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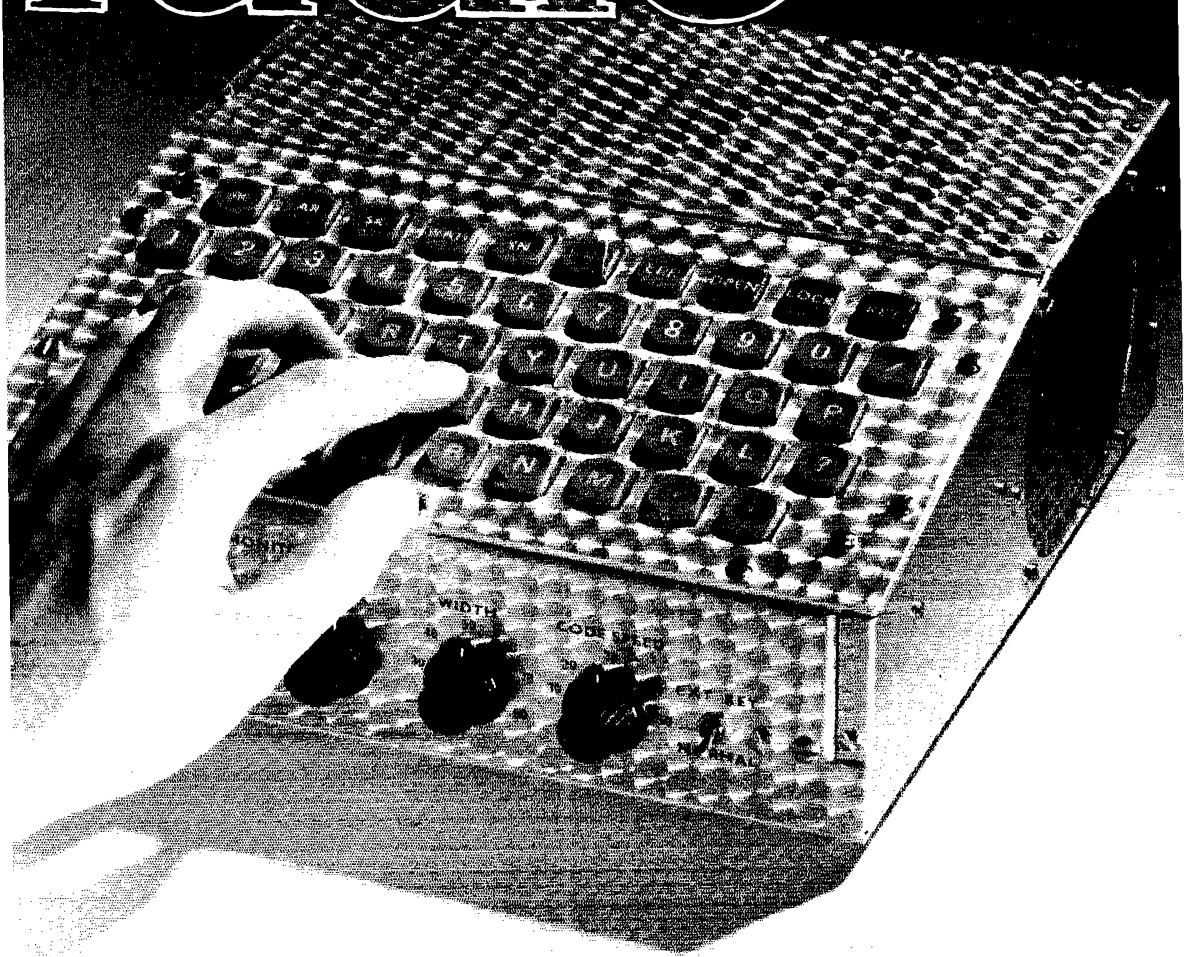

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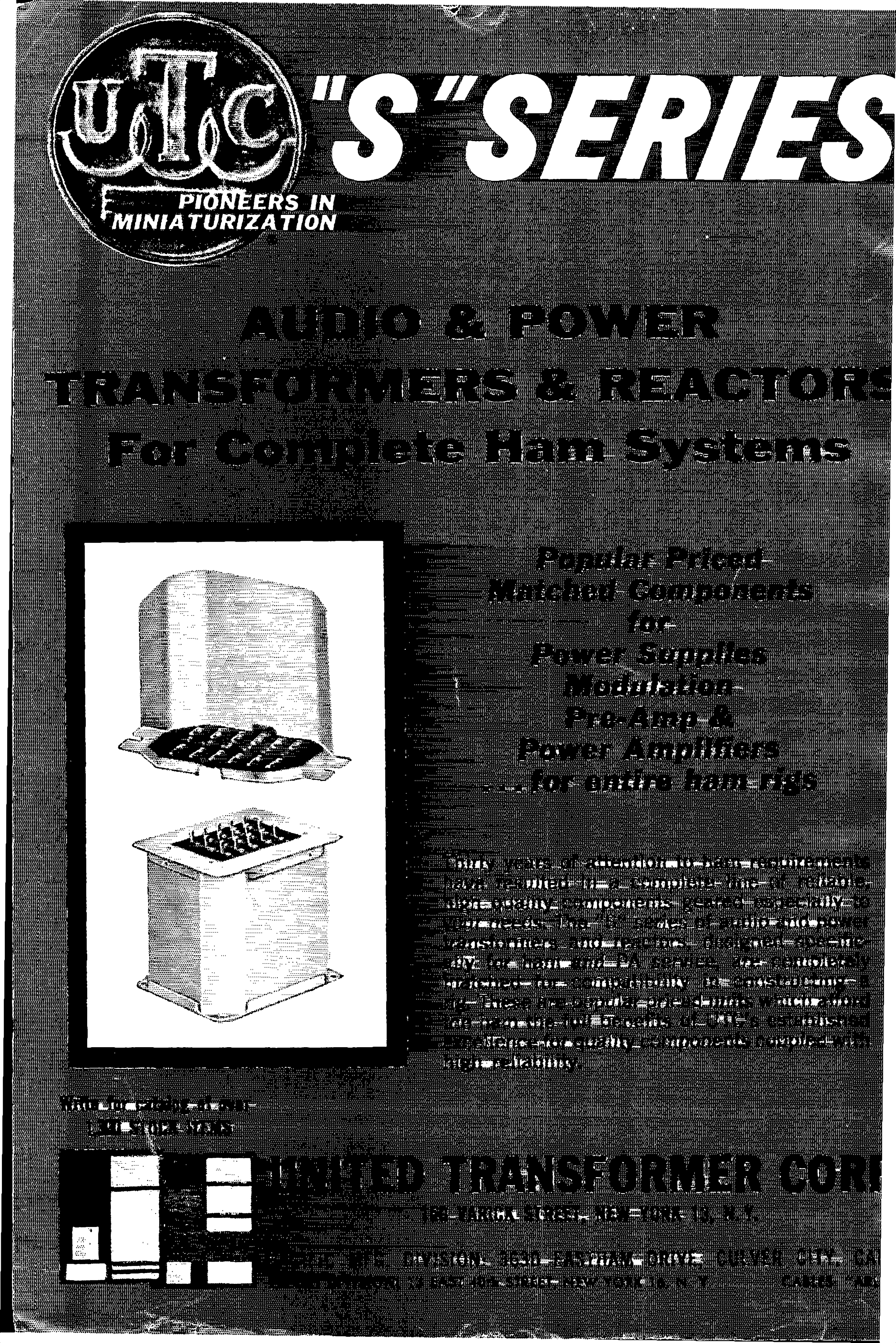
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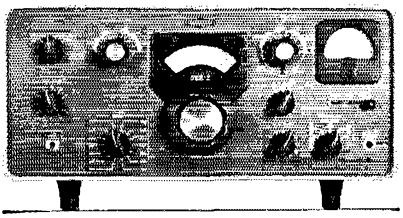

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QST

AUGUST 1965

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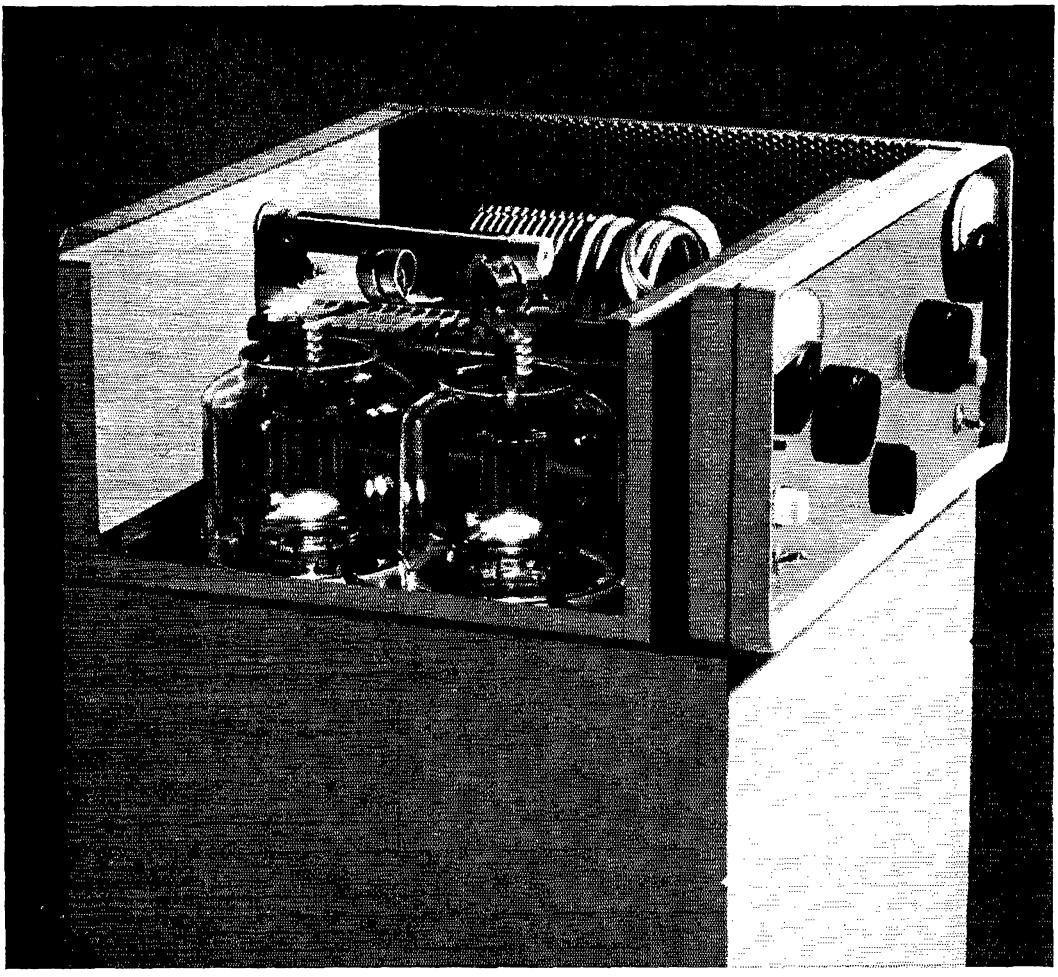

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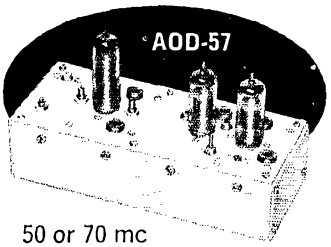
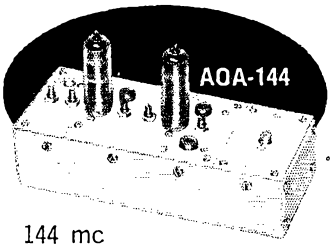
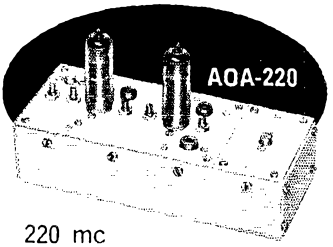


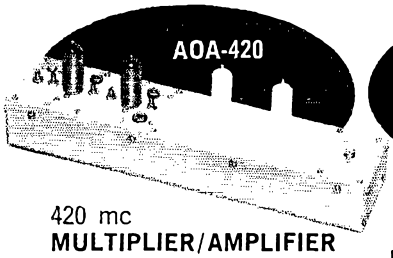
50 or 70 mc
DRIVER/TRANSMITTER
The AOD-57 completely wired with one 6360 tube, two 12BY7 tubes and crystal (specify frequency). Heater power: 6.3 volts @ 1.2 amps. Plate power: 250 vdc @ 50 ma.
AOD-57 complete.....$69.50



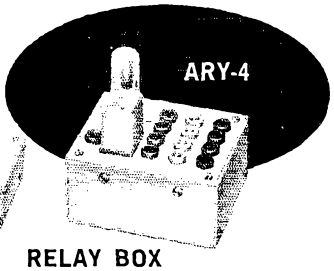
144 mc
MULTIPLIER/AMPLIFIER
The AOA-144 uses two 6360 tubes providing 6 to 10 watts output. Requires AOD-57 for driver. Heater power: 6.3 volts @ 1.64 amps. Plate power: 250 vdc @ 180 ma.
AOA-144 complete.....$39.50



220 mc
MULTIPLIER/AMPLIFIER
The AOA-220 uses two 6360 tubes providing 6 to 8 watts output on 220 mc. Requires AOD-57 for driver. Heater power: 6.3 volts @ 1.64 amps. Plate: 250 vdc @ 150 ma.
AOA-220 complete.....$39.50



420 mc
MULTIPLIER/AMPLIFIER
The AOA-420 uses two 6939 tubes providing 4 to 8 watts output on 420 mc. Requires AOA-57 plus AOA-144 for drive. Heater: 6.3 volts @ 1.2 amps. Plate: 220 vdc @ 130 ma.
AOA-420 complete.....$69.50



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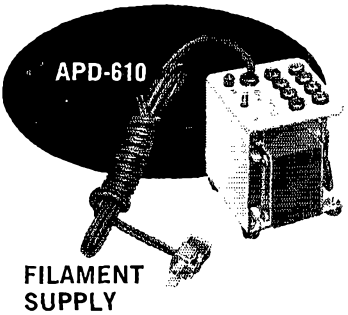
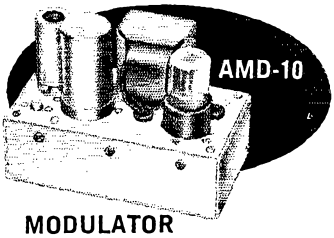
Four circuit double throw. Includes coil rectifier for 6.3 vac operation.
ARY-4 Relay Box complete $12.50



FILAMENT SUPPLY
The APD-610 provides 6.3 vac @ 10 amperes.
APD-610 complete.....$9.50



MODULATOR
The AMD-10 is designed as a companion unit to the AOA series of transmitters. Uses 6AN8 speech amplifier and driver, 1635 modulator. Output: 10 watts. Input: crystal mic. (High Imped.) Requires 300 vdc 20 ma, no signal, 70 ma peak: 6.3 vac @ 1.05 amps.
AMD-10 complete $24.50

COMPLETE TRANSMITTER

6 METERS	50 mc	AOD-57
2 METERS	144 mc	AOD-57 PLUS AOA-144
	220 mc	AOD-57 PLUS AOA-220
	420 mc	AOD-57 PLUS AOA-144 PLUS AOA-420

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

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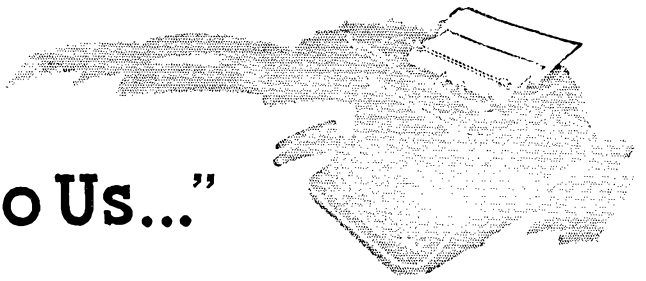
Vice-Director: Ray K. Bryan W5UYQ
2117 S.W. 61st Terrace, Oklahoma City, Okla. 73159



"It Seems to Us..."

"YOU GUYS UP THERE . . ."

We had a landline call the other day from an old-timer with a two-letter call, following up his earlier written correspondence with headquarters — a postcard addressed to "ARRL Nut House" and greeting the staff as "you nit wits." He claimed to have been licensed forty years, but in all that time had never shown the initiative to obtain the old Extra First, the Phone Endorsement to the First, the Class A, the Advanced or the Amateur Extra Class license.

Needless to say, he was thoroughly unhappy both with Docket 15928 and with the League. He dropped his League membership last year. A small clique was running the League to suit themselves, he said. It seemed that every phrase of his tirade began, "You guys up there. . . ." It developed that despite an ARRL membership during most of the past 20 years, he had taken part in *one* League election, some years ago, just to vote *against* the incumbent. He had never written a letter or otherwise expressed his views to his director.

And indeed, it certainly sounds as if he were willing, by default, to let the paid staff do all the running of the League, reserving to himself only the right to gripe like the devil whenever "those guys up in Newington" don't do what he wants.

Fortunately, the attitudes of this amateur are not widely held in the fraternity. But there is a tendency at times to forget that ARRL is a representative democracy, that the members of the League remain in the driver's seat, in part through their selection of directors (and vice directors) each two years.

So, if we may turn the old boy's phrase around, "You guys out there" in the Atlantic, Canadian, Dakota, Delta, Great Lakes, Midwest, Pacific and Southeastern Divisions are hereby notified that it is your turn. "Happenings" in this issue contains formal announcement of the opening of nominations for director and vice director, and lists the present incumbents.

Now is the time to review the policies of the League as against your own needs and desires, and those of amateur radio generally. Appraise what your director has done during his current two-year term, and how he feels on various issues. Talk it over with others. If you're satisfied your director has done a good job for the League and amateur radio, then nominate him for re-election — don't wait for George to do it. On the other hand, if you know of an amateur you think is capable of doing a better job, first be sure your candidate is willing to run — and then start in. The mechanics of election are thoroughly covered in the formal announcement; further details are spelled out in the Articles of Association and By-Laws, free of charge on request from members.

In every case where more than one candidate is nominated and eligible, ballots will be sent to all Full Members the second week in October, returnable by noon of November 20. This is the second phase of representative government, and of course it is important for all members to weigh the facts and mark their ballots accordingly, mailing them in time for arrival at headquarters before the deadline.

The third phase of government by the members is in keeping your director informed of your views. The fellow who inspired our writing these words made three mistakes. He disqualified himself as an "influencer" of League action by letting his membership go; he wrote about a policy matter to the headquarters staff rather than to the director of his division; and he wrote about incentive licensing almost a month after the League had adopted its position in respect to Docket 15928. (The second mistake is actually no problem; hundreds of letters from members received at headquarters were forwarded to the appropriate division directors prior to the Board meeting.)

In respect to the third, however, once League policy has been established by the Board, it cannot be changed by headquarters. No matter how convincing a letter is, no matter how sound the reasoning of its writer may be, the League staff, the "hired hands," in Newington, just cannot unilaterally change the ARRL viewpoint. This is the prerogative of the members, delegated to their elected representatives.

To be fully represented in amateur affairs, then, it is necessary that you remain (or become) an active member of the League, participating in the nomination, election and "education" of your director — yet respecting his good intentions and allowing him to use his informed judgment on your behalf. His actions are subject to your own review at election time each two years. After all, the League belongs to "you guys out there." QST

COMING A.R.R.L. CONVENTIONS

September 4–5 — Maritime Province, Digby, Nova Scotia
October 1–3 — Ontario Province, Sudbury
January 22–23, 1966 — Southeastern Division, Miami, Florida
March 19–20, 1966 — Michigan State, Saginaw
April 22–24, 1966 — ARRL National, Boston, Massachusetts
May 28–29, 1966 — Roanoke Division, Natural Bridge, Virginia
May 27–29 Southwestern Division Anaheim, California

MARITIME PROVINCE CONVENTION

Digby, Nova Scotia **September 4–5**

The Maritime Province ARRL Convention will be held Saturday and Sunday, September 4 and 5, at the CPR tourist hotel, Digby Pines, Digby, Nova Scotia. Registration will begin at 9:00 A.M. Saturday. Activities will include the annual meeting of the Nova Scotia Amateur Radio Association, a meeting of the New Brunswick ARA, s.s.b. breakfast, swap shop, ARRL forum, hidden transmitter hunt and homebrew mobile and QSL card judging contests. A tea for the ladies is planned for Saturday afternoon. Banquets are scheduled for both nights of the convention, each followed by entertainment. A Sunday afternoon motorcade to tour *HMCS Cornwallis* should be of interest to everyone. Speakers include ARRL Vice-President Alex Reid, VE2BE; Communications Manager F. E. Handy, W1BDI; and Captain J. M. Paul, Commanding Officer, *HMCS Cornwallis*.

Convention prices for the Digby Pines Hotel, including the banquets, are as follows: single with meals, $16 per day; double with meals, $14 per person; triple with meals, $12.50 per person; children up to and including 13 years of age, $7.50 per day with meals. For those not staying at the hotel, each banquet will cost $3.50; lunch, $2.50; breakfast, $1.50

For further convention details or reservations, write K. Lake, VE1PX, Box 152, Cornwallis, Nova Scotia.

Strays

Subject to the issue of a special license, the Jamaica Amateur Radio Association will be operating portable equipment from the Girl Guides Golden Jubilee International Camp from August 9 to August 19, Kingston, Jamaica. The call will be 6Y5RA. C.w., a.m. and s.s.b. will be used on all bands from 3.5 to 28 Mc.

—...—

The RSGB QSL Bureau will be closed from August 19 to September 7, 1965. It is requested that no cards be sent to G2MI to arrive between these dates.

Amateur radio operators are invited to contact WB6LKH/MM during the period 10 August to 10 October. The station will be at the site of the *Sea Lab II* operations off Scripps Institute of Oceanography at La Jolla, California. *Sea Lab II* is a chamber 57 feet long by 12 feet in diameter and is submerged to a depth of 210 feet. Twenty men in two teams of ten will live fifteen days each in *Sea Lab II* breathing a specially prepared helium and oxygen atmosphere. The aquanauts will work both inside and outside the Lab to determine the effects of this type of environment on man. Team leader of the men in *Sea Lab II* will be astronaut-turned-aquanaut CDR. Scott Carpenter.

There may develop a network of amateur stations at Shrine hospitals for crippled children, thanks to the work of various hams around the country. Here we see young Rodney Schreurs, age 13, talking via 2-meter repeater to a youngster in another hospital, while W6MLZ, WA6CBJ, and W6CLQ look on.

QST:

This is the day my son died. He was putting up a six meter antenna with wires. ~~for a sked~~ He climbed a tree in our back yard. The metal mast hit a high tension wire.

Please warn your readers of this danger.

Yours truly,

This tragic letter from a grieving father needs no further comment.

Perfect Code at Your Fingertips

A "Typewriter" for Generating Morse Characters

BY PAUL HOROWITZ,* W2QYW

The code typewriter shown on our cover this month is a purely amateur effort, and a beautiful-looking and -acting job it is. By haunting the surplus market, the author was able to build the whole thing for less than the cost of commercial electronic keyers of conventional design. It uses computer techniques to generate the letters and numerals of Continental Code, together with other frequently-used combinations such as BK, SK, and punctuation.

Whether or not you're interested in building a similar machine, you should read the article to get a bit of insight into the methods that are becoming widely used in electronic circuitry outside the framework of ham radio.

PREVIOUSLY described keyboard senders,[1,2] for generating Morse characters have used multiple-winding shift registers in an effort to reduce cost. But the thought of winding and connecting 80-odd separate coils on small cores is somewhat depressing, especially when through a happy chance the author was able to pick up some ready-made shift-register modules in electronic surplus, at very reasonable cost. This, together with a glut of diodes obtained from the same source, inspired the keyer design to be described here. The cost would reach impressive proportions if everything had to be paid for at "new" prices, but the actual cost in this case was in the neighborhood of $50. Although there is no constant source of supply, surplus of this nature is becoming fairly common, and by keeping watch for it as it comes on the market the cost of building up circuits using computer techniques can be made quite reasonable.

Operation

With these introductory remarks we come to the keyer itself. Pressing a key on the typewriter-sized keyboard initiates read-in of the code character to a magnetic-core shift register and formation of code in accordance with a free-running time base. The character and space are self-completing, the keyboard being electrically locked out until one dot length after completion of the character, at which time it once again has a "memory." Holding down a key causes repetition of the letter, with proper spacing; pressing a different letter will cause it to send the two letters with the correct space between. There are completely independent speed and weight controls: the speed is adjustable from 5 to 55 w.p.m. and the dot/dot-plus-space ratio can be set anywhere between 18 and 82 per cent. A switch on the front panel defeats the automatic-spacing circuitry, so that an external paddle can be connected (across the "T" and "E" keys) to function as a regular automatic keyer. An internal monitor oscillator of variable frequency drives

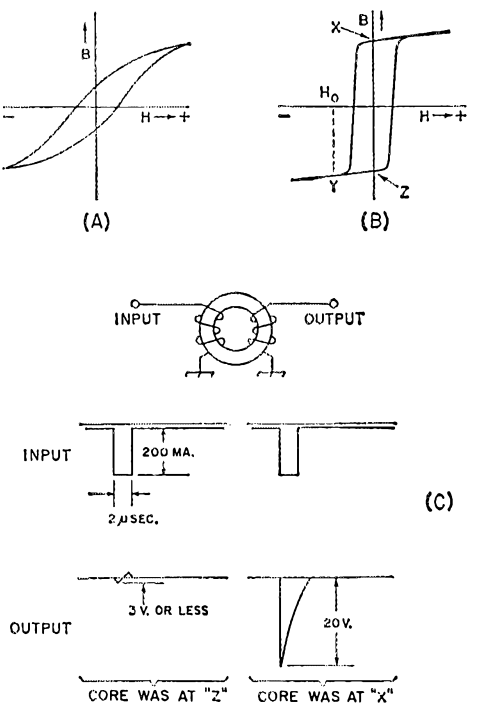
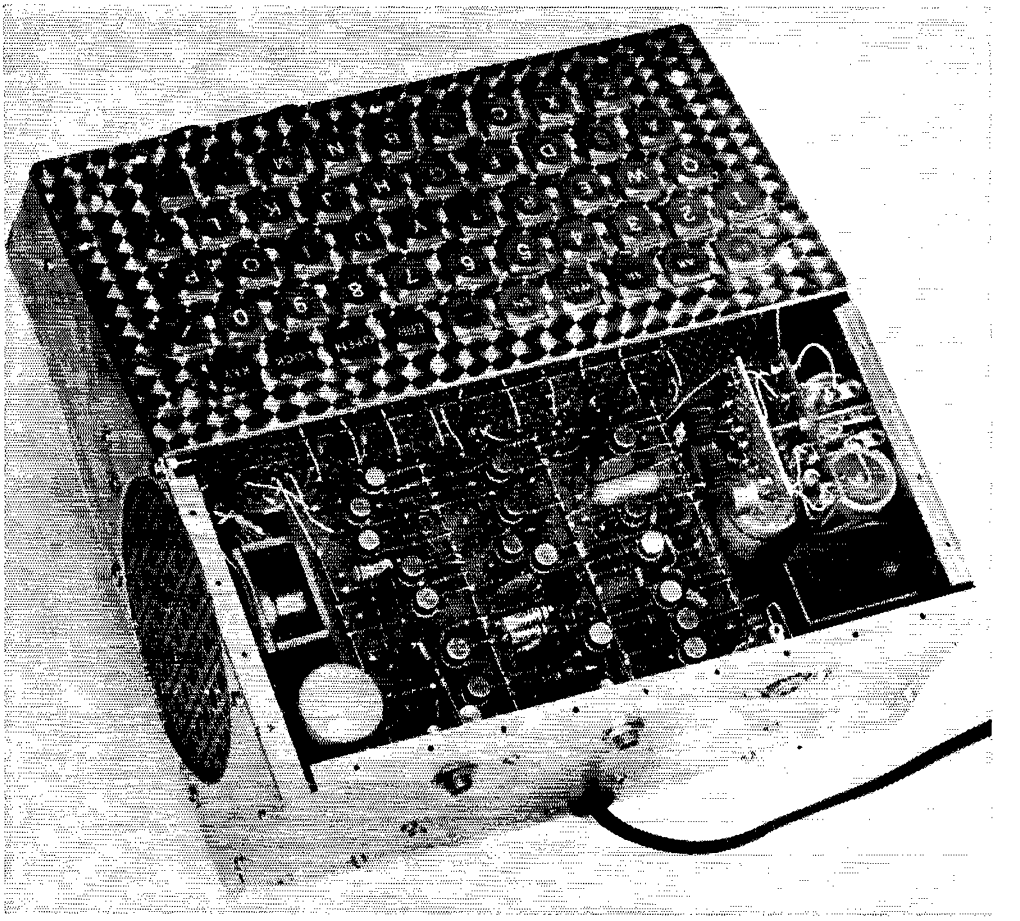


Fig. 1—Operation of magnetic memory cores. Ordinary iron has a magnetization curve of the type shown at A; magnetic material suitable for memory cores has the "square-loop" type of magnetization curve at B. C shows the difference in output from the secondary winding of a square-loop core when a current pulse is made to flow through the input winding, for the two general cases—core previously magnetized in the "positive" direction and left in state *X*, or in the negative direction and left in state *Z*.

* 138 Hillcrest Ave., Summit, New Jersey.

[1] Johnson, "Codamite," *QST*, May, 1961.

[2] Granberg, "A Push Button Keyer," *CQ*, September, 1964.



Top view, showing the business end of the circuit board. The rotund object next to the speaker is the mercury relay. The jacks along the rear are for headphone monitor, keyed output, and external paddle (insulated). The power supply and regulators are opposite the speaker. The shift-register OR diodes can be seen under the engine-tooled keyboard plate.

earphones or a built-in speaker. Either polarity can be keyed by the mercury-wetted keying relay.

Shift Register

A magnetic-core shift register is used for the memory and formation of code characters. A shift register is simply a row of devices, such as transistors, relays, neon bulbs, or magnetic cores, each of which can be in one of two possible states ("on" or "off" would be natural for transistors or bulbs: "1" or "0" are terms used for cores). These devices are wired together in such a way that applying a pulse to a "shift" input makes each element go into the state of the element to its left: that is, the whole pattern of 1's and 0's shifts over one notch.

In order to understand the shift register used here, we must first explain the operation of magnetic memory cores, the same kind as used in computer memories. These little doughnut-shaped cores have quite unusual magnetic properties. The materials used for such cores are called "square loop," in honor of the shape of their hysteresis curves (Fig. 1B); here we have plotted the flux density B against the field intensity H (which is proportional only to the magnetizing current in the windings and assorted geometrical factors, in the case of a core of such high symmetry as a toroid). Thinking of the H axis as current we see that, with no current applied, there is a residual B field which depends on the magnetic "history" of the core — that is, the two states here are the two possible directions of permanent magnetization, corresponding to points X and Z, rather than, as in the case of neon bulbs or transistors, two different values of current flow.

In order to tell which state a core is in, we use the fact that the B field is what does the inducing of voltages in secondary windings on the core; we can "query" the core simply by sending a current through the primary winding and seeing whether a pulse is induced in a secondary, indicating a change of state. For instance, if we apply a short pulse of current corresponding to

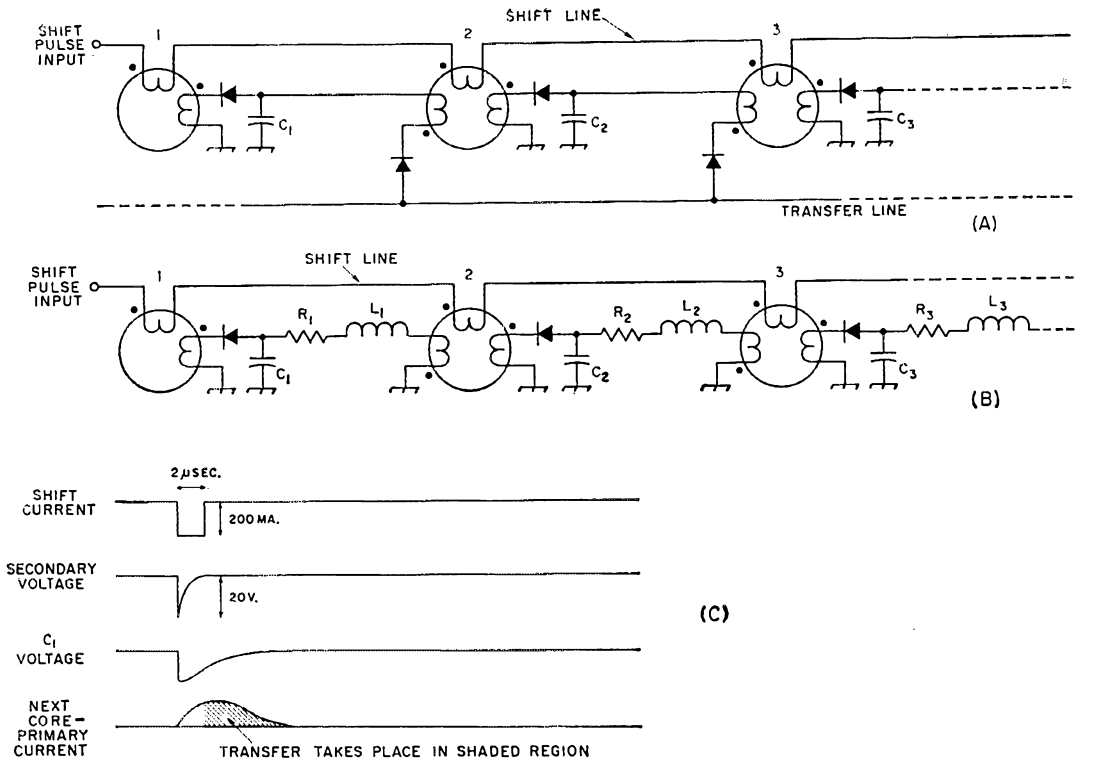


Fig. 2—A basic shift-register arrangement, A, and an alternate practical circuit which includes provision for delaying the shift until the input pulse is over, B. Dots associated with windings indicate corresponding ends of coils wound in the same direction. Typical operation of circuit B when a shift pulse is applied is shown in C.

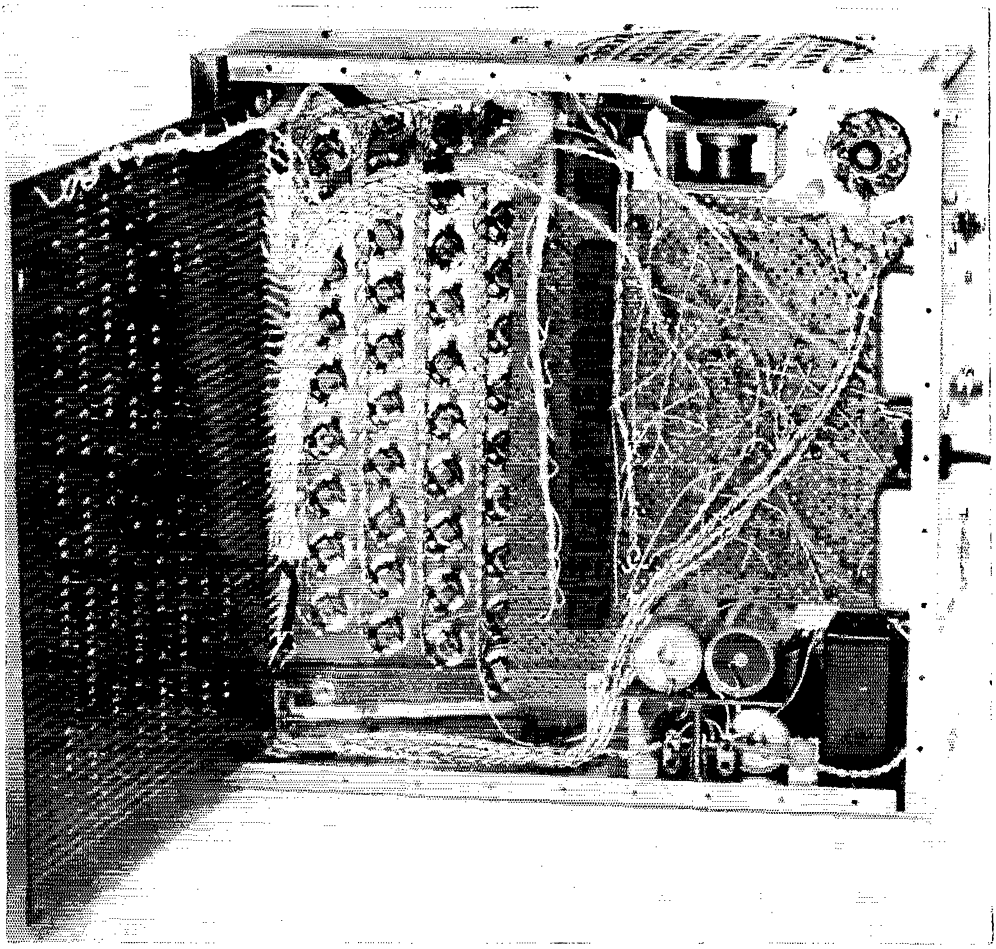
H_0 in Fig. 1B, we get a large pulse out if the core magnetization is at X at the time the current pulse is applied; if it is at Z we get almost nothing. Fig. 1C shows roughly what these pulses look like. Note that a small output occurs even if the core had been at Z. This is because the curve from Z to Y slopes down somewhat, allowing a small voltage to be induced (induced voltage is proportional to the time rate of change of B). Now it should be clear that the squareness of the B-H curve is desirable to keep the "0" output small compared to the "1" output. Note that the kind of "read-out" described left the core at Z in either case. It is "destructive," when the looked-for pulse is obtained — but, of course, when we're finished we've got what we wanted to know.

Fig. 2 shows two possible ways of forming a shift register out of magnetic cores. In Fig. 2A, imagine that core No. 1 is in state X, which we shall call a "1," and all other cores are "0" (state Z). A negative pulse on the "shift" line induces a negative voltage in the secondary of core 1, which charges C_1; although the same shift pulse is applied simultaneously to the remaining cores, there is no output from their secondaries. At this point, therefore, *all* cores contain 0's and only C_1 is charged. Now suppose we connect the "transfer" line to ground by a switch, or a p.n.p. transistor. This discharges C_1 through core No. 2, changing its state to 1. If a second pulse is next applied to the shift line, a negative pulse is now induced in the secondary of core No. 2, placing a charge on C_2; subsequent grounding of the transfer line then "sets" core No. 3. Cores 1 and 2 are unaffected in this case. Thus a series of shift pulses each followed by grounding of the transfer lead will cause any pattern of 1's and 0's to travel by steps along the register.

Grounding of the transfer lead must be delayed with respect to the shift so that the shift pulse doesn't "zero" the newly formed 1 in the next core, since the shift pulses are applied simultaneously to all cores. The problem of introducing delay is solved differently in the circuit of Fig. 2B, where transfer to the next core is delayed by $R_1L_1C_1$. Fig. 2C shows representative waveforms for this configuration; note that the shift pulse must be kept short, so that the delayed transfer of 1's can still take place.

Circuit Operation

The reader may wonder why all this fuss over shift registers. The reason is this: A pattern of 1's and 0's can be placed in a shift register all at once, through an extra set of primary windings, and shifted out one at a time by means of successive shift pulses. This is ideal for our purpose: We make each key read in a particular pattern when pressed, and then shift it out at code speeds



Bottom view with matrix swung out; the strips visible on this side connect to the keyboard switches, whose top row is concealed in this view. The row of square objects in the center is the shift register. Nylon screws and nuts secure the matrix in its normal position.

to generate Morse characters. To see how this is done, look at Fig. 3, the block diagram of the keyer. A square-wave time base periodically shifts the register, turning on code generator flip-flop $Q_{10}Q_{11}$ and starting a dot or dash if *any* 1's are in the cores; a pulse derived from the other half of the time-base square wave is used to shift core No. 11, resetting $Q_{10}Q_{11}$ (and ending the dot or dash) whenever it finds a 1 in core 11. In order to generate code, we simply put 1's into the cores in a pattern corresponding to the code group of a particular letter so that they shift out the end of the register (core No. 11) in order to complete a dot or dash.[3] The mere presence of 1's starts a dot or dash when the register is shifted.

The code generator output is then just the Morse character, which drives the monitor and keying relay. The relative timing of the time-base "on" and "off" pulses (determined by the asymmetry of the square wave from which they are derived) determines the "weight" of the code. If the "off" pulse occurs midway between "on" pulses, standard-weight code results; delaying the "off" pulse gives heavier code, and vice versa.

Each key on the keyboard must magnetize its particular pattern of cores. This could be done, for example, with multiple-pole buttons. The method used in references 1 and 2 is to wind a number of separate primaries on each core, which can be separately energized by s.p.s.t. pushbuttons. Here, instead, we used a single primary on each core together with a matrix of diodes, a section of which is shown in Fig. 4. A negative current into the "keyboard common" causes current to flow only through those core windings connected by diodes to the pressed key.

The rest of the circuit simply disconnects the keyboard common while a letter is being sent, since otherwise the pattern could not shift along intact. When a button is pressed, read-in occurs through the diode matrix as explained above,

[3] This is the scheme used in References 1 and 2.

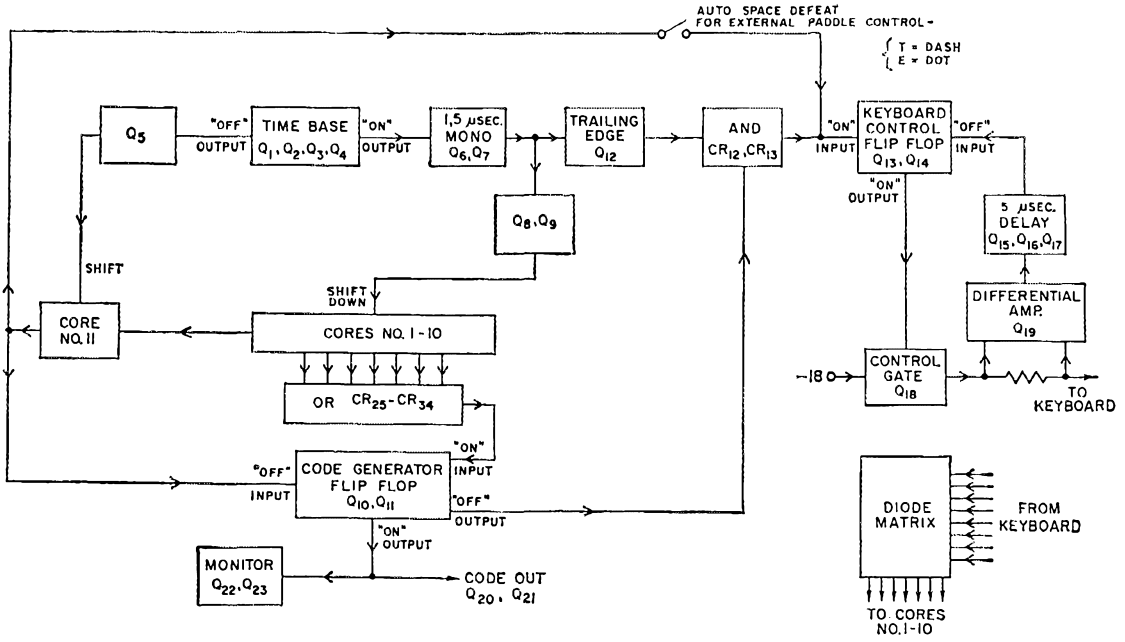


Fig. 3—Logical diagram of the keyboard keyer.

and after 5 μsec. $Q_{13}Q_{14}$ flips and disconnects current from the keyboard. This control flip-flop is reset only after a shift pulse has failed to turn $Q_{10}Q_{11}$ on, which will occur one dot length after the character is completed. Read-in can then take place immediately, if a key is closed, but read-out must wait for the next shift pulse, two dot lengths later, for a total space of three dot lengths (see Fig. 5).

Circuit Details

The keyer uses several kinds of digital circuits that may be unfamiliar, and are best reviewed first. A "flip-flop," Fig. 6A, is a pair of transistors connected so that only one can conduct at a time, and remains conducting until switched off; the values in divider R_3R_6, for example, are chosen so that when Q_1 is conducting, Q_2 is cut off, and vice versa. R_7 makes it possible for the off transistor to be reverse-biased. In the circuit of Fig. 6B there is a single input, unlike Fig. 6A, which has two. If Q_1 is conducting; C_1 is discharged and C_2 is charged; a positive input pulse turns off Q_1, whereupon the uncharged C_1 forces Q_2 on. Successive inputs reverse the states.

A monostable multivibrator is a variation of the flip-flop with only one *stable* state; if normally-on Q_1 (Fig. 6C) is turned off, Q_2 will turn on, until C_1 is charged through R_1, at which time it returns to the original stable state. Monostables are used for delays or to generate pulses of a prescribed width. Another type of multivibrator, not used here, is the free-running or astable multivibrator, Fig. 6D; here the states are both unstable and alternate to produce square waves at a frequency determined by the time constants.

Two other circuits used frequently with pulses are the *AND* and *OR* gates, Figs. 6E and 6F. As long as either or both inputs in Fig. 6E are at ground, the output is also; only if both input 1 *AND* input 2 go positive does an output result. In the *OR* gate, Fig. 6F, a positive pulse either at input 1 *OR* input 2 (or both) gives an output.

With these preliminaries, we go to the circuit itself.

Time Base. Unlike most keyers, the time base is not a free-running (astable) multivibrator, but a flip-flop (bistable) "multi" triggered from a unijunction oscillator. This allows a wide range of speeds (10:1 or more), and *independent* control of weight, by charging C_1 from a current source Q_1 whose current depends on the state of the flip-flop Q_3Q_4. The action of Q_1 is simply to convert a voltage across base resistor R_2 into a collector current since the emitter voltage follows the base voltage while the base current is down by beta, the transistor's current amplification factor. The current source is necessary in order to keep the impedance looking back from the slider of R_3 constant as the speed is varied by means of R_1, and hence the ratio of currents (weight) independent of speed. That the speed is independent of the weight follows directly from the constant sum of impedances looking into the slider of R_3, over a whole cycle, considering Q_3 and Q_4 as voltage sources during saturation. C_2 and C_3 are essential for triggering, since the pulse from the oscillator, Q_2, drives the emitters of Q_3Q_4, rather than being steered to the bases as in the more usual configuration. This type of time base should be readily adaptable to other electronic keyers.

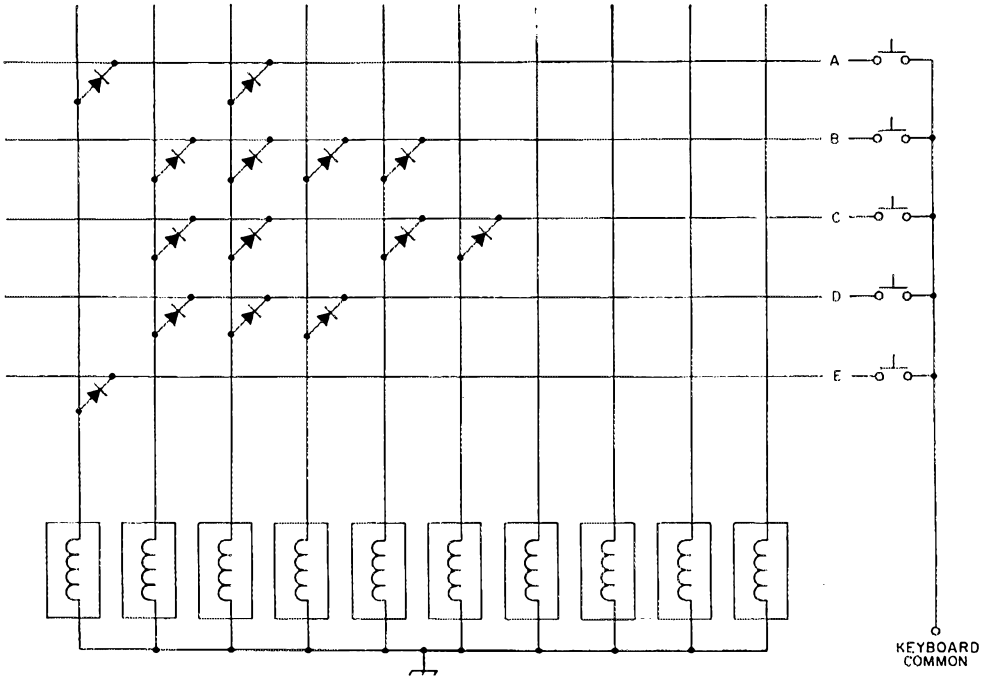


Fig. 4—How the diode matrix is built up. Horizontal lines represent connections to keyboard keys; vertical lines are connections to individual cores in the shift register. A cross-connection between two lines with a diode places a "1" in that core when the appropriate key is pressed; the diodes are used as gates to isolate the core input from each other, and thus insure that current flows only to the proper cores; they also prevent reverse current during shifting.

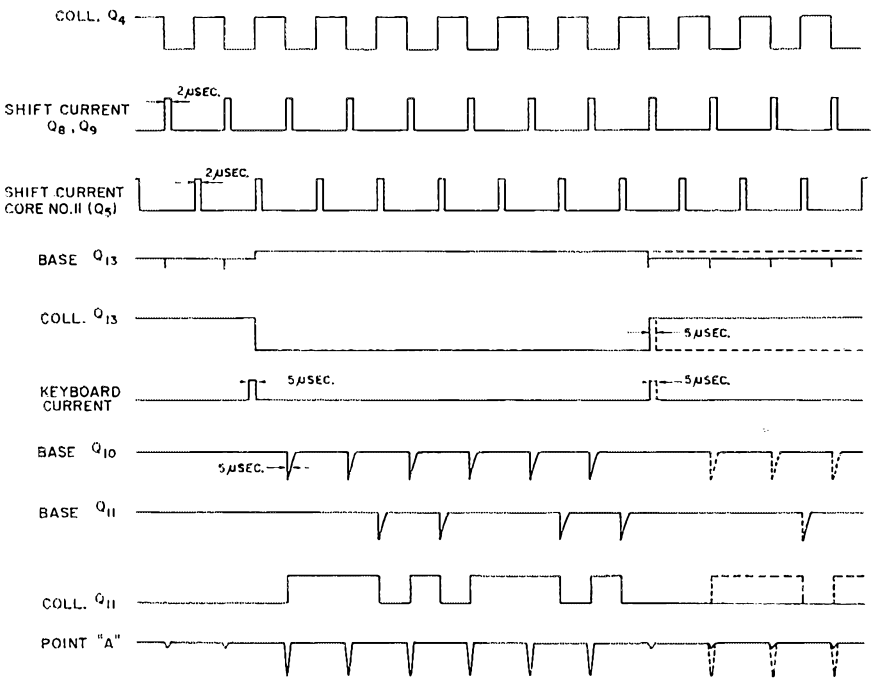


Fig. 5—Waveforms in various parts of the circuit for sending the letter C. The dotted patterns show the behavior if the Q key should be pressed during any part of the time the C is being sent. The short pulses are not scaled for time.

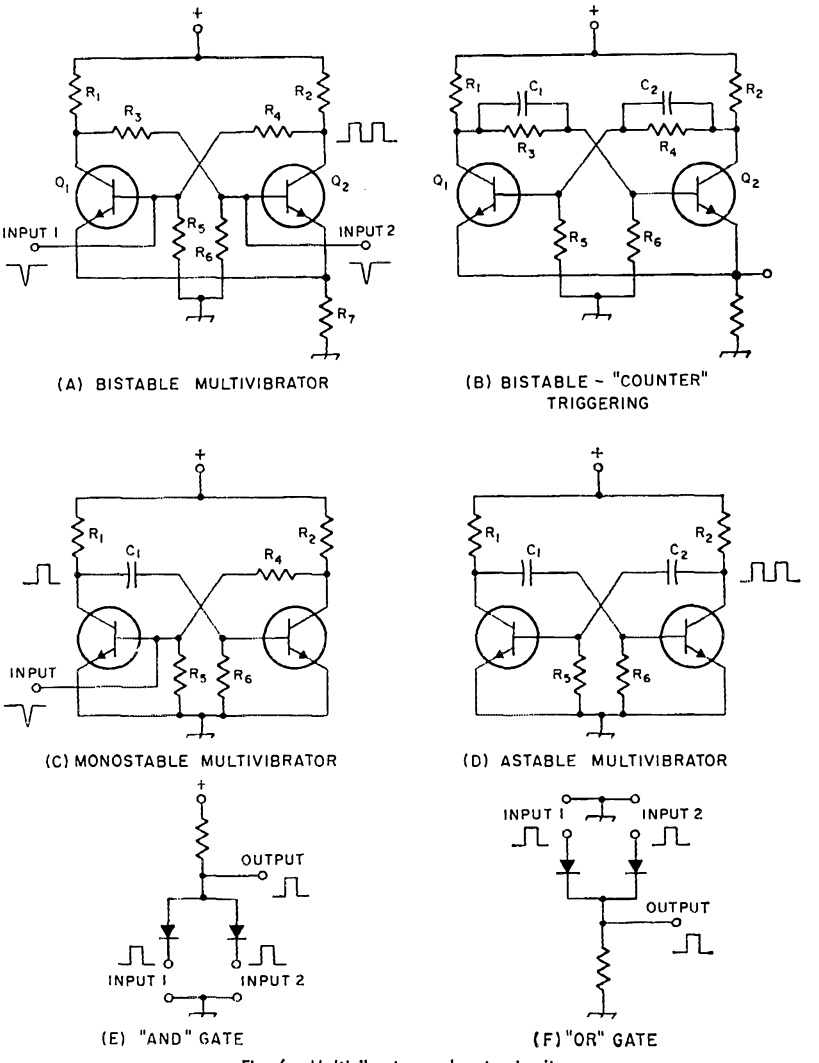


Fig. 6—Multivibrator and gate circuits.

Shift Register and Drivers. The shift register is made from commercial modules,[4] obtained surplus. They require a shift pulse of 150 ma. for 2 μsec., and drop up to 3 volts per core across the shift winding during shift. The monostable ("one-shot") multivibrator Q_6Q_7, generates a 2-μsec. square pulse, which is clipped by CR_5-CR_9, inclusive, and applied to current sources Q_8 and Q_9, each of which shift five cores. Core No. 11 is driven by Q_5 in the opposite phase. Core output is −20 volts for a "1" and −3 volts for a "0;" a built-in delay network drives the next core with about 5 ma. for 5 μsec., propagating the 1's along.

[4] C & K Components, Inc., 103 Morse St., Watertown, Mass. The A67C is electrically equivalent to the A66, A62, or A56. These modules can be obtained new for $110 for the set of eleven; inquiries should be addressed to Mr. Kincaid at the company address. The author has a limited number of the surplus modules which he will sell for a nominal price to those seriously interested in building a similar unit; inquiries should be sent in care of the Technical Editor, QST, Newington, Conn. 06111.

Shift-register modules equivalent to the C & K A67C specified in Fig. 7 can be wound on Infinetics 479 molybdenum Permalloy cores, ½-mil tape-wound on ¼-inch bobbins, rated at 11 maxwells. These cores are available from Infinetics, Inc., 1602 Jessup St., Wilmington, Del., for about a dollar each in small lots. The part number for the core is S-125C31-HA-1577F. The input and output windings are each 120 turns of No. 42 Formvar enameled wire; the shift winding has 22 turns of No. 42. The delay network (which is included in the A67C module) consists of a 5-millihenry inductor, a 0.001-μf. mica capacitor, a 3000-ohm resistor, and a silicon diode (1N457 or equivalent)

Code Generator, Relay, Monitor. Diodes CR_{25} through CR_{34} (an *OR* gate) drive Q_{10} whenever any core shifts a "1." R_4,R_5 and CR_{10} insure that no trigger gets to Q_{10} from a "0." Core No. 11 drives Q_{11} in the same way. Q_{21} operates the mercury relay when Q_{11} is on, while Q_{20} is only

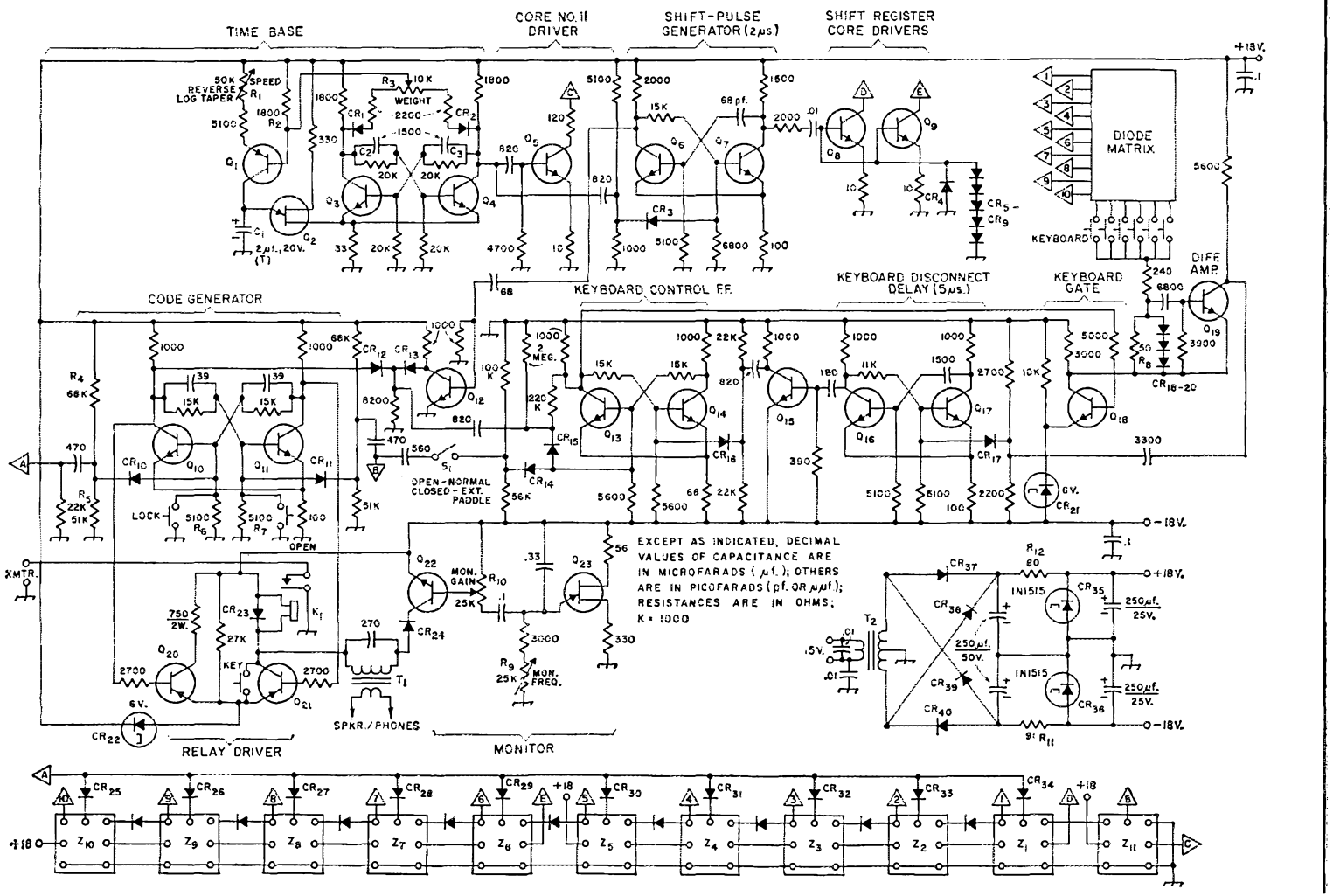

TIME BASE
CORE NO. II DRIVER
SHIFT-PULSE GENERATOR (2μs)
SHIFT REGISTER CORE DRIVERS
+15V.
50K SPEED REVERSE LOG TAPER R1
WEIGHT
DIODE MATRIX
KEYBOARD
DIFF. AMP.
CODE GENERATOR
KEYBOARD CONTROL FF.
KEYBOARD DISCONNECT DELAY (5μs.)
KEYBOARD GATE
OPEN-NORMAL CLOSED-EXT. PADDLE
LOCK
OPEN
XMTR.
KEY
-18V.
EXCEPT AS INDICATED, DECIMAL VALUES OF CAPACITANCE ARE IN MICROFARADS (μf.); OTHERS ARE IN PICOFARADS (pf. OR μμf); RESISTANCES ARE IN OHMS; K = 1000
MON. GAIN
MON. FREQ.
SPKR./PHONES
RELAY DRIVER
MONITOR
IN1515
+18

Fig. 7—Circuit diagram of the keyer. Except as listed below, capacitors with polarity indicated are electrolytic; others may be mylar, ceramic or mica as desired. Fixed resistors are ½-watt composition. Transistors not listed below are type 2N1306 or equivalent; diodes not listed below, are for text reference.

C_1—Tantalum.
CR_{21}, CR_{22}—Zener, 6 volts (1N1509 or equivalent).
CR_{35}, CR_{36}—Zener, 18 volts (1N515 or equivalent).
CR_{37}-CR_{69}, inc.—750 ma., 100 p.i.v. (1N537 or equivalent).
K_1—Mercury-wetted-contact relay, 700 ohms, 20 ma. operating current (W.E. 275D, Clare HG-1051, Potter & Brumfield JM1-114-11, JM-114-12).
Q_1, Q_{20}, Q_{21}—2N1131, 2N1924, or equivalent.
Q_2, Q_{23}—Unijunction; 2N2160.
Q_3, Q_5, Q_6, Q_{22}—2N697 or equivalent.
R_1—Composition control, counter-clockwise log taper (Ohmite CB5031 or equivalent).
R_3, R_9, R_{10}—Composition control, linear taper.
R_{11}, R_{12}—Approximate values; use 150-ohm w.w. 10-watt adjustable and set for Zener current of 30 ma.
T_1—Transistor output transformer, 10,000 to 3.2 ohms (UTC SSO-10).
T_2—Power transformer; 40 volts, 0.3 amp., center-tapped (Triad F-91X).
Z_1-Z_{11}, inc.—Core and delay-network assembly (C & K Components type A67C); see text.

for the purpose of balancing current drain when the relay is off; this makes power-supply regulation simpler. Zener diode CR_{22} reverse biases Q_{20} and Q_{21} during the off state. The monitor consists of a free-running unijunction oscillator, Q_{23}, and a keyed Class B amplifier, Q_{22}; CR_{24} eliminates backwave.

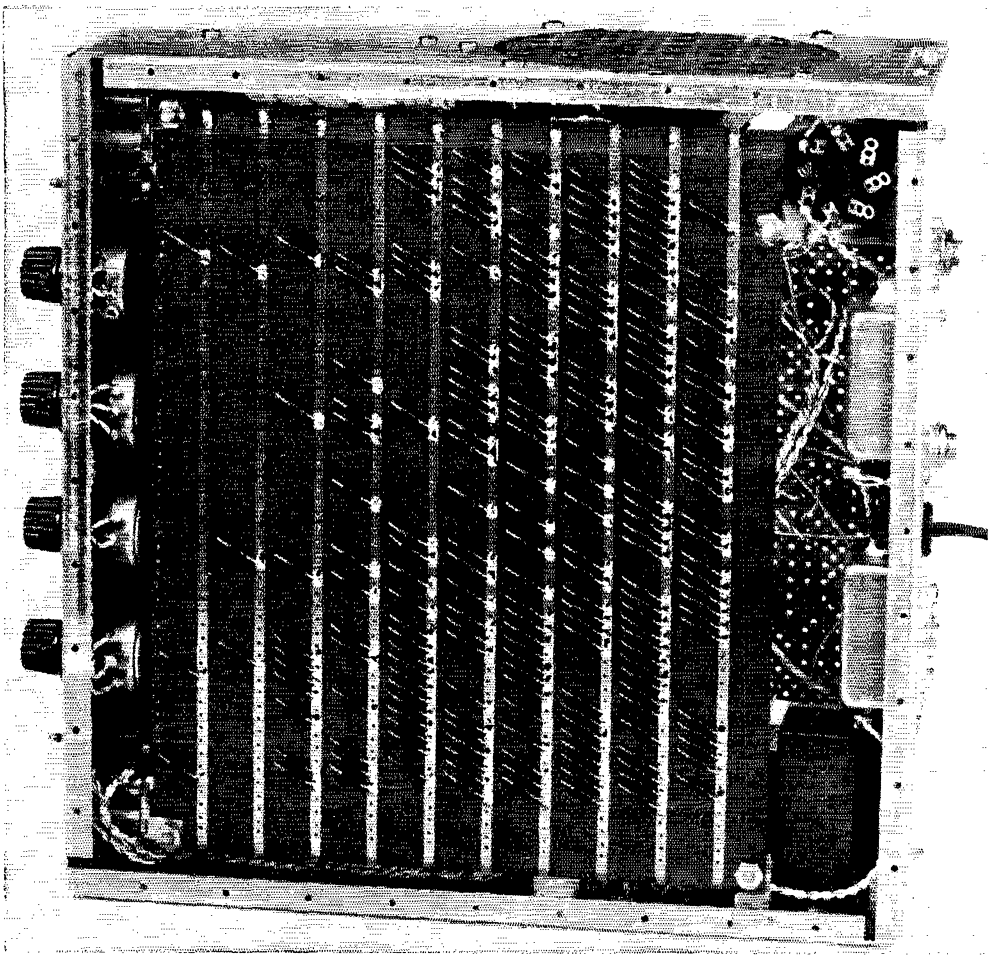
Keyboard Control and Matrix. The keyboard common must be disconnected while a letter is being sent. With the keyer idle Q_{10}, in the code generator, is on, and therefore negative pulses on the collector of Q_{12} derived from the trailing edges of the shift pulses are coupled by the $CR_{12}CR_{13}$ *AND* gate to Q_{13} of the keyboard control flip-flop. Q_{13} is therefore off, holding Q_{18} in saturation and providing a keyboard-common return to ground. When a key is pressed, keyboard current through R_3 turns Q_{19} on, which triggers monostable multivibrator $Q_{16}Q_{17}$, whose trailing edge, 5 μsec. later, turns Q_{14} off — the keyboard is now disconnected. During those 5 microseconds the proper cores were magnetized, of course. As long as 1's remain in the cores, Q_{10} will be driven off during shifting, so gate $CR_{12}CR_{13}$ will not pass the subsequent pulses from Q_{12}, and Q_{13} remains on. Only when a shift pulse has failed to turn off Q_{10} — i.e., only after completion of a letter plus one dot length — will Q_{12} turn off Q_{13} by way of the gate; read-in can now take place, and read-out will commence with the next shift pulse, two dot-lengths later. Fig. 5 shows representative waveforms. For automatic key operation, keyboard control flip-flop $Q_{13}Q_{14}$ is reset by core 11 following each dot or dash. The diode matrix (Fig. 4) is connected to the input windings of the cores, which are coupled together with diodes for isolation.

Power Supply

The keyer requires supplies of plus and minus 18 volts at 100 ma. each. The supply shown in the schematic is adequate, and regulates over line voltages from 95 to 125 volts. The series resistors should be adjusted for 30-ma. Zener diode current. If a wider range of regulation is desired, transistor series regulators can be used. The keyer circuitry continues functioning to 11 volts on both supplies, although the speed changes.

Construction

Because of the number of diodes required, the matrix was made on a printed circuit board by etching 50 stripes on one side and 10 stripes, at right angles, on the other. Holes were drilled and the diodes inserted. The box was made from 4 × 10 inch "SeeZak Rails," particularly convenient for bending the sloping front. The keyboard was made of two pieces of 3/32-inch aluminum, one drilled and counterbored for miniature push-button switches and recessed behind a second, which was punched with square holes in a standard typewriter format, with an extra row for special characters (SK, AR, BT, AS, etc.). The keys were obtained surplus, and the center of the face was recessed with a two-fluted end mill; after applying dry-transfer letters (Letraset No.



View with bottom plate removed, showing the diode matrix; the ten stripes are connected to the ten shift-register core primaries. The etched phenolic board is mounted on hinges for easy access to underlying parts. Octal socket is for the mercury-wetted keying relay; visible next to it are r.f. filters for the a.c. line.

441) the cavity was filled with clear epoxy (Shell Epon 828). The under side was drilled to a press fit on the switches (Lafayette MS-449). Extra keys were provided to open and lock the code flip-flop (across R_7 and R_6, respectively), and to key the output by hand across the collector and emitter of Q_{21}. The rest of the construction is standard. The circuit and cores are wired on punched phenolic. No ventilation is required, since the total dissipation is only 4 watts.

In operation, the keyer makes no errors, even when keying a rather hot kilowatt. Pressing two keys "at once" will always initiate the earlier one, since the circuitry resolves to 5 μsec., although *holding down* two keys and allowing the keyboard control to load in when ready will always give an output whose spaces are the sum of the spaces of the two (or more) letters held down.

The technique of send'ng with this keyer is slightly different than typewriting, since the different letters have different lengths. The operator must keep slightly ahead of the code, holding each button until the letter begins (although there *is* a two-dot-length memory [5]). Once one develops a feeling for it, sending is almost effortless.

I would like to thank Mr. H. Granberg, OH2ZE, for inspiration and helpful correspondence during the early stages of this keyer, and Mr. Ralph Stanley for the use of his workshop.

QST

[5] It would not be too difficult to add another shift register, if a longer memory were desired. The extra shift register would be loaded by the keyboard, and its pattern transferred to the other shift register (rather than being shifted-down) just before read-out of the original register; in this way the memory would be extended back a whole letter. However, with this arrangement the automatic repetition of a held button would definitely be a hindrance, since a second read-in would take place before the first had begun to read out; the best solution to this is probably to make read-in occur only when a keyboard button is *closed*, with some shaping to prevent multiple read-in from contact noise or bounce. The present memory seems quite adequate, however, and any gain from a larger memory seems doubtful.

An Audio Peak Limiter for Voice Transmission

The benefits of audio compression are well known. The compressor or limiter described here uses transistors to form a compact package that can be hooked in between the microphone and the normal speech amplifier of any phone transmitter. Operating characteristics are similar to those of the tube-type compressor described in February 1963 *QST*.

BY SYDNEY H. MOATE,* W6ZEM

THIS article is for the amateur who is interested in more 100-per-cent QSOs and up to 10 times more *average* power output[1] from his transmitter, at very modest cost. The unit described here is reasonably simple to construct and has the following features:

It prevents overmodulation and flat-topping while allowing up to 10 db. more average output. No modification of the transmitter is required. The limiter connects in series with the microphone leads and may be cut in or out as desired. It is designed with fast attack (approximately 1 millisecond) to prevent overshoot, and with the fast release (approximately 100 milliseconds) necessary for effective speech limiting. Naturalness of the voice is not affected when using up to 15 db. of limiting. Vox and other speech-operated circuits work more reliably. The total cost of the parts should not be over $20.

Used with an s.s.b. transmitter, the average output power will increase greatly, and if a scope is used on the output of the transmitter you will notice that each syllable and word will modulate the transmitter to peak power without flat-topping.

A brief description of the circuit, Fig. 1, follows: The input stage is an emitter follower, which provides a high-impedance input (43,000 ohms) to match high-impedance microphones. R_1 regulates the amount of limiting. Next is the controlled stage, using the common-emitter configuration with the emitter bypassed through a transistor which controls the gain. The audio output is taken from this stage at R_2. The bypass transistor, Q_3, is turned on through the 100K resistor to provide full amplification. The third stage, Q_4, is a common-emitter amplifier used as a voltage amplifier. This is followed by a direct-coupled common-collector stage which is a current amplifier providing a low-impedance source. The output is rectified by two 1N34As and filtered by the 25-μf. capacitor to obtain d.c. control voltage. The 1N34A across this capacitor prevents the developed voltage from exceeding approximately 0.2 volt. This provides for fast release even on loud noise pulses. Power requirements are 9 volts at 3 ma.

The construction of this device is simple and straightforward. The author constructed his on a phenolic board and placed the whole unit with its 9-volt battery in a $2\frac{1}{4} \times 4\frac{1}{4} \times 1\frac{1}{4}$-inch Minibox. Placement of parts is not critical but should be in logical sequence. A few words of caution are in order: be sure to have a good ground connection between the circuit ground and the metal box, and also between the box and the transmitter proper. The output must be completely shielded to prevent hum and r.f. pickup in the high-impedance circuits. It is suggested that the circuit be followed as closely as possible to avoid difficulty. Approximate placement of the parts may be seen in the photograph.

Setting Up

Installation and adjustment may be accomplished as follows:

1) Before connecting the limiter, adjust the transmitter volume control for proper modulation. Note the setting, and do not change it again until after R_2 in the limiter has been adjusted.

2) Disconnect the microphone from the transmitter and connect the output of the limiter to the microphone input. Connect the microphone

* 1321 8th St., San Fernando, Calif.

[1] This should not be confused with peak-envelope power, which will remain the same for a given transmitter. The limiter (compressor) increases the average power output by "filling in the gaps" in those intervals during which the actual voice power output is normally low. The increase in average power will depend on the characteristics of the speaker's voice and his habits of speech. — *Editor.*

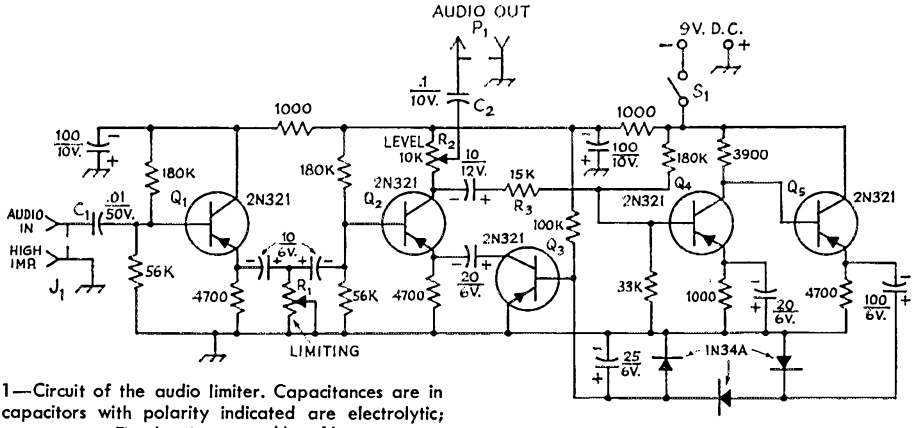


Fig. 1—Circuit of the audio limiter. Capacitances are in μf.; capacitors with polarity indicated are electrolytic; others are paper. Fixed resistors are ¼ or ½ watt; resistances are in ohms (K = 1000). Operating current at 9 volts is 3 ma.

C_1, C_2—See text for discussion of values.
J_1—Microphone jack (Amphenol 75-PC1M or similar).
R_1—10,000-ohm Audio taper (Mallory MLC 14-A-5)
R_2—10,000-ohm linear control.
R_3—See text.
P_1—Mic. connector (Amphenol 75-MC1F or similar).
S_1—S.p.s.t. toggle mounted on R_1

to the input of the limiter.

3) Turn on the limiter and set R_1 at maximum.

4) Speak into the microphone in normal voice, and at the same time adjust R_2 for proper modulation of the transmitter. *Do not adjust* R_2 *again.*

5) Adjust the amount of limiting at R_1. This should be about 12 to 15 db. when speaking at normal voice level.

6) Use the transmitter volume control for proper level with the desired amount of limiting.

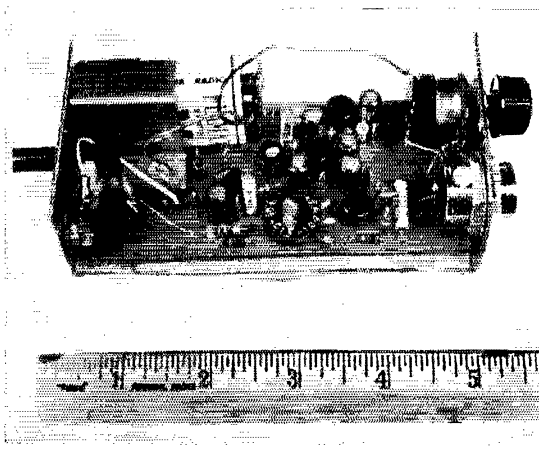
Caution: It is possible to overdrive the limiter. Adjust R_1 so this cannot occur.

Certain conditions must be met when using audio limiting. Background noise should be kept to a minimum, and breathing into the microphone should be avoided as much as possible. If high background noise is present, reduce the amount of limiting used on local QSOs for better signal-to-background-noise ratio. On other contacts this will not be noticed, and full limiting may be used if desired. Another requirement is that the transmitter must be able to withstand the increased demands on it. The average power will be roughly what it would be on c.w., so using the c.w. rating for your particular transmitter will be fairly safe, but for the first time or two keep your eyes open for overheating. Because of the fast attack and release times of this limiter, it will pump for a few cycles (like a damped oscillation) when it is first turned on. This does not affect the operation after the initial turn-on, but prevents one from turning the unit on and off between transmissions. However, this is no drawback, since the current drain is so low that a single battery should last from three months to a year, depending on the amount of operation. If desired, a well-regulated and well-filtered a.c. supply could be used, but I did not consider this worth the additional cost.

Under some conditions a couple of minor modifications may be in order. Since this limiter is used in series with your existing microphone and speech equipment, it is desirable to have the proper frequency response. If you desire more lows, increase the value of the 0.01-μf. input capacitor, C_1, to 0.02 μf. or more. Using 0.1 μf. will give fairly flat response and will not affect your present frequency response. To restrict the high frequencies to reduce sibilants and other high-frequency sounds, bypass the output to ground through a low-value capacitor. In my case, it required 0.001 μf. shunted across the output.

The desirability of audio shaping becomes apparent if one realizes that voice input is not

[2] If a control cannot be found for R_2, replace it with a 10,000-ohm fixed resistor, with the output taken from the collector of Q_2. The audio level is then adjusted by the transmitter's audio gain control.



The limiter is built on a phenolic card fitting into a Minibox. At the right, alongside the microphone fitting, is the limiting control, R_1, with the on-off switch, S_1. The cable leaving the unit at the left terminates in a microphone plug. The miniature control at the lower center is the output level control, R_2. In general, the parts layout follows the circuit diagram.

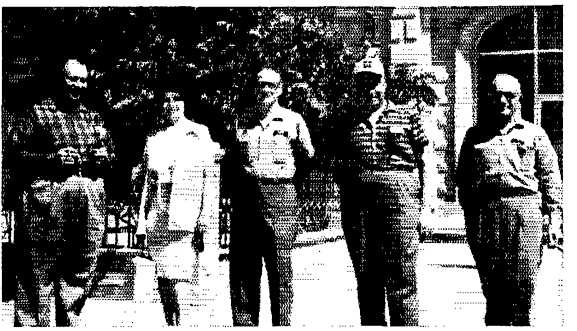
flat, and since the limiter is a fast variable-gain amplifier it will limit more on the louder frequencies and less on the softer ones, thus tending to make the output frequency response flat. Therefore, shaping the response as much as possible to the voice frequencies from 300 to 3000 cycles should be a good compromise.

R_3, in series with the base of the transistor following the controlled stage, may be increased in value for more output voltage, and vice versa.

This limiter may be used with any transmitter using voice modulation — s.s.b., a.m., or n.b.f.m. Properly used with an a.m. transmitter it will provide a very high average percentage of modulation without distortion or overmodulation on peaks. With n.b.f.m. it will prevent excessive deviation on peaks, thereby preventing the attendant distortion and a broad signal.

The results using the limiter on s.s.b. have been most gratifying. I no longer use the a.l.c. in my transmitter as it is not necessary. Many checks have been made on the air by switching the unit in and out. A great many different reports have been received and the results seem to depend on the receiving equipment being used, although all agree that the signal is easier to read using the limiter. Most stations said that the signal was 1 to 2 S units stronger on the S meter. The results I observed were more answers to CQs, more complete QSOs, and better operation of the Vox. My relative output meter, which used to average about ¼ scale as I spoke, averages ¾ scale with limiting, while the oscilloscope shows no flat-topping and every word modulates to peak power. But results are best under the worst band conditions. When the band starts to fold and I am having trouble getting more than 50 per cent of what is being said to me, almost invariably the other station will get me Q5. Isn't that what we're all after? QST

Strays



The Grand National Convention of the Association of Radio Amateurs of the Republic of Mexico, was held in Torreon, Coahuila, Mexico in May with over 500 attending from both sides of the Rio Grande. Shown in the photograph, taken just outside the Hotel Elvira, where the convention was held are, from left to right: Hank Fischer, K5YHF; Chula Arpee; Lee Arpee, XE2PAY; Tito F. Fernandez, WA5DFO; and Joe Korkames, W5BKB.

IARC CONVENTION

The International Amateur Radio Club will hold its third annual convention on September 18 and 19 at Geneva. There will be visitors and guests from many parts of the world, making it truly an international convention. Besides the customary assortment of technical papers, there will be an opportunity to operate the stations 4U1ITU — 4U6ITU at ITU headquarters in Geneva, and the station HB31TU which will be set up at the scene of the ITU Plenipotentiary Conference headquarters in Montreux. Tentative plans call for a charter jet flight from New York on the evening of the 16th, returning to NYC on the 20th. Those interested in this flight should contact Richard Lannigan, American Express, 65 Broadway, NYC phone WHitehall 4-2000. For further information on program, accommodations, and IARC activities, write to the International Amateur Radio Club, Box 6,1112 Geneva 20, Switzerland. Or look for 4U1ITU on 20 meter s.s.b. — they usually can be found on 14,292 kc. at about 1200Z.

