-170AC, $225.00. Cartons, manuals, both clean, no marks. Sry, no shipping; you pick up. W3CFX, St. Michaels, Md. 21663.

DRAKE 2B, 2AQ, Q-multiplier, 2AC calibrator, extra 10-meter xtals. All are in mint condx. $195.00 Sry, won't ship. WA1AZW, Framingham, Mass. Phone 1-617-879-0013 after 4 PM my time.

HT-32, $199; HQ-170A, $199, together for $380, with manuals. Both look, work like brand new. Inspection invited. Mitch, WB2UPB, Tel: 516-RO6-7097, 3403 First St., Oceanside, N.Y. 11572.

NATIONAL NC-300, vy clean: $145.00: DX-40, VFO, HR-10, all excint condx: $110.00; HA-230 gen. coverage rx excint, $65.00. Wollensak 1980 perfect, like new, $210. Steve WA2BUF, 116 Hudson Ave., Haverstraw, N.Y. 10927.

FOR Sale: Drake R-4 in mint condx, used vy little, $300. Mosley 20 mtr. 3-element beam, new, $33.00. 6 mtr. transceiver, Lafayette HE-45, $50.00. Henry Niklas, 1138 Dorchester Avenue, Dorchester, Mass. 02137. Tel: 617-288-5846.

GOOD Condition: DX-60A, $55.00; HG-10, $25.00. "Twoer", $30.00. WA4YNU, Box 2248, Poquoson, Virginia 23362.

FOR Sale: Johnson K.W. complete with desk, Ranger driver, and coax T/R switch, all in gud condx. $300.00. 3-section crank-up tower, $100.00. Hy-Gain Tri-Band beam, $30.00. Model 26 printer, $30.00. Small prop pitch motor, $25.00. W6JFZ, 4624 W. 63 St., Los Angeles, Calif. 90043. Phone 2945760.

COMPLETE Amateur servicing. Kits wired, tested. J-J Electronics, Canterbury, Conn. 06331.

TOROIDS, 88 and 44 mhy. Center-tapped, unused 5/$1.50 ppd 11/16" perf. tape and 3/box; RTTY page printer paper, $5.50/case. Hallicrafters HT-37, electrically perfect, $175.00. HQ100AC, $95.00. 2 meter Tecraft Criterion conv. $30. Johnson 10 pass filter, $8.00. Saturn 6 halo, $9.00. Wanted: PTO for Collins 51J3, 2 meter transverter, RTTY gear. Stamp for list. Van, W2DLT, 302Z Passaic, Stirling, N.J. 07980.

HEATH SB-101, $370; HP-23, $49.95. Works perfectly. Swan 240, with matching a.c. supply, speaker built-in, $250.00. You pay shipping. WIERX, Rowayton, Conn. 06853.

SELL: SX-100 Hallicrafters, $125 00; Knight T-60 transmitter, $35.00. All with manuals and in A-1 condx. Marvin Luedtke, 6209 Nasco Dr., Austin, Texas 78757.

CONTROL Panel lettering (On aluminum foil). 5¢ a word. Stamp and call brings sample! Samco, Box 203, Wynantskill, N.Y. 12198.

MUST sell new stereo equipment for school expenses. All equipment is new in factory-sealed cartons. Sony 250-A (cost $135), $100; dual 1015 Changer and base (cost $97.45), $70; Bogan AT-400 40-watt stereo amp (cost $139.95), $95.00. All this is new equipment in factory sealed cartons. Full warranty. Used amateur equipment, Galaxy V, $255; AC power supply, $50.00; HQ-170C, $129.00; Heath TX-1 Apache, $50.00; new Hy-Gain 14AVQ in factory-sealed box, $30.00; new heavy-duty self-supporting 40-ft. tower, $65.00. Martin Mitchell, WA5HTF, 2128 A 70th St., Lubbock, Texas 79412.

FROM W2LF's estate: QSTs run from January 1945 to June 1967. Some missing issues, about 23 to 44. George Batterson, 126 Westfall Road, Rochester, N.Y. 14620. Phone 716-476-3402.

SB101, 2nd rig, used less than 5 hours. Checked out OK on all bands. Sell to best offer. W1WJO, A. Misenti, 12 Longview Dr., Simsbury, Conn., 06070. Tel: 203-658-9182.