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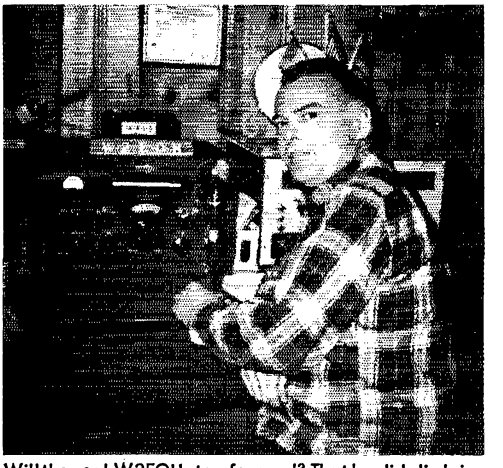
WB6AON didn't know the repercussions it would cause when he wrote on the back of his QSL to 9M4LP, "I don't win contests, but I have fun." It so happened that 9M4LP's XYL, Lorna, opened the mail first the day the card arrived. The next day, 9M4LP, who is an avid contest enthusiast and who several times a year hangs a "Do Not Disturb" sign on the door of the radio shack, discovered a new plaque hanging on his shack wall. It was inscribed with WB6AON's quotation and was headed by the following: Motto of the ideal amateur husband!



Will the real W2EOH step forward? That he did disclaiming any relationship to the W2EOH shown in the June QST VHF SS caption. As is obvious, we goofed and the real pilot of the aircraft shown was W2OEH.

A Slow-Scan Vidicon Camera

In Three Parts — Part III

Setup and Operating Procedures

BY COPTHORNE MACDONALD,* WA3BTK, EX-WA2BCW

BECAUSE of the slow scanning rates, a slow-scan TV camera requires much more time and patience to adjust initially than does a conventional closed-circuit TV camera. With normal TV, 30 complete pictures come along every second and one can see the results of an adjustment immediately. Not so with slow-scan TV: one must wait at least 8 seconds to see the results of many adjustments. Patience and a systematic setup procedure are essential for proper operation of the equipment and the sanity of the operator. Fortunately, if good quality components have been used, and attention has been paid to adequate ventilation, the adjustments need not be made frequently.

Setup and Alignment

The vidicon can be permanently damaged by the application of improper voltages, or by lack of scan if the beam current is high. To prevent this the step by step setup procedure outlined below should be followed *before the vidicon is installed.*

1. Check all points where waveforms are given, with a calibrated d.c.-coupled scope. The given sawtooth amplitudes across the yoke windings (waveforms A and B) will produce a square raster approximately 5/16 x 5/16 inch. If the positive excursion equals the negative excursion (as shown) the raster will be centered on the vidicon, if not, readjust the centering controls.

If the period in waveform A is not 66.7 ms. adjust R_{11} until the horizontal multivibrator locks in at 15 c.p.s. If the vertical period is not 8 seconds, adjust R_8.

The pulses in waveform C should be 5 ms. wide at a 15-c.p.s. repetition rate and 30 ms. wide at 1/8-c.p.s. repetition rate. The horizontal-rate pulse width can be adjusted by changing R_{14} and the vertical rate pulse by changing R_{18}.

The beam control, R_7, should be set at full counter-clockwise position for waveform D, and full clockwise for waveform E. The high frequency square wave between blanking intervals should be approximately 10 kc., though this is not at all critical.

Waveforms F, G, H, and I are given to aid trouble-shooting.

2. The subcarrier frequencies are set next:

A. Set up a scope and audio oscillator or other means to check the audio frequency at the "s.c.f.m. monitor" jack.

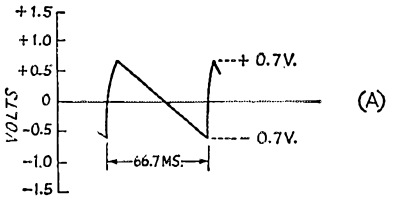
B. Ground Pin 7 of V_{6B}. Adjust R_6 for an output frequency of 1200 c.p.s. Unground Pin 7.

C. Pull V_6 out of its socket. Adjust R_5 for an output frequency of 2300 c.p.s. Replace V_6.

D. Short the primary of T_2. Adjust R_4 for an output frequency of 1500 c.p.s. Unshort the primary of T_2.

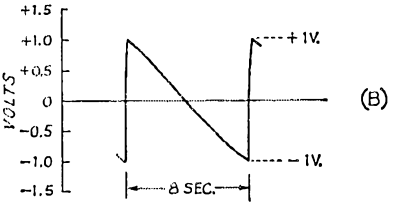
* Westinghouse Electric Corporation, Electro-Optical Equipment Dept., P.O. Box 10534, Pittsburg, Pa. 15235

Parts I and II appeared in June and July, 1965, *QST*, respectively.



Waveform A

Horizontal deflection-voltage waveform measured between black and red deflection-coil leads.



Waveform B

Vertical deflection-voltage waveform measured between green and white deflection-coil leads.

3. Check the current in the red focus coil (L_2) lead. Adjust R_{19} until the current is 20.5 ma.

4. Check voltages at the vidicon socket with a vacuum-tube voltmeter.

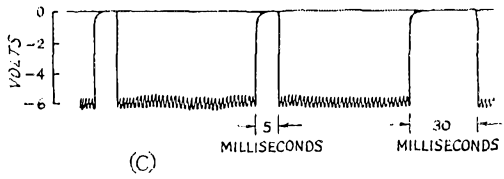
Between pins 1 and 8 — 6.3 volts a.c.
Pin 7 to ground — 0 volts
Pin 5 to ground — + 300 volts d.c.
Pin 6 to ground — Adjust R_1 for a reading of + 75 volts.
Center arm of R_2 to ground — Adjust R_2 for a reading of + 10 volts.

5. Make a bar pattern test chart by applying strips of ¾-inch-wide black electrical tape to white cardboard. Make the white spaces between strips of tape equal to the tape width. Determine the proper vidicon-to-lens distance by setting the lens focus adjustment at the shortest distance marked on the lens barrel (2'6" for examp'e). Position the bar pattern that same distance in front of the lens. With a piece of white paper held at the rear of the lens to pick up the test pattern image, check lens-to-paper distance for best focus on the paper. Put the lens in its normal mount and position the vidicon in the yoke-focus coil assembly so that lens to faceplate distance is 0.1 inch less than the optimum lens to paper distance determined above. With the test pattern the same distance away from the lens, optical focus will now be approximately correct. Orient the pattern so that the bars are vertical.

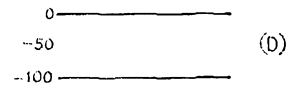
6. With vidicon socket still disconnected, check the operation of the video amplifier by monitoring pin 2 of V_{6A} with a d.c.-coupled scope. Turn R_3 fully clockwise. The voltage should be very close to zero. Wrap a piece of insulated hookup wire around the lead going to pin 1 of V_{11}. Bring this lead close to the vidicon target or target lead. The voltage at pin 2 of V_{6A} should go several volts negative if the amplifier-detector circuit is working properly. Remove the wire.

7. Shut off the power to the camera. Connect the vidicon socket to the vidicon, being careful not to disturb the lens-to-faceplate distance set previously. Set R_7 (beam control) fully counterclockwise. Set R_6 (contrast control) fully clockwise. With normal room illumination on the test pattern, set the lens at f/1.9. Monitor pin 2 of V_{6A} with a d.c.-coupled scope. Turn on the camera power. Allow a 5-minute warmup period. Set S_1 in the "auto" position; the shutter should open every 8 seconds for about 0.5 second period.

8. Cap the lens. The voltage at pin 2 of V_{6A} should be near zero. Advance R_7 clockwise just beyond the point at which the V_{6A} pin 2 voltage goes sharply negative. After a minute or so the voltage should return to zero; if not, increase R_7 a little more. (If the output still does not drop to zero, stray light is probably reaching the vidicon faceplate. Check for light leaks in the camera housing.)

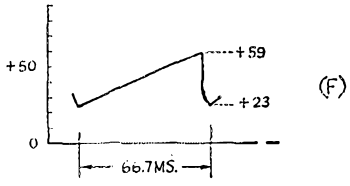


Waveform C
Measured between pin 7 of V_{6B} and chassis.

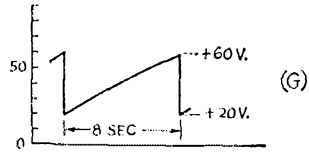


Waveform D
Measured between Grid No. 1 (pin 2) of the vidicon and chassis, with beam control fully counterclockwise.

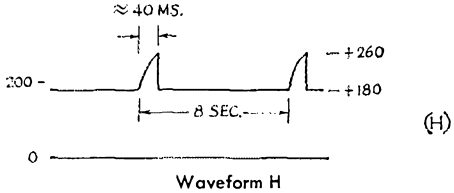
Waveform E
Measured between Grid No. 1 (pin 2) of the vidicon and chassis, with beam control fully clockwise.



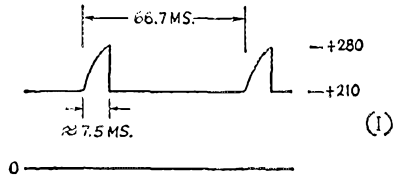
Waveform F
Measured between pin 8 of V_4 and chassis.



Waveform G
Measured between pin 8 of V_2 and chassis.



Waveform H
Measured between pin 6 of V_{1A} and chassis.



Waveform I
Measured between pin 1 of V_{3A} and chassis.

9. Uncap the lens. Some voltage variations should now be seen on the scope as the vidicon is scanned.

10. View the picture on a monitor. A coarse bar pattern should be visible if monitor contrast is set properly. Rotate the yoke until the bars appear vertical on the monitor and the top of the scene is at the top of the display.

11. Electrical and optical focus should be touched up to give the sharpest picture. Move the vidicon *a little at a time* to optimize optical focus, and R_1 *a little at a time* to optimize electrical focus. This is a rather tedious procedure since the effects of an optical focus change do not show up until 8 seconds later. It cannot be rushed. However, if the adjustment is made by moving the vidicon, and if lens-to-test-pattern distance is the same as the lens focus setting, the lens focus distance calibration will be correct for all settings once the focus procedure has been completed.

12. With the monitor contrast and brightness controls set so that 1500 c.p.s. gives a just-barely black picture and 2300 c.p.s. gives the desired "white" brightness, view some scene at proper focus distance. Adjust "f" stop and contrast control, R_3, for the most pleasing picture.

Camera Operation

A few rules of thumb are:

A. If the picture "white" areas are too dim, open the lens, turn R_3 farther clockwise, or increase the light on the scene.

If dark areas in the picture are too bright, do the opposite.

B. Operating with low video gain (R_3 near the c.c.w. end) and high light level can degrade resolution. For this reason, and also to permit lens settings giving maximum depth of field, operate with the R_3 near the clockwise end, and adjust the "f" stop for the most pleasing picture.

C. Vidicon sensitivity depends on target voltage. The +10 volts suggested in step 4 should be satisfactory in most cases. Should white spots be visible in the monitor display, reducing the target voltage may eliminate them. If more sensitivity is needed, the target voltage may be increased, but in no event beyond +15 volts.

D. Do not operate with R_7 more clockwise than is necessary to produce a good picture, since the additional beam current may produce shading effects, and vidicon damage if the sweeps should fail.

E. If the vidicon is removed, replace it in the same position so that the same raster area is scanned; otherwise, shading may appear due to "raster burn" effects.

F. If the shutter is kept in the "open" position, much less light will be required; of course, one cannot view moving objects in this mode.

QST

Strays

QST congratulates . . .

Harry V. Williams, W1MBK, who was just elected as president and chief operations officer of the Hartford Fire Insurance Company and the Hartford Accident and Indemnity Company and . . .

Russell McFall, W3JAB, who was recently elected president of Western Union, at 43 the youngest man ever elected to the top post of the 114-year-old company and . . .

Alexander A. McKenzie, W1BPI/W2SOU, well-known to commercial radiops as co-author of *Radio Operating Questions and Answers*, who has joined the staff of IEEE as assistant to the managing editor and . . .

John M. Norton, K2GHN, licensed in 1959 as W8TBM, who has been promoted to general manager of IBM's Advanced Systems Development Division, White Plains, New York and . . .

K2TFA, K2TFE, K2UKE and W2HZZ, who are teaching a course, "Electronics for Scientists and Engineers" under the auspices of the Mid-Hudson section, American Institute of Chemical Engineers and . . .

Andrew V. Smith, W7JMW, who has recently been appointed Vice President and General Manager of the Oregon Area Pacific Northwest Bell Telephone Co., and . . .

The Most Reverend Nevin Hayes, OA7Q, prelate nullius* of Sicuani, Peru (but a native of Chicago) upon being named Titular Bishop of Novasinna by Pope Paul VI and . . .

* Roughly, an administrator of a small area not a part of any diocese.

Dr. Leonard C. Silvern, K6RXU, adjunct professor, University of Southern California, who will teach at the NDEA Summer Institute for Educational Media Specialists.

—···—

Remember the Stray in January 1965 *QST* where W6HG asked hams holding all three top radio tickets — Amateur Extra, First Class Telephone, and First Class Telegraph, to get in touch with him? So far, 29 have responded. Most of the calls are from states near the coasts. In fact, there was not a single WØ or W8 in the bunch.

—···—

Christian Zangerl, OE9CZI, has written a booklet entitled, *The Radio Amateur's Vocabulary*, which is a German-to-English dictionary of amateur, electronic and communications words and phrases. It contains over 4000 words and expressions and should be useful to hams, students, and SWLs. The booklet can be obtained directly from Christian Zangerl, Dornbirn Nachbauerstr 28, Vlbg., Austria. The price is $1.25 U. S. Funds or 11 IRCs.

—···—

The Post Office Department promises faster mail service with the new Zip codes. Use yours when you write League Headquarters. Use ours, too. It's 06111.

—···—

FEEDBACK

In Fig. 4 of the "Miser's Dream" receiver (May *QST*), an a.g.c. disabling switch should have been shown in the *cathode* circuit of the 12AX7 a.g.c. amplifier stage.

The Mainline TT/L F.S.K. Demodulator

An Advanced Design, Including Auto-Start, for Converting F. S. K. to Teletype Pulses

BY IRVIN M. HOFF,* K8DKC

The demodulator described in this article, designed by Keith Petersen, W8SDZ, and the author with the assistance of K3NIO, makes use of the principles discussed earlier in this series on RTTY. Its superior performance has been verified by RTTY enthusiasts who have built it from advance information. Included is a brand-new auto-start system that ignores c.w. and phone signals, and an optional automatic motor control for unattended operation.

This is the seventh in the series of articles by K8DKC on radioteletype principles and practice.

SIGNIFICANT advances in radioteletype reception have recently been made through government contracts and industrial research. As only a limited group has had access to this information, many of these developments have not been brought to the attention of the amateur. It also seems unfortunate that many of the technical points already published in amateur journals specializing in RTTY have not received the attention they deserve.

The Mainline TT/L F.S.K. Demodulator is an outgrowth of the concerted effort of several amateurs to remedy this situation. It was designed with current commercial practice in mind and incorporates a number of features never before offered to the amateur. Although most of these features are not really "new," the manner in which they are applied represents a new approach to demodulators in amateur communication.

This unit, designed specifically for this series of *QST* articles, was developed by Keith Petersen, W8SDZ, and the author with the guidance and assistance of Victor Poor, K3NIO, Chief Engineer, Frederick Electronics Corporation.

Basic Philosophy

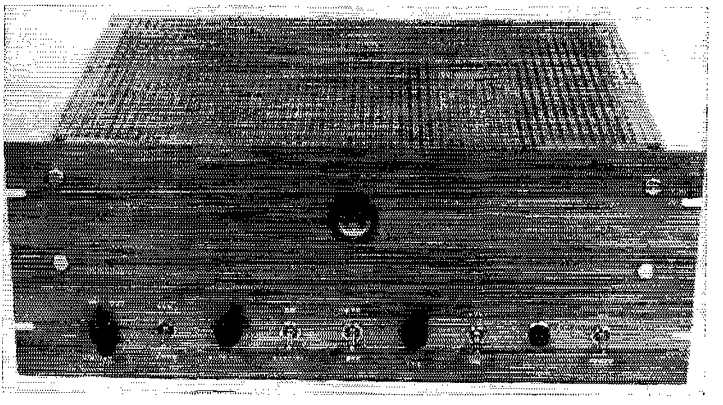
Recent experiments by amateurs and others indicate that a.m. reception[1] offers substantial improvement under certain types of conditions. These would include strong nearby interfering stations, and weak signals exhibiting selective fading. On the other hand, f.m. reception still has certain advantages during very rapid fading and with some types of static and impulse noise. Since there is no clear-cut separation of these conditions, it was felt that the optimum demodulator should offer either f.m. or a.m. reception at the option of the operator.

We believe the Mainline TT/L F.S.K. Demodulator is the first unit designed with both types of reception in mind. Under normal circumstances, it would be necessary for the individual to build two separate demodulators and then change back and forth as conditions would indicate. This is not only a duplication of components, but is somewhat inconvenient for the average operator.

Thus the primary aim of the TT/L was to offer a basic unit that was suitable for either optimum f.m. or optimum a.m. reception. Simple front-end sections for either a.m. or f.m. could then be added at low cost, and easily exchanged

*1733 West Huron River Drive, Ann Arbor, Michigan 48103.

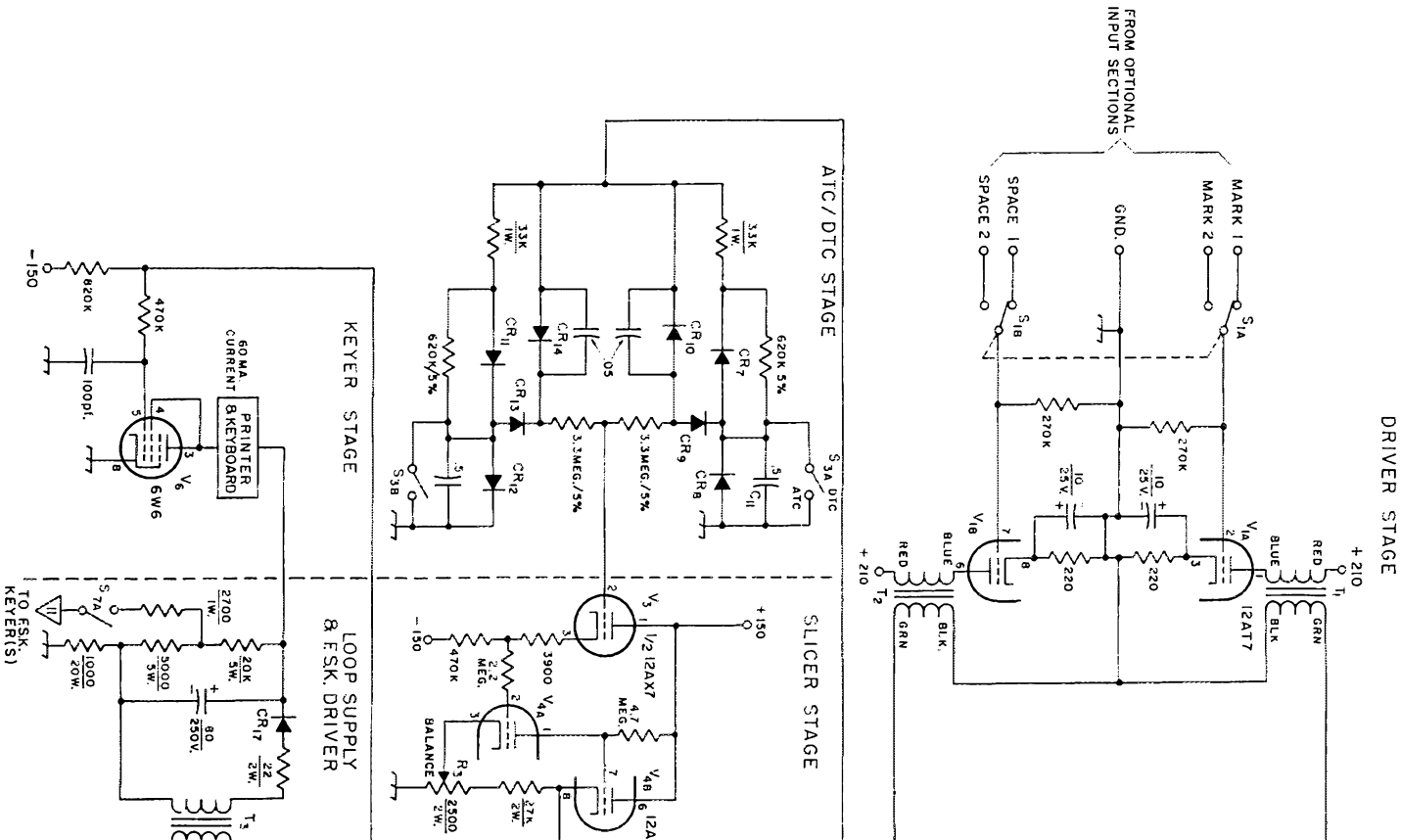
[1] The operating principles of the various circuits used in this demodulator were described in April 1965 *QST*, in the article "Over-All Design Considerations for RTTY Demodulators." The reader should refer to that article for additional explanation.

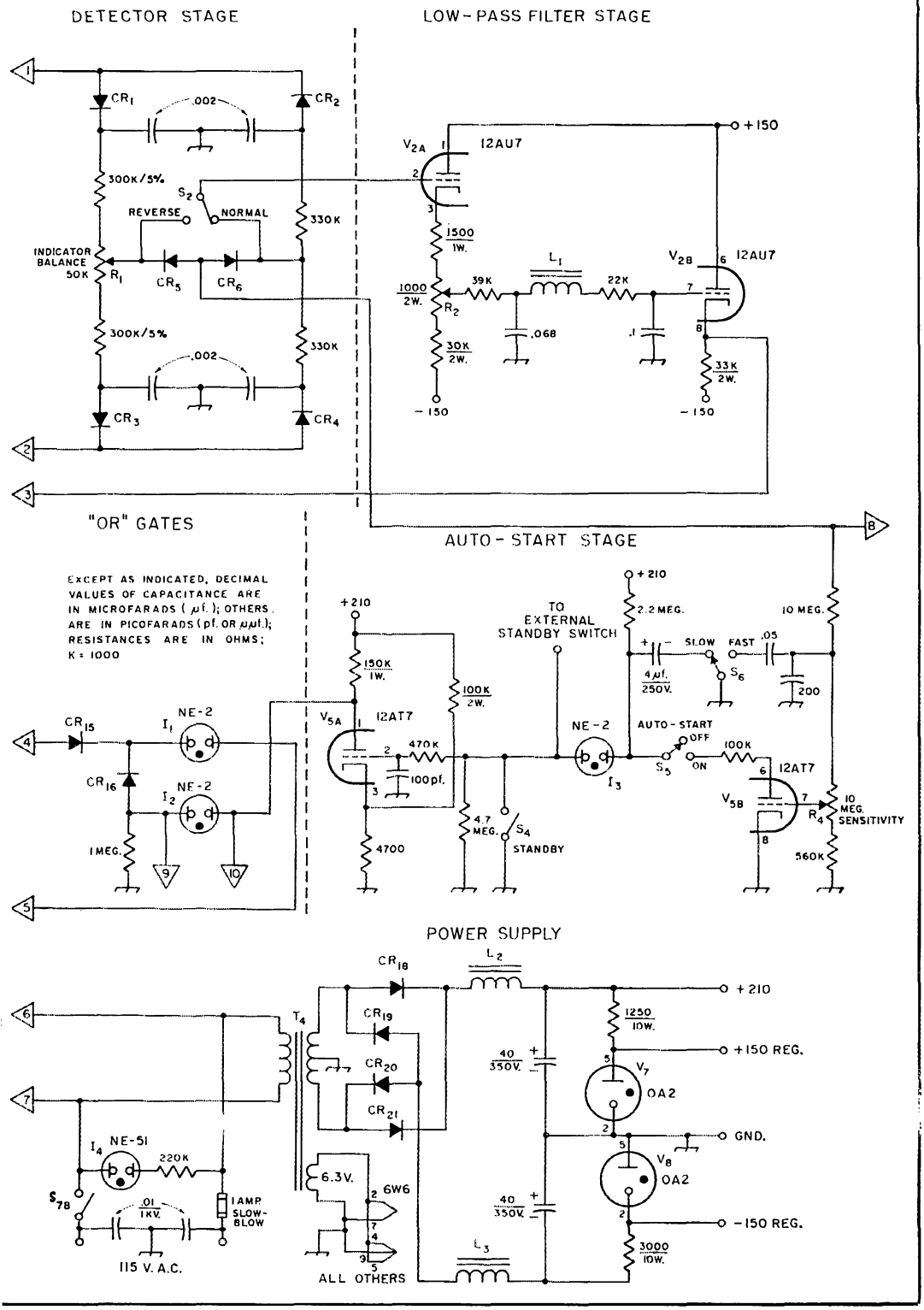


This Mainline TT/L Demodulator, using a somewhat earlier version of the circuit, shows one possible arrangement of panel controls. The physical layout can be varied to suit one's taste, so long as the usual principles of audio and d.c. circuit construction are observed.

Fig. 1—Circuit of the Mainline TT/L F.S.K. Demodulator basic unit. Capacitors with polarity marked are electrolytic; 0.01-μf. capacitors across 115-volt line are disk ceramic; others are Mylar. Except as indicated, resistors are ½ watt. The 30,000-ohm resistor in the cathode circuit of V_{2A} should be within 5% of the specified value.

CR_1-CR_{17}, incl.—Silicon (Sarkes-Tarzian F-4 or equiv.).
CR_{18}-CR_{23} incl.—Silicon, 800 p.i.v. (Sarkes-Tarzian F-8).
L_1—350 henrys (Stancor C-2345).
L_2—13 henrys, 65 ma., 500 ohms (Stancor C-1708).
L_3—12 henrys, 30 ma., 400 ohms (Stancor C-2318).
I_1, I_2, I_3—Neon lamps, NE-2.
I_4—Neon lamp, NE-51.
R_1, R_2, R_3, R_4—Linear control.
S_1—D.p.d.t. toggle.
S_2, S_6—S.p.d.t. toggle.
S_3, S_7—D.p.s.t. toggle.
S_4, S_5—S.p.s.t. toggle.
T_1, T_2—Interstage audio, 1:3 primary:secondary turns ratio; 10 ma. (Stancor A-53).
T_3—125 volts, 50 ma.; 6.3 volts, 2 amp. (Stancor PA-8421).
T_4—520 volts c.t., 90 ma.; 6.3 volts, 4 amp. (Stancor PC-8420).




DETECTOR STAGE
LOW-PASS FILTER STAGE
CR1
CR2
.002
300K/5%
330K
REVERSE
NORMAL
S2
INDICATOR BALANCE 50K
R1
CR5
CR6
CR3
CR4
V2A
12AU7
+150
1500 1W.
1000 2W.
R2
39K
L1
22K
V2B
.068
.1
30K 2W.
33K 2W.
-150
"OR" GATES
EXCEPT AS INDICATED, DECIMAL VALUES OF CAPACITANCE ARE IN MICROFARADS (μf.); OTHERS ARE IN PICOFARADS (pf. OR μμf.); RESISTANCES ARE IN OHMS; K = 1000
AUTO-START STAGE
+210
TO EXTERNAL STANDBY SWITCH
2.2 MEG.
10 MEG.
SLOW
FAST
.05
4 μf. 250V.
S6
200
150K 1W.
100K 2W.
V5A
12AT7
470K
100pf.
4700
4.7 MEG.
S4
STANDBY
NE-2
AUTO-START
OFF
ON
S5
100K
V5B
10 MEG. SENSITIVITY
R4
560K
CR15
CR16
I1
I2
I3
1MEG.
POWER SUPPLY
CR18
L2
CR19
CR20
CR21
T4
1250 10W.
+150 REG.
40 350V.
V7
OA2
GND.
V8
-150 REG.
3000 10W.
L3
I4
NE-51
220K
S7B
.01 1KV.
1 AMP. SLOW-BLOW
115 V. A.C.
6.3V.
6W6
ALL OTHERS

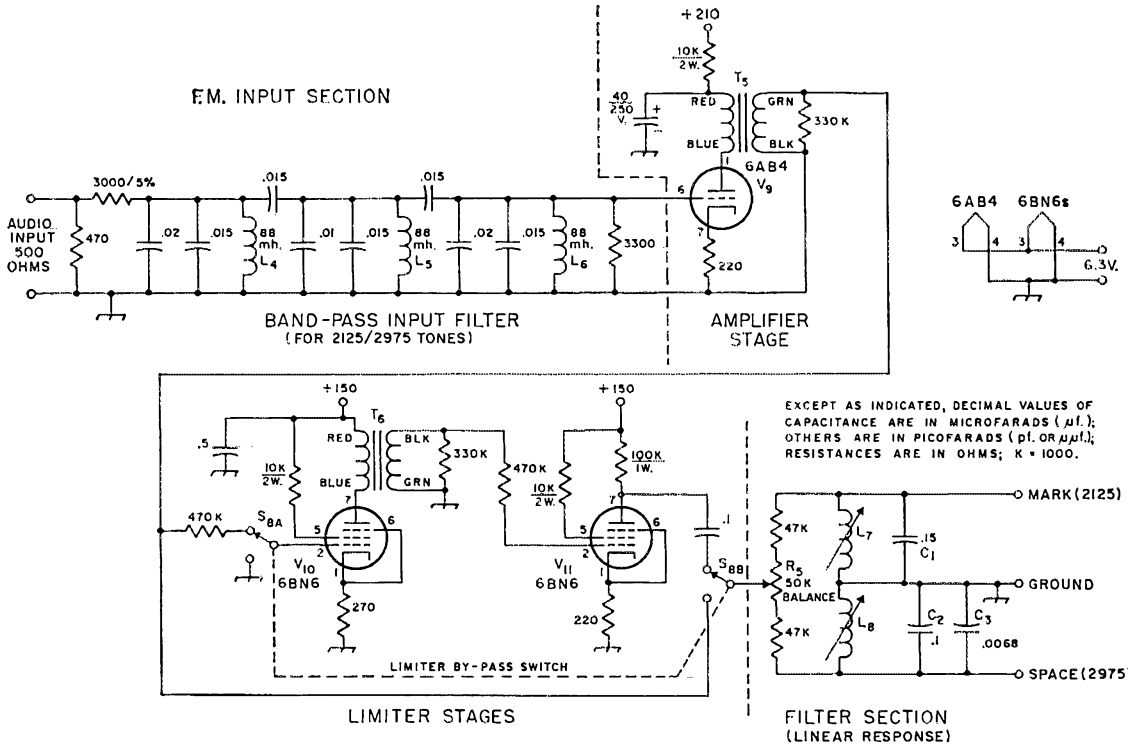


Fig. 2—The f.m. input-section circuit. Except as indicated, resistors are ½ watt; capacitors are Mylar.

C_1, C_2, C_3,—Values are for 2125 mark and 2975 space. For 1275 and 2125 space, omit C_3 and change C_1 to 0.33 and C_2 to 0.2. L_7 and L_8 must be adjusted accordingly.

L_4, L_5 L_6—88-mh. toroid.

L_7, L_8—Adjustable, 8-60 mh. (Miller 6319).

R_5—Linear control.

S_8—Phenolic rotary, 2 poles, 2 positions.

T_5, T_6—Interstage audio, 1:3 primary:secondary turns ratio; 10 ma. (Stancor A-53).

for different front ends should future development merit such a move. This would offer the ultimate versatility at minimum expense, and at the same time provide an excellent "test bed" for comparative checks.

Circuit Description

The circuit of the basic TT/L unit is shown in Fig. 1. A switch, S_1, enables the operator to select various input sections he may have constructed. V_1, a 12AT7, is used as an amplifier to raise the voltage to a level sufficient for the detector stage which follows. Transformers in the plate circuit of this tube further raise the output voltage to over 100 volts.

The detector stage is a normal parallel-combined system to which a second detector, CR_1-CR_3, has been added for the indicator and auto-start circuits as well as for reversing the reception should the transmitting station be "upside down."

The output from the detector goes into a cathode follower, V_{2A}, which isolates the low-pass filter from the detector. The low-pass filter, a 3-pole Butterworth cutting off at 28 cycles, was specially designed for this demodulator. It has excellent skirt selectivity and gives an optimum "eye pattern"[2] on RTTY reception. It is believed this is the first low-pass filter with these characteristics ever offered the amateur. The output of this filter will be essentially sine-wave.

Another cathode follower, V_{2B}, provides the proper output termination for the filter and also provides the very-low-impedance drive needed for the automatic threshold corrector stage which follows.

The DTC/ATC stage was derived from the Page patent[3] as well as from a Press Wireless patent of 1948.[4] A switch, S_3, when placed in the ATC position allows normal reception on single-channel copy at keyboard-speed typing. The DTC position is normally used for all other receiving conditions.

A third cathode follower, V_3, separates the DTC from the slicer stage. V_3 presents the proper impedance to the DTC on both negative and positive output voltages. If the DTC output were fed directly to the slicer, little or no DTC action would occur at times when the output was positive, because the grid of the slicer goes to low impedance with positive voltage.

The slicer is a modified trigger tube with stable characteristics. Inputs as low as 30 milli-

[2] Poor, "Filters for RTTY," *RTTY Bulletin*, May, 1964.

[3] U. S. Patent No. 2,999,925 held by Page Communications Engineers, and valid until January 1978.

[4] U. S. Patent No. 2,443,434 held by Press Wireless, and valid until June 15, 1965.

volts will cause the slicer to change its output from mark to space, giving in excess of 60 db. dynamic range for this stage alone.

The output of the slicer is fed through an *OR* gate to the grid of the keyer tube. The keyer tube then acts as an on-off switch to control the action of the printer, which is connected in its plate circuit. Any reasonable number of printers (or reperforators) can be placed in series in the plate circuit. The output of the f.s.k. driver then switches from "+" to "−" as the printer receives RTTY.[5] This occurs both for incoming signals and at those times when the keyboard is used. As a result, this system adapts immediately to "retransmit," where reception on one band will automatically key a transmitter on another. This is sometimes used for relaying traffic automatically from one band to another.

The reversing voltages on the f.s.k. driver offer a simple method of quickly adapting various transmitters to RTTY, and at the same time offer optimum keying characteristics with no relays, as described in May *QST*.[5]

The power supply uses large transformers and chokes for extended life and cool operation.

The F.M. Input Section

The f.m. input section, shown in Fig. 2, probably will be the "workhorse" unit for those not able or not desiring to obtain the expensive filters needed for optimum a.m. reception. A switch, S_8, on this section bypasses the limiters and changes it into a broad-filter a.m. input unit. Consequently, the average operator will feel little need to add further sections to the basic unit.

A 1-kc.-bandpass input filter of the 3-pole Butterworth type was designed for this unit by K3NIO. This filter will work with the 2125/2975 audio input tones, but not with the 1275/2125 tones. We have no input filter design to offer for those tones, and such a filter would be proportionately difficult for the home enthusiast to construct with normal test equipment.[6]

There are two stages of limiting, V_{10} and V_{11}, each using a 6BN6. This tube is used almost exclusively in better-quality f.m. receivers for stereo hi-fi sets. It is one of the finest limiters in use today, and each stage approximates the gain normally obtained from two ordinary stages. This unit limits clear down to −63-db. input level — thus making true the comment you can copy signals you can't even hear.

The limiter stages are transformer coupled for zero time constant. This enables the limiter to recover instantaneously from noise bursts and impulse noise pulses that are greater in strength than the RTTY signal. The usual *RC* coupling is not suitable for optimum limiting.

The output of the limiter goes to a filter using low-*Q* TV coils. These not only are adjustable,

[5] Hoff, "Transmitting Radioteletype," *QST*, May, 1965.

[6] For those requiring the 1275/2125 tones, an excellent bandpass input filter can be obtained through Electrocom Industries in South Bend, Indiana.

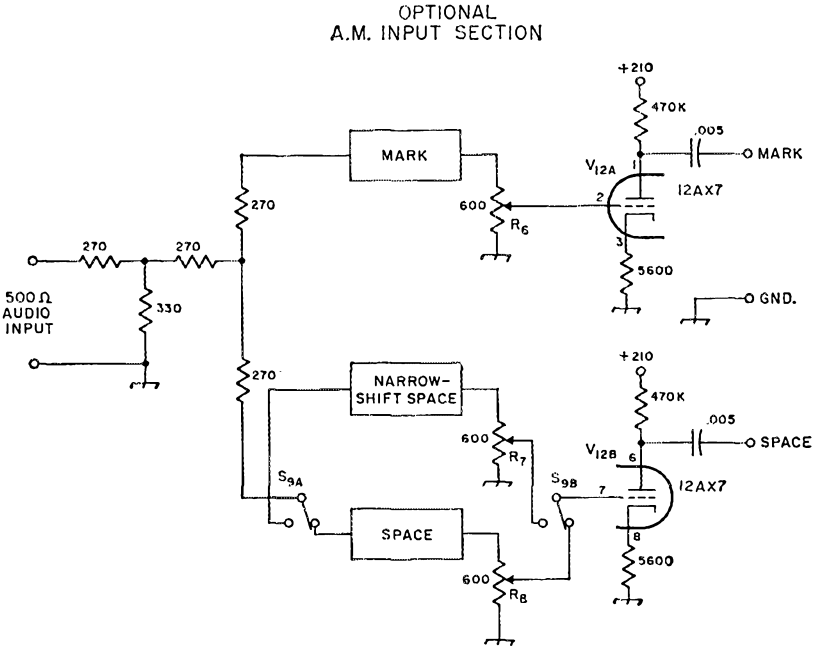


Fig. 3—Optional a.m. input-section circuit. Resistances are in ohms; fixed resistors are ½ watt. Capacitances are in μf.; capacitors are Mylar. Narrow bandpass filters are required for optimum performance.

R_6, R_7, R_8—Linear control. S_9—D.p.d.t. toggle.

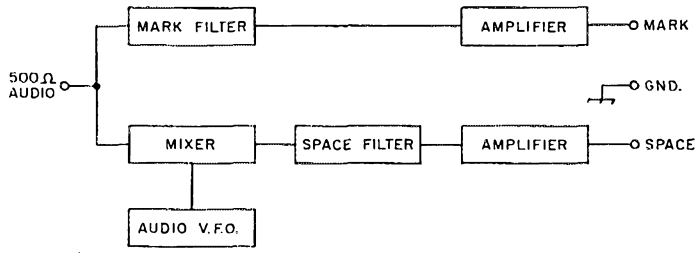


Fig. 4—Block diagram of heterodyne system for using fixed-frequency filters with different f.s.k. shifts, a.m. system.

but are readily obtained and easy to mount. For this purpose they are ideal, and while equal results could be obtained with 88-mh. toroids if very carefully used, it is not likely that the average amateur would have the equipment to properly "swamp" the toroids to such low *Q* as is needed.

While speaking of toroids, it is unlikely that single-tuned toroids would be optimum for normal use on RTTY. Their unloaded *Q* is around 200 for audio frequencies in this range, and loading them to have proper "nose" response gives skirt selectivity such that the TV coils are better when all other factors are considered.

The Optional A.M. Input Section

Best results on a.m. reception would be obtained with rather narrow channel filters. If one is able to buy or obtain plug-in filters of commercial type, or has the ability to design and build his own, the optional input section shown in Fig. 3 will be quite advantageous. Among other things, the narrow filters make it easier to eliminate interference from nearby signals. If the filters have 100–180 cycles bandwidth, a simple alternate input section can be constructed. For narrow shift, appropriate filters are exchanged for those used on normal shift.

Because of the sharpness of the filters, a problem exists with this arrangement when the shift is not "normal." At such times one can switch back to the f.m. input section, which adequately copies any shift that is legal.

In the event that quite narrow filters are used (under 100 c.p.s. bandwidth), a third optional system might be desired, incorporating some form of mixer system to heterodyne one of the incoming signals to that of the fixed filter frequency. Such systems complicate construction, but do give excellent results with only two sharp filters, which can then be used for all shifts by varying the oscillator feeding the mixer stage. A block diagram of this method is shown in Fig. 4. These systems have to be most carefully designed to eliminate "birdies" (mixer products) and to remain linear with the varying input voltages that are common in a.m. reception. It is felt that only the most advanced enthusiasts would care to invest in such a system, although the system has definite advantages when signals are weak or QRM is heavy.

The output of the optional a.m. system can be adjusted to approximate that of the f.m. section by adjusting the receiver level appropriately.

The Indicator Circuit

An oscilloscope makes a very nice display for tuning audio tones quickly and accurately. However, it adds considerable expense to a demodulator, particularly if it is designed to work from both d.c. and a.c. deflection voltages. If an ordinary a.c. oscilloscope is connected across the output of a linear discriminator prior to rectification, the pattern often displays ellipses instead of straight lines. This is not very impressive to the operator, and he feels it may be due to "cheap" filters he is using. To get straight lines on the scope, it is necessary to have filters with 25 db. or so of channel separation. However, a linear discriminator is still an excellent device for f.m. reception, and one should not be alarmed at the scope presentation.

Actually, a different presentation is normally used for linear discriminators. It involves using a d.c. scope on the output of the detector, and results in a "flipping-line" display. If the scope has sufficient gain, extremely narrow shifts will give a display identical with those at around 850 shift, and be just as accurately tuned. A normal a.c. scope is inadequate for tuning narrow shifts with a linear discriminator.

An alternate tuning system that is inexpensive and quite accurate has been devised for the Mainline TT/L F.S.K. Demodulator. Shown in Fig. 5, it is called a "minus-minus" display, and really is a mark-space voltage-comparison indication. The detector is arranged so that the output voltage is always negative for either mark or space. These mark and space voltages are then used to operate a 6FG6 electron-ray tube. Since mark is not on at the same time space is on, the fluorescent pattern does not flicker when the two voltages are identical. If it does flicker, a quick adjustment of the receiver tuning corrects it. This is the first simple display that adequately tunes any shift on straddle tuning (receiver tuned so that mark and space output voltages are equal on frequency shifts that are smaller

than the shift for which the filters are adjusted.) Enough gain is provided to give usable displays on less than 30-c.p.s. shift. The operator will soon discover that the gain is linear, and with an appropriate dial on R_9, shifts can be accurately determined.

Auto-Start Principles

In addition to converting the incoming signal from the radio receiver into d.c. pulses to operate the printer, an important thing a demodulator can be arranged to do is to copy stations on the frequency when the operator is not present. Basically, what is needed for such "auto-start" operation is some means of putting the printer back into the idling (marking) condition when the signal goes off. This system could be likened to a "squelch" circuit where it takes a signal somewhat above the noise level to break the squelch and allow the printer to operate. A quick review of what has been done in the past might be of interest.

With no typing, there is a steady carrier signal in the mark channel. With typing, this carrier is shifted to the space frequency for those pulses corresponding to a "key-up" condition. Thus the output of the mark channel is quite similar to c.w., in that it consists of on-off pulses. Unlike Morse c.w., the "on" time is greater than the "off" time, although this is somewhat dependent on the text being transmitted. For instance, the characters A, E and Line Feed contain more spacing than marking pulses.

To allow the printer to come out of squelch quickly and yet stay in auto-start reliably, previous circuits have used fast attack and slow release times. These circuits work rather well, although quite a few extra characters of garble often are printed after the signal goes off, because of the necessarily long release time. The principal trouble with such systems is that they respond equally well to both c.w. and RTTY, so if the station being copied goes off and is replaced by a c.w. station, the printer merrily goes on its way printing gibberish — and frequently wasting much paper in the process.

On 6 and 2 meters, where there is little or no c.w. activity on the frequencies normally used for RTTY, another problem exists. Frequently there is voice operation on the same channel used for RTTY, and the fast-attack, slow-release system will attempt, in many instances, to trigger from the voice signals. If the system is set up for unattended auto-start, the machine often will print some gibberish. To overcome this, a long attack time — 3 to 5 seconds — is combined with an equally long release time. Then a steady mark signal of at least 3 to 5 seconds is required to allow the printer to come out of squelch. Turning off the units at the end of a transmission often takes a deliberate lengthy space signal such as is obtained if the "break" key is held down for 3 to 5 seconds. These systems rarely, if ever, turn on for c.w. or voice, and rarely will turn on even for RTTY without the long steady carrier preceding typing.

Thus in one case, c.w. will trip the auto-start equally as well as RTTY. In the other case, neither c.w. nor RTTY is likely to trip the unit unless the steady carrier is first transmitted. The latter system would be of little use to those who like to copy while others are in contact. Also, the special shut-down technique often needed may well allow the printer to run wild if the long space signal is not sent when the transmitter goes off the air.

INDICATOR CIRCUIT

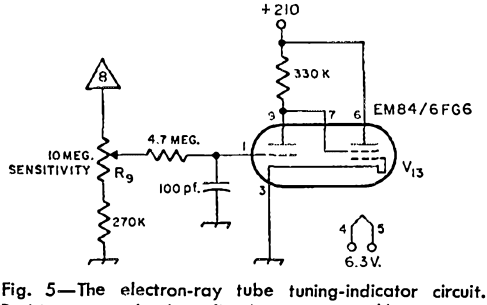


Fig. 5—The electron-ray tube tuning-indicator circuit. Resistances are in ohms; fixed resistors are ½ watt. Capacitances are in μf.; capacitors are mica.

R_9—Linear control.

The Mainline TT/L Auto-Start System

It was pointed out that c.w. is normally off (key up) more than it is on (key down), depending on the type of "fist" the operator has and on the content of the text. Such letters as Q, Y, and numbers like 9 and Ø, of course, are mostly key down. However, these characters occur less often in normal use, and it is probable that average c.w. key-down time may run from 40 per cent to 60 per cent of the total time. If a system could be devised that would require, say, 75 per cent or more of key-down time to operate, it might well ignore c.w. entirely. Unfortunately, it would probably also ignore RTTY.

K3NIO has devised a clever auto-start system in which digital computer techniques are used for recognizing RTTY characters.[7] This system works very well, but it is quite complex and involves many more parts than the average demodulator. K3NIO and K8DKC continue to use this system on the 80-meter band with excellent results, but each is planning to replace it with the new system to be described.

W8SDZ did not have facilities to build the complex character recognition system of K3NIO, but he *did* wish to be in a position to monitor a frequency being used by others while retaining auto-start. He pondered this "75 per cent" business for a while and came up with an ingenious application of the basic TT/L circuitry to auto-start operation — a technique with so much application that any RTTY operator will instantly say, "This is for me." It makes use of the dual-detector system in the TT/L.

[7] Poor, "Autostart for the H. F. Bands," *RTTY Bulletin*, July, 1964.

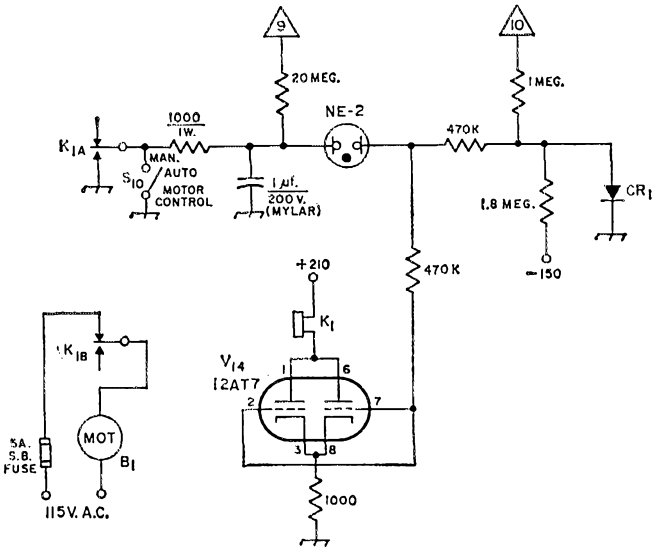


Fig. 6—Optional automatic motor-control circuit. Numbered leads at top connect to corresponding numbers in OR gates in basic unit, Fig. 1. Note: If motor does not start with S_{10} in "manual," turn S_5 off; S_{10} will then keep the motor on indefinitely.

B_1—Motor in teletype machine.

K_1—110-volt d.c. relay (Potter & Brumfield KAP11DG); see text.

S_{10}—S.p.s.t. toggle.

CR_1—Silicon diode, 400 volts p.i.v. (Sarkes-Tarzian F-4 or equivalent).

Since RTTY f.s.k. involves a constant carrier (even though it is shifted to a new frequency for space and then back again for mark), if both the mark and space channels are sampled it will appear as though there is a steady carrier at all times. The TT/L system as developed by W8SDZ takes 3 to 4 seconds to charge sufficiently to remove the squelch from the printer. However, it only takes a half second or so of loss of signal to lock up the printer in squelch once more. As a result, this 6:1 ratio of attack to release time requires an 80 per cent to 85 per cent key-down ratio to allow the printer to operate. The circuit has been designed primarily for use with f.m. reception, limiter in.

Since this circuit is activated from either (or both) the mark and space channels, it requires no special signal from the transmitting station to operate it, although it may miss a few RTTY characters for the 3 to 4 seconds it takes to charge it initially. However, an optional switch can be thrown for half-second attack and release time. This offers little protection against c.w., but is excellent for copying stations in round tables, or using fast break-in. With the fast release time only 3 or 4 erroneous characters will be printed, after the signal has disappeared, before the printer returns to squelch. Since both mark and space channels are sampled, the system will remain operational as long as there is RTTY on the frequency, as the construction of the characters being used is immaterial.

Because of the slow attack time, the TT/L auto-start system also offers protection against voice transmissions interfering with normal RTTY operation. Thus it can be left running on v.h.f. frequencies shared with phone operation.

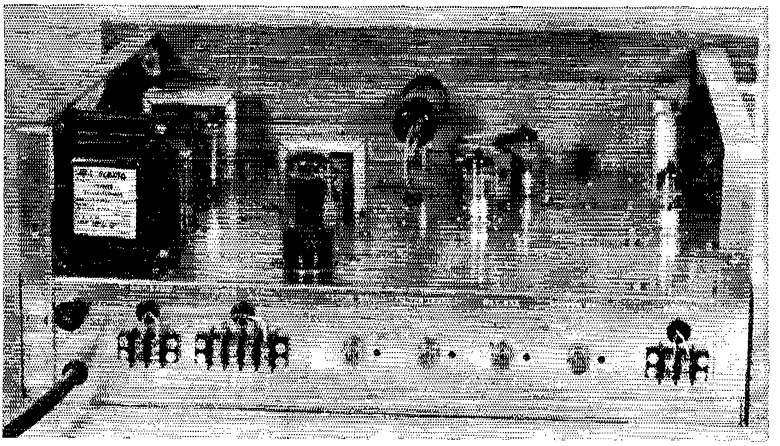
In the auto-start section of Fig. 1 a switch, S_6, is included to allow the operator to copy fast break-in with optimum results (the fast-attack position) or to give optimum protection against non-RTTY signals (slow-attack position) should the desired station terminate its operations.

Optional Motor-Start Control

One other optional circuit that, if incorporated, will give tremendous flexibility in monitoring a specific frequency for long periods of time when it is probable that there is no activity on that frequency is motor-start control for the printer. Several earlier demodulator designs have offered motor-start control combined with simple types of auto-start. These systems have often failed to operate satisfactorily, partly because of the type of auto-start circuit used and partly because of the peculiarities of the relays used to control the power for the printer motor. Most relays require more current to turn on than to turn off. Thus a fixed-level squelch at best is marginal.

The circuit shown in Fig. 6, developed by W8SDZ, has several advantages over other motor-control systems. It will not turn on the motor from voice modulation activity should the operator use the system on v.h.f.; it will not turn the motor on with normal c.w.; and, best of all, it will keep the motor turned on for about 45 seconds after the auto-start system has put the printer into squelch. Thus the motor is prevented from constantly turning on and off on short transmissions, as well as during the required c.w. identification.

The motor-control circuit was developed around the Potter & Brumfield KAP11DG-110 v.d.c. relay and utilizes the peculiarities of that relay. The constructor will find use of that particular relay beneficial, as it is possible that other relays would not give the same performance — and perhaps not work at all. A complete description of how the circuit works is somewhat beyond the scope of this general



An inside view of the demodulator shown in the other photograph. Power-supply components are along one edge of the chassis, to separate them from the audio and other circuits.

article, but it effectively compensates for the relay characteristics.

This system has been in use at W8SDZ for several months and has given completely satisfactory results, even when he is not in the house. It is being used on the 80-meter band, where normal auto-start had not previously been considered possible except with the character-recognition digital-computer technique.

Initial Tune-Up

There are two variable controls (pots) which should go on the front panel: the indicator sensitivity control, R_9, and the auto-start sensitivity control, R_4. All other pots can go on the rear of the chassis. They are set-and-forget types. All switches should be on the panel for maximum operating convenience.

Initial adjustments are as follows:

1) Ground the input, with the limiter switch turned to "off."

2) Connect a d.c. voltmeter (about 100-volt range) between the chassis and the cathode of V_{2B}. This is a low-impedance point and a v.t.v.m. is not necessary. Adjust R_2 in the cathode circuit of V_{2A} for zero volts on the meter.

3) Connect the demodulator to the receiver, set S_1 in the f.m. position with the limiters working, and adjust the balance pot, R_5, to give equal plus and minus swings on the meter as the receiver is tuned from mark to space, using the receiver's crystal calibrator for a tone. Adjust the TV coils for the correct tones as described in May *QST*[5], page 21. The swing will be around 50 volts plus and minus.

4) While receiving RTTY, and with the receiver tuned to give equal voltages on mark and space as in (3) above, adjust the indicator balance pot, R_1, to give no flicker. This will need no further adjustment.

5) Repeat step (1) above.

6) With the printer turned on, the auto-start switch, S_5, off, and the standby switch, S_4, set for normal reception, slowly rotate the slicer balance pot, R_3. In one direction the printer will run "open" and in the other direction it will stop running. Go slowly in each direction several times, noting the points at which this change occurs. Then set the pot at the midpoint. No further adjustment will be needed.

7) If the alternate a.m. section was constructed, the pots on the mark (R_6) and space (R_7 or R_8) channels can be set to give equal output voltages of about ±50 volts at the cathode of V_{2B} with normal audio level from the receiver.

This completes normal tune-up. These adjustments should hold for a long period of time.

Drift Latitude

Since the Mainline TT/L Demodulator incorporates an optimum variable threshold corrector, drifting signals or stations that are off

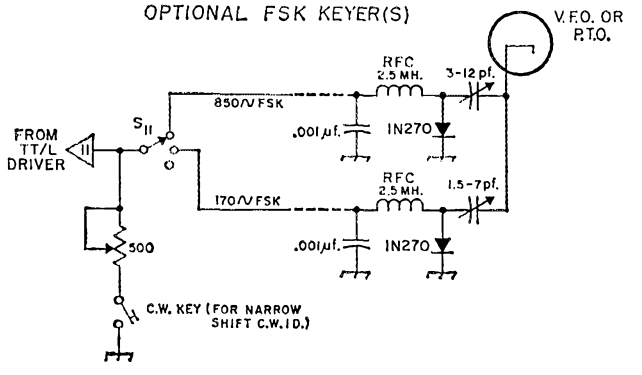


Fig. 7—Optional f.s.k. keyers. Input terminal connects to similarly-numbered terminal in Fig. 1.

S_{11}—Rotary, 1 pole, 3 positions.

frequency can be copied satisfactorily; little or no extra bias[8] will be introduced. This is a particularly nice feature for round-table unattended copy.

Parts and Cost

If all parts are purchased new, the total cost, including a suitable chassis, is approximately $107 for the basic unit, indicator, and f.m. input section. With the exception of the three 88-mh. toroids in the bandpass input filter of the f.m. section, all components can readily be obtained from regular distributors. The 88-mh. toroids can be purchased from various individuals who periodically advertise in Ham-Ads and in RTTY publications.

The capacitors should all be of the Mylar type except those in the power supply and the 4-μf. unit in the auto-start section. These are ordinary electrolytics. The diodes in the power supply should have an 800-volt p.i.v. rating; Sarkes-Tarzian F-8 or equivalent types are recommended. The other diodes are all silicon types and should have very high reverse resistance — 200 megohms or more. Sarkes-Tarzian F-4 or equivalent are an excellent choice at low cost. Germanium will not be adequate except for the f.s.k. keyers.

It is suggested that the two neon bulbs, I_2 and I_3, in the auto-start circuit be mounted on the front panel. I_2 lights when unit is in standby, and I_3 lights when the unit is in normal receiving condition.

[8] I.e., unequal signal pulse lengths on mark and space.

Summary

To summarize, the Mainline TT/L F.S.K. Demodulator offers the following features:

1) A basic unit for optional f.m. and a.m. input sections.

2) Adaptability to other optional input units.

3) The first minimum-bandwidth low-pass *LC* filter design offered the amateur enthusiast.

4) A stable slicer giving in excess of 60-db. post-detector dynamic range.

5) Ability to copy shifts approaching zero with stable transmitter-receiver equipment; a 2- to 3-c.p.s. shift can be copied accurately.

6) DTC/ATC variable threshold corrector for optimum a.m. and f.m. reception.

7) A new type of tuning indicator that is accurate and yet inexpensive.

8) Auto-start circuit, for unattended operation, that ignores c.w.

9) A 3-pole Butterworth input bandpass filter for the f.m. section; 1.0 kc. bandwidth.

10) Over 70 db. of limiting with normal volume levels (f.m. input section).

11) Limiter having zero time constant for instantaneous recovery from noise pulses.

12) F.m. filter section can be modified for using 1275/2125 tones by substituting appropriate filters.

Many of these features were never before used in an amateur unit, and several have not heretofore been available in commercial equipment.

(EDITOR'S NOTE; the eighth article of this series to cover RTTY tuning indicators, will appear in a subsequent issue.) QST

Strays

Stolen Equipment

On May 24, 25, or 26, an SX-111 receiver, Serial No. 1110110, a v.o.m., a Weller soldering gun, and an f.m. table radio were stolen from the shack of K3CLA. Anyone with information please contact St. Joseph's Prep Radio Club, 18th and Thompson Streets, Philadelphia, Pa. 19121.

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The Post Office Department promises faster mail service with the new Zip codes. Use yours when you write League Headquarters. Use ours, too. It's 06111.

—•••—

An all-ham wedding took place recently in Louisville, Ky. Nancy Griggs, K4ZZK, was married to Guy Partridge, K4KZH, by Rev. Cannon Addison Hozia, WA4EKU. Included in the wedding party were the best man, K4KGE and ushers K4FLP and W4YYX! The bride was given away by her father, Bill Griggs, W4RXX.

—•••—

Ronald Melvin, WA5EVD, will be operating from the 10,000-foot level of White Mountain in Mono County, California, during the last two or three weeks of August. A group from Ohio State University will be traveling there to do work at the University of California altitude research station. All operating will be on or around 3860 kc. QSLs should be sent via W8LT, Ohio State University ARC, P.O. Box 3052, Columbus, Ohio 43210.

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The fourth annual QRP ARC International QSO Party will begin at 0100 GMT on August 29 and will end at 0100 GMT August 30.

Exchange — Members send QSO number, RST, and QRP number. Nonmembers send QSO number, RST, and "NM."

Scoring — Each completed contact counts one point. A 1.5 multiplier is given for contacts completed on a.m., and a 1.5 multiplier is given to stations running 20-watts input or less.

Log Data — Logs sent for credit should contain date/time, your QSO No., RST sent, station worked, his QSO No., RST, and QRP No., band and mode.

Frequencies — C.w.: 3.540, 7,040, 14.065, 21.040, 28.040 Mc. Phone: 3.855, 7.260, 14.260, 21.300, 28.540 Mc.

Certificates will go to the first-place phone and c.w. station in each state and Canadian Province. To be eligible for an award, a minimum of 75 points must be scored. Certificates will also go to first-place winners on each continent.

For more information on the contest or on membership in the QRP ARC, send a s.a.s.e. to K8DZR, 2146 Chesterland, Lakewood, Ohio 44107.

When Is A Feed Line Not A Feed Line?

Some Interesting Aspects of Antenna Installations

BY LEWIS G. McCOY,* W1ICP

WHEN is a feed line not a feed line? When it becomes an antenna! Basically, the function of a feed line is to transfer the r.f. power from a transmitter to an antenna as efficiently as possible and to do it without radiating. When the line radiates it can no longer be considered a simple feed line. If it radiates it is also an antenna, or part of the antenna. This article will discuss the pros and cons, of radiating feed lines — and believe it or not, there are pro's!

Antenna Radiation Patterns

Before getting into the discussion of feed-line radiation a few words about antenna radiation patterns are in order. Every antenna in a practical amateur installation, regardless of type, will have some kind of radiation pattern. In those directions where the signal is strongest we have "lobes" and in the directions where the signal is weak, "nulls." A study of the ARRL *Antenna Book* will reveal that you can actually calculate in which directions an antenna will work best before you put the antenna up.

The Novice, starting out in amateur radio, will usually put up a simple half-wave dipole antenna as it is one of the easiest to make and get working. Let's get one fact straight immediately. A radiating feed line will change the theoretical radiation pattern of an antenna. However, and this is most important, the fact that the feed line radiates isn't necessarily a bad thing. True, it will give you lobes in some directions you didn't plan on. However, the power radiated from a feed line isn't necessarily "lost" power. The power radiated from the line could be putting a signal into an area where you normally wouldn't have any signal if just the antenna were radiating. So there can be an advantage, particularly for the Novice who wants to work as many different directions as possible.

On the other hand, as a Novice progresses to the General Class license, he may start thinking in terms of a rotary beam antenna where he can actually concentrate most of the radiated power in one direction. In this case, a radiating feed line is strictly undesirable. In the case of a rotary beam, the *only* radiation should be from the beam. Any feed-line radiation will upset the beam pattern, not only in transmitting but in receiving too.

Recently we received a letter from an amateur who had made some front-to-back checks on three identical commercial tri-band beams, all at the same height above ground and all at about the same distance (about one mile) from the amateur who made the checks. "Front-to-back" on a beam antenna is the ratio of the strength of the signal off the front, the desired direction, to the signal strength off the back, the undesired direction. The three beams showed the following results for front-to-back on the three bands the beams were designed for:

	14 Mc.	*21 Mc.*	*28 Mc.*
Beam "A"	11.5 db.	11 db.	10 db.
Beam "B"	12 db.	0 db.	12 db.
Beam "C"	11 db.	3.5 db.	0 db.

Obviously, something was rotten in Denmark! Here were three identical beam antennas yet they showed completely different characteristics. No doubt there could have been something wrong electrically, either with the way the antennas were installed or the way they were adjusted. However, there is the other possibility, feed-line radiation. A radiating feed line could easily upset the front-to-back ratios simply because the signal radiated by the feed line could mask the true pattern of the beam antenna by itself. So, before you condemn your antenna for poor front-to-back, read on.

When we start thinking in terms of beam antennas, or antennas where we don't want any undesired lobes, eliminating transmission-line radiation can be very important. Our desire with a beam is to obtain the type of pattern a beam is known to give. If the feed line radiates, we won't have the ideal pattern. Fig. 1 shows a typical pattern. We have taken some liberties in showing the r.f. radiation but the drawings will serve to make the point. In Fig. 1 we see the maximum radiation (maximum forward gain)

The Novice won't be in amateur radio long before he becomes interested in antenna patterns, gain, and anything to do with improving his signal by improving his antenna installation. This article will provide him with some information that can be put to good use in his future antenna experiments.

* Beginner and Novice Editor.

towards the front of the array with a smaller amount to the back. There are some smaller lobes from the beam but for our purposes we'll ignore those.

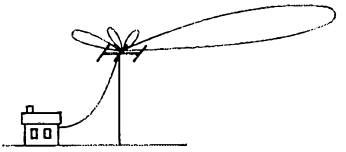


Fig. 1

Now take a look at Fig. 2. Let's suppose in this case that the feeder is radiating with a group of high-angle vertical lobes. At A, we get an idea of what these lobes look like in relation to the normal beam pattern. B is the view looking down on the antenna. It is easy to see that our beam would have poor side rejection and the "nose" would be quite broad. In addition, we would have both low- and high-angle radiation. In plain English, such a condition would be a mess! Keep in mind that in any antenna, the receiving pattern is generally the same as the transmitting pattern. The antenna in Fig. 2 would respond to both low- and high-angle signals, without appreciable attenuation of either, and the beam could show a poor front-to-back ratio because of the feeder pickup.

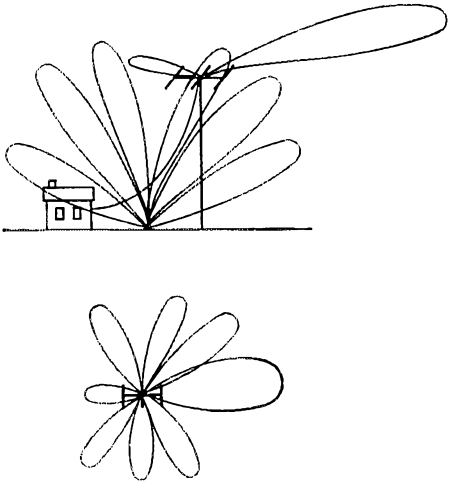


Fig. 2

Another example is shown in Fig. 3. In this case assume that the feeder is radiating as an omnidirectional, low-angle vertical. Such an antenna could radiate equally well in all directions. If you superimpose the beam pattern over this you wind up with poor front-to-back, poor side rejection, and a poorly-defined forward lobe. To repeat, we have taken liberties in showing these patterns, but they do point up the seriousness of keeping your feeders from radiating if you want the best your beam has to offer.

It becomes fairly obvious from the drawings that a radiating feed line should be avoided in a beam installation. As stated earlier, feed-line radiation may or may not be important in feeding a half-wave dipole. In any event, the Novice reader shouldn't become unduly worried if he has such an installation. The signal from the feed line will no doubt *help* you to work in some directions. However, when we think of beams, we don't want anything but the beam radiating — otherwise a primary purpose in using the beam is defeated.

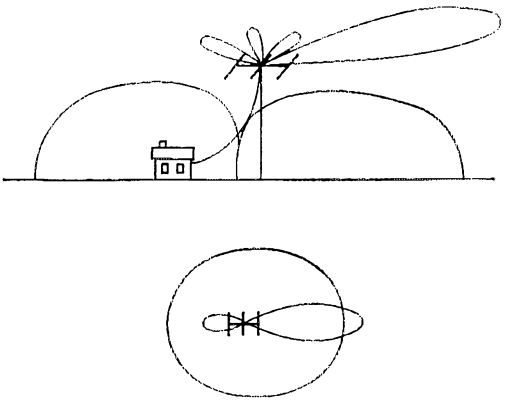


Fig. 3

Why Transmission Lines Radiate

It would require much more space than this article to go into a complete discussion of the why's of transmission lines. It is suggested that the newcomer read the three articles[1] by W1DF that appeared in *QST* this year. These articles go into much greater detail on the why's of transmission lines than we can do here. Basically however, and possibly oversimplifying, feed lines do not radiate because the radiation field set up by the currents and voltages in one of the conductors tend to "buck" the radiation field from the other conductor. Incidentally, so called single-wire feeders are really a misnomer because the single wire must radiate so it is actually part of the antenna.

Whenever the currents and voltages in the feeders are not balanced the feed line will radiate. This usually occurs when power from the antenna is coupled back to the feeders. An unbalanced condition is set up and the radiation fields from the individual feeders don't buck each other out. You may have read or heard that it is always good practice to dress your feeders away from the antenna as symmetrically as possible. This is done to avoid radiation coupling between the antenna and feeders.

In nearly all beam installations these days coaxial feed lines are used. In coax, the feed current is carried by the inner conductor and the *inside* of the outer shield. If coaxial line is

[1] Grammer, "The Whys of Transmission Lines," Parts I, II, & III, Jan., Feb., March *QST*, 1965.

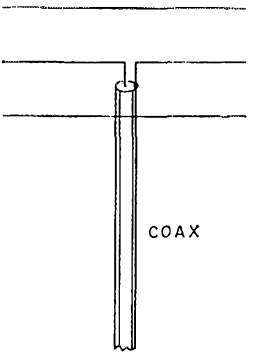


Fig. 4

used properly, the outside of the shield should be "cold" for r.f. Of course if all current is *inside* the line there can be no radiation from the inside.

Checking Your Installation

There are two reasons for radiation from the outside shield of a coaxial line. Whenever you connect the two conductors of coaxial line to a split dipole, as shown in the beam in Fig. 4, you unavoidably connect both the inside and *outside* of the outer shield to one side of the antenna. This makes the outside of the coax part of the antenna. Probably the best cure for this type of installation is a device called a "balun." A balun is simply a circuit that isolates the balanced load, the antenna, from the unbalanced line, the coaxial feeders. There are many types of baluns, but in this case a 1-to-1 type balun would be required. For example, both the input and output sides of the balun could be 50 or 75 ohms to fit the impedance of the coax used.

The other reason for radiation from the coax arises from the use of a length of coax that happens to be resonant in the band in use and there is coupling or pickup between the line and the antenna. The toughest problem here is determining whether you have a resonant length of line. We did some experimenting and came up with a satisfactory method. It consists of coupling a grid-dip meter to the outside of the coax and checking for resonances. This method is shown in Fig. 5.

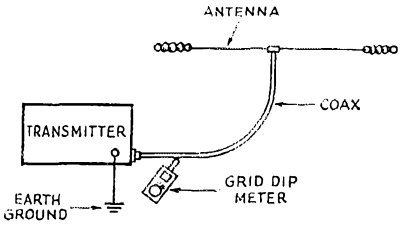


Fig. 5

In making such a check there are a couple of precautions that should be observed. First, make sure that all connections to the transmitter — ground lead, mike or key leads, interconnecting cables and so forth — are in place.

It should be kept in mind that any leads that wander around before finally reaching ground are part of the over-all length. Next, manually close your antenna relay so that it is in the transmit position. Also, be sure that your transmitter is tuned up beforehand on the frequency or band being checked. With the power to the rig off, couple the grid-dip meter to the outside of the coax line and carefully tune the grid-dip meter through the band being checked. You may have to make a single loop in the coax in order to get tight enough coupling to the grid-dip coil. If there is no dip, it means the feed system is not resonant. You can easily find the resonance by going through the grid-dip range, but as long as it isn't in the band in use you don't need to worry.

Next, open the antenna relay to the receive position, make sure your antenna trimmer on the receiver is tuned for a peak and then check again with the grid-dip meter. (Keep in mind that you don't want feed-line pickup in receiving any more than in transmitting; that's why we want to check the receiving setup as well). If you find that you have a resonance in either receiving or transmitting the easiest thing to do is change the length of the feed line by adding a few feet of line to move the resonance out of the band.

Using a triband beam adds a few complications to the problem. You may have resonances on one band but not on another. In this case you'll have to experiment with different lengths of line to get the one that keeps resonances out of any of the bands to be used.

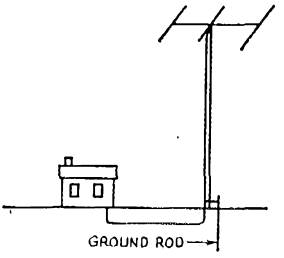
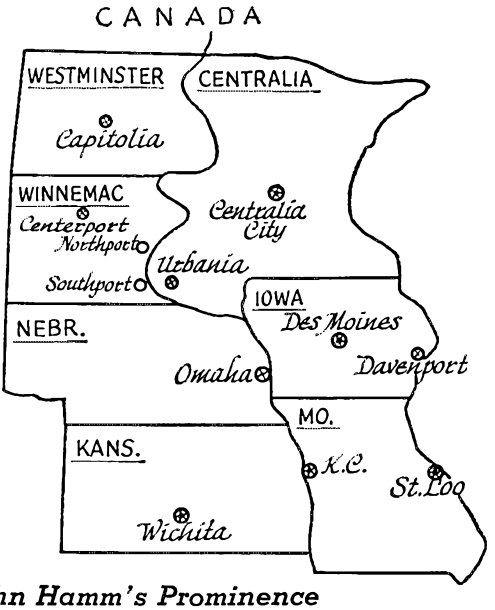


Fig. 6

Those are the methods for checking. It may be of interest that we gave a talk on this subject at a recent ARRL convention. One of the hams who attended the talk called a few weeks later to tell us that he had a condition where the front-to-back was only about one S unit, and upon changing the line length the front-to-back jumped to about six S units. So, before you condemn the beam manufacturer, take a good look at your installation.

If possible, when making your antenna installation, bring your feed line straight down from the antenna. If you have a metal tower bring the line down *inside* the tower. Connect a ground rod at the base of the tower to the outer shield, and then run the coax underground to the shack as shown in Fig. 6. The ground rod at the base, with the outer braid connected, will serve as an excellent lightning protector. QST

Pardon us for taking liberties with the map of the U.S., but this will show what the text is talking about. Any similarity to actual states is purely incidental as far as Centralia, Westminster and Winnemac are concerned. This is the fictitious Tenth Region of the National Traffic System.



The Anatomy of Public Service Communications

Part 3: The Price of John Hamm's Prominence

BY GEORGE HART,* W1NJM

No energetic leader such as John Hamm, WA0XHH, can stay out of national prominence long. Now John becomes embroiled in the nationwide traffic system as a key official and finds he has taken on quite a job. Then, comes the emergency. . . .

JOHN HAMM, WA0XHH, has become a prominent amateur, both locally and nationally. By diligent, enthusiastic and vigorous effort (*i.e.*, by sticking his neck out) he has become both EC and RO for his town of Southport. The SCM for Winnemac has asked him to accept appointment as SEC and RM. Headquarters has invited him to accept appointment as Transcontinental Corps director, Central Area. John has to make up his mind.

Decisions, Decisions . . .

This is what always happens. An amateur who is active, versatile, intelligent, willing and dedicated gets many more jobs offered than he can possibly handle. Sometimes he accepts too many of them, works his heart out for a year or two or maybe three (if he is made of stern stuff), then gradually becomes so sick of it that he finally chucks everything, sells his gear, lets his license expire and is never heard of again — not on the amateur bands, anyway.

But we did say that intelligence is a part of it, didn't we? If he is intelligent, he will realize beforehand that he can do just so much voluntarily in his spare time (yes, John Hamm has a full-time job for the mundane purpose of making a living), and he will not accept every job offered. And if he is dedicated, he will accept those jobs at which he feels he can do the most good.

So John had to make up his mind. The section had some good ECs to choose from for SEC, and some good ORS to choose from for RM. But locally, there was no one to replace him as EC or RO — no one, that is, who he felt would or could do the job the way it should be done. So he decided to keep the local EC/RO job and turn down the SEC/RM offer. The local job would have kept him busy enough, but being a TCC director appealed to him because it was different, it put his administrative abilities to a different kind of test, on a national level. Besides, a good TCC director was needed. John felt that he could do a good job, that he was needed, and that the job would be an interesting challenge. So he accepted.

What a TCC Director Does

Let's take some time to consider just what he let himself in for. We have already covered his EC/RO functions to some extent, and as already mentioned these functions alone took quite a chunk of his spare time, but not all of it provided he fortified himself with good assistants and an active planning committee. One of the finest attributes of leadership is the ability to delegate, and John delegated most of the local functions under the completed, functioning AREC organization so that his job consisted mostly of coordinating. After all, that's what he is — a coordinator.

The TCC job is a lot different. All John knows about it is what he has experienced. This has amounted to keeping a schedule with a west coast counterpart once a week, receiving some

*National Emergency Coordinator, ARRL

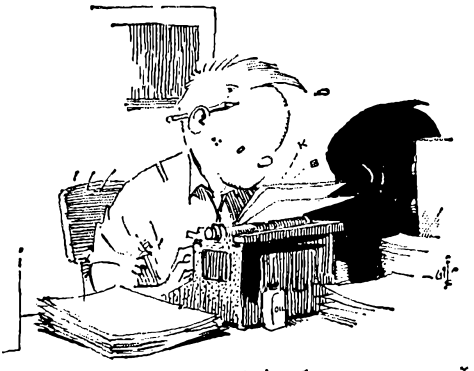
traffic from him, peddling it into Central Area Section or Region nets or the Central Area Net, as practical, and reporting results and traffic count to the director. The operator at the other end has been a crackerjack, and John is pretty good himself. Signals have been usually good on 40 meters, but sometimes they have gone to 20 when the skip was too short. Once in a while during the winter they even used 80. John and his counterpart watched the propagation forecasts, picked the best band and the best time they could both meet. The schedule was successful (that is, all traffic cleared) better than 90% of the time. It had been a rewarding experience, and each time John cleared the last of his TCC traffic after receiving it from his counterpart he felt a very strong sense of self-satisfaction.

As a TCC station, he had only one schedule a week to worry about. As TCC director, it now became his responsibility to see that all traffic reaching the Central Area Net destined for points in the other two areas was safely relayed to TCC stations in those areas, and that all traffic destined for the Central Area originating in the other two Areas was received by his own crew and relayed as near as possible to its destination in the shortest possible time.

Fortunately, a plan to accomplish this was already in existence when John took over. All he had to do was keep each function filled by a qualified station capable of making contact with its counterpart in another area and clearing the traffic. This required constant attention and coordination with the other two TCC directors, and continuous beating of the bushes for Central Area stations who had the combined signal strength, operating ability and availability to do the job — not to mention continuously beating them over the head to see that the job got done.

There is a great deal more to this job than operating; in fact, operating is only an incidental part of it. A lot of paper work is included. John must line up three functionaries a day, a potential of 21 different stations for all functions, and twice that number if you include alternates. Of course there aren't really that many because some stations take more than one function, and of course John sets the example by doing at least one function a week himself. It can't all be done on the air. John can "sound them out" on the air, but when it comes to signing them up it requires some letter-writing, or at least card-writing, to make sure the explanation is clear of just what each station has to do.

Then there is the business of sending out certificates. Some of those on the roster when John took over already had received certificates from the former director, but John decided to start from scratch. By keeping records (more paper work) of each functionary's performance, and by applying the rules in the NTS manual, he issued new certificates to each functionary qualifying, whether he had received one before or not. Thereafter, he intended issuing a new certificate each year.



...a lot of paperwork

The former TCC Director-Central left a few vacancies in the chart, and John's first job was to fill them. Meanwhile, he decided to perform them himself. This is not always a good idea, because it often results in the director's being "saddled" with these functions. The TCC director's job is to *direct* the operation, not do the work himself. Nevertheless, most conscientious TCC directors can't bear to see the function go begging and take it on themselves until or unless they can get someone.

The Central Area of TCC has three functions per night, designated C, E and F. Eastern and Pacific Area TCC each have four functions. Eastern has A, B, D and K, Pacific has G, H, I and J. Each function links with another function for an out-of-net schedule (except A, which reports directly into Central Area Net from the Eastern Area). The links are formed in this direction: A to Central Area Net; B to H; C to K; J to D; E to G; I to F. So there are eleven stations involved in six TCC schedules and eleven functions every day, including Sundays, holidays and vacation days. John's Central Area has responsibility for its end of three schedules every day.

In an emergency, the cycle can be stepped up, so that instead of performing all the functions once a day, they are performed two, three or six times a day, as required by the emergency situation.

This may all sound complicated, but it's basically quite simple and straightforward. In order to take care of out-of-area traffic each day, the Central Area Net must contain four TCC functionaries: one to bring traffic in from Eastern Area (A); one to collect traffic going *to* the Eastern Area (K); one to bring traffic in from the Pacific Area (F); and one to collect traffic going *to* Pacific Area (E). Since A is an Eastern Area station reporting directly into CAN, this is not John's responsibility, and that is why his concern is only three functions instead of the four each of the other TCC directors has.

Anyhow, John had to get busy and find stations to fill the vacancies. This was done by listening and observing on the Region nets and the Area Net — listening for outstanding operators with good, hefty signals. When he found

them, he solicited them. Each operator solicited was asked to take only one function per week. Almost without exception, they were flattered and honored to be considered for a TCC job, and some of them readily accepted. Others would have liked to but for one reason or another could not.

Candidates from independent nets were not to be neglected, either. John did a lot of listening around. Even an occasional DX-type operator with a good fist, strong signal and lots of operating savvy would occasionally accept a challenge to do something useful in amateur radio operating.

Once he got the vacancies filled (except one, which he assigned to himself so he wouldn't get out of practice), John kept right on looking for qualified operators. It isn't the easiest job in the world. TCC-caliber operators don't grow on trees. As and if he found them, he assigned them to alternate spots, the aim being eventually to have each function backed up by an alternate — because even the most reliable operator occasionally has a personal emergency, or takes a business trip or a vacation.

Meanwhile, John has to collect reports from each of his functionaries every day. These can be mailed in on cards supplied by the League, but many of the gang prefer to send them in by radio. Some of the boys are hotshots when it comes to operating, but not so hot when it comes to reporting, and sometimes John has to coax, plead, threaten and bribe to get them to report.

Then there are times when certain operators suddenly find they can't make the schedule and notify John at the last minute, so either he has to do it himself or get someone else to do it on a crash basis, or it doesn't get done and some TCC functionary is left holding a fistful of traffic. Another time one of the functionaries moves, gets married, gets divorced, finds the function is interfering with his business or social life, or for some other reason (there are scads of them!) decides he wants out. Usually they don't leave much leeway, and John has to find a replacement in a hurry.

No, it's not an easy job John let himself in for. But then, dedicated amateurs aren't looking for easy jobs. One of the biggest thrills in amateur radio is doing something that is difficult and doing it right. Being the TCC director kept John Hamm plenty busy, but it carried an infinite sense of responsibility and importance in the scheme of things. We seldom lose a TCC director just because he finds it too much work and gets tired of it.

Region and Area Net Managers

Of course the TCC director (there are three of them) is not the only hard worker in the NTS division of ARPSC. Through his experience at Area and Region net levels, John became acquainted with the best operators in amateur radio. Some just liked to operate, but others were interested in the organizational aspects as well, and these are the real NTS leaders. Although John didn't get a crack at managing a Region or Area net, he did get to know these officials pretty well through his regular TCC operating and organizing, and especially the Central Area Net manager, with whom he had to coordinate operations. They were all dedicated workers.

Mode

John didn't care a hang what mode the guys used for their out-of-net schedules, just as long as they got the traffic through. For their Area Net liaison they have to use c.w., and so a good working knowledge of c.w. traffic net procedure is basic. Outside the Area nets, some of the TCC boys experimented with RTTY (an ideal mode if signals are strong enough) and even sideband. Why not? The object is to get the traffic from one Area to another. They used the mode by means of which they could do the job best.

Comes the Emergency

Emergencies have a perverse habit of occurring where preparation is poorest. John Hamm became so busy with his TCC work that his local EC/RO work slipped a little. But he was brought sharply back to the local scene one day when a low pressure storm system moved in over a large area of the midwest which included Southport. The Weather Bureau issued tornado warnings and John immediately alerted his AREC organization. This was almost automatic, because his assistant ECs also received the warning and activated their nets.

No sooner did the alert go out than a tornado funnel suddenly formed along the western edge of Southport and literally tore a hole in the city. Damage was pretty severe in the affected area and communication was disrupted. The AREC went methodically to work. Mobiles were dispatched to the scene, others took stations at hospitals and police stations. Fixed stations already established at Red Cross and c.d. headquarters were activated. The local net on six meters went into action. John's boys were well drilled and ready. No telephone communication with the disaster area was available, but emergency communication was established with strategic points by AREC mobile in jig time, all in accordance with the pre-arranged plan.

For the time being, the situation was strictly a local one, and no liaison was established with the NTS section net. The station that would normally have this duty kept busy as relay for disaster area mobiles, some of which were having a tough time reaching control direct.

But this tornadic condition spread all over the state, and soon alerts and reports of funnels were reported to the SEC, who quickly conferred with the RM and PAM and the section NTS nets were alerted. The state of Winnemac was pretty well organized. The two nets had some common members, so they were well connected. In each of the Section nets were representatives from Local nets, plus a few stations that re-

ported in regularly from rural areas. The SEC now took charge of the situation and Southport became just one of several hotspots. The whole state was affected.

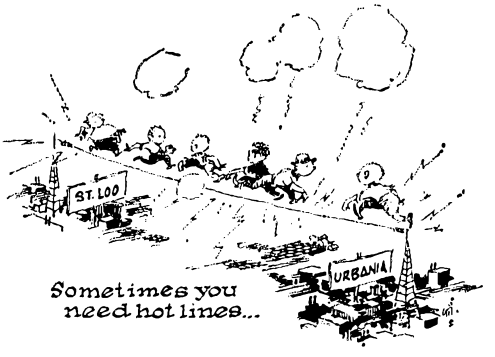
The SEC designated the Winnemac Phone Net on 75 meters as the Section Emergency Net, and put it into continuous operation. Stations in "key cities" (larger cities able to support a "key stations" to be manned around the clock by volunteer amateurs) throughout the state were kept on the frequency 24 hours per day. As the emergency and priority traffic began to build up, these "key stations" played a most important role because the net control station, whoever he was, knew they were always there. If traffic appeared for which there was no immediate outlet, the station carrying it could give it to one of the key stations to hold until an outlet was on the net, or to pass via the key city "Intercom" Net to another net which did have an immediate outlet. This is the way the situation developed in the Winnemac Section ARPSC.

Hot Lines

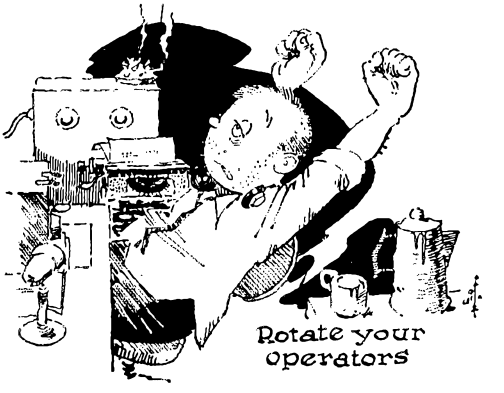
High precedence traffic became heavy between the capital city of Centerport and the large city or Urbania in the adjoining state of Centralia, where the Red Cross was being called upon for emergency supplies for stricken areas. So a "hot line" circuit was set up between the two cities. Two stations were selected, one at each city, and put on a separate frequency from all nets, maintaining constant touch with each other to handle the flow of official Red Cross traffic between Centerport and the large Red Cross supply center in Urbania. Also, high precedence traffic to and from various towns in Winnemac could utilize this circuit through a Centerport key station which was able to contact the station at the Centerport end of the hot line via landline or v.h.f. link set up for the purpose.

The Emergency Spreads

By this time, tornadoes were occurring over parts of the three fictitious states of Winnemac, Westminster and Centralia, in the central part of the U.S. Consequently, SECs of all three sections requested activation of the Tenth Region Net of NTS to handle interstate high precedence traffic, of which quite a bit was developing. Thus, while the SECs continued to coordinate affairs within their respective sections, the NTS Region Net manager now assumed control of interstate communication and the Region Net went into continuous session. At the request of the Red Cross, another hot line circuit was set up by the Region Net manager between Urbania and St. Loo, where Red Cross area headquarters was located.



The Region Net operation intensified as the emergency situation deepened. Each Section saw to it that there was a representative in the net at all times. Emergencies are no respecters of arbitrary coverage boundaries, however, and



a good many of the Sections represented maintained adjacent-section liaison, set up between and among SECs without respect to NTS operational boundaries. There were also now operating two hot lines, one between Centerport and Urbania and another between Urbania and St. Loo. High precedence traffic for these lines was channeled through the Section Net NCS and put directly onto the line without going through the Region Net.

Rotation of Personnel

What kept this setup going 24 hours per day? Rotation of personnel. Especially operators at key stations and at hot line stations were rotated as frequently as possible, so there would be a minimum of efficiency lost because of exhaustion on the part of operators. Net control station rotated frequently, too, but not the net manager. Once he sets things up they should be able to run themselves without his constant presence.

The Situation at Area Level

Not many storms or storm conditions spread over an area the size of an NTS Area, but an emergency communications situation *caused* by such conditions might very well do so. Our fictitious states of Westminster, Centralia and Winnemac would fall into the Tenth Region, Central Area of the National Traffic System. Should the emergency communications situation

spread over into the Ninth or Fifth Region, those Region nets and the Central Area Net will need to be activated. By whom? By their respective net managers at the request of the Tenth Region Net manager. How? By amateur radio, how else? Managers of NTS nets in adjoining Sections and Regions will have been alerted to this possible need and will be standing by. So will the net members, especially regular representatives of the Sections in those Regions. The Area Net manager will then coordinate all inter-Regional traffic functions and be responsible for setting up any required hot lines transcending Region Net boundaries.

Confusion Reigns

Confused? *Sure* you are, and so would everybody else be if such a thing happened. It's a confusing situation, and nobody ever knows what Old Dame Nature is going to do, when she gets together with Old Man Disaster, to make it more complicated and more confusing. But it's better to be confused now, when we are working it out on paper, than when the actual time comes. The more confused we are now, and the more we worry about it and *do* something about it, the less confused we'll be when the real thing comes along.

Meanwhile, back in Southport, John Hamm is still struggling to get things operating properly in his pitiful little town which is now just one of many midwestern towns and cities in trouble. Next month he's going to find himself precipitated into the middle of a nationwide disaster situation. How come? He's also TCC-Central director, remember? QST

"... and after the OMEGA Class ----"

BY JOHN G. TROSTER,* WP68FLOP/W6ISQ

CQCQCQCQCQCQ this is W9BR . . . ahhh . . . W . . D . . niner . . fiver . . . DogXrayOceanPapa."

"W Dog 49 BXOB here is WQ63WOOF . . . oh my, that was last week. Sorry, this is W . . . err . . . P 6 . . . ahh 8 FLOP."

"WB68 whatever it was, this is W Denver . . 94 . . DXOP. You're 5 by 6 here near Chicago. Co."

"WD95DOG . . XO . . Papa . . . WP . . like Papa sixty eight Frank Love O-Papa. You're 5 by 7 here near San Francisco. And say please QSL. You're my first 'WD95'er. Got a 'WD94' and 'WD96', but you WD95'ers is hard to find. Name is Jack. WD4X90P . . . ahhh . . . guess there was another 'D' in there somewheres . . . this is W6IS . . . err . . . W6P8F . . . ahh . . go ahead."

"Okay, ok . . . PW86 and all that . . . well, only a few of us '95's' . . . and you're lucky 'cause I expect to be a 'WS' in a week or so. How long you been a 'WP'?"

"W5OX9P this is KF . . . sorry, last year . . . ahhh . . WP68PLOF . . . errr FLOP. Can't seem to remember what my calls are any more. Well, anyway, I just got my 'WP' yesterday."

"How many times you take the exam?"

"Well, like the regulations says, you don't get your 'WP' until you flunked the exam 'Persistently' . . . that's 4 times. Ain't easy. And say . . . I been outa town a few months . . what's that 'WD' prefix ya got there mean again?"

"Say, you *have* been outa touch. That's the prefix for the 'Dunno' class! Yeah, I took my exam for the First Class a month or so ago. So, well, once ya take the exam even . . . you're never really the same old station . . . like how would you still like to be signing a 'WL95' call when you already took the exam for 'WF'? I mean . . . after all . . when ya take the exam already . . . you're at least a little better than a 'WL'. Right? But I still 'Dunno' if I passed. So I'm a 'WD' for a while till I find out. OK?"

"Guess I was lucky I got my 'WP' when I did . . . don't have to worry about that 'WD'. But I'm gonna pass that next exam one of these months now, so I'll get my 'WF' ticket too. WD49 somethin', this is N . . sorry . . WQ . . . ahhh . . . go ahead."

"WB . . . no 'P' . . you *was* 'Persistent' . . . 66 . . . 68? . . . 86? . . . whatever . . .

*45 Laurel Ave., Atherton, Calif.

Well, very good. Sure, take a shot at the 'WF'. You'll pass it OK. No problem. Like I been studying for my 'WS' . . . that's the 'Sensational Class' . . . . and a bit on the 'Terrific Class' . . . ahhh, that's 'WT'. And, of course, ya know, if ya have your 25 w.p.m. code ok for the 'WT' Class, you don't have to take it again for either the 'KSD' Class . . . ahhh . . 'Super Duper' or the 'Super Collosal' . . . that's 'KSC' . . . hmmm. The 'WP' near San Francisco, this is the Chicago station."

"No foolin'. Well then, I think I'll maybe skip over the 'WF' and 'WS' and go straight for 'WT'. Oh I dunno . . ."

"No, no . . you can't get the 'Dunno' until *after* you take the test. Like me."

"Oh, yeah, sorry. Well, I'll go straight for the 'Terrific Class' with that code test . . . pass that one easy. Lessee, one dot is 'e', one dash is 'm' or maybe . . . oh well, ditditditdahdahdahditditdit . . . or cq . . . and all that. Sure . . get that 'WT' down and go for the 'KSC', 'Super Collosal'. Yeeeaaaahhh, 'KSC68' sounds good, huh? As far as prefixes go, I mean. One little thing though. What's my incentive supposed to be to get a 'KSC' Class ticket?"

"Where ya been fella? Ya *need* a 'KSC', plus 40 wpm to get *THE* big one. And you *know* it's worth going after . . . 'specially if ya want to work 160."

"Meters?"

"No, gigacycles."

"Via OSCAR?"

"No prefix for that Class yet."

"Well, what's *THE* class ya get when ya pass the 40 w.p.m. and theory?"

"OMEGA Class!! . . . that's a 'WOW' prefix . . . like in 'Wonder of Wonders'."

"That's *THE* end, ain't it?? . . . !!"

"Well, not quite. There's really one more Class. But it's kind of a let-down after all them other nifty Classes and prefixes and stuff."

"Yeah, it's gotta be a anti-climax *after* OMEGA."

"Yeah, you're right. After ya had a OMEGA Class ticket for 3 years . . . they give ya back your old beat-up original 'W/K' three-letter call." QST

Strays

Wow! Look at all those two-letter calls! On Feb. 19 the Houston ARC held its sixth annual Old Timers Night. These fellows in the photo above have all been licensed for 40 years or more. L. to r., first row: W5WU, K5JLQ, W5QV, W5LI; second row: W5OX, W5KTL, W5FJ, W5AIR, W5DB, W5VA; third row: W5AFL, W5WR, W5EOS, W5AF, ex-9AWR, W5TD, W5EI; fourth row: W5EC, ex-5AC, W5FE, W5QK, W5ID, W5JN, W5TN, W5ZG, W5RIH; back row: W5APP, W5AE, W5PO, W5DN, W5AEQ and W5DS. W5RIH was the oldest timer there—his original ham activity dates back to 1911.

Now is the Time!

An Address to the 1965 ARRL National Convention

BY WILLIAM S. GRENFELL,* W4GF

I WANT to present to you some factors which I sincerely believe are vitally important to the future of Amateur Radio. First off, let me say I don't pretend to be a prophet nor do I claim to have a magic crystal ball. But I do believe I have some knowledge and experience which permits me to speak with authority on a most important factor which will affect the future of the Amateur Radio Service.

I have been an active licensed amateur for 35 years and an employee of the Commission for 25 years. For the past thirteen years, I have been involved in the amateur licensing and regulatory function of the Commission.

During these past 35 years, amateur radio has been a most important part of my life. I am deeply concerned about its future, as deeply concerned, I believe, as anyone at this convention. From both a personal standpoint, and as a part of my job, I hope that everything possible is done to preserve and enhance the Amateur Radio Service!

I think no one here today will quarrel with the fact that the entire future of amateur radio hinges upon the preservation of the amateur frequency allocations. It should be obvious that no effort which may support this end should be neglected. Before we consider the future, let us take a brief look at the past.

The concept of harmonically related amateur high frequency bands, as we have them today, was first implemented in the mid 1920s when, as a result of a national allocation conference, the Amateur Service was allocated a total of 4000 kc. in four bands below 30 Mc. The first subsequent international conference (Washington, 1927) added the 10-meter band but trimmed some of the other bands so that the result was a total amateur allocation of 3,485 kc. in the five bands below 30 Mc. The next two international conferences (Madrid, 1932 and Cairo, 1938) made no change in the total space below 30 Mc. allocated to the Amateur Service in North and South America.

The Atlantic City, 1947, conference gave us the new 450-kc.-wide 15-meter band, but some trimming of the 160-, 20- and 10-meter bands reduced the net gain so that we wound up with a total American "allocation" of 3500 kc. However, as you know, the operation of the wartime loran system established in the 160-meter band was continued after the war, and the sharing arrangement in this band left us the geographically limited use of 25 kc. segments only, the net result totalling 3325 kc. for the use of United States amateurs in the bands below 30 Mc.

* Acting Chief, Amateur & Citizens Radio Division, FCC.

● *When W4GF finished his presentation at San Jose, and the extended applause had faded, the first question from the floor was, "How can we get copies of your talk?" QST's editor, in the audience, had already decided the message should be brought to the attention of every amateur possible, and is pleased to reproduce it herewith. Reprints will be available on request to Hq., including quantities for affiliated clubs.*

The Geneva, 1959, conference made no significant change in Amateur allocations in the American region. However, in early 1963, a better domestic plan for sharing with loran was arranged which made available to amateurs at least two 25 kc.-segments of the 160-meter band in all areas of the United States and its possessions. Thus, the current useful allocation for United States amateurs below 30 Mc., totals 3350 kc.

Compared to some of the other internationally recognized radio services, the Amateur Radio Service has not fared badly at all. Some services have lost, and others have gained frequency space over the years. However, if you have studied the reports of the preparatory work and the negotiations carried on in these international frequency conferences, you know that without exception it has been a tough, hard battle to preserve the amateur high-frequency allocations as well as they have been.

Unlike some people, I don't pretend to be able to forecast when the next international frequency conference, which may affect amateur allocations, will occur or what the result will be. However, an international conference on certain maritime problems has been proposed for late 1966 or early 1967. We don't know for sure whether the conference will be held or not, but we think it probably will be. It is not beyond the realm of possibility that the agenda of that conference, if it is held, may be enlarged to take a new look at the entire international high-frequency allocation table. We won't know until the International Telecommunication Union (ITU) plenipotentiary conference is finished in November of this year whether the proposed conference will be held. Then, if the conference is to be held, we may not know for sure what the scope of the agenda will be until the Administrative Council of the ITU meets next spring. It may come soon; I hope it will come much later: but one thing I know for sure is that eventually we will have such a conference and I am sure a hard fight for the

survival of the amateur high frequency allocations will be necessary.

NOW IS THE TIME TO PREPARE! Before the United States goes to an international conference to present its position to the other nations, national requirements must be evaluated. We must have what amounts to a national frequency conference. Furthermore, the United States must decide whether it should propose changes in the international allocations or should resist any changes. As well as it can be done in advance, it must be determined whether any minor concessions can be made in order to effect or preserve allocations of major importance to this country.

Preparation for a frequency conference requires a hard, tough, soul-searching evaluation here at home of the relative importance of each of the radio services. It requires an evaluation of all facets of the United States' use of radio frequencies, military and civilian.

The needs of the various United States government departments and the services under the Federal Communications Commission's jurisdiction must be weighed and a balance agreed upon. The Commission must evaluate the relative importance in the public interest of each of the radio services it administers and must be prepared to convince the other government departments concerned of the soundness of its evaluation. Therefore, it should be obvious that all of the existing, and potential assets of the Amateur Radio Service should be enhanced and developed to the greatest extent possible.

When the Commission considers the value of the Amateur Service to the United States, what does it find? The amateur's ability to enhance international good will is recognized, but how can you put a quantitative value on it? You can't measure it or weigh it, and certainly you can't put a dollar value on it. Well, you may ask, "How about the communications services the amateurs provide to the public?" Yes, you may be able to add up the number of messages relayed: the number of participants in the traffic nets, in the emergency corps (AREC), and in civil defense (RACES) communications. However, one of the most noteworthy activities of the amateurs as peace-time communicators may be demonstrated only sporadically and by chance, when a disaster, such as a flood, fire, or earthquake strikes. We know that if amateurs are there and equipped they will surely boost the credit side of the amateur ledger.

What about the amateurs as contributors to the advancement of the radio art and as a reservoir of electronic technicians? How does the amateur measure up as a public interest asset in this sector of amateur activity? Granted, activities like moonbounce and Project Oscar are bright stars in the amateur's crown. However, let's face it — a majority of the amateurs do not have the time nor can they afford the equipment to engage in such projects.

There remains one practical, measurable way by which most, if not all, amateurs can demonstrate their value as a national asset and that is by qualifying by examination for progressively higher classes of amateur operator licenses. Here is the way that, when called upon, the Commission can put forth some cold hard facts that will count heavily for the Amateur Service when national allocation policies are being considered. Here is the way our delegation can go to the next international conference, firmly convinced of the value of the Amateur Service to the United States, and ready to fight on an international level to hold every kilocycle of its allocations.

This is not to say that the Amateur Service has a poor "image" here in the United States. However, there is always room for improvement and every practicable way of achieving such improvement in the Amateur Service should be used.

Does a higher class license with no extra privileges encourage amateurs to demonstrate progress through examination? I think you all know the answer to that question. During the 13 years that the Extra Class license has been available, less than 2 percent of the amateurs have qualified for it. Will reserved-band operating privileges encourage qualification for a higher class license? I am convinced it will. In January, February and March of this year, only 30 Extra Class examinations were taken each month. In April, after the Commission's Notice of Proposed Rule Making in Docket 15928 was released, 290 took the examination. I don't have the totals for May and June, but I see no reason why they shouldn't be even greater. This degree of interest, in spite of the fact that the exact nature of the privileges to be gained is not yet certain, is most encouraging.

I am sure you all realize that full implementation of a license/operating privilege incentive system, such as has been proposed, will take considerable time. The date of the next international frequency conference is an uncertain period of time away in the future. However, preparation for that conference, cannot begin too soon and, I believe, NOW IS THE TIME TO MAKE THAT BEGINNING!

Up to here I have dealt mainly with the importance of improvement of the public interest value of the Amateur Service here in the United States. Of vital importance to the future of the Amateur Radio Service, which lies in the preservation of generous international frequency allocations, is the improvement of the Amateur "image" in the eyes of the other countries who will be participating in the future allocations conferences. Somehow, some way, they must be persuaded that the Amateur Service is a good thing for them.

Many ideas toward this end have been expressed in convention speeches, magazine articles, and in formal and informal meetings. Every possibility should be explored and every opportunity or method of selling amateur radio to the governments of other countries should be developed and pursued.

(*Continued on page 148*)

Happenings of the Month

ELECTION NOTICE

To All Full Members of The American Radio Relay League Residing in the Atlantic, Canadian, Dakota, Delta, Great Lakes, Midwest, Pacific and Southeastern Divisions:

An election is about to be held in each of the above-mentioned divisions to choose both a director and a vice-director for the 1966–1967 term. These elections constitute an important part of the machinery of self-government of ARRL. They provide the constitutional opportunity for members to put the direction of their association in the hands of representatives of their own choosing. The election procedures are specified in the By-Laws. A copy of the Articles of Association and By-Laws will be mailed to any member upon request.

Nomination is by petition, which must reach the Headquarters by noon of September 20. Nominating petitions are hereby solicited. Ten or more Full Members of the League residing in any one of the above-named divisions may join in nominating any eligible Full Member residing in that division as a candidate for director therefrom, or as a candidate for vice-director therefrom. No person may simultaneously be a candidate for both offices; if petitions are received naming the same candidate for both offices, his nomination will be deemed for director only and his nomination for vice-director will be void. Inasmuch as all the powers of the director are transferred to the vice-director in the event of the director's resignation or death or inability to perform his duties, it is of as great importance to name a candidate for vice-director as it is for director. The following form for nomination is suggested:

Executive Committee
The American Radio Relay League
Newington, Conn. 06111

We, the undersigned Full Members of the ARRL residing in the.....Division, hereby nominate.....of..... as a candidate for director; and we also nominate..... .....of.....as a candidate for vice-director; from this division for the 1966–1967 term.

(Name Call City Date)

The signers must be Full Members in good standing. The nominee must be a Full Member and the holder of at least a General Class amateur license, or a Canadian Advanced Amateur Certificate and must have been a member of the League for a continuous term of at least four years at the time of his election. No person is eligible who is commercially engaged in the manufacture, sale or rental of radio apparatus capable of being used in radio communications, or is commercially engaged in the publication of radio literature intended in whole or in part for consumption by radio amateurs.

All such petitions must be filed at the headquarters office of the League in Newington, Conn. 06111 by noon EDST of the 20th day of September, 1965. There is no limit to the number of petitions that may be filed on behalf of a given candidate but no member shall append his signature to more than one petition for the office of director and one petition for the office of vice-director. To be valid, a petition must have the signature of at least ten Full Members in good standing; that is to say, ten or more Full Members must join in executing a single document; a candidate is not nominated by one petition bearing six valid signatures and another bearing four. Petitioners are urged to have an ample number of signatures, since nominators are occasionally found not to be Full Members in good standing. It is not necessary that a petition name candidates both for director and for vice-director but members are urged to interest themselves equally in the two offices.

League members are classified as Full Members and Associate Members. Only those possessing Full Membership may nominate candidates or stand as candidates; members holding Associate Memberships are not eligible to either function.

Voting by ballots mailed to each Full Member will take place between Mid-October and November 20, except that if on September 20 only one eligible candidate has been nominated, he will be declared elected.

Present directors and vice-directors for these divisions are: *Atlantic:* Gilbert L. Crossley, W3YA and Edwin S. Van Deusen, W3ECP. *Canadian:* Noel B. Eaton, VE3CJ and Colin C. Dumbrille, VE2BK. *Dakota;* Charles G. Compton, WØBUO and Charles M. Bove, WØMXC. *Delta:* Philip P. Spencer, W5LDH, W5LXX and Franklin Cassen, W4WBK. *Great Lakes:* Dana E. Cartwright, W8UPB and Charles C. Miller, W8JSU. *Midwest:* Robert W. Denniston, WØNWX and Sumner H. Foster, WØGQ. *Pacific:* Harry M. Engwicht, W6HC and Ronald G. Martin, W6ZF. *Southeastern.* Thomas M. Moss, W4HYW and Charles J. Bolvin, W4LVV.

Full Members are urged to take the initiative and to file nominating petitions immediately.

For the Board of Directors:
July 1, 1965

JOHN HUNTOON
Secretary

ANTI-QRM BILL

Last autumn FCC requested of Congress that it promulgate a new section of the Communications Act to strengthen FCC's ability to control

Mayor Victor Schiro (with mustache) proclaimed the week of June 21–27 as Amateur Radio Week in New Orleans. Amateurs taking part in the ceremony and shown above are, from left K5SGK, W5RU, W5NO and ARRL Director W5LDH. Incidentally, W5RU is proprietor of the famous Antoine's Restaurant in New Orleans.

Ivan Loucks, W3GD/K4GD, who retired on June 30 as Chief, Amateur and Citizens Radio Division, FCC, presented the 1965 John Mansfield Memorial Award to the New England "Ham of the Year" Stewart Perry, W1BB, "Mr. 160 Meters."

harmful interference to radio reception by non-communications devices. The text of the proposed Section 302 reads:

"DEVICES WHICH INTERFERE WITH RADIO RECEPTION

"Section 302 (a) The Commission may, consistent with the public interest, convenience, and necessity, make reasonable regulations governing the interference potential of devices which in their operation are capable of emitting radio frequency energy by radiation, conduction, or other means in sufficient degree to cause harmful interference to radiocommunications. Such regulations shall be applicable to the manufacture, import, sale, offer for sale, shipment or use of such devices.

"(b) No person shall manufacture, import, sell, offer for sale, ship or use devices which fail to comply with regulations promulgated pursuant to this section.

"(c) The provisions of this section shall not be applicable to carriers transporting such devices without trading in them, to devices manufactured solely for export, or to devices for use by the Government of the United States or any agency thereof. Devices for use by the Government of the United States or any agency thereof shall be developed, procured, or otherwise acquired, including offshore procurement, under United States Government criteria, standards, or specifications designed to achieve the common objective of reducing interference to radio reception, taking into account the unique needs of national defense and security."

Under the present Section 301, FCC may take action against users of various restricted and incidental radiation devices, whereas it now seeks the authority to set standards in advance.

The amendment to the Act has been introduced into the Senate as SB 1015. Hearings were held by the Senate Commerce Committee on a number of communications measures in June; ARRL General Counsel Booth was among the witnesses testifying in favor of SB 1015.

The ARRL testimony pointed out that radio amateurs were especially susceptible to interference from these devices since we have to operate from our residences wherever they may be; unlike government or large commercial stations we can't usually relocate to a low-noise location. It pointed out that most power companies maintain and operate their power transmission lines so as to avoid interference to nearby receivers. Nevertheless, the legislation should be broad enough to prevent the installation of extremely high voltage lines in built-up areas.

The League also noted that other electrical devices such as motors, switches and appliances cause severe interference and add to the spectrum pollution if not properly designed and installed. The proposed legislation should be broad enough to cover these items.

Finally, the ARRL testimony mentioned that not only do poorly designed radio and television receivers radiate unnecessarily, but are more susceptible to interference from other sources, including properly operated licensed transmitters on other frequency bands, than is necessary. The bill should cover the proper design and construction of receivers to make them less susceptible to unwanted signals.

The remarks concluded with a statement that there is a most pressing need for the legislation proposed by this bill, and urging favorable action on it.

EXAM POINT CHANGE

The Federal Communications Commission has changed its annual examination point for western Virginia from Roanoke to nearby Salem, because of more-suitable examination facilities in the latter city. The next examination in Salem is scheduled for October 6. The full FCC exam schedule for July 1–December 31, 1965, can be found on pages 38–39 of July *QST*.

W1EFW (third from left) was presented a silver bowl for his service as New England Division Director from 1957 through 1964. The present Director, W1QV and W1HKG look on as W1VRK makes the presentation.

Minutes of Executive Committee Meeting
No. 304
May 21, 1965

Pursuant to due notice, the Executive Committee of The American Radio Relay League, Inc., met at the Chateau Frontenac, Quebec, P.Q., at 9:30 A.M. May 21, 1965. Present: President Herbert Hoover, Jr., in the Chair; First Vice President W. M. Groves; General Manager John Huntoon; Directors Charles G. Compton, Robert W. Denniston and Noel B. Eaton. Vice President F. E. Handy, Treasurer David H. Houghton and General Counsel Robert M. Booth, Jr., were also present, as were various ARRL directors in attendance at the Board meeting.

On motion of Mr. Eaton, unanimously VOTED to grant approval to the holding of a Maritime Province Convention at Digby, N. S., September 4–5, 1965, and a Southeastern Division Convention at Miami, Florida, January 22–23, 1966.

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

Boston College High School Amateur Radio Society — Dorchester, Mass.
Celina Amateur Radio Club — Celina, Ohio
Clarkson College Amateur Radio Club — Potsdam, New York
East Palestine Radio Club, Inc. — East Palestine, Ohio
Fair Lawn Amateur Radio Club — Fair Lawn, N. J.
Fed Hamsters — New York City, N. Y.
The Merck Employees Radio Club — Rahway, N. J.
Northern Saskatchewan Amateur Radio Club — Prince Albert, Sask.
Oroville Amateur Radio Society — Oroville, Calif.
Rancocas Valley Amateur Radio Association — Riverside, N. J.
Turtle River Amateur Radio Club — Grand Forks AFB, N. Dak.
West Seneca Central School Amateur Radio Club — West Seneca, N. Y.
Cleveland Amateur Radio Club — Cleveland, Tenn.
MacDowell School Radio Club — Detroit, Mich.

There being no further business, the Committee adjourned, at 9:45 A.M.

JOHN HUNTOON
Secretary

K1EMO, Deputy Governor and Commissioner of Finance of Massachusetts took part in ceremonies at the New England Division Convention in Swampscott, April 25, which announced the granting of call-letter plates to Massachusetts amateurs as of July, 1965.

WHAT BANDS AVAILABLE?

As of June 20, 1965, the following amateur bands and modes were available to holders of Conditional, General, Advanced and Extra Class FCC amateur licenses:

Frequencies are in megacycles.
A0 — unmodulated carrier
A1 — c.w. telegraphy
A2 — modulated c.w.
A3 — a.m. radiotelephony
A4 — facsimile
A5 — television
F0 — steady, unmodulated pure carrier
F1 — frequency-shift telegraphy
F2 — audio frequency-shift telegraphy
F3 — frequency or phase-modulated telephony
F4 — F.m. facsimile
F5 — F.m. television
nfm — narrow-band frequency or phase-modulated radiotelephony

3.500–4.000	A1[1]
3.500–3.800	F1
3.800–4.000	A3 and nfm[1]
7.000–7.300	A1
7.000–7.200	F1
7.200–7.300	A3 and nfm
14.000–14.350	A1
14.000–14.200	F1
14.200–14.350	A3 and nfm
21.000–21.450	A1
21.000–21.250	F1
21.250–21.450	A3 and nfm
28.000–29.700	A1
28.500–29.700	A3 and nfm
29.000–29.700	F1, F3
50–54	A1
50.1–54	A2, A3, A4, narrow F1, F2, F3
51–54	A0
52.5–54	F0, F1, F2, F3
144–148	A1
144–147.9	A0, A2, A3, A4, F0, F1, F2, F3
220–225	A0, A1, A2, A3, A4, F0, F1, F2, F3, F4
420–450[2]	A0, A1, A2, A3, A4, A5, F0, F1, F2, F3, F4, F5
1215–1300	A0, A1, A2, A3, A4, A5, F0, F1, F2, F3, F4, F5
2300–2450, 3300–3500, 5650–5925	A0, A1, A2, A3, A4, A5, pulse, F0, F1, F2, F3, F4, F5
10,000–10,500	A0, A1, A2, A3, A4, A5, F0, F1, F2, F3, F4, F5
21,000–22,000 and all above 40,000	A0, A1, A2, A3, A4, A5, pulse, F0, F1, F2, F3, F4, F5

[1] Except that 3900–4000 kc. is not available at Baker, Canton, Enderbury, Guam, Howland, Jarvis, Palmyra, American Samoa and Wake Islands.

[2] Plate input power must not exceed 50 watts in certain parts of Calif., Ariz., Nev., N. Mex., Texas, Miss., Ala. and Fla. Exceptions may be authorized after application to the FCC.

NOTE: The bands 220 through 10,500 Mc. are shared with the government radiopositioning service, the latter having priority.

In addition, portions of the 1800–2000 kc. band are available in each state, as shown in the table on page 60, *QST* for July, 1963; in the 51st or later edition of the *License Manual*; or on Form S-15, a copy of which will be sent free of charge from headquarters upon receipt of a request accompanied by a self-addressed envelope. QST

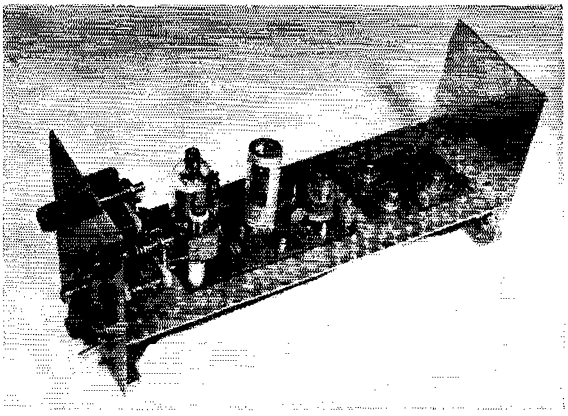


Fig. 1—Top view of the mixer-converter unit showing layout of front panel and placement of components on printed-circuit boards.

A 6-Meter S.S.B. Mixer-Converter

BY WILLIAM DEANE,* W6RET

WHEN I decided to construct this 6-meter, s.s.b. mixer-converter, the opportunity to attempt another project occurred at the same time — the construction of a printed-circuit board.

If you have a s.s.b. transmitter-receiver combination, capable of operating at 14 Mc., the construction of a mixer-converter unit will enable you to operate in the 6-meter band. The same techniques that apply to v.h.f. construction in general are applicable to the unit described in the text. The frequency stability of the unit is aided by the use of a regulated B-plus supply which feeds the crystal-oscillator stage. The construction of this mixer-coverter will provide you with an interesting project.

The Circuit

The schematic diagram of the mixer-converter is shown in Fig. 2. Two 6CW4 nuvistors are used in the receiver r.f. stage, connected in the familiar cascode configuration, which was chosen because of its simplicity and stability.[1] Continuing with the receiving converter portion of Fig. 2, the antenna is connected to the tapped grid coil, L_1, through the send-receive switch, S_2. A 3–12-pf. ceramic trimmer capacitor (C_3) is used to peak L_1 to the portion of the band in which you will operate. Coil L_2, in the plate circuit of the second 6CW4, is tuned to 50 Mc. by spreading or compressing its turns. Coil L_3, in the plate circuit of the mixer stage, is tuned in the same manner. The oscillator injection signal for this stage is supplied by the 36-Mc. oscillator in the transmitting converter section. By combining the 36-Mc. energy with the 50-Mc. signal being received, an i.f. output of 14 Mc. can be taken from J_4.

The transmitting-converter circuit contains a 6U8 tube. The triode section serves as a 36-Mc. oscillator and the pentode portion is used as a 36-Mc. amplifier which drives the grid of the 5763 mixer stage. The 14-Mc. s.s.b. energy is supplied to the 5763 mixer through J_1 and coil combination L_8 and L_9. Combining the 14-Mc. s.s.b. energy with the 36-Mc. signal produces a 50-Mc. s.s.b. signal at the plate of the 5763 mixer stage. Coil L_6 is tuned to 50 Mc. and supplies drive to the grid of the 2E26 amplifier tube, which uses a pi-network plate tank circuit — also tuned to 50 Mc.

A suitable power supply for use with the mixer-converter unit is shown in Fig. 3. Several voltages are required. The mixer requires between 200 and 250-v.d.c. and draws approximately 35 milliamperes of current. The receiving converter section draws approximately 10 milliamperes and is supplied with 105 volts d.c., regulated. The 2E26 amplifier stage is supplied with 400–450 volts, d.c., at 45 milliamperes. The bias supply shown in the schematic diagram could be eliminated by using a small 2-volt battery to provide the required negative voltage for the grid of the 2E26 stage. Silicon-diode rectifiers are used in a full-wave bridge configuration, but could be replaced by a vacuum-tube rectifier at a slight sacrifice in output voltage. A pair of pin jacks can be placed in series with the 450-volt bus, bridged by a 10-ohm, 1-watt resistor, to permit metering of the 2E26 plate current.

Construction

The photographs in Figs. 1 and 4 show the general layout and construction technique used by the author. This particular layout was used because of limited space availability on my

*8831 Sovereign Road, San Diego, California 92123

[1] Additional tuned circuits may be required in the cascode r.f. stage, to reduce image problems in some locations. — *Editor.*

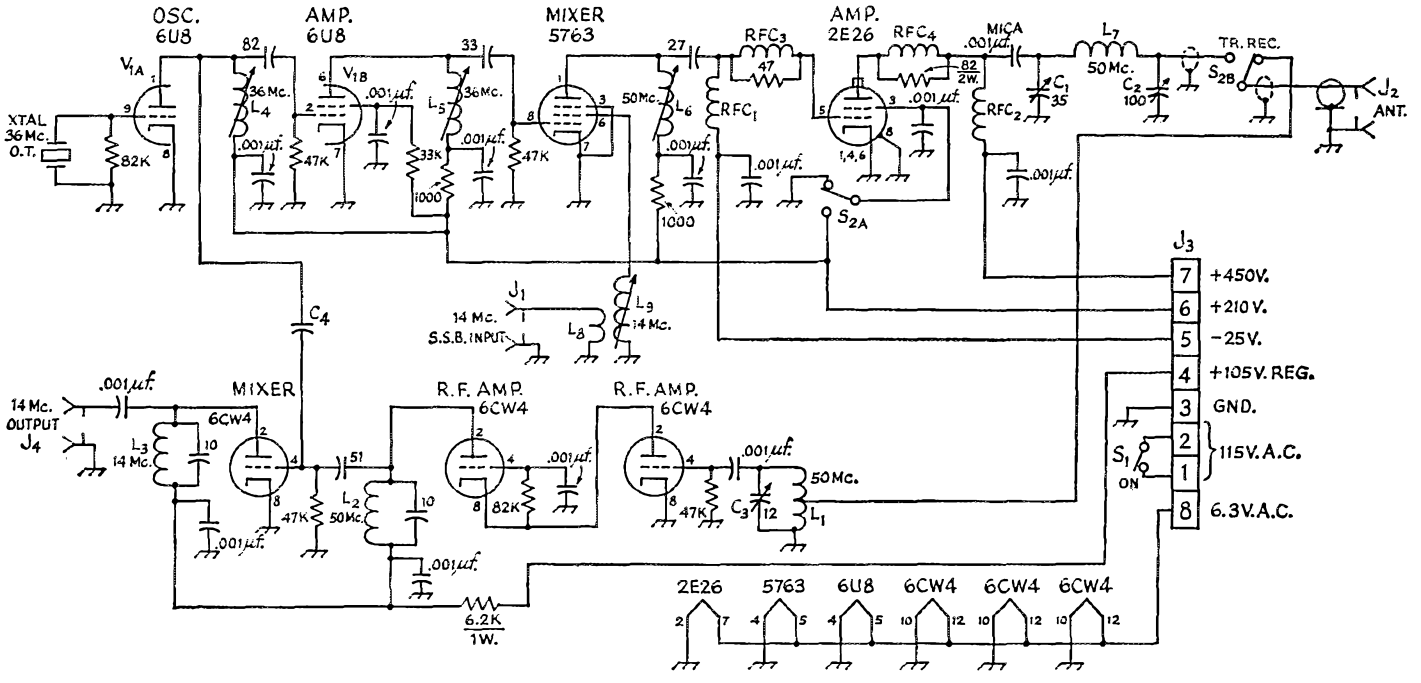


Fig. 2—Schematic diagram of the mixer-converter circuit. Fixed capacitors of decimal value are disk ceramic; others are disk or tubular ceramic, unless otherwise stated. Resistors are ½-watt unless otherwise indicated.

C_1—35-pf. variable (E. F. Johnson 35R12).
C_2—75-pf. variable (E. F. Johnson 75R12).
C_3—3–12-pf. ceramic trimmer.
C_4—1 or 2-pf. ceramic (Erie type N330 usable).
J_1, J_4—Phono connector.
J_2—Coaxial connector (Amphenol UG-290/U).
J_3—8-terminal male chassis connector (Jones S-308-AB).
L_1, L_2—11 turns No. 22 enam. close-wound, ¼-inch dia. iron-slug form. Tap L_1 at 2 turns from cold end.
L_3—11 turns No. 22 enam., ¼-inch dia. iron slug form.
L_4, L_5—10 turns No. 30 enam. close-wound on ¼-inch dia. iron-slug form.
L_6—10 turns No. 22 enam. close-wound on ¼-inch dia. iron-slug form.
L_7—6 turns No. 14 enam., ¾-inch dia. by ⅞ inch long.
L_8—4 turns No. 22 enam. over cold end of L_9.
L_9—40 turns No. 30 enam. close-wound on ¼-inch iron-slug form.
RFC_1—44 turns No. 30 enam. close-wound on 100K 1-watt resistor.
RFC_2—50 turns No. 20 enam. close-wound on a ½ by 2½-inch ceramic standoff insulator.
RFC_3—Parasitic choke 4 turns No. 22 enam. on 47-ohm ½-watt resistor.
RFC_4—4 turns No. 18 enam. wire on 82-ohm 2-watt resistor.
S_1—S.p.s.t. toggle switch.
S_2—2-pole, 2-position ceramic wafer switch.
Circuit-board kit is Kepro S-101-A.

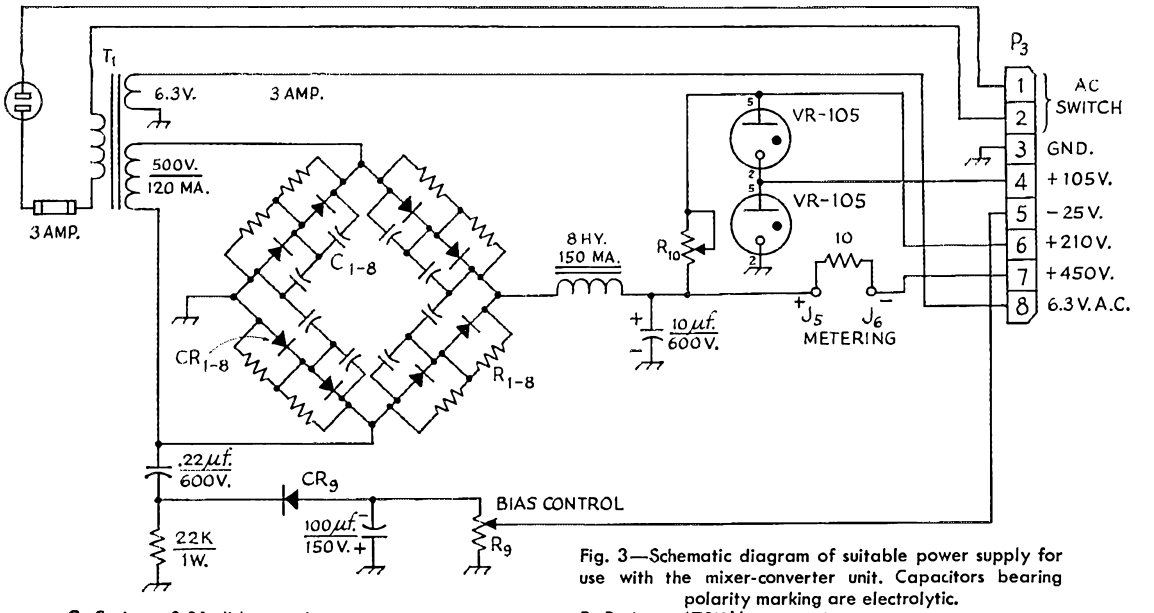


Fig. 3—Schematic diagram of suitable power supply for use with the mixer-converter unit. Capacitors bearing polarity marking are electrolytic.

C_1-C_8, inc.—0.01 disk ceramic.
CR_1-CR_9, inc.—Silicon-diode rectifiers (1N2070 or equiv.)
P_3—8-terminal female cable connector (Cinch-Jones P-308-AB).
J_5, J_6—Pin jacks (1000 v. insulation or better).
R_1-R_8, inc.—470K ½-watt resistors.
R_9—20K 2-watt wire-wound control.
R_{10}—5K 25-watt adjustable resistor.
T_1—500 volts 120 ma. secondary. 6.3 volts at 3 amp. (Stancor PC-8405 usable).

operating desk. The unit could be constructed on a standard 7 × 9 × 2-inch chassis (or larger), if the power supply is to be mounted on the same chassis. The chassis shown in the photographs was fashioned from a piece of heavy-gauge aluminum and is 4½ inches wide by 13 inches long. The front and rear panels are made from the same material but are 4½ × 6 inches in size. Two aluminum angle brackets are used to connect the panels to the chassis. The bottom plate and cover are made from light-gauge stock. The unit was dressed up with dark gray paint and white decals upon completion.

The Printed Circuit Boards

The converter circuit was laid out on a 3 × 4-inch piece of copper-clad, laminated circuit board. The layout was first plotted to scale on a piece of graph paper. After several attempts, the layout shown in Fig. 5, at A, was used. You may prefer to use your own circuit-board arrangement, rather than duplicate the layouts shown in Fig. 5.[2] When the final circuit arrangement is decided upon, the circuit can be drawn on the copper-covered side of the p.c. (printed circuit) board. The portions of the copper that are to be retained are coated with resistant paint. After the paint has dried, the tube socket holes are punched in the board. The p.c. board is next placed in a small plastic container and covered with etching solution. The etching process takes approximately 30 minutes, during which time the solution should be agitated by rocking the plastic container back and forth. When the process is completed, the board is removed from the solution and thoroughly washed with clear water. *Warning:* The etching solution contains ferric chloride and can cause irritation to the skin. If the liquid comes into contact with the skin, immediately cleanse the area with running water.

The mixer p.c. board is laid out and etched in the same manner. Fig. 5B shows the layout on a piece of circuit board cut to a 3 × 6-inch dimension. Following the etching process, the resistant paint can be removed with lacquer solvent, or by careful scraping with a knife blade. Steel wool can be used to clean the copper surface, following removal of the paint. Next, the small holes for mounting the various components are drilled in the boards. The 6CW4 tube sockets are prepared for mounting by bending the tabs out and drilling small holes in them, suitable for accepting a small brass nail which is passed through the tab and the circuit board, then soldered in place. The nail is soldered to the tab and the circuit board, then the excess portion of the nail is snipped off. A light-duty soldering iron should be used for all wiring, to prevent heat damage to the circuit board.

When attaching components to the mixer circuit board, remove the metal tube shields from the sockets of the 2E26 and the 6U8. These sockets are held in place by soldering their base terminals to the appropriate points on the circuit board. The 5763 socket is not modified and is mounted on the circuit board with 4–40 nuts and screws. Tube socket terminals 1 and 6 of the 6U8, and terminals 1, 5, 6 and 9 of the 5763, are not soldered to the p.c. board. All terminals of the

[2] Templates for these printed circuit boards are available from ARRL Technical Dept. for 25 cents. Send self-addressed, stamped envelope.

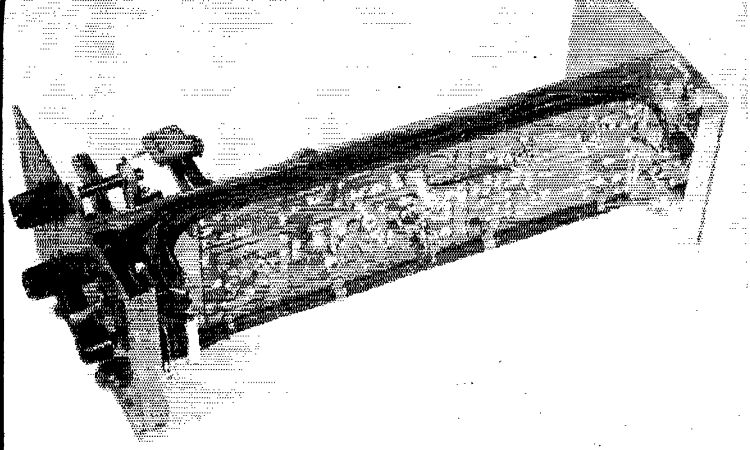


Fig. 4—Bottom view of the mixer-converter unit showing placement of components and method of cabling the coaxial leads.

2E26 socket are soldered to the circuit board.

You will note from examination of Fig. 4, that some of the small fixed capacitors are mounted under the circuit boards, permitting the leads to be kept short and direct. There will be two cutout areas on the main chassis plate, providing a space for mounting the circuit boards. They will be 2⅝ by 3¾-inches and 2⅝ by 5¾-inches in size, respectively. The p.c. boards are mounted to the main chassis with 4–40 hardware.

Plate tank capacitors C_1 and C_2 are mounted on the front panel of the unit, above the a.c. switch, panel lamp assembly and send-receive switch. The input and output jacks, and the power receptacle are mounted on the rear apron of the chassis. If desired, a small edgewise 0–100-ma. meter can be mounted on the front panel to permit metering of the 2E26 stage. The wiring between S_2 and its related circuitry is done with RG-58/U cable, which is held in place with metal clamps along the sides of the chassis.

Tune-up and Adjustment

Preliminary alignment of the mixer-converter is done by adjusting all coils in the converter section to 50 Mc. with the aid of a grid-dip meter. The tuned circuits in the mixer assembly are pre-aligned in the same manner. After these adjustments are made, connect a dummy antenna to J_2, attach the power supply with P_2 and remove the 2E26 from its socket. Connect a v.t.v.m. to Pin 8 of the 5763 stage and place the send-receive switch in the *send* position, with the power supply *on*. Next, adjust L_4 and L_5 for maximum indication on the v.t.v.m. (about −45 volts). Turn off the power, install the 2E26 in its socket, and connect a 0–100-ma. meter across the pin jacks in the power supply. Now, connect the 14-Mc. s.s.b. input signal to J_1 (5 watts is required). With the power *on*, the 2E26 plate tank is brought to resonance with C_1, resulting in a meter reading between 30 and 50 milliamperes. Adjust L_6 and L_9 for maximum plate-current reading on the 2E26 stage. With C_2, adjust the loading for a meter reading of 45 ma. at resonance. Remove the 14-Mc. s.s.b. input signal. The 2E26 plate current should drop to approximately 35 ma. and the r.f. output should drop to zero. This completes the mixer adjustment. The unit can now be connected to the antenna and loaded up in the usual manner.

Connect a coax cable between your receiver input terminal and J_4 of the mixer-converter unit. With the function switch in the *receive* position, tune your s.s.b. receiver to 14.3 Mc. and adjust C_3 for maximum noise. (14.3 Mc. corresponds to a receiving frequency of 50.3 Mc.). Coils L_2 and L_3 can be peaked for maximum response after tuning in a weak signal by moving one turn of each coil toward, or away from, the main body of the coil. C_3 should also be peaked at the same time.

This completes the adjustments, making the unit ready for on-the-air use. Since I have completed this project, I have not been able to operate during a 6-meter band opening but have received favorable reports on signal strength and readability during local contacts. I wish to thank Bob Fleischman, WA6WFE, for his excellent photography connected with the pictures in this article. QST

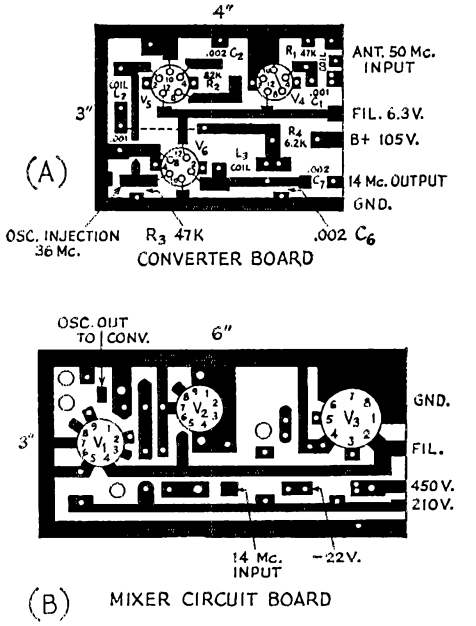


Fig. 5—Layout of the printed-circuit boards used to contain the mixer and converter assemblies. Templates available (see text).

Answers to Last Month's Antenna and Transmission-Line Quiz

Here are the answers to W5KTR's 30-question quiz in July QST. A score of 20 puts you in the really knowledgeable class, while 15 is about average — provided, of course, that you were sure of the answers and not just guessing! If you missed on Questions 3, 4, 6, 11, 12, and 30, you're weak on fundamentals that every ham should know.

1) False. V.s.w.r. is lower at the input because of line losses.

2) True V.s.w.r. depends on the impedance of the load, which is the receiver when receiving and the antenna when transmitting. These impedances are seldom identical.

3) True.

4) False. Reflected "power" is not actually power at all, but is a convenient fiction.

5) False. Feed-line radiation is usually negligible, unless the antenna is unsymmetrical with respect to the feed line or unless the conduction path along the outside of the coax from the antenna to ground is resonant.

6) False. Greater v.s.w.r. gives greater line loss.

7) True.

8) False. However, radiation is usually negligible below u.h.f.

9) False. However, some gamma-fed beams have exhibited a slight skewing of the pattern, which would seldom be of concern.

10) True.

11) False. Open-wire can better handle the large voltages which may be encountered, has lower loss at high v.s.w.r., and may be used as a quarter-wave impedance transformer — i.e., as a "tuned feeder."

12) False. The antenna tuner affects only the impedance seen by the transmitter.

13) True. The gain of a dipole can be increased by as much as 7.2 db by placing it in front of a flat screen reflector. Gains in excess of 6 db. are readily achieved in practice.

14) False. The difference is about 2 db. if both are tuned for maximum gain.

15) False. The radial system gives greater efficiency, typically by 3 db. or more.

16) False. Longer radials improve the gain, due to decreased ground reflection losses on sky wave.

17) True. The horizontal dipole has greater gain in its most-favored direction, even near the horizon where the vertical monopole is often thought to be superior.

18) True. Signal-to-noise ratio is usually determined by atmospheric or other external noise, and is not significantly altered unless antenna efficiency is very low.

19) True, when loss resistance of loading coils is made sufficiently low. The main advantages of the half-wave dipole are simplicity and greater bandwidth.

20) False. The folded dipole normally has greater bandwidth depending on construction details.

21) True

22) True — much better, because of lower ground-reflection losses.

23) False. Ground-reflection losses are small in either case.

24) True.

25) False. Arriving signals will be randomly polarized, and a horizontal antenna usually gives greater gain.

26) True, when all noise is arriving at elevation angles near the horizon. Thus, a longer Yagi is preferable to two stacked Yagis, since the larger Yagi reduces the aximuthal beam width.

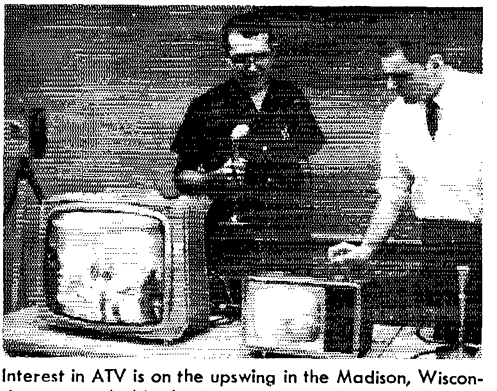
27) True. Almost 5 db. is achieved at a spacing of 0.67 wavelength.

28) False. Up to about 6 db. is obtained, due to doubling of the field strength by addition of the direct and ground-reflected waves. The ground reflection is more efficient with horizontal polarization than with vertical, which accounts for the superior performance of sufficiently elevated horizontally polarized antennas for DX work. Ground reflection characteristics also depend on ground electrical properties as well as the smoothness of the terrain in the antenna foreground.

29) False. The gain varies with height within a ± 1-db. range, and is maximum for a height of about 0.6 wavelength, at an elevation angle of 24.6 degrees above the horizon.

30) False. They are essentially equivalent. The folded dipole simply provides an impedance transformation. QST

Strays



Interest in ATV is on the upswing in the Madison, Wisconsin area, probably due in some part to the demonstration shown in the photograph taken during an ATV talk/demonstration before the Four Lakes ARC of Madison, Wisconsin. Shown in the photograph are W9FNT (left) and W9VZL.

THE SAGA OF CEØXA

The island of San Felix. The c.w. station is at the upper level (note the beam antenna) some 275 feet above the phone station, which is near the water's edge and the large cave opening. A 1500-foot long-wire antenna is strung from the hut at the top level to the large peak in the background the phone-station beam is left of the hut.

The First Amateur Radio Operation From San Felix

BY G. E. CUSHING*, W4QVJ

On Easter Sunday we loaded 1000 lbs. of gear, equipment, spares, beams, masting, etc. on the scales at the Miami airport, and just prior to sunset departed Miami by jet for Antofagasta, Chile, with stops at Panama and Lima. Arrival at Antofagasta was made just prior to sunrise. Confusion immediately became chaos as we entered the first of our many problems with various customs officials. The customs men here finally agreed to let the customs men at Iquique, our ultimate destination, worry about the proper admission procedures for the equipment. We flew on to Iquique where we were met by Howard Springer, CE1GJ, and officials of the company owning the fishing boat which was to take us to San Felix. They informed us that our hoped-for departure that afternoon was not possible, but Tuesday morning would see us off.

But Tuesday morning brought out rumors, the ill effect of which was to plague us for nearly five days. The Department of Fish and Wildlife in Santiago claimed they had private information that we were actually ichthyologists using amateur radio operation as a disguise and our clearance to depart from Iquique was being withheld pending "investigation." All kinds of persuasion were tried to have this story discredited but daily we were met with refusals for departure. We secured our bulky gear in a dockside storage warehouse, and watched as the boat loaded supplies and provisions for the trip. We were ready, the boat was ready; only the adamant position of the functionary in Santiago was blocking us as our precious days of vacation sped by. We complied with every request placed before us and finally the Consul of Chile at Miami, Hon. Sergio Del Rio, placed a phone call to the Chilean Director of Tourism, Sr. Rene Pairoa, completely explaining our dilemma of four days duration in Iquique. Pairoa swept away the irritating red tape, objections, rumors, etc. and secured the cooperation of the sub-secretary of the Chilean Navy, who issued orders for our

* Box 8045, Jacksonville, Fla.

In mid-1962, the Archipelago of San Felix/San Ambrosio became the target of a group of ambitious DXpeditioners. The islands, which straddle the 80th parallel, are Chilean territory and are approximately 560 miles east of the nearest Chilean mainland. The adventurous group included Ed Cushing, W4QVJ; Dale Strieter, W4DQS; Jake Schott, W8FGX; Mac Reynolds, W9EVI; Gene Liggett W8ZCT; and George Allendorf. Here is their exciting story. For reasons of space we have had to omit the part of the story relating to their trials and tribulations in getting a charter boat to tote them to San Felix.

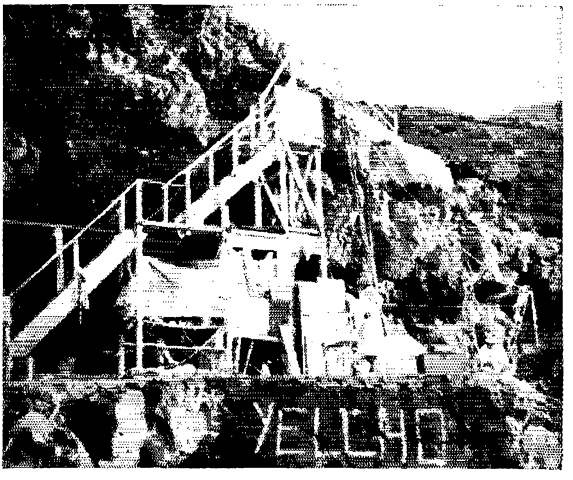
immediate clearance for the trip to the Islands. We gathered up our gear, sped to the docks, scrambled aboard the fishing vessel and cast off lines at 2245Z on Friday, April 23. We were to miss the high-volume QSO possibilities of weekend operation, but, at least if the weather and navigation held true, we would get to San Felix in time for about three days of operation.

We approached the island right on schedule. Our ship's captain had navigated us perfectly over the 70-hour trip from Iquique to San Felix. Our objective was in sight as early as 1600Z that Monday morning and all were urging more speed upon the 10-knot parting of the waves. By mid-afternoon we had passed San Ambrosio some 12 miles to the east of San Felix. About 2245Z we rounded the southwestern cape of Cerro San Felix and headed gingerly into the landing area. The arrival on shore was obviously going to be made after dark and we dragged all the gear from the hold to the deck, loaded it into the seine skiff, clambered aboard and headed ashore at 2315Z. We stepped ashore without wetting as much as a toe-nail, and despite sea-legs, loose rocks and confusion we had a station on the air calling CQ about 30 minutes later. K4SMX came back. We gave him a report but he didn't return. We sent him another report. No come-back. Then HK3AFB, Lee in Bogota, called and the first two-way QSO from the new country of San Felix/San Ambrosio was in the logs at 2349Z, April 26. A few QSOs were made s.s.b.-to-c.w. and then the rig was used exclusively on c.w. on 20 and 40 for the balance of the night. Inasmuch as the path up the cliffs was precipitous and perilous we postponed the assembly of the second station until daylight. We had a 20-meter dipole and a 40-meter dipole going well and we settled down for the evening.

Upon finishing the station installation we were treated to a hot meal by George Allendorf, who, while we were assembling the station, had set up the two-burner stove and fixed soup, roast beef, dessert and hot coffee that truly hit the spot.

The first full night of operation resulted in approximately 750 QSOs on 40- and 20-c.w. About 1230Z this rig was put on s.s.b. while the c.w. station was being assembled some 250 feet up the cliff in a 4-room hut used by Chilean fishermen. Our phone station remained at the water's edge, near the kitchen and generators. We strung the a.c. power line up the cliff to the c.w. station, thus saving the back-breaking climb with the cumbersome and heavy 1750-watt generator. The second beam was assembled and placed on a small ledge on the cliff directly above the c.w. station and the 250-foot coax line dropped over the side. By mid-morning we had both stations functioning with both beams raised. The pile-ups were growing rapidly by the minute and the roar, cry, groans and howls rivalled the Chilean "jaurea" (cry of the wild pack of dogs), as CE3AG calls it. Apparently there was no bottom to these pile-ups, inasmuch as the size did not diminish as the hours passed. The 4-room fishermen's shack on the plateau below Cerro San Felix literally was over-run with a c.w. pile nearly 35 kc. wide, with the din and clamor audible for several hundred feet! Down at the phone site it was a matter of spreading out the pile to a point where the operator could get one or two letters of a call and then ask the pack to abate long enough to pick up the balance of the working station's call. Then off to the races again!

The transceiver phone boys suffered the agonies of their insufficiency. Their attempts at getting from the calling frequency down to the listening spot and then trying to get back to their original transmitting frequency cost many a transceive station his QSO, as the operator on our end called some of them 4 to 5 times in an attempt to give them a contact. But they mainly contributed to others having to wait unduly long for a contact. Better operators, and those with separate receivers, certainly had no problems. The insistence of phone operators to give their names, locations, and offer chit-chat also held back the



The phone station at CEØXA. The operating position is behind the canvas sun screen. The stairs lead up to the c.w. station on the cliff.

W8ZCT, "the hardest worker of the entire group."

The author, W4QVJ.

George Allendorf, "made the trip a gastronomical pleasure."

progress on s.s.b. The main objective of a trip of this nature, especially at peak operating periods and when the stay on the island is short, is to get as many calls as possible correctly in the logs. Requests for our names, QTHs and geographical location only served to take up time that can be used to log another two or three stations.

Conditions didn't shine on us all of the time but certainly we had no complaints. We had one c.w. session on 21 Mc. that started shortly after 1400Z and ended at 0130Z the next day, with some 780 QSOs resulting. Conditions on 15 meters were excellent. Twenty meters was the workhouse only because of band occupancy. Fifteen offered better signal strengths for longer periods and was suited for quicker report exchanges. Apparently many are not yet convinced that 15 is open daily. Many Europeans muscled their way through the W/K/WA pile-ups on 15 with excellent signals.

Gene Liggett, W8ZCT, who was on his very first expedition, showed himself a veteran in short order. He scrambled about in the ship's rigging with the maritime mobile antenna, scaled the cliffs in the darkness putting up antennas the first night on shore, and the next day got the beams up in short order. To cap off the antenna system he traversed the canyon at the base of the mountain and then started the ascent of Corro San Felix. The angle of climb here approximates 30 degrees and the ground cover is that of loose rocks, dirt and perilous footing caused by the volcanic rock crumbling readily. Gene took off wearing a harness to which was attached one end of a spool of No. 18 copperweld wire. Gradually the spool unwound as Gene climbed upwards to the point where he was hardly visible high on the slopes of the mountain. He tied it down to a large rock formation about 500 feet above sea level and the other end was anchored to the "Chick Sale" behind the c.w. shack. This wire was approximately 1500 feet long and was used on both 40 and 80.

The c.w. station was manned by W4DQS, W8FGX, W8ZCT and W4QVJ. The phone rig was operated by W4QVJ, W9EVI and W8ZCT. Every day W8FGX would come to the phone station for the Cincinnati Reds baseball scores and even W4DQS made about 4 QSOs on s.s.b.

Our shortened stay on the island precluded erection of the Vee's we had planned for the lower frequencies and for which we had brought a half-mile of wire and poles. Our first charter arrangements had allowed us 8 full days on the island and had we been blessed with that time we would have had both stations on the top level, Vee's for 80 and 40, and also would have accommodated many more QSOs. The shortened time deprived us of the weekend operation when we were certain that many more DX stations could have had an opportunity to work us.

But DX certainly was not scarce. One phone log page plus a portion of another shows over 45 consecutive QSOs not interrupted by a stateside QSO. Sometimes all continents were coming through at once. Europeans, Asians, and Oceania. UMs nearly blocked the receivers during the nightly openings to Europe and Asia. Africa was by far the most difficult though several made it with no apparent trouble.

It certainly would be most difficult to single out one station as having the "best" signal during our stay on the island. Several stations were head and shoulders above the rest but many times conditions permitted even the extremely low-power boys to work us with ease. Memorable is EI4Q roaring through the afternoon phone pile-up on 20 meters through Ws, South Americans, etc., and his signal would have one believing that he was on the other end of the island! Some people claim that W3CRA is very big in Asia but doesn't have much going south. Let it be known that CRA has it big going down the 80th parallel whether it be on c.w. or s.s.b. W4BJ had a big signal on 40, 20 and 15 and we never had any problem copying Ray at any time, on any band.

In order to make our plane connections at Antofagasta where Lan Chile was accommodatingly making another flag-stop with a Caravelle jet to pick us up on Monday night, we had to cease operations very early Friday morning. At 0530Z the phone station was secured. At 0830 the c.w. station was finishing off operations by going back and forth between 40 and 80 and

W9EVI, "kept the home folks advised."

W8FGX, "handled one of the traditions of our trips—the working of a Novice."

W4DQS, "experienced in the preparation for such trips."

to close things out switched to 40 s.s.b. and ran off 27 V/ZL contacts with the boys from "down under" who showed excellent discipline and cooperation, making it possible to handle the entire group in under 20 minutes. We tore down the stations and packed all the gear in the darkness (which made it par for the course inasmuch as we made every departure and arrival in darkness) and departed San Felix Road in the faintest light of early morning on April 30.

We arrived at Antofagasta at dusk on Sunday evening, May 2, and hustled to the Hotel Turismo Antofagasta where the lobby sitters had their evening tranquility shattered as the bearded, battered troop entered the lobby of the city's finest hotel. Some 30 minutes later, however it was somewhat a different sight after the first shave and shower with hot water in 10 days transformed the group in both appearance and spirit.

Enroute to Miami we stopped at Lima, where we were met enthusiastically by OA4J, OA4CV and OA4RE. One of them had a preprinted QSL card bearing our call sign and carrying his QSO information. We checked our logs and signed his card. If the plane had not made it back to the states there would have been at least one confirmation for San Felix. Their hospitality at the airport was unlimited and a most pleasant hour was spent with the representatives of the OA gang.

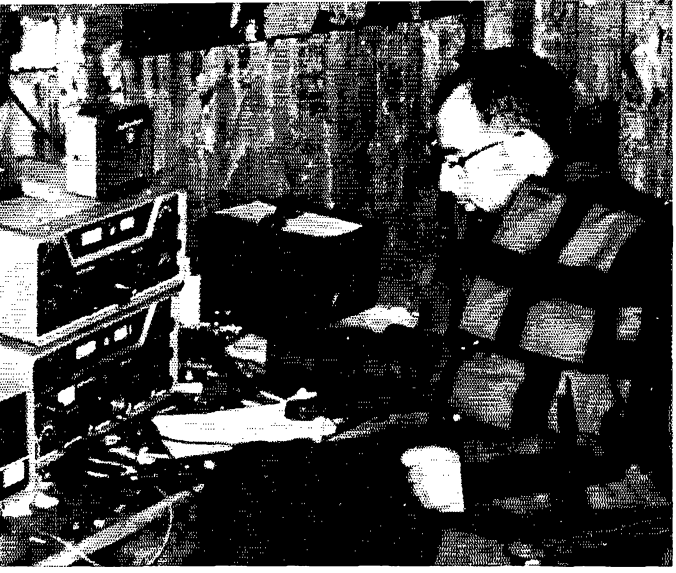
Operating Observations

Some 6500 QSOs were made from 2350Z Monday until 0830Z Friday. Though there was a strong attempt, no QSOs were made on 10, either s.s.b. or c.w. No phone was successful though an SWL card could be sent to W2JT, who was heard making a "blind call." 40, 20 and 15 carried the load. ZL/VK QSOs were rare on 20 except for the few fellows from "down under" who very cleverly went over the long path in the 21-23Z period. But 40 was their band and excellent signals from VK/ZL-land were quite common.

One of the apparent tragedies of an operation such as this, where future operation is problematical at its best, is the number of fellows, and some of the calls quite prominent, who insist on more than two QSOs per band. If we had been there for the expected 8 days this would have been less annoying. However, with only three days operating time the multiple QSO fellows were serving to deprive others of their only log entry. For a while it appeared that some of the "DX hogs" were attempting to work each operator twice per band, per mode. No doubt some worthy stations using low power and equally desirous of a QSL were shut out of at least one contact by the repetitious calling of a few. The matter of asking for QSL addresses, names, our location etc. can really be handled much easier by the QSOed station moving off frequency and asking around from others rather than persistently calling for the info. From time to time we announced our location, QSL address, etc. and a brief bit of listening would have saved both time and tempers.

One fine example of considerate behavior is that of W8PQQ. When Al was QSOed he asked if he was definitely in the log. He was assured that he certainly was — he came back, gave a snappy "roger" and we never heard from him again on any band. More of that type of operating would be a credit to the DXer, both the casual type as well as the dedicated one. There is a W2 to whom we are threatening to send a freighter load of San Felix black volcanic stone to be dumped on his suburban New Jersey lot as the prize for being in the log the most often, the quickest, as well as calling us the most when we were transmitting (as several tapes show!).

As to log-keeping, operators on a well-organized trip such as this are experienced DXers from both ends of the pile-up and they well realize your anxiety to have your call entered in the log correctly. Use readily understood phonetics, not complicated by "cuteness" or ones that tell a story, and your chances of getting in the log correct the first time are excellent. Similarly one should realize that the DX station knows his call sign very well — he is hearing it all over the band—give him your call sign clearly and distinctly. The logs are kept with call signs and signal reports only, with no room provided for



W4DQS operating the c.w. station. Note the aspirin bottle on the wall shelf!

names, locations, rig descriptions, weather reports, etc. As mentioned, the operator knows the importance of log-keeping accuracy and trust him to avoid sloppy entries. We used indelible laundry pens and even in case of water damage the calls would be legible.

As a matter of background and to explain the magnitude of an undertaking such as this, a brief paragraph of the details of planning is in order. From past experiences in ventures of this nature a check list of needs has been evolved. This list includes station supplies, food supplies, first-aid equipment, general-support equipment, spares for generators, rigs, various helpful items that experience has proven almost indispensable. As an example we had a spool of No. 12 wire suitable for a.c. power cable. This spool provided us with a power line that stretched from the water's edge up the cliff to the c.w. station at the base of San Felix Hill, a distance of some 350 feet. By having this line along we saved the back-breaking (and dangerous) labor of lugging one of the generators both up and down the cliff, plus saving the twice daily task of hauling gasoline to that generator. By using one's head you can save your back. This check list of gear, equipment and spares, some 4 pages in total, is not reprinted here for obvious reasons but suffice it to say that when the nearest radio or hardware store is 750 miles or more distant it would behoove one to have everything imaginable along.

Concluding Notes

W4DQS and W8ZCT, both electrical engineers, handled the preparation and set-up of equipment and antennas respectively. DQS is long experienced in the preparation for such trips and completed the run-in of the generators and station gear before the trip as well as acting as the collecting point for all gear. ZCT, as mentioned, was on his first DX-pedition and proved himself a rugged traveler (no seasickness) and the hardest worker of the entire group. W8FGX, Lt. Col. of Cincinnati Police, handled one of the traditions of our trips — the working of a Novice. We called this lad on 15 meters and though somewhat non-plussed at a DX station answering his CQ he carried off the QSO in fine style complete even to his street address, etc. He can get his card from W4DQS — the only Novice in the log! W9EVI kept the home folks advised through his highly directional "CQ North Suburban Chicago — No toll calls please". That, friends, is a truly directional CQ! Mac was his true effervescent self throughout the trip and furthermore he DID NOT get sick on the boat. George Allendorf had to leave some 235 lbs. of food at Miami when we were forced to pare down the tonnage prior to weigh-in. This admittedly cramped the culinary style of the trip but George made this trip a gastronomical pleasure with his baked ham, roast beef, orange juice, Chinese fortune cookies, between-meal-snacks, etc. It would be difficult to hire someone to handle the preparation of the food, do the KP while enduring the hardships of solitary island life and George, not blessed with an amateur license, was a priceless member of the trip. He also suffered the Bajo Nuevo/Serrana Bank food debacle and vowed that this trip would be different and he succeeded admirably. As a tribute to his skills we weighed in personally at the airport scales prior to leaving Chile and found we all had gained a pound or two! W4QVJ grew a magnificent beard which he brought all the way home to Florida for display. He owned 21 words of Spanish when leaving Miami and came back knowing 22 words and talking to himself.

This venture could not have been made without the on the spot help and guidance of CE1GJ, Howard Springer, who is back in the 7th district now. Howard labored long and hard to cut the red tape once we were there, kept his rig intact until we were actually in operation on the island despite his imminent departure for the States, and wined and dined the group at several meals during our stay at Iquique. Our ship was a product of his shipbuilding company.

The Chilean Consul at Miami, Hon. Sergio Del Rio, and Carlos Castelblanco, turned out

(Continued on page 150)

CEØXA QSL INFORMATION

For a QSL from CEØXA please send your QSL showing QSO data with time in GMT only to: W4DQS, 928 Trinidad, Cocoa Beach, Florida 32931, with a self-addressed, stamped envelope (or IRCs)

Simple Ignition-Noise Reduction

BY HERMAN LUKOFF,* W3HTF

HERE is a cheap and dirty method of reducing ignition noise — cheap because the total cost is less than three dollars, and dirty — well, you will find out about that when installing the modification.

After installing my new 5-band s.s.b. mobile transceiver, along with the usual noise preventives (coaxial capacitors, resistance suppressors, and bonding), I found no sign of my own ignition noise on 80 and 40 meters, but a noticeable amount on 20, and an annoying amount on 10 and 15 meters. The S meter registered S5 on 15 meters, and I was quite obviously not hearing the weaker stations because of my own ignition noise. With 15 meters playing a more important role in the coming years, this situation had to be corrected — but how?

Several years ago, I had tried to shield the ignition wires by pulling shielding over the existing high-tension wires. After the first damp day, the experiment met with total failure as sparks flew in every direction. Apparently, the insulation on the high-tension wires had developed cracks and pin holes through long service, and arcing resulted.

* 506 Dreshertown Road, Fort Washington, Penn.

[1] Campbell, "Exit Ignition Noise," *QST*, May, 1959.

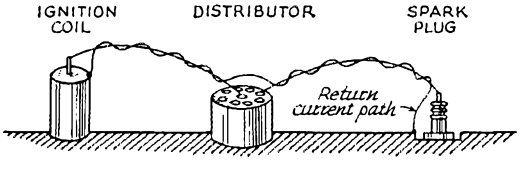


Fig. 1—Sketch showing the general idea of the twisted-wire noise suppressor.

There was little point in doing this experiment again, and besides, the work involved in shielding the distributor and ignition coil [1] appeared to be more than I cared to handle. Of course, I could always admit defeat and purchase a commercial shielded system for $30 to $50, but for some vague reason the idea was unattractive and lacked challenge.

The thought occurred to me to try twisted-pair transmission line for the ignition system. If it worked, the twisted-pair line could easily be provided by merely twisting a ground wire around the existing high-tension wires. The twisted pair should provide noise reduction over the open-wire line, but the amount of reduction was to be determined.

Ground-Wire Installation

As a test, No. 16 glass-insulated wire (Belden No. 8565) was twisted around each ignition wire. Although bare wire could have been used, insulated wire was selected to avoid the possibility of breakdown in the event pin holes existed in the ignition wires. Be careful to use insulation that will hold up under high-temperature conditions. Regular low-voltage auto wire, available at auto-supply houses, is probably adequate. If anyone experiences breakdown, regular high-tension wire should be substituted, although the noise reduction may be less because of the thicker insulation and consequent greater spacing between conductors. Three to five twists per foot of the ground wire around the ignition wire (as shown in Fig. 1) can be reasonably accomplished and is adequate. The ground-return wire should be wrapped as tightly as possible over the high-tension wire to keep the spacing to a minimum. It is important to note that the original ignition wires need not be disturbed.

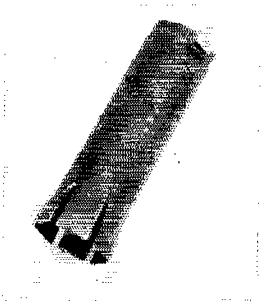


Fig. 2—Ground clamp for spark plugs.

Spark Plugs

Several problems remained to be solved, such as how to anchor the ground-return wire to the spark plug. Two feet of ¾-inch (i.d.) hard-drawn copper tubing (or brass pipe) was purchased and cut into 3-inch lengths. The tubing is too small to permit the shoulder of the spark plug to be inserted. One end of each piece of tubing is slotted hexagonally with a hacksaw to a depth of ½ inch, as shown in Fig. 2. The 6 tabs thus formed were

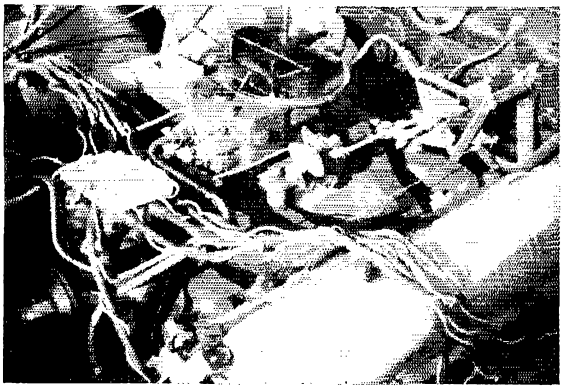


Fig. 3—The aluminum plate on top of the distributor serves as a junction block.

bent outward sufficiently to permit the tubing to be slipped over the hexagonal shoulder on the spark plug. A tap of the hammer on the tubing will give a wedge fit that seems to stay put, but yet can be broken loose when required with a tangential tap. This operation can be accomplished without removing the spark plugs from the engine. A hole was drilled in the top end of each piece of tubing and a ½-inch 6-32 screw was inserted, with one nut to hold the screw in place, and another nut for securing the ground wire. In my particular case the ignition wires approached the plugs axially and fitted nicely inside the tubing (see Fig. 4). If the ignition wires are attached to the plugs through right-angle fittings, or if external suppressors are used, it will be necessary to use a shorter piece of tubing to obtain clearance.