EICO 753 w/751 a/c p.s. In FB condx. $160.00. WA5RVD, 241 Stuart, Shreveport, La. 71105.

DRAKE station for sale. All units are in perfect operating condition. 2B, 2BQ, 2AC, $160. T4X, AC-4; $330.00, Accessories: Heath SB-600 speaker, $12.00. Johnson T-R switch, never used, $20.00. WA9AUM, James Cain, Wiley Hall, Hanover, Ind. 47243.

KWS-1, absolutely clean and unmodified and in exclnt working order: $550.00. Will ship. 25-50 Mc 500 watt General Electric FM xmtr, complete in 6 ft. cabinet, w/meters. Uses two 4125As in the final. $275.00. Will ship. Wanted: Several G-E mobile units, TPL or MASTRs. W9DSV, Box 87, Webster, Wisc. Tel: 715-866-2468.

SBE34, Clean, in gud condx. Mike, mount, book, cables, $225.00. Hustler MO2 and RM20, $10.00. P E-101C, new, $3.50. Fornaire FCB5 (CB) OK, $20.00. F.o.b. C.o.d. all for $240.00. Joseph Bodio, WA5ECL, 1920 Alta Woods Blvd., Jackson, Miss. 39204.

FOR Sale: Lafayette code oscillator and semi-automatic bug, both together for $10.00; also 14AVQ, vertical antenna and roof mount, together, not used for $30.00. Need instruction book for MARS EK-20 keyer, will borrow or buy. R. Nicodemus, RD #8, Colonial Vill., Greensburg, Penna. 15601

75A-4 Serial #5388 (latest model) in perfect condx with .800, 3.1 and 16. kc (for RTTY) filters, manual, original packing, $460.00. CE-100V serial #918 (one of last made) in peak condition, manual, original crating, $495.00. HT-41 linear, manual, $175.00. Jim Dittrich, K2OIN, 249 Meadow Lane, Vestal, N.Y. 13850.

CW Station: Heath HW-16 with HG-10B, $120.00; Hallicrafters HA-1 keyer with Vibroplex, $45.00, like new. 3-400Z, new socket also pancake blower KW. P1 DUX coil: caps, HB choke, meters, etc. for linear, $30.00. Will ship postpaid to first money-order or check. WA4KRU, 907 Pinecrest Drive, Vidalia, Georgia 30474.

SELL: Swan 500, seven months old, 117XC, AC supply, VX-1, best offer, and Heath SB-200, $150.00. Nick, K9KLR, P.O. Box 1816, Gary, Indiana 46409.

HEATH Marauder, just factory aligned, in exclnt condx, $170. Eugene Ornskin, WB2VIO, 313 Crown St., Brooklyn, N.Y. 11225.

NATIONAL HRO5OT w. crystal calibr. and Select-O-Ject, A,B,C,D coils, $125.00. Johnson Ranger I w PTT, $89.00. Both in A-1 condx. K9HQC, Laurence Van Someren, Baldwin, Wisconsin 54002.

LAST Chance. Factory overhauled Hallicrafters HT-32A: SX-101A, Heath Warrior HA-10, 1 KW P.E.P. linear. All for $475.00 cash. No separation. You pick up. Abramson, K9-KWV, 2942 Jarlath, Chicago, Ill. 60645.

SALE: Drake 2B with xtal cal. and spkr. $175.00. $40.00. All are in exclnt condx. WA9VOB, 1057 S. Dunton Ave., Arlington Heights, Ill. 60005. Tel: (312)-259-5818.

QUESTAR Wanted. Will swap Swan 500 with AC and DC supplies plus VOX unit and external Swan MARS oscillator and remotely-tuned mobile Swantenna. W1CNY, 228 Hickory Hill Lane, Newington, Conn. 06111.

BENDIX Inverter, 24v. DC input, 115v AC output @ .45a 400 Hz. Fred R. Profe, W1QXT, 487 Pinerock, Hamden, Conn. 06514.

QSTS: 1928 thru 1965. In QST binders. Few missing. $25.00. W6KG, 5200 Panama Ave., Richmond, Calif. 94804.

SELL: Model 15 RTTY, model 14TD, Model 14 typing reperforator. Package for $110. Pick up deal only, sry. Sell TD and reperforator separately and ship F.o.b. WA4RGL.