Distributor and Ignition Coil

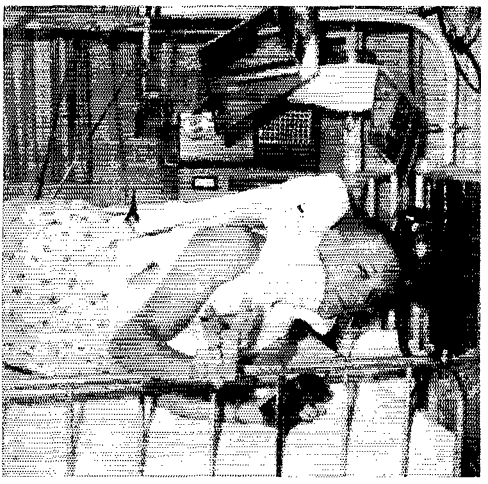
The next item of concern is how to tie together the many ground wires converging at the distributor. A 3-inch-square thin aluminum plate was fabricated and holes were drilled in it corresponding to the positions of the wires emerging from the distributor. Machine screws (½-inch 6-32) were inserted into each hole and secured with two nuts. The plate was set on top of the distributor and used as a junction block for all of the ground wires. The ground wires act to hold it in place. Do not connect the plate to ground except through the ground wires. The photograph of Fig. 3 shows the junction block. The ground wire to the ignition coil can connect to the clamp that holds the coil, after it has followed the high-tension lead as far as possible to its source.

This modification produced a marked reduction in ignition noise. It was gone completely on 20 meters and the S meter now read S2 instead of S5 on 15 meters. There were two immediate effects: Several levels of weaker signals became Q5, whereas before they were down in the mud: secondly, I started noticing the ignition noise of every car that passed me, where previously only busses and trucks attracted my attention.

Considering the hour spent in the workshop and the hour installing the modification, the effort involved is small compared to the 15-db. reduction in noise level and the small cost. QST

Fig. 4—This view shows ignition wires entering the spark-plug grounding connectors.

Strays



Two Hundred Meters and Down, by the late Clinton B. DeSoto, is a 184-page history of early amateur radio (to 1936) which has been out of print for about ten years. The League arranged for reproduction, through a photographic process, of a number of copies of this book and has some still in stock at a special reduced price (because of quantity purchases during the anniversary year) of $1.00, approximately our cost. Address ARRL Hq., 225 Main St., Newington, Conn. 06111.

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Congratulations to Bert Groves, W5QNA, son of Soupy Groves, W5NW (ARRL's First Vice-President), who was an Honor graduate from Baylor Univ., Col. of Medicine, Houston, Texas, this year.

Ken Waldvogel, WA2UKF is shown here in his 200-pound cast after being operated on for a double curvature of the spine. A series of three winches on his bed allow movement so that he can reach his amateur equipment. Ken is a senior in Brighton High School in Rochester, New York and expects to graduate this spring.

Building Fund Progress

As ANNOUNCED by Director Anderson at the Board meeting in May, the Roanoke Division was the seventh ARRL Division to exceed quota in the Building Fund Drive. Congratulations to all those whose contributions have made this possible!

This brings us almost to the half-way mark in terms of numbers of divisions meeting quota. The race for being the eighth division to hit 100% of quota is currently between the Northwestern Division (Director Thurston) and the Delta Division (Director Spencer.) Northwestern is but a whisker away, needing only $135 in contributions from its members in order to finish the job. Delta is not far behind, with only $292 needed. Delta, incidentally, made a big jump this past month, quite a number of contributions having come in from Tennessee.

Here are the seven divisions which have already met quota:

Canada — **New England**
Dakota — **Pacific**
Hudson — **Roanoke**
Rocky Mountain

The percentage standings of the remaining nine divisions look like this:

Northwestern	96.6	West Gulf	78.6
Delta	88.3	Atlantic	68.3
Southwestern	87.5	Southeastern	59.0
Central	87.0	Great Lakes	58.6
Midwest	86.7		

Don't forget that every dollar you contribute to the Building Fund is matched by a dollar from a special fund which was established by a group of men in business who feel that much of their success can be traced back to their initial enthusiasm in amateur radio. Each one of your dollars will do the work of two.

Let's complete the drive in sixty-five.

Members Are Saying

Thank you for making me very proud of our League. You have my moral support and this contribution. — *W1IUES*

We would like to let you know that we are 100 per cent ARRL and support everything it stands for — *W12YOE*

Enclosed is my modest contribution to the fund for our new building. I am very fond of our American Radio Relay League because although I am a newcomer to radio hamming and only 13 this year, all that I have learned about this hobby I got from the League publications. — *KP4BEN*

Please add this check to the building fund. Wish it could be more, but we did want to feel we had a small part of the new building. — *W6BLI & W6ZKU*

It suddenly hits me squarely between the eyes that you have a very large problem about which I have done precisely nothing! I have had the privilege of pounding brass since 1928, as W9EIP, W9CY, and K2GT, and I have not contributed significantly to ensure that privilege. Therefore, I desire to donate to the Building Fund. — *K2GT*

Enclosed is a check for the Building Fund resulting from a practically-unanimous affirmative vote, thus confirming club members' confidence in the League's handling of amateur affairs. — *W8NCV, Greater Cincinnati Amateur Radio Assn.*

Grateful to be "in" on this building project; gives me a feeling of pure joy to think of all the wonderful years I have been a fellow member with the greatest fraternity on earth. Long live ARRL — *my* League! — *W7JQR.*

I got to thinking about how much ARRL has already done for me in my one year of operation as a ham. The contribution is not a lot, but maybe it will help show the appreciation of a 16-year-old. — *W1ØHMN.*

With the enclosed contribution I would like to say that while I may not always agree with the ARRL I am behind it one hundred percent. . . . I enjoy the hobby very much and would hate to see ham radio destroyed. We need ARRL. So keep up the good work and don't let the dissenters bother you too much. — *KØAVW.*

Here is my membership renewal along with an additional little bit for the building fund. Most of the "little fellows" out here in hamdom do appreciate the job the ARRL has and is doing so all I can say is, keep up the good work. — *DL4NK/KØBLH.*

I am a new member in the amateur radio society but already I can see what a vital role is played by the ARRL in the life of a ham. — *WN2GPX.*

I am enclosing a small check. I began ham radio around 1918 and got my first license in 1923. I appreciate all that you have done for me and for the many hams that come on in later life. — *W5JQC.*

Correspondence From Members-

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

SOME TALK, SOME DO

¶ In reading over the pro and con about the FCC and ARRL dirty work in proposing an upgraded license structure for amateur radio classes in the June *QST* several things crossed my mind. The first was that of the many physically handicapped amateurs that I know none was complaining about how unfair the FCC was or how dastardly the ARRL was in proposing all these changes to our sacred hobby. Secondly, some years ago I happened across some old issues of *QST* in the days when that nasty ole FCC had said that the day, of the spark mode of radio transmission was passe and after a certain date this mode would no longer be allowed. The unhappy hams who were dedicated to the art of spark had the same complimentary things to say about the FCC, ARRL and organizations in general as the happy hams who were on the con side of the statements in June.

If you want to feel sorry for someone remember my friend who sends c.w. on the traffic nets with his toes because his arms and hands don't work; my friend who has been a victim of polio since he was three and copies code on an electric typewriter with his hands instead of his fingers because his fingers don't operate independently; or, my friend who has been blind from birth and has to do his studying by braille. You, my friend, have ten fingers which operate on the end of two hands that work when told to and you see with two good eyes the results of their work. On second thought, maybe we should all feel sorry for the fellows that have all their physical facilities and not waste time on the handicapped, for they have something some of us lack. What they possess is the good ole "I want to, I think I can, by golly I'm gonna, and, look what I got for myself, an Extra Class ticket."

Now that sorry time is over it's back to the *License Manual* and the W1AW code practice. See you down at the local FCC exam point. — *K3JYZ*

THE MULTIPLE UNTRUTH

¶ Hearty congratulations to Ivan Loucks, W3GD, for his lucid statement on the present state of affairs of the Amateur Radio Service ("Amateur Radio and the Public Interest," June, *QST*). This article should be required reading for those self-appointed saviours of amateur radio who have emitted such clouds of billowing smoke that some amateurs have been fooled into thinking that a fire exists within the structures of the FCC and ARRL. This, of course, is nonsense and W3GD aptly clears away the smoke, showing the outbursts to be merely false alarms.

These self-appointed saviours of amateur radio make use of a technique of confusion which, while new in the field of amateur radio, is old in the more sophisticated field of politics. This technique is termed the "multiple untruth." Some time ago the use of the "multiple untruth" was discussed by Richard H. Rovere in a penetrating article in the *New Yorker* magazine. Mr. Rovere was discussing this technique in regard to politics, but his remarks apply equally well to unscrupulous radio amateurs, ever eager to violate the structure of amateur radio. This technique of attack as described by Mr. Rovere states:

> "The multiple untruth need not be a particularly large untruth but may instead be a long series of loosely related untruths, or a single untruth with many facets. In either case, the whole is composed of so many parts that anyone wishing to set the record straight will discover that it is utterly impossible to keep all the elements of the untruth, or falsehood, in mind at the same time. Anyone making the attempt may seize upon a few selected untruths and show them to be false, but doing this may leave the impression that only the statements selected are false and that the rest are true. An even greater advantage of the "multiple untruth" is that statements shown to be false can still be repeated over and over again with impunity because no one will remember which statements have been disproved and which haven't!"

Radio amateurs disturbed by slanted editorials and who unthinkingly accept statements of opinion and multiple untruths for fact should remember that masters in the art of fantasy exist in amateur radio who are willing and able to provide the unwary reader of their wares with inaccurate descriptions of things and events which have never occurred. These antics do little good and much harm to the amateur radio service. — *W6SAI*

¶ Although I am a newly licensed Novice, I hope that a long-continued interest in, and observation of, amateur radio will entitle me to express my opinion on some current affairs affecting amateur radio. I am a sometime reader of *73* Magazine and read Mr. Green's rantings with the same sort of embarrassed self-consciousness that one feels when he hears a rebellious teen-ager berating his own father. I am confident that the majority of radio amateurs are of sufficient maturity and soundness of judgment to recognize these false prophets for what they are, and to continue to give their support to the ARRL.

I frankly do not know if I will ever personally acquire the technical proficiency required to qualify, but I nevertheless strongly feel that incentive licensing is mandatory if amateur radio is to continue to fulfill its purpose as a serious hobby with the capability of serving society. — *WN4ZFT*

¶ As a member of the League, I would like to express my appreciation for the fine work that ARRL is doing on behalf of the amateurs. While it may be true that not everything ARRL does represents the best approach to a problem, neither is it true that everything ARRL does is "wrong." It seems to me that much of the criticism directed toward the League originates with a few individuals who may

have a narrow, personal viewpoint on some specific problem. Personally, I am pleased with the efforts of the League on behalf of amateurs as a group, and hope that the bouquets you earn will at least equal the brickbats which are frequently tossed! — *W4CTS*

¶ I enclose my check which I should like the League to use as the start of a new kitty, the purpose of which would be to defray the extra legal expenses required to effectively enjoin or otherwise legally obstruct certain people from continuing to defame the character of the ARRL.

I am personally aware of one specific accusation which has no foundation in truth and which suggests that other allegations may be equally unfounded.

Since these besmirching remarks are perhaps regarded by the League as being beneath its dignity to appropriately answer, I would suggest that the disposition of these funds be a matter of discretion.

Suffice it to say that I resent blatant, unfounded, wild talk against an institution which has been around a long, long time and without which we hams would have very little to crow about. — *W1IBY*.

AREN'T THERE *OTHER* WAYS TO SAY THESE THINGS . . . ? . . . at least DIFFERENT ways?

¶ What has happened to originality and spontaneity of expression up and down the dial? Surely there must be many, many ways to express ourselves without falling back on the weary, bone-dry cliches that have become our verbal stock-in-trade in amateur radio.

Just imagine the newness and stimulation of one whole operating session during which we heard none of these:

1. The Fine-Business Syndrome:
   "FB on your weather; FB on your antenna, too; FB on just getting the chow call and FB on your XYL taking you apart if you don't get going."
2. The Pledge of Eternal Friendship:
   "From now on, we'll sure be looking for you on the bands. So if you hear us on, give us a shout and if we hear you on, we'll do likewise."
3. The Humorous (?) Goodnight:
   (a) "W-a-l-l-l . . . guess its getting time to hit the ole snore shelf."
   (b) "I think we'll be pullin' the Big Switch, pretty soon . . ."
4. Since There's No "Q-Signal" to Say, "I'm Bored Stiff With This QSO:"
   "Think I'll sign with you and take a look across the band. . . ."
5. Ping-Pong:
   "Get your hand on the switch, OM, 'cause back she comes to you."
6. The Big Gamble:
   ". . . and WA7XXX is now standing for any POSSIBLE (???) call around this frequency." — *KØTYO*

OP AID

¶ You had a good idea in enclosing page 64A in June *QST* in a distinctive light blue to bring to our attention the necessity of national calling and emergency frequencies.

I intend to have a separate receiver on 3875 kc. for monitoring at all times I am in my shack.

George Hart, W1NJM, is doing a good job as National Emergency Coordinator, so give him a pat on the back for me. — *W1JB/W1APK*

VALUE

¶ I'm thirteen and I'm a paperboy making ten bucks a month. ARRL is worth two weeks work to me. Why? I have had a heck of a lot of fun in ham radio already. I've even felt I have learned something. Being a member of ARRL means a heck of a lot more fun and lots more learning. In this spirit I renew my membership. As for incentive licensing, I'm for it. — *Pat Durkin*

DEFINITE IMPRESSION

¶ I have just read my copy of the June issue and I wonder if some of the stuff in it was really read by the editorial staff?

I thought I had a fairly catholic sense of humor, but these pieces of John Troster — boy! This is not funny, it's sick.

Some of the items printed in Strays are just plain ridiculous:

> "W2XYZ would like to hear from other hams who are Chinese midgets and operate mobile from a surf board."

These people don't really want to contact their counterparts, they just like to see their names in print. I'm not talking about all such items, just the far-out, silly ones.

You have pretentions of being a combination technical journal and fraternal society organ, but the editorial content seems to be drifting toward the pre-adolescent set. Frankly, it's starting to cloy. — *WØRVF*

¶ W6ISQ's diatribe on the use of phonetics in phone work really hit the lid on the head! Under any conditions less than excellent, those cute homemade phonetics won't get your call through, and with foreign ops, who have trouble even with ordinary English — well, forget it. Both ARRL and MARS have well known and easily distinguishable alphabets . . .

Be assured that all of W6ISQ's stories are appreciated here at "Two Hungry Zebras Yawning." — *WB2HZY*

¶ While I have not been very active on the air during the past years, I still enjoy operating whenever I can and keeping in touch by reading *QST* each month. I especially enjoy the very pointed but enlightening articles by W6ISQ. However, I believe that the article in the April issue would have been better had it been left unpublished. Such trite nonsense deserves no place in *QST*. — *W1BPE*.

¶ Three cheers for John Troster, W6ISQ! He is really an excellent author. Although just an Associate Member, I look forward to *QST* primarily because of John Troster. Tell John to keep up the good work! — *John Cipollina*.

WELL BALANCED

¶ Enjoyed my first copy of *QST*. I notice that it is well balanced as to the sections on technical and operating news. I also like the ads grouped where the text does not interfere with perusing the ads (and vice-versa). I am particularly impressed that about five pages were devoted to ethics and public relations. I have never seen this done, to any extent. If, for example, the "Sports" magazines stressed the ethics of using a rifle, instead of stressing the legal right to shoot, a friend of mine, who

is a rancher, and regularly has to solder up holes in his water tanks, repair his insulators and fences, and bury his dead cattle, wouldn't be so enthusiastic to bury the hunter himself. You certainly have a delightful, orderly and attractive magazine! *John Haddaway, ex-9AXE.*

WELL DONE

¶ Please extend thanks to the many amateur radio operators who responded to the call for assistance on 27 May 1965 from the Personnel Office, 2045 Communications Group, Andrews AFB, Maryland.

It became apparent that we had to contact SSgt Roy Ellickson, WA0ASG, a member of this organization who was traveling to New York by private automobile. A relatively short time later, it was learned that a network of hams was operating in our behalf. As a result, SSgt Ellickson was contacted and a high priority military project was completed on time. Again, may we offer thanks for the splendid cooperation that was extended through this very fine program. — *James A. Williams, MSgt., USAF*

LISTEN . . .

¶ The other night I clocked 5 CQs on one frequency in the c.w. portion of the 20-meter band. Three of them were calling CQ DX. On the phone section of the 20-meter band I heard numerous CQ DX when there were DX stations also calling; and invariably a 5/9 CQ comes on top of a QSO in which I am involved when I know the fellow could hear me if I heard him that loud.

Either many operators never listen across the band or on the frequency before they call or they do not give a darn!

However, it is important to understand that, with band conditions as they are today, there should be an absolute minimum of CQing! It should be reserved for bands such as 15 and 10 which can appear dead. Operators should discipline themselves to listen rather than expect stations to listen for them. This is especially so when working DX. The percentage landing on top of an existing QSO is extremely great while the necessity of calling CQ is very slim.

The constant din of CQers is a factor which is gradually keeping DX stations off the American phone bands. Thus, it can not help DX scores but it can spoil other QSOs.

Another fact I note is that not all CQs come from stations which appear to be newly licensed. Old-timers, who should know better, are doing it as well. But the new operator should be instructed that:

It is better to listen
And the band review,
Than to call and call
An indiscriminate CQ! — *W4NJF*

BAD HABITS

¶ C.w. procedure can be so simple and speedy that it breaks my heart to hear it used improperly. A number of errors that have sprung up since the war follow:

Keyers: An electronic keyer in the hands of an expert can be a beautiful thing to hear. Even when used by an expert (how few of them there are!) it can be used too fast for circuit conditions or the ability of the man at the other end, however. As mostly used, far too many mistakes are made, leading to frequent repeats; also spacing between letters or words is often poor.

"Handle": "Name" uses less character — since was a wonderful thing with its two letters: mine is fj. I personally have no objection at all to being called OM, and the early female ops had no objections to being called OW. It is ridiculous to hear circuit time being wasted for repeat after repeat to get the handle.

Procedure: "I'm running 600 watts to a trap dipole." I doubt very much the truth of this statement I just heard this morning. What he probably meant was: "I'm running 600 watts wid a trap dipole." Let's be accurate: Few hams can measure power farther along than the plate of the final.

"Hw Copy?" Why not just "Hw?" It served for many years.

These are of course only a few, but should serve. Many of us are far more critical of the appearance of our stations than the way they sound on the air. — *WGFB*

HIGH PERFORMANCE

¶ I have very recently built the homebrew beam called "Scotsman's Delight" as described in the June 1963 issue of *QST*. This beam presented little if any problems to me and I have many helpful items for other hams who would like to build such a beam.

First of all, it is a high-performance beam, although it only costs about 5 dollars. In three days I have worked three continents and six new countries with above 569 reports.

On the side of the house, the beam may be mounted using a right-angle iron and pipe nipples. For greater height the beam can very passably be mounted atop a 30- or 40-foot TV mast and turned with an ordinary TV rotor. This is the arrangement that I use and it works very well. The beam can be made for two bands by placing the driven or the reflector elements on one bamboo pole and the other set of elements on a separate element each, as the phasing lines are of unequal distance. If the driven elements are placed on the same pole, one piece of RG-59/RG-11 coax may be used for both antennas. This is a very excellent beam and as I've stated, it gets out exceptionally well. I would recommend it to a beginner or an old timer. — *WB6EFM.*

Strays

Stolen Equipment

On June 18, an SBE-33 (Serial No. 122218) and Collins microphone were stolen from W6GCG's car. The owner had modified the SBE-33 by adding a large aluminum knurled tuning knob and a small sub-miniature switch at the rear of the cabinet for switching the v.f.o. to MARS frequencies. Contact C. A. Andrews, W6GCG, 1276 Susan Way, Sunnyvale, California or the Sunneyvale California Police Department.

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A number of people attending the National Convention in San Jose last month praised the attractive July cover of *QST*. The artist, Susan Engwicht, daughter of *ARRL*'s Pacific Division director, was introduced to, and received the appaluse of, those gathered at the convention banquet.

AMATEUR RADIO PUBLIC SERVICE CORPS

CONDUCTED BY GEORGE HART,* W1NJM

Test Messages and the SET

A FEW months ago we finished the ARPSC Field Bulletin No. 3, dealing with last year's SET and the test messages that were mailed to various ECs around the country for origination back to us during the SET. The twelve messages carried a "test emergency" precedence, and the purpose of the test was twofold. First, we wanted to see just how long it would take the messages to be delivered, and second, we wanted to see what mistakes, if any, would be made. We won't go into a detailed discussion of the results here, but it's quite evident that many of us are still making careless errors in our traffic handling.

Some of the things that happened to some of the messages are a little hard to believe. Anyone interested in the details of the test can get a copy of the bulletin while the supply lasts.

Speaking of the SET, this is probably as good a time as any to make a pitch for this year's, which is scheduled for October 9 and 10. We will have a special bulletin to all ECs, SECs, SCMs and higher level NTS managers soon, but this will serve as a preliminary announcement for all AREC members.

Let's try to make this the biggest and best SET in history. The only way we are going to accomplish that is by having *every* EC (yes, all 1200 or so of them) hold a drill of some sort, originate a message to headquarters (for their extra point), and more important, send us their results! You, as AREC members, should support your EC in his plans for a drill, and if he doesn't have any plans, see if you can build a fire under him and get some sort of an exercise going. The drill doesn't have to be as extensive as K4URX's (see elsewhere in this issue), but every AREC group should hold some sort of a shindig. For those of you who aren't members of an organized AREC group and want to participate in the SET, why not check into your Section net (see the net directory)? You might also contact your local Red Cross chapter and offer your services in case they want to originate a message to another chapter or to their National Headquarters.

Net Registration

In last month's column, we ran the annual call for net registrations for the 1965-66 net directory. The deadline for filing registrations is August 1. We urge all net managers to check the date of their last registration. If it is over a year old, or if there have been any changes made since the last registration, please send us a CD-85 or facsimile *pronto*.

* National Emergency Coordinator.

A few weeks ago, we got a request from one of the RMs for a supply of traffic handling aids that he could hand out at a club meeting at which he was going to speak. We think the idea of a traffic man going to a club meeting as a guest speaker and giving a talk, directed more at the non-traffic handlers, on the basics of traffic handling and net operation, is a good one. We would like to see more RMs and PAMs and other traffic men doing this. The best way to sell an idea is through personal contact, and what better way could there be to introduce non-traffic handling amateurs to the idea of traffic handling than by a talk (which need not be long or boring) by someone who is experienced in the field. The large reservoir of information from *QST*, plus your own experiences, could make a very interesting talk, and could be instrumental in opening the door for many who haven't yet gotten around to investigating this phase.

This southern gentleman is H. J. Hopkins, W4SHJ. Hoppy may be known to most of you as the 4RN manager, but he is also the Virginia SEC and just recently took over as acting SCM.

We'll be happy to send you some handout material for the meeting. All you have to do is tell us approximately how many people you expect at the meeting, and what you need. — *W1BGD.*

National Traffic System

Every NTS net has a much more important purpose than just handling traffic, and that is the training of operators to function with a minimum of difficulty under difficult situations. How often have you been on a net and have a "new" traffic man check in, complete with traffic and mistakes? I'm sure we all have had this experience at one time or another, but have we done anything to help this newcomer?

Some years ago when we were just getting our feet wet in traffic handling and net operation, the task of being NCS

One of these cats, a real traffic hound, is Jim Speck, W5PPE, the TCC Central Director. Jim took the reins from W4ZJY back in January of this year.

of EAN was placed on our not-so-broad shoulders for one night. Since this was our first attempt at being NCS of a high level net, and only the second time we had checked into the net, you can imagine that the session wasn't run quite as it should have been. Two days later, a letter was received from one of the top traffic men in the country who had been in the net that night, and he, ever so gently, told us what we had done wrong, and made suggestions as to how we could improve. The criticisms were taken in the spirit in which they were given, and a marked improvement was noted the next time the NCS job came our way. The same fellow also sent another letter, similar to the one that we received, to another station that was also new on the net, but the result was quite the opposite, and the new man was rather resentful of being told that he was doing something wrong. You can see that giving this type of criticism can be a sticky proposition unless you are tactful in your approach (which, in this case, the sender of both letters was) and make it clear, either directly or indirectly, that this isn't a bawling out but that you want to help the other fellow improve.

The only way we can continue to grow is by recruiting new traffic men, *and* after they have learned the basics to help them improve their detailed procedure. Letters such as this can often lead to a long friendship and will leave a lasting impression on the recipient. How about it, fellows and gals, let's help the new traffic man become the good operator he wants to be. — *W1BGD.*

May reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation (%)*
EAN	31	1739	1.143	56.1	100
CAN	31	1542	.924	49.6	100
PAN	31	1579	1.071	50.9	98.9
1RN	60	424	.345	7.1	89.7
2RN	62	613	.711	9.8	99.4
3RN	62	659	.162	10.6	98.9
4RN	55	906	.520	16.4	97.6
RN5	62	1470	.428	23.7	92.9
RN6	62	887	.673	12.6	98.5
RN7	31	662	.591	21.3	73.3[1]
8RN	62	396	.308	6.4	72.6
9RN	31	511	.589	16.5	97.5[1]
TEN	62	564	.162	9.1	70.7
ECN	28	150	.287	5.4	75.0[1]
Sections[2]	1299	7814			
TCC Eastern	124[3]	781			
TCC Central	93[3]	718			
TCC Pacific	124[3]	977			
Totals	1899	22,392	EAN	10.5	EAN/CAN
Records	2227	22,882	1.100	22.1	100

[1] Representation based on one or less sessions per day.
[2] Section nets reporting (47): PTTN, EPA (Pa.); GBN (Ont.); BUN (Utah); NCCW, NCNL, THEN (N.C.); MTN (Man.); WSBN, WBEN (Wis.); MDD (Md.-D.C.-Del.); SCN, NCN, SCVSN (Calif.); OSSBN, BN (Ohio); OSN (Ore.); NJPN, NJNN (N.J.); OQN (Ont.-Que.); MWN (Mich.); VN, VSN, VSBN (eve.), VSBN (morn.) (Va.); SCEN (S.C.); OZK (Ark.); AENT, AENR, AENM, AENP (eve.), AENP (morn.), AENH, AENB (Ala.); TN, ETPN, TPN, TSSBN TSN (Tenn.); NLIVHF, NLS (N.Y.C.-L.I.); RIN, RISPN (R.I.); MSN, MJN, MSPN (eve.), MSPN (morn.) (Minn.).
[3] TCC functions not counted as net sessions.

Another pretty fair month with one new record (rate) and an almost in the traffic department. QRN continues to be a problem to some of the nets, but it's not nearly as bad as it was 5 years ago. Cheer up fellows and gals, it won't be long before we start having our long skip problems again.

K1WJD has issued EAN certificates to W1ZFM, WA1CRK and W4PNM. Bud hopes that the representation figure will stay at the 100% mark after a long session of "almosts." W9DYG makes special mention of W4ZJY, W9ZYK, W9JOZ and KØGSY for the fine job they have been doing as substitute NCSs. WB6JUH complains that with normal conditions, traffic holding its own, a good rate and acceptable representation, he can't find anything to complain about. WA2GQZ reports that there is some shuffling around on 2RN with a lot of the younger members being sidetracked by final exams, but things are beginning to straighten themselves out. K5IBZ sez that the QRN was the worst he has experienced in a long time, and it really hurt RN5 by almost washing out a few sessions. WB6BBO issued an RN6 certificate to W6QMO and comments that they now have two Nev. reps. K7JHA really went wild with the RN7 certificates, sending one each to *W7s* AGA GYF JHA JEY PWA, *K7s* URU IFG ZRF and VE7QQ. W9QLW is issued a 9RN certificate to W9WJH, and is looking for some new blood to help fill a few of the skeds. WØLGG is hoping that the younger TEN set will help keep things rolling while the older members are tending their farms.

Transcontinental corps: W3EML reports that all functions are filled, but the failures pulled the percentage down. Conditions seems to be the major problem. W5PPE sez that condx are giving his boys a hard time too; likewise from W7DZX. Cheer up fellows, things could be worse, and if you do, they probably will get worse.

May report:

Area	*Functions*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern	124	84.7	2159	781
Central	93	83.9	1443	718
Pacific	124	87.1	1956	977
Summary	341	85.3	5558	2476

TCC roster: Eastern Area (W3EML, Dir.) — *W1s* BGD EMG NJM, WA1CRK, W2GVH, K2SIL, *WA2s* BLV RUE, *WB2s* AEJ GUK HWB, *W3s* EML NEM, *K3s* FHR MVO, W4DVT, K4VDL, WA4PDS, W8CHT, *K8s* KMQ NJW. Central Area (W5PPE, Dir.) — *W4s* OGG ZJY, WA4AVM, W5PPE, *W9s* CXY DYG JOZ VAY ZYK, *WA9s* AUM BWY, WØOHJ, KØGSY.

Net reports:

Net	*Sessions*	*Check-ins*	*Traffic*
75 Meter Interstate	31	899	569
HBN	31	386	758
EASN	31	235	129
North American SSB	26	691	618
7290	42	948	565
Northeast Area Barnyard	26	596	4

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Diary of the AREC

On Apr. 19, the Sixth Avenue bridge in Des Moines, Iowa, collapsed, taking with it all telephone lines between the Des Moines high schools. WØSEJ operated WØGHZ, the club station at the Technical High School, as NCS, with *WA0s* CSZ DIO FUA and KØBNA operating from the other schools. The operation supplemented the regular telephone system until the lines could be restored. — *WØSEJ.*

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When a minor earthquake hit Seattle, Wash., on Apr. 29–30, some 80 amateurs participated in a net, providing

communications to isolated areas and to the Red Cross. About 820 messages were handled. — *W4UJX.*

Tornadoes, with winds of more than 70 m.p.h., accompanied by heavy rains and hail, hit southeastern Wisconsin May 8. The Milwaukee-Waukesha AREC net was activated by ECs K9KJT and W9ZPV. Each EC acted as NCS for his own county, and W9EKW, the Milwaukee-Waukesha Red Cross station, served as master control for the operation. Through mobile units, the weather bureau was kept informed of the status of the storm and tornadoes. Fourteen stations furnished tie-in links. — *K9KJT, EC Milwaukee Co., Wisc.*

Members of the Glens Falls, N. Y., AREC provided communications for a canoe and kayak race in North Creek, N. Y. The group had set up two 6-meter stations, one at the starting point and one at the finish line. Communications between judges and timing signals were handled. Just as the last boat was starting, a medical emergency arose at the starting line. K2AYQ took the mike and contacted W2LYW, at the finish line, who in turn, contacted the North Creek Volunteer Ambulance and the state police who sped to the scene and took care of the emergency. — *K2AYQ, EC Glens Falls, N. Y.*

A natural gas leak ignited and caused a fire and explosion in Regina, Sask., on May 24. The impact of the blast was sufficient to smash windows up to several city blocks away, and completely disrupted telephone service to the disaster area. At the request of the local c.d., the AREC set up an emergency communications network between the disaster area and the c.d. office. Within minutes of notification, an AREC net was organized with *VE5s* GG HP VD and SC operating mobile. Stations in Saskatoon and Swift Current stood by, ready to offer any help that might be required. Thirty-five minutes after activation of the net, telephone service was restored. — *VE5VD, EC Regina, Sask.*

During the night of May 13, central Wyoming was receiving general heavy rainfall which, combined with a heavy, wet snowpack in the mountains between Glendo and Casper, started an exceptionally fast run-off with danger of local flooding. On May 14, W7YWE, SEC Wyo., signed on the air after hearing a local radio report of possible flood danger. K7IAY in Casper was already on, and soon they were in contact with K7ITH, EC Casper, who was patrolling the Garden Creek area which is always a potential trouble spot during fast run-offs. A telephone call was received at W7YWE reporting flooding at the Wyoming Boys' Ranch near Glenrock. K7ITH was asked to proceed to the Boys' Ranch area and W7DW assumed the patrolling in the Garden Creek area. The sheriff's office in Douglas was contacted and W7YWE was requested to keep them informed as to the conditions at the Ranch.

W7YWE acted as NCS for the Wyoming AREC net and W7KHI was alternate. Both stations were equipped with emergency power. K7IAY also acted as NCS when needed. K7TFW checked in from Cheyenne c.d. headquarters, and was able to provide liaison with the national guard and state patrol. K7ITH, on his way into the Ranch area, reported sections of roadway, bridges and telephone lines washed away in Boxelder Canyon. At the Ranch, a bridge had already washed away and buildings were being damaged by water.

During this time, the Douglas national guard unit had been called out to the La Prele area to evacuate flooded families and watch the water level in the reservoir which was rising rapidly. K7NQX from Cheyenne volunteered to go along for radio patrol since he was familiar with this area.

W7YWE, via K7WRR, K7SLM and W7CQL began one of several direct reports to radio, television and wire news services. These reports came direct from the scene from W7TZK at Elendo, K7NQX at La Prele, K7ITH at the Wyoming Boys' Ranch and W7DW at Deer Creek in Glenrock.

A report of a missing plane in the Eastern Wyo. area was received. W7KIII, K7NSF and W7CQL, with assistance from FAA, discovered the plane had been found and the Highway patrol was notified as to its location.

The entire operation lasted some three days with over 40 amateurs participating. — *W7YWE, SEC Wyoming.*

San Antonio, Texas and vicinity were deluged with heavy rain on the morning of May 18. This rain combined with the accumulation from the past two days caused some flooding along the San Antonio river and its tributaries. The disaster survey team, a group of amateurs trained in disaster evaluation by the Red Cross, surveyed the situation and provided necessary communications to the Red Cross, civil defense headquarters and the police department from the disaster area. Ten amateurs participated. — *K5HZR, EC San Antonio, Texas.*

On Apr. 17, WA6AGW was mobile near the ghost town of Chubbock, Calif. when he discovered the word "help" scrawled in the sand. Having seen a few planes in the area earlier, his first thought was that possibly one of them had crashed, and he put out a QRRR on the West Coast Amateur Radio Service System frequency. W6VX intercepted the call and notified the highway patrol in Los Angeles. Later the FAA called W6VX on the telephone to get more information on the nature of the emergency. Two light planes were dispatched to WA6AGW's location, and since no air to ground communication was available, a message was dropped asking if WA6AGW was in trouble. He wasn't and since there was no signs of any emergency in the area, the operation was terminated. — *W6VX.*

Between May 14 and 25, AREC members in eastern and central Nebr. were activated to alert operation for four tornadoes and one flood. In each case, SEC WØHYD started the net into which an average of 50 stations checked. Liaison was maintained with c.d. in various cities and with the weather bureau. Net sessions lasted for about three hours and each operation was concluded when it was evident that an emergency situation wouldn't arise. — *WØHYD, SEC Nebraska.*

Since we have a break in the emergency and alert reports, we will try to catch up on some of the non-emergency activity reports.

Jan. 9 — Mobile units of the Central Arkansas Radio Emergency Net provided communications and acted as pick-up cars for the March of Dimes Telerama. Twenty-five amateurs participated in the 21 hour operation.

Feb. 7 — Members of the Houston (Texas) Amateur Radio Club provided communications for the Channel Derby, a 100-mile boat race from Highlands, Texas to Galveston, and return. Five stations were set up along the route, and the progress of the participants was relayed to the communications center at the starting line.

Feb. 20 — In connection with a fallout shelter drill in Houston, Port Arthur, and Port Lavaca, Texas, the West Gulf Emergency Net provided communications between the shelters.

Feb. 14 — Decatur Co., Ind., AREC members provided communication for the third Sabin Oral Polio Vaccination program. Liaison was maintained between the six distrib-

(*Continued on page 150*)

K7ITH was able to spare a minute to have his picture taken during the flood operation in central Wyoming on May 13. See the Diary for details.

Hints and Kinks For the Experimenter

V.H.F. SCOPE CONNECTIONS

WHEN you wish to check modulation patterns, obtaining vertical deflection voltage for the plates of an oscilloscope can be quite a problem above 50 Mc. A simple solution is shown in Fig. 1. For low-power transmitters a "tee" connector may be used to sample the output of the transmitter which is fed to the scope via a ½-wavelength balun to provide a push-pull vertical deflection voltage. High power will require a small coupling capacitor — the exact value will depend on the power of the transmitter and the frequency used. Any type of coax may be used, and the length of line between the transmitter and scope can be made ¼ wavelength, or odd multiples thereof, for maximum deflection voltage. The shield of the connecting coax should be grounded to the scope. This system has been used from 50 to 432 Mc. at powers up to 1 kw., and it works very well. — *Jon O'Brien, W6GDO*

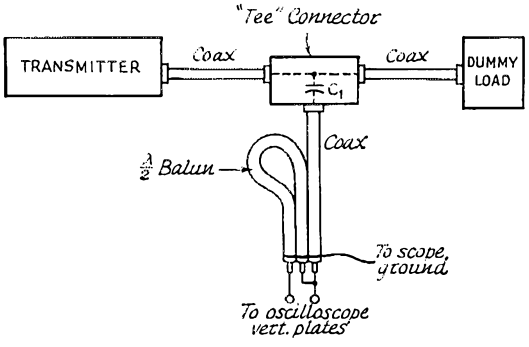


Fig. 1—Test setup to check the modulation patterns of v.h.f. transmitters. Low-power transmitters may be directly connected to the scope with a "tee" connector. Medium- and high-power transmitters will require C_1, which the author mounted in a modified "tee" connector.

C_1—1-20-pf. disk ceramic (the value will depend on frequency and power level used).

SOLDERING ALUMINUM?

ALUMINUM can be soldered with most of the tin-lead solders ("Hints & Kinks," September, 1964) as well as with some special solders. When first made, these joints appear satisfactory, but unfortunately, they are seldom permanent. Aluminum readily sets up a galvanic cell with the other metals and corrosion soon starts. In order to be even fairly permanent, the joint must be kept absolutely dry.

Atmospheres near the seacoast, with high humidity, or industrial smog, are poison for the joint. If the joints can not be kept dry they must be protected with lacquer, paint, or other organic substance. This may give fair life to the joint but it is better practice to make joints of aluminum by welding, brazing, or riveting. In some cases, plain fluxes (of a special nature) have been used without any solder and good life obtained.

In the past, the writers have tested hundreds of solders submitted to one of the government bureaus. Joints which had strength (tensile or sheer) equal or better than the basis aluminum would invariably fail when placed in a pan of water for a few days. Some would even fall apart upon one night's soaking in ordinary tap water. So unless you can keep the joint absolutely dry, don't solder. — *R. W. Woodward, W1VW, and William Nighman, W4ZSH*

OSCILLOSCOPE TUBE STRETCHER

THE distance from my eyes to the oscilloscope tubes of my Heath Monitorscope and Ham-Scan is neatly mismatched to the focusing ranges of my bifocals. Becoming tired of either having to bend forward and getting a "crick" in my neck, or having to lean back and then being hardly able to see the patterns, I decided something must be done.

The solution was quite simple, as Fig. 1 shows. The stamp collectors' counter of a nearby store furnished two very fine 3½-inch-diameter magnifying glasses at two dollars apiece. The handles were unscrewed and the lenses installed at the ends of thin metal bars. The bar stock should be flexible enough to position the lens, yet strong enough to support its weight. Pieces of scrap lead were used as anchor weights. Almost any gimmick will do to support the lens, even to screwing the brackets to the scope case. However, for the sake of convenience, I would suggest the support be flexible as to position, and not be fastened to the case. — *Thomas M. Lees, K1MRL*

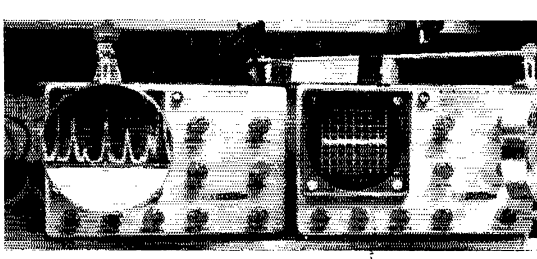


Fig. 2—K1MRL's tube stretcher is constructed from a stamp collector's magnifying glass, a piece of bar stock, and a counter weight. The distance between the scope and the glass is adjusted for best focus from the operating chair.

HEATH "TWOER"

To peak the final in the Heath "Twoer," it is necessary to use an insulated tool and probe through a hole in the side to find the final's tuning capacitor. This is a difficult procedure at best, and almost impossible when operating mobile.

By gluing an insulated rod to the tuning capacitor and placing a knob on the end of the shaft, a permanent tuning control is available on the Twoer's side. I used a plastic alignment tool cut to ¾ inch length, and joined the rod to the capacitor with epoxy cement. In order to move the unit in and out of the cabinet, a slot was cut in the cabinet just below the license holder. — *Harvey Mandell, WA2AAE*

CHEAP AND EASY SQUELCH

Oftentimes it is desirable to incorporate a squelch circuit in a communications receiver. Generally this requires the addition of a vacuum-tube circuit. A quick and easy way to add this feature to receivers that have a conventional diode-type second detector is shown in Fig. 3. A 1-megohm control is added between the receiver's B supply and the return of the last i.f. transformer's secondary winding.

Depending upon the amount of positive bias that reaches the secondary of the i.f. transformer, the detector diode will reach different degrees of cutoff. This is preset by the squelch control. The incoming i.f. signal, depending on its strength, will override the positive bias on the detector, and permit it to conduct. The sensitivity of this circuit is only slightly inferior to a conventional squelch circuit. Various squelch levels can be secured by appropriate settings of the control. — *W1CER*

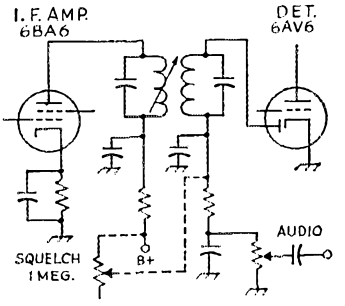


Fig. 3—Circuit for the addition of a squelch to a communications receiver. The tubes and unmarked components are those found in a typical circuit. The addition of the squelch control is shown with dotted lines. The control is 1 megohm, linear taper.

COIL FORMS AND STANDOFFS

Low-loss coil forms and standoff insulators can be fashioned from short pieces of the polyethylene insulation contained in RG-8/U and RG-11/U coax cable. You remove the vinyl plastic outer casing, the shield braid, and the inner conductor of the cable. The polyethylene inner insulation can be cut to the desired length

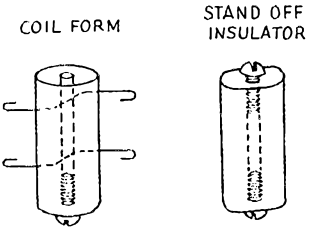


Fig. 4—Polyethylene coil form and standoff.

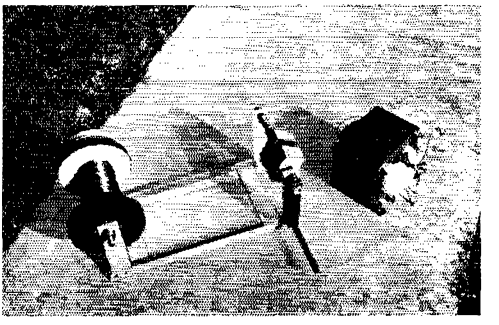
and attached to the chassis by threading an 8-32 screw into the hole in the center of the material. If you wish to use these sections as coil forms, it can readily be done by heating some No. 20 bus wire with a soldering iron and pushing it through the form (see Fig. 4). The addition of the bus wire will provide anchor points for the ends of the coil wire. The insulating material taken from smaller types of coax line (such as RG-59/U) can also be used in a like manner, if smaller forms are required. — *W1CER*

V.H.F. GROUNDS

Securing short ground-return paths around tube sockets in v.h.f. equipment can prove troublesome, when using aluminum chassis material. Brass rings can be fashioned from sheet stock by cutting out a circle of material with a socket punch. The diameter of the circle should be about one inch larger than the tube socket you intend to use. The inner hole can then be made with a socket punch of the correct diameter to allow the tube socket to pass through. Mounting holes are drilled so that the ring may be mounted below the chassis with the same bolts that hold the tube socket. It is then possible to make direct solder connections to the brass ring when returning bypass capacitors and related circuit elements to ground. — *W1CER*

TRANSFORMER WINDING JIG

After reading W1ICP's article on transformer winding (*QST* for February, 1964), I decided to make a plate transformer. To make the winding job easier, I constructed the jig shown in the photograph. It is made from aluminum sheet and angle stock. I then wound the transformer beside the jig which has dual primary and 1250-volt 1-amp. secondary. A jig will reduce the winding time on large transformers by many hours! — *Leon O. Beasley, WA5ENP*



I.A.R.U. News

From Angola to Zambia radio amateurs throughout the world share common frequencies but not always common regulations. With reciprocal operating becoming more and more a reality each day and with many radio amateurs traveling to foreign lands, it is the wise amateur who seeks to learn his foreign counterpart's basis of operation. We hope to present, in summary, pertinent information from the major licensing countries with the hope that it will be helpful to all.

One of the most far-reaching licensing systems is that of the United Kingdom whose licensing agent is the General Post Office. The GPO exam and the U.K. regulations are standard in most of the Commonwealth nations and in many of the nations which have become independent of the British Empire. The exam is in two parts with the 12 w.p.m. sending and receiving test given by the GPO and the theory exam written and graded by the City and Guilds of London Institute.

To secure the one-year, renewable, U. K. license, which is generally good anywhere in the British Commonwealth of Nations and in most of its former colonies, one need be over 14 years of age, a British subject, and pass the examination. Since a valuable certificate of skill is granted for the successful completion of the theory examination many persons take the examination without any thought of becoming a radio amateur.

The U.K. license structure includes the Amateur A, Amateur B, Amateur Mobile, and Amateur Television licenses. The Amateur B is a phone-only license restricted to operation above 420 Mc. Distinctive call letters beginning with G8 and ending with three letters are assigned to this group. The Mobile and Television licenses are endorsements to the Amateur A which entitles the holder to full amateur privileges. The Amateur A draws his call from a block which includes:

G2AA-G2ZZ	G2CAA-G2CZZ
G3AA-G3ZZ	G2DAA-G2DZZ
G4AA-G4ZZ	G2FAA-G2FZZ
G5AA-G5ZZ	G2HAA-G2HZZ
G6AA-G6ZZ	G3AAA-G3PZZ
G8AA-G8WV	G3RAA-G3RZZ
G2AAA-G2AAZ	G3TAA-G3TZZ
G2BAA-G2BZZ	G3UAA-onward

G0, G1 and G7 have not been issued, and G9 is restricted to commercial companies for experimental purposes, and so does not appear on the amateur bands. Special events stations are generally issued GB2, GB3 or GB4 calls and may have any combination of suffix. None of the calls is based on location and a G2 may be located right next to a G6. When operating from an alternate address within the U.K. the appropriate country designator is added to the prefix and /P is added to the suffix. G2AA, as an example, if operating from Scotland would sign GM2AA/P. If the same amateur takes up permanent residence in Scotland he would become GM2AA.

G3SDN, shown above (r.) with IARU Secretary Huntoon, W1LVQ, was a visitor at ARRL Hq. during April. As an Ambassador of the International Amateur Radio Club, he was able to discuss many of the problems of international amateur radio.

Amateur A and Mobile licensees may use 150 watts d.c. input in telegraphy or pure continuous waves, amplitude tone-modulated telegraphy, amplitude-modulated telephony, s.s.b. reduced carrier, s.s.b. full carrier, s.s.b. suppressed carrier, carrier-shift telegraphy, audio-frequency-shift telegraphy, and, frequency- or phase-modulated telephony on 3.5–3.8, 7.0–7.1, 14.–14.35, 21–21.45, 28–29.7, 144–146, 420–450, 1215–1325, 2300–2450, 3400–3475, 5650–5850, 10,000–10,500 and 21,000–22,000 Mc. They may also use 10 watts on 1.8–2 Mc. and 50 watts on 70.2–70.4 Mc. With 25 watts mean power and 2.5 kilowatts peak power they may use amplitude, width, or phase modulated pulse on 2350–2400, 5700–5800, 10,050–10,450, and 21,150–21,850 Mc.

The only persons permitted to speak into the microphone or operate the key of a U.K. station are U.K. licensees and persons holding an amateur radio certificate. In either case the station may only be operated in the presence of the station licensee. Communications may be made

upon request, during disaster relief operations only, for the British Red Cross Society, the Saint John Ambulance Brigade and/or any police force in the U.K. but no other third-party messages may be handled under any circumstances.

Equipment for frequency measurement must be available at all times to verify the transmitting frequency and frequency stabilization must be employed to conform with the state of the art. Interference may not be caused to other services and avoidable interference to other amateur stations is discouraged. Band width must conform with good practice and ITU standards are used (for speech communication a frequency range of 300 to 2700 cycles would result). ITU standards also prevail for spurious emissions, which include harmonics, keyclicks and parasitic oscillations. Below 30 Mc. spurious may not exceed 40 db. below the fundamental *and* not more than 200 mw. From 30 to 235 Mc. spurious must be at least 60 db. below the fundamental *and* not more than 1 mw. for powers above 25 watts, or 40 db. below the fundamental *and* not more than 25 microwatts for powers less than 25 watts.

With the exception of special stations such as GB2RS, the RSGB bulletin station, no amateur stations may engage in broadcasting. No amateur station may use code or ciphers, send misleading, mischievous, objectionable or obscene transmissions, or engage in propaganda, business, or advertising for social, religious, or commercial organizations. Recordings of an amateur station may not be played back without the permission of the recorded station, and then only if the call sign of the recorded station is *not* retransmitted. And, of course, the use of spark transmitters is forbidden.

U.K. amateurs must keep their logs in GMT, with the date, call sign of the other station, time of start and finish of QSO, frequency used, and the emission type. The logs must show the duration of the transmission regardless of whether or not a QSO resulted. If the station is operated by a U.K. amateur other than the licensee he must sign his full name and call in the log; if by the holder of an Amateur Radio Certificate he must sign his full name and serial number.

Call signs must be sent at the beginning and end of each period of sending; they must be sent whenever a change of frequency is made; if c.w. is used they must not be sent faster than 12 w.p.m.; and, if telephony is used the letters may be confirmed by well-known words, but such words must not be facetious or objectionable in nature.

To aid persons interested in securing the United Kingdom amateur radio license the Radio Society of Great Britain publishes *The Radio Amateurs' Examination Manual* which discusses the examination in detail and gives sample questions from past examinations. Typical questions might include the following: Give a circuit diagram of a typical superheterodyne receiver for amateur use. Indicate briefly the functions of each stage and of the components it contains. Draw a diagram of a simple valve oscillator incorporating anode-grid feedback, with provision for microphone modulation; explain its action and say what modification would be advisable for actual operation. Compare the advantages and disadvantages of absorption and heterodyne frequency meters and state under what conditions each type is used. A coil whose inductance is 10 henrys is connected in series with a capacitor of 10 microfarads across a 240 volts 50 cycles/sec a.c. supply; what is the potential difference between the terminals of (a) the inductor and (b) the capacitor. In order to maintain 24 hour contact between two stations 3000 miles apart more than one frequency of transmission is usually required. Why is this? Describe the paths which might be followed by the radio waves between the two stations: or, state the condition laid down by H. M. Postmaster General in respect of the licensing requirements for (a) frequency control and measurement, (b) non-interference, (c) receiver.

For this various information we are deeply indebted to Mr. A. O. Milne, G2MI, Mr. B. W. F. Mainprise, G5MP, author of the *Examination Manual* and to the Radio Society of Great Britain. Additional information on licensing may be secured by writing directly to Mr. John Rouse, G2AHL, Sec., RSGB, 28 Little Russell Street, London, W.C. 1, England. QST

DX OPERATING NOTES

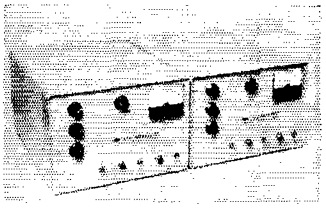
Just at press time we received word that a reciprocal operating agreement had been signed by Belgium and the United States. Other United States Reciprocal Operating Agreements exist with: Bolivia, Canada, Costa Rica, Dominican Republic, Ecuador and Portugal. Several other foreign countries grant FCC licensees amateur radio operating privileges on a courtesy basis; write headquarters for details.

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: Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Haiti, Honduras, Liberia, Mexico, Nicaragua, Panama, Paraguay, Peru, and Venezuela. **Canadian** radio amateurs may handle these relatively unimportant third-party messages with amateurs in Bolivia, Chile, Costa Rica, El Salvador, Honduras, Mexico, Peru, U.S., and Venezuela.

Flash — Israel — U.S. third-party traffic effective August 6.

• Recent Equipment —



Gonset 903A and 913A V.H.F. Amplifiers

A USEFUL addition to the v.h.f. equipment market has been offered by the Gonset Division of Altec Lansing Corporation, Anaheim, California. The 903A and 913A r.f. amplifier assemblies offer an opportunity for a significant boost in power for owners of low-power 6- or 2-meter gear. The Model 903A is designed for operation in the 144-148-Mc. range, while the Model 913A is tailored to the 50–54-Mc. band.

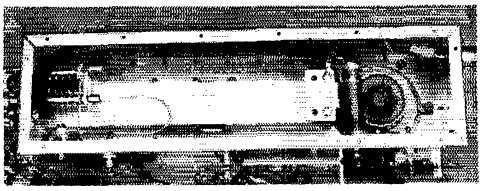


Fig. 1—Inside view of the r.f. compartment, showing the layout of the 2-meter strip-line tank circuit. The r.f. choke is located over the anode cap of the 4X150A. The plate tuning capacitor is obscured by the strip line. The loading capacitor and output link can be seen above the plate inductor.

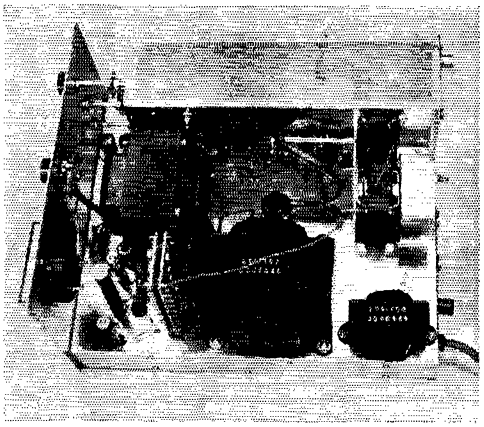
The amplifier tube used in both models is the same — a 4X150A. Class AB_1 operation can be used for rated power input in any mode — a.m., s.s.b., f.m., c.w., f.s.k. — although Class C is a possible alternative for those types of transmission for which it is suitable. For linear amplification of s.s.b. the peak-input rating (indicated d.c.) of the 903A and 913A is 500 watts. To reach this input level with the plate-supply voltage available — approximately 1700 volts, depending on the a.c. line voltage — requires a plate current somewhat in excess of the 4X150A's published maximum rating, 250 ma.; however, the tube supplier, Amperex in this case, has sanctioned the use of the higher value of plate current in these amplifiers. As a linear amplifier for conventional a.m. with carrier, the tube's rated plate dissipation (250 watts) sets the possible maximum input at approximately 375 watts. A shorting bar is located on the rear apron of each unit, permitting AB_1 operation with it closed and Class C operation with this circuit opened.

These amplifiers are companions to the Gonset Sidewinders (s.s.b. transceivers) but they can be used with any low-power exciter capable of supplying at least 5 watts of output power. The manufacturer can supply attenuator pads for reducing driver levels by 5, 10 or 15 db. The amplifiers, with the exception of the grid and plate tank circuits, are identical. The units are furnished with complete power supplies and use bridge-rectification circuitry. Silicon-diode rectifiers are used in both the bias and B-plus supplies. The input impedance of the amplifiers is 50–75 ohms, while the output impedance is a nominal 50 ohms.

The uncluttered simplicity of these units may tend to create an illusion of austerity on behalf of the manufacturer, but examination of the schematic diagram reveals a full complement of well-designed circuits. For example, r.f. isolation is accomplished through the generous application of feedthrough capacitors where d.c. and filament leads enter the r.f. compartment. A brute-force a.c. line filter is employed at the point where the a.c. cord enters the chassis. In addition to these features, an r.f.-sampling network is included in the circuit to permit metering of relative output power. Additional meter switch positions enable the user to observe grid current, screen current and plate current. A fifth switch position provides the operator with a more sensitive indication of relative power outputput during tune-up.

Additional Features

The plate tank circuit in the 2-meter amplifier uses an efficient strip-line configuration (Fig. 1).



Top view of the 903A and 913A amplifiers. The tube cooling fan can be seen at the rear of the chassis, adjacent to the r.f. compartment. Power-supply components and silicon-diode rectifier boards are located between the panel meter and the plate transformer.

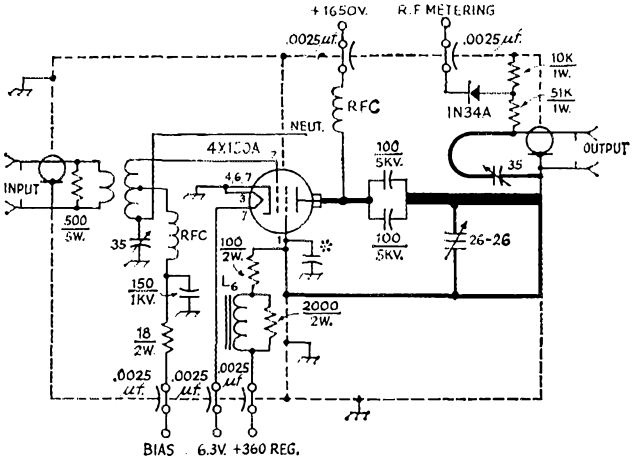


Fig. 2—Schematic diagram of the Model 903A amplifier. (*Built-in screen bypass capacitor).

The plate-tank inductors in both amplifiers are silver plated, offering good surface conductivity. These r.f. assemblies are enclosed in a metal compartment, covered by a perforated-steel top which permits the circulation of air from the cooling system. The cooling fan is mounted inside the cabinet, but with its air-intake vanes exposed through the rear of the enclosure, permitting cool air to be drawn in from outside the cabinet. This air is passed into a pressurized grid-tank compartment and in turn is forced through the 4X150A socket and chimney assembly, then up through the tube's anode cooling fins.

All controls necessary to the adjustment and operation of the amplifiers are accessible from outside the cabinet. The units are enclosed in a heavy-gauge perforated-steel cabinet, finished in light gray.

An interesting application of the strip-line tank circuit is illustrated in Fig. 2. You will note that the d.c. voltage is supplied to the 4X150A plate through an r.f. choke and is isolated from the strip line by a pair of ceramic blocking capacitors. The plate-tuning capacitor, a 26-pf.-per-section butterfly unit, is then tapped down on the line at a point of lower r.f. potential. This permits the use of a tuning capacitor with closer-than-normal plate spacing. In addition, through increased bandspread, the plate tuning is less critical than in the usual case. The same principle is employed in the 6-meter model, but a plate coil is used rather than a strip line.

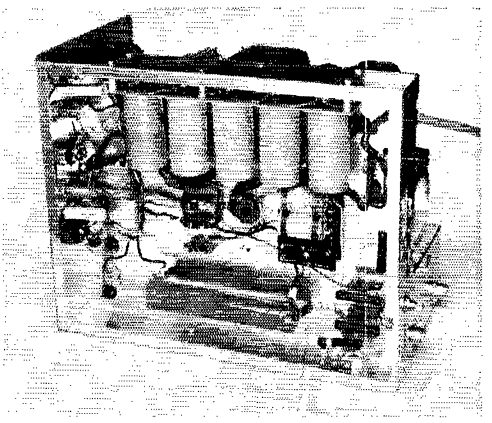
A bias control, located on the rear apron of the chassis, permits adjustment of the static plate current. Although it is not necessary, additional heat reduction during the standby period can be secured by opening the circuit, at link 2, with a pair of external relay contacts. This places added bias on the 4X150A during standby, dropping the plate current to zero. The screen-grid supply is regulated at 360 volts by a pair of 0B2s and an 0A2, series-connected from the 1650-volt-line through dropping resistors.

The units come equipped with a 4X150A tube, but a 4X250B or 4CX250B may be substituted directly. If Class C operation is not contemplated, a 7580 tube may be used.

Operation

Used with a Communicator III, the Model 903A amplifier provided some 15-db. improvement over the signal level of the Communicator alone during on-the-air tests. Since this was in the Class AB_1 mode, requiring no driving power, an attenuator was needed between the two units to "swamp out" most of the Communicator's output.

Using the amplifier in combination with the Communicator III, we have used power levels up to 300 watts input, in Class AB_1 a.m. linear service, without exceeding the plate dissipation rating of the 4X150A. During a 20-hour period of testing the amplifier, the unit performed well with 180 ma. of plate current being used. The screen-grid current registered a negative reading on the meter, common to this family of tubes



Bottom view of the Gonset amplifiers, showing parts placement. The bias control, r.f. input and output terminals, and links 1 and 2, can be seen on the rear apron of the chassis.

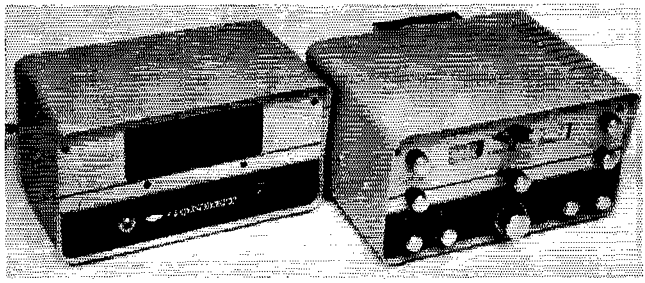
when operated Class AB_1. No control-grid current was permitted to flow.

Negligible heat-cycle drift was evidenced in the tuned circuits when going from standby to transmit. On-the-air reports, under a.m. linear conditions, indicated good audio quality and quantity. There was no evidence of hum or spurious responses, offering proof that the neutralization circuit in the amplifier was properly adjusted. The versatility of these amplifiers should suggest many useful applications to the prospective buyer. — *W1CER*

Gonset 6- and 2-Meter R.F. Power Amplifiers, Models 903A and 913A

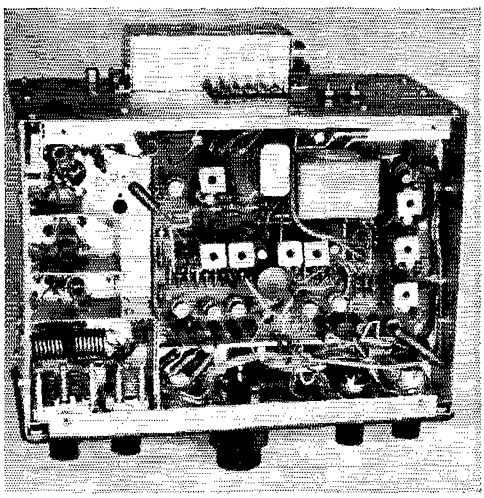
Height: $8\frac{1}{2}$ inches.
Width: $12\frac{5}{8}$ inches.
Depth: $17\frac{5}{16}$ inches.
Weight: 60 pounds.
Power Requirements: 115 volts a.c., 60 cycles
Price Class: $300.
Manufacturer: Gonset, Inc. 1515 S. Manchester Ave., Anaheim, California.

The Gonset Sidewinder 6-Meter Transceiver



MOST of what we said about the Gonset 2-Meter Sidewinder in March 1965 *QST* also goes for the 6-meter version shown here, so we will not repeat ourselves extensively. Like its higher-frequency older brother, the 6-meter Sidewinder is basically a sideband job. It works excellently on c.w., and well enough on a.m., if you accept the a.m. limitations that inevitably go along with the sideband approach to transceiver design.

There are interesting and useful departures from the 2-meter design. The packaging is strictly 2-unit in concept, instead of the r.f. and power supply boxes clamping together in one over-all assembly as they do in the 2-meter version. This is both convenient and inconvenient, depending on what kind of operating you do most, mobile or fixed-station work. Of more interest is the 6-meter provision for crystal-controlled transmitter operation, permitting transmission on frequencies other than the one where the receiver portion is set. This is a considerable aid in v.h.f. work, as compared with being stuck on the receiving frequency.



The shielded partitions to the left are final amplifier assembly and output network. The large printed board contains the 9-Mc. s.s.b. generator and receiver i.f. The crystal filter is at the upper right.

There is a 5-position v.f.o.-crystal switch. One position is brought out to the front panel, to permit insertion of favorite crystals, as conditions require, and three more connect to a crystal board inside the unit. Even one or two crystals adds quite a bit to the versatility of the Sidewinder, as the 4-range tuning system provided by the 35-Mc. crystals in the h.f. oscillator, Q_{18}, makes each crystal usable for four frequencies. The crystals should be in the same range as the v.f.o. They work with Q_{19}, which becomes a buffer when the v.f.o. is used. A crystal at 5700 kc., for example, gives crystal control at 50.2, 51.2, 52.2 or 53.2 Mc. depending on the Sector switch.

Another operating aid makes its appearance in the 6-meter version of the Sidewinder — a device that adds much to the utility of the unit, especially in s.s.b. and c.w. operating. This is a receiver offset tuning control, which permits moving the receiving frequency about 400 cycles either side of the transmitting frequency. This may not seem like much tuning to anyone accustomed to v.h.f. a.m. communication, but it adds a lot to the pleasure and efficiency of sideband or c.w. work.

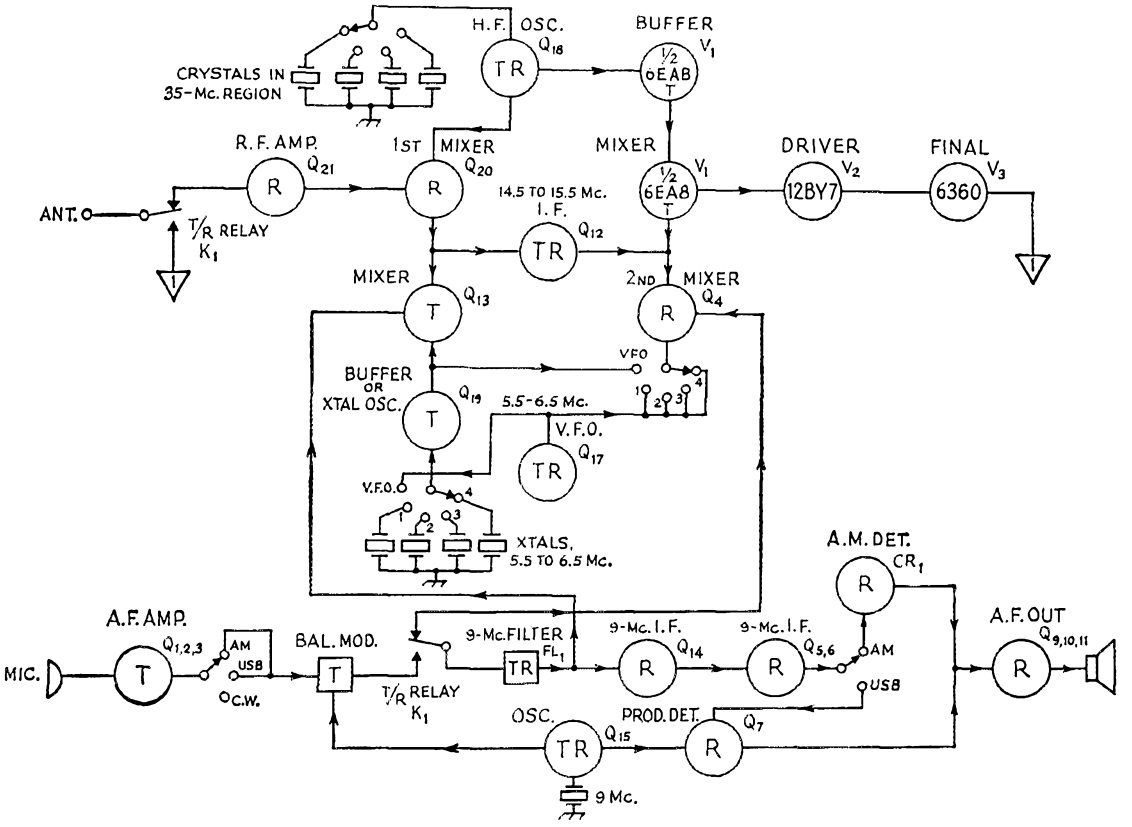
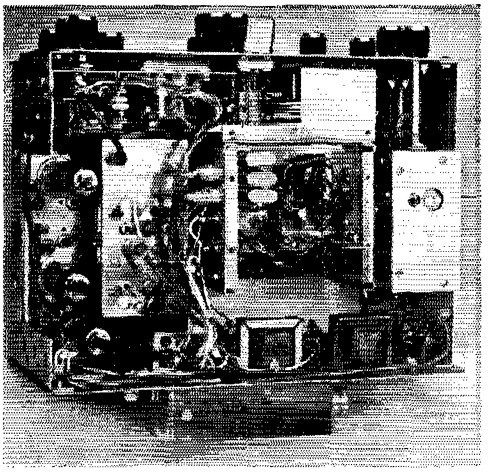


Fig. 1—Simplified block diagram of the Gonset 6-Meter Sidewinder. There are more transistors and diodes than are shown here, as audio stages are not shown individually. Receiving stages are labelled R, transmitting stages T. TR indicates dual-function stages.



Top view of the 6-meter Sidewinder. Operation of the transmitter from the v.f.o. or crystals is selected by a front-panel switch. One crystal receptacle is located on the front panel, and three others inside the v.f.o. sub-chassis. One crystal will provide operation on four 6-meter frequencies as explained in the text. The three tubes at the right are the mixer, driver and final amplifier—the only tubes used in the Sidewinder.

Except for the differences necessarily involved in the lower frequency, the 6-meter Sidewinder is closely related to the 2-meter version, so we will not run through the two pages or so of explanation required to do justice to this latest addition to the Gonset line. The 9-Mc. sideband generator, receiver i.f. and audio sections, the v.f.o. and other parts are the same as used in the 2-meter model. Re-reading the discussion of the Sidewinder's circuitry in *QST* for March together with Fig. 1 will explain the unit fully. — *W1HDQ*

Gonset Sidewinder 6-Meter Transceiver, Model 910A

Height: 5½ inches.
Width: 9½ inches.
Depth: 9 inches.
Weight: 11 pounds; power supply 13½ pounds.
Power requirements: 12.6 volts at 8 amps. max., 115 volts a.c., 100 watts. A.c. and d.c. supplies are separate units.
Price Class: $400, A.c. supply $68, d.c. supply $80.
Manufacturer: Gonset, Inc., 1515 S. Manchester Ave., Anaheim, California

Hamfest Calendar

Alabama — The Huntsville ARC will be host to the annual North Alabama Hamfest which is to be held at the Community Center in Big Spring Park on Sunday, August 15, 1965. Contests, dinner and entertainment for both children and adults are planned. Reservations at a local motel are available. For further information, contact William C. Probus, WA4DBQ, 2607 Woodview Dr., S.E., Huntsville, Alabama 35801.

British Columbia — The British Columbia Amateur Radio Association will hold its annual picnic at Bear Creek Park, North Surrey, Sunday, August 22.

California — The Marin and Tamalpais Radio Clubs will hold a joint picnic at Mortons at Kenwood, on August 15.

Delaware — August 15 is the date for the Delaware Hamfest. In case of rain, the date will be August 22. Place is Wheelers Park, Harrington, Delaware. Tickets in advance, $1.50, $2.00 at the gate. Tickets and information from Pete Robinson, K3OCI, 304 Kesselring Ave., Dover, Delaware 19901.

Idaho — The WIMU Hamfest will be held at Macks Inn, Idaho (20 miles south of West Yellowstone) on August 6, 7, and 8. Activities will include mobile hunts, demonstrations, home-brew equipment contests and activities for the women and children. Information from P.O. Box 276, Providence, Utah 84332.

Indiana — The Tri-State Amateur Radio Society of Evansville, Indiana will hold its 18th Annual Hamfest on August 29, at Ecco Valley recreational area, Highway 460, west of Evansville. Bar-B-Q chicken dinners available at site, entertainment for the ladies and kids, mobile and c.w. contest. Advance registration is $2.00, $2.50 at the gate. For more information write Jack Young, K9LAU.

Indiana — On Sunday, August 15, the D.A.R.A. will hold its 8th Annual Hamfest from 1000 to 1500 EST in Delaware County Lions Club Fairgrounds, Muncie, Indiana. Bring the family, entertainment for all, lunch available, advance registration is $1.00, $1.50 at the gate. Monitors on 50.4 Mc. and 3910 kc. Contact Gilbert T. Rager, W9BZI, 1407 May Ave., Muncie, Ind.

Kansas — The annual Kansas-Nebraska Radio Club Hamfest will be held August 29 at the National Guard Armory, Concordia, Kansas. Registration at 9:00 A.M. Talk-in on 3920 kc. Games for the XYLs and harmonics. Covered dish luncheon at noon. Free coffee and pop. MARS meeting at 1:00 P.M. More details from Fred Young, WØLMS, 616 west 10th, Concordia, Kansas.

Kentucky — The Henders on ARC is planning to hold its annual Hamfest at Henderson, Kentucky, August 8, at the Audubon Raceway Park. There will be a laser exhibit, Telestar exhibit, communication satellite exhibit, and a direct hook-up with the NORAD base for reports on the latest UFO sightings. For details, write Larry Yates, WA4PMA P.O. Box 83, Henderson, Kentucky 42420.

Massachusetts — The Six-Meter Mobileer Club is holding its Fourth Annual Jamboree Sunday, August 8, at the Weymouth Fair Grounds, Weymouth, Mass. Tickets are $1.50 at the gate. Details from K1MAK, P.O. Box 94, Wollaston, Mass. 02170.

Minnesota — Picnic reminders from the Minnesota area. For more details, check with the sponsoring clubs: Duluth ARC, August 1, St. Cloud ARC, August 8, and Minneapolis ARC, August 15.

Missouri — The Zero-Beaters ARC will hold its annual Hamfest at the City Park in Washington, Mo., on Sunday August 1. Information from Kenneth Fleer, WAØBSZ, R.R. 2, Box 231, Washington, Mo. 63090.

Nebraska — The annual Kansas-Nebraska Radio Club Hamfest will be held August 29 at the National Guard Armory, Concordia, Kansas. Registration at 9:00 A.M. Talk-in on 3920 kc. Games for the XYLs and harmonics. Covered dish luncheon at noon. Free coffee and pop. MARS meeting at 1:00 P.M. More details from Fred Young, WØLMS, 616 west 10th, Concordia, Kansas.

New Jersey — The Burlington County Radio Club plans to hold their annual picnic on August 14 at the home of W2RQC, Jobstown, New Jersey.

New York — The NYSPTEN will hold its picnic on August 21 at Thatcher State Park near Albany, N. Y.

New York — The Hamfest and Picnic of the FLIRC will be held at Hempstead Town Park, Point Lookout on August 28. There will be auctions, contests, displays, etc. Plan an outing for the entire family.

Ohio — The W8VTD 8th Annual WARA Hamfest will be held Sunday, August 29, at the Newton Falls Community Center, Newton Falls, Ohio. Exhibits, movies, shop and swap, and good food. Mobile check-in frequencies are 28.8 Mc., 50.5 Mc., and 145.3 Mc. Bring the family.

Pennsylvania — The South Hills Brass Pounders and Modulators, Pittsburgh, Pennsylvania will hold its 28th Annual Hamfest at St. Clair Beach Pavilion, Route 19, south of Pittsburgh on Sunday, August 1. Details from Irwin I. Tryon, W3WFR, 1500 Trotter Dr., Pittsburgh, Pa.

Pennsylvania — The Pack Rat's 10th Annual Family Day and Picnic will be held on Sunday, August 8 (rain date August 15), at Fort Washington State Park, Flourtown, Pa. Fun, games and free soda. Registration is $1.00 per family, no advance registrations. Talk-in frequencies are 145.2 and 50.2 Mc. starting at 9:30 A.M. Bring your food and family. Further information from Francis Brick, W3SAO, 821 W. Lindley Ave., Phila., Pa. 19141.

Tennessee — The Bristol Hamfest will be held on Saturday afternoon and all day Sunday, August 14 and 15 at the American Legion Park, Bristol, Virginia. Registration is $1.00. Luncheon facilities are available. Write Bristol ARC, 213 Stafford St., Bristol, Tenn. 37622.

Texas — The first Annual Texas Wide-Band F.M. Picnic will be held at Zilker Park in Austin, August 8. Call-in on 52.525 and 146.94 Mc. For information write W5NFC, 2024 Ford St., Austin, Texas.

Texas — The Dallas ARC is sponsoring the Annual Big-D Hamboree on Saturday, August 28 at Holiday Inn Central, 4070 N. Central Expressway, Dallas, Texas. Registration is $2.00. Pre Hamboree party Friday night. For further information write DARC, P.O. Box 30532, Royal Lane Station, Dallas, Texas 75230.

Virginia — The Shenandoah Valley ARC will hold its 15th Annual Banquet and Hamfest at Winchester, Virginia on July 31 and August 1. Steak banquet is Saturday, July 31 at 7:00 P.M. Price is $3.00 per person in advance, $3.50 at the door. Banquet will be at the Lee-Jackson Restaurant on Route 50, one-half mile east of Winchester. Hamfest on Sunday at the Virginia National Guard Armory, Winchester. Registration $1.00. Information or advance banquet tickets from George B. Ritter, W4UGX, P.O. Box 139, Winchester, Virginia 22601.

Virginia — The Black Diamond ARC Ham Picnic is August 29 at Bluefield City Park.

Virginia — The Bristol Hamfest will be held on Saturday afternoon and all day Sunday, August 14 and 15 at the American Legion Park, Bristol, Virginia. Registration is $1.00. Luncheon facilities are available. Write Bristol ARC, 213 Stafford St., Bristol, Tenn. 37622.

OPERATOR OF THE MONTH

Have you thought back over the past month and picked out your nomination for "operator of the month?" Considerations to bear in mind include a clean signal, good keying, careful enunciation, correct procedure, judgment and courtesy. The League's Operating Aid No. 11 lists further examples. Send your vote for "Operator of the Month" to the ARRL Communications Department, 225 Main St., Newington, Conn. 06111.

During June the following additional amateurs were nominated in recognition of their extra skills and courtesies:

WB2MKD	WA6HYU
K3BFF	W8RVZ
WA4NGZ	K8TPF
K4RHL	WNØJTI
WN4YKC	WØSJM/4
W5LDH	GW6YQ
WN5MKS	PY2CQ
W5RU	PY2SO
VR2DK	

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

There's a disturbing tendency for the new breed of new U.S. ham to get himself an FCC license before he gains a listening acquaintance with the amateur bands. The transceiver boom is helping this along. Such a newcomer will make out okay if he's real ham material but he embarks on his amateur career under handicap. Much like a ball player with a good swing who hasn't yet learned to field, this unfortunate fledgling hasn't yet learned to listen.

Listening proficiency is no cinch to attain. It's more than a matter of mere intent and the expert trimming of receiver controls. An accomplished listener, given a headset full of hashy noise, may extract meaningful signals beyond the notice of rookie radiomen. ("Which station are you reading?" asks the young and eager Field Day logger at the 40-c.w. position. "All three," replies the old-timer, patiently.)

Some overseas licensing authorities, particularly in the Eastern bloc, insist on short-wave listening experience before issuance of transmitting privileges. This is old-fashioned — American hams regularly came up through s.w.l. ranks in the 1930s — but operators heard from those countries seem to know their way around right off the bat. It's hard to spot a beginner. The system may be a traditional hold-over but they seem to thrive on it.

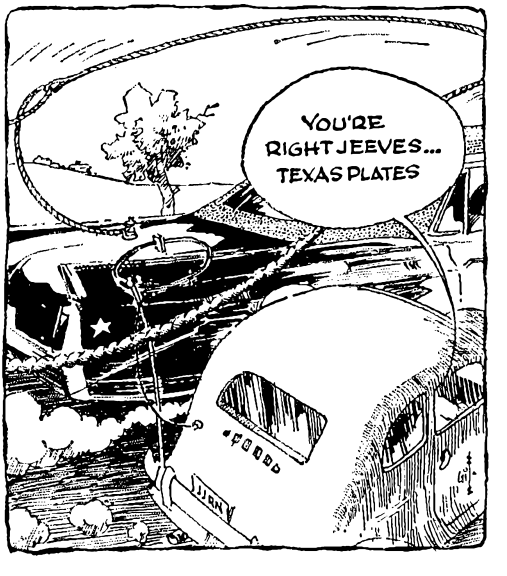
Short-wave listening in our country and much of the world is no longer a well-worn stepping-stone to hamdom. Our s.w.l.s often are attracted to amateur radio and become FCC grads in time, but there's a large batch of listeners who find themselves sufficiently entertained just by receiving. They're dedicated, enthusiastic and skillful. Many of them copy c.w. and almost all are avid propagation students. They know their way around our bands and other ranges much better than a good many FCC licensees. Intercept is their specialty and they're good at it.

Bona-fide s.w.l.s are more numerous now than ever despite such new and varied lures as CB radio and TV-watching. This is easily confirmed by scanning a few of the many current s.w.l. publications. They tend to specialize their monitoring; some stick to the ham bands, others prefer ship frequencies, etc. The term short-wave listener also loosely includes hobbyists who practice intercept on other frequencies. Thus we note in Newark News Radio Club's *Official Bulletin* (Vol. 31, No. 6) that 64-year-old Mr. Tyndall of Vermont has verified reception of some 6400 stations in 154 countries on the standard broadcast band. Listener Holbrook of Maryland, 36, has only 2140 confirmations from 82 BC-band countries but then he's a comparative beginner. Furthermore, he spends some of his intercept time on lower frequencies where he has collected 1076 verifications from stations in 42 countries on *long wave*. That, fellows, is DXing.

Most radio amateurs tend to look down on the short-wave listener as a dilettante sportsman with interests necessarily more shallow than their own. This generalization is a mistake. We do hope each one will eventually join our ranks as a transmitting amateur. They're superb ham material. Meanwhile we're glad to consider s.w.l.s and their venerable institution firm friends and supporters of amateur radio. After all, they, too, are *amateurs*.

What:

Summer short-skip conditions have made every DX band sound like 40 meters, often far into the night. Plenty of DX in there, too, if your receiver and eardrums can handle those locals. We'll give the "How's" Bandwagon a midsummer layover this month but we'll subsequently deal with the generous reports of (20 c.w.) **Ws** 1BDI 1ECH 3HNK 7DJU 7VRO 8TRN 8YGR 8ZCQ, **K5**MHG, **WAs** 2WIJ 2WOR 4KXC 4QBX 5EID 5IIS 5IPM 5JEY 6JOT 6VAT 9AQE 9BGK 9FMQ, **WBs** 2NLH 6CWD 6FRP 6ITM 6MEQ 6MWY, **KA**2TP; (20 phone) **W8**ZCQ, **WAs** 2WIJ 2WOR 4QBX 4SRS 5IIS 5IPM 6VAT 9BGK, **WB6**CWD, W. P. Kilroy, L. Stewart; (15 c.w.) **Ws** 1BDI 1ECH 3HNK 7DJU 8YGR 8ZCQ 9RCJ, **Ks** 1QGC 5MHG, **WAs** 2WIJ 3AZI 4HVC 4KXC 4QBX 4SQI 4SRS 5EID 5IIS 6JOT 6TGH 6WTD, **WBs** 2JGI 2LDX 2LSV 6FRP 6KBN; (15 phone) **Ws** 3HNK 8YGR 8ZCQ, **Ks** 1QGC 6OVF, **WAs** 2WIJ 4KXC 4QBX 4SRS 5IIS 6JOT 6VAT 6WTD 9BGK 9GZH, **WBs** 2LDX 2MJD 2NHX 6CGL 6CWD 6LCS; (40 c.w.) **Ws** 1BGD 1ECH 3HNK 6TYM 7DJU; **Ks** 1MJC 5JVF 8YSO, **WAs** 2FUL 3AZI 4KXC 4OYX 4SQI 5EID 5IPM 6WTD 8IJI 9BGK,



* 7862-B West Lawrence Ave., Chicago, Ill. 60656.

WBs 2CUU 2JGI 2LDX 2MJD 2NLH 6KPN 6KVA 6MOS, KA2TP; (40 phone) WAs 4OYX 9BGK, WB6MOS; (80 c.w.) Ws 1BGD 7DJU, K5JVF, WAs 8IJI 9IXF; (75 phone) WA7AVI; (10 phone) WAs 4QBX 5IIS 9BGK; (10 c.w.) K5MHG, WA5IIS; (15 and 40 Novice), WNs 1CGB 2OLD 2PFD 3BSV 5KYH 7BOA 7BOB 9NSR and ØKDS, plus reports rolling in meanwhile. Say, who's going to claim the first 28-Mc. WAC of the new solar-cycle upswing? Will it be this year?

Where:

ASIA — KA2TP summarizes, "Some time ago I told you we were conducting a QSL-habit survey among KA stations. The inquiry was mailed to 117 KAs. Self-addressed stamped postcards were returned by 48 stations, only 41 per cent. Twenty-two reported that they QSL 100 per cent, 19 only on receipt of cards, 2 only when requested, and the remaining 5 reported varying degrees of lesser action. If we assume that those who didn't take the trouble to check and return the postcards also don't QSL, we conclude that 20 per cent of KA stations QSL 100 per cent, and another 20 per cent upon receipt or request. I don't know how this 40 per cent compares with other groups, but we aren't satisfied. FEARL is doing all it can to remind the boys that there's a lot of interest in their QSLs and to encourage them to improve the KA reputation. Club stations, of course, are a special problem because casual operators may not have the same interest in receipt or issue of QSLs that personal-station operators have, or should have." . . . . . Slight but required change in the Iran bureau address — make it Amateur Radio Society of Iran, ARMISH/MAAG, APO, New York, N. Y., 09205. EP2DS (W9AUM) writes ARRL Assistant Secretary W1ECH, "Having just taken over the duties of QSL manager, I find many cards for amateurs who have returned home. If ex-EP2s AC AF AM AO AY BB BD BE BH BK BL BM BN BO BR BS BY MR NM RK RS RU RY SM SX and VS will send me self-addressed stamped envelopes I will forward their deserved QSLs." . . . . . W9LNQ discovers, "The power of the press really works. Got my JT1CA card from W7VRO who read my 'help!' squib. Dick has over 2000 such QSLs left and will respond to s.a.s.e." W7VRO confirms this, specifying JT1CA QSOs between May, 1963, and March 1, 1964. W7MX hints that VE7ZM may be able to help confirm some JT1CA QSOs not listed in W7VRO's records . . . . . W1ECH fears for the safety of K1RAN because HZ3TYQ's QSL aide, W1RAN, doesn't appear in the latest *Callbooks*. It's Ned Raub, W1RAN, 207 Thames St., New London, Conn., and make it a *large* s.a.s.e. . . . . The *DXpress* of Holland's VERON says DL8AX lacks logs from VA1BW after March '64, also that an OD5 bureau is active again — RAL QSL Bureau, P.O. Box 1217, Beirut, Lebanon.

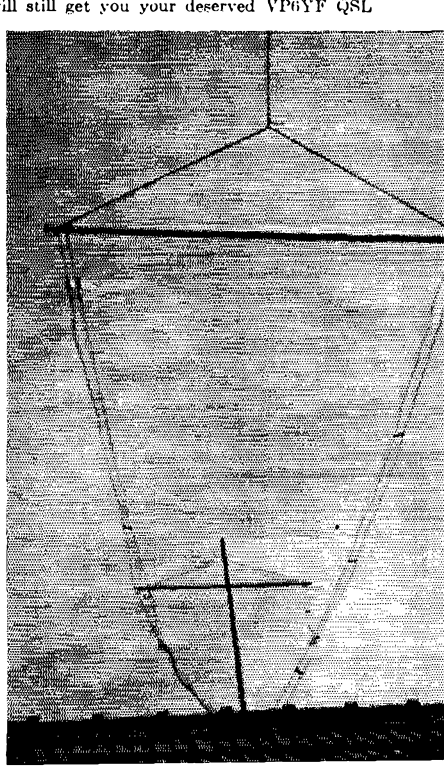
AFRICA — CR6GO, QSL chief for Angola's LARA, clarifies, "We have been receiving many cards for CR8s AB AF, etc., but we do not correspond with these stations; try REP, Lisbon. Likewise for CR4 and CR5 stations. They are not LARA members so we must forward their QSLs to REP." . . . . . W1WPO of the ARRL DXCC Desk says W7ZMD will continue as QSL manager for ex-ZD8BB to take care of stragglers. It's always difficult to close those books . . . . . ZD8HL writes, "I prefer QSLs via W2CTN rather than via the Patrick AFB address. They must be sent back to Jack anyway, a two- or three-week delay." . . . . . "I have TL8SW logs on hand through May of this year," reports W1BPM. "QSLs for TL8SW sent to the ARRL bureau or otherwise unaccompanied by s.a.s.e. or equivalent will not be answered." Dick recently relayed a batch of ZS8E and ZS8H QSLs to branch bureaus. If yours doesn't show in due time try W1BPM with s.a.s.e. . . . . K9ECE, QSL charge for CT3AQ, hopes for tighter liaison with that station so he can deliver faster goods. Meanwhile, patience . . . . . QSLs should not be sent to 6O6BW's Somalia address for QSOs dated after May 28, 1965. They go to W4HKJ instead. Bill also holds 6O6BW logs for the period January 5, 1964, to April 17, 1965.

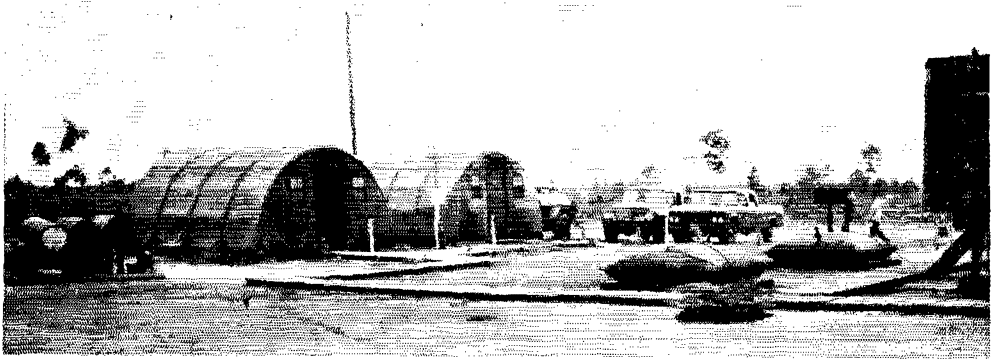
OCEANIA — "The radio station on Johnston island that acts as QSL bureau is KJ6BZ," states USAF T/Sgt E. Cousert, MARS director on the scene, in lines to W1ECH. KJ6BZ's current address appears in the listings to follow . . . . . K9ECE understands that FO8AG will bring him up to date with more log material upon return from a Hawaiian vacation . . . . . Ex-VR2ES, now ZL3WM, tells WB6GFJ that mail service in the Pacific leaves much to be desired. WB6GFJ writes, "Those still awaiting QSLs from VR2ES can ship theirs via me, and George will be sure to take care of them." . . . . . K6SDR, who signed KG6AAY in 1963-'64, tells W1DGT that "KG6AAY/p" is unknown to him and most probably a woodwork dweller . . . . . W8YGR took a hint from "How's", wrote to ZL2OY, and now is the proud possessor of a QSL confirming a three-year-old VR5AA contact . . . . . Better mark your *Callbook* carefully before extracting addresses, especially if your bifocals are steamed up. W1VG finds K3KTY receiving a flock of misshipped KG6IG cards that should go to W3KTY. We still urge that venerable and indispensable ham directory to group FCC calls by prefix, not suffix . . . . . "VK3TL ran out of VK9TL cards," reports VERON's *DXpress*. "New stock will come from the printer shortly and then the backlog will be cleared."

EUROPE — W1WPO is told by ON4QX that QSLs for 1956 ON4QX/LX contacts, also those for 3A2CZ of 1961-'62, and LX3QX, should be addressed P.O. Box 331, Antwerp, Belgium, % ON4QX. No International Reply Coupons are required . . . . . VERON has it that ON8 calls are issued to amateurs visiting Belgium . . . . . ONs 4FU and 5DO, on a midsummer Monaco maneuver, want cards for 3A0 work sent to their home addresses. Companion ON4QJ prefers his via W2CTN. They may also sign FØ calls on the way home, same QSL instructions.

HEREABOUTS — K8YUW/1, on duty at Davisville with K1NAP, wants ex-KC4 antarctic personnel to claim their QSL receipts. "We have cards in tile that go back to the 1950s. The operators who made these contacts never stopped by to pick up their cards, nor have we been advised where to send them." Observe in the *Callbook* that KC4AA-type stations and Navassa KC1s are *not* QSLd via K1NAP . . . . . K8YUW/1 also points out that the call KG4AE is used by a stream of amateurs on temporary MCB duty at Guantanamo Bay. If you work that station and desire a QSL, check carefully with the operator for specific QSL instructions. Otherwise your pasteboard will probably just pile up as unforwardable. Same goes for any multioperator DX station you work, for that matter . . . . . K9ECE is happy to state he's right up to date with HKØQA QSLing . . . . . S.a.s.e. to WA4KXC will still get you your deserved VP6YF QSL

HL9KB (W4RXP) is an old Korea hand regularly workable at 1130–1300 GMT on 20 c.w. Al feeds 100 watts into that ZL Special beam and receives with an R4. HL9KB's 1962 layout appeared in October QST of that year.



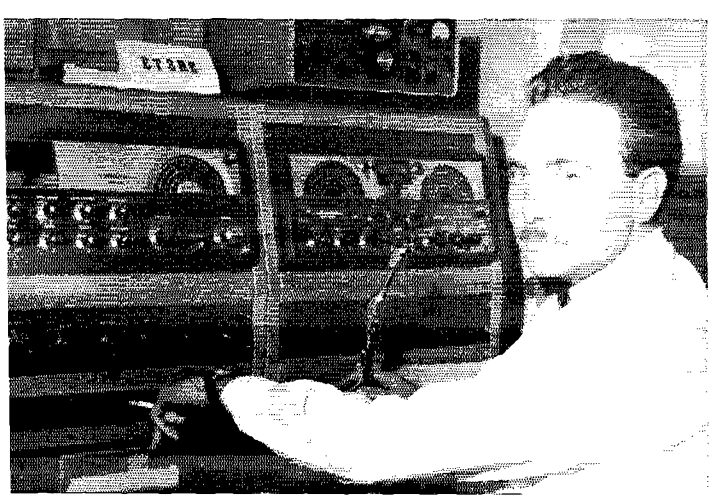


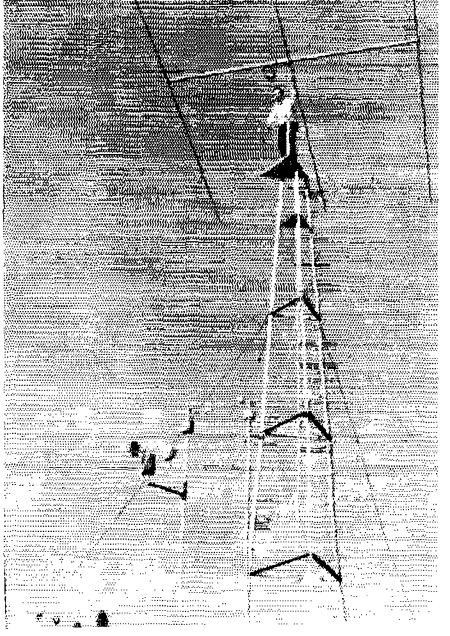
HS1FJ, active on 14- and 21-Mc. c.w. from Thailand, a country still off limits for W/K/VE/VO QSOs due to ITU/FCC ban status, radiates from Korat, northeast of Bangkok. Operator K6DGW/KLETK uses a KWM-2A and dipole in the B-2 hut at left, powered by a 300-kw. diesel generator in the hut at right, favoring 20 or 15 c.w. almost daily at 1300-1700 GMT. Fred writes, "I'll be in and around Thailand for the next 19 months so I certainly hope that the ban can be lifted during this period to give me a chance to provide a new country for the gang."

. . . . . YS1O no longer handles the El Salvador bureau. YS1IM gives W1ECH this new address: CRAS, P.O. Box 517, San Salvador, El Salvador . . . . . W1BPM discovers that IRCs are not convertible in Jamaica . . . . . "PJ2MI will forward logs every two weeks, and QSLs will then go out promptly," *assures VE3EUU*, Jose's new QSL agent. Bert requests the customary s.a.s.e., or s.a.e. with IRC, plus strict adherence to GMT QSO reference . . . . . U. S. fours and sevens should take note that their local ARRL Bureau QTHs have changed since the *June '65 QST* listing . . . . . WB6CWD salutes OE3PWW for the prettiest QSL of the month and wishes all amateurs would adopt *cards no larger than* 3¾ *by* 5¾ inches . . . . . Hot s.w.l. tip from L. Stewart: WWV *does* QSL . . . . . Our "QSLers of the Month" are BV1-USA, CO8CO, CR4BB, CT1GE, DJs 6HE 7HZ 9LJ/M1, DL9PU, EP2RC, Fs 8VJ 9YP/FC, FG7XT/FS7, FL8RA, Gs 3AWZ 3FKM 3HWO 3IYP 3NOF 4PX, GD3HQR, HBs 9MQ ØZT, HI8XAL, HP1IE, HR2SY, I1s BGH TAR, JT1CA, Ks 3SWW/KG6 7TRG, KA2DF, KG4AM, KL7EN, KM6BI, LU1DAB, OA4s AO OS, OD5s AI BL, *OE5CA, ON4TC, OY1R*, SMs 5LL 7TE, SP8HR, TF3AB, TGs 7SS 8IA 9RH, VE0NM, VKs 2QK 7SM 9NT, VPs 1WY 2AX 4LE 7DJ 7NS 7NY 8IJ, *VS6FO*, YU2LE, Ws 1TS 3AG 3KB, WAØs GQI LDK, XE1HE, YA4A, YU3AT, YV5s BNR CEY, ZDs 5M 8HL, ZLs 1CA 1HW 2AMH, 4S7DA, 4U1ITU, 5A5TR, 5W1AZ, 6O6BW, 6Y5FH, 7Q7PBD, 7Z3AB, 9K2AD, 9G1FK, 9M6LX, 9Q5s PA and RB, all applauded for rapid QSL service by "How's" correspondents W8s TRN YGR, Ks 1QGC 3SLP ØFPC, WAs 3AZI 6VAT 8DXW 9BGK, WBs 2NLH 6CWD 6MEQ, KA2TP, ON4ZY and L. Stewart. QSL aides Ws 2CTN 2GHK 3HNK 4HKJ 6BCT 7ZMD 8HCP 8NGW 8ZCQ, Ks 2CWQ 4KMX 5AWR 8TBW 9BTU, WAs 2WUV and 6WTD also receive honorable mention. Any prompt pasteboard producers you'd like to see saluted here? . . . . . *Help!* W1BPM has no QSL luck with *CE2AW, ZS9G*; WA4QBX likewise with EA9EO, 7X2DU; WB9BGK gets no results from CE9s AB AN, KC4USB, ZS4KJ, 6Y5LK/VP5; *ON4ZY yearns for* cards from CT2BO '63, ET2US's Jack '62, KC6BO's Dale '63, PX1OAC (F7OAC), VS1FJ '63; PY2BGL is frustrated by ST2AR and TC3ZA both '63. Can you clew 'em in? . . . . . K7YDZ adds his call to the list of those *who would* be glad to serve needful overseas DX stations as QSL managers . . . . . Let's check individual recommendations now, keeping in mind that each item is necessarily neither "official", complete nor accurate. . . .

AP2AD, Ahmed Ebrahim, Telecom. Engr., SUI Northern Gas Pipelines, P.O. Box 91, Multan, W. Pakistan
CE8CM, Casilla 777, Punta Arenas, Chile
CO2LW (via ANRAC)
CP8AU, C. Greene (K2DGD), Casilla 64, Riberalta, Beni, Bolivia
CT2AL, c/o Portuguese Airways, Lages, Azores
CT3AQ (via K9ECE)
CX8AAW, P.O. Box 286, Montevideo, Uruguay
DJ0NE (*to* W4PC)
EA3OT (via WB6BSJ)
EA6BC, P.O. Box 34, Palma de Mallorca, Balearic Islands
F7GM, Box 3203, APO 10, New York, N. Y.
FK8BH, P.O. Box 637, Noumea, New Caledonia
FL8AK, (via W7TDK)
FL8RA, A. Rotger, B.A. 188, Djibouti, Fr. Somaliland (or via REF)

ET3RS collects a lot of 14-Mc. DX from Addis Ababa with that rotary yagi when time away from United Nations duties permits. Max signs HB9RS back home. (Photos via W1ECH)

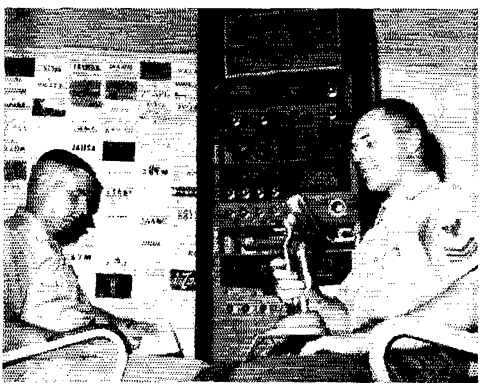




4X4TP, only 16, especially enjoys QST's notes on the activities of youthful ARRL members. Tsvi has worked 171 countries and plenty of W/K/VEs on 15 and 20 since obtaining his license in '63. 4X4TP prefers the home-brew approach to ham gear, an increasingly rare attitude among newcomers. (Photos via WB2KUP)

FO8AG (via K9ECE)
FP8CM, A. Desmueles, VE2AFC, Box 382, Quebec 4, P. Q., Canada
FY7YL, P.O. Box 267, Cayenne, Fr. Guiana
GB3RRC (via RSGB)
HI8JBR, Casilla 321, Santiago, D.R.
HK0OA (via K9ECE)
HR1HZY (via WA5CNP)
HS1F (via DJ7LD)
HS1FJ (via WA6QJY)
HS1HS, P.O. Box 2008, Bangkok, Thailand
JA1PAQ, S. Mitsumata, 3-10 Tamagawa Yogamachi, Setagaya-ku, Tokyo, Japan
JY1AU (to W8IIMI)
K7TJC/KJ6, c/o MARS, APO, San Francisco, Calif., 96305
KB6EPN, C. Preece, 2049 St. Louis Dr., Honolulu, Oahu, Hawaii
KH6FBJ/KH6 (to KH6FBJ)
KH6FHE/KJ6, R. Chong, 2565 Lynnwood St., Apt. 19, Las Vegas, Nev.
KJ6BZ, c/o MARS Stn., Det. 1, 1957th Comm. Gp., APO, San Francisco, Calif., 96305
ex-KR6OF (to W5HEF)
LA2QJ/p (via NRRL)
LA5CI/p (via LA1NG)
LA5ZJ/p, c/o Norwegian Embassy, Reykjavik, Iceland
LA8FI/p (via NRRL)
LX0s AA AB (via W2CTN)
MP4BFH (via RSGB)

KG6ALU, formerly KG6GX, is club station for Navy personnel attached to the transmitter station at Barrigada, Guam. WA6LED (left) and W8HIB are shown trying a little 20-meter sideband although most of the station's activity takes place on 7- and 14-Mc. c.w.



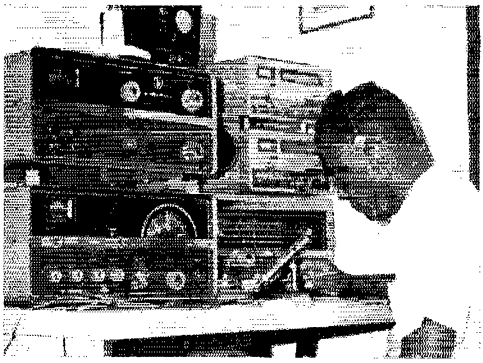
ex-MP4QB-BDT-TAU-MAO, VK4QD, 5A5TA (to OD5EE)
OD5EE, J. Garrett (W5LAK), P.O. Box 3, Beirut, Lebanon
OX3UD (via W2CTN)
OY2GHK (to W2GHK)
PJ2s CJ MI (via VE3EUU)
PJ3CD, P.O. Box 82, Curacao, N. Antilles
ex-PK5LK (to WB6OYJ)
PY2GFK (via LABRE)
TF2WJF (to W4PVI)
TG9EP (via W9HOG)
TI2WD/8, R. Madriz, P.O. Box 346, Puntarenas, C.R.
VK9AG, A. Nunn, Box 112, Rabaul, T.N.G.
VP2KL, Hammarlund DXpedition, Box 7388, GPO, New York, N. Y., 10001
VP2SRC, P.O. Box 142, St. Vincent, B.W.I.
VP5NF (via VP5RH)
VP6YF (via WA4KXC)
ex-VQ6GM-VS9ASM-VS9PGM-6O2GM (to G3BYM via RSGB)
VR1B (via VK2EG)
ex-VR2ES (via WB6GFJ)
VR4CR, A. Carter, c/o Weather Officer, Honiara, Solomon Islands.
VS5MH (via WA2WUV)
W1RCQ/KH6 (to WA4IKU)
W2IEV/mm, USNS *Twin Falls*, P.O. Box 4036, Patrick AFB, Fla.
W2ZIA/ZK1 (to W2ZIA)
W5MGU/ZK1 (to W5MGU)
WA4IKU/KH6 (to WA4IKU)
ZB2AM, M. Matthews (G3JFF), CPO Mess, HMS *Rooke*, Gibraltar
ex-ZC5DO (to 9M4DO)
ZD7IP (via RSGB)
ZD8s BC HL (via W2CTN)
ZD8PI, H. Austin (WØPI), 279 Hoole Ln., Chester, England (or via ISWL)
ZP5AZ, c/o U.S. Embassy, Asuncion, Paraguay
4W1G (to HB9NL)
4W1I (to HB9TB)
5N2AAC (to G3PCY)
6Y5XG (via G8VG)
7X2AH (via WA4STL)
9E3USA-9F3USA (to ET3USA, via W7TDK)
9M2EF, (via W7TDK)
9U5MV, B.P. 75, Usumbura, Berundi
9X5MH (via DL1ZK)

Your benefactors for the preceding catalog: **Ws** 1BDI 1ECH 1VG 1WPO 6NJU 6TYM 7VRO 8YGR 8ZCQ, **Ks** 1MJC 1QGC 6GIL 9QIE, **WAs** 3AZI 4OYX 4QBX 4WIP 5EID 5IIS 8DXW, **WBs** 2NLH 6CWD 6MEQ 6MWY, KA2TP, ON4ZY, Columbus Amateur Radio Association *CARAscope* (W8ZCQ), DARC's *DX-MB* (DLs 3RK 9PF), DX Club of Puerto Rico *DXer* (KP4RK), Far East DXploiters *Bulletin* (JA1BN), Florida DX Club *DX Report* (W4LVV), International Short Wave League

Monitor (12 Gladwell Rd., London N. 8, England), Japan DX Radio Club *Bulletin* (JA1DM), Long Island DX Association *DX Bulletin* (W2FGD), Newark News Radio Club *Bulletin* (L. Waite, 39 Hannum St., Ballston Spa, N. Y.), North Eastern DX Association *DX Bulletin* (K1SHN, W1BPW), Northern California DX Club *D Xer* (Box 608, Menlo Park, Calif.), Ontario DX Association (VE3FXR), Puerto Rico Amateur Radio Club *Ground Wave* (KP4DV), VERON's *DXpress* (PA0s FX LOU VDV WWP) and West Gulf DX Club *DX Bulletin* (W5IGJ). Is it your turn to slide some scoop along?

Whence:

EUROPE — DARC (Germany) invites amateurs throughout the world to participate in its WAE DX Contest, No. 11 in the series, scheduled for c.w. from zero GMT, August 14th, to 2400 the 15th, and phone on September 11th–12th, same times. Non-Europeans will trade RST001, RST002, etc. (no "T" on phone, naturally) with Europeans once per band at one point per QSO. Additional points are yours by sending "QTC" (QSO reports) to European stations at one point per QTC. Each QTC consists of (1) time in GMT, (2) station call, and (3) QSO number of any previous WAE Test contact. For example, W9HPJ raises DL9YL and earns a contact point thereby; W9HPJ previously worked G2IDG at 1207 GMT for G2IDG's 96th Test QSO. So, besides the QSO point for his serial swap with DL9YL, another point goes to W9HPJ if he successfully sends "1207/G2IDG/096" to DL9YL. W9HPJ can work DL9YL later on the same band only for transmitting additional QTC. Over the entire Test period each QTC can be sent to Europe by W9HPJ but once, and DL9YL can accept no more than 10 QTC per band from W9HPJ. It thus figures that the more Test QSOs accumulated, the more QTC are available to parlay into additional points. *Scoring:* Multiply combined QSO and QTC points collected on all bands by the combined numbers of multipliers collected on all bands, the latter deriving from DARC's Worked-All-Europe Countries List — CT1 CT2, Germany, Spain, EA6 EI F FC G GC GD GI GM, Shetlands, GW HA, Switzerland, Liechtenstein, HV I IS IT, Norway, Bear isle, Jan Mayen, Spitzbergen, LX LZ, San Marino, OE OH OHØ OK ON OY OZ, Holland, PX, Sweden, SP, Greece, Rhodes, Crete, European Turkey, TF UA/UV/UW1-6 UB/UT/UY5 UC UN UO UP UQ UR, Franz Josef Land, YO YU ZA ZB2 3A2 and 9H1. Entries go to Dr. H.-G. Todt, DL7EN, Chlodwigstr. 5, 1 Berlin 42, Germany, postmarked no later than September 15, 1965 (c.w.) and October 15, 1965 (phone). Top Test performances in many regions will be rewarded with certificates of merit. Gluck! . . . . . C.w. results for the 10th WAE DX Test turned up these U.S.A. call area champs: K1HVV, Ws 2JAE 3WJD 4KXV 5WZQ, WA6SBO, Ws 7ABO 8GQU and 9IOP (no Zeroes applied). VEs 1ZZ 2WA and 3IR led Canadian call areas. Continental highs were recorded by W2JAE, CP5EZ, DJ3KR, CN8GB, EP2RC and VK5NO, while DJ3KR, DL7AA, DJ5BV and DM4YPL ran 1-2-3-4 in Germany. Yank phone leaders by call area are W1BPW, WA2TKL, Ws 3WJD 4RLS 5KC, K6ERV, Ws 7HAD 8GMK and 9TQL (again no Zeroes). VE8RG paced Canadian entries. Continental voice honors go to W3WJD, DJ6QT, YV5BPJ, EA8CR and VS1LP with Oceania unreported. DJs 6QT 3WE 2YA and DL7BA scored in that order on the mike home front . . . . . Next month we'll outline procedure for participation in the WADM (E. Germany) DX competition scheduled for the 2nd-3rd of October, a c.w.-only affair, and we'll have details on the 7th Scandinavian Activity Contest sponsored by Norway's NRRL on September 18th–19th (c.w.) and 25th–26th (phone) . . . . . "Having a DX ball as DJØNE on 15 through 80 meters," chortles W4PC . . . . . W4IA, for many years W1UE of ARRL Hq., tells W1BDI he expects another twelvemonth as SVØWAA, Athens.

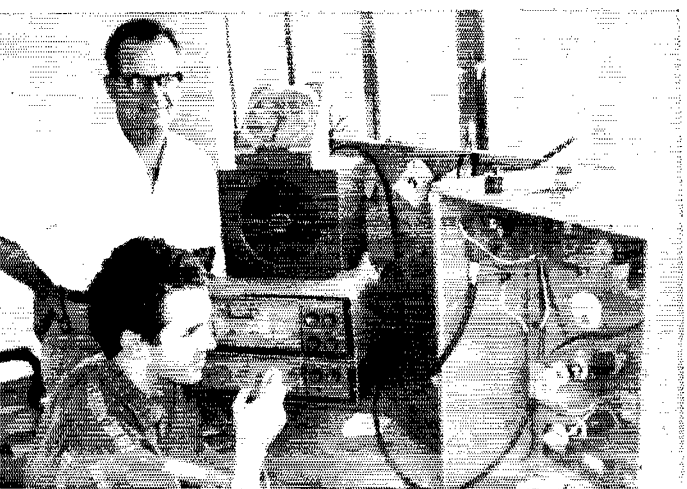


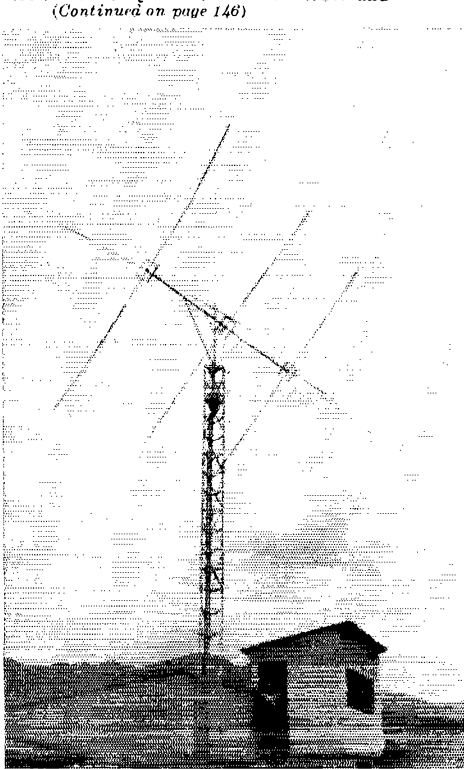
HKØAI still enjoys his rare San Andres DX status with an SX-117, HT-37, HT-41 and a W9TO-style keyer built by friend W4DQS. Vic has added a little weight over the years; compare this picture with that of HKØAI in December 1954 "How's". (Photo via W4DQS)

ASIA — The 6th All-Asia DX Contest, a c.w.-only fracas, gets the DX spotlight on the last week end of this month. Sponsor JARL (Japan) invites world-wide participation from 1000 GMT on the 28th to 1600, the 29th. Non-Asians will work Asians on 1.8 through 28 Mc., exchanging serials consisting of RST plus the operator's age (YLs are gallantly permitted to substitute two zeroes for the latter revealing figure). Final score derives from total contacts multiplied by total band-countries worked. Single-band, multiband, single-op and multi-op categories are available, certificates of meritorious performance will be awarded, and there's a special trophy due the highest scorer on each continent. Entries must arrive JARL Contest Committee, P.O. Box 377, Tokyo Central, Japan, no later than December 30, 1965. A self-addressed envelope and sufficient IRCs to that address will secure instructions on preparation of your contest summary in the preferred form. Good long-haulin'! . . . . . Results of the 5th All-Asia brawl list these top U.S. call-area scorers: Ws 1GYE 2HL 3ZNB 4KXV 5KC, WA6SBO, Ws 8GQU 9IOP and ØEQN; no Sevens or Canadians applied. Continental multiband winners are WA6SBO, EP2RC, DL7AA, PY1MCC, KG6AY and 6O6BN, while homeland district honors went to JAs 1VX 2HO 3AOV 4AO 5FQ 6AA 7AD 8BB 8ACH and

(Continued on page 146)

HK4TA of Medellin is well staffed with OM Raul ably assisted by son Roberto. Their 6146 final is modulated by 807s, the receiver is an NC-400, and that impressive quad works 20, 15 and 10 meters. HK4TA's favorite hangout is just above 14,100 kc.





CONDUCTED BY JEAN PEACOR,* K1IJV

QSL Sure

A radio shack without QSLs? That would be worse than a 60-foot tower with no beam. What can become mere habit as the final touches are added to any QSO by mailing your card of confirmation, may hold far deeper significance for the recipient. Your QSL may be someone's prized possession. This is evident in many radio shacks.

We've all visited shacks where the QSLs used as wall decor held our gaze until the card of a mutual friend was found among them. Radio amateurs rarely pass by such an array without a few sideward glances and what a conversation piece this can be for non-amateur friends. "Never heard of the Canary Islands?" They'll never forget them having asked the question.

There are those who take the time to encase each QSL card as it's received in a protective plastic covering, some use neat files, while others may use leather bound books. Whatever system chosen, one thing fairly certain regarding these QSL cards is that they seldom end up in anyone's attic.

Bearing this in mind, YLs should welcome the following comments received from an interested OM whose number of contacts in the recent YL/OM contest aroused a new awareness relating to YL QSLs. He reports that YL QSLs are better than ever. The trend toward more and more YLs using photo QSLs surprised and delighted him. The majority of cards he received had pictures either imprinted or added by using photo-stamps. That this is appreciated by the OMs, appears to be an understatement.

There's a second trend, however, that was not looked upon quite as favorably. This is the attitude taken by some YLs that if one would like their card, one must send a s.a.s.e. Various reasons have been given for this approach, none of which are too convincing.

To paraphrase an old saying, the original intent of a QSL-card's purpose was to add a final courtesy to an interesting QSO. YL QSLs are better than ever, prized by many, — so, keep QSLing Sure!

Two YLs in Paradise

At the time of writing about WB6DNW in the April column, Marie was thought to be the only YL operator in her community. It's a pleasure to now report that there are two YLs in Paradise, California. Hazel Mallory, WA6AVI, has also been active there for the past four years.

Ever since receiving her General class license and the call W5GCD when she was thirteen years old, Hazel has been an active ham. This was accomplished without anyone else in her family being even slightly interested in amateur radio. She built her own first station, including the receiver, and operated c.w. until her father decided he would like to also listen and helped her purchase a Globe-Scout kit which enabled her to then operate phone.

From her home in Arkansas, Hazel used to talk to Bernie Mallory, W6ECE, who attended school in Compton, California. Following her graduation, she went on to attend California's LaSierra College which allowed her skeds with Bernie to shift from 15 or 20 meters to 75, or person to person. Bernie well remembers visiting her at college one day only to find her climbing over the roof top putting up a new dipole for use with her new homebrewed-sideband rig.

They decided that two stations took up too much room on the bands and relieved the congestion by uniting stations and their lives in marriage in 1958. Bernie was then a freshman at Loma Linda University School of Dentistry. Upon graduation, they settled in Paradise where they now live with their family of three boys.

Hazel is active on the air some part of almost every day on any band from 80 to 2 meters on a.m., s.s.b. or RTTY. Their station received a public service award last year and handles many phone patches for stations in the Pacific. They have found radio a most convenient way to maintain contact from home to car to Bernie's office which is fifteen miles away.

* YL Editor, *QST*. Please send all news notes to K1IJV's home address: 139 Cooley St., Springfield, Mass.

Dr. and Mrs. W. B. Mallory, W6ECE and WA6AVI.

Sadie MacLeod, VE1ANX, shown with one of her two grandchildren, enjoys c.w. and can be found operating every day between 3:30 and 4.30 p.m., usually on 80 meters.

Bernie makes this one observation for any of the young OMs in amateur radio. "If you want peace and tranquility in married life, have your ham station in the family room rather than the garage, request new beams for gifts instead of ties, and marry a ham. It's much better than trying to convert them later!"

Code — It's Everywhere

The following excerpts from a poem by Sadie MacLeod, VE1ANX, of Armdale, Nova Scotia express some thoughts which resulted from her studies for her amateur license in May 1964.

I became a radio ham.
And my mind is in a jam.
All I hear is code, code everywhere.
Many mornings at day's peep,
When I want so much to sleep,
The birds start sending messages out there.

QRS bird! I must copy.
(Wish I weren't quite so dopey)
Relentlessly I force myself awake.
When I gather up my wits,
All I'm hearing is eight dits.
That bird was just correcting a mistake.

Sometime, when I call CQ,
Possibly I'll contact you.
If so, have patience; surely I'll get better?
Anyway, I send my best
88 and all the rest.
Many thanks es hope to CU later.

W8MBI — Memorial Station

The Buckeye Belles have obtained the call W8MBI as a Memorial Station to Marie Helminski who passed away on July 5, 1964.

Marie was licensed in 1952, was a Charter Member of Buckeye Belles and the first Certificate Custodian for their certificate, which she helped to promote.

The Memorial Station will be operated portable at various times from different locations in Ohio. It will also be heard on the Monday Buckeye Belle Net on 3900 kc. at 1230 GMT twice a month during the summer months and on other bands at various times.

Memorial Station QSLs should be sent to the trustee, Ruth L. Rickett, W8LGY, 7390 Sawmill Road, Worthington, Ohio 43085. Contact with this station counts as one contact toward the Buckeye Belle Certificate. QSLs are not required for the certificate, however, W8MBI Memorial Station will soon have QSLs available for those contacting this station.

Feedback

In the March 1965 "YL Column," the captions for the pictures of ZS1NQ, Gwen Smith, and ZS6GH, Diana Green, were reversed. Diana is on the left and Gwen on the right.

YL Club News

Red letter day in Canada

May 19, 1965 marks the start of "The Ontario Trilliums," a newly organized Canadian YL Club and believed to be Canada's first such club. Congratulations and best wishes for success to the following new officers: Pres., VE3BII, Jeanine Burgess (see pix Feb. 1965 column); V. Pres., VE3DGG, Jean Evans; Treas., VE3BBO, Doris Cody; Secy., VE3EZI, Ivy Smythe; Pub. Mgr., VE3FRN, Doris Taylor.

The Harmonies YL Radio Club announces the following newly elected officers: Pres., WB6FKD, Helen Whitcomb; V. Pres., K6AYU, Jo Moise; Secy-Treas., WB6BNP, Ruth Villasana; Cert. Chairman, W6CQS, Edna O'Donnell. Their certificate is available to all local OMs contacting 6 members and to DX stations for 3 contacts and confirmations. Meet the gals on 50.35 Mc. and send confirmations for certificate to W6CQS, 6401 Gale St., Long Beach, Calif.

1965 Buckeye Belle officers are as follows: Pres., K8RZI, Fran Porter; V. Pres., K8CEN, Louise Gambil; Secy., WA8FSX, Ruth Garrison; Treas., WA8CJP, Ruth Williamson.

The Only Operator YL Club (T.O.O.) announces the following officers as of June 1: Pres., K5BTM, Dot Dickinson; V. Pres., Historian, K3TNL, Elinor Wendland; Secy.-Treas., Cert. Custodian, K7ADI, Ruth Donnelly. QST

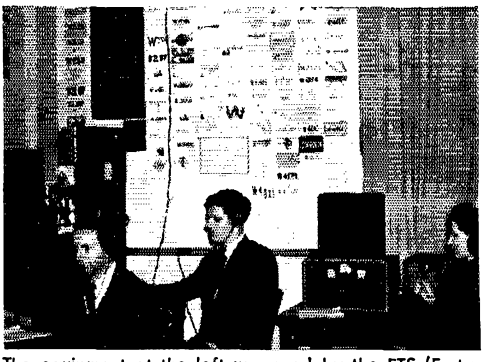
The greater New Orleans Amateur Radio Club is proud to have this YL radio amateur, Adele Boorstin, WA5KEC, as a member. Adele is 16 years old and a junior in high school. She was first licensed as a Novice in July 1964 and passed her General exam a month later. Look for her on 6 meters, 40 meters c.w., or, sometimes on 20 meters s.s.b.

Photo courtesy of Ray Boorstin, WA5FBQ, Adele's brother.

W2USA

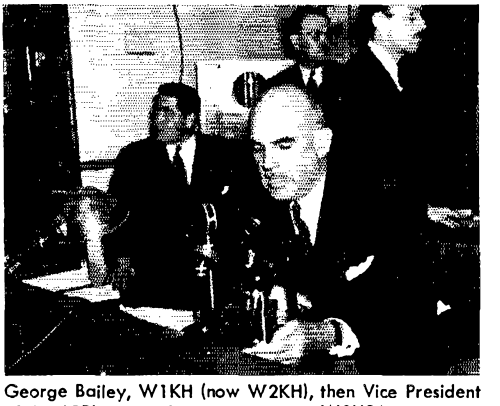
The World's Fair Amateur Radio Station, K2US, is open again this year and it is reminiscent of another World's Fair in New York back in 1939. Amateur Radio was represented then, too, with the official station, W2USA. Here are a few pictures sent to us by Arthur H. Lynch, W4DKJ, manager of that operation more than twenty five years ago.

This somewhat faded photo shows the ARRL display at the entrance to the operating room of W2USA. The globe at the center made one rotation every minute. Adjacent to this display was a window through which visitors could observe the nine complete stations which were usually operating at the same time



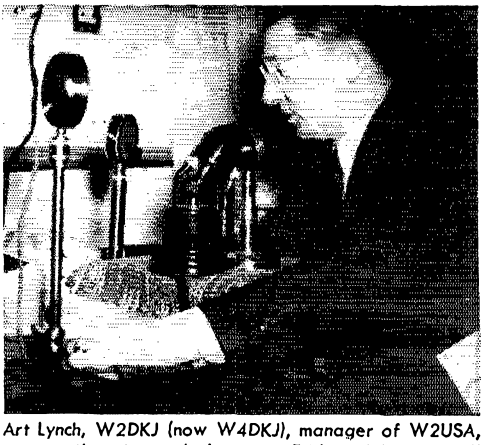
The equipment at the left was used by the FTS (Forty-Meter Traffic System) and carried hundreds of messages from visitors to their friends in all parts of the world. Also shown is the 75-meter phone rig. *Photo by W2WD*

Kay Kibbling, W2HXQ, the trustee for W2USA.
Photo by W2WD



George Bailey, W1KH (now W2KH), then Vice President of the ARRL, was a frequent visitor to W2USA.
Photo by W2WD

Standing is Oscar Oehman, W2KU, chief operator and host of W2USA. At left is the 40-meter c.w. position and at right is the 75-meter phone position. Photo by W2WD



Art Lynch, W2DKJ (now W4DKJ), manager of W2USA, was on the air regularly every Friday night using all of the station transmitters.

CONDUCTED BY SAM HARRIS,* W1FZJ

From the Seashore at Radioville, Arecibo, Puerto Rico

ONE of the advantages of living in Puerto Rico is that you can work on your antenna the year around. The disadvantage is (temporary I hope) that I not only do not have a big enough antenna, I don't have any antenna at all. (I do have a commercial low-frequency tri-bander up 50 feet but the statement still stands.) Fortunately we only live about 100 yards from the ocean and as a result a relatively low antenna should suffice. (A low antenna is one which only clears a two-story house by 50 feet or so.)

Naturally the big question is what should we put up? The object of the game is to communicate with the continent. (That's you, fellows!) You don't need an aerial to work anywhere on the island. Puerto Rico is only 95 miles long and 35 miles wide. We are situated along the north coast a little west of center and the farthest point of the island isn't more than 75 miles away. Miami, Florida, however, is 1100 miles away and it's another 150 or so to Sarasota and W4GJO whom we earnestly hope to work on 432 Mc. before the snow flies. The 1650-mile hop to Massachusetts on 144 Mc. is a little harder and we sure are looking for any takers in between.

Now if you had as your goal the aforementioned paths that you wanted to break down, what would you put up to get started with? We will probably spend the next month or so trying to solve the tower problem. (That's right! Those nice Rhododendron Swamp 170-foot Rohn towers are still there complete with all their beams.) Helen is sure she wants a 32-element 50-Mc. beam but can't make up her mind whether it should be 8 four-element Finneys or a couple of Les Cushman's 16-element colinears. (That ought to bring the long-yagi men out of the bushes.) The fact of the matter is that when 50 Mc. is open you don't need any antenna. We spent the better part of the June VHF QSO Party listening to W4GJO on a 20-foot piece of wire. I guess she figures if she can hear him with a piece of wire when the band is open, she should be able to do it anytime if she has an antenna. Besides that, she points out that Hal, ZD8HL, on Ascension Island has an 11-element yagi working on 50 Mc. and how do I expect her to work him with a piece of wire? In any event we know Helen will have a good antenna for 50 Mc. but what am I going to use on 144 Mc. and up? (No use suggesting a 1000-foot dish. Someone is using that device 24 hours a day, seven days a week.) If you have any good suggestions, don't hesitate to suggest. I have a one-track mind and unless someone comes up with a good idea I will probably end up with a barrage of colinears!

144 Mc. and Up

From Berea, Ohio, K8AFN writes that after a delay of four or more years, he has once again returned to the v.h.f. bands and enthusiasm is higher than ever. Jon has been working on an APX-6 for 1296 Mc. with hopes of interesting someone else in Northeastern, Ohio, in doing some moonbounce work. Have you tried Chuck, W8AUE? Another project at Berea is the organizing of a two-meter traffic and emergency c.w. net. For this project, John would like some suggestions concerning the use of an 832A in the final. Anyone with information concerning same might write to him at 381 Front Street, Apartment D-11, Berea, Ohio 44017. From the *Highbanders Log*, we've snitched the information that at the present time two stations are active in Columbus, Ohio, on 1296 Mc. and they will soon be joined by Sid, K8ZES, President of the High Banders. WB2OSA sez that he and WA2KIK are now experimenting on 1225 Mc. Information also comes from Karl that W2HIL now has a receiving setup for A5 on 432 Mc and is collecting parts and equipment for the transmitter. As far as his own equipment, WB2OSA has increased his power for A5 work to 475-watts input and has a cavity for the 4CX250B under construction. Among the many projects in progress at the QTH of K7ICW are the following: semi-conductor power supplies for v.h.f. s.s.b. gear; finishing touches and metering panel on a 432-Mc. 4CX250B final; parts stage for a 1296-Mc. converter and a 7289 final to be driven from 432 Mc.; corner reflector antenna for 1296 Mc.; pole-mounted transmitter/receiver to be considered; heavy-duty guying and anchors for new antenna farm (continuing process); coax repairs and construction, especially the foam flex variety; Zenith mount for future u.h.f. antennas; 5894 432-Mc.-test rig completed; overhauled feedlines and installed 50-Mc., 220-Mc. and 432-Mc. beams. Whatever do you do in your spare time, Al? We hear that another station in 7 land (but this one in Washington) is on the verge of 432-Mc. operation. W7CNK has a good looking 432-Mc. exciter about ready to go. Out in Ohio, 432-Mc. activity is good and a new station on that band is Dick, W8IJL at Tiffin, Ohio operating at 432.02 Mc. At Watervliet, Michigan, W8PT is now ready for anybody that needs Michigan on 432. Jack is using a Parks 2N3399 transistor preamp and finds it better than the best 416B he has had. His varactor-diode tripler driven by a 522, is fed to a 24-element colinear for beacon service on 432.105 and is almost ready to go. During the month of May, Jack worked the following on 432 Mc.: WA9HUV, W9BTI, W9JEC, W9OKB, W9ZIH, WA9NKT and W8RQI. Another Michigander (?) K8WXO writes that he is now rebuilding his long talked of 49-1300 Mc. log periodic. He sez that the ice-storm damaged mast has been replaced and now

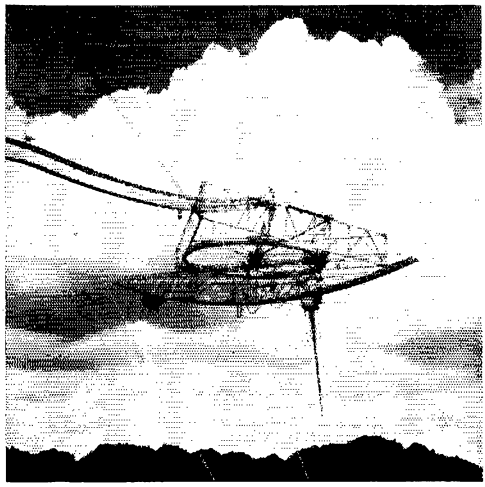
(*Continued on page 89*)

* P.O. Box 1738, Arecibo, Puerto Rico 00613.

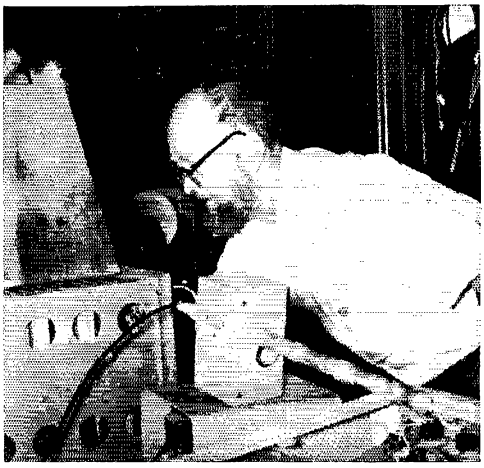
W1BU • W1HIV • W3SDZ • HB9RG • W9GAB • DL3YBA • K1IGY • G3LTF • WA4BYR • W7ORG • K3GYF/3 • W9HGE • K2MWA/2 • LX1SI • W8TYY • OZ8EME • W2CCY • W4HHK • K1SDX • W7UAB • DJ4AU • W1HGT • K2CBA • W2ROP • K6MIO • W1OUN/1 • K3SDR/3 • W1OOP •

The KP4BPZ Story

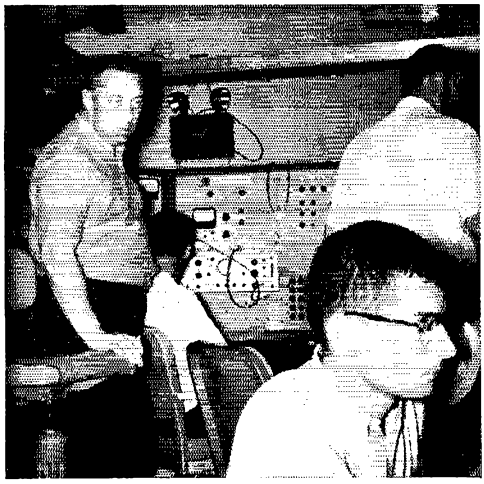
Success at Arecibo! The July 3 moonbounce tests, carried out under the call KP4BPZ, were an outstanding contribution to the moonbounce program. Despite minor technical problems which were encountered, 28 contacts were completed on 432 Mc. The stations worked are listed in the border of this box. At least twice this number of contacts could have been made if time and QRM had not been against us. Contacts were made on c.w. and s.s.b., each mode providing strong signals and perfect readability. A complete story and more pictures will appear in a subsequent issue of QST. — W1CER



The antenna structure used at Cornell's Arecibo Ionospheric Observatory. On the left, the catwalk is shown. The 432-Mc. antenna projects downward from the structure.



Sam Harris, W1FZJ/KP4, enthusiastically tuning in a moonbounce signal on the Collins R-390A receiver. A total of 28 contacts were made on 432 Mc.



Final checkout just prior to the start of the test. Left to right: Doug DeMaw, W1CER; Dr. Dyce, KP4CMO; Walt Zandi, K2KWL (Seated right) and Sam Harris, W1FZJ/KP4.

The July 3 moonbounce crew. Left to right: Doug DeMaw, W1CER (W8HHS); Andres Sanchez, KP4BEU; Sam Harris, W1FZJ; Dr. Rolf Dyce, KP4CMO (K6DSJ); Ray Jurgens, W8MSL. Not shown is Walt Zandi, K2KWL. The smiles on the faces of the crew reflect the success of the project.

(*Continued from page 87*)

the Finco 6-N-2 is back up to 65 feet for comparison on those bands, and the corner reflector on 432 Mc. with a v.h.f. u.h.f.-TV antenna for comparison there. Hopes to have some performance reports soon. From the Chicago area, WA9AWP writes that there are groups and individuals using 450 Mc. in the Chicago area for point-to-point communications for the control channels of at least two repeaters, soon to be put into continuous operation. Al sez there are many more pieces of this used f.m. equipment sitting in ham shacks just waiting for crystals and a tune-up. Sez Al, "With the exception of the control channels of the repeaters, all the activity is in the last megacycle of the band, 449.4 being the most popular. 449.7 and 449.8 Mc. are the two-repeater output frequencies of the repeaters mentioned. When the repeaters are put into continuous service, these channels will be quite busy. I have probably the only 450 Mc. mobile rig in the area and, the 450 base-to-mobile communications have proved to be of very short range unless the base antenna is very high, 100 feet or more." Thanks Al, that information ought to put some more of the fellows in your area and others "on the ball."

WB2CLN writes that he has been working away on 220 Mc. and has now worked stations in New York, New Jersey, Pennsylvania, Rhode Island and Connecticut. Five states, 3 call areas and greatest distance being 145 miles. Good work Tom! 220-Mc. activity is the best it has been in years in the southern Ohio area. Nightly skeds are maintained between W8DQU in Bedford, W8CSW in Powell, W9HLY in Decatur, Indiana and K8ZES. Sid sez that band conditions are always as good as two meters and seem to average slightly better. "No signals from W0EYE during Lyrids or Aquarids on 220 Mc.," so sez Jack, W8PT, "although I heard him on 144 Mc. during both showers. Am running ½-hour skeds with W0EYE on Sundays at 0930." Jack's 4X250B-transmitter is now completed and working and another sked is with W0OFY.

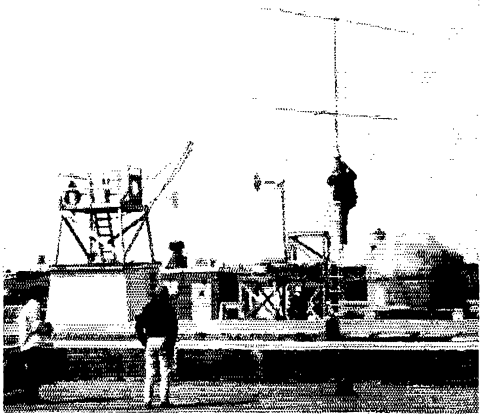
Along the ATV line, Larry, K8UHC tells us that conversion of an APQ-2 for 432 Mc.-TV work is about half completed. He also writes that Bill, K8YEU had an ATV system in operation for demonstration at the Tri-State Amateur Radio Association picnic on June 6. Hope the demonstration was a huge success, Bill. W2IYR reports that a dual-polarized yagi is in use at his QTH and the 8-element horizontal, 8-element vertical is an improvement over the 12-element colinear. Al keeps skeds every Monday night at 0200 GMT with K1RPB and W1STR. Signals average 3-3-9 each way with 90 watts input at all stations.

Shelby Ennis, W4WNH, sez: "E_s began to go up on May 19th. Came in at 2330 Z with TV channels 2-6 solid QRM. Exciter had gone out (that's normal isn't it?) that morning so repaired it and put beacon signal on the air. E_s went up into the low-f.m. band but no 144-Mc. signals heard. On May 20, more E_s on TV but not as good as the previous day. Put beacon signal on air. N.D. Am trying to keep the v.h.f. superregen going at all times during the day to watch for E_s build up. XYL keeps check when I'm gone. Maybe one of these days we'll catch it. Understand that they heard E_s in Europe on 144 Mc. a couple of months ago; I think we here just don't watch carefully enough." Could be right, Shelby. Thanks to you and the XYL for taking the job over. In Texas, the El Paso VHF-UHF Amateur Radio Society is sponsoring and trying to get a new or a common frequency on which two-meter operators can meet without having to look all over four megacycles of the band. Frequency selected is 145.2 Mc. and for those interested, members or non-members, the Society is making available an 8-Mc. crystal for the reduced price of $1.00. The Society has ordered six crystals especially for 145.2 Mc. and they will be available from the Society Secretary, Karl White, W5YL, on a first come, first served basis. Likewise, the Society is ordering six crystals for 50.2-Mc. operation and these will be available from the secretary.

K7ICW writes that on May 16 a special sked was arranged with K7ZIR to test effectiveness of slow-speed c.w. reception with narrow-band filters, especially to note residual signal trace of meteor trails. Several stations participated including Al, K7ICW, K6GCD, W6CDB, W7UAB and K7AAD in Oregon. Results showed that noise blanked signals here and only m.s. peaks were readable. K7ZIR was running 1 Kw. to four 15-element yagis. No meteor showers were in progress." He also tells us "that a fluke aircraft enhancement path to W7ZC at Springdale, Utah (200 miles northeast of Las Vegas) gave us our first QSO on 144 Mc. in May." Evening skeds with W6CDB in southern California on 2-way s.s.b. were solid during May. During these skeds signals were unvarying and only limited by intermittant QRN. Rotation of the beam at both ends showed that the obstacle gain path was still there up to 30-degree rotation from true bearing. Signal levels were Q5-S5 both ways. Tropo and aircraft enhancement paths to other stations were intermittant except to W6DQJ who is also presumed to be obstacle gain. Other s.s.b. stations worked were K6TSK, W6DEE and K6GCD. In one case A3 was readable from W6DQJ. From Tempe, Arizona, W7AYY writes that his two-meter nuvistor preamp is now installed on the back of the SR-34 and seems to improve the signal to noise ratio by a good 15 db. Don sez he's still hampered by cross-polarization problems on 144 Mc. but has ordered a three-element beam with hopes of having it installed vertically and in use by June contest time. How'd you come out Don? A correction received from WB6EBO to the effect that the person building the repeater in California is WB6MSM and not K6MSM as stated in the column. Sorry, fellas. Will try to keep such errors from happening again. K8PBA writes from Ypsilanti, Michigan that the two-meter s.s.b. roundtable that was established some time ago to help develop an interest on s.s.b. for two meters has had most gratifying results. "The time has come," sez Bob, "for it to change from a roundtable to a net. The door is open for a name for the net and it has been suggested that some one of you who read this may have a suggestion to put forth. Please feel free to do so." O.K. now fellas, how about it! Another Michigan station, W8IBB, tells us that his 144-Mc. transmitter is ready to be tested but he's awaiting arrival of a crystal. The five element beam is installed in the attic and John is receiving W8KAY and K9UIF almost every night at 0300Z. Very little local activity is noted at Johns QTH between the hours of 0230 and 0400Z, and all local activity heard since May 15 has been on A.M.

Word has been received from KH6CMM to the effect that he and WB6KAP of Woodside, California are attempting to duplicate the work done by KH6UK and W6NLZ on two meters. Thus far, Mac, KH6CMM has heard Vic (WB6KAP) twice, but signals were buried in the noise and no two-way contact was made. Skeds are held twice daily at

0515Z and 1400Z with liaison contact on 7095 kc. Sez Mac: "Upon establishing contact on 7.0 Mc., one of us begins transmitting on 144.010 Mc. Thus far Vic has been doing most of the transmitting as my amplifier is inoperative. However, I should have the amplifier back on the line before the end of the month and I will transmit a continuous beacon. This will be somewhat easier for Vic as my beacon is keyed automatically, while his must be manually operated. Vic runs a kilowatt to a Johnson 6N2 amplifier and a single 15-element Telrex yagi horizontally polarized. He receives with a Tapetone 417A-converter and a Collins 75S-1. Here in Hawaii I run a kilowatt to a pair of 4CX300s in the amplifier originally described in February 1960 *QST*. The antenna system consists of four 8-element long yagis



Members of the University of Pennsylvania Amateur Radio Club, W3ABT, are shown here hard at work adding some v.h.f. beams to the already congested Moore School of Electrical Engineering roof. The club has 97 members and operates all bands between 80 and 2 meters. Participating in the activity are K3QFF, K3OJK, WA3BRZ, WN3DBP, and WN3DBQ.

stacked two wavelengths apart, horizontally polarized, and fed with a hundred feet of RG-17A/U transmission line. The receiver is a nuvistor converter followed by a Collins 75A-4 with a 500-cycle mechanical filter and a 100-cycle audio filter. During one of our skeds, Vic indicated an interest in conducting similar skeds on 432 Mc. and towards this end I have already begun preliminary design work on suitable equipment with a view toward conducting skeds later this year or next summer. Finally, I am open to suggestions for a practical parametric amplifier for 432 Mc. I have not seen anything which appeared to have any value, and post detection integration methods for getting under the noise seem to be somewhat sketchy, at least those ideas published thus far. The paramp route seems to be the only method within reach for weak-signal detection and amplification at 432 Mc., through lowering the expected 4.0 to 5.0 db. noise figures for the converter. Any suggestions from your readers would be helpful and much appreciated. One last note. I expect to be here at Sunset Beach, just a few miles along the beach from KH6UK's location, for at least three or four more years. I will definitely be working during this time on 144 and 432 Mc., in an attempt to establish contact with someone in California. If anyone, having a suitable location, is interested in these tests, he may contact me by mail, on the 7095 kc. liaison sked with Vic, or at 0430Z on 3810 kc. each Sunday when I check in with K7AAD and the gang on the west coast." Thanks for all the information, Mac, and sure do hope that you and Vic make it in the near future. Be sure to let us know how things progress on both 144 and 432 Mc.

Clubs

On Saturday, September 25, 1965, the Windblowers V.H.F. Society, Inc. will mount their eleventh annual Big Blow starting at 1400 and ending at 2400 EDT. Big Blow stations will be W2NLN in Connecticut, W2WBY in New York, W2NUL in Pennsylvania and W2ZDR in New Jersey. Transmitting frequencies will be between 144 and 146 Mc.

All v.h.f. enthusiasts are invited to participate and qualify for the special certificate of achievement to be awarded to each participant who successfully communicates with all four Big Blow stations.

From W4MVB we hear that: "A group of amateurs from Jacksonville, Florida will operate from Mt. Mitchell, North Carolina on 144 and 432 Mc. on the 14th and 15th of August. The call will be W4MVB/4 and the location will be one of the highest points east of the Mississippi. Operation is scheduled to get under way on the 14th at noon and continue until 10:00 A.M. on the 15th. Even-hour operation will be on 144 and odd hours will be 432. Frequencies to be used will be 145.200 and 432.000 Mc. Antenna headings will be tried as follows: first quarter hour, north; second quarter hour, east; third quarter hour, south; and fourth quarter, west. If this does not work out we will play it by ear. A.m. and c.w. will be used on 432 and s.s.b. and c.w. on 144 Mc. It is planned also that the last five minutes of each quarter hour will be used to transmit c.w. if the above antenna headings work out. Of course any mode will be acknowledged at any time. It is hoped that approximately 250 watts will be available on each band. No claims will be made at this time about what we expect to work but there are approximately 20 states within 400 miles of this point." Good luck to you and the gang Jess. Hope you have miny, miny contacts.

50 Mc.

WB2LDE reports that on May 1 and 2, stations from Texas, Oklahoma, Florida and Alabama were being heard at his QTH, a portable one at which he was using a Clegg Thor and a 3-element beam. John sez only one Alabama station was heard and two Oklahoma stations were weak but readable. On the 9th, at his home QTH, a band opening was observed during which he worked stations in Missouri, Kansas, Illinois and Wisconsin. All four of these were new states for John. On the 11th, 12th and 18th, stations in Florida were worked; but the opening of the 19th was the best opening of the year in the opinion of WB2LDE. "The band opened to the midwest at about 1500 EST and stayed open until about 0300 on the 20th." Stations were worked in Illinois, Kansas, Wisconsin and Michigan, while those heard but not worked were in Missouri, Iowa, Nebraska and Minnesota. At New York, WB2OYB reports openings on May 4, 5, 6, and 7 with 4s, 5s, 9s and 0s worked. K3UOX tells us that on June 5 he worked WA4WQK in Columbus, Georgia for 12 minutes and received a report of Q5, S9. The wonder of it all is that Gene was using a Heathkit Sixer and a 60-inch whip while mobile in motion in his '64 Volkswagon. Keep at that mobile work, Gene. It's more fun that way. From Washington, D. C.,

(Continued on page 148)

Operating News

F. E. HANDY, W1BDI, *Communications Mgr.*
LILLIAN M. SALTER, W1ZJE, Administrative Aide — GEORGE HART, W1NJM, National Emergency Coordinator
ROBERT L. WHITE, W1WPO, DXCC Awards — ELLEN WHITE, W1YYM, Ass't. Communications Mgr.
GERALD PINARD, Club Training Aids — PETER CHAMALIAN, W1BGD, Communications Asst.

W1AW Extends Code Practice Schedule. Effective at once ARRL announces the availability of *additional* code practice speeds at 20- and 25-words per minute from W1AW.

This is responsive to a showing of considerably increased interest in the 15–25 speed ranges in view of the FCC Docket 15928 proposal.

We're undertaking to send four extra mid-evening periods each week (to follow usual slower-speed nights) to give additional practice at 20- and 25-w.p.m. All practice is transmitted simultaneously, addressed to amateurs, on 1805-, 3555-, 7080-, 14,100 kc., also 50.7 and 145.6 Mc. There are two daily periods set aside for the tape-sent transmission of code practice, these at 2330- to 2359 GMT and 0130 to 0230 GMT, our mid-evening in Connecticut. The first or earlier hour code practice covers those speed ranges most needed to get within reach of the General Class Amateur License (10-13-15 w.p.m.). All practice groups will continue to include letter-numeral groups taken from the tube tables of the '65 *Radio Amateur's Handbook*.

The mid-evening sessions, scheduled to start daily at 0130 GMT, covers both Novice-Technician speed ranges and this newly requested 20- and 25-w.p.m. practice for the many getting ready for FCC's Amateur Extra Class examinations, if and when the Docket is finalized and assuming the requirements stick with the proposal, of course.

The 0130-0230 GMT CP sessions cover the following consecutively sent ranges:

Days of Week (GMT)	*W.P.M. SPEEDS*
Mon. Wed. Fri. Sun.	5 7 10 13 20 25
Tues. Thurs. Saturday	15 20 25 30 35

Adaptation in our operating patterns. Change is one phenomena that can be universally counted upon. There's a publication not in our field but known as *Changing Times*. In contemplating how change might effect radio amateurs, it seems to us that, as with other groups, we have to learn to adapt gracefully and usefully to change. The change from spark to c.w. was helpful and was progress though it took more than a decade before amateurs would agree to this.

But we must accept necessary or inevitable changes, and new things and adapt ourselves and organizations to the times and the conditions. Television is here to stay and we have adapted well to meet the technical problems of TVI. Our contest rules change customarily by evolution rather than revolution. The soundest changes result from study and analysis of results and the comments of all the participants.

A decade ago amateur v.h.f. operation was limited to some of the larger cities and populous areas. Today its use by amateurs is approaching the universal. Official v.h.f. station-appointment (OES) is available to those amateurs who are active in v.h.f. nets and capable of contributing to the traffic pattern, as well as for propagation-reporting v.h.f. actives. ARRL aims at maintaining an integrated traffic system. The v.h.f. and h.f. and work by-mode-best-suited must interconnect to increase the number of points all can reach. The capabilities of operators who will handle communications reliably, in daily work and in emergency-disaster situations as well, the individual challenge to enlarge our own amateur lives as well as to increase message system capability depends on making personal amateur interest more versatile instead of narrow. Even where the preference is given to one transmission mode such as s.s.b., a.m., c.w., or RTTY, we each need to know enough about the others capabilities so we can operate in more than one kind of group and transfer communications between these systems.

Speaking of change, every eight or ten years the pattern of FCC regulations has changed. We amateurs have successfully adapted to operate under new conditions — but with no lessening of the joys of amateur operating. In fact there has constantly been the increased communications horizon — in mobile work, in the DX capability of one's transmitter and in some acquaintance with scatter and satellite techniques as well. Change also flows from improved gadgetry and miniaturization as well as the exchange of ideas and knowledge accomplished through bulletins and *QST*. So let us accept the changes doing all we can to guide them so they improve things. We will adapt ourselves and our patterns to times and

C. D. ARTICLE CONTEST

A new Communications Department article contest, a continuation of the very successful *QST* Article Contest during the 1964 anniversary year, needs your best ideas (in 800–1200 words) relating to League organization, clubs, training exercises, and operating techniques. Periodically, the best articles submitted for the "CD Contest" will be chosen to appear, with the winner electing to receive (a) a bound 1965 *Handbook* or (b) a *QST* binder, League emblem and the ARRL DX map.

conditions. Things have and will continue to change. In adapting which we are bound to do, consciously but over the long term we achieve ever superior results through amateur radio.

— *F. E. H.*

ELECTION NOTICE

To all ARRL members residing in the Sections listed below:

You are hereby notified that an election for Section Communications Manager is about to be held in your respective 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 have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be received at ARRL 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, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reasons of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

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

Communications Manager, ARRL [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.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— *F. E. Handy, Communications Manager*

Section	*Closing Date*	*SCM*	*Present Term Ends*
Idaho	Aug. 16, 1965	Raymond V. Evans	Apr. 10, 1965
Oklahoma	Aug. 16, 1965	Bill F. Lund	Aug. 9, 1965
Rhode Island	Aug. 16, 1965	John E. Johnson	Oct. 12, 1965
Arkansas	Aug. 16, 1965	Curtis R. Williams	Oct. 13, 1965
Indiana	Aug. 16, 1965	Ernest L. Nichols	Oct. 14, 1965
San Diego	Aug. 16, 1965	Don Stansifer	Oct. 15, 1965
Vermont	Aug. 16, 1965	E. Reginald Murray	Oct. 17, 1965
New Mexico	Aug. 16, 1965	Newell Frank Greene	Resigned
Hawaii	Sept. 10, 1965	Lee R. Wical	Nov. 11, 1965
Wisconsin	Oct. 11, 1965	Kenneth A. Ebneter	Dec. 10, 1965
Illinois	Oct. 11, 1965	Edmond A. Metzger	Dec. 15, 1965
Western Florida	Oct. 11, 1965	Frank M. Butler, Jr.	Dec. 15, 1965
Saskatchewan	Oct. 11, 1965	Mel Mills	Dec. 17, 1965
New York City & Long Island	Oct. 11, 1965	Blaine S. Johnson	Jan. 2, 1966
East Bay	Nov. 10, 1965	Richard Wilson	Jan. 10, 1966

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.

South Dakota	Seward P. Holt, KØTXW	July 3, 1965
Western Mass.	Percy C. Noble, W1BVR	Aug. 11, 1965
Kentucky	Lawrence F. Jeffrey, WA4KFO	Aug. 20, 1965
Southern New Jersey	Albert E. Hankinson, W B2PHV	Aug. 26, 1965

(*see next column*)

In the Washington Section of the Northwestern Division, Mr. Everett E. Young, W7HMQ, and Mr. Herman F. Helgesen, W7AIB, were nominated. Mr. Young received 422 votes and Mr. Helgesen received 277 votes. Mr. Young's term of office began May 3, 1965.

In the Los Angeles Section of the Southwestern Division, Mr. H. G. Garman, W6BHC, and Mr. Vaidean, WB6JGA, were nominated. Mr. Garman received 625 votes and Mr. Vaidean received 400 votes. Mr. Garman's term of office began May 18, 1965.

In the Manitoba Section of the Canadian Division, Mr. J. Thomas Stacey, VE4JT, Mr. Michael Pura, VE4MP, and Mr. Edwyn Dalgliesh, VE4EF, were nominated. Mr. Stacey received 38 votes, Mr. Pura received 37 votes and Mr. Dalgliesh received 24 votes. Mr. Stacey's term of office began July 1, 1965.

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for May Traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
K6BPI	79	1620	1573	71	3343
W3IV8	14	1008	919	64	2005
K2KQC	1	799	738	13	1551
WØLGG	32	757	685	35	1509
W3CUL/4	130	694	631	26	1481
KØONK	111	619	582	17	1329
K6YVN	30	637	585	39	1291
WA9CUP	106	594	562	12	1274
W9JOZ	31	563	563	0	1157
W1PEX	179	467	399	45	1090
K6EPT	79	505	304	201	1089
W7BA	16	501	148	50	1015
W7DZX	15	496	449	5	965
WA2RUE	39	508	359	41	947
K9IVG	17	477	430	6	930
W4TUB	9	439	431	4	883
K9NBH	837	18	0	7	862
W3KML	32	149	316	6	833
W6RSY	36	395	257	120	808
WA4RQR/9	32	356	382	6	776
W9YHZ	0	392	376	6	774
W6GYH	221	249	240	4	714
WØOHJ	32	339	329	10	710
W3CUL	37	321	281	33	672
K9KZB	15	327	300	27	669
W6VNQ	19	324	309	7	659
WA9CNV	19	291	158	124	592
WA4GQM	47	280	201	63	591
K7JHA	13	305	264	3	585
WA4ICH	25	272	217	56	570
WB6JUH	19	273	228	15	565
K3LSV	159	203	35	155	552
WA4IMC	232	157	146	11	546
W5GHP	68	238	172	59	537
WA4BMC	271	105	138	21	535
WB2HWB	118	220	169	23	530
WB6BBO	79	241	204	4	528
W6ZJB	39	243	234	9	525
W1BGD	42	216	174	83	515
K7LWD	19	251	237	3	510
K2VNL	19	215	217	28	509
W4EVN	34	225	227	15	501
Late Reports:					
WØOHJ (Apr.)	40	640	626	14	1320
K6YVN (Apr.)	27	144	413	25	909
WA9BWY (Apr.)	11	299	286	25	621
WA2UZK (Apr.)	88	291	217	22	618

More-Than-One-Operator Stations

W6IAB	798	1730	1335	384	4247
W8YDK	2286	623	560	72	3541
W4LEV	65	922	887	35	1909
Late Reports:					
K6WAH (Apr.)	118	898	961	38	2015

BPL for 100 or more *originations-plus-deliveries*

W3ELI 386	W1TXL 115	W9BHR 107
K2RI 339	WA5HNN 115	W4WHK 105
W7NPK 211	W4SAZ 114	WA9LWJ 105
W7APS 199	WB6FHH 114	W2OE 104
WA9GJU 147	WA8FIC 114	W9NZZ 103
K4JIG 138	W2EW 113	WA9JKT 102
W8DAE 122	WA8IMY 112	Late Reports:
K3ZYP 118	WA9EBT 111	W2EW (Apr.) 216
WA4UXC 117		WA4PWF (Apr.) 135

More-Than-One-Operator Stations

WA4OHO 385	K4CSH 148	WØYC 131
K5TYP 216	W8ERD 148	K3CSG 101
KR6GF 210		KR6DI 101

BPL medallions (see Aug. 1954, p. 64) have been awarded to the following amateurs since last month's listing: WA4BSC, W4URX, W7NPK, WA8NUW.

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 of 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.

A.R.R.L. ACTIVITIES CALENDAR

(Dates are shown in GMT)

Aug. 5: CP Qualifying Run — W6OWP
Aug. 19: CP Qualifying Run — W1AW
Sept. 5: CP Qualifying Run — W6OWP
Sept. 9: Frequency Measuring Test
Sept. 11–12: V.H.F. QSO Party
Sept. 17: CP Qualifying Run — W1AW
Oct. 7: CP Qualifying Run — W6OWP
Oct. 9–10: Simulated Emergency Test
Oct. 16: CP Qualifying Run — W1AW
Nov. 13–15: Sweepstakes Contest, phone
Nov. 20–22: Sweepstakes Contest, c.w.

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

Aug. 7–8: Illinois QSO Party (p. 96, this issue).

Aug. 14–15, Sept. 11–12: WAE DX Contest, DARC (p. 83, this issue).

Aug. 21–23: New Jersey QSO Party, GSARA (p. 108, this issue).

Aug. 28–29: Sixth All Asian DX Contest, Japan Amateur Radio League (p. 83, this issue).

Sept. 18–19, 25–26: Seventh Scandinavian Activity Contest, NRRL (next month).

Sept. 18–20: Eighth Pennsylvania QSO Party, Nittany ARC (next month).

W1AW SCHEDULES

Operating-Visiting Hours

Monday through Friday: 7 P.M.–1 A.M. EDST.
Saturday: 7 P.M.–2:30 A.M. EDST.
Sunday: 3 P.M.–10:30 P.M. EDST.

The ARRL Maxim Memorial Station welcomes visitors. The station address is 225 Main St., Newington, Conn., about 7 miles south of Hartford. A map showing local street detail will be sent on request.

Operating Frequencies

C.W.: 1805 3555 7080 14,100 50.7 145.6
Voice: 1820 3945 7255 14,280 50.7 145.6

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

Official Bulletins

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

C.W.: Mon. through Sat., 0000; Tues. through Sun. 0400.
Voice: Mon. through Sat. 0100; Tues. through Sun. 0330.

Caution: Note that in the U.S. Canada bulletin hours usually fall on the evening of the previous day by local time.

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 Aug. 19 at 0130 GMT. Identical tests will be sent simultaneously by transmitters on c.w. listed frequencies. The next qualifying run from W6OWP only will be transmitted Aug. 5 at 0400 Greenwich Mean Time on 3590 and 7129 kc. *CAUTION!* Note that since the dates are given per Greenwich Mean Time, Code Proficiency Qualifying Runs in the United States and Canada actually fall on the evening previous to the date given. *Example:* In converting, 0130 GMT Aug. 19 becomes 2130 EDST Aug. 18.

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

Code practice is sent daily by W1AW at 0130 and 2330 GMT, simultaneously on all 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 Sunday, 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 list 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 June *QST*.
Aug. 2:	*It Seems to Us*, p. 9
Aug. 10:	*A Slow-Scan Vidicon Camera*, p. 11
Aug. 18:	*Kit Building — What's Involved*, p. 19
Aug. 24:	*Oscar III and W6EE*, p. 28
Date	**Subject of Practice Text from *Understanding Amateur Radio*, First Edition**
Aug. 26:	*Vacuum Tubes*, p. 31
Aug. 30:	*Plate Dissipation*, p.

SUGGESTED OPERATING FREQUENCIES

RTTY 3620, 7040, 14,090, 21,000 kc.
WIDE-BAND F.M. 52.525 146.94 Mc.

GMT CONVERSION

To convert to local times subtract the following hours:

ADST −3, AST −4, EDST −4, EST −5, CDST −5, CST −6, MDST −6, MST −7, PDST −7, PST −8, Hawaiian −10, Central Alaska −10.

A convenient conversion card is available, free of charge, from the ARRL Communications Department, 225 Main St., Newington, Conn. 06111.

Briefs

Re the '64 SS, reported in last May's *QST*, the Southern New Jersey Novice award winner should have been shown as WN2MRA and WA6SLU should have been listed along with others who won section awards for top performances in both the phone and c.w. portions of the November Sweepstakes. Sorry, OMs!