SWAN 2000 watt linear amplifier, never used, guarantee card not sent in. $390.00. W9ICE, 370 Aspen Lane, Highland Park, Ill. 60035.

DRAKE 1A, $100.00; C-E 20A, VFO, $90.00; 10A, VFO, $50.00. Lou Hayes, W9BWV, 803 N. Harlem Oak Park, Ill. 60302

HAMMARLUND HQ-170AC, $235.00. New cost $430. Gud C.W. and S.S.B. receiver 160-6 meters. In vy gud condx. Will ship. David Soldar, Rte 3, Manhattan, Kansas 66502.

TRANSMITTER TX-1, Apache 5-bands, $110.00. Jones, 1132 W. 124th St., Los Angeles, Calif. 90044. Phone 757-4438.

SALE: 75A4, 3 filters and matching speaker, mint condx. $375; SX-122 and matching R-46A speaker, mint, $165.00;

M&M electronic keyer and Brown Bros CTL keyer, both brand new, $48.00. Send for list of other items, meters, variable capacitors, etc. Earl Crews, W4DBH, 2522 Shafer St., Norfolk, Va. 23513. Tel: 703-853-4903.

"DON And Bob" authorized Collins warranty repair station in South Texas plus repair on other major lines. KWM-2 complete tube replacement kit—list $63.70 your cost, $29.95; 32S-3 tube kit, list price $40.40, your cost $19.95; 75S-3B tube kit, list $38.25, your cost $15.95. Used gear specials: K WM-2 $700.00; 516F-2, $95.00; 75S-3B, $450.00; NCX-3, $175.00; SB-300, All filters, $225.00; HT-32B $249.95; SC-122, $250.00; HRO-60, Slicer, coils, speaker, $250.00; HQ-170A. $175.00; 85KCIF, $1.50; 6V1QA transformer, $3.95; 12V10A, $4.95; 1000KC xtal, $3.95; Telex HMY-2000 headset, $3.95. Write for list. Don, K5AAD, Bob, WA5UUK, Madison Electronics, 1508 McKinney, Houston, Texas 77002. Tel: 713-CA4-2668.

VIKING II, VFO Model 122, Matchbox and Gonset mod. indicator, $75.00. All clean, no scratches. Manuals for all. Sry, can't ship. W2NZG, Tel a.c. (201)-427-3893.

FOR Sale: Davco DR-30 communications receiver, 80-6 mtrs. in 10 positions, plus separate positons for WWV. Cost new $389.50. Will sell for $250 or your best offer. K1QQX, 400 Willard Ave., Newington, Conn. 06111.

SELL: HT-37 and Drake 2B with 2BQ for only $165.00 each. Both in excellent condition. Cannot ship, sry. KØCKX, Tel: 319-338-1815, 52240.

COLLINS 30L-1 for sale, serial 1397. Absolutely mint. Kept in plastic. $350.00 F.o.b. Shipped in original carton. Roddick, K7BDG, 5105 East Sunset, Yakima, Washington 98901.

1930 ARRL Handbook in mint condition. Need SSB KW amplifier or used Tri-Band beam. Will negotiate trade. WB4HIM, W. J. Crosby, 3529 Tula Dr., Jacksonville, Fla. 32211.

SBE-34 with mike, used only 3 hours, HW-80 mobile ant. and bumper mount, new. Heath P2 SWR and Twoer, like new. Must sell. Mario Lovator, 3725 West 82nd St., Chicago, Ill. 60652. Phone 585-5863.

ANTENNA Equipment: Vesto HPX-100. 100-ft. self-supporting tower, $770; Telrex 20M546 5-element optimum spaced 20-meter beam, $385. Telrex A2675RIS rotator (with Telrex mast and cable, less control box), $330. F.o.b. St. Louis, Missouri. G. Grothen, 90 Florissant Park Dr., Florissant, Missouri 63031.

DX Awards Log. This 150-page book just published giving number and type of contacts needed for over 100 major awards for hams and SWLS by clubs world-wide includes cost and how and where to apply. Individual logs provided for each award to keep complete record of contacts and confirmations. Required over two years to prepare. Most complete and up-to-date source of DX Awards available. $3.95 postage paid ($4.95 foreign). The McMahon Co. (W6IZE, R. McMahon) 1055 So. Oak Knoll, Pasadena, Calif. 91106.