W1AW NOTE

W1AW now transmits bulletins and code practice on 160, 80, 40, 20, 6 and 2, as detailed above. Additional equipment for the station has been under long-term construction and is to be installed as fast as it becomes available. Note elsewhere on this page the frequencies and times for bulletins and for the two daily sessions of tape-sent code practice so as to make full use of these services.

DX CENTURY CLUB AWARDS

Honor Roll

The DXCC Honor Roll consists of the top ten numerical totals in the DXCC. Position in the Honor Roll is determined by the first number shown. The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total DXCC credits given, including deleted countries. Positions in cases of ties are determined by date and time of receipt. All totals shown represent submissions received through May 31, 1965.

W1FH ... 313/339
W4DOH ... 313/337
CX2CO ... 313/334
W2AGW ... 313/337
W3GHD ... 313/337
W1GKK ... 313/338
4X4DK ... 313/331
W8POQ ... 313/330
G2PL ... 313/336
W9RBI ... 313/338
W2TOC ... 313/332
W8BRA ... 313/336
W8UAS ... 313/334
W8JIN ... 313/338
W6GUQ ... 313/338
W7GUV ... 313/336
W8EWS ... 313/337
PY2CK ... 313/336
W8HGW ... 313/338
HB9J ... 313/337
W4GD ... 313/334
W2LV ... 312/331
W2JT ... 312/331
W2BXA ... 312/336
W2LPE ... 312/333
W8BF ... 312/333
W3KT ... 312/336
W9HUZ ... 312/332
W8MPW ... 312/330
W1JYH ... 312/335
W6YY ... 312/332
W9NDA ... 312/336
W9YEV ... 312/336
W7PHO ... 312/330

W4OGW ... 312/329
W1BIH ... 312/336
W2ZX ... 312/331
W8KIA ... 312/336
G3FKM ... 312/329
WØDU ... 312/334
W3GAU ... 312/335
W6AM ... 312/337
WØOWZ ... 312/334
G4CP ... 311/335
G3AAM ... 311/335
W8DMD ... 311/333
W3LMA ... 311/333
W2SUG ... 311/328
W2BOK ... 311/328
K3UPG ... 311/335
DJ1BZ ... 311/329
DL3LL ... 311/327
CE3AG ... 311/335
W1GLX ... 311/334
W5MMK ... 311/332
W9LNM ... 311/334
W8KML ... 311/332
W8JBI ... 311/330
W4ML ... 311/331
W3JNN ... 311/335
LU6DJX ... 311/335
WØAIW ... 311/334
W5KC ... 311/334
W5CKY ... 311/330
W4AIT ... 311/334
W8LKH ... 311/331
KV4AA ... 310/334

W2DEC ... 310/326
W1ME ... 310/333
OE1ER ... 310/332
K2DCA ... 310/327
W5ABY ... 310/327
WØBFB ... 310/328
W7GBW ... 310/334
WØELA ... 310/333
W6GPB ... 310/331
5Z4AO ... 310/328
W6EBG ... 310/335
VE7ZM ... 310/334
K2RZT ... 309/326
G8KS ... 309/327
W4TM ... 309/331
W2ZGB ... 309/325
W5AFX ... 309/334
WØODF ... 309/326
W4LYV ... 309/329
W2OKM ... 309/327
W4VPD ... 309/326
W2LAX ... 309/326
W2WZ ... 309/332
W4OPM ... 309/324
K4LNM ... 309/323
W2UVE ... 309/327
W2AYJ ... 309/328
W9AMU ... 309/326
W2TVR ... 308/326
W8DAW ... 308/332
W1HZ ... 308/326
WØNTA ... 308/328
W7ENW ... 308/332
W5UX ... 308/323

W6GYV ... 308/326
W2TP ... 308/317
WØSYK ... 308/326
W3RNO ... 308/326
W2FZY ... 308/321
W4PLI ... 308/323
DJ2BW ... 308/325
K6EVR ... 308/325
HA3MU ... 308/327
W3JTC ... 307/330
W2FXN ... 307/321
K6ENX ... 307/324
W8IRN ... 307/325
W4GXB ... 307/328
G3FXB ... 307/325
W3WGH ... 307/322
K2LWR ... 307/320
K4AIM ... 307/321
W5OLG ... 307/328
W4MR ... 307/327
DL6EN ... 307/322
W2SSC ... 307/323
W2HTI ... 307/322
WØOGI ... 307/323
DL7BA ... 307/324
W1ZW ... 306/323
W3ECR ... 306/323
W8NGO ... 306/323
W2GUM ... 306/328
W8PUD ... 306/323
WØPGI ... 306/321
W7AC ... 306/330
W7WVE ... 306/323

HB9MO ... 306/323
W2NUT ... 306/322
DL1IN ... 306/322
PAØFX ... 306/326
WA2IZS ... 306/323
W9GIL ... 306/323
W1HX ... 306/326
ON4DM ... 306/325
VK3KB ... 306/329
W4OM ... 306/328
W1MV ... 305/322
W6WWQ ... 305/322
DL3RK ... 305/322
W2YTH ... 305/323
W3NKM ... 305/322
K6EC ... 305/317
W5KBU ... 305/323
W3CGS ... 305/324
K2GFO ... 304/325
W5ADZ ... 304/326
G3YF ... 304/326
W2HMJ ... 304/324
K2OEA ... 304/320
W9KOK ... 304/328
K4RID ... 304/318
W2PCJ ... 304/321
W2SAW ... 304/321
K2UVU ... 304/317
W6OSU ... 304/316
W6KEV ... 304/326
W5OT ... 304/315
W4ZRZ ... 304/310
G3AAE ... 304/324
W2DOD ... 304/322

Radiotelephone

CX2CO ... 313/334
W3RIS ... 313/338
PY2CK ... 313/336
W8HGW ... 313/335
W9RBI ... 312/335
W8BF ... 312/333
4X4DK ... 312/330

W8GZ ... 312/335
W7PHO ... 312/330
W4OOH ... 312/334
W2ZX ... 312/334
5Z4ERR ... 311/333
W6YY ... 311/331
PY4TK ... 311/328

W8KML ... 310/331
W1PH ... 310/331
W4JT ... 310/324
W9JJF ... 310/327
W3JNN ... 310/331
WØAIW ... 310/331

W8PQO ... 309/326
W2BXA ... 309/331
W6AM ... 307/331
HA4MU ... 307/326
W4QCW ... 306/319
ON4DM ... 306/325
T12HP ... 305/327

G2PL ... 305/325
G3FKM ... 305/319
W9NDA ... 304/324
K4AIM ... 304/318
DL3RL ... 304/320
W3KT ... 303/322
G8KS ... 303/317

New Members

From May 1, through May 31, 1965, DXCC Certificates and Endorsements based on contacts with 100-or-more countries have been issued by the ARRL Communications Department to the Amateurs listed below.

W1EVT ... 225
W8SYR ... 211
W6KTE ... 202
OH3QC ... 155
UR5KDS ... 150
YU3EA ... 148
W7TDK ... 133
OH3ND ... 129

W7WLL ... 120
G3ERB ... 118
DM3BJD ... 112
WA4PNP ... 111
UA3KAO ... 111
WA6VAT ... 110
HA6KVB ... 110
KP4CKX ... 110

VE2AJV ... 110
PY2BKO ... 109
UT5RX ... 109
WA2TJA ... 108
WA6UQS ... 107
DM3ML ... 106
UA3UH ... 105
VO1AW ... 104

UIGO ... 104
ON4NM ... 104
W5DWB ... 102
W9BGX ... 102
DJ2WE ... 102
W3LMZ ... 101
K4JSZ ... 101
G3LUW ... 101

SP3AIJ ... 101
UA1KBA ... 101
UA3AA ... 101
YV5BNR ... 101
5R8AI ... 101
WB2AMO ... 100
K2LAI ... 100
K3IEC ... 100

WA4EPL ... 100
K4MYO ... 100
K5HYB ... 100
WA8CGZ ... 100
K8USW ... 100
G2ATM ... 100
UA6KAF ... 100

Radiotelephone

K4TJL ... 311

SM5CVZ ... 158
WB2EPG ... 107

K9BPO ... 103

K6OJO/4 ... 101
UCJW ... 101

VP9BY ... 101

W5RCU ... 100
K8IKB ... 100

Endorsements

W5LGG ... 320
K4TJL ... 312
W6ULS ... 300
K8ONV ... 300
W6UHA ... 299
W8SZS ... 293
VE5JV ... 292
W1RAN ... 290
WA6TGY ... 282
W5VSQ ... 280
K8IKB ... 280
G8JM ... 274
W7BA ... 272
OZ7GC ... 272
W4OEP ... 271
WØOAQ ... 270
K6JIC ... 260
W5MCO ... 255
W6PLK ... 255

VE5RG ... 255
W6REH ... 251
W9AZP ... 251
OZ3Y ... 248
OH2YV ... 242
KØEZH ... 241
W2ZTV ... 240
DL6QW ... 239
VP7NS ... 238
K6EXO ... 233
YV5BOA ... 233
W2VJN ... 231
W6AAO ... 230
W3HTF ... 229
IT1AGA ... 228
WA6KNE ... 225
W1AW ... 224
W1GDQ ... 220

K6PQC ... 220
W8LUZ ... 220
SM5AJR ... 219
W2GHK ... 217
W8GMK ... 215
SP5ADZ ... 215
KL7DTB/6 ... 211
VS1FZ ... 211
WB2CKS ... 210
K6BWX ... 203
G3GSZ ... 201
WB2HXD ... 200
WA4LYQ ... 194
LA5Q ... 194
K7UCH ... 190
GR6DB ... 186
SM7TV ... 183
ZE3JO ... 180

W9GXH ... 178
W1GJK ... 176
UC1W ... 173
K1PNL ... 172
K4CEB ... 172
ZD5R ... 172
KP4BJD ... 171
SM5BIU ... 171
W7MH ... 170
W8RCM ... 170
E97E ... 163
SM3BNV ... 163
W3URE ... 162
KP4BJU ... 161
DJ2XR ... 161
W2MZV ... 159
DJ3CI ... 158
W8HDB ... 157

K9JAU ... 155
SM6AMD ... 153
PY5ASN ... 151
W6FB ... 150
SV8WAA ... 150
K1IMD ... 148
W1WLZ ... 142
VE3ACD ... 141
OE2EGL ... 141
UA6FJ ... 141
W1HNI ... 140
WA2LMW ... 140
WA2RMP ... 140
W5EGS ... 140
HB9TE ... 140
WA6KMF ... 135
DM2AEC ... 134
VO2NA ... 132

JA3BG ... 131
K1UDD ... 130
W2GKW ... 130
VE1AFY ... 130
KP4BAJ ... 130
K3MCO ... 125
EA1FD ... 124
W1MRQ ... 120
K2MRB ... 120
W6PLS ... 120
K6RSY ... 120
K8DBW ... 120
K4LRX ... 119
W6QBH ... 111
WA4QME ... 110
WB6AKZ ... 110
W8TRN ... 110
KØJPJ ... 110
XE1FE ... 110

Radiotelephone

G3DO ... 313
DL7BA ... 305
W4AZD ... 281
K8ONV ... 271
W3CGS ... 267
W6ZJY ... 260
W7CMO ... 247
W6REH ... 244
W8SZS ... 235
W2ZTV ... 231

VE3ES ... 231
F2MO ... 231
K6EXO ... 230
OZ3Y ... 228
WA6KNE ... 225
VK2JZ ... 222
WA2HOK ... 221
DL7AA ... 216
WB2FSW ... 210

ZS5PG ... 210
VE5JV ... 204
W2LEC ... 202
W2GHK ... 201
W6KTE ... 200
WA8AJI ... 200
W8CUT ... 200
I1ZCT ... 200
W4AVY ... 193

K1IDW ... 190
WA6TGY ... 182
W1BPM ... 180
K6AZP ... 180
W6KUT ... 180
GR6DB ... 178
WB2HXD ... 168
W1GJK ... 167
VE2ANK ... 152

K4FTZ ... 150
FSHA ... 150
PAØEFM ... 150
W7MKI ... 149
I1LX ... 146
W8HDB ... 142
W5EGS ... 140
K8AXG ... 134
PAØUC ... 134

VE3ACD ... 132
K2IDF ... 131
K3HHY ... 131
W9UT ... 130
K1IMD ... 126
WA6MWG ... 126
W9GXH ... 125
VE1AFY ... 122
W1MGP ... 121
WØOMH/5 ... 120

Station Activities

ATLANTIC DIVISION

DELAWARE—SCM, Roy A. Belair, W3IYE—SEC: K3NYG. PAM: W3CFA. V.H.F. PAM: K3OBU. RM: W3EEB. DEPN meets Sat. on 3905 kc. at 1800 local time. DSMN meets Tue. on 50.4 Mc. at 2100 local time. Dover 6 & 2 Net meets Wed. on 50.4 Mc. at 2000 local time. Kent County Emergency Net meets on 3905 kc. at 1300 local time. Renewal: K3BYJ as ORS. The Annual Delaware Hamfest and Picnic will be held at Wheelers Park, Harrington, Del., Aug. 15. Rain date is Aug. 22. There will be games for the kids, picnic tables, swap shop, and prizes. K3YZF has RTTY mach. and soon will have a TU. W3CZS has a new 6- and 2-meter beam. W3QQV is running 1 kw. on 6. Both are in Kent County. K3YHR will be portable from Indian River Inlet until mid-Sept. W3EEB will be operating portable from VE1 and VE2 in August. W3HC is active in MARS. K3NHL reports good conditions on the DX bands. Traffic: W3EEB 240, K3YZF 149, K3YHR 48, K3NYG 11, W3IYE 1.

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—SEC: W3ELI. RMs: W3EML, K3MVO, K3YVG. PAMs: W3SAO, W3SGI, K3LSV, W3FLP. The E. Pa. C.W. Net had a QNI of 354 and a total QTC of 313. The PTTN hit another record of 360 QNI with 241 QTC. On June 6 our section officials met at Allentown and organized the Eastern Pennsylvania Emergency Phone and Traffic net. This will meet nightly on 3915 kc. at 1800 local time. Net manager is W3FLP. This is a directed net and will conform with NTS regulations. All Pennsylvania stations are welcome to participate. New appointments: K3ZUN as ORS, K3-MYS and W3CBH as OBSs, K3LSV as V.H.F. PAM in the Delaware County area, W3UKP as new EC for Cumberland County. Near Gear Dept.: K3VAX added a lightning arrester and a new Mic. W3RV added an SB-400. W3NOH got the sky-wire erected at the new QTH. WA3BBI is now General Class. W3VR and W3-CUL have been QRL fishing in Florida. K3MNT has a part-time summer job. New club officers: Ivyridge ARC—K3EOQ, pres.; W3FDG, vice-pres.; K3FOQ, secy.; W3MIC, treas. University of Penna. RC—K3OJK, pres.; K3ALD, vice-pres.; K3LSI, secy.-treas. Mahoney ARC of St. Joseph's College—K3IAM, pres.; WA3BRU, vice-pres.; WA3BOO, secy.; W3GJL, treas. Delaware Council of Amateur Radio Clubs—W3ELI, chmn.; W3GIF, vice-chmn.; W3AES, secy. North Penn RC—K3ISW, pres.; K3ROK, vice-pres.; W3DJL, treas.; K3FLG, secy. K3WEU operated from Maine during the summer months on 6 through 80 meters. The Bucks and Windsor ARCs merged into the Penn Wireless Assn. of Windsor and Bucks County. New officers are K3JQH, pres.; W3ICC, secy.; W3MJR, treas. W3OY had a recent QSO with W4OMZ and soon found out he was talking to the captain of the ship. A work change put the spraggs to traffic-handling for K3RZE. Last minute news: K3-OGX is a new OES in the Lancaster area and is forming a v.h.f. traffic nets. Traffic: W3IVS 2005, W3EML 833, W3CUL 672, K3LSV 552, W3ELI 443, K3ONW 412, K3-MVO 392, K3DCB 266, K3AIZ 243, K3WEU 230, K3PIE 188, K3MYS 159, W3VR 155, W3QDW 143, W3VAP 143, K3ZYT 142, K3ZUN 121, W3ZRQ 113, K3CSG 103, K3-GSU 97, K3YQJ 85, K3YVG 68, W3MPX 65, WA3CKA 64, WA3BHN 60, WA3CKX 57, K3PWM 41, K3HNP 37, W3CBH 31, K3KTH 31, W3AES 30, K3HKW 30, K3JQL 30, W3RV 26, K3RZE 26, K3MHD 19, K3KKO 17, K3LPT 12, K3MNT 12, W3OY 12, K3ZSK 9, K3RUA 8, W3JKX 7, W3BFF 6, K3HTZ 5, K3VAX 5, K3JHF 2, W3LXN 2, K3MTF 1.

MARYLAND-DISTRICT OF COLUMBIA—SCM, Bruce Boyd, W3QA—SEC: W3CVE. RMs: K3JYZ, W3-CQW, W3UE, W3ZNW. PAMs: W3JZY, K3LFD.

Net	*Freq.*	*Time*	*Days*	*Sess.*	*QTC*	*Ave.*
MDD	3643	0000Z	Daily	31	299	10.7
MEPN	3820	2200Z	M-W-F	21	42	2.0
MEPN	3820	1700Z	S-S	(incl. in above)		
MDDS	28200	0130Z	Daily	29	32	1.1
MDDS	3650	2200Z	Sun.	5	5	1.0
MSTN	50150	0100Z	Daily	31	82	2.0

The keynote for May seems to be *travel*. W3HQE went to Europe again in June. W4EXM/3 is working out of Honolulu and has been in the combat areas of Viet Nam. W3ECP attended the ARRL Directors' meeting at Quebec. W3WTO has been working Maryland from Cape Kennedy on 6 meters. K3KMO operated from Texas for two weeks while on reserve training. W3RKK, K3IQK, K3VCG are all moving to new locations and K3JYZ is moving to a new antenna farm in August. Even W3QA got in a few business trips which helped to keep his on-the-air time at zero. Six meters was lively in both skip and traffic. K3YKC reports working 30 DX stations during band openings. Welcome to the new South Central Pennsylvania Six-Meter Traffic net on 50.7 Mc. reported by K3IPX/3. This net has liaison with MISTN daily. K3URE had 22 QNIs in MSTN besides working in other 6-meter nets. Equipment changes in the section include a new 100-mw. transistor transmitter at K3GZK, re-wired 814 rig at W3QCW and antenna repairs at W3ZNW and K3NCQ. K3QQD is getting ready for Field Day and K3URZ is building an automatic keyer. W3EOV (OPS) is overhauling his RTTY gear and working more c.w. W3PQT was busy in MEPN and military nets on 20 meters. W3PQ is in favor of Docket 15928 as is. Schoolwork held down K3ZYP's usual high total but he still managed to stay in the BPL. W3ECP reports that W3VJ is seriously ill at the Naval Hospital in Philadelphia. W3CYA (OO) logged illegal commercial stations in the ham bands. Delaware SCM W3IYE, Delaware SEC K3NYG, Delaware MDD rep. W3EEB and MDD RMs W3QCW and W3-MCG met with the Maryland SCM to coordinate emergency teams for MDD. Traffic: (May) K3WKV 405, K3ZYP 209, W3PQ 137, K3JYZ 128, W3PQT 112, K3QDD 82, K3IQK 71, W3EOV 69, K3TJE 56, K3GZK 48, W3-QCW 46, K3IPX/3 44, W3UE 44, W3ZNW 32, K3LFD 27, K3URE 25, W3LBC 23, K3LLR 17, W3ECP 15, WA3BNL 14, K3KMO 12, W3RKK 5, K3VCG 5, K3-URZ 4, K3NCM 2. (Apr.) K3VHS 32, K3VCG 4, W3-WTW 3.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: K2ARY. PAM: W2ZI. RM: WA2-BLV. K2RI, operated by WB2GUK, did an outstanding job of handling traffic at the Rotarians Radio Group Convention held in Atlantic City. Mobile van and equipment operated on all bands. The activity was provided by the Southern Counties ARA. N.J. Phone & Tfc. Net totals for May: 31 sessions, QNI 489 and traffic 188. W2ZI, the net manager, has just returned from a West Coast trip. W2BEI, Audubon, has worked G3HIZ more than 400 times since 1938. K2SHE, Crosswicks, took a trip to Idaho and the Midwest during June. Another vacationer, W2BZJ of Pennington, enjoyed a 2-week Caribbean cruise during May. With regret we report the passing of W2MMD, Monroeville. He was a very active member of Gloucester County C.D. and the Gloucester County ARC. The Audubon ARC has started a net on 145.5 Tue. nights at 7:30. W2WZM, Maple Shade, attended the recent ARRL Convention at Swampscott. WA2KOK, an SJRA member, is taking basic training at Fort DIX. K2IEO, another SJRA member, has been assisting a sightless neighbor in securing a ham ticket. Hamfest dates: SJRA, Sept. 12 at Molia Farms; Gloucester County ARC, July 25 at Crystal Birch Lake; Southern Counties ARA during August—contact WB2PHV. K2JKA and K2PQD recently worked FG7-XT/FS7 on RTTY. W2MBC is the Cherry High School radio station. Its club news are published monthly in SJRA's *Harmonics*. Traffic.: (May) K2RI 343, WB2-GUK 223, W2RG 165, WA2VAT 86, W2GIW 20, K2GIO 11, W2BEI 9, W2ZI 8, W2BZJ 6, K2SHE 6. (Apr.) K2SHE 10.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2ZRC. PAM: W2PVI. RMs: W2RUF, W2EZB, W2FEB. NYS C.W meets on 3670 kc. at 1900, ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 2200 GMT, NYS C.D. on 3510.5 kc. and 3993 (s.s.b.) at 0900 Sun. and 3510.5 kc. at 1930 Wed., TCPN 2nd call area on 3970 kc. at 0045 and 2345 GMT, NYSCN on 3510 kc. Sun. at 1000 and 3670 kc. at 1700 Sat. Con-

• 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.

gratulations to BPLers K2KQC and W2OE. Endorsements: K2KNV as ORS and OO, K2KTK as OO. Appointments: W2SEI and WA2UFI as ORSs, both transferring from other sections. Congratuations to the West Seneca Central School ARC and the Clarkson College ARC (W2TAB) on becoming affiliated with ARRL. RAGS elected W2ETY, pres.; W2ZOJ, 1st vice-pres.; W2YRL 2nd vice-pres.; W2SEI, secy.; W2-PGD, treas. The club is planning a big year; among public service projects is communications for the 1000 Islands Marathon Boat Race. The 1965 WNY Hamfest, sponsored by the RARA, exceeded all previous WNY hamfests in every event, including total attendance which was well over 700. K2HUK had the honor of presenting ARRL Sweepstakes Awards to K2KTK and K2IML for WNY. Club Awards (RARA) went to K2-IML and WA2HUV. WA2ZNG and WN2PCP also got club awards in V.H.F. and Novice, respectively. K2KTK won the c.w. contest by sending 39.8 w.p.m. WA2KMI was M.C. and the main speaker was W3GD, Commissioner from the FCC. A fine job was done by W2ICE, program chairman, and many others. Your SCM also attended the Rome Radio Club's Ham Family Day which included something for everyone. W3YA, our Director, spoke on the highlights of the Board meeting. We had a chance to see the K2GVI repeater on 2-meter f.m. This services the Utica-Rome area and can be copied well into Syracuse. The only hole in complete statewide coverage along the throughway is in the Rochester area. WA2KND was selected RARA's outstanding Ham of the Year. K2YFP, pres. of the Utica ARC, reports that the club trip to ARRL Hq. was a big success. The NYSPTEN Picnic will be held Aug. 21 in Thatcher State Park near Albany. Traffic: K2KQC 1551, W2OE 326, W2GVH 177, WB2GAL 155, W2RUF 132, W2HYM 119, W2LYG 109, WB2HLV 102, W2FEB 79, WA2IHP 69, K2JBX 69, WA2TUT 65, K2OFV 44, K2KTK 41, K2MIP 40, WB2FPG 39, W2RQF 34, WB2-NZA 32, K2MQN 31, K2BWK 30, W2FPG 30, WA2ANE 26, K2IMI 26, W2NITA 23, W2RLV 23, WB2ERK 21, K2HOH 16, W2FCG 14, WB2IJF 13, WA2FOJ 11, K2-AYQ 10, K2DNN 8, WA2PZD 7.

WESTERN PENNSYLVANIA—SCM, John F. Wojtkiewicz, W3GJY—Asst. SCM: Robert E. Gawryla, W3-NEM. SEC: K3ZMH. PAMs: W3TOC (v.h.f.) K3VPI. RAMs: W3KUN, W3MFB, W3UHN, K3OOU. Traffic nets: WPA, 3585 kc. 0000 GMT Mon. through Sun. Studying to upgrade your license? Now is the time to do it. Our eminent Director, W3YA, donated the entire fund of the Penn. State Club's treasury, which has been dissolved, to the Nittany ARC for the purchase of new equipment. K3BTF won nomination for the City Council at Connellsville. The new call of the Two Rivers ARC is WA3DFM. W3NWB received 35-w.p.m. certification from ARRL. Have you? W3MTW is busy with incorportation plans for the McKean County ARC. W3-BEX tries out vertical antennas. Like to golf? W3-SJO does. A new member of the Etna Radio Club is K3VYO. Get out to the South Hills Brass Pounders & Modulators ARC Hamfest the 1st Sun. in August at St. Clair Beach. Winners of the club's ground-wave contest were K3WNY, W3BWU, WA8KPO, K3PLN, W3MCE and W3SIR. K3ZMH is the newly-appointed Section Emergency Coordinator for Western Pennsylvania. Our thanks to K3OTS, former SEC, for a job well done. K3ZGI is maritime mobile on 6 and 2. W3KPJ emits 6-meter c.w. with a 6N2. WA3AIR is back on the air after changing his QTH. K3FFJ came up with several "USA-SH" Honors awards. K3AKR worked 7 California stations in one hour on 50 Mc. K3-PPZ and K3NNW are back on after repairing their beams. New Gear Dept.: WA3BHV, a new Collins KW and a 75-SB3; K3HTR, a new 75-SB3; WA3BNO a Gonset G-50; W3NAV, Coke Center Radio club, a Ranger purchased by W3TTV. Officers of the Horseshoe ARC are K3IML, pres.; K3FGL, vice-pres.; K3HDH, secy.; K3SIQ, treas.; W3VPF, act. mgr. K3WFZ has a new keyer. W3NKI, Carnegie Institute of Technology ARC, provided communications for the Spring Carnival Buggy Races with WA8DYP, K3TUT, K3KCE, WA3-ADW taking part. Endorsements: K3PQK as OBS. New appointments: K3ZGI as OBS/OPS; K3VYY as EC for Beaver County; W3LHN as EC for Allegheny 80 through 10 meters. Traffic: (May) K3PYS 117, W3LOS 49, W3KPJ 40, K3OOU 33, W3GJY 22, W3UHN 20, W3-IYT 17, K3SMB 14, W3LOD 5, K3SOH 5, W3SMV 3. (Apr.) K3WFZ 4.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: George J. Nesbed, W9LQF. SEC: W9-RYU. RM: WA9DXA. PAMs: W9VWJ, WA9CCP and WA9KLB. (V.H.F.) Cook County EC: W9HPG, K9-ATH left the class of bachelors on June 5. W9HPG was omitted on last month's list of those participating in the League's Frequency Measuring Tests. W9SXL is moving to 7-Land. K9TKT is now on RTTY. The Northwest Amateur Radio Club provided communications for the Boy Scout Caporee at Illinois Beach State Park at Zion. W9ENF, W9KGS and K9ZWY provided communications at the Mid-America Canal Races on the Fox River. From the reports received, many of the Illinois section amateurs copied the Armed Forces message. K9UIY handled earthquake traffic from YS1RFE shortly after the disaster struck. The Interstate Single Sideband handled a traffic total of 569, according to W9NWK, NCS. The Worth Township Amateur Radio Club supplied communications for the annual parade in Oaklawn. K9VVL has finished his last semester at Illinois Institute of Technology. Your SCM spoke before clubs at Decatur, Sullivan, Champaign and Springfield during May explaining the new FCC docket and is available for other club meetings. K9RCT, of Princeton, was co-valedictorian of his graduating class at the U. of I. in June, majoring in EE. K9ARJ, WA9KHR, K9DQU, K9GFX, and K9KYJ furnished communications for the Motorola Sportmens Club. New appointments include WA9GUM as ORS and W9AZP as OO. K9EBE, Travis Marshall, has resigned from Hallicrafters to accept an executive position at the E. F. Johnson Co. at Waseca, Minn. WA9GCM has a new SB-400 to work the hard ones. WA9CCP, K9NBH, W9YHZ, K9KZB, WA9CNV, WA9EBT are recipients of the BPL award for May traffic. Traffic: (May) WA9CCP 1274, K9NBH 862, W9-YHZ 774, K9KZB 669, WA9CNV 592, WA9EBT 292, WA9LUG 158, W9JXV 96, W9AXR 84, W9EVJ 80, K9-BTE 72, WA9GUM 62, W9NXG 50, W9HOT 31, W9DOQ 26, K9HSK 22, K9CYZ 16, W9PRN 16, W9IDY 13, WA9AJF 9, K9UIY 8, W9LNQ 5. WA9FIH 4, K9DQU 3, WA9KKA 2, WA9NFS 2, K9RAS 2. (Apr.) W9IFY 54, W9JXV 49, W9LNQ 8.

ILLINOIS QSO PARTY

August 7-8

All amateurs are invited to participate in the Third Annual Illinois QSO Party, sponsored by the Illinois Chapter No. 17, CHC. The contest starts at 1600 GMT August 7 and ends at 2200 GMT August 8. The same station may be worked once on phone and once on c.w. Suggested frequencies are 3600 3900 7100 7220 14,100 14,-300 21,100 21,300 28,100 and 28,700 kc. Exchange QSO number, report and county (in Illinois) or State, Province or Country. Illinois stations multiply total QSO points by the number of different states, Provinces and countries worked. All others use the number of different Illinois Counties for multiplier. In Illinois, single and multiple operator stations will compete for 1st, 2nd and 3rd place certificates. Outside Illinois, a certificate will go to the high scoring station in each State, Province and country. Logs must show dates, times, stations, exchanges, band, mode and score claimed. Illinois stations must show whether single or multiop. Postmark logs no later than Sept. 1, 1965 and send to Illinois QSO Party c/o Cliff Corne, K9EAB, 711 West McClure Avenue, Peoria, Illinois, 61604, U.S.A.

INDIANA—SCM, Ernest L. Nichols, W9YYX—Asst. SCM: Donald Holt, W9FWH. SEC: K9WET.

Net	*Freq.*	*Time*	*Days*	*Tfc.*
ILN	3515	1900 CDT	M-Sat.	No Report
111 PON	3925	1700 CDT	M-F	85
111 PON	3925	0830 CDT	Sun.	
111 PON	3545	0930 CDT	Sun.	
No. Cent. Phone Net	3915	0800 CDT	M-Sat.	1470
Phone Net	3915	1300 CDT	M-Sat.	
IEN	3940	0900 CDT	Sun.	No Report

Net	*Freq.*	*Time*	*May tfc.*	*Mgr.*
IFN	3910	1330Z Daily 2300 M-F	341	K9IVG
ISN	3910	0000Z Daily, 2130 M-Sat.	838	K9CRS
QIN	3656	0000Z Daily	132	WA9BWY
RFN	3656	1200Z Sun.	40	WA9IZR

K9GLL, PAM of the Hoosier V.H.F. nets, reports May tfc. of 53. W9QLW, RM of 9RN, reports 100% representation by Ind. in May. New appointments: W9SNQ as OBS, WA9JWL as OES, W9HCQ as EC of Hendricks Co. BPL winners: W9JOZ, K9IVG, WA4RQR/9, W9NZZ and W9BHR. QIN Honor Roll: K9HYV, K9VHY, K9WWJ, W9ZYK, W9QLW and WA9BWY. The Tri-State ARS is planning seminars to train members for higher class licenses. W9BHR operated at a carnival at the Ind.

Inst. of Technology, Pike Co. has an active emergency net on 147.9 Mc. every other Mon. at 8 P.M. New officers of the Purdue ARC are K9QXS, pres.; WA9CSA, vice-pres.; K9DHN, secy.; W9EOZ, treas. W9HPG, spoke at the Purdue ARC banquet. Correction: Under "Traffic" in June *QST* WA9CYG was listed incorrectly as WA9CVV. *Amateur Radio exists because of the service it renders.* Traffic: (May) W9JOZ 1157. K9IVG 930, WA4RQR 9 776, W9QLW 278, WA9BWY 276, W9ZYK 239, W9NZZ 183, W9MM 161, K9VHY 148, W9BHR 110, WA9IZR 107, WA9FDQ 86, W9YYX 74, W9HRB 73, K9VHY 70, K9CRS 59, W9VAY 59, K9GLL 55, WA9AUM 42, K9WWJ 36, K9EFY 33, W9RTH 32, W9YB 32, WA9BRD 30, W9BUQ 25, K9RWQ 25, W9CC 24, W9SNQ 21, W9FZW 23, K9ZLB 21, W9DGA 20, W9FWH 17, W9CLY 16, WA9BGI 13, K9UEO 13, K9ILK 12, K9KTL 11, K9VZQ 11, K9BSL 10, W9BDP 8, WA9KBT 5, W9DOK 4, K9DIY 3, K9TSJ 3, WA9AXF 2, WA9DRO 1, W9HCQ 1, WA9LNX 1, WA9MEJ 1, K9YKE 1. (Apr.) WA9BWY 621, W9VAY 153, K9DHN 81, K9QVT 68, WA9AXF 4.

WISCONSIN—SCM, Kenneth A. Ebneter, K9GSC—SEC: K9ZPP. PAMs: W9NRP, K9IMR, K9HJS, WA9EZT.

Net.	*Freq.*	*Time*	*Sess.*	*QNI*	*QTC*	*Mgr.*
BEN A.M.	3985 kc.	1200Z Mon.-Sat.	26	259	73	W9NRP
BEN N	3985 kc.	1700Z Daily	31	499	222	K9HJS
WSBN	3985 kc.	2215Z Daily	31	1062	412	K9IMR

Other nets: WIN on 3535 kc. daily at 2345Z and SWRN on 50.4 Mc. Mon.-Sat. at 0200Z. New appointments: W9RTP and W9IBM as ORSs, K9JXW as OPS and W9NGT as EC for Washington County. Renewed appointments: K9FPM as OES; W9GIL as ORS; K9WIE as OPS; W9HDV, K9UTN and W9ONI as ECs. K9LGU is running an NCX-3 and moving to New Holstein in Calumet County for you county hunters. W9BCC took a trip to England. WA9GJI has a new SW-350 in his car. K9WIE has up to 111 countries confirmed. WA9IVH has a new Drake 2-B. K9UUJ has a new NCX-5 and a Hustler mobile. BARS (W9YT) officers are K9GMP, pres.; K9WHO, vice-pres.; K9FWF, secy.-treas.; W9-MLO, engineer. Wausau officers are K9JPS, pres.; K9-CIN, vice-pres.; K9BCB, treas.; K9HFR, secy. K9JXW is c.w. Asst. EC and K9HJS Phone Asst. EC for Marathon County. W9VSO led the OOs with 21 notices in May. BPL for May was made by WA9GJU and WA9-LWJ. Traffic: (May) WA9GJU 415, W9DYG 305, WA9-LWJ 228, K9IMR 200, K9HJS 111, K9JXW 76, W9GOC 65, W9YT 57, K9GDF 50, K9GSC 50, K9UTQ 36, W9-HWQ 24, W9IBM 12, W9APB 11, W9RTP 9, WA9IVH 8, K9WVM 8, W9AYK 7, K9DBR 5, K9RCK 5, K9UUJ 2, K9WIE 2, W9OTL 1. (Apr.) WA9FOM 182, WA9MRK 80, K9LGU 22, W9IBM 6, K9FHI 5.

DAKOTA DIVISION

MINNESOTA—SCM, Herman R. Kopischke, Jr., WØTCK—SEC: WAØBZG. RMs: WØISJ, WAØJDG. PAMs: KØFLT, KØVPJ. MSSB PAM: WØHEN. V.H.F. PAM: WAØCQG. MSPN meets M-Sat. on 3820 kc. at 1800Z and 2400Z., Sun at 1500Z. MSSB meets M-F on 3805 kc. at 1730Z and on 3812 at 0045Z. MSN meets daily on 3595 kc. at 0030Z. MJN (slow-speed c.w.) meets daily on 3595 kc. at 0100Z. MSTN meets S-F at 0430Z and Sat. at 0200Z on 52.4 Mc. The North Star YL meets on 3820 kc. at 1500Z each Tue. All nets meet one hour earlier by GMT during DST. Same local time. Congrats to WAØJDG on his appointment as MJN RM and to WAØIDB as OES. Many thanks to WAØEPX and KØJEJ for their services as past RMs for MJN and MSN. Appointments endorsed: KØFLT as PAM, KØEGE and KØICG as ECs, WØRQJ as ORS and WAØDGW, WAØEDN, KØFLT and KØICG as OPSs. The St. Paul Radio Club elected KØRSJ, pres.; WØQKJ, vice-pres.; WØKKO, treas.; WAØERB, secy. The Arrowhead ARC elected WAØBJY, pres.; WAØERW, secy.-treas.; WAØIEF, chairman. EC-OPS WAØEDN is operating mobile with a new HW-12. OPS WAØIEF put up a new TA-33. Greetings to WNØMNP and WAØMAV, new hams in Duluth. KØUIJ is enjoying s.s.b. with a new *HX-10* and a Drake *2B*. Bill operates from the new home he built. OES KOOST worked Utah, Wyoming, Idaho, Pennsylvania and New England on 6 during May and heard many others. KØYOF had daily skeds with KØICG on 20-meter mobile during his vacation to Denver and the West Coast. It's good to hear OPS WØKYG back on the air after having rig troubles. WAØFCJ is building a Heath HR-10 receiver. Congrats to WØYC and WAØJKT on making the BPL. Picnic reminders: Aug. 1, Duluth; Aug. 8, St. Cloud; Aug. 15, Minneapolis. Traffic: (May) WØYC 283, WAØJKT 213, WAØEPX 116, KØZZR 98, WØKJZ 49, KØZRD 42, WAØAAM 41, KØICG 37, WAØBZG 31, WAØEDN 31, WØTCK 31, KØVPJ 31, WAØASV 30, WAØDKP 28, KØFLT 27, WØHEN 27, WAØIIJ 26, WAØFUR 25, WØUMX 24, WAØIEF 16, KØZKK 14, WØFKC 13, KØIGZ 13, WØISJ 13, WAØ-DVH 12, WØATO 11, WAØCQG 11, WAØFCJ 11, WNØJIA 11, KØZRC 10, WAØJPR 9, WAØACI 7, WAØDFT 7, WØMXC 7, WAØEZQ 4. (Apr.) WAØCQG 25, WAØDKP 20, WNØKDS 4.

NORTH DAKOTA—SCM, Harold L. Sheets, WØDM—SEC: WAØAYL. PAM: WØCAQ. OBS: WØPQW. Cass County EC: WØCAQ. Grand Forks County EC: WAØBIT. More than 200 hams attended the fine annual hamfest staged by the NDSU Club. KØHXL and KØQWY won the hidden transmitter hunt with a super sniffer. WØFUP won the mobile contest. WAØAYL completed his WAS by hooking KH6GF over the RE in Hawaii and WAØAAD snagged his 53rd county to complete them all. WØBHT finally got that new Warrior linear wired and fired up. WNØMJJ and WNØMJK are new Novice calls in EGF while WNØLQU came through in Cavalier. KØHXL as a new remote-controlled vertical for the mobile and it works. The Bismarck Radio Klub (BARK) elected KØQYD, pres.; KØEOF, vice-pres.; KØHDA, secy.; WØQWG, treas.; KØCND, act. mgr. The Turtle River Amateur Radio Club of the GFAFB has become an ARRL affiliated society. W5FLO Ø is the secy.-treas. KOOSL, possessor of a Clegg 99er, is the new act. mgr. of the Forx Amateur Radio Club. KØQYD recently completed remodelling his shack and from reports it rivals a BC studio. KØCND has added a Drake 2B to his station. K9-VFY Ø has been busy experimenting with many forms of the ever-popular quad. WØCGM and KØJLU are going to be working in Bismarck this summer. Herb *has an HW-12 with him.* WØDM *got his HW-12 back* and worked portable with it on a trip to Indiana and South Dakota. RACES report: 898 check-ins, messages handled 283, 22 sessions, daily average check-ins 44.6 Traffic: KØITP 78, WAØAYL 18, WØDM 8, KØCND 2.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN—SEC: WØSCT. RM: KØGSY. This is my last report as SCM. Effective July 1, Seward P. Holt, Box 58, Clear Lake, South Dakota, takes over the job. I'd like to thank SEC Lester R. Lauritzen, who submitted 71 consecutive reports on time, and KØBMQ and KØ-GSY who handled the RM job. This month I received fewer reports than any time during my years as SCM. Please help Mr. Holt all you can. Traffic: (May) KØ-GSY 309, WØSCT 64, WAØAOY 20, WØDIY 13, KØZBJ 12, WØGWW 10, KØYJF 7, KØBSW 6, WØJCE 4, WAØ-CKH 2, WØCQN 1, WØDJO 1. (Apr.) KØZBJ 26.

DELTA DIVISION

ARKANSAS—SCM, Curtis R. Williams, W5DTR—SEC: W5NPM. RM: K5TYW. PAM: WA5GPO. NMs: K5IPS, W5NCT and WA5IEQ. Congratulations to WA5IUNN on qualifying for the BPL medallion and to K5VBF and WA5BRB on qualifying for Arkansas Single Sideband Section Net certificates. Both the phone and c.w. section nets could use your help. Your EC would like to have your station and skill registered with him in the Amateur Radio Emergency Corps in case he needs to call on you during an emergency. Our recent tornadoes should remind you that it *can* happen here! *Be prepared.* Register *now.* Net reports:

Net	*Freq.*	*Time*	*Days*	*Sess.*	*QTC*	*QNI*	*Ave. Tfc.*
OZK	3790	0100Z	Daily	31	200	231	6.4
RN	3815	0000Z	Daily	31	69	486	2.2
APN	3885	1200Z	Mon-Sat	26	39	847	1.5

Leading QNIers on OZK were WA5BDU 27, WA5IIS 26, W5NND 23, W5FUD 22, WA5HNN 18. Welcome to WA5KUD and WA5KAK. Navy MARS held a recent area meeting in Little Rock with the District Director, NØASF, and the Arkansas Phone Net held a ham picnic in North Little Rock with excellent attendance. Traffic: WA5HNN 250, WA5IIS 228, W5OBD 199, W5-NND 136, W5DTR 44, K5TYW 32, W5NCT 12, WA5-KUD 6.

LOUISIANA—SCM, J. Allen Swanson, Jr., W5PM—SEC: W5BUK. RM: W5CEZ. PAM: W5TAV. V.H.F. PAMs: WA5KHE, W5UQR. WA5KIV is a new ORS; WA5JVL and W5ZJO are new OESs. W5UQR, K5HFI and W5JFB submitted very fine v.h.f. reports. W5TAV is issuing Section Net certificates to all members of the Gulf Coast Hurricane Net. WA5EVU is being appointed EC for the Natchitoches Area. K5PGS has undergone more surgery but will lead a group from New Orleans to the Philmont Scout Ranch in New Mexico later this summer. The East Jefferson High Radio Club was active in FD. WA5KAJ is the proud possessor of a new Warrior. WA5HGX is having fun sending OB on 14.3

Mc. three times a week. W5CEZ was scouting most of June. K5OKR still is pounding brass on LAN and thanks Alice for never missing a monthly report. W5GHP has had a change of work schedule which is curtailing his net activities. WA5EID strives for WAC and DXCC now that school is out. WA5LTF is attending night broadcasting school. WA5DES reports that short skip has been erratic on 40-meter c.w. WA5BLO still is going strong on c.w. nets. W5JFB is active on 6 and worked Los Angeles on 50.1 Mc. for the first s.s.b. Calif. QSO. K5FYI still is loyal to MARS. The Chetimachi Amateur Radio Club, recently organized in the Houma Area, has voted to be 100% ARRL, according to K5-KQG. W5MXQ reports the Jefferson Radio Club was active in FD. W5LDH is to be congratulated on getting the ARRL Board Meeting action on Incentive Licensing to the division boys in such a short time. Phil was on the air immediately after his return passing the word. W5BUK spent four weeks traveling the 8th Naval District. By the time you read this report Yours Truly will be up East for a month's tour of Yankee-Land and a visit to Headquarters so be patient if your letters are not answered immediately. Traffic: W5GHP 537, W5CEZ 375, W5MXQ 104, K5OKR 87, WA5RLO 38, WA5DES 24, W5PM 24, WA5EID 17, K5FYI 16, K5-KQG 10, WA5HGX 7.

MISSISSIPPI—SCM, S. H. Hairston, W5EMM—SEC: W5JDF. The Jackson mobiles are doing a fine job, especially WA5IWJ, W5EPT and WA5CAC. K5UYP now has completed the Collins KW with all the trimmings through 6 meters. K5VBA has new antennas, tuners, s.w.r. bridge and has a potent signal. W5JDF reports "Miss" constantly improving. W5WZ reports much c.w. traffic passed. Looks like every rig W5CQJ puts on the air has a fine signal. W5SHX really puts in time on the bands. W5RF is back on the air. WA5FII has his rig in fine condition. W5JHS deserves recognition for his faithfulness to the Gulf Coast Side Band Net. K5MDX reports ZL3VB as his DXCC No. 301. WA5INZ has the best traffic total for the month. Congratulations to K5TYP, Keesler ARC, for the fine Armed Forces Day showing. Listen for W5GWD. W5-OSA is having a ball with the new mobile rig. We all will miss K5RIX. He was a wonderful example to all. W5NNZ is active now in Jackson and WA4LEP/5 in Meridian. Traffic: WA5INZ 465, W5JDF 327, K5TYP 216, WA5FII 129, W5WZ129, K5VBA 81, W5BW 12, K5MDX 11.

TENNESSEE—SCM, William A. Scott, W4UVP—SEC: W4RRV. PAMs: W4PFP, WA4GQM, WA4AIS. RM: W4MXF.

Net	*Freq.*	*Days*	*Time*	*Sess.*	*QNI*	*QTC*
TN	3635	M-Sat.	1900C	25	197	138
TSN	3636	M-W-F	1900E	13	69	34
TSSB	3980	M-Sat.	1830C	26	1188	132
TPN	3980	M-Sat.	0645C	27	838	97
	3980	Sun.	0800C			
ETPN	3980	M-Fri.	0640E	21	448	78

Sorry to report the resignation of W4RMJ as TPN PAM. Leo has made a real contribution to this net. W4PFP has agreed to take on the job. We are sorry to report the passing of XYL W4CZE. TSN members want nightly sessions. The Tenn. section did a fine job on the Building Fund Drive. Frye RC now is the 4th District QSL Bureau. The local post office reports many QSLs are not deliverable; please register your call and address with the P.O. WA4GQM and K4JIG continue their BPL ways. We need four qualified OOs. Roane City ARC officers are K4TKQ, pres.; WA4PWW, vice-pres.; WA4PWQ, secy.-treas. Traffic: WA4GQM 591, W4FX 456, W4OGG 429, K4SXD 224, WA4IBZ 211, W4ZJV 197, K4JIG 169, W4PQP 154, WA4JVU 109, W4-MXF 74, WA4OXD 50, W4UVP 37, K4UWH 37, W4PFP 36, W4TZJ 33, WA4RHG 31, W4WBK 30, K4WWQ 28, W4TZB 24, W4YAU 23, W4TYV 21, K4EWI 19, WA4-NUJ 19, WA4KHD 18, WA4OSD 13, WA4HGQ 9, W4-LLJ 8, K4UMW 8, WA4EWW 7, W4VTS 7, WA4YNF 7, WA4RQD 6, W4SGI 6, W4VJ 6, WA4IZB 4, K4KYL 4, WA4AJB 3, WA4PTD 3, K4VZI 3.

GREAT LAKES DIVISION

KENTUCKY—SCM, Mrs. Patricia C. Schafer, K4-QIO—SEC: K4URX. PAMs: W4BEJ, WA4RDE, K4-YZU, V.H.F. PAMs: WA4IUW, K4KZH. RM: WA4-LCH. Appointments made in May: WA4TJS as OES. Endorsements: W4CDA, W4BAZ, K4QCQ, K4KWQ as ORSs; W4KJP, K4WMV as OPSs; K4NYO as OBS; W4NOA as EC.

The Henderson Amateur Radio Club will hold its Second Annual Hamfest Aug. 8 in Henderson. W4RHZ and WA4LCH maintained emergency communications for Covington State Police force during a power failure in May for one hour thirty minutes. All Kentucky nets aided in the Indiana tornado emergency. W4BAZ is building a new home. WA4LCH and K4CSH made the BPL in May. Ky. was represented 100% in 9RN in May with WA4LCH being there 30 times. K4QCQ and W4-RHZ checked in often, too. W8UPB, Great Lakes Division Director, spoke at the Kentuckiana Radio Club meeting in May. WA4FLG passed the General Class exam. WA4IEJ is building a new quad. K4NQV is experimenting with ham TV. WA4OPS and son, WA4FLF, have purchased a lot and cabin on Barren River Lake and will be portable. WA4AUR is back from a fishing trip in Canada. Traffic: (May) WA4LCH 570, WA4AGH 377, K4CSH 227, WA4RDE 151, W4BAZ 133, W4RHZ 130, W4CDA 80, WA4UAZ 61, W4KJP 56, K4YZU 56, WA4GMA 46, WA4HJM/4 46, W4OYI 38, WA4AUR 32, W4BTA 30, WA4KFO 28, K4LOA 20, W4PLN 13, W4-JRA 12, WA4MEX 9, W4SZB 8, WA4OMH 2. (Apr.) W4BTA 122.

Net	*Freq.*	*Days*	*Time*	*Sess.*	*QNI*	*QTC*
EMPRN	3960	M-F	0630			
MKPN	3960	Daily	0830	31	450	109
KTN	3960	Daily	1900	31	709	377
KYN	3960	Daily	0900	61	418	389
			1900			

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: K8GOU. RMs: W8EGI, K8QLL, W8ELW, K8-KMQ. PAMs: W8CQU, K8LQA, K8JED, V.H.F. PAM: W8PT. Appointments: K8AEM, W8ALG, K8HPO, K8-JZP, W8NDM as ECs; W8DQL, W8FDO, K8IUZ, W8-WQH, W8ZJE, W8ZLK as ORSs; W8ALG, K8CKD, W8DVB, W8EJR, K8EFY, K8GJD, K8GOU, W8IWF, K8LQA, W8TIC, K8VDA as OPS: WA8DZP, W8HFA, WA8JJH, W8PT as OESs; WA8DZP, W8NWW, W8-UUS as OBSs; W8CQN as OO. New officers: Kent ARC W8IWF, pres.; K8CGD, vice-pres.; WA8DOA, secy.; W8VV, treas.; K8BPT, WA8CTC, WA8IGY, WA8OET, K8RDO, K8UFI, board. WA8IAQ, who is K8PBA's YF, is doing OK now in the hospital. K8NTE has a Heath KW compact. W8QBI a new 72-ft. Rohn crack-up tower. K8JHA, K8JUG and K8NTE are on RTTY. K8-EFY has an SR-150 and an SB-200, also is mobile with an HW-12. W8WQH's YF is WN8QBV and his son is WN8MUO. K8JJC is out of the hospital. W8HK is moving to Florida. WA8CVH and W8WUD have ham TV going. W8FLW's XYL is out of the hospital and OK. W8IOC took 1st place, antique class, with his 1929 Ford. K8ATX (Pop) has son, K8AHZ and daughter WA8-DWN graduating from high school. K8UTI put up a 60-ft. windmill tower. K8SLG uses a Heath HW-12 transceiver, and sponsors the Clio Area Schools ARA with the club call WA8PLQ. W8WNX designed and built a good 432-Mc./417-A r.t. stage. W8SS and XYL, W8-RLT and W8MKZ flew to London to an SB dinner, and will be joined by W8GA at Hamburg to attend a German Hamfest. They then will attend the European Ham Convention in Switzerland. W8ICM joined the "Bad Heart" club and is critical. Another ham family: OM WA8DCK, mom WN8PNN, daughter WA8KUO. K8SWQ made General. K8IUZ is working at Sparton and will graduate from U. of M. this fall. K8KMQ works TCC, SRN and QMN. K8ZJU says the Ecorse Memorial Parade communications were handled by W8-MPD, W8VWY, K8AMA, K8ZEG, K8ZJU and WN8-OYG. W8EJR is using a Millen v.f.o. and DX-40 for c.w. K9RHU/8 has a new Drake R-4 receiver. Silent Keys reported: K8LIZ and W8PTN. Traffic: (May) K8-NJW 497, K8QKY 313, K8LNE 292, K8KMQ 262, WA8-BQK 124, W8BEZ 113, K8ZJU 112, K8HLR 94, W8ELW 80, K8WQV 71, K8GOU 63, WA8KXO 60, W8EJR 59, WA8ENW 53, K8JED 39, W8FX 35, WA8CTE 30, K8-MEO 28, K8QLL 27, WA8LRC 26, K9RHU/8 25, W8-RTN 24, K8TIY 23, K8LQA 22, W8HKT 21, W8IBB 18, W8AHV 14, W8FWQ 14, WA8HGE 14, WA8MEE 10, W8AUD 6, K8GJD 6, K8PYW 6, W8WNX 6, W8YAN 6, K8VDA 5, W8DSE 2, W8ZHB 2. (Apr.) K8GOU 173, K9RHU/8 77, W8EJR 55, W8IUC 34, WA8GBN 14, WA8GRI 13, WA8HYR 8, WA8AXF 4.

OHIO—ACM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, W8DAE. SEC: W8HNP. RMs: W8-BZX, W8DAE, K8LGB. PAMs: W8VZ, K8BAP, K8-UBK. K8EXI joined the Silent Keys. The Apricot Net heard an illustrated lecture and toured the Sohio's Tracking Station. Findlay RC's *W8FT News* mourned their 92-year-old W8QP, who joined the Silent Keys. Your SCM attended the dinner at Atwood Dam of the Canton Chapter of the Quarter Century Assn. along with W8ACH, W8AXR, W8DCC, W8DNC, W8DVM, W8BUK, W8EUK, W8HR, W8LVW, W8MEI, W8MND, W8NAL, W8NBK, W8NWR, W8OYV, W8QAZ, W8RZ, W8SJC, W8SQW, W8WH, W8ZA, W8ZWE. K8TRS and K8UBK. The Seneca County sheriff spoke to the Seneca RC on emergency communications. Babcock & Wilcox saw two movies, Secret Cargo and Great Bear Lodge.

WE THINK you will be interested in a couple of production modifications to the NCX-5 transceiver. The first is a rather substantial change in the balanced modulator circuit which replaces the 7360 sheet beam tube with a solid state ring-type balanced modulator. The new balanced modulator is characterized by extreme stability with respect to external or magnetic influences, on-off cycling, aging, or warm-up time. In fact, it will hold carrier suppression to a minimum of 50 db through all of the above, and typically can be adjusted to provide 65 or 70 db of suppression! Of much importance to us at the factory, production problems are minimized because of the elimination of tube selection.

THE UNUSUALLY HIGH suppression of the new balanced modulator made necessary the second modification, which consists of replacement of the carrier balance control with a new CARRIER INSERTION control, and automatic insertion of carrier in the AM and CW positions of the NCX-5 function switch. We found that the carrier balance control did not have sufficient "unbalancing" effect to produce enough carrier for AM and CW operation! We then had to provide the new CARRIER INSERTION control for this purpose in the former location of the carrier balance pot. The carrier balance control has become an internal factory adjustment which need never be touched by the operator.

DURING OPERATION of the NCX-5, the CARRIER INSERTION control has no effect in the SSB position of the mode switch. Full carrier suppression is obtained at all times regardless of its setting. In the CW or AM positions, maximum carrier suppression is obtained when the control is turned fully counter-clockwise, and carrier is gradually inserted as the control is turned clockwise. It may therefore be pre-set to provide automatic insertion of the proper amount of carrier in either the AM or CW positions of the function switch, and may also be used, if desired, to easily provide varying amounts of carrier for tune-up of a separate linear amplifier — such as the NCL-2000.

THE ABOVE MODIFICATIONS will first appear in NCX-5 transceivers shipped in August, which may be identified by a MARK II designator in the serial number. Exterior appearance of the MARK II units is identical to earlier units, and there are no other differences apart from the above. Price will remain at $685.00.

PRESENT NCX-5's may be modified to incorporate the new balanced modulator, and we have designed a MARK II kit for this purpose which will be made available by our Customer Service Department at our cost. The modification kit includes schematics, pictorial diagrams, step-by-step installation and alignment instructions, and all parts (including solder). NCX-5 transceivers so modified are identical in operation and appearance to MARK II units with only one exception — the new CARRIER INSERTION control operates in the SSB position of the function switch as well as in the AM and CW positions. By the way, this is a fairly extensive modification involving (in addition to the balanced modulator proper) the function switch, the input and output of the balanced modulator, and an additional amplifier/gating tube. Based upon extensive field trials of the kit, the average amateur with construction or kit-building experience will require approximately five hours to make the change. Even though many NCX-5 owners will probably not bother with the kit, we're sure that *all* owners of National gear will be pleased to know that our policy is to keep their equipment current by making such kits available when a production change of this nature takes place.

SPEAKING OF PRODUCTION, you probably know that we haven't been able to keep up with the demand for the NCX-5 since shipments first began back in November of '64. Taking into account the improvements in what is already the highest performance transceiver on the market, we don't expect to do better than one week to 10 days delivery through the rest of '65. Therefore . . . why not assure yourself of the quickest possible delivery and place your order for the MARK II NCX-5 now?

MIKE FERBER, W1GKX

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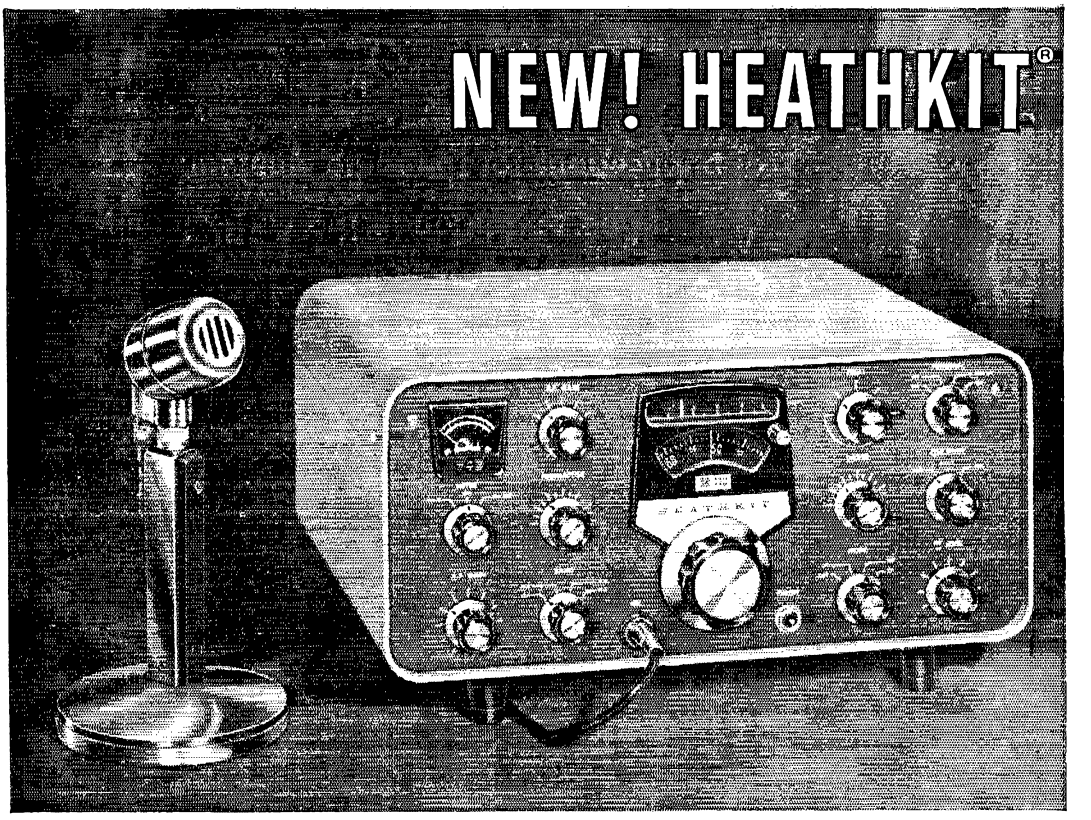

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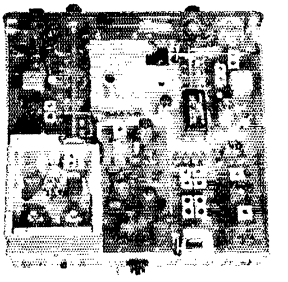
SB-110 SPECIFICATIONS—RECEIVER SECTION: Sensitivity: 0.1 uv for 10 db signal plus noise-to-noise ratio. **Selectivity:** 2.1 kc @ 6 db down, 5 kc max. @ 60 db down. **Image rejection:** 50 db or better. **IF rejection:** 50 db or better. **Audio output impedance:** Speaker, 8 ohms; Headphones, 600 ohms or higher. **AGC characteristics:** Audio output level varies less than 12 db for 50 db change of input signal level (0.5 uv to 150 uv). **TRANSMITTER SECTION: DC power input:** SSB, 180 watts PEP; CW, 150 watts. **RF power output:** SSB, 100 watts PEP; CW, 90 watts (50 ohm non-reactive load). **Output impedance:** 50 ohm nominal with not more than 2:1 SWR. **Carrier suppression:** 55 db down from rated output. **Unwanted sideband suppression:** 55 db down from rated output at 1000 cps & higher. **Distortion products:** 30 db down from rated PEP output. **Hum & noise:** 40 db or better below rated carrier. **GENERAL: Frequency coverage:** 49.5-54.0 mc in 500 kc segments (50.0-52.0 mc with crystals supplied). **Frequency selection:** Built-in LMO or crystal control. **Frequency stability:** Less than 100 cps drift per hour after 20 minutes warmup under normal ambient conditions. Less than 100 cps drift for ±10% supply voltage variations. **Dial accuracy:** Electrical, within 400 cps on all band segments, after calibration at nearest 100 kc point. Visual, within 200 cps. **Dial backlash:** No more than 50 cps. **Calibration:** Every 100 kc. **Power requirements:** High voltage, +700 v. DC @ 250 ma with 1% max. ripple; Low voltage, +250 v. DC @ 100 ma with .05% max. ripple. Bias voltage, —115 v. DC @ 10 ma with 5% max. ripple. Filament voltage, 12.6 v. AC/DC @ 4.355 amps.

Write for complete SB-110 specifications and schematic.



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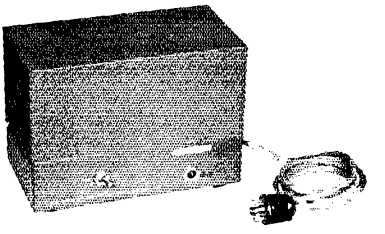

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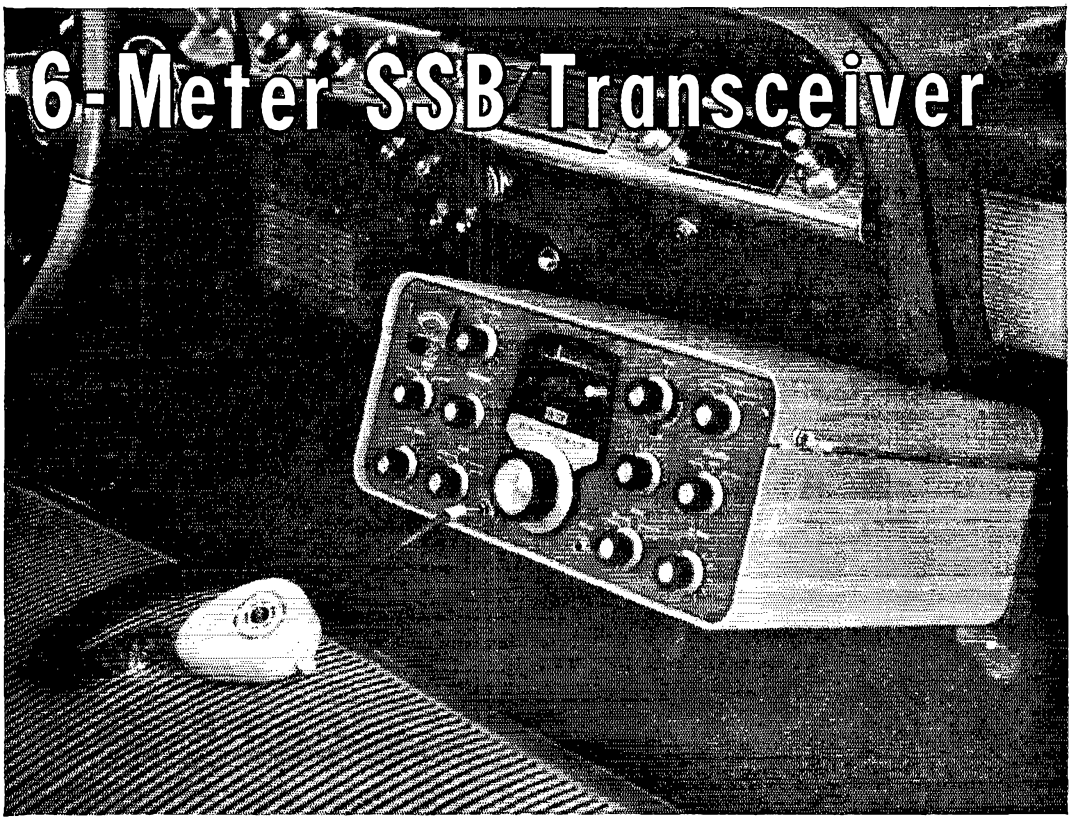

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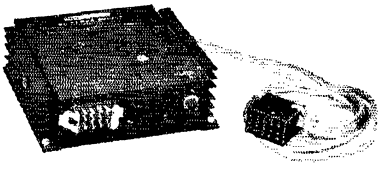

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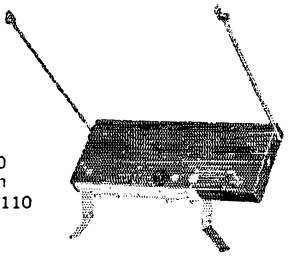
• Permits easy installation of SB-110 on transmission hump or under dash
• Allows direct plug-in of entire SB-110



MOBILE POWER SUPPLY HP-13 . . . $59.95

• Permits mobile operation of SB-110 • All solid-state circuitry • Circuit breaker protected—remotely controlled • 12 v. negative ground only

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The improved full coverage SIDEBAND TRANSCEIVER

DRAKE TR-4

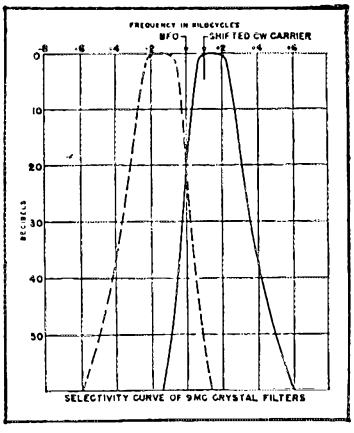
$585.00 Amateur Net

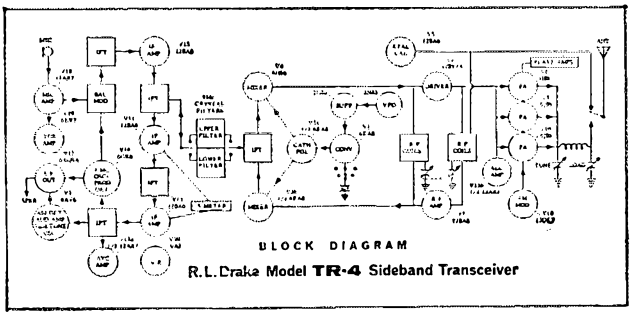
All features of Drake TR-3 PLUS ...

- ★ **Solid State VFO** with linear permeability tuning for maximum stability
- ★ **Automatic Transmit/Receive Switching on CW** (semi break-in)
- ★ **CW Sidetone Oscillator** built-in
- ★ **VOX or PTT on AM**
- ★ **Connections for External Receiver**
- ★ **Diode Detector on AM**
- ★ **Relative RF Output Indication**

Features of TR-4 and TR-3

- **Full Frequency Coverage** on all amateur bands 10 through 80 meters. No additional crystals required.
- **Upper and Lower Sideband** on all bands.
- **VOX or PTT** built-in.
- **Output Impedance Adjustable** with pi-network.
- **Separate Receiver S-Meter and Transmitter Plate Ammeter.**
- **300 Watts PEP input on SSB.**
- **Controlled-Carrier Screen Modulator** for AM built-in.
- **Shifted-Carrier CW** 260 watts input.
- **Two Special 9 Mc Crystal Filters** for sideband selection.
- **Separate RF and AF Gain Controls.**
- **1 Kc Dial Accuracy.**
- **100 Kc Crystal Calibrator** built-in.





R.L.Drake Model **TR-4** Sideband Transceiver

ACCESSORIES
for either TR-4 or TR-3

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Model RV-3 . . . $79.95

MATCHING SPEAKER
Model MS-4 . . . $19.95

MOBILE MOUNTING KIT
Model MMK-3. . . $6.95

POWER SUPPLIES
AC Power Supply Model AC-3 $79.95
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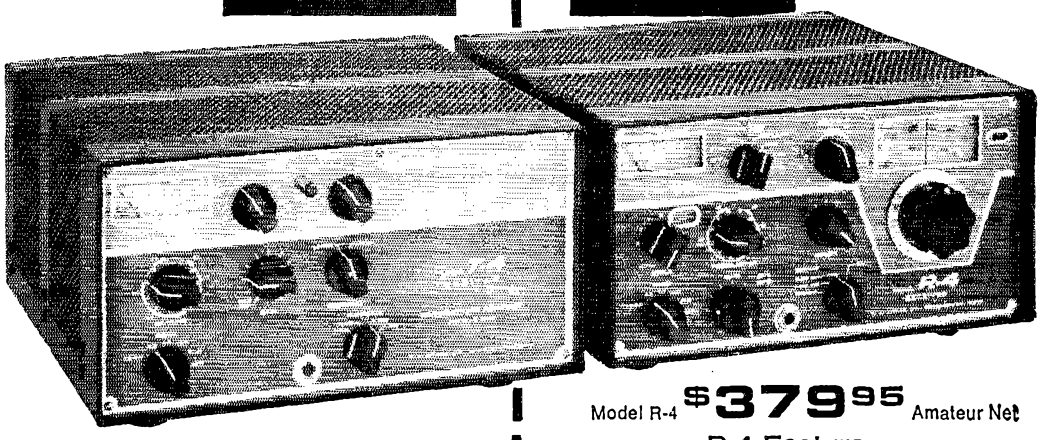
Super-combination for transceiving...

The new Receiver-controlled Exciter...

DRAKE T-4 RECITER + **DRAKE R-4 RECEIVER** = The ultimate in transceiving



Model T-4 **$269.95** Amateur Net

T-4 Features

Covers all Ham Bands 160 thru 10 meters.

Covers MARS and Other Frequencies between ham bands.

Upper and Lower Sideband on all frequencies.

Automatic Transmit Receive Switching on CW (semi break-in).

Controlled Carrier Modulation for AM is completely *compatible with SSB linear amplifiers.*

VOX or PTT on SSB and AM built-in.

Adjustable Pi-Network Output.

Two Crystal Lattice Filters *for sideband selection,* 2.4 Kc bandwidth.

Transmitting AGC prevents flat topping.

Shaped Grid Block Keying with side tone output.

200 Watts PEP Input on SSB—180 watts input CW.

Meter indicates plate current and relative output.

Compact size; rugged construction.

Model R-4 **$379.95** Amateur Net

R-4 Features

Linear permeability tuned VFO with 1 Kc dial divisions. *VFO and crystal frequencies pre-mixed for* all-band stability.

Covers ham bands 80, 40, 20, 15 meters completely and 28.5 to 29.0 Mc of 10 meters with crystals furnished.

Any ten 500 Kc ranges between 1.5 and 30 Mc can be covered with accessory crystals... (160 meters, MARS, etc 5.0-6.0 Mc *not recommended).*

Four bandwidths of selectivity, 0.4 Kc, 1.2 Kc. 2.4 Kc and 4.8 Kc.

Passband tuning gives sideband selection without retuning.

Noise blanker that works on CW, SSB, and AM is built-in.

Notch filter is built-in.

100 Kc crystal calibrator is built-in.

Product detector for SSB/CW, **diode detector for** AM.

Crystal Lattice Filter gives superior cross modulation and overload characteristics.

Compact size; rugged construction.

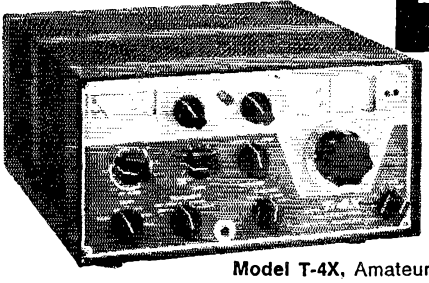
Complete Transmitter

(LESS POWER SUPPLY)

DRAKE T-4X

All T-4 features plus

- Solid State VFO and
- XTAL Oscillators...



Give:

Separate control of receive and transmit frequencies

Transceiver operation with frequency control by either Rcvr or Xmtr

Coverage on 80, 40, 20, 15 meters completely and 28.5 to 29.0 Mc of 10 meters with crystals furnished

Four extra 500 Kc ranges can be covered with accessory crystals (160 meters, other 10 meter ranges, MARS, etc.)

Model T-4X, Amateur Net: **$379.95**

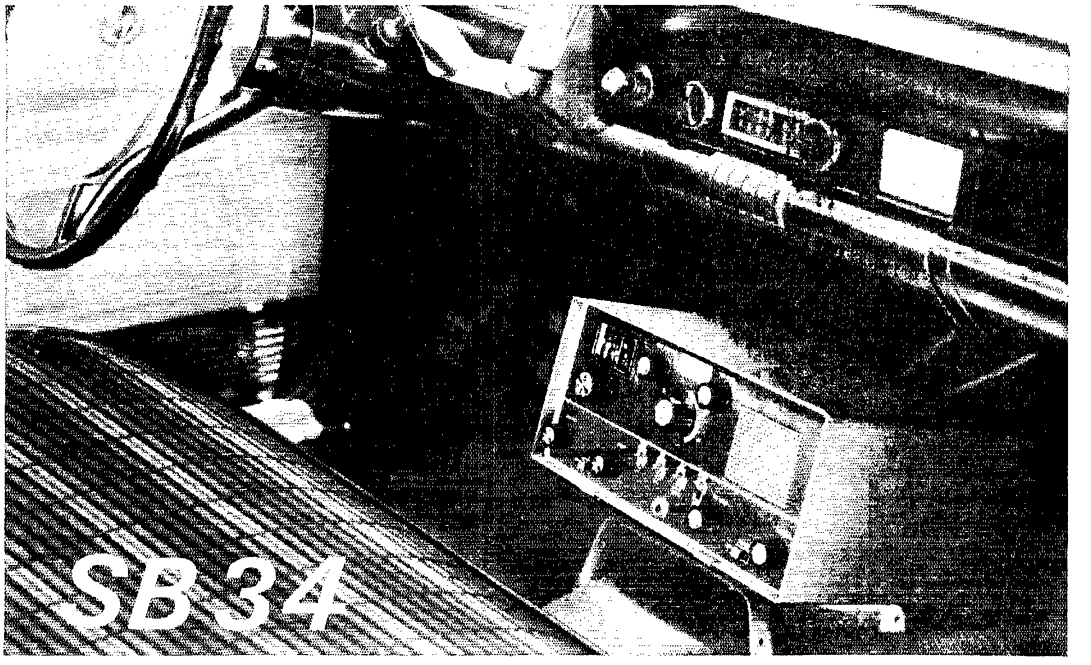
AC-3 Power Supply for T-4 and T-4X: **$79.95**

R. L. DRAKE COMPANY MIAMISBURG, OHIO 45342

Parma RC's *P. R. C. Bulletin* informed us too late that the date of the Cuyahoga County hamfest had been changed to July 11. W8LYD spoke on microwaves. Six Meter Nomads' *The Amateur Extra* states that WA8GEO has a new baby boy and K8BLB won the transmitter hunt. Toledo's *Ham Shack Gossip* listed the calls of those who participated in emergency during the tornado as follows: W8ACF, W8BCQ, W8CDA, W8FVT, W8HNP, W8HSW, W8HWX, W8HYE, W8IQC, W8KPJ, W8MUK, W8PCS, W8QUR, W8RYP, W8RZM, W8RZN, W8RZQ, W8SOM, W8TNT, W8UEL, W8VWQ, W8WDL, W8YAT, W8ZSY, W8ZXJ, K8BOX, K8DPE, K8GVI, K8HNI, K8ISE, K8KAS, K8KYB, K8LBU, K8LCW, K8LFI, K8MGB, K8OCI, K8QHY, K8QOX, K8RGK, K8SQE, K8TVW, K8UVQ, K8WQD, K8ZCZ, K8ZJC, K8ZTZ, WA8DQY, WA8DTA, WA8FBI, and WA8FVT. The Ohio Council of Amateur Radio Club's 1965 officers are W8TV, chairman; K8DJM, vice-chairman; W8OUU, secy.; W8EMK, treas.; K8HDO, awards chairman. The Genoa Area High School RC took a trip through W8PD conducted by K8QPW. W8TSD received his Extra Class license, K8EHJ is now W2AUB, WA8JQK received 2nd-class radio telephone operator's license. W8EEQ is now active on 2 meters with an Amico transmitter and a Gonset. Springfield ARC's *Q-5er* tells us that W8IMP joined the Silent Keys, W8HQX and WA8HVK are on 432 Mc. The Reynoldsburg Area ARC Net meets Fri. at 2130 on 50.298 Mc. W8EWP has a new vertical antenna. W8FBP was married recently. Southeast ARC's *Ham Fax* says that K8AXC was in the hospital. WN8PDD was in Florida. WA8KNR won a scholarship to study physics at Carnegie Tech., according to Mt. Vernon ARC's *K8EAN Newsletter*. Columbus ARA heard Manny Schegloss, of OSU Disaster Research Center, speak on Disaster Research and Don Tobin speak on Russia—As Seen Behind the Iron Curtain; Franklin County AREC members held a picnic; K8NHF joined the Silent Keys; K8HDO was named National Goodwill Worker of 1965. WA8PTA, WN8PDG, WN8PYQ, WN8OCX and WN8OLL are new hams in Cortland. W8CXM received his CP-30. Maj. Gen. Loren Windom, W8GZ, Commander 37th Division, retired after 41 years of service. W8ECX underwent lung surgery. K8AFN is preparing to go on 1296 Mc. with an APX-6. K8III is in Okinawa with the Army. W8RNL joined the Silent Keys. WA8CXY is a new OBS. W8DAE and W8ERD made the BPL in May. We had a number of tornado alerts in May, but lucky for us very few touched down. We still need lots of ECs! Traffic: (May) W8DAE 441, WA8GYT 339, K8VBO 309, WA8CXY 276, WA8CCD 176, K8VBH 167, W8BZX 162, WA8FSX 158, W8ERD 155, W8FSM 132, WA8GYX 119, K8DDG 87, K8BPE 82, W8FQD 60, K8LGA 60, K8BYR 59, K8UBK 56, WA8AJZ 50, W8LAG 49, K8DHJ 30, WA8FKD 30, K8DIU 26, W8CXM 23, K8BNL 22, WA8FTX 22, W8SYD 17, W8TV 14, K8BAP 13, WA8JXT 7, W8DIH 6, K8LGB 6, K8PJH 2, W8WEG 2. (Apr.) K8LGA 60.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RM: WA2VYS. PAM: W2IJG. Section nets: NYS on 3670 kc. nightly at 2400 GMT; NYSPTEN on 3925 kc. nightly at 2300 GMT; ESS on 3590 kc. nightly at 2300 GMT; Emergency Coordinators on 146.500 kc. Fri. at 0130 GMT. Appointment: WB2HZY as OBS. Endorsement: WB2FXB as OBS. We are sorry to report as a Silent Key, K2SDV, the XYL of K2SDU in Burnt Hills. K2TXP and W2JEB received special recognition from the Rensselaer County ARC Chapter for hurricane and flood traffic-handling. The Westchester Club had a representative from Amprex who spoke on tube manufacturing. May was "home brew" night at the Schenectady Club with prizes for the best appearance, wiring, design and most original. The Mt. Vernon H.S. Club had 23 members, 12 with licenses, according to Pres. WB2GLC. Three new Novices were added to the membership list of the New Rochelle H.S. Club during the school year. WB2HZY reports a 20-w.p.m. CP and 1000th QSO in May on his 16th birthday. K2SJN, Westchester EC, reported ARPSC nets aided in a search for a type "O" negative blood donor for the local hospital. WA2WGS is new Radio Officer for Ulster County RACES. Antennas and patterns was the school science fair project for WN2POM, who received his Technician Class license later. WA2RZF has a new SX-140 and an HT-40 with plans for a 6-meter beam. WB2FVD has new 6-meter gear. W2SZ, the RPI Club, has been active on 6 with 300 watts and a converter ahead of a Super Pro. WB2FXB is Asst. EC in Westchester County. Traffic: (May) WA2UZK 205, K2TXP 201, WA2VYS 190, K2SJN 72, W2ANB 59, WB2FNB 39, WA2JWL 24, WB2DXL 30, WB2HZY 29, WA2LJM 28, W2SZ 25, W2PKY 22, W2URP 21, WA2VYK 21, WB2HYA 13, WA2VYT 13, WA2WGS 12, W2BXP 5. (Apr.) WA2UZK 618, W2SZ 21.



...but where's the power supply?

The power supply—and it's universal for both 12V DC and 117V AC—is neatly tucked in a corner **inside** the exceptionally small cabinet that mounts easily in the front section of the car—and leaves plenty of room for the driver and other members of the family.

And **SB-34**, 4-band SSB transceiver, goes mobile on a moments notice!

Two power cables come with your SB-34. Use one when you are operating the '34 as a fixed station on 117V AC. Use the other for 12V DC mobile. No strapping—no conversions. There's even a handle on the case for easy carrying.

Convenient certainly—but dollar-saving too because the very low price **includes** this universal supply—saves you the cost of a separate inverter. And it's assuring to know that '34 is easy on the battery—that the all transistor receiver draws only 500ma on standby.

Suggested price.

$395

THE BIGGEST SSB TRANSCEIVER VALUE!


EXPANDED FREQUENCY COVERAGE


PANEL SWITCH SELECTS USB OR LSB


SOLID-STATE DIAL CORRECTOR


NO RELAYS— SOLID-STATE SWITCHING


DELTA RECEIVER TUNING


COLLINS MECHANICAL FILTER

HIGHLIGHTS: 135 watts p.e.p. input (slightly lower on 15). **Freq. range:** 3775-4025 kc, 7050-7300 kc, 14.1-14.35 mc, 21.2-21.45 mc. 23 transistors, 18 diodes, 1-zener diode, 1-varactor diode, 2-6GB5's PA, 1-12DQ7 driver. **Speaker built in** (external speaker provisions)

Pre-wired receptacles on rear accept VOX and Calibrator—both optionally available.

SIZE: 5"H, 11¼"W, 10"D. Approx. 20 pounds.

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SIDEBAND ENGINEERS

317 ROEBLING ROAD, SOUTH SAN FRANCISCO, CALIF.

Export sales: RAYTHEON Raytheon Company, International Sales & Services, Lexington 73, Mass. U.S.A.

NEW YORK CITY AND LONG ISLAND—SCM, Blaine S. Johnson, K2IDB—Asst. SCM: Fred J. Brunjes, K2DGI. SEC: K2OVN. Section nets:

NLI	3630 kc.	1915 Nightly	WA2EXP	—RM
VHF NET	145.8 Mc.	2000 TWTh	W2EW	—PAM
VHF NET	146.25 Mc.	1900 FSSuM	W2EW	—PAM
NYCLIPN	3932 kc.	1600 Daily	WB2HWB	—PAM
NLS (Slo)	3630 kc.	1845 Nightly	WA2RUE	—RM

NYC-LI AREC Nets: *See Dec. 1964 column for schedules.* Please note that all Hudson (Bronx) AREC nets now meet on Mon. at 2100 local, sayeth WA2QAO, Bronx EC. Venerable OBS of the Nassau AREC 10, W2EHA, has a new flit gun for chasing bugs out of the new HB 160-meter tunable converter. W2DQN, former stalwart of Wantagh ARC, now is with the Boeing guys in Seattle. BPL certificates went to WA2RUE, WB2HWB and W2EW. WB2EUH escaped unscathed from school this year and is safely ensconced in Army MARS for the summer. WB2HWB won the engagement with Regents and Finals and now is lifeguarding with the local YMCA. W4TRU/2, sojourning in this place for a spell, is a member of NYSPTEN and handled over 30 messages from the Dominican Republic area in May. W2GKZ reports that the new officers of the LI DX Assn. are W2MES, pres.; W2GQN, vice-pres.; WB2HXD, treas. WA2LJS is a member of Navy MARS! WB2OTT, of NLS and NLI, made WAS on the side. New officers of the Wantagh ARC are W2ELK, pres.; WB2MQL, vice-pres.; WB2DOB, rec. secy.; K2KSK, treas.; WB2IYA, corr. secy. WN2RQF is a new member of the Kings AREC Net. W2DBQ, 1st RM of NLI back in '36, has a new half-wave on 80 with open-wire type feeders, so look out! WB2QFX is the new Asst. EC for V.H.F. in Manhattan. WA2VKK, our EC for Manhattan, received an award from the N.Y. State C.D. Commission for his work in RACES. WA2VKK also works as a volunteer in the emergency room of Roosevelt Hospital! W2PF, one of the founding fathers of our Hudson Division, is now an engineering consultant in the communications field! W2GP, who has to joust with the supper-hour to get on NLI, is blasting away on 160 meter with 50 "incha li'l watts"! WB2BKS, intrepid OES/OBS, has been fightin' off the W5s and W7s on 6 meters but they keep comin' in! K2DGI, not to be outdone by the Class A linear boys, is building a Class C linear (whatsamatter, my amplifiers always made pretty good oscillators). WB2PUK's HW-32 isn't feeling well and is having an alignment! K2JFE is now mobiling around on 2 meters. WB2AWX decided to rewire the rig so he won't get anymore jazz from the mike. K2PQY is getting all wrapped up in narrow-band f.m. along with WA2QXH, WA2QJB and WA2BRY. WB2QFT borrowed a DX-40 from WB2LME and is going nuts trying to make phone contacts. WB2HJT has switched from an HT-40 to a G-76 for greater zing! WA2KSP is mobiling with a Communicator IV. W2EW's jr. operator and YL-in-law made him a granpaw! K2DEM got hitched and commissioned in the USAF in that order, according to the *NYRC News*. New officers of NYRC are WA2SCG, pres.; K2BEA, vice-pres.; K2CON, secy.; W2EEO, treas. *Spurious Radiations*, of the Rockaway ARC, reports that the hamfest and picnic of the FLIRC will be held at Point Lookout Town Park Aug. 28. This is a Long Island affair with all amateurs welcome. Come one, come all! Traffic: (May) WA2RUE 947, WB2HWB 530, W2EW 345, WB2DBW 259, WB2EUH 172, W4TRU/2 139, W2GKZ 124, K2AAS 122, WB2AEK 98, WB2NGZ 85, WA2LJS 80, WA2UCP 65, WB2OTT 57, W2ELK 42, WN2RQF 31, W2DBQ 26, WB2MLN 21, W2EC 20, WA2VKK 17, K2YQK 10, WA2OOL 6, W2PF 6, WB2BKS 5, K2DGI 5, W2GP 5, WA2DTY 3, WB2PUK 3, WB2AWX 2, WB2EXI 2, K2JFE 2, K2PQY 2, WB2QFT 1. (Apr.) W2EW 352, WB2NGZ 63, WN2RQF 37.

NORTHERN NEW JERSEY—SCM, Edward F. Erickson, W2CVW—Asst. SCM: Louis J. Amoroso, W2LQP. SEC: K2ZFI. Section-wide NNJ ARPSC networks:

NJN	3695 kc.	7:00 P.M. Daily	WA2BLV	—RM
NJ Phone	3900 kc.	6:00 P.M. Ex. Sun.	W2PEV	—PAM
NJ Phone	3900 kc.	9:00 A.M. Sun.	W2ZI	—PAM
NJ 6&2	51150 kc.	11:00 P.M. M-W-Sat.	K2VNL	—PAM
NJ 6&2	146700 kc.	10:00 P.M. Tu.-Sat.	K2VNL	—PAM
NJNN	3725 kc.	7:20 P.M. MTWTh	WB2KKG	—RM

All times local. AREC skeds are available from K2ZFI. New appointments: WA2OQV as EC East Orange; WB2QGB as OBS on 21.350 kc. Tue., Sat., Sun., at 7 A.M. local, 21.300 kc. Thurs. at 5:30 A.M. local. Congratulations to WA2PWI on making the A-1 Operator Club! K2EQP is back in operation after antenna repairs. WB2QGB has an s.s.b. adapter for his Valiant II. WB2GCD has a new Heath 2-kw. linear. WB2KXG needs Wyoming to complete WAS. WA2CCF and com-

Another Hy-Gain "FIRST"

A high performance ALL-BAND VERTICAL that's yours for less than $50.00!

hy-gain's NEW MODEL 18 AVQ

for 10 through 80 Meters

■ An Individually Tuned Hy-Q Trap for Each Band ■ Takes Full Power ■ Rugged Total Performance Construction ■ Easily Installed Using Minimum Space

Now for the first time...a modestly priced, easily erected all-band vertical that delivers outstanding omni-directional performance on each band...Hy-Gain's Model 18AVQ. The 18AVQ is expressly designed for the Ham with minimum space who wants to operate on all bands at full power. It is ruggedly constructed of heavy gauge, taper-swaged aluminum...uses four separately tuned Hy-Q air dielectric traps...each trap factory pre-tuned to provide peaked performance on a specific band within the 80 thru 10 meter frequency range. The low angle radiation pattern developed by the 18AVQ insures uncompromised performance for short haul or DX communications. SWR is 2:1 or less on all bands. The 18AVQ is simple to install (ground or rooftop)...takes one man only minutes from carton to contact. Withstands 100 mph winds when properly guyed. For uncompromised high performance...for the Ham with space limitations...for a price you can't afford to pass...you'll want Hy-Gain's all new Model 18AVQ...**$49.95** Net.

SPECIFICATIONS

Power Rating	1 kw AM, 2 kw PEP
Feedline Required	52 ohm coax
Minimum Ground Required	8 ft. Ground Rods
Overall Height	32' 2"
Weight	14½ lbs.
Mast Bracket	Double-grip, heavy gauge stamped aluminum – takes mast diameter up to 1⅝"

Available now from your Hy-Gain Distributor

HY-GAIN ELECTRONICS CORPORATION

8414 N.E. Highway 6 – Lincoln, Nebr. 68501

pany have managed to have an Amateur Radio Week proclaimed in Englewood for Field Day week. Your SCM, SEC K2ZFI and PAM W2PEV spoke to the Sparta AREC group. The SCM and SEC also spoke to a large audience of the Edison Radio Club. WB2DIK and WB2JVE are organizing a 6-meter c.w. net on 50.4 Mc. at 6 P.M. local time Tue. and Fri. *Participation in organized c.w. nets is a good way to increase your code speed for a higher grade of license!* K2DEL (Knight Raiders) has a Ranger and an SX-96. WB2MAT has replaced his Gonset I with a III on 2 meters. WN2SPD received his radio Boy Scout Merit Badge. Jersey City Nets: 145.35 Mc. 6 P.M. local; 146.5 Mc. 7 P.M. local. See W2ZAL for details and sign up in the AREC! WB2MMM is on 2-meter RTTY while WA2OOD is looking for a machine. WB2PBG is on 6 and 2 meters with a TX-62. K2RDX has corrected his problem with an automatic noise figure indicator and also reports good results from a beer-can balun. WB2KLD proudly states he worked a 6-meter band opening with *no TV!* Ten ECs participated in the NNJ section during the May 22 Pre-Set Exercise. ECs participating: K2KDQ-Passaic, W2ZAL-Jersey City, WA2SED-Sparta, K2ZFI-Towaco, WB2ALF-Old Bridge, WB2GFY-Highland Park, K2VNL-Cranford, W2HXP-Fanwood, W2COT-Maplewood, W2IIN-Union City. Thanks also go to managers of the NTS section nets—WB2AEJ-NJN, W2PEV-NJ Phone Net, K2VNL-NJ 6&2. *Start thinking about the SET in October! Sign up in AREC now; let's not get discouraged because of the new rules.* Congratulations to WB2OUU on the receipt of his General Class license. WB2FQG is putting up a 20-meter quad. K2ULR is on ham-TV and is interested in meeting other ham-TV enthusiasts. Traffic: (May) K2VNL 509, WA2TEK 399, WB2AEJ 225, WB2ALF 185, K2KDQ 184, WB2KSG 134, WB2HLH 132, WB2GFY 121, W2CVW 112, W2CVW 112, WB2JWB 107, WA2VID 98, WA2TWS 79, WB2FIT 68, WB2KXG 66, WA2WAJ 60, K2ZFI 46, K2DEL 45, WB2KLD 36, W2DRV 33, WB2ICH 31, WA2KHL 26, WB2IYO 22, W2PEV 17, W2TFM 12, WA2CCF 9, K2MFX 8, WB2QGB 7, K2SLG 5, W2CFR 4, W2ABL 2, K2EQP 2, W2EWZ 2, WB2MAJ 2, WA2PWT 2, WA2TWL 2, WB2FVO 1, W2NIY 1. (Apr.) WB2ALF 110, WB2BCS 28, WB2KXG 12, K2EQP 4. (Feb.) WB2GFY 91.

SIXTH NEW JERSEY QSO PARTY

August 21-23

The Garden State Amateur Radio Assn. invites all amateurs the world over to take part in the Sixth New Jersey QSO Party.

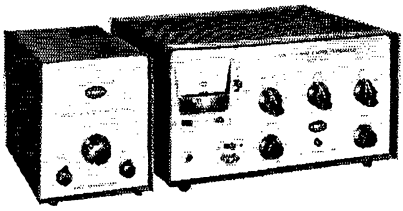
Rules: 1) The time of the contest is from 2300 GMT August 21 to 0400 GMT August 23. 2) Phone and c.w. are considered the same contest. A station may work another station twice per band, once on phone and once on c.w. The same station may be worked on other bands. New Jersey stations may work other New Jersey stations. 3) General call is "CQ New Jersey," N. J. stations are requested to identify themselves by signing "DE NJ" on c.w., and "New Jersey calling" on phone. Suggested frequencies are 1810, 3530, 3900, 7030, 7250, 14075, 14275, 21100 kc. 50-51 and 144-146 mc. 4) Exchanges consist of QSO number, RST, and QTH (state, province, or country). N. J. stations will send county for QTH. 5) *Scoring:* Out of state stations multiply number of complete contacts times number of N. J. counties (maximum of 21). N. J. stations multiply number of complete contacts times total number of states, provinces, and countries. 6) Certificates will be awarded to the first and second place stations in each section, and lower where deemed necessary. Novice and Technician awards will be issued when two or more logs are received. 7) Logs must also show GMT time, date, band, and emission, and be postmarked no later than September 11, 1965. Logs go to GSARA, Red Cross Building, Broad Street, Shrewsbury, New Jersey.

MIDWEST DIVISION

IOWA—SCM Dennis Burke, WØNTB—Asst. SCM: Ronald M. Schweppe, KØEXN. PAM: WØNGS. WØDRE has received his WAS certificate and needs only a card from Asia to complete his WAC. WØNTA and WØQVZ, you'd better get going. John is after you and already has racked up thirty countries. WØQVZ broke his foot while hamming it up in VP9-Land. He did not say how. Under the leadership of our "Fearless Leader"

AMECO *Leader in Compact, Quality Ham Gear*

NEW VFO FOR TX-62 or any other VHF TRANSMITTER



NEW AMECO VFO FOR 6, 2 & 1¼ METERS

The new Ameco VFO-621 is a companion unit designed to operate with the Ameco TX-62. It can also be used with any other commercial 6, 2, or 1¼ meter transmitter.

Because it uses the heterodyne principle and transistorized oscillator circuits, it is extremely stable. An amplifier stage provides high output at 24-26 MC. The VFO includes a built-in solid state Zener diode regulated AC power supply.

This new VFO is truly an exceptional performer at a very low price **Model VFO-621 $59.95 net.**

The NEW AMECO TX-62

In response to the demand for an inexpensive compact VHF transmitter, Ameco has brought out its new 2 and 6 meter transmitter. It is easy to tune because all circuits up to the final are broadbanded. There is no other transmitter like it on the market!

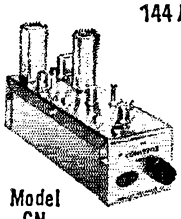
SPECIFICATIONS AND FEATURES

Power input to final: 75W. CW, 75W. peak on phone.
Tube lineup: 6GK6—osc., tripler, 6GK6 doubler, 7868 tripler (on 2 meters) 7984-Final. 12AX7 and 6GK6 modulator.
Crystal-controlled or external VFO. Crystals used are inexpensive 8 Mc type.
Meter reads final cathode current, final grid current and RF output.
Solid state power supply.
Mike/key jack and crystal socket on front panel. Push-to-talk mike jack.
Potentiometer type drive control. Audio gain control.
Additional connections in rear for key and relay.

Model TX-62 Wired and Tested only $149.95

AMECO EQUIPMENT CORP. 178 HERRICKS RD., MINEOLA, L. I., N. Y.

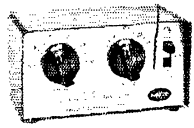
NUVISTOR CONVERTERS FOR 50, 144 AND 220 MC. HIGH GAIN, LOW NOISE



Model CN

Has 3 Nuvistors (2 RF stages & mixer) and 6J6 osc. Available in any IF output and do NOT become obsolete as their IF is easily changed to match any receiver. Average gain — 45 db. Noise figure — 2.5 db. at 50 Mc., 3.0 db. at 144 Mc., 4.0 db. at 220 Mc. Power required 100-150V. at 30 ma., 6.3V. at .84A. See PS-1 Power Supply. Model CN-50W, CN-144W or CN-220W wired. (specify IF.) $49.95. Model CN-50K, CN-144K or CN-220K in kit form. (specify IF.) $34.95

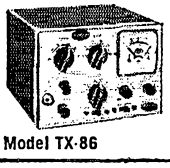
ALL BAND NUVISTOR PREAMP 6 THRU 160 METERS



MODEL PCL, Wired, $24.95
MODEL PCLP, with built-in power-supply, wired, $32.95

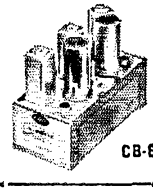
2 Nuvistors in cascode give noise figures of 1.5 to 3.4 db. depending on band. Weak signal performance, image and spurious rejection on all receivers are greatly improved. PCL's overall gain in excess of 20 db. Panel contains bandswitch, tuning capacitor and 3 position switch which puts unit into "OFF," "Standby" or "ON," and transfers antenna directly to receiver or through Preamp. Power required—120 V. at 7 ma. and 6.3 V. at .27 A. —can be taken from receiver or Ameco PS-1 supply. Size: 3″x5″x3″.

COMPACT 6 THRU 80 METER TRANSMITTER



Model TX-86

Handles 90 watts phone and CW on 6 thru 80 meters. Final 6146 operates straight thru on all bands. Size — only 5″ x 7″ 7 7″ — ideal mobile or fixed. Can take crystal or VFO. **Model TX-86 Kit $89.95 — Wired Model TX-86W. $119.95. Model PS-3 Wired $44.95. Model W612A Mobile Supply wired $54.95.**



CB-6

CB-6K — 6 meter kit, 6ES8-rf Amp., 6U8-mix./osc. $19.95
CB 6W — wired & tested ... $27.50
CB-2K — 2 meter kit, 6ES8 1st rf amp., 6U8 — 2nd rf amp/mix. 6J6 osc. $23.95
CB-2W — wired and tested. ... $33.95
Model PS-1 — Matching Power Supply — plugs directly into CB-6, CE-2 and CN units. PS-1K — Kit ... $10 50
PS-1W — Wired $11.50

EASY TO UNDERSTAND AMECO BOOKS

Amateur Radio Theory Course $3.95
Amateur License Guide ..... .50
Radio Operators' Lic. Guide, EL 1-2 ..... .75
EL 3 ..... 1.75 EL 4 ..... 1.25
Amateur Log Book ..... .50
Radio Electronics Made Simple 1.95

CODE PRACTICE MATERIAL

Ameco has the most complete line of code records, code practice oscillators and keys. Code courses range from start to 18 W.P.M. and are on 33, 45, or 78 r.p.m. records. Model CPS oscillator has a 4″ speaker and can be converted to a CW monitor.

Write for details on code courses and other ham gear.

Dept. QST-8

Ameco equipment at all leading ham distributors.

AMECO EQUIPMENT CORP.

178 HERRICKS RD., MINEOLA, L. I., N. Y.
Affiliated with American Electronics Co. and Ameco Publishing Corp.

WØNWX, new 160-meter mobiles, WØMMZ and WØRCW to name a couple, are sprouting up everywhere with amazing success. One of the excellent 160-meter mobiles is WAØGSQ. WØHDL, whose XYL and children have been in Denmark for over a year, is cleaning house in anticipation of their early return. "Hawk" is a comparative newcomer to amateur radio, having been licensed in 1930. Project Oscar sort of cooled off this time but WØPFP gave it his usual thorough attention. WØNWX, WØATA, WØNGS, WØSEJ, WØBEB and WAØAUF passed the Amateur Extra Class exam at Des Moines recently. If changes are made in our license procedures let us take them in stride, your friends are not about to let you down. Nets for May:

160 meters	QNI 545	QTC 7	sessions 31
75 meters	QNI 1136	QTC 152	sessions 26
Hamilton County	QNI 134	QTC 7	sessions 29
Jasper County	QNI 160 (for April)		

Traffic: WØLGG 1509, WØGHZ 135, KØASR 99, WØNTB 97, KØBNA 72, KØQKD 67, WAØDIO 50, WAØCSZ 34, WØFDM 20, WØQVZ 15, WØNGS 12, WØJPJ 8, WØGPL 7, WØUSL 5, WAØFUA 4.

KANSAS—Acting SCM/SEC: Robert M. Summers. KØBXF—PAMs: KØEFL, WØBOR. V.H.F. PAMs: KØVHP, WØHAJ.

Net	*Freq.*	*Time*	*Days*
KPN	3920 kc.	0645 CST	Mon.-Wed.-Fri.
		0800 CST	Sun.
NCS: WØORB, KØGII, KØUER, KØEFL			
QKS	3610 kc.	1830 CST	Mon. through Fri.
NCS: WØBYV, WØVBQ, KØBXF			
KWN	3920 kc.	1830 CST	Mon. through Sat.
NCS: KØEMB, WAØCCW, KØZDQ			

OOs reporting: KØBXF and WØPFG. OES reporting: KØGIC with 4-8-meter band openings into Wichita. ORS endorsements: WØFDJ and WØVBQ. New OBS appointees: KØEMB and KØGZP. KØHGL, Pittsburg, is reported about to join the ranks of married hams. The Kansas WX Net was very active during May, it seems that not a day went by that a report of severe WX did not exist somewhere in Kansas. WAØEHA, Manhattan, and WØCWJ, Junction City, are coordinating emergency communications with WØFRC, Zone 2 EC. Quite a few ARRL appointments are now due for renewal. Send in your certificates now. If you don't hold an appointment and are interested, write your SCM. WØOHJ made the BPL in April and May. Traffic: (May) WØOHJ 710, KØGII 239, KØHGI 211, KØBXF 43, KØGZP 39, WAØEMQ 35, KØEFL 16, WAØCCW 11, WØBYV 7, WØFDJ 6, KØLPE 6, WØZUX 3, WØBMW 2. (Apr.) KØHGI 122, KØJBA 60.

MISSOURI—SCM, Alfred E. Schwanke, WØTPK—SEC: WØBUL. New appointments: WØBUL and WAØEMX as OBSs; WØWYJ as ASM. Appointments renewed: KØAEM and WØTPK as ORSs. WØBUL as SEC, WØAIM as EC, WAØFLL as OES, WØBUL, WØBVL and WØTPK as OPSs. WØOUD has resigned as manager of MON and SMN. She will continue as manager of MNN. WØWYJ is the new manager of MON. KØEQY, manager of BHN, has been transferred to Oklahoma. WØTPK is NCS Mon. for MEN to replace KØEQY. WØOMM received her DXCC certificate. WAØEMS is going to Utah for schooling and then to Pakistan. WNØLZZ is a new Novice in Rolla. WØTPK received the Extra Cl. license. WØGQR was appointed Grundy County C.D. Radio Officer for RACES. KØIHY is in Joplin for the summer, and WA9DGR/0 is in Chicago. WØWYJ received top section award for s.s. the second year in a row. MEN will operate informally up to Sept. 1. KØLGZ has a new Swan 350. The Teen Net has changed time to 2315 GMT. WØBVV worked XE1PY on 50 Mc. WAØFLL was featured in a TWA newspaper for "get well" traffic for a fellow worker who was confined in the hospital near Joplin, Mo. ranked No. 10 in section traffic standings for 1963, up from number 12 in 1963. Net controls for the Hambuchers net are KØGZP, KØHGI, WAØHWJ and WØGQR. Net reports for May:

Net	*Freq.*	*Time*	*Days*	*Sess.*	*QNI*	*QTC*	*Mgr.*
MEN	3885	2345Z	M-W-F	13	286	49	WØBUL
MON	3580	0100Z	Tu.-Sun.	26	153	142	WØOUD
MNN	3580	1900Z	M-Sat.	26	78	17	WØOUD
SMN	3580	2200Z	Sun.	5	14	12	WØOUD
MoSSB	3963	2400Z	M-Sat.	22	388	72	WØOMM
PHD	50.4	1245Z	Wed.	4	22	3	WAØFLL
PON	3810	2100Z	M-F	20	252	109	WØHWJ
HBN	3880	1805Z	M-F	21	582	86	KØEQY
TEEN	3935	2315Z	M-W-F	10	99	26	WAØEMX

Traffic: (May) KØONK 1329, WAØFKD 200, WØWYJ

SIX BANDS IN TWO MINUTES!

This is the performance that K4KXR of Gotham can demonstrate, using his Gotham V-80 antenna with 35 foot feed-line connected to the coil at the antenna's base, and his HT-40 transmitter. Neither the antenna nor the coil is touched. Without worrying about the standing wave ratio on various bands, Bob merely switches his rig to the desired band (80-40-20-15-10-6 meters), plugs in the crystal, tunes grid drive, plate tuning and plate loading, and he is on the air. No TVI at any time even with TV receiver in the same room. Contacts vary from local ragchews to DX thousands of miles away.

GOTHAM VERTICALS DELIVER THE CONTACTS

PROVEN! PROVEN! BY THESE EXCERPTS FROM UNSOLICITED TESTIMONIALS:

CASE HISTORY #71
"I am very delighted with the first V80 and want another for a different location." A. C., California.

CASE HISTORY #159
"I ordered a Gotham V40 Vertical Antenna and found it so successful that several others are wanting them, too. Will you please send me four more." W. A., Alaska.

CASE HISTORY #248
"I just wanted to let you know how pleased I am with my Gotham V80 antenna. I have worked a W.A.S. of 46/43, a WAC of 3/3, and DXCC of 14/12 in about 12 months." G. W., Maryland.

CASE HISTORY #111
"The V160 did a beautiful job on a VE1 for me. Also, I forgot to take it down during the hurricane of last week. It is just as straight as it was when I bought it." D. S., New Jersey.

CASE HISTORY #613
"I have never been happier with any antenna than I have been with the V80. I have worked all bands with it and have had tremendous success — i.e., DL4s, ZS3, etc., all solid copy." R. D. S., Penna.

CASE HISTORY #483
"My V80 is working wonders. I am able to maintain a 1:1 SWR all across the 40 meter band. After many years on 10, 15, and 20, the XYL and I are getting great kicks out of some of the lower bands." J. A., New Mexico.

CASE HISTORY #146
"I have had very good luck with mine (my V80) feeding it with a Johnson Adventurer; works fine on all bands." B. I., Nebraska.

CASE HISTORY #555
"Being an owner of your V80 vertical I would like to let you know of the excellent results I am getting with it, both working the DX and the local stations on the lower bands. It certainly is an excellent antenna system." F. H. Jr., New York.

CASE HISTORY #84
"A few months ago I purchased your V40 vertical and have achieved outstanding results on the air." K. G. B., North Carolina.

ALSO AVAILABLE AT
AIREX RADIO CORP, NEW YORK CITY
GRAHAM RADIO, READING, MASS.
EDWARDS RADIO, PROVIDENCE, R.I.
BROSCH ELECTRONICS, WEST GERMANY
VAREDUC-COMIMEX, PARIS, FRANCE
VICTORY ELECTRONICS, ODENSE, DENMARK
CAM GARD STORES, CANADA

AN ANTENNA THAT SURVIVES THE COMPETITIVE STRUGGLE CONTINUES TO BE ADVERTISED.

WHY

THE GOTHAM VERTICAL ANTENNA IS THE BEST ALL-BAND ANTENNA FOR YOU

- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Non-corrosive aluminum used exclusively.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- Uses one 52 ohm coax line.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price.

73,
GOTHAM

DO YOU KNOW

1. YOU WILL HAVE NO DIFFICULTY INSTALLING YOUR GOTHAM VERTICAL ANTENNA IN JUST A FEW MOMENTS, REGARDLESS OF YOUR PARTICULAR PROBLEM, SO ORDER WITH CONFIDENCE EVEN IF YOU HAVE RESTRICTED SPACE OR A DIFFICULT SITUATION.
2. LOADING COIL NOT REQUIRED ON 6, 10, 15 AND 20 METERS. FOR 40, 80, AND 160 METERS, LOADING COIL TAPS ARE CHANGED MANUALLY EXCEPT IF A WIDE-RANGE PI-NETWORK OUTPUT OR AN ANTENNA TUNER IS USED, IN THIS CASE BAND CHANGING CAN BE DONE FROM THE SHACK.
3. EVERY GOTHAM ANTENNA IS SOLD ON A TEN DAY TRIAL BASIS IF YOU ARE NOT FULLY SATISFIED, YOU MAY RETURN THE ANTENNA PREPAID FOR FULL REFUND OF THE PURCHASE PRICE. THIS IS YOUR GUARANTEE OF FULL SATISFACTION.

FILL IN AND SEND TODAY!

Airmail Order Today — We Ship Tomorrow

GOTHAM Dept. QST
1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money order for:

☐ V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS..... $14.95

THE V40 IS ALSO MADE FOR CITIZENS BAND OPERATION, WITH SPECIAL INSTRUCTIONS. DESIGNATE CB-11 ANTENNA. PRICE SAME AS THE V40

☐ V80 VERTICAL ANTENNA FOR 80, 40, 20, 15, 10 AND 6 METER BANDS. MOST POPULAR OF THE VERTICALS. USED BY THOUSANDS OF NOVICES, TECHNICIANS, AND GENERAL LICENSE HAMS... $16.95

☐ V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS. EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO..... $18.95

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

Name.....
Address.....
City.....Zone.....State.....

178, KØAEM 119, WØHVJ 101, WØOUD 90, KØEQY 73, KØHNE 54, WAØEMX 53, WØTPK 33, WØBUL 30, KØMMR 28, WØOMM 21, WØKIK 18, KØOYV 10, WAØDGT 8, KØFPC 6, WA9JDR/Ø 5, KØWOP 4, WØGQR 3, WØBVL 2, WAØFLL 1. (Apr.) WØWYJ 48, WØZLN 35.

NEBRASKA—SCM, Frank Allen, WØGGP—SEC: KØJXN. Appointments: KØJFN as Class I OO. Monthly net reports: Neb. C.W. Net, WAØGHZ, 1st sessions QNI 122, 2nd session QNI 126, QTC 51. AREC Phone Net, WØIRZ, QNI 171. NACN, AREC C.W. Net, WAØEEI, QNI 6. The Net now meets at 8:30 p.m. CST Sat. on 3782 kc. Nebr. Morning Phone Net, KØUWK, QNI 628, QTC 36. West Nebr. Phone Net, WØNIK, QNI 478, QTC 47. Nebr. Emergency Phone Net, WAØBID, QNI 1161, QTC 131. Nebraska Storm Net, 1st session QNI 665, QTC 25, second session QNI 430, QTC 4, KØJXN, net manager. Work is being completed on obtaining an *HW-12* for installation at the North Platte Weather Bureau to assist in coordination. Congratulations to KØJFN on appointment as Class I OO. Traffic: WØLOD 221, WAØGHZ 185, WAØBID 86, WAØBIE 60, KØJFN 50, WAØBOK 39, WØEGQ 28, WAØEEI 26, WAØIXD 26, WAØEUM 24, WØPQP 21, KØJFO 20, WØNIK 20, WØVRE 16, WØFTQ 15, KØHNT 14, WØHYD 14, WØRJA 14, KØFJT 12, WØFQB 12, WØGGP 12, KØHNW 10, WØLJO 10, WØBFV 8, KØECH 8, WAØGJV 8, WØYFR 8, WØWKP 6, WØVEA 5, WAØBYK 4, WAØIXF 4, WAØAKG 3, WAØJAV 3, WØCIW 2, WAØETE 2, WØRAM 2, KØUWK 2, WØWZR 2, WØHOP 1.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Fred Tamm, K1GGG—SEC: W1EKJ. RM: W1ZFM. H.F. PAM: W1YBH. V.H.F. PAM: K1RTS. Net reports for May:

Net	*Freq.*	*Time (local)*	*Days*	*Sess.*	*QTC*	*QNI*	*Mgr.*
CN	3640	1845	Daily	31	215	238	W1ZFM
CPN	3880	1800 M-Sat.	1000 Sun.	30	229	420	W1YBH
CTN	3640	1800	Sun.				W1RFJ

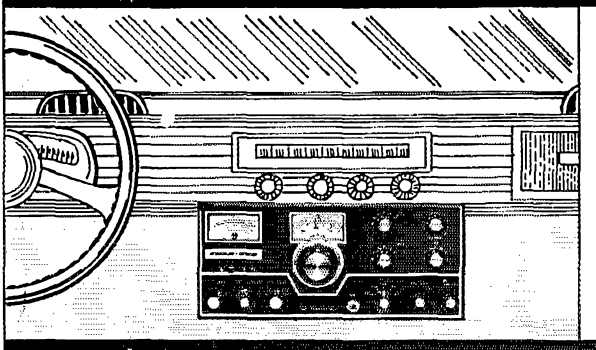
High QNI CN: K1FQT, K1LMS, W1ZFM, K1OQG, K1STM. CPN: W1FVU, W1LUH, WA1AAQ, K1LMS, K1SRF, K1EIC, W1YBH, K1YGS, K1LFW. Reports received: OO—K1QGC. OES—WA1CPU, WN1DUV, K1QNF. New voices on 2 meters in the Norwalk area are *K1SJV, K1SFY* and *KN1UTS*. *AREC additions:* WA1DNM and K1BUI. W1ADW and K1FEM are doing a fine job editing the *CARA News Letter*. K1CSB is in the Army for the next three years. K1JWC is back from Bolivia and stationed in Washington, D.C. W1WNK and K1FEM are entering the Coast Guard Academy—W1CGA might just use two new operators. WA1CPU is working on a new 220-Mc. linear and experimenting with reflectors on 2 meters. W1YNP is leaving for San Diego for the next 18 months and as a going-away present happened to nail Gus, as AC4H and AC3H. This helps his DXCC besides. WN1DSK, Plainville, is enjoying traffic work with a homebrew 6146 transmitter and BC-794B receiver. WA1DIU, Groton Sub Base Amateur Radio Club station, is in operation. W1BGD made the BPL again in May. Traffic: (May) *W1BGD 515, W1ZFM 253, W1NJM 247, K1OQG 217*, K1FQT 209, K1LFW 198, K1RQO 172, W1EFW 149, K1STM 139, K1EIC 127, K1EIR 119, K1GGG 66, K1LMS 55, W1IOW/1 44, W1YBH 41, W1BDI 32, W1CTI 27, W1QV 20, WN1DSK 17, K1NTR 14, W1OBR 11, W1YNP 10, K1SRF 9, WA1ALZ 8, K1YGS 8, W1BNB 4, W1CUH 4, W1FVU 4. (Apr.) K1LFW 135, W1YNP 11.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker Jr., W1ALP—W1AOG, our SEC, received reports from ECs: W1s STX, JVZ, LVK, K1s ICJ, DZG. W1JVZ has his Extra Class ticket. Our sympathy to W1LJT on the death of his wife. Silent Keys: W1BRK, ex-KN1FKQ. New officers of the Norfolk County RA are W1IXI, pres.; W1ALK, vice-pres.; W1KBL, treas.; K1EPL, secy. WA1DEC has his Tech. Class license. K1LZV has an *HQ-180* and a *Viking Valiant*. W1AW's Official Bulletins are sent by tape at 18 w.p.m. W1ALB still is traveling. W1WAJ has an HT-32 on the air. K1IBR has a digital readout transceiver for 6. W1NKQ is back on the air. W1LHY is s.s.b. with a new Galaxy. W1NF is active in Intruder Watch. WN1EKH is on 80-meter c.w. WN1DWZ is on 15-40-80-meter c.w. K1YXO is on several bands. K1TXF is moving to Oklahoma City, Okla. The Malden ARA held its 12th annual auction. Boston College H.S. ARS, W1BCH, now is an ARRL affiliated club. W8ARB/1 is going to Japan K1LPL is going to France. W1IHZ is going to California. WA1DHM is putting up a tower. W1AEC has stacked beams for 10-15 and 20. K1BZL worked ZS, YV and 6Y5 on 10. The T-9 Club met at W1IBF's. Need-

going mobile?

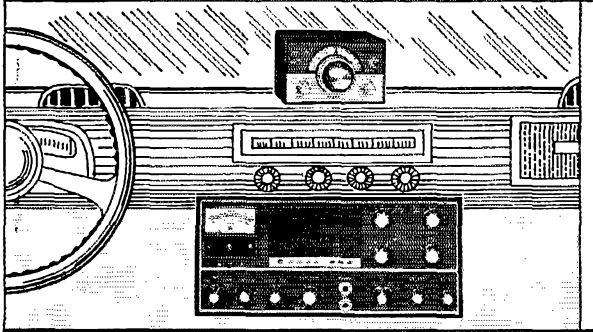
GET MORE POWER. . . BETTER
AUDIO QUALITY. . GREATER VERSATILITY
WITH SWAN
5 BANDS 400 WATTS

MODEL 350



Mounts under dash or on tunnel, or with a Model 22 Adapter and Model 405 mobile VFO can be mounted in the trunk. **$395**

MODEL 400

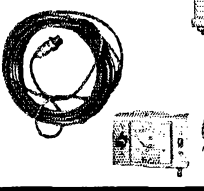


Particularly adaptable to sports cars with consoles and bucket seats. New Model 400 deluxe with outboard VFO can be mounted in trunk, under dash or on tunnel with Model 406 VFO mounted on dash or steering column for maximum ease of operation.

Model 400 **$395**
Model 406 **$ 75**

MODEL 55 SWANTENNA

Developed specifically for use with Model 350 and Model 400 transceivers. Remote controlled band switching, mobile antenna covers all phone bands 75 through 10 meters. Built-in output indicator for tune up to maximum efficiency. Rated 500 watts PEP input to transceiver. Complete with control unit. **$95**



MODEL 412 DC SUPPLY for either Model 350 or 400 **$130**

SWAN ELECTRONICS CORP.
Oceanside, California

ham EN had 20 QNIs, 3 traffic; EM1OMN had 4 sessions, 33 QNIs, 1 traffic. K1WHM is in Maine for the summer. W1THT has a Galaxy 5. W1QGN is on 20-meter s.s.b. K1TTN has a new harmonic. W1HKG flew over the hamfest at Swampscott and was on 6 for 2 hours. W1BGW is a member of TOPS. W1FWS has a rig on 6. The 6-Meter Crossband Net had 21 sessions, 321 QNIs, 18 traffic. W1EYZ, W1LEL and others on the License Plate Committee are to be commended on their fine work in getting plates for us this year. W1OFK has a new apartment in Somerville. W1LLZ is back on 10 and built a receiver. W1FFT is having transmitter trouble. W1AUQ has been endorsed as ORS and K1-WJD as OO. W1NBC has had his call for 25 years. His son is WA8AJD and his brother is W1MKX. K1-RAO is on 2 and 6, also WA1DXO. M.I.T.RS, W1MX, is going to sponsor the Mass. QSO Party on Oct. 2-3; K4BVD is in charge. K1MAK says the 6-Meter Mobileer Club will hold a Jamboree Sun., Aug. 8 at the Weymouth Fairgrounds. W1CT is working DX. W1QWT has been elected pres. of the N.E. Purchasing Agents Assn. Silent Keys: W1EYR, WB2LZG, ex-K1RHP, reports K1ICJ. The Sharon H.S. Club is busy with exams for its members. K1KNP had a nice write-up in the paper about helping "Hub Co-Eds" keep in touch with their parents in Santa Domingo. W1PEX made the BPL again. Heard on 75: W1WAY, K1s VJI, BOP. WA1-CRK-WA2UFI sends in his last report. K1VPJ worked the Bahamas on 6. K1CMS and family are going on a trip to Vancouver, B.C. K1ZBZ has a new Waters Clipreamp for 2. W1AGR was in the hospital for a short stay. Section nets:

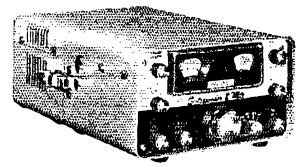
EMNN	3733 kc.	6:30 P.M.	MWF	K1PNB RM
EMCWN	3660 kc.	7:00 P.M.	MTWTF	W1EAE RM
EM2MN	145.8 Mc.	8:00 P.M.	MTWTF	W1DOM PAM
6MCN	50.85 Mc.	7:30 P.M.	MTWTF	K1BGK PAM
EM1OMN	28,950 kc.	8:00 P.M.	Thur.	W1ZLX PAM

EM2MN had 21 sessions, 242 QNIs, traffic 208. Net certificates have been issued to WA1s CSG, DEC, DED. New officers of the South Carver V.H.F. Society: K1-AII/KL7, pres.; W1VDE, vice-pres.; W1BVP, treas.; Bob Griffin, secy. Traffic: (May) W1PEX 1090, WA1-CRK 481, WA1DAG 228, W1OFK 146, WA1CSG 143, W1DOM 93, K1VOK 76, K1VPJ 50, W1LES 36, W1AOG 25, WA1CRR 33, W1ZSS 33, K1LCQ 30, K1GKA 22, W1JDP 18, W1SIV 15, K1CMS 13, WA1DED 8, WA1-DEC 7, K1FZE 7, K1BGK 5, K1ZBZ 2. (Apr.) WA1-DAG 102, K1CMS 15.

MAINE—SCM, Herbert A. Davis, K1DYG—SEC: K1QIG. PAMs: K1BXI, K1ZVN. RM: WA2NPU. V.H.F. PAM: K1OYB. Traffic nets: Sea Gull Net, 3940 kc. 1700 to 1800 and 2000 to 2100 local time Mon. through Sat.; Pine Tree Net C.W., daily on 3596 kc.; Two Meter Phone and Traffic Net 145.08 Mc. Thurs. 1930 to 2030 hours; C.D. Nets Wed. and Sun. In the western part of the state there is 6-meter activity and a lot of traffic is being passed between states. It is hoped other stations will join from over the state to help pass the traffic. Two meters is being used quite a lot over the state for traffic, nets and ragchewing. The help of all stations could be used. This month meet the Emergency Coordinator of your county: Aroostock K1CLF, W1-TCF, Androscoggin K1ZVN, Cumberland K1OYB, Hancock K1DYG, Knox W1FKC, Kennebec K1BZD, Lincoln K1OAZ, Oxford W1WXI, Piscataquis W1OTR, Penobscot W1SDW, Somerset K1QIG, Sagadhoc K1SZC, Waldo K1TZH, Washington W1FJP, Franklin and York do not have an EC at this date. These fellows mentioned have done a lot of work and need the help of everyone who has the time. There is a place for all active stations. Keep your emergency equipment ready; it may be needed at any time. Traffic: K1TMK 202, WA1ADK 65, K1NAN 63, K1WQI 41, K1TVT 38, W1-ROY 17, K1VIP 7.

NEW HAMPSHIRE—SCM, Robert C. Mitchell, W1-SWX/K1DSA—SEC: W1ALE/W1TNO. PAM: K1APQ. RM: W1DYE. The GSPN meets on 3842 kc. Mon. through Fri. at 2300Z and on Sun. at 1330Z. The VTNH Net meets on 3685 kc. Mon. through Fri. at 2230Z. W1-FOG has a new HW-12. The GSPN picnic was held at W1KVG's. Everyone attending reports having a good time. There was an auction, a penny hunt for the children, swimming, ping-pong, shuffleboard, horseshoes, boat rides and refreshments by W1KVG. The GSPN extends thanks to Tom and his XYL for another very enjoyable get-together. VTNHN certificates have been issued to K1BGI, W1PFU, W1EVN and W1DYE. K1-APQ reports 435 check-ins and 25 traffic for GSPN. New officers of the Contoocook Radio Club are W1-SHJ pres.; WA1BSU, vice-pres.; K1VWM, treas.; K1-BGI, secy.; K1OXO, act. mgr. W1CBB has been in the hospital and is now home taking it easy. W1EVN forgot to bring his shoes to the GSPN picnic. W1QKA

THINK SMALL...



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SPECIFICATIONS *

Frequency Range	143.975 to 148.025 MC
Modes of Operation	AM, SSB, CW
Carrier Suppression	50 db
Sensitivity	0.5μv for 10 db $\frac{S+N}{N}$
Selectivity	3.1 KC crystal bandpass filter
Output impedance	50 ohms
Audio Output	2.5 watts into 3.2 ohms
Antenna Input Impedance	50 ohms unbalanced

NEW * — from GONSET

- Two new power amplifiers—model 903A for 2-meter, model 913A for 6-meter
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- Gonset Sidewinder 6-meter SSB-AM-CW Transceiver with all the features of the 2-meter.

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and W1DUB are making new records for out state on 2415 Mc. The MVAREC reports 56 check-ins and 7 traffic. W1YMJ is having rig problems on 80. K1QPS and K1LNU are mobile on 75. Traffic: (May) K1BGI 97, W1ALE 66, W1SWX 11, W1DYE 6, W1EVN 4. (Apr.) W1DYE 17..

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: W1YNE. PAM: W1TXL. RM: W1BTV. V.H.F. PAM: K1TPK. Endorsements: K1EWL as ORS. The Cranston Radio Society elected W1BTV, pres.; W1YKQ, vice-pres.; K1KCA, treas.; W1ZPG, secy.: W1ZPG, net mgr.; K1HZE, QSL Mgr. A meeting of the AREC members was held recently at the Cranston Club. The SEC W1YNE explained future plans for the organization and a family picnic was planned for the summer. Announcement was made that a room will be available in the State House so that the AREC and c.d. will be operating from the same location. Any ham interested in joining the AREC, send your application to the SEC or SCM. The R.I. Emergency Net meets every Mon. at 2000 local time on 51.5 Mc. K1EWL recently graduated from high school and received his DXCC award at about the same time. K1LII, club secy. for the W1AQ Club of Rumford, announced that the club expected to have a larger number participating in Field Day this year than in the history of the club. Traffic: W1TXL 419, W1BTV 101, K1USD 38, K1YEV 38, K1VYC 31, K1TPK 28, K1BRJ 8, W1YKQ 7, K1EWL 2.

VERMONT—SCM, E. Reginald Murray, K1MPN—SEC: W1VSA, RM: W1WFZ. May net reports:

Net	*Freq.*	*Time*	*Days*	*QNI*	*QTC*	*NCS*
Gr. Mr.	3855	2130Z	Dy ex S	513	33	W1VMC
Vt. Fone	3855	1300Z	Sun.	128	—	W1UCL
VTNH	3685	2230Z	M-F	no rep.		K1UZG
VTCD	3993	1400Z	Sun.	39	19	W1AD

K1IJJ got his WAS on 80-meter s.s.b. 1965 Vt. QSO Party winners are W1AYK, K1UZG, W1ZNM and W1FPS. Outside winner is W1SWX (N.H.). Congrats to all. Predominant comments on logs sent in—where were all Vermonters? Let's show them next Feb. Anybody for Grand Isle? Congrats again to BARC on a very fine Intl. Field Day Hamfest. We regret to report W1AWP as a Silent Key. Geraldine was the XYL of W1BD. W1JLF and W1CBW moved to new QTHs. W1VMC has moved to Highgate Springs. Traffic: K1BQB 346, K1UZG 32, K1MPN 15.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR—C.W. RM: K1IJV. Because of the lack of most of the club bulletins this month, news for this report is pretty slim. The West. Mass. C.W. Traffic Net slowed down to only 74 messages handled, with the following stations in attendance (arranged in order of activity): K1WZY, W1DVW, K1IJV, W1BVR, K1SSH, K1YMS, K1LBB, W1MNG, W1DWA, W1ZPB, W1QKX, K1WAR. This net is open to any and all in the Western Massachusetts section. It operates nightly at 7 p.m. local time on 3560 kc. Speed of the net will gladly be adjusted to the speed desired by those participating! In other words, you don't have to be a whiz of a c.w. operator. K1RYT reports that he received his certificate from Conn. Wireless Assn. at 61.9 w.p.m. and that he is very proud. Most of the rest of us would be also! The Hampden County Radio Association wound up the season with a combined banquet and business meeting. K1RPB was elected president, replacing the outgoing president, K1IJU, who did an exceedingly good job as prexy. K1PMK becomes the new vice-pres.; with K1LDT as secy. and old stand-by W1LRE as treas. New board members are W1KUE, W1IC, WA1CTL, W1GIV and K1HYI. W1JWV won one of the regional Hallicrafters "New Ideas" prizes. Congrats. Speaker at the May meeting at HCRA was W1HDQ, of ARRL Hq., who gave a blow-by-blow description of the history of v.h.f. W1BVR expects to be operating portable from Lanesboro later this summer. Traffic: K1IJV 68, W1BVR 67, K1WZY 57, K1RYT 50, K1SSH 39, K1LBB 27, W1DWA 13, W1DVW 10, W1ZPB 3.

NORTHWESTERN DIVISION

IDAHO—SCM, Raymond V. Evans, K7HLR—PAM: W7GGV. W7JFA, of Driggs, was named Idaho Music Educator of The Year. Directly off the music room is a complete station for the Ham Radio Club of the Teton High School. Many a new ham comes from the Teton High School under the direction of Clarence. W7GMC reports that hamming took a back seat to vacation during May. W7JHM practically is carrying the FARM Net single handed. A little help there, fellows. Our sincere sympathy to W7BAR on the loss of his wife, Minnie. Reserve the first week end in August for the W1MU Hamfest, always a grand time for the whole family.

Clegg APOLLO ... SIX METER LINEAR
... for any good exciter

The Apollo Linear was conceived as a capable companion to the popular Clegg Venus sideband transceiver. Alone or with the SS Booster this station produces a superb signal on six. The Apollo is not, however, exclusive – try it with an HX 30 . 62S1 ... 99'er ... Communicator IV ... or homebrew – it makes any exciter sound big on six.

SPECIFICATIONS AND FEATURES

- Power input is 675 watts peak DC.
- Parallel final tubes pi-network coupled for 50-70 ohm output.
- RF Power Output
  - SSB (PEP) 350 W
  - CW 350 W
  - AM 75 W carrier with 180 mil. plate current
- Power supply built in, using the latest solid state techniques.
- Three illuminated meters continuously metering critical circuits for easy tune-up.
  Grid Current Relative Output Plate Current
- Instant Exciter/Linear selection when used with the VENUS (other units require plug-in accessory relay).
- All functions controlled from front panel when used with the VENUS.
- Attractively styled cabinet matches the VENUS.
- Blower for cool operation.
- No neutralization is necessary.
- Tube line up: (2) 8236 (1) OA2
- Power requirements: 115 VAC, 60 cycle, 500 VA (approx. at full load).
- Physical Dimensions: 15" wide, 7" high, 10½" deep.
- Weight: Approx. 35 lbs.

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APOLLO/VENUS INTERCONNECTING CABLE
(PART NO. 510-007) $9.75

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FARM Net: 20 sessions, 539 QNI, 97 traffic. Traffic: W7GMC 21, K7NEY 5.

MONTANA—SCM, Joseph A. D'Arcy, W7TYN—Asst. SCM: Harry Roylance, W7RZY. SEC: W7KUH. PAM: W7YHS.

Montana S.S.B. Net	3910 kc.	1800 MST	M-F
Missoula Area AREC Net	3895 kc.	0900 MST	Sun.
Montana State Net	3520 kc.	1900 MST	T-Thurs.
Montana PON	3885 kc.	0815 MST	Sun.

Endorsement: K7SVR as OO. The Annual C.D. Drill was held in May and W7TCK handled traffic from the RACES gang around the state. If you are interested in joining the RACES setup in the State of Montana drop a line to W7SFK. Ray is doing an FB job as director and could use your help in the state RACES setup. W7RZY sends word of the OFRC and advises that the Montana PON group held its picnic July 4, forty miles south of Livingston. K7WUF will be working for the phone company in the state this year. W7RZY has an order in for a Johnson 6N2. W7SZB will spend his month's vacation in 6-Land. K7TQM is back on in Billings after his school year in Great Falls. K7PKV took a trip to California in June and his mobile signal did a real fine job back into the state. W7CJN and W7FLB passed the Extra Class exam. K7ABV, K7ASN, K7CJM, WN7CNF, K7DTW, W7INI, K7KER and K7-VTT earned degrees at M.S.C. WA7BQS graduated from high school and received a scholarship to M.S.C. K7-WOC received an appointment to the Air Force Academy Prep School. K7DTW moved to Lynchburg, Va., with the General Electric Co. K7EVS has moved to Butte from Bozeman. K7DCB has a new SB-34, WN7-CAB a TR-3. K7PWY did a real fine job setting up communications for a Boy Scout Camporee in Yellowstone Park. K7SVR, K7PWY and all the gang of W7-ZOD should be lauded for a job well done. Montana S.S.B. Net reports 639 QNI, Montana PON 92 QNI, 28 traffic. Fellows, news of your activities as well as that of your club group would be most appreciated. Traffic: (May) K7SVR 50, W7NPV 37, K7YEM 30. (Apr.) W7-NPV 16.

OREGON—SCM, Everett H. France, W7AJN—RM: W7ZFH. K7IFG, mgr. of OSN, reports sessions 20, attendance 190 high 12, traffic 70 high 10. BRAT awards to W7ZFH and K7IFG. New members on OSN are K7-QFG, K7QQG, K7WWR and WA7ASP. They also are regular check-ins on OEN. W7DEM, EC for Josephine County, reports that Grants Pass hams furnished communications during the Annual Memorial Day Boat Race on the Rogue River, a 50-mile trip to Gallice and return. Eight stations were activated and scattered down the river; 4 emergency powered units and 3 mobiles were used in addition to the control station at the starting point, which used a.c. line. The following hams participated: W7DEM, W7ADF, W7DXY, W7GMK, W7CPV, W7KEN, K8PMB, K7UAQ, K7VMV, K7WSW, K7YNO, K7YQM, K7RDP, WA7ADW, WA7ADY and WA7ABL. W7NLW has gone s.s.b. after years of c.w. K7ZMR is keeping OSN busy relaying his MARS traffic from overseas. More net information: W7GWT reports that the AREC 2-Meter Net is on 145.350 Mc. Mon. through Fri. at 0300 GMT with 50 to 70 station check-ins during the week. W7JHA reports a new net, NWTN, Northwest Technical Net Sun. at 2300Z on 3970-kc. c.w., a.m., s.s.b., n.f.m. modes plus SWLs. The purpose, to aid Advanced, General and Conditional class licensees to prepare for First and Extra Class. K7JHA, of Washington, is mgr.; K7CTP, secy.-treas. Traffic: (May) K7IWD 510, K7IFG 286, W7JHA 91, W7ZFH 60, K7ZMR 43, K7BHJ 30, W7AJN 19, W7DEM 11, K7DVK 2. (Apr.) K7ZMR 32.

WASHINGTON—SCM, Everett E. Young, W7HMQ—SEC: W7HMQ. RM: W7OEB. PAM: W7LFA. V.H.F. PAM: W7PGY. NTS traffic:

			QNI	*QTC*		*Sess.*
WSN	0200Z	Daily	343	175	3535	31
WARTS	0230Z	Daily ex. Sun.	No report		3970	

W7DZX attended the ARRL Convention at San Jose. Watch for the Northwest Technical Net for assistance in upgrading, now operating Sun. 1600 local time on 3970 kc. W7JEY takes all Royal City traffic. K7PVO/4 now is heard from Hunter AFB with a 2B and a noise generator. K7RSM/KM6 will be active when the Robot arrives. W7NNH is in Mo. on vacation. K7CDI is staying with A-1 transmission. K7DED was heard on WSN. W7ZNN, of Lewiston, was seen in Richland visiting friends. K7QOM, K7RRM and K7PWN are back home after another college year. W7COG is firing up the SB-400. A new A-1 operator is K7URU, who also had a 2-hour QSO with SVØSC/MM and a 7-hour "go" with VE7BMN. The Clallam County ARC will host the An-

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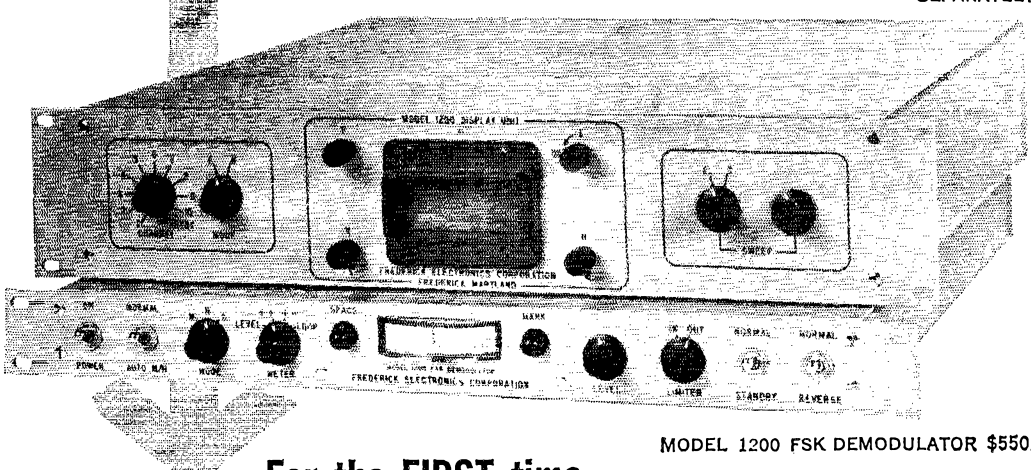

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Conventional FSK demodulators introduce errors due to their fixed decision threshold under conditions of selective fading on either the mark or space frequencies. With DTC in the Model 1200 FSK demodulator, the normally deleterious effects of frequency selective fading are used to advantage. The Model 1200, with its variable decision criterion, compensates for the selective fading by varying its decision threshold to provide optimum decision.

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INTERNATIONAL DIVISION

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nual Picnic for the Victoria, B.C., ARC Aug. 1. W7AMC spent two weeks in California. W7GYF, ORS, was heard from WA7CYA/7 on FD. K7MGA hits the air with a new Swan 350. Floyd says it's great for s.s.b. and a.m. and he uses it net and mobile. OES K6QKL/7 reports the use of a mixer, 7360 for 6 meters, and plans a 7077 converter for 2 meters. W7CNK is heard on 432 Mc. with a new exciter. W7JC is having trouble with the transmitter. K7CHH also is having problems. W7DND on mobile? W7BON is building a new home around the ham shack. W7HMA is becoming a real DX hound . . . 20 mts. KL7CSR visited W7BTB and K7KAH at the ARAB Hamfest. W7OIII is back from Montana. W7VRO snagged 9M2GJ, CT3AQ, AC1H, UM8FM, 4S7RN, 4S7WP, 9M4MT, VU2LE and VU2AJ. Did you work Mount Baker ARC on FD? If so, send your card and 15¢ to K7SKW for a nice certificate. K7CHV now operates from KH6-Land. W7JJK is working high, wide and handsome from W7JJK/AM. Memorial Day week end found trailerites and families meeting on the Teanaway River. Those taking part were W7REC, W7LFA, W7ZJF, W7DJQ, K7KXN, K7JUT, K7PKE and K7MGA. The Puget Sound Council of Amateur Radio Clubs is planning its Annual Banquet for Sun., Sept. 12, at Waller Road Grange. W7DZX renewed as OPS and ORS; W7AMC as ORS, W7OEB, OO and ORS, now becomes Route Manager. Ev has the blessing of WSN, our NTS affiliate, and all the section wishes him well in his new duties. K7MGB is a new OES.

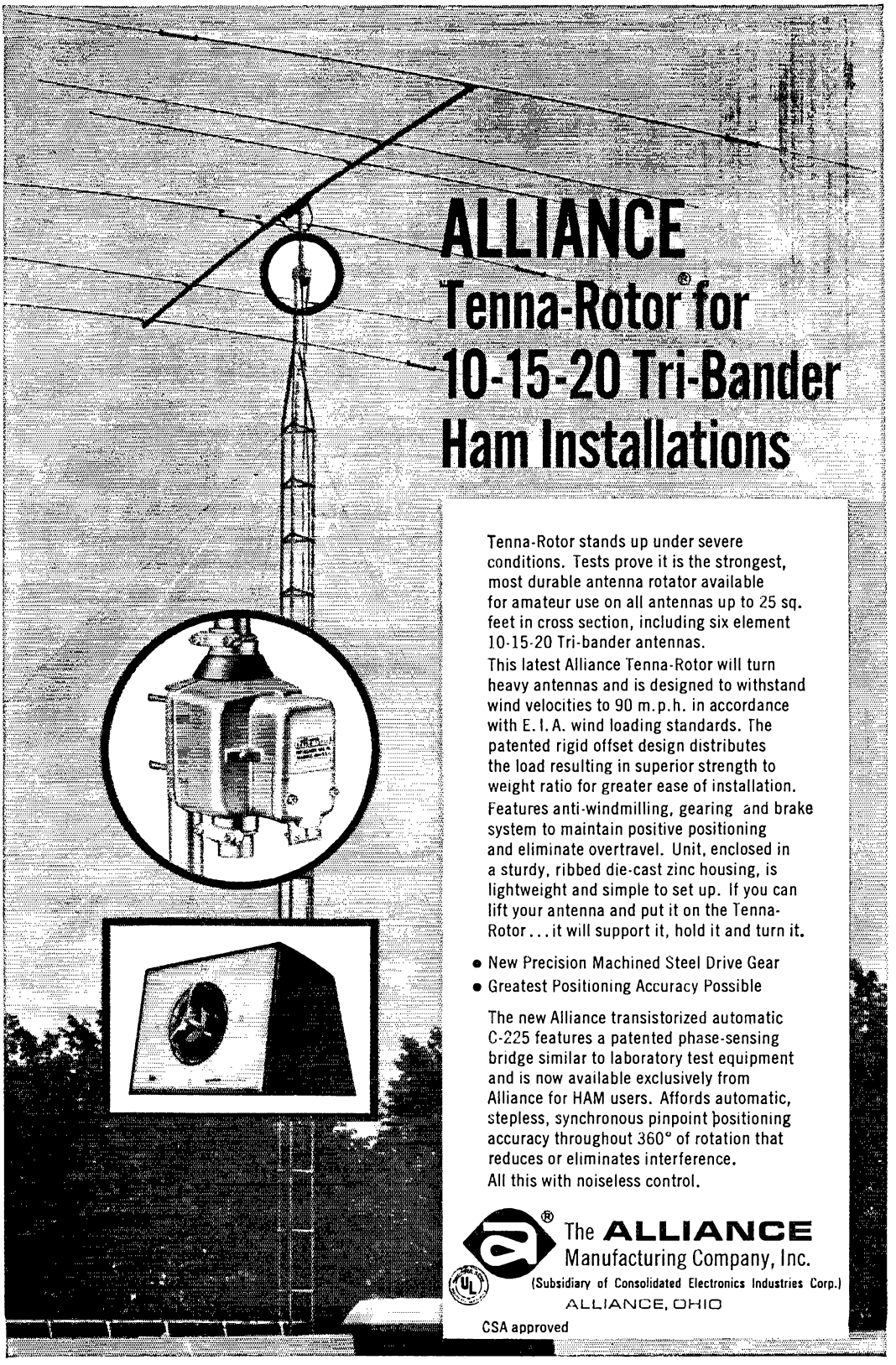
N.W. Slow Speed	0400Z Daily QTC 230 QNI	72 Sess.	3700 ke.
NTN	Noon Daily QTC 463 QNI 863	" 31	3970
N.W.S.B.	No report		
C.B.N.	No report		

Traffic: W7BA 1015, W7DZX 965, K7JHA 585, K7TCY 295, W7APS 275, W7NPK 225, K7CTP 213, W7BTB 84, W7JEY 74, W7OEB 57, K7ZPM 55, K7URU 36, W7HMQ 34, W7AMC 28, W7AIB 26, W7GYF 21.

PACIFIC DIVISION

EAST BAY—SCM, Richard Wilson, K6LRN—SEC: W6OLF. Congrats to K6SPP, the very good editor of the HRC's *Chewed Rag*, for passing the General Class exam. The LARK operated WA6ODP during Field Day from Crane Ridge; The ORC, W6OT from the Oakland Hills; the SARS, WB6GUG from the Twin Sisters in Solano county; the MDARC, W6CX at the Diablo Valley College and K6JHV took WA6CVB, WB6ABJ and WA6ZTY to Lake County. WA6WNG is waiting for his WAS certificate and is getting an SB-400. WA6ZTY operated K6JHV in the CQ V.H.F. Test and worked 16 counties. WB6ETY was off the air with power supply troubles which he repaired between final exams. WB6EKX is putting the finishing touches on a new kw. final featuring 4-6JE6s and solid state power supply in a 9x16 cabinet. W6CBF participated in Armed Forces Day by working WAR, NSS and AIR copying the RTTY from A6USA and c.w. from NPG. K6LRN worked NPG, WA6PTU and WA6QZA took a 5000-mile trip through 13 states and were in contact with the Bay area every day using a Swan-240. W6TYM and W6OJW are active OOs. K6GK is back from vacation. WB6ILH needs Wyoming for WAS. W6BB has a new HQ-170 and TH-6 beam and is starting a 10-meter n.t.m. net among members in Oakland and Berkeley using low-powered surplus transceivers on 29.655 Mc., according to K2RDP/6. For the past few months I have been stressing public service operation. A lot of you may be wondering where, how and when. Where—anywhere, really on NCN, NCTN-SCVSN. How—contact your EC, SEC, club president or me. The tough one is when—like people who claim they have no time for that boy scout jazz, ham radio is a hobby, etc. I'm not suggesting you give up your normal pursuits. It's not necessary to spend a lot of time. In this day of bandswitching rigs you can QSY from 20 to 80, QNI a net to see if you can help and be back in the pile-up in about 20 minutes. The average session of NCN is about 30 minutes, and most any net will excuse you early if QRU. Why don't you try it? Add a new dimension to your operations. C'mon, just once. NCN-0300Z-3.635 daily, NCTN-0100Z 3.905 daily. SCVSN-146.7-0400-M-F. There are others but these appear to handle the bulk of the traffic and SCVSN and NCN are NTS. Traffic: K6LRN 118, WA6WNG 112, W6BB 27, K6GK 12, WA6ZTY 12, WB6EKX 8, WB6ILH 5, WA6QZA 5, WA6PTU 4, WB6ETY 1.

HAWAII—SCM, Lee R. Wical KH6BZF—Asst. SCM/SEC: Ernie J. Kurlansky, KH6CCL. PAM: KH6ATS. RM: KH6EWD. V.H.F. PAM: KH6ECT. Congratulations and kudos to KH6EEM, our newest Official Observer. KG6APJ has been active in O-scar III work and also is involved in AF MARS and is president of the Marianas ARC. KG6AJQ, who has been inactive for



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Tenna-Rotor stands up under severe conditions. Tests prove it is the strongest, most durable antenna rotator available for amateur use on all antennas up to 25 sq. feet in cross section, including six element 10-15-20 Tri-bander antennas.

This latest Alliance Tenna-Rotor will turn heavy antennas and is designed to withstand wind velocities to 90 m.p.h. in accordance with E. I. A. wind loading standards. The patented rigid offset design distributes the load resulting in superior strength to weight ratio for greater ease of installation. Features anti-windmilling, gearing and brake system to maintain positive positioning and eliminate overtravel. Unit, enclosed in a sturdy, ribbed die-cast zinc housing, is lightweight and simple to set up. If you can lift your antenna and put it on the Tenna-Rotor... it will support it, hold it and turn it.

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more than five years, has just blossomed forth with an SX-101, an HT-37 and a three-element Moseley beam for his setup. W6IBU/KG6, a new voice on Guam, hailing from Northern Calif., is very active on 20-meter s.s.b. with his 170-watt p.e.p. signal. KG6AJI is very active working Ponape, Palau and Koror Islands. K7-LIC/KG6 has his new Conditional Class license. He is active in AF MARS and is resident engineer at the 1958th COMMRON on Guam. KG6AD has left for the mainland for an extended visit/vacation. W1TRB/KG6, operating KG6FAE, was cited for his fine public service, being instrumental in providing emergency communications between Andersen AFB/rescue and a seagoing freighter whose radio operator was stricken with an acute attack of appendicitis. KH6ECT is unable to get on 2 meters since his move to Honolulu from Kauai. KH6EWD, our RM, is contemplating more c.w. work. KH6ATS, our PAM reports the Friendly Net, 1000 hours local time, 2000 hours GMT, on 7290 kc. had 112 check-ins for April. KH6FLN has his General Class license and worked WN5KYH to give Dave his much-sought-after KH6 contact. Don't forget the phone nets: 50Th State Net 1900 hours local on 3895 kc. and the "No Ka Oe" Net 1230 hours local on 7290 kc. Sat. only. It's reported KH6BVS is bound for the Mainland. Ex-W6VUN is with the Stanford Research Institute and is now KH6EYP. Hawaii's QSL Mgr., KH6DQ, wishes to remind all KH6ers to forward their s.a.s.e. to him for your QSLs. He has quite a backlog of unclaimed cards which I've told him to discard if not claimed. *All clubs note*: Club secretaries should send a list of members and their calls to the QSL Mgr. and an 8½ x 11 manila s.a.s.e. so as to obtain all member's cards. Hawaii, Maui and Kauai should take advantage of Johnny's offer. The Honolulu Sideband Club does! The S.S.B.ers recently met for dinner at the Columbia Inn. Keep your Form 1s coming. Traffic: (May) KG6AIG 109, KH6ATS 20, KH6BZF 4, KH6FLN 2, W4ENM/KH6 1, W6IBU/KG6 1, KG6AJQ 1. (Apr.) KH6ATS 16, KG6AJI 1, KG6APH 1, KG6APJ 1.

NEVADA—SCM, Leonard M. Norman, W7PBV—SEC: W7JU/K7JU. W7BJY, custodian of the Southern Nevada Amateur Radio Club's certificate for the past fifteen years, has just issued certificate No. 89 to WA6-WWW. W7AAF, ex-W8GAY/W8BGP, and K7RBM are trying to make the 3660 net go again. W7ASU has moved to Livermore, Calif. K7QYR is on 6 meters. K7ZOK and his XYL are vacationing on the East Coast. W7CTK and W7PBV each have a CV89 TU. W7PC is out of the hospital and doing fine. K7ULP is home from the Far East. W7PRM has a HB TU using a Model 15 printer. WA7ARZ, WA7BEU, W7JU, W7-PRM, W7PBV, K7PYF. W7TGK and K7ZOK are modifying the ARR/15 receiver. WA7DEG is in Las Vegas. K7OLQ is back on 80-meter. W7KOI has a new NCX-5. K7HYP is on RTTY with WA7CWM building the TU. K7LBQ is attending school in Colorado. Traffic: W7-AFF 93, W8GAY/7 17, W7JU 4, W7PBV 4.

SACRAMENTO VALLEY—SCM, John F. Minke, III, WA6JDT—Congratulations to W6TEE and WB6PHQ, who will be married Sept. 18. Both Les and Vickie are active members of the RAMS. K6RHW is our new PAM. W6OFK and WA6FWU have been appointed ORS and OES, respectively. These fellows are all members of the newly-affiliated Nevada County ARC, which is in the process of going mobile on 6-meter f.m. W6BGX and WA6FWU have been maintaining Mon. skeds on 6 meters between Grass Valley and Soda Springs. The Sacramento County Emergency Net held a simulated emergency test on 146.28 Mc., one of many to improve their ability in handling anticipated emergencies. The Yolo Co. C.D. ARC held its first eye-ball QSO May 21, after being in existence for only 10 years! WA6YQS won first place in the San Juan Industrial Arts Fair (electronics div.) with a grounded-grid 4-1000A kw. amplifier. The RAMS held its Annual Ichthyosaur Campout in Nevada over the Memorial Day week end. Many reported via mobile-7 into the RAMS Sat. Morning Net on 3965 kc. from that rare DX, Nye County. WA6SLU finally fixed the rotator atop of his 100-ft. tower and is back in business working DX—via long path from Carmichael. W6LSW has taken the job as EC for El Dorado County. Please send in those traffic reports to reach me by the 6th of each month. Let's get the Sacramento Valley Net going. Traffic: W6WGO 101, K6-YBV 42, W6LNZ 30, WB6MAE 26, WA6JDT 19.

SAN FRANCISCO—SCM, Hugh Cassidy, WA6AUD—W6KZF, our SEC, is looking for additional reports from the ECs. WA6NDZ has an AN/TXC-1 facsimile transceiver in operation and is looking for 2-meter skeds. New officers of the Eureka Club are W6BWV, pres.; WB6GVI, vice-pres.; WB6GDJ, secy.-treas. The Eureka Club plans to change its meeting place to the National Guard Armory. WB6FZH has a beam up and gets excited over DX stations calling him. W6NCM,

WB6KJP and WB6EGC are Asst. ECs in Western Marin. WB6AIS is looking for another EC in the Bolinas/Stinson Beach area. K6LHN graduated from the University of California in June and hopes to be active again soon. WA6ALK has been catching 6-meter openings to the 7th, 9th and 5th districts. An RTTY net is active on 146.7 Mc. at 0300Z every Wed. WB6CKT had problems with a cranky generator during the June V.H.F. Contest. W6ARQ worked into VE7-Land on 6 meters during an opening on May 30. Also worked into Arizona. W6CYO operated portable from 7-Land during June. WA6STS, WB6KDF and WB6CKT operated from battery power during a May test. WA6ARE operated portable from his hospital bed during the same contest. WA6VGS still is in the Navy and is being transferred to a destroyer in the Pacific. WA6LWQ has moved back to Santa Rosa. W6DXA has installed an SB-34 in his minibus and has hit the open road. W6GQA worked all four Armed Service radio stations during Armed Forces Day. The Annual Report to the Directors showed the San Francisco section slipping in traffic standings during 1964. The Tamalpais Club scored high at the Fresno Hamfest, winning two of the transmitter hunts. WA6-RWH was the big powerhouse in the hunts. The Marin and Tamalpais Radio Clubs will hold a joint picnic at Mortons at Kenwood Aug. 15. W6SG, at the Marin Red Cross Headquarters, has a new transceiver and new antennas. Traffic: WB6GLD 95, W6UDL 34, WB6-GVI 14, WA6AUD 13, K6TZN 13, W6CYO 10, W6GQA 1.

SAN JOAQUIN VALLEY—SCM, Ralph Surovan, W6JPU—At the Fresno Hamfest, W6ELP won a TR-3, W6QFR a mike, W6PSQ a clock radio, WA6EDQ a 6&2 meter beam, W6JUK held open house for the 250 hams who attended. WA6BUH has a Swan 350. K7VNO, ex-W6ZOI, attended the hamfest. WB6MCA, who is 13 years old, got his General Class license. The SJV Net had 73 contacts, traffic 38. 725 check-ins, 8 phone calls and 12 QNTs. W6CUA is net control. WA6YZS is on 75-meter s.s.b. with a 32S-1. WB6KHW has an HW-12. W6JPS has an Elmac receiver mounted in his station wagon. W6PPO is on 6 meters, K6ACO is on 20 meters working DX. K6ANN is on 20 meters with an HW-32. W6TZN reports that he has heard the astronauts several times on 296.8 Mc. WB6JLX is WAC using 40 watts. WN6OAI and WN6OAJ are new calls heard in Atwater. NCN is looking for Kern and Tulare check-ins around 3625 kc. W6ADB attended the Fresno Hamfest. The Turlock gang held FD at Hatfield State Park. The Fresno gang held FD at Kearney Park. WA6TQL is on mobile with an HW-12. WA6QNE gave a talk on 2-meter repeaters at the Tulare Radio Club. W6IFC has a slot antenna on 2 meters. W6ARE is having rotator problems. W6-NTK is running a kw. remote control. WA6KCS is mobile on 2-meter t.m. WB6HVA's son is WB6MWY, which makes the fourth ham in the family. WA6HWA has a Galaxie 5. W6TRP is mobile with a Swan transceiver. K6MPM is OBS. Traffic: W6ADB 106, WB6-HVA 67, K6MPM 64, WB6JLX 43.

SANTA CLARA VALLEY—SCM, Jean A. Gmelin, W6ZRJ—The Santa Clara Valley Section Net reports 20 sessions, QNS of 78 and traffic of 34. W6RSY made the BPL and works NCN, RN6 and PAN. K6DYX was on vacation during June and July in Ohio. WB6FHH is back in Atherton and works NCN. W6YBV is fighting ITV on the NCN frequency. W6QMO was active on the National ARRL Convention. W6JXK works as Navy MARS traffic liaison station. W6DEF reports that WA6GVP is now San Mateo County Radio Officer. Also WA6TZO is the proud papa of a baby boy. WA6RRH reports that the new name for the 2-meter RTTY net is Bay Area Radioteletype Net, BARN. W6PLS took part in Armed Forces Day and also was active in the Seattle quake emergency. WA6CVU works NCN. WA6-JSA now sports a new tower and beam. K6MTX again is rebuilding RTTY gear. W6IBW works the SPECS Net. W6SAW is active as OO and OBS. W6MMG is active on MARS. K6YKG is busy trying to build up code speed on the mill. Traffic: W6RSY 808, K6DYX 268, WB6FHH 194, W6AGR 144, W6YBV 132, W6QMO 122, W6DEF 98, W6JXK 98, WA6RRH, 78, W6PLS 32, W6HC 30, WA6CVU 16, WA6JSA 8, W6ZRJ 7, K6MTX 4.

ROANOKE DIVISION

NORTH CAROLINA—SCM, Barnett S. Dodd, W4-BNU—Asst. SCM: Robert B. Corns, W4FDV. SEC: W4MFK. RMs: K4CDZ and WA4ANH. PAMs: W4AJT and WA4LWE. V.H.F. PAM: W4HJZ. K4TTN checked into the SSBN several times while on vacation in Connecticut. WA4FFW says the Alamance County AREC Net held a test run during May which was very effective and most enjoyable. WA4VTV is off on a month's vacation to Kentucky and Illinois. K4EO is getting his 10- and 15-meter equipment in shape to go chasing after that elusive DX. WA4ANH is building a 20-watt 2-meter rig. W4EVN and W4LEV earned BPL in May

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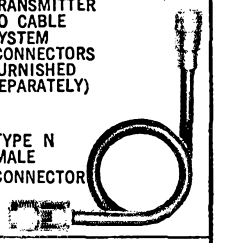

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KIT 50UHF $45.50
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and Hank says, "This is my first BPL and, boy, it's *work*." W4BZL and W4VON turned in very FB OO reports. New appointments include W4UWS as ORS and WA4KFH as OES.

Net	*Freq.*	*Time*	*Days*	*QTC*	*Mgr.*
NCN(E)	3573 kc.	2330Z	Daily	430	K4CDZ
NCN(L)	3573 kc.	0300Z	Daily	154	WA4ANH
SSBN	3938 kc.	0030Z	Daily	98	K4LWE
THEN	3865 kc.	0030Z	Daily	43	K4WLV

Traffic: W4LEV 1909, W4EVN 501, W4LWZ 233, W4BDU 166, W4IRE 144, WA4ICU 97, K4CWZ 67, K4IEX/4 55, WA4PYJ 42, WA4ANH 40, W4OTE 32, WA4FJM 30, K4EO 28, WA4VTV 18, WA4MKY 12, W4BNU 11, W4AJT 10, K4CVJ 7, WA4FFW 5, WA4GEU 5, K4TTN 3, W4ACY 2.

SOUTH CAROLINA—SCM, Charles N. Wright, W4PED—SEC: WA4ECJ. Asst. SEC: W4WQM. RM: WA4PFQ. PAMs: K4WQA (s.s.b.), K4OCU (a.m.).

Net	*Freq.*	*Time*	*Sess.*	*QTC*	*QNI*
SCN	3795 kc.	Daily 0000Z and 0300Z	54	128	265
SCEN	3820 kc.	Daily 0030Z; Sun. 1130Z/2030Z	36	44	231
SCSB	3915 kc.	M-F 0100Z; Sat., Sun. 0000Z	30	201	1149

The possibility of a statewide 2-meter net is improving. K4WQK, Calhoun Falls; WA4QKQ, Anderson; K4JVV, Greenwood; K4ZAW, Charleston; W4PED, North Augusta, and WA4ICB, Charleston, were heard testing recently. Several successful contacts had been made in the state from the station located at the TV transmitter site at Caesers Head. Start planning now for the National Simulated Emergency Test, which will be held in October. W4WQM will coordinate S.C. plans. Let's equal or better the records which our state set several years past when we were in the top participation group. Traffic: WA4OWY 91, W4WQM 89, K4OCU 72, WA4JHD 43, W4NTO 41, K4BMI 39, W4PED 38, K4LNJ 32, K4WQA 22, WA4QKQ 21, WA4OAZ 16, WA4LPV 13, WA4ICF 12.