DRAKE R4A and T4X, practically new, in mint condx with factory warranty cards, $295.00 each. W4 Wattmeter, like new, $35.00; WRL Atlas 2 Kw. desktop linear uses four 572s in grounded grid, used but little, $260. D-104 mike, G-stand, $18.00; Mars SWR bridge, $12.00. Drake TV 1000 low-pass filter, $12.00. Vibroplex Bug, $10.00. Write or phone L. Miller, 939 Roumfort Rd., Philadelphia, Penna. 19150. Phone CH7-7943. WA3IKD.

COLLINS 75A-4, 0.5, 2.1 and 3.1 KhZ filters, matching speaker; KWS-1 with spare 4X250Bs, antenna switch, vernier dials, both excellent condition. $950.00 F.o.b. J. D. McWilliams, W6RTG, 1800 First St., San Pedro, Calif. 90732. Tel: 201-832-5227.

ROTORS: 2 AR22R automatic rotors for sale, or trade for 1 TR-44 rotor. Less than one year old and in great shape. $20.00 each. Contact Marc Brown, 6545 Varna, Van Nuys, Calif. 91401. Tel: 213-782-5398.

TRADE Concord transistorized stereo-tape recorder Model 440 (in mint condition) for used name-brand communications receiver above $200. Descriptive literature sent upon request. K3IGO, 1917 Haywood St., Farrell, Pennsylvania 16121.

WANTED: 23 Channel CB unit and pair 1 watt walkie-talkies. W8BNO, 424 Lewis Seifert Road, Hubbard, Ohio 44425.

HT-32, excellent condx, $220.00. R. Dayton, WA8EGF, 401 Northwood, Rochester, Michigan 48063.

SELL: Apache SB-10, $150.00; Lafayette HA-350 receiver, $90.00; T-60, $30.00; HG-10B VFO, $20.00. All in gud condx. You pay shipping. Tom Mann, WA8TWR, Box 669, Lewisburg, W. Va. 24901.

VIKING 500 trans and SX-100 rec for sale. Both perfect, like-new condx, Eng. owner. Make best offer for together or separate. K1KON, 3 Beechwood Road, Norwalk, Conn. 06854.

SELL: DX-100B, excellent condition, $100. Sorry, no shipments. K1GCS, 8 Norton Ave., Guilford, Conn. 06437.

HALLICRAFTERS HT-32B like new, $310.00; Drake 2B $160; BC221AK, $50.00; SX-28, S36, S37 mounted in 36" cabinet with speakers, $200. 60w mobile transmitter 10M, $18.00. A. Zappia, 51 Willard Way, Huntington Sta., N.Y. 11746.

GONSET 6M 220 watt linear, $70; H.B. 10 watt 6M exciter, $20.00; Telrex 6MSR 11-element spiral ray, $50; Topaz transistorized 300-watt power supplies: C10WDG, $40.00; 300XL, $50.00; Kuptrian p.s. 12 vdc-300 vdc, 150 vdc, $27.00; Clegg Thor VI w/a.c., p.s./modulator, $149.00; Motorola 30D on 6 AM w/transistorized modulator, $25.00. Gonset #3012 (152-162 mc), #3011 (40-50 mc.) tuners @ $25.00; FM-SCA background music adaptor, $35. Specially made Hy-Gain 6M center-mounted chrome-plated 2-ring halo w/23" chrome mast for body mounting, $30.00. (XYL will love). Globe Matchbox, $8. Shielded ignition coil, $20.00; 12 Ava, $15.00. All F.o.b. Richard M. Jacobs, WAØAIY, 4941 Tracy, Kansas City, Missouri 64110. Tel: (816)-HI-4-1968.

WILL Trade Heath DX-60 for $60 Mosley CM-1; RME 4300; National NC-173 or any receiver of same value. John Erb, 218 Shaddle, Mundelein, Illinois 60060.

CAMERA Fans: Will trade Minolta SR-101, 200 MM, 58 MM, 35 MM Mc lenses, many accessories, for SSB transceiver. Will consider cash either way for difference. W6ZAG, 1045 Ocean, Santa Monica, Calif. 90403.

FOR Sale: Globe Chief DeLuxe xmtr, Globe VFO V-10, Globe modulator SM-90, Astatic mic JT-30. All in fine condx. Best offer takes all. WA2JZU, 18 Elm Road, Pompton Plains, N.J. Tel: 835-3804

COLLINS 75A4 receiver, very good, serial 4441, with filters 3Kc, 2.1 Kc, and 500 cycles, $345.00; Collins KWS-1 low serial No., gud condx, complete with co-ax relay and mike: $465.00; Gonset 2-meter amplifier, Model #903A, exclnt condx, $145.00; Polycom 2-meter transceiver, very gud, $95.00. All equipment with full manufacturers manuals. Milt Krauthoff, W9BTQ, N89, W16800 Cleveland Ave., Menomee Falls, Wisconsin 53051.

WANT: Heath VC-2 voltage calibrator. Must be like new, and with construction manual. State price. F. W. Gensch, 396 Winnebago Ave., Menasha, Wis. 54952.

WANTED: AN SW-3 and 1930 issues of Short Wave Craft. W4COC, Tom Boone, 112 W. Sycamore St., Greensboro, N.C. 27401.

WANTED: Type 4D32 or 4D22 tubes. Ken Shaw, WB6VHE, 88 West 41st Ave., San Mateo, Calif. 94403.

SELL: Henry 2KS linear, on air now, $650.00. In A-1 shape. WA1HNV, 66 Autumn St. Ext. Rochester, N.H. 03867.

KNIGHT R100A, exclnt condx. With spkr. S/meter, manual: $60.00. WA2BLE, Barken, 274 E. Mt. Pleasant Ave., Livingston, N.J. 07039.

FOR Sale: NC-300, Viking Valiant, SB-10, National spkr. All in gud opertg. condx. Any reasonable offer accepted. Don Backstrom, Rd 2, Russell, Penna. 16345.

QUICK Sale: Knight T-60 xmtr; HE-30 recvr, HA-90 80-10M VFO, plus bug, relay, padded headphones. First $60 check to Tom Bellamore, WB2PAR, 1090 Arlington Road, New Milford, N.J. 07647.

HW-12A, HP-23. Both look and perform perfectly. If speedy, add Heath mobile speaker. $140.00. Greg, WA7FSB, 2567 S. 150th E., Bountiful, Utah 84010.

CLEGG Intercepter B with allbander, $295; Hallicrafters HA-6 transverter and power supply, $125.00; Hammarlund HQ-180-C, $350.00; Central Electronics MM-2, $90.00; Monitor radio Model DR200, with matched speaker, $150.00; Parks Electronics Model 432-3 converter from 50 Mc., $45.00; Clemens SG-83A signal generator, $200.00; Heathkit SB-630, $75.00; Comdel speech processor CSP11, $50.00; Comdel directional Wattmeter DW-1550, $75.00. Every item listed above is complete, with instruction book. All units are in new condition, some not even used. Ted Valpey, W1ATP, P.O. Box 87, Mellen Street, Holliston, Mass. 01746.

RARE QSTS! 50-year-run! All or none. 1916-1966. SASE for list. No offers under $500. H. E. Sanders. Tel:501-663-2297. 5110 N. Country Club Blvd., Little Rock, Arkansas 72207.

FOR Sale: Radiola III. A real antique. $30.00. Mrs. Ruth S. Banks, 371 S. Park Place, East Aurora, N.Y. 14052.

ALL American OMs, XYLs, YLs visiting Spain are welcomed by Old Timer V. S. Alexandersen (T-2X EI3CX, ES3CX (1925-1936) at his home in Palma de Mallorca (Baleares), Espana. Camino Son Toells 37, Casa "Ses Eures", St. Augustin.

TOWER GPRBX50G, E-Z Way crank-up tilt-over; E-Z winch, rotator all set up. Easily reached. Mobile (complete) antenna; Hallicrafters speakers, etc. William Kannia, P.O. Box 375, Botsford, Connecticut 06404. Tel: Newtown 426-2617.

EICO 720, $50.00; Johnson 275 watt Matchbox, with SWR meter, $65.00. B&W 426 TVI filter, $10.00. Make offer. Paul Wilcox, 1340 Southlyn Dr., Kettering, Ohio 45409.

WANTED: Two-element Tribander, or B-24 beam. W1VAH.

SPEEDY Sale: CE-20A with VFO, $90.00; Gonset 500W linear, $150.00. National NC-300 receiver, $150.00. Wolf, K2DDC, 151 East Johnson, Bergenfield, N.J. 07621.

KWM2 and PM2 for sale. Late model with sealed relays: $750.00 firm. Lafantasie, 613 S. Susana, Redondo Beach, Calif. 90277. Tel: 372-7543.

SELL Collins 30L-1, one KW amplifier, gud condx, $350.00. K2POI, 559 Grant Blvd., Syracuse, N.Y. 13203.

FOR Sale: 1 Mosley TA-33 Jr, $75.00; 1 Mosley A-92-S 2-meter beam, $20.00. In original cartons. W4RFP, P.O. Box 158, Snow Hill, N.C. 28580. Tel: 747-3476.

SELL: Microwave test-set "X" Band frequency meter; signal generator, power meter, TS-147-A with manual, $85.00. RTTY page printer paper, 3-ply, $7.50/case. WB2PLY, Box 207, Princeton Jct., N.J. 08550. Tel: (609)-452-9038.

FOR Sale: Ameco TX-62 transmitter, VFO-621, $125.00. Also Hammarlund HQ-170A, VHF, $250.00. In mint condx. J. Michael's, 80 Birch Lane, Woodmere, N.Y. 11598.

HEATHKIT "Twoer", in excellent condition, crystal, mike and plugs included, $39.00. WN5VGT, 2536 Duncan, Pampa, Texas 79065.

SELL: Hallicrafters HT-32A, SX-115, HF-41 with spare used finals, in exclnt condx, $750.00, plus packing and shipping charges. K2ADZ, 1551 W. Hill Rd., Elmira, N.Y. 14903.

FOR Sale: Hallicrafters SX-140, $55.00; Heath Apache, power supply; needs work. Make offer. WA9TQW, 848 Meadowlark Lane, Glenview, Illinois 60025.

HAM-M Rotator, complete, Mosley Classic 33 10-15-20 meter beam, plus 4 ft. section of Rohn Tower to contain the Ham-M. First $150.00 buys all. F.o.b. W1CPI. Tel: 783-2702.

HAMMARLUND HQ-100C receiver, $125.00; Globe Hi-Bander 6 and 2 transmitter, $65.00; National VFQ, Model 62, $35.00. John E. Spiegel, W4MEL, 1586 Moravia Ave., Holly Hill, Fla. 32017.

ARRL DX Competition

(*Continued from page 76*)

Barbados

WA3DVO/8'6
20,943- 39- 179- A- 4

OCEANIA

Philippine Islands

DU1FH 807,884-154-1754- C-

French Oceania

FO8BS 46,055- 61- 252- C-

Guam

KØILI/KG6
549,582-121-1514- C-
KG6AAY (K8RXD, W6EIF, WB6WIG)
193,050- 90- 715- C-

Hawaiian Islands

KH6IJ 3,799,962-246-5149- C-71
KH6BZF
1,654,209-197-2799- C-
KH6GJW
423,330-137-1030- B-14
KH6GLJ 240,786- 98- 819- B- 7
KH6GCF (K2SIL, KH6GLZ)
212,976-102- 696- C- 5

Marsh ll Islands

KX6FJ 43,218- 49- 294- C-
KX6DC (WB2SXF, oprs.)
12,771- 33- 129- C-

Australia

VK2APK
1,132,950-182-2075- A-
VK3ATN
1,074,789-210-1708- B-25
VK3AXK
270,072-121- 744- A-42
VK4JE 188,340- 86- 730- A-
VK4FH 105,444- 87- 404- A-39
VK3QV 104,331- 83- 419- A-11
VK5WO 33,264- 48- 231- B-
VK3SM 11,523- 23- 167- B-
VK2FU (VK2s BKM FU)
2,269,716-219-3455- B-88
VK2AND (multiopr.)
186,888-104- 599- A-17

Territory of New Guinea

VK9GN 655,860-170-1286- B-

Fanning & Christmas Is.

VR3DY
1,054,116-188-1869- A-

New Zealand

ZL1AGO
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5W1AS 697,809-141-1653- A-

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9Y4LA 477,630-145-1102- A-
9Y4LO 323,136- 99-1088- B-4

Check logs. CW: W2s EGI MLO, W4s JUK ZNI, WA5PPZ, W6EYR, W8FEM, VE2PJ, VE3ATF, CX1JM, DJ2RE, DM2s AMF AND BBF BJD, DM3TEA, DM6MAO, F2SQ, F6ACC, GM3CSM, HA2RB, HA5FA, HA8UY, LA2MA/MM, LU4DMG, OH5s RZ UQ, OK1US, OK2s BCH BCI BIP KNN OV, OZ7ON, PAØWAD, PZ1CQ, SM3CJD, SM5BXT, SM6s AVD BZE DHU, SM7DMT SMØGM, SP5CJU, UW6BK, VK3XB, YU1KA, ZL1TZ, ZS6AG, UG6-004-1. *Phone*: W1s BGJ DO, W2EGI, K2SWT, WA2VSO, W3s JGM MDJ, W4s CGW DGY EWR RNC, K4TBN, W5s BUK CIO/5 FFW, W6s CFG OJW PDF, W7GGO, K9LET, WA9RKI, W9UAZ/4, VE3BDB, W8ILH/VE6, VE7s AIS AJ NH, DJ2RE, F5PW, G2AJB, LA8EJ, LU4DMG, OH5UQ, PY2GC, SL2ZI, SM2COR, SM.5 BFE DQG GA, SM6DHU, SM7CSN, VK3s KS XB, YU3RS 780, SWL-A-5489. QST

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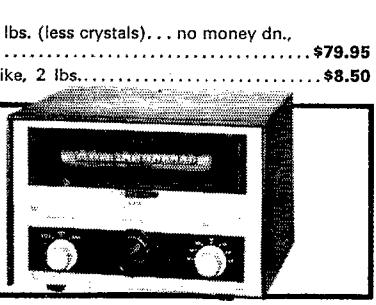

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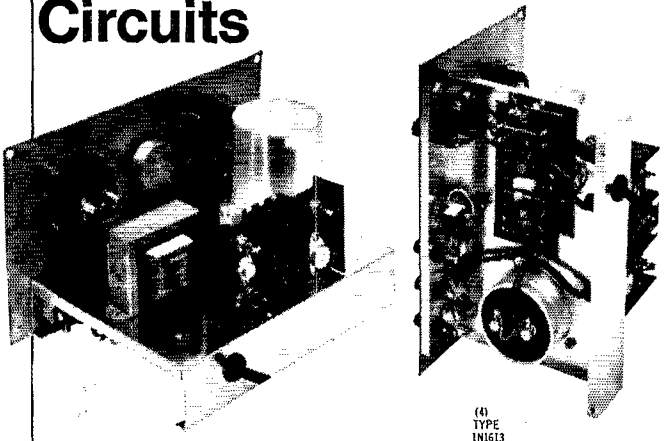

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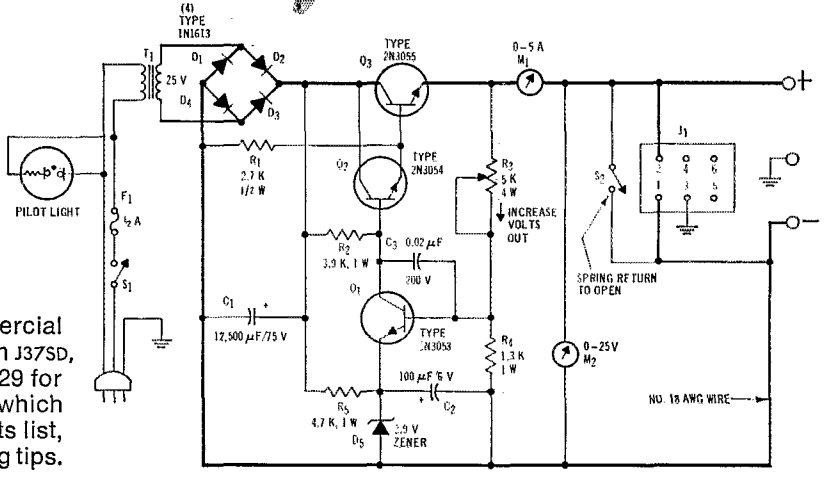

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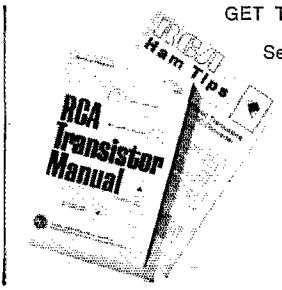

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