VIRGINIA—Acting SCM, H. J. Hopkins, W4SHJ—PAM: W5VZO. RMs: W4QDY, W9SHJ, W4ZM, WA4EUL. Phone Net Managers: W4OKN, K4SCL, WA4UXL. W4QDY had to resign the SCM post effective June 1. It appears the *Va. Ham* publication also will have to be curtailed unless we get the required volunteers. Many VSBN members worked ARRL proxy W6ZH, who visited and operated WA4OFT in May. The number of members who enjoyed the Roanoke Hamfest is too long to list. Now stand by for the Tidewater shindig in Norfolk. The Roanoke Division Convention will be held in Natural Bridge in May 1966. W4KFC worked AC3H for a new one and submitted the 14-copy comment to FCC on Docket 15928. Did you? WN4UMX operated in his high school physics class in Waynesboro. W5VZO has issued the second of his series of newsletters covering phone activities. WA4PZF finally received his ORS and WA4DAI the OPS. K4SCL and W4SHJ recently qualified for the Extra Class license. W4ZAU has the CP-25 and K4ASU, after some friendly needling by W1NJM of Hq., copied 60 w.p.m. on the first try! W4JUJ announces the VA-CWC award still will be issued for contacts prior to June 1965. Globe-trotting W4CVO has completed his third round-the-world trip and is now settling in Falls Church. Traffic: (May) WA4FCS 248, W4DVT 243, WA4EUL 231, W4MXU 226, W4RHA 154, K4LJK 138, K4SCL 113, WA4AYP 112, K4ASU 109, W4ZM 108, W5VZO/4 101, W4SHJ 98, WA4EDG 86, K4GRZ 80, K4YCH 77, W4OWE 63, W4OKN 62, WA4JXO 42, K4FSS 41, WA4BOQ 40, WA4PZF 35, WA4DAI 33, W4PTR 23, K4SDS 21, WA4EHM 19, W4JXD 15, WA4REU 12, W4ZAU 10, W4KX 9, W4BZE 8, W4JUJ 8, K4VCY 8, WA4HHX 7, K4PIK 7, K4ITV 6, WA4KVR 6, W4MK 6, W4TE 4, K4NOV 1. (Apr.) W5VZO/4 120, WA4PXX 36, WA4BOQ 22, WA4FSC 13, WA4HHX 9.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—SEC: W8SSA. PAM: K8CHW. RM: W8LMF. S.S.B. Net Mgr.: W8EEO. West Virginia Nets meet on 3570, 3890, 3903 and 3905 kc. Congrats to all West Virginia amateurs who helped in the Building Fund Drive and successfully put the Roanoke Division over the top! WA8IMY and WA8FIC made the BPL! WA8MRK has received OPS appointment. Apologies to K8SKT, active EC for Cabell County, for mixing up his call. W8PBO has received the Natl. Science Fellowship Award and is in California. W8IRN, EC for Kanawha County, and his group have the emergency communication bus ready. WA8GGI c.w. training net mgr., reports excellent progress in the first month of operation, with several new

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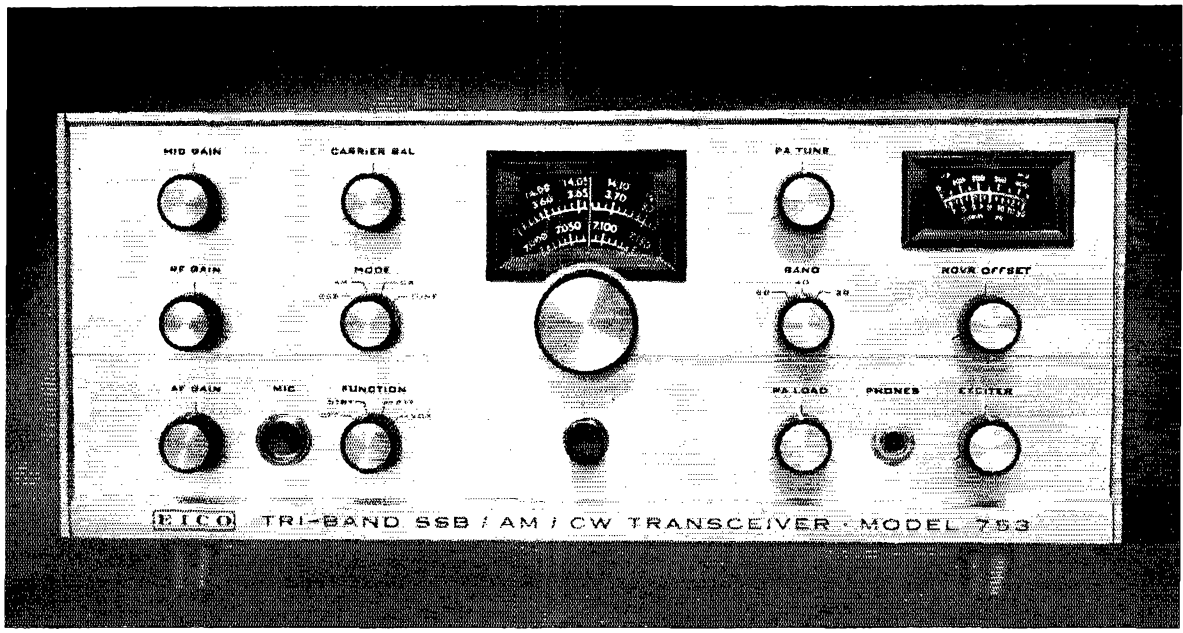

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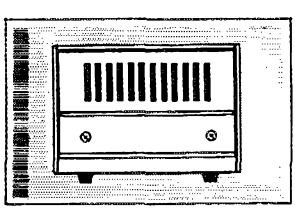

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outlets for traffic. W8HZA has received his Old OTC certificate. The Kanawha County Six Meter Emergency Net meets every Wed. at 9 P.M. on 50.250 Mc. WA8EKC.

WVN CW. Net	22 sessions	68 stations	89 messages
phone	18	345	79
PON	22	120	215

WA8APZ and K8GEP are giving W8WHQ competition in the high-power mobile class. Remember the Black Diamond ARC Hamfest, Aug. 29, Bluefield City Park. Traffic: WA8FIC 301, WA8IMY 184, WA8DGE 98, K8-TPF 61, K8WWW 57, K8WHN 43, W8HZA 37, WA8MRK 35, W8CKX 28, K8SKT 13, K8MHR 9, WA8FIE 5, WA8CRW 4, K8CHW 3, W8JM 3, W8VOI 3, WA8ALI 2, WA8KGU 2, K8ELH 1, K8PJS 1.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald Ray Crumpton, KØ-TTB—SEC: WØSIN. I have the sad duty of reporting the death of G. Edward Drumeller, WØFXQ (prewar W9FXQ), of heart failure May 23. He had been licensed continuously since 1929 and maintained moderate activity all the time. He lived in Denver. Thanks to the efforts of WAØAGY and KØZRT in holding code and theory classes Boulder, Colo., is now well represented on the Novice map. Most common frequencies used are 7.166, 7.158, 7.171, and 21.156 Mc. Calls most usually heard are WNØKKA, WNOLLY and WNØLNV. Heard occasionally are WNØKKB, WNOLLU and WNØIMO. Best times are afternoons, evenings and week ends. WØWYX, atop Squaw Mountain, who has been retransmitting the Denver area AREC nets at 1600Z each Sun., has now had to QRT for the summer. Bob reports he will try to get on some evenings so that the fellows will have a retransmission to work through at least part time. He picks up the stations on 10, 6 and 2 meters and retransmitts each of them to 28.73 Mc. The 10-meter frequency on which to transmit is 29.6 and he will look over the entire 2- and 6-meter bands for check-ins. This works fine. We still have not had much luck on the t.m. frequency. Net traffic: Columbine Net 265, Colorado HNN 310. Traffic: WØHXB 285, KØZSQ 180, KØDCW 133, WAØJEV 28, WØSIN 26, WAØJTB 19.

NEW MEXICO—SCM, Newell Frank Greene, K5IQL—Asst. SCM: Kenneth Mills, W5WZK. SEC: K5QIX. The Roadrunner Net meets at 1930 MST, Mon. through Fri. on 3838 kc. All modes are welcome. W5QHK is a new OO. New Mexico amateurs did a fine job during the Benent "Telethon," with the Caravan Club doing the leg work in Albuquerque and the Roadrunner Net furnishing the statewide links. So many were in there pitching, we can't begin to list the calls. The Roswell c.d. group staged a practice alert. W5UAR and W5KWR aided in contacts with Albuquerque and Santa Fe. This column was the final official act of yours truly as SCM. When you read this W5UBW will have assumed the post as temporary successor. I wish to express thanks for the honor and support accorded me during my stay in New Mexico. I am sure you will do the same for all who try to serve you. Very 73. Traffic: WA5DUH 57, W5-WZK 49, WA5FLG 47, W5UBW 42, WA5FFL 16, K5VXJ 7.

UTAH—SCM, Marvin C. Zitting, W7MWR/W7OAD—Asst. SCM: Richard E. Carman, W7APY. SEC: W7-WKF. Section nets: BUN meets daily on 7272 kc. at 1930Z, W7OCX net mgr.; UARN Sat. and Sun. on 3525.5 kc. at 1430Z and on 3987.5 kc. at 1500Z, W7LQE net mgr. Vice-Director W7OCX had a fine time at the ARRL Board Meeting in Quebec. K7RAJ continues to work rare DX on s.s.b. After nearly 34 years of hunting DX with low power W7POU now has more than enough confirmations for DXCC. By the time this appears in print W7EHX should be home from the U. of Calif. with her BS degree. W7BAJ has been very busy on RTTY. K7EZR is active on BUN and the Noontime Emergency Net. W7LQE and W7VTJ have been spending less time on the air and more time on their jobs. Your SCM and his XYL, K7RJB, announce the arrival of twin girls. Traffic: W7LQE 149, W7OCX 53, K7EZR 35, W7VTJ 29, W7MWR 14, K7SDF 3, K7RAJ 2, W7BAJ 1.

WYOMING—SCM, Wayne M. Moore, W7CQI—SEC: W7YWE. RM: K7IAY. PAMs and OBS: W7TZK and K7SLM. Nets: Pony Express, Sun. at 0800; YO, Mon., Wed., Fri. at 1830 on 3610; Jackalope, Mon. through Sat. at 1230 on 3920. K7ITH has been appointed EC for Natrona County. The emergency communications during the Deer Creek flood in May worked very well. K7HBB is moving near Cody to operate a dude ranch. As of this writing, K7IVK is recovering very well from major surgery in Colorado Springs. W7NNX has a new XYL. Best of luck to you, Ray and Florence. Ray also

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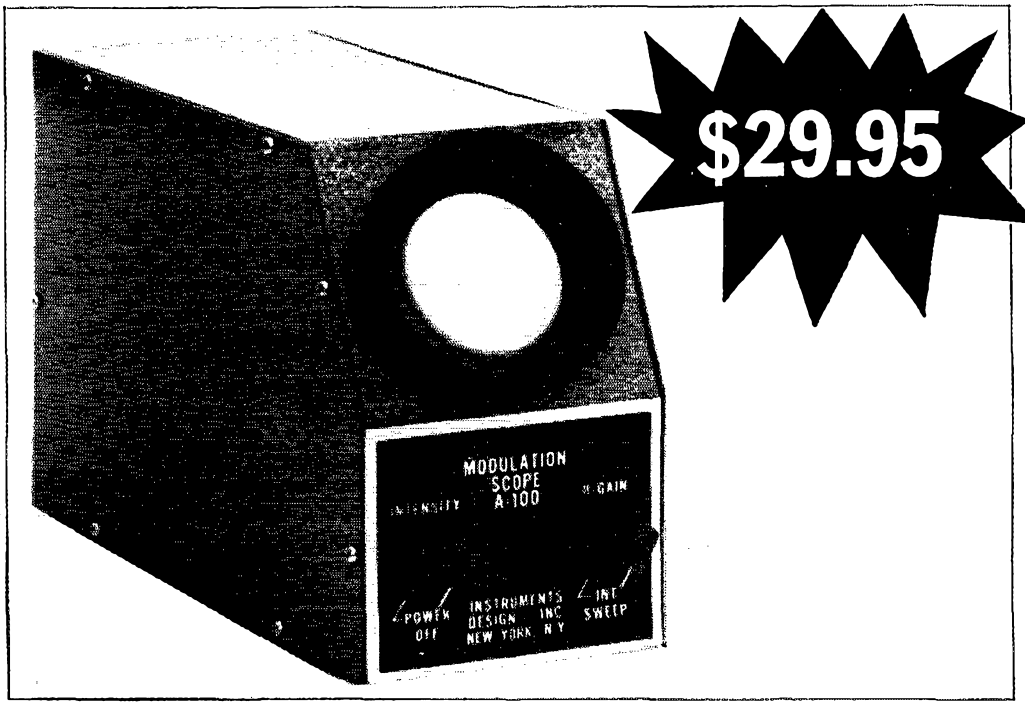

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73, Elliot WA2HDP

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has some new teletype gear we hope to hear on the air soon. W7YB has returned from his round-the-world cruise and is resting up on top of Boysen Peak—getting in some hamming from a very good location also. Traffic: K7IAY 84, K7POX 34, K7SLM 14, W7NKR 9, K7AHO 8, K7GBX 8, W7VEW 8, WA7BPO 6, K7MGM 5, W7CQP 4, K7QJW 4, K7LOH 3, W7TZK 3, W7AEC 2, W7ASB 2.

SOUTHEASTERN DIVISION

ALABAMA—SCM, William S. Crafts, K4KJD—Asst. SCM/SEC: William C. Gunn, W4NML. RM: WA4EXA. PAMs: K4NSU and K4WHW. Remember the N. Ala. Hamfest at Huntsville Aug. 14-15. Congrats to K4HPR on making the top Alabama and Southeastern Division V.H.F. SS score. Alabama had a big turnout in this contest. WA4UXC made the BPL. W4WWF was made a lt. col. on Gov. Wallace's staff an FB honor. Your SCM was honored by membership in the A-1 Club. Thanks to those responsible. May net reports, section-wide nets (times GMT):

Net	*Freq.*	*Time*	*Days*	*Sess.*	*Ave. Tfc.*	*Ave. QNI*
AENB	3575	0100	Daily	30	5.3	7.3
AENM	3985	0030	Daily	31	8.0	43.8
AENP	3955	1230	Mon.-Sat.	26	1.2	16.0
AENP	3955	2400	Daily	36	3.0	14.4
AENR	50.55	0115	Wed./Fri.	7	0.0	19.0
AENT	3970	2230	Daily	35	2.11	5.4

WN4ZIU is a new Novice in Stewart. K4WWP was awarded a B.S. in physics from the U. of A. New equipment: W4LHW a tower and tri-band quad, K4FJZ a 2A, WA4WKN an SB-33 and a TA-33 Jr., K4WSU a tower and TA-36, WA4WGI an HT-18 Hy Tower, WA4ZKU now is on 6. Traffic: (May) W4YNG 196, WA4UXC 151, K4BSK 140, K4KJD 113, WA4HFE 109, W4NML 105, K4GHX 93, WA4EXA 80, WA4JWS 56, WA4LIT 51, K4WHW 45, K4NUW 37, WA4QNI 34, W4WBF 22, WA4FYO 20, K4GXS 20, WA4MGI 20, K4WOP 17, WA4RMY 13, K4NSU 10, K4DSO 9, K4BTO 8, K4FJZ 8, K4WWP 5, K4FZM 4, W4ZVI 4, W4CIU 2, WA4EBS 2. (Apr.) K4GHX 26.

CANAL ZONE—SCM, Thomas B. DeMeis, KZ5TD—The Office of the Amateur Radio Coordinator J6 has sent the local amateur clubs licensing proposals similar to those of FCC for study by the amateurs. At the CZARA meeting, a lively discussion was had on the recent proposals. KZ5PW gave a lecture on the proposals with graph presentations to clearly outline them. KZ5KR has returned from Oklahoma City. KZ5GR left and will be operating from Ft. Benning, Ga. KZ5BX is tearing down his station and will be leaving also. KZ5FM is being stationed in Macon, Ga. and KZ5GK is being sent to Imperio, Calif. KZ5LC now is operating with a Henry 2-K linear. KZ5AX set up for Armed Forces Day and was reported to be 200 kc. wide. KZ5TD, also reported to be wide on 20 meters, found the problem to be a low resistant joint in the new 20-meter beam. KZ5TD now is running a kw. with a converted BC-610 with four 813s in the final. These had been converted for use by IAGS and were issued by Army MARS. KZ5AW will be visiting around the Atlanta area. KZ5EX is working on a four-element quad. KZ5DR is satisfied with his new Heath linear. KZ5RD is building the new Heath s.s.b. transmitter. KZ5PR will be on the air with new equipment shortly. KZ5JW now is on s.s.b. with new equipment.

EASTERN FLORIDA—SCM, Albert L. Hamel, K4SJH—SEC: W4IYT. RM C.W.: W4LUV. RM RTTY: W4RWM. PAM S.S.B.: W4OGX. PAM 40: W4SDR. PAM 80: W4TUB. PAM V.H.F.: WA4BMC. Congrats to St. Pete's WA4OHO set-up at the Civic Center for good public relations work. During the recent high winds alert of the 2-meter net in the Orlando/Winter Park area 23 stations checked in in 25 minutes. That is good EC organization. WA4JYB and W4VWL received their A-1 Operator certificates. Call area leaders in Fla. QSO Party: C.W.—K4VFY, W1FZ, W2KTR, WA3COJ, K4RIN, W8BZY/5, K7SJN, K8GWK (nat'l. winner), WA9AIB, KØRPW, VE2IL, VE3ELL, VE5JI. Phone—WA4BMC, WA3COJ, WA4CEA, K5TYP, W7NOL. Fla. *Skip* prints the details. Normally this dope would not appear in this column but what goes in here depends on you traffic reporters. Use the Form 1 and give us the dope. Looks like W4IEI will be spending some time in SM-Land. How about you v.h.f.ers ganging up on me by sending in your requests for appointment as OES; and if you really want to burn me up, how about you qualified and deserving operators applying for ORS and OPS appointments? Traffic: (May) W3CUL/4 1481, W4TUB 883, WA4BMC 535, WA4IJH 486, WA4BGW 415, WA4LHK/4 395, WA4OHO 393, W4CZA 337, W4KIS 319, WA4IWO 296, W4LUV 240, K4SJH 235, W4DFU 214, WA4NEV 211, W4FPC 188, WA4NBT 170, W4WHK 158, W4IEI 157, K4YSN 140, WA4BAW 137, WA4SCK 123,

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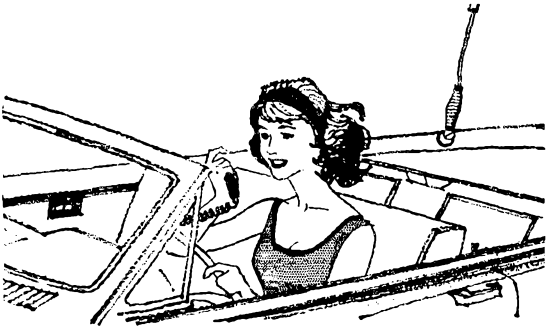

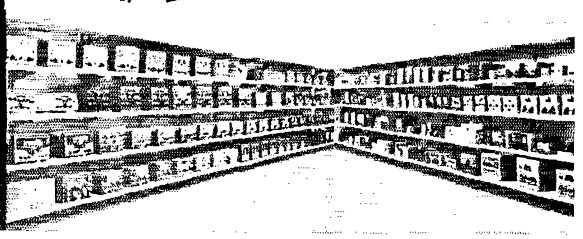

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SX110	89		
SX111	149		
SX140	77	DRAKE	
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S40	59		
S108	79	SBE	
S118	67	equipment.	
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HT33	249	trade. Write	
HT37	299		
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INVADER 200	299		
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NC190	149		
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GONSET 2M 2MTR	129		
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EICO 720	99		
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MT1	49		
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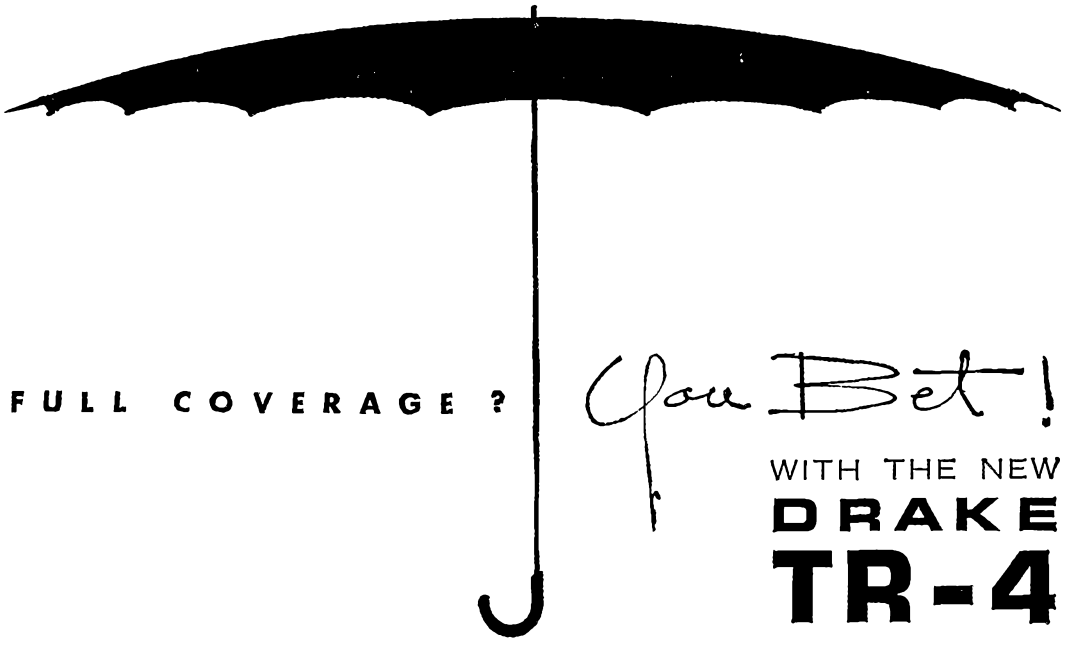
GEORGIA—SCM, Howard L. Schonher, W4RZL—Asst. SCM: James W. Parker, Sr., W4KGP. SEC: W4-SAZ. RM: W4DDY. PAMs: K4PKK, K4YZE, WA4-HSN, WA4JSU. K4NFP reports renewed activity. KP4-BCA/4 now is on 40 with an SBE-34 and a vertical. K4QPL was active in the CD Party. W4DDY continues to confine activity to GSN, 4RN and classes. WN4YED has a new 60-ft. crank-up tower. WA4TYW is building a new 432-Mc. transceiver. W4LRR moved to a new location in Atlanta and plans a DX-pedition to North Georgia. WA4VMF worked 150 stations on 6 in 24 days with a new Ameco TX-62. K4YZE continues interest in v.h.f. emergency work. W4SAZ is busy giving Novice exams. WA4CJN graduated from high school. WA4FUN is s.s.b. with an NCX-5. K4QVL is running an SR-150. Can't believe results. W4AN is s.s.b. with an HX-20. Visitors to the shack of WA4JSU during May included WA4FNY, K4FLR, WA9FZK and W4RZL. Doc is looking forward to a new super linear. K4QNA won a finger talk machine at the Birmingham Hamfest and wants to swap it for a mike. All stations are requested to report v.h.f. activity. The information will be most valuable in encouraging stations in more remote areas to participate by allowing us to point out possible reliable contacts in the area. Traffic: W4DDY 272, W4SAZ 188, WA4UYT 180, WA4GAY 105, W4FOE 84, WA4CJN 81, K4NFP 67, W4RZL 60, K4QPL 36, WA4JSU 20, WA4WKZ 12, K4YZE 11, WA4JXL 5, WA4VMF 3, W4-LRR 2, WA4TYW 2, WN4YED 2.

WEST INDIES—SCM, Jose E. Saldaña, KP4JM—The appointment of KP4BBN as Official Observer is announced, as well as the reorganization of the West Indies section. The Dominican situation now a month old, has disrupted the life of thousands and placed a heavy burden of traffic responsibilities on KP4s. Red Cross urgent requests for medical supplies took top priority. Many long hours of vigil and constant monitoring of the frequencies of KP4s was of substantial help in alleviating much suffering, pain and misery. KP4s TL, BL, BBN, JM, WR, WT, VH, ZC, DP, AWX, AVB, AXC, AKS, AW, AKP, BKY, ACQ, AST, ANH, CKV, AXM, SV, HM, ES, BY, ARW, KE, ASN, CLC, CKW, RE, AQT, APB, MS, GN and CO deserve the "well-done" accolade. This "well done" likewise to nearly 40 in HI-Land who surmounted difficulties and personal risk to help. Our space here prohibits giving so many calls. The PRARC quadrupled its membership in '64 and 300 were at the March hamfest. To KP4AXC and BAN our wishes for recuperation from the recent mishap and congrats to KP4WT (YL) and KP4BMZ (OM) for the Honor Roll mention in April *QST*.

WESTERN FLORIDA—SCM, Frank M. Butler, Jr., W4RKH—SEC: W4MLE. PAM: K4NMZ. RM: W4BVE. Section net reports:

Net	*Freq.*	*Time*	*Days*	*Sess.*	*QNI*	*QTC*
QFN	3651 kc.	2330/0300Z	Daily	62	861	969
WFPN	3836 kc.	2300Z	"	31	No Report	

Pensacola: K4SOI operates mobile with a new SBE-34. K4RSH moved to Jacksonville. The County RACES Plan was rewritten by RO K4QOJ. K4BSS again is active on QFN and WFPN. W4UL has 500 watts on 80-meter s.s.b. WA4IIF put up a new antenna farm. W4-PAA got his tower damage repaired. Milton: W4POY. Whiting Field, has a new 2B and checks into WFPN. K4NMZ is revising the 6 and 2 meter antennas. Fort Walton/Eglin AFB: W4TFL moved to Georgia. K4SDA was a recent visitor. W5BZQ, at Eglin many years, joined the Silent Keys. WA4NYJ is vacationing in Europe. W4ROM is home between trips as marine operator. W4ZWD still is aboard the SS *Santa Emilia*. The EARS operated W4SRX at the Armed Forces Day Exhibit. W4MMW is the new Okaloosa County EC. W4NN is back on with a Swan 350. W4RKH, W4MMW and W4IID attended the Mobile Hamfest. The 2 meter Billy Bowlegs transmitter hunt was won by WA4WVJ. The hidden bunny was W4UXW. Panama City: K4GVV is on s.s.b. with an SB-10 and a DX-100. WA4NVG is vacationing on the West Coast. Talahassee: WA4EOQ is reactivating the 2-meter intercom net. K4ARK and W4GAA were appointed Asst. ECs. Traffic: (May) WA4IMC 546, W4BVE 323, WA4EOQ 50, K4BSS/4 44,



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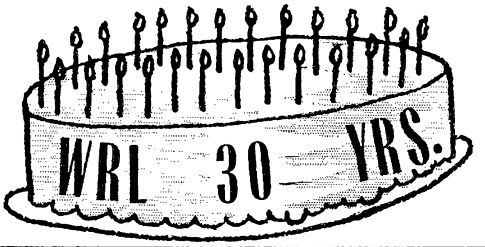
SOUTHWESTERN DIVISION

ARIZONA—SCM, Floyd C. Colvar, W7FKK—SEC: K7NIY. PAM: W5CAF. RM: K7TNW. New appointment: K7NII as OES. W7WUB/7 is building a 432-Mc. tripler and final amplifier, also a 144-Mc. "Long John" antenna. OES reports: W7AYY and K7OFL. Congratulations are in order for K7QWR, who won a Hallicrafters SR-160 and an HA-8 splatter guard in the recent Hallicrafters contest. W7AAY has a new tri-bander up and is active on 20 meters. KN7DAQ is a new Novice in Tempe. Many questions are being received relative to 220-Mc. activity in our section. If you operate on this band, please inform this office so that I can publicize the activity for others to see. W7AH, the c.w. DX king, is on s.s.b. for the first time, and working many countries. He is using home-brew equipment. *Traffic: W7FKK 26, K4ANZ/7 1.*

LOS ANGELES—SCM, H. G. Garman, W6BHG—Asst. SCM/SEC: John A. Vaidean, WB6JGA. RMs: W6BHG, WB6BBO, W6QAE. PAM: W6ORS, K6YVN, K6EPT, W6GYH and WB6BBO made the BPL with two late BPL reports from K6WAH and K6YVN. Endorsements have been made for WB6BBH, W6IBD, W6MEP, W6OI, WA6TWS. New appointments: WB6KVA and WA6WTX as ORS, WB6JGA as SEC and Asst. SCM. WB6HRH, now has a Ranger II, SX-71 with a vertical J and five-element beam. K6MDD says the traffic count is down. WB6KGK finally ran into the traffic man's problem of an unlisted phone for delivery. WB6JGA reports that the repeater will be in operation shortly. K6GIL is installing a new TR-4 in the new Impala. WB6KVA has a spot in NTS as SCN representatives for RN6. WA6WTK is busy with Official Bulletins. W6YRA is conducting bi-weekly propagation tests with San Diego. K6UMV has a new Signal Generator. WB6GGL reports having fun on the Sat. night transmitter hunts sponsored by the Marina Amateur Radio Club. WB6GXI reports a nomination meeting for the 8-Ball Net. W6PCP was slowed down because of surgery. WB6AEL says the June issue was the first mention of his station since 1919. W6NAA reports he is training for Sheriff Dept. radio dispatcher. W6ORS is *selling his boat to build a ham shack.* WA6YMY has his hands full with Novice signals and hopes that the new Novice term will eliminate some and encourage others. W6FNE reports the new AREC tower and also the repeater will be open f.m. repeater on 145.520 input and 146.700 out. W6PUZ now has his Extra Class license. WB6MEQ worked several new countries. WB6BOW just completed a 14-Mc. to 50-Mc. s.s.b. converter. W6IBD finally has 300 countries confirmed for DXCC. W6YUZ is mobile with a Swan 240 and has worked some DX. Glad to have a report from K6YVN again with a good traffic total. WA5TAW is reworking the entire antenna system. The Loyola High School Amateur Radio Club is now ARRL affiliated. I want to thank each and everyone of you for casting your votes in my direction, and to thank all those who campaigned on my behalf. I hope I am able to meet your expectations as your newly-elected SCM. As a reminder, please send your Form 1s in on the first of the month. Please include the ZIP code with your complete address. SCN meets *daily at 0300Z on 3600 kc.* Check in and get acquainted with the traffic men. Have you sent in your application for AREC? Traffic: (May) K6YVN 1291, K6EPT 1089, W6GYH 714, WB6BBO 528, W6WPF 427, WB6HRH 310, K6MDD 287, W6QAE 131, WA6TWS 106, WB6KGK 98, WB6JGA 89, K6GIL 82, WB6KVA 81, WB6BBH 58, W6FD 49, WA6WKF 46, W6USY 44, W6YRA 34, WB6GGL 30, K6UMV 30, W6BHG 17, WB6GXI 10, WB6FPQ 9, W6PCP 5, WN6NCF 3. WB6AEL 2, W6JNX 2, W6HUJ 1. (Apr.) K6WAH 2015, K6YVN 909, WN6AKZ 54, WB6FPQ 9. (Mar.) WA6TAW 81. (Feb.) WA6TAW 94.

ORANGE—SCM, Roy R. Maxson, W6DEY—Traffic net reports: SoCal Six by *SCStatic* K6DLM, 1198 check-ins, 488 traffic count. 246 Net by WA6CXB, 680 check-ins, 160 traffic. Orange County Net by WB6ERG, 268 check-ins, 29 traffic. Riverside City ARA transmitter hunts, held the 1st Fri. and 3rd Sun., had WB6NNV



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as bunny with regulars WB61DX, K6KKR, W6NSN, K6DLY, WB6DXR, WN6KRK and others. Kudos to WA6WZQ and K6LJA for their amateur license training program for the blind. The Newport ARS had Johnny MYC, Ray NJJ and Dave IDJ supplying the program at a recent meeting. W6PM is at his new QTH, Bainbridge Island, Wash. K6MJU received a commendatory letter from the Red Cross for his assistance in disaster areas recently. W6QZQ is out of the hospital and doing well. K6GMA passed the Extra Class exam. W6VT is back from Europe; ditto WA6MQL and WA6KRU from Hawaii. WA6DFT has a new 1-kw linear. K6IME and W6DEY visited with W6JQB and W6HKD at the Citrus Belt ARC re AREC and c.d. W6WRJ is doing an FB job as OBS. Traffic: W6ZJB 525, WA6DFT 201, W6DNA 125, WA6ROF 44, K6IME 34, K6YCX 32, W6WRJ 31, WA6CXB 20, W6YOZ 11.

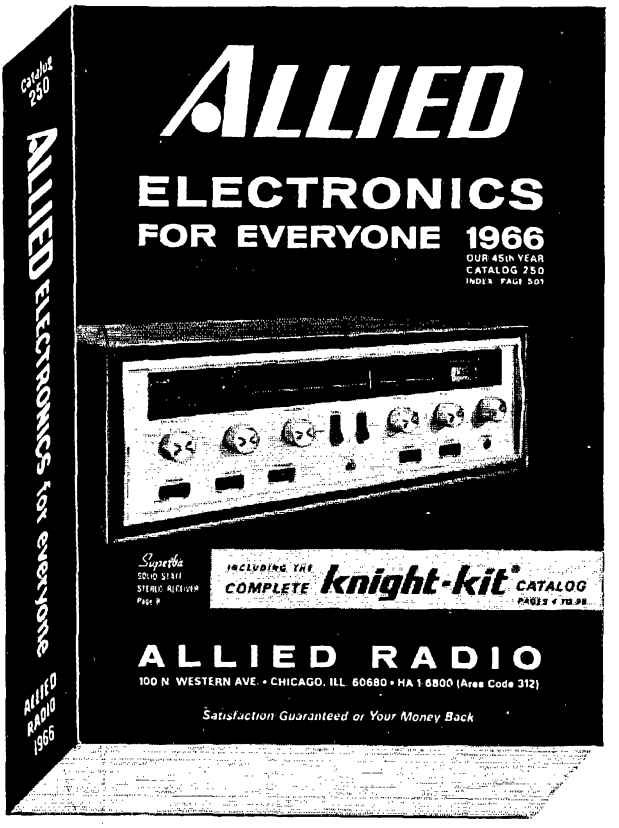
SAN DIEGO—SCM, Don Stansifer, W6LRU—ORS W6NVQ, in Solano Beach, is NØYQG in Navy MARS, and recently received his ARRL 35-w.p.m. Code certificate. New Novices in the San Diego area include WN6s POD, POE, POF, POG and POH, all night-school students under SCM W6LRU. WA6DWH reports having worked his 100th country. The newest member of the San Diego DX Club is WB6GMM, city fireman, and the president of the North Shores Club. New FCC Engineer WA4RGF reports a number of the local "old-timers" taking their Extra Class exams. WB6BSV is a new member of the San Diego V.H.F. Club. WA6SKT worked a W8 recently on 52-Mc. f.m. New officers of the General Dynamics Convair Amateur Radio Club are K6QXN, pres.; WA6YHA, vice-pres.; WA6VHB, secy.-treas. W6RCD and his XYL vacationed in New York and the Caribbean area in late June and early July. WN6OHZ and WN6OIA will enjoy a Boy Scout 50-mile hike on the Muir Trail in the High Sierra in August. WA6SBO represented the San Diego DX Club/W6QSL Bureau at the National Convention in San Jose. W8VQS/6 has moved to the Monterey area from San Diego. The June meeting of the San Diego DX club was held at the home of W6OME. Traffic: W6IAB 4247, W6YDK 3541, K6BPI 3343, W6VNQ 659, WB6JUH 565, W6EOT 464, WB6KNN 109, WB6GMM 89, WA6ZWR 63, K6LKD 11, W6LRU 7, WB6JLC 6.

SANTA BARBARA—SCM, Cecil D. Hinson, WA6OKN—RM: W7WST/6. WB6DPV continues to set records with his 30 watts. He won the '64 SS on phone for this section. Jim will start college in the fall at U.C.S.B. and let's hope he has time to keep up the good work on the air. Mincom employees have formed an amateur radio club. W6KZO seems to have forsaken 75-meter s.s.b. in favor of 2-meter f.m. along with several other Santa Barbara hams. WA6NVC has a new SBE-34 and SBE linear. K6HDN has moved to Thousand Oaks and just a few blocks from WA6OKN. Traffic: W7WST/6 179, WB6DPV 29.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Since your SCM has been hospitalized because of a heart attack he suffered May 14, there will be no report this month. All section members join in wishing him a speedy recovery.

OKLAHOMA—SCM, Bill F. Lund, K5KTW—Asst. SCM: Cecil Andrews, W5MFX. SEC: K5DLP. The Tulsa Electron Benders V.H.F. F.M. Group assisted with communications at the dedication of the Keystone Lake by providing contact with all First-Aid Stations around the lake. The Tulsa radio clubs had a combined meeting, held at Nelson Electric Mfg. Co., and had Bob Ryule from Hi-Gain give a talk on antennas. WA5MSL is a new General Class licensee in Bartlesville and a brother of K5OVE. WA5DBJ is mobile with a new Swan 350. W5JTG has added a new vertical antenna to his TR-3 and is working a lot of DX on 20 and 15 meters. W5NBI is a new OO in Sapulpa and doing a fine job. W4SKI/5 has moved to a new QTH in Lawton and now is running 800 watts to a 4X250 final. W2WOE/5 has gone to DL4-Land for an extended period. W5EHC advised me that his brother WØFXQ



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(prewar W9FXQ) passed away in Denver, Colo., May 23. Ed had been an active ham since 1929. I have once again given political immunity to the SCMs and SECs from the fair State of Texas in order that they may attend the West Gulf Convention held in Oklahoma City. Traffic: K5TEY 478, W5QMJ 142, K5KTW 49, K5-DLP 40, W5DRZ 36, W5MFX 28, W5NBI 24, KØBWN/5 18, K5CBA 10, W5PML 8, K5OCX 6.

SOUTHERN TEXAS—SCM, G. D. Jerry Sears, W5-AIR—SEC: K5RDP. PAM: W5ZPD. RM: K5ANS. Many amateurs in Southern Texas were involved in emergency communications because of tornadoes and floods. All amateurs operating these or other emergencies, please pass your reports to the SEC. Texas State RACES, under the direction of K5TRY, has been busy with several such emergencies. K5WIW, operator at Texas A & M, is home at Jacksonville in No. Texas for the summer with a homebrew 75-watt rig. The Houston Amateur Radio Club will set up a working station at the Trade & Travel Fair in Houston Sept. 17 through 26 on 1400 to 2200 CST daily. W5ZPD, our PAM, reports the first Bolivian reciprocal licensee is CP5AO/5 operating from the Houston area. Congratulations to new officers of the South Texas Emergency Nets elected at the STEN Convention in Corpus Christi June 5: K5-CGO, NCS; K5EWU, ANCS; W5LVC, secy.-treas.; K5PPV, pro. ARC sponsor at Texas A & M. W5TUU, has completed the requirements for Ph.D. in electrical engineering. K5LZA has a new bride, WN5FAT. K5-ANS reports bands conditions are playing hob with 7RTN, the 7-Mc. RTTY net. The net needs more participation. WA5HFU was asst. net mgr. of Tex C.W. Net while K5ANS was in Austin recently. The Bryan Texas, Amateur Radio Club has set up a mobile and calling frequency of 28.875 Mc. W5AC has a new trap dipole to replace the old antenna used for 15 years, also a new s.w.r. bridge to check it. W5AQN is planning a new ham shack. K5ETI moved to Victoria and is laying out an antenna farm. Reports were received for May from K5ANS, W5ABQ, K5ZSC, K5HZR, K5-LQJ, K5EJL, K5WIW, K5LWL and W5ZPD. Traffic: K5HZR 103, W5AC 94, K5ANS 59, W5ABQ 33, K5PNC 27, W5AIR 3.

CANADIAN DIVISION

ALBERTA—SCM, Harry Harrold, VE6TG—SEC: VE6FK. PAM: VE6PV. ECs: VE6SA, VE6SS, VE6-AFJ, VE6HB, VE6ALL. RM: VE6AEN. ORS: VE6BR. OPSs: VE6CA, VE6PV, VE6HM, VE6SS, VE6BA, VE6ADS. OOs: VE6HM, VE6NX, VE6TW, VE6TY. OBSs: VE6HM, VE6AKV. OESs: VE6DB, VE6AKY. With very few reports coming in this month your SCM has very little on which to report. Vulcan reports that it now has six on phone and four on c.w. and is getting another class ready for classes this fall. Calgary AREC still is going strong. We regret at this time to mention as a Silent Key VE6HZ, a well-known ham who was respected by all who knew him. OO VE6TW reports that band activities for the summer are falling off. SEC VE6FK reports that AREC groups are doing fine as he listens to a lot, but that the ECs are lax in sending in their reports. We hope to have another provincial AREC picnic this fall. More later on this from the SEC. Traffic: VE6HM 150, VE6FK 45, VE6XC 13, VE6TY 11, VE6ADK 10, VE6SS 7. VE6ADS 6, VE6-ABS 5, VE6AFJ 5, VE6AKK 3, VE6BL 2, VE6SA 2, VE6SU 2.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB—IVE7AFG, VE7AUA and Ken Carrier received their Bachelor of Applied Science, Electrical Engineering degree. VE7AFG then went to Nanaimo and got married and is off to Toronto to work. VE7OM has been in the hospital recovering from surgery. VE7VC and VE7CC also are recovering but we should not feel too sorry for Jim as he has his s.s.b. rig in bed with him. VE7ND allowed the press to take one joint of a finger. VE7BBB was awarded a silver cup for YL/XYL. The Vancouver Club held 2-meter hidden transmitter hunts every Sun. in May. VE7BIY's ARC-5 d.s.b. came out suppressed c.w. carrier. VE7BFN/8 has worked two hundred countries in three months. VE7XO lost his father in May. VE7BBP is secy. and founder of the Esparanto Club, which meets daily on 3900 kc. at 2400 GMT. The B.C. Slow-Speed Net on 3700 kc. meets Mon. through Sat. at 0300 GMT. Here is a good net to work up your operating speed and message-handling ability. VE7OM, our SEC, looks forward to EC monthly reports and finds no increases from other months. Why? ECs sleeping? Have you filed a Form 7 for 1965 and received your membership card from your EC or have you had your old card endorsed? Traffic: VE7BIY 63, VE7BJV 63, VE7BHH 48, VE7AC 37, VE7QQ 25, VE7BLO 19, VE7RBB 16, VE7AMW 9, VE7AKY 7, VE7BHW 6, VE7BDN 5, VE7CT 5, VE7BCT 4, VE7-BOQ 3.

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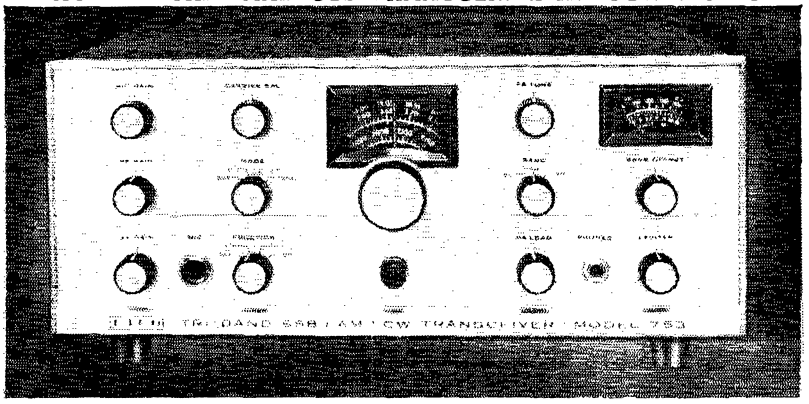

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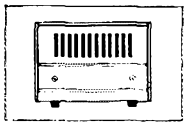

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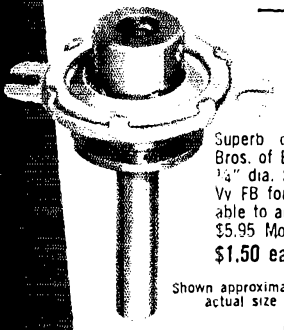

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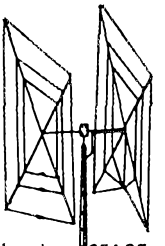

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MANITOBA—Acting SCM, M. S. Watson, VE4JY—VE4 amateurs are reminded that news for *QST* must be communicated to reach your SCM not later than the 6th of each month. Let us have your news. Because so many Manitoba amateurs are engaged in farming operations net members decreased during spring activities. VE4XA, a valued member of the net, has been transfered to VE2-Land and in time will be heard on 20 from Montreal. This makes the third loss recently by transfer to Montreal. VE4EF, of Margaret, Man., is the latest on the sick list at Killarney Hospital. A rash of transceivers, both fixed and mobile, seem to be invading VE4-Land. The May meeting of the ARLM was taken over by a swap and auction. Have not heard of any Manitoba Hamfest in 1965. VE4JQ was heard mobile from his summer QTH at Clear Lake. Happy birthday to VE4RB. VE4TE is now settled at Neepawa and putting out an FB signal, both fixed and mobile. Traffic: VE4JT 114, VE4QX 46, VE4NE 13, VE4SC 13, VE4JY 12, VE4EI 11, VE4LG 10, VE4QD 8, VE4JA 6, VE4QJ 6, VE4UX 6, VE4SW 4, VE4EG 2, VE4XN 2.

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: E. W. Street, VE1EK, and R. P. Thorne, VO1EI. SEC: VE1HJ. Congratulations to VE1AGG and his XYL on the arrival of a new harmonic. VE1AKC, genial editor of the Cape Breton *Newsletter*, is being transferred to the VE7 area. VE1AJI reports that the LCARA recently provided communications for the Annual Fish Derby. Nearly 4000 youngsters took part and mobiles were used to relay the results to the judges' stand. VE1ST has been transferred to the VO district, while VE1AJF will be changing his call to a VE3. The Cape Breton Net now meets on 3730 kc. at 0930 Sun. VO1FG has a new linear, while VO1CS and VO1EE are active with new HW-12 rigs. VO1FU now has his A-3 privileges. VO1s EC and FY have moved to new QTHs. DXers VE1TG, reporting for the "Causeway Clan," advises that VE1AKH nearly went mobile the hard way when an oil truck came into his GTH without bothering to open the door! VE1ACG has his station set up at one end of the service bench. A good way to check for TVI! A belated report on a mid-winter storm advises that VE1s TG, CT, PS, BL, GX, YE, AGW, IB, WA, SQ, AX, FR, HC, AIX, JB, RT, GA and VE2BQV were active with emergency traffic.

ONTARIO—SCM, Richard W. Roberts, VE3NG—VE3DUU is home again and I hear that he is on 75-meter phone. The Grey-Bruce ARC was active in FD. My sincere thanks to VE3ETM and his XYL, in Windsor, for making my visit very enjoyable. We tip our cap to VE3DJK, of Cornwall, for the excellent job he is doing in keeping the local club going. I regret very much to have to inform you that VE3IB passed away in England last April. Also we will miss VE3DBR, of Scarboro, who passed away in April. VE3FFU advises that the Renfrew ARC operated FD at Chalk River this year. The Kitchener gang did a swell job of public relations for ham radio while operating at the local Sportsman Show. We will all miss VE3BV, of Hamilton, who became a Silent Key recently. Our condolences to the families of all those, who will be missed so much by all of us. VE3BS was guest speaker at the Niagara ARC. The Ottawa Valley Mobile ARC has a new emblem but I have yet to see it. The club recently assisted the local flying club with communications during an Air Rally. Our SEC, VE3EUM, commends the following chaps: VE3BUW, most active EC; VE3BWM, now Clinton EC, formerly North Bay EC, real worker, VE3BYQ, AREC member of the Hamilton group, although blind, by far the best traffic man we have. The Ontario ARRL Convention will be held at Sudbury Oct. 1-3. Traffic: (May) VE3CYR 135, VE3BZB 108, VE3DPO 102, VE3NG 99, VE3DMU 74, VE3EBC 67, VE3EHL 62, VE3AWE 56, VE3GI 55, VE3FGV 48, VE3-DVE 40, VE3DRF 39, VE3TT 21, VE3BLZ 19, VE3ETM 18, VE3BWM 13, VE3BUR 9, VE3DH 2, VE3VD 2. (Apr.) VE3CFI 25.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—Asst. SCM: Claude DuBerger, VE2ALH. We are pleased to welcome our new Asst. SCM. Living in Quebec City he will be able to bring us outside news of interest. It is with deepest regret we announce a tragic drowning accident. VE2PY accidentally fell off a rock in a river near Rawdon and was swept away in the swift current. VE2SF

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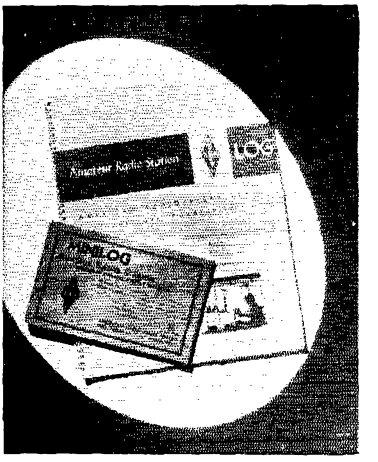

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arranged a jolly reunion for Red Lymburner, now operating as VE3LY/W4 in Florida, when visiting in Montreal. Among the 29 friends assembled the total ham years reached 1057. The 20-Meter Trans-Canada AREC Net is a going concern and worth your investigation. It is held on 14,140 kc. Sun. at 1800Z. VE2BVY reports that the new French C.W. Net, RTQ (see May column) is making progress with 87 messages and 281 QNIs so far. NCSs are VE2s BRT, BIL, BUY and BVY. VE2EC reports VE2-BWB and VE2BWT are newcomers in St. Maurice Valley. VE2BVN will be heard on 80 meters with modern equipment. VE2AGQ/VE3 is active on OQN and ECN. VE2ALH reports: L'assemblée officielle du bureau des directeurs de L'ARRL a eu lieu dans la vielle capitale de Québec le 21 mai '65. VE2HB, VE2LG, VE2AAH, VE2ET et VE2NK ont suivi de près les différentes activités. Un souper fut offert aux amateurs. VE2AIR travaille à Toronto durant les vacances. Un nouvel amateur, VE2BJF, opère un HX-11 aver de bons résultats. La charmante Laury Ann, soeur de VE2BJF, pratique son code pour se presenter aux examens amateurs en juillet. VE2BUY est maintenant en phonie et avec un nouveaux SX-111. VE2AYX opère en s.s.b. aver un HX-20 et un SX-117. VE2s TJ, DF, AAH, UZ, ADL, RB, AVV et ATD sont toujours actifs sur 20 m. VE2ALH est très QRL mais semble revenir actif sur le "traffic handling." Traffic: VE2BRD 78, VE2DR 77, VE2OJ 48, VE2CP 37, VE2EC 33, VE2ALH 23, VE2BG 15, VE2BRT 10.

SASKATCHEWAN—SCM, Mel Mills, VE5QC—Your SCM is not only going on a new business venture but will have a practically new house also. The story is not that bright as the cause was fire! Fire is a terrible thing and makes one reflect—so check all those cords and leads for overloading or frayed insulation. Make sure you ground everything and have a master cutoff switch installed right *now*. Don't take chances, clean up the shack! Also check to make sure that your insurance covers your equipment, there's more value there than you think. I wish to thank all those who worked so hard to make "Hamfest '65" such a success, and, of course the many hams and their families who attended and, we hope, had a good time. Am very sorry about the brevity of this report but all my records are either burned or tied up! Traffic: (Apr. and May) VE5HP 260, VE5LM 147, VE5PZ 17, VE5EO 12, VE5HQ 8, VE5PU 4, VE5YR 4, VE5FC 3, VE5CB 2.

August 1940

. . . The cover and lead story this month were all about "New Radio Control Gear for Model Airplanes." C. E. Bohnenblust, W9PEP, and C. H. Siegfried combined their talents to design and build a radio controlled, gas-powered model airplane which used an RK-62 super-regen receiver and a clever mechanical system and escapement for control. The combined weight of the plane and radio equipment was 13½ pounds and the ship had a wing spread of 12 feet. Other technical articles included a complete precision frequency standard using a 1000-kc. crystal which was described by G. M. Brown, W2CVV. The Main Line Radio Club of Haverford, Pa., had plenty of experience in "treasure hunts" (transmitter hunts) and a resumé of the club's findings was reported in an article "Radio Direction Finding," by the club's Technical Chairman, James M. Bruning, W3EZ. Helpful pointers, along with actual constructional information, should be of interest even today to those interested in the subject. Arthur H. Lynch, W2DKJ, then Managing Director of the World's Fair amateur radio station, W2USA (see "W2USA" elsewhere in this 1965 issue), wrote an interesting article on "The Fixed 'Rotary' Beam Antenna." "Designing a Wide-Range U.H.F. Receiver" by F. W. Schor, gave details of an f.m./a.m. receiver. . . . F. E. Handy, W1BDI, announced a new ARRL service, the Code Proficiency Certificates. W1AW started the award runs on August 5 with

a speed of 15 w.p.m. which worked up in steps of 5 w.p.m. to 35 w.p.m.

. . . "On the Ultra Highs" column reported a new 1940 DX record for 56 Mc.: W6QLZ and W3RL worked over 2000 miles. QST

Silent Keys

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

W1ASU, Clarence J. Green, Worcester, Mass.
W1BRK, Elbridge A. Pickard, Arlington, Mass.
ex-KN1FKQ, Rene G. Boutin, Wollaston, Mass.
W2DQ, Frank J. Ryder, Sayville, N. Y.
K2JHA, Harold H. Riker, Flushing, N. Y.
W2NCT, John L. Kresse, Huntington, L.I., N. Y.
WB2NPD, Walter E. Thompson, Parlin, N. J.
WN2PNF, Arthur T. Goldman, Parlin, N. J.
K2QJA, William M. Merritt, Memphis, N. Y.
WN2SCW, Barry Haviland, Montclair, N. J.
K2SDV, Ruth Gilbert, Burnt Hills, N. Y.
W2SPE, Roswell P. Beattie, Watertown, N. Y.
WA3ATY, Theodore W. Miller, Chinchilla, Pa.
K3HBO, William H. Shaw, Chester, Pa.
W3QEW, William W. Steckiel, Scranton, Pa.
W3RP, Robert C. Barnes, Baltimore, Md.
WA4HDX, Robert C. Parry, Clearwater, Fla.
WA4LZZ, Theodore F. Kowalewski, Pompano Beach, Fla.
W4PPL, Harry Pieper, Tampa, Fla.
W5DI, Robert T. Bradford, Little Rock, Ark.
K5RRP, Paul C. Munoz, El Paso, Tex.
W5ZLS, Clyde B. Trevey, Jr., Houston, Tex.
K6EOF, Raymond H. Freek, Glendale, Calif.
W6IKK, Charles R. Parmenter, Redwood City, Calif.
W6JVL, Mario A. Maury, Montclair, Calif.
W6QJR, J. Jay Jakosky, Newport Beach, Calif.
W6ZX, Percy W. Dann, Fresno, Calif.
WN7AZC, Lawrence P. Conklin, Moses Lake, Wash.
K7CSU, Clayton H. Saxon, Bend, Ore.
W7GWL, Archie A. Swan, Bremerton, Wash.
W8CJB, Louis M. Shobe, Flint, Mich.
WA8GVY, Paul W. Musgrave, Columbus, Ohio
WA8HEP, Dan A. Fodor, Detroit, Mich.
W8IMP, Gerald Cochenour, Springfield, Ohio
K8NHF, Harry E. Des Granges, Lewis Center, Ohio
W8QP, Edward H. Mitchell, Findlay, Ohio
W8RNL, William A. Vignos, Canton, Ohio
W9IEN, Lester E. Sprinkle, Hinckley, Ill.
WA9JBK, Wayne R. Honselman, Monticello, Ill.
WNØEGA, Edward L. Snyder, Lamar, Colo.
WØFXQ, G. Edward Drumeller, Denver, Colo.
WØGZN, Alfred E. Ubben, Minneapolis, Minn.
WØHHC, Frank E. Vickers, Kansas City, Mo.
KØJLP, Edward Odell, Mission, Kansas
WØWMA, Kenneth W. Holgate, Minneapolis, Minn.
DL3MIB, Hermann Schmid, Schwaeb. Gmuend, Germany
EI5L, Jack Comben, Co. Dublin, Ireland
G6IO, E. Rayner, London, England
KH6GN, Robert M. Loveland, Honolulu, Hawaii
KV4BZ, Draper F. Henry, St. Thomas, V. I.
VE3CXP, Ronald F. Sigston, Ottawa, Ont., Canada
VE3DBR, Eric T. Edwards, Scarborough, Ont., Canada
VE3IB, Wally Hainge, Toronto, Ont., Canada
VE6HZ, Glen C. Phillips, Calgary, Alt., Canada

How's DX?

(Continued from page 83)

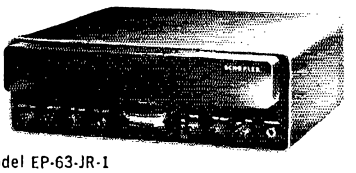
9ACX . . . . . Advises via W2GHK indicate that W4BPD is about ready to finish up his AC-land swing and start wending westward toward Europe and a Carolina Christmas . . . . . 9M4JW tells W7DJU he expects to sign 9M6JW again before year's end . . . . . WB6MEQ once tried JA3WU's seated-on-the-floor operating technique due to a shortage of furniture. "Never again!" . . . . . RSC (Ceylon) will fling its 2nd VU2/4S7 DX Contest October 23rd–24th (phone) and 30th–31st (c.w.). We'll have participation specs in a more timely *QST* . . . . . OD5EE (W5LAK) has a Collins layout cookin' on 14,075 kc. from Beirut when not busy with the oil-hunting game . . . . . HS1FJ (K6DGW) writes, "RAST (Thailand) is working closely with the Royal Thai Government and progress already has been made toward having the QSO ban lifted. With recent passage of the reciprocal licensing bill by Congress the outlook is even better. U.S. embassy officials in Bangkok now are investigating a possible agreement between the United States and Thailand to permit reciprocal licensing." Meanwhile the HS taboo continues . . . . . KA2TP, erstwhile FEARL prexy, earned himself a star and reassignment to the Pentagon. Turk writes, "Hated to terminate my first real DX assignment so soon, but I was fortunate enough to be selected for promotion." FB, General!

AFRICA — Ascension excerpts, first from ZD8BC (ex-VP7BG): "Just moved in from the Bahamas and I'm having quite a time working DX and being DX on 20, 15 15 and 10, c.w. and s.s.b. I'll be here for at least a year. There are good openings to the States at 1200 GMT on 14 Mc. and 1500 on 21 Mc. Asia peaks around 1630 on 20 meters and we get pretty good Pacific openings around 0900." Next from ZD8HL, recently VP2KL of Anguilla: "I'm planning several more DXpeditions in the next year or so, including an extended Caribbean trip with a couple of weeks on all islands possible. Africa, too, perhaps." W1WPO finds ex-ZD8BB now on the short end of the DX stick signing W7FFF/2 in New York City . . . . . According to W3HNK, 5A5TR knocks off this month but 5A3TX will be going strong Tuesdays and Sundays, 14,070 kc., at 2030 GMT . . . . . Relax — W1ECH understands that ZD7IP will be on St. Helena for three years or more . . . . . WA3AZI recommends 9Q5PA's new SB-400 on 15 phone or c.w., Thursdays and Saturdays around 1900 GMT . . . . . TL8SW shuts down on the 12th of this month for a vacation in Spain. Syd will be back in the C.A.R. for another year beginning in mid-October, says W1BPM.

OCEANIA — VK9GW, whom K7SNB finds very audible on 14,240 kc. at 0430–0500 GMT, wants to work more W/Ks from his lonely Australian antarctic outpost. "He's been there three months and has another year to go. They get no mail during the long winter months down there, and, with little other recreation, he spends much of his time on the air." . . . . . WA4IKU (W1RCQ) visited KH6IJ, OD5LX, the 4U1ITU gang and other DX pals on a recent global whirl. Bill also enjoyed portable-KH6 DXing . . . . . W1WPO learns that VK2IO, a TV serviceman, wants to correspond with Yanks in the same line.

HEREABOUTS — VP6BW, regularly on 40's low edge at 1000–1100 GMT, tells W6TYM he needs only KH6 and KL7 for his 7-Mc. WAS . . . . . "I'm active on 14,160 kc. every morning but Sunday signing CP8AU," writes K2DGD. "Neighbor CP8s AM and AP usually are on 15 and/or 20 meters between 2230 and 0200 GMT." CP8AU listens on 14,277 kc. as a rule, working W9RPX, Ks 1GUR 4GOX and other friends . . . . . "Really miss that good old Okinawa DX," laments W5HEF/4, formerly KR6OF . . . . . TG9EP displays his TR-3 and NCL-2000 almost nightly on 7200–7230 kc., 0500 GMT or so . . . . . During the last two weeks of this month K2HVN will radiate from Prince Edward Island, mainly on 7050-kc. c.w. Bill intends to try c.w. and a.m. on 80, 75 and 15 meters as well . . . . . TI2WD/8 writes W1TS of Hq., "Boy, it really gets rough when you have ten stations calling you on top of the guy you are working. I'll be very active from Puntarenas but I hope W/Ks will become more patient." . . . . . A QSL from GI3PGD will wrap up WA7BOB's 21-Mc. WAC as WN7BOB. It's a breathless wait because that was Chuck's only European Novice QSO . . . . . K1QGC fears that FCC will eventually crack down severely if W/Ks continue to play around in pile-ups without designating the station they're after, and W1ECH feels that if all the guys he hears yelling unnecessary CQ-DXs were laid end to end it would be a good idea . . . . . New brass of CRAS (El Salvador)

ECHOPLEX...



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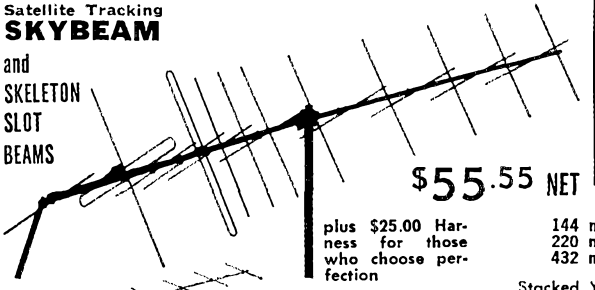

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includes president YS1IM, secretary YS1RRD, treasurer YS1RSE, directors YSs 1IR 1RES and 2MFI. VERON's newsletter points out that KX6BQ is a group effort with a half dozen operators, so be sure to name the op you worked when QSLing. This is always wise practice, even on QSLs for supposedly single-operator DX stations. . . . . Indonesia is still not workable for FCC-licensed amateurs (ITU FCC Ban List) but, the grapevine indicates that the country's call areas go so: 8F1 western Java, 8F2 middle Java, 8F3 eastern Java, 8F4 Sumatra, 8F5 Borneo, and 8F6 Celebes-Moluccas. QST

World Above 50 Mc.

(Continued from page 90)

K3YKC writes that conditions were excellent May 4 through May 9 with stations being heard from Kansas, Illinois, Missouri, Oklahoma, Florida, Tennessee, Michigan, Wisconsin, Minnesota, Indiana, Alabama and Nebraska. Other openings occurred during the last part of May but conditions were just hit and miss sez Mac. At Auburn, Alabama, K4FJZ caught band openings on five different days during May and heard stations in 1, 5, 8 and 9 lands. WA4STJ in Hollywood, Florida, observed six-band openings and heard all but 6 and 7 lands. Total states 2-way s.s.b. for Jim now stands at 28. Miami speaks through WA4QLZ who observed 9 different openings and heard or worked all but 6 and 7 lands. John also worked VE3 land. WA4OMH reports from Kentucky that he heard approximately 10 states during 8-band openings in May plus VE, CO and VP lands.

Now is the Time!

(Continued from page 47)

I don't presume to know all the possible ways of selling amateur radio to other governments, but let me tell you of one instance where it was accomplished. A good friend and a member of my amateur club was assigned to a United States mission abroad. The country had no amateur radio service. Their use of radio in the other services was being greatly expanded but they had very few people sufficiently trained to maintain the equipment being installed. My friend convinced the appropriate government officials of that country that establishment of an Amateur Radio Service would stir an interest in radiocommunications and would be a good method of training native personnel who would be needed for the maintenance of their new radiocommunications systems.

Today that country is off the ITU "banned list" and has a number of licensed amateurs whose activity has added a new country to the DX country totals of many of you here. I am sure that is one country which will be a friend of the Amateur Radio Service at the coming international telecommunications conferences. This is just one example. Every opportunity to "sell" amateur radio internationally should be pursued and NOW IS THE TIME to do it! QST

ARPSC

(Continued from page 69)

ution centers and the main headquarters.

Feb. 14 — Fifteen members of the Harford Co., Md., AREC and civil defense staged a mock nuclear explosion in the Baltimore area as a test of the county c.d. program.

Feb. 21 — The Cobb Co., Ga., AREC staged an airplane crash for a local simulated emergency test. Twelve amateurs participated and provided communication to Red Cross, civil defense, fire and police headquarters.

— • • • —

Forty-one SECs reported for April, representing 19,898 AREC members. This is 2 SECs and about 1,500 AREC members more than last April. How about some of you SECs who haven't reported in years shaking the dust off your report forms, filling one out and sending it in? Those sections reporting this month are: N.N.J., Tenn., N.C., Ind., Iowa, Nebr., N.Y.C.-L.I., Los A., Miss., Alta., Sask., E. Pa., W.N.Y., Del., Ga., Hawaii, E. Mass., W. Pa., Ariz., Kans., Wyo., Wisc., Maine, Mich., Ala., E. Fla., Wash., Nev., Ohio, Utah, Minn., Mo., Ont., N. Mex., Ark., S. Tex., Va., Colo., S. Dak., Okla. QST

The Saga of CEØXA

(Continued from page 60)

every bit of help they could and Sr. Del Rio's phone call to the Chilean Director of Tourism, Sr. Rene Pairoa, was the factor that enabled us to finally clear port at Iquique. Sr. Pairoa's offices and influence overcame the tangle of red tape.

Past experience has taught us that having a station and representative at each end of a trip can be extremely valuable. While CE1GJ handled the Chilean end of things we had W4BJ, Ray Farwell (ex-W2BJ), handling the stateside end for the entire time we were away. Ray kept a steady stream of factual bulletins flowing during the days we were awaiting clearance and also kept the Chilean Consul in Miami advised of our progress, or lack of progress. Ray's work, 'round the clock, proved to be priceless.

The crew of the boat *Sutiran* and the officials of the company owning it became fast friends with us and, as an indicator of our thanks we donated a flask of "cheer" as we left the vessel in the harbor at Antofagasta. Our understanding is that the cook drank it all.

Gear and Equipment

The transmitters and receivers were Hallicrafters SR-150 and SX-117 combinations. It was subjected to numerous baggage transfers both going to Chile and returning and, of course, also subjected to somewhat wet maritime mobile operation coupled with the rough ride in the hold of the ship. It functioned faultlessly. We used Hy-Gain tri-banders at about 35 feet on telescoping masts. Both beams were assembled and erected in less than three hours from the cartons bespeaking the ease of assembly. Long wires and open-wire line fed dipoles completed the antenna system.

Though nearly all of us claimed at one point or another during the trip that this would be our "last one" it is almost a sure bet that the future will see elements of the group once again on the trail of a "rare one". San Felix/San Ambrosio apparently was the last "new one" in this hemisphere and we enjoyed doing our best to put it on and get it confirmed in as many logs as possible in the time available to us. QST

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 noncommercial in nature.** Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Address and signatures are charged for. **An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ rate.** Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) **Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions. No checking-copies can be supplied.**

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

PEORIA Hamfest September 19. Exposition Gardens. Peoria Area Amateur Radio Club, advance registration $1.00 until Sept. 11. Ferrel Lytle, W9DHE, 419 Stonegate Rd., Peoria, Ill.

THE Federation of Long Island Radio Clubs will hold its annual hamfest and picnic at the Hempstead Town Park, Point Lookout, Long Island, on Saturday August 28 from 9 a.m. until dark. Plan an outing for the entire family. The park features ocean swimming, boardwalk, playground area for children, golf and food service.

GREATER Bay Area Hamfest, Peacock Gap Country Club, San Rafael, Calif. October 16-17. Write to Box 113, Hayward, Calif.

BIGGEST? Nope. Best? Heck, yes! Warren ARA Hamfest August 29th, Newton Falls. Arrows from Rt. 534 and Turnpike Warren Exit 14. Details: WARA Hamfest, Box 809, Warren, Ohio.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

MOTOROLA used FM communications equipment bought and sold. W5BCQ, Ralph Hicks, Box 6097, Tulsa, Okla.

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WANTED: All types of aircraft on ground radios. 17L 618F or S388, 390, GRC, PRC, 51 JRVX. Collins linear amplifier, Type 204; Especially any item made by Collins Radio, ham or commercial. Also large type tubes and test equipment in general. For fast cash action contact Ted Dames W2KUW, 308 Hickory, Arlington, N.J.

SELL swap or buy ancient radio set and parts magazines. Laverty, 118 N. Wycombe, Lansdowne, Penna.

WANTED: Military and commercial laboratory test equipment. Electronicraft, Box 17, Binghamton, N.Y. Tel: 724-5785.

SAVE On all makes of new and used ham equipment. Write or call Bob Grimes, 89 Aspen Road, Swampscott, Massachusetts; 617-598-2530 for the gear u want at the price u want to pay.

WANTED: 2 to 12 304TL tubes. Callanan, W9AU, 118 S. Clinton, Chicago 6, Ill.

304TL tubes wanted. Also other xmttg and special purpose tubes. We will buy military or commercial transmitters and receivers with designations ARC, GRC, URR, 51 and MN. Air Ground Electronics Co., 64 Grand Pl., Kearny, N.J.

WANTED: Collins Parts. BC-610, GRC-27, Autodyne. Bethpage, L.I., N.Y.

INTERESTING Offers galore in the new combined "Equipment Exchange-Ham Trader". Next 12 issues $1.00. Sample free. Brand, Sycamore, Ill.

WE Buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., P.O. Box 516, 199 Front, Hempstead, N.Y.

NOVICE Crystals 80-40 M, $1.05 each. Others, 75¢. Free list. Nat Stinnette, W4AYV, Umatilla, Fla. 32784.

SWAN 400, 406-VFO, 117B, AC supply, flawless, w/cartons, manuals, $400. Davis, 675 Sierra Meadow, Sierra Madre, Calif.

WANTED: For personal collection: QST, May 1916, WICUT, 18 Mohawk Dr., Unionville, Conn.

TUBES Wanted. All types, highest prices paid. Write or phone Lou-Tronics, Inc., 74 Willoughby St., Brooklyn 1, N.Y. 11021. Tel. UL5-2615.

ACT Now!! Barry pays cash for tubes (unused) and equipment. Barry Electronics, 512 Broadway, NYC 12. Call 212-WAlker-5-7000.

COLLINS Amateur equipment bought, sold and serviced. Paul A. Reveal, W2DC, 129 Midland Ave., Glen Ridge, N.J.

WANTED: Tubes, all types, write or phone W2ONV, Bill Salerno, 243 Harrison Avenue, Garfield, N.J. Tel. GArfield Area code 201-471-2020.

QSLS?? SWLS?? Personalized made-to-order! Largest variety samples 25¢. DeLuxe, 35¢. (Refunded). Sakkers, W8DED, Box 218, Holland, Mich. 49424.

QSLS, samples 20¢. QSL Press, Box 281, Oak Park, Illinois 60303.

QSLS "Brownie" W3CJI, 3111 Lehigh, Allentown, Penna. Catalog with samples, 25¢.

C. FRITZ back on the job! Bringing hams greater QSL returns, over a quarter century! Samples 25¢ deductible. Box 1684, Scottsdale, Arizona (formerly Joliet, Illinois).

QSLS-SMS. Samples 10¢. Malco Press, Box 375 M.O., Toledo 1, Ohio 43601.

DELUXE QSLS. Petty, W2HAZ, P.O. Box 5237, Trenton, N.J. 08638. Samples, 10¢.

QSLS. See our new "Eye-Binder" cards. Extra high visibility. Samples 25¢. Dick, W8VXK, 1994 N. M.-18, Gladwin, Mich.

QSLS, SWLs XYL-OMs (sample assortment approximately 9¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fatabulous. DX-attracting, prototypal, snazy, unparagoned cards (Wow!). Rogers KØAAB, 961 Arcade St., St. Paul 6, Minn.

DISCONTINUING QSL Printing. Prices reduced to use up remaining card stocks. Send for samples, prices. Gariepy, 2624 Kroemer Road, Fort Wayne, Indiana.

CREATIVE QSL Cards—25¢ for catalog, samples, 50¢ coupon. Personal attention given. Wilkins Printing, Box 787-1, Atascadero, Calif. 83422

QSLS, 100 for $3.00, 28 new drawings. Samples 10¢. Brigham, Colston St., North Billerica, Mass.

QSL, SWL, cards that are different. Quality card stock, Samples 10¢. Home Print, 2416 Elmo Ave., Hamilton, Ohio.

QSLS Distinctive samples dime. Volpress, Box 133, Farmingdale, N.Y.

DON'T Buy QSLS until you see my free samples. Bolles, W5OWC, Box 9363, Austin, Texas.

QSL, SWLS, WPE, Samples 10¢ in adv. Nicholas & Son Printery, P.O. Box 11184, Phoenix 17, Ariz.

QSLS. 18 sharp samples, 10¢. Filmcrafters, Box 304, Martins Ferry, Ohio.

PICTURE Of yourself, home, equipment, etc. on QSL cards made from your photograph. 250, $7.50 or 1000, $14.99 ppd. Samples free. Write to Picture Cards, 129 Copeland Ave., La-Crosse, Wis. 54603.

ZIP Code Rubber Stamp. Call, name, address, with ink pad. $1.00. K4ISA, Perry, Box 8080, Allandale, Fla.

SUPERIOR QSLs, samples 10¢. Ham Specialties, Box 73, Hobbs, New Mexico (formerly Bellaire, Texas).

QSLS. Samples 25¢. Rubber stamps: name, call and address $1.55. Harry Sims, 3227 Missouri Ave., St. Louis, Mo. 63118.

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.

QSLS Kromekote 2 & 3 colors, attractive, distinctive, different. Free ball point pen with order. Samples 15¢. Agent for Call-D-Cal decals K2VOB Press, 31 Argyle Terrace, Irvington, N.J.

QSLS $2.50 per 100. Free samples and catalog. Garth, Box 51Q, Jutland, N.J.

3-D QSL Cards have that prestige look, with glittering colors and metallics in raised space-age designs fused to brilliant plastic finishes. Cost so little more than mere mediocrity! Samples 25¢ (refundable). 3-D QSL Co., Monson 2, Mass.

QSL Specialists. Distinctive Samples, 15¢. DRJ Studios, 2114 N. Lavrgene Ave., Chicago, Illinois. 60639.

QSLS-100 3-color glossy $3.00; silver globe on front, report form on back. Free samples. Rusprint, Box 7575, Kansas City, Mo. 64116.

AT Last! Something new in QSL cards! All original designs. Send 25¢ for samples to Yarsco, Box 307, Yorktown Heights 1, N.Y.

CUSTOMIZED QSLS with your autographed photo. Dime brings sample. Pic-Ur-QSLs, Rice Lane, Baltimore, Maryland, 21207.

RUBBER STAMPS $1.00. Call and address. Clint's Radio W2UDO, 32 Cumberland Ave., Verona, N.J.

QSLS New cartoons. Top quality, fast service. Samples 20¢. Ed's Press, 3232 Le Moyne, Chicago, Ill. 60651.

QSLS, Gorgeous rainbows, cartoons, etc. Top quality! Low prices! Samples 10¢ refundable, Joe Harms, WA4FJE, W2JME Edgewater, Fla. 32032.

QSLS, Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

QSL Cards: free samples, catalog 20¢. Knight Printing Co., 1550 Downey, Indianapolis, Ind.

3-LINE Rubber stamp or 1000 address labels, Only $1.00. Betty Harms, W1JWW, Mystery Hill, No. Salem, N.H.

ATTRACTIVE QSLS: Guaranteed largest variety of individual samples (25¢ deductible). Paul Levin, K2MTT, 1033 Utica Ave., Brooklyn, N.Y. 11203.

QSLS. Large selection, including photos, rainbows, glossy stocks, cuts, etc. Fast service. Samples, dime. Ray, K7HLR, Box 1176, Twin Falls, Idaho, 83301.

QSLS. Twenty exclusive designs in 3 colors. Rush $3.00 for 100 or $5.00 for 200 and get surprise of your life. 48-hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

"GOLDEN Call" QSLS (Only QSL) crafted by Samco for 1965. Samples 10¢. Samco, Box 203, Wynantskill, N.Y. 12198.

QSLS: Quality with service. Samples free. R. A. Larson Press, Box 45, Fairport, N.Y.

PLASTIC Holder frames and displays 20 QSL cards, 3 for $1.00 or 10 for $3.00. Prepaid Tepabco, Box 198, Gallatin, Tenn.

QSLS. Large selection, including photos, rainbows, glossy stocks, cuts, etc., fast service. Samples dime. Ray, K7HLR, Box 1176, Twin Falls, Idaho 83301.

QSLS. 18 samples 10¢. Filmcrafters, Box 34, Martins Ferry, Ohio.

QSLS, SWLs, 2 and 3 colors, 100 $2.00, samples dime. Bob Garra, Lehighton, Penna.

QSLS. Free samples, fast service, customized cards. W7IIZ Press, Box 183, Springfield, Oregon.

"GOLDEN Call" QSLS (Only QSL) crafted by Samco for 1965. Sample 10¢, "Compare if you care". Samcot, Box 203, Wynantskill, N.Y. 12198.

QSLS, YLRL specials, QMs, engraved badges, reasonable, samples 10¢. W2DJH Press, 31 Warren St., Warrensburg, N.Y. 12885.

QSLS. WA6QAY Press, Box 17112, San Diego, Calif. 92117.

DX-QSL. The original plastic display for your cards. Holds twenty cards, 3 for $1.00. Ten for $3.00. Satisfaction guaranteed. Dealers' inquiries invited. DX-QSL, Box 19033, Houston, Texas 77024.

CANADIANS! Sell, exchange Invader 2000, Valiant, R-390 rcvr, Tapetone rcvr, TBS50D, BC375E, 696A, APR-4, ART-13, Edison cylinder gramaphone, Atwater-Kent antique, G4ZU antenna, many others, parts, etc. VE3BVX, 11 Sussex N., Lindsay, Ont., Canada.

CANADIANS: Receiver GR-17 (RCA AR88LF), $150.00; AN/URC4 transceiver, $25.00; No. 19 wireless set AC power supply, $20.00; 1154 transmitter, $20; 1000 kc. xtal, $2.00; projection lens B&H 2" f 1.6, $15.00; Link transmitter chassis 25UFM FD2, $10.00; tubes 813, $4.00, 829, $5.00. C. Gutman, 7526 Mountbatten Rd., Cote St. Luc, Montreal 29, Que. Canada.

FOR Sale cheap QSTs or COs, any quantity. Send your list for quotation. Cash for Callbooks before 1942. Want early radio gear and publications. Erv Rasmussen, Box 612, Redwood City, Calif.

RANGER I, $125.00, in excint condx, with Shure microphone and manual. James Taylor, 167 Silverbirch Ave., Toronto, Canada.

WANTED: Collins SC-101 station control for KWS-1/75A-4. State condx and best cash price. Aaron D. Solomon, VE1OC, 8 Crichton Park Road, Dartmouth Nova Scotia, Canada.

CASH For Your Gear. We buy sell and trade. Send for free bargain list. H & H Electronic Supply, 506 Kishwaukee St., Rockford, Ill.

WANTED: FR-2409 bandpass filter. State price. Pete Chamalian, W1BGD, 111 Buena Vista Road, West Hartford, Conn. 06107.

DXER Beware: A real bomb. York 5000 transmitter, 1 kw. using 4-1000A, bridge power supply, vacuum tuning condenser. Size 33" wide, 24" deep 6 ft high. Further details. Bill Brown, WØSYK, 28 Marine Lane, Hazelwood, Mo. Tel.: HEmpstead 4-5440.

CASH For Callbooks, U.S. Government Amateur Callbooks wanted. W8EF, 801 Lakeshore, Grosse Pointe 36, Mich.

CASH, Sony Transistor TVs, etc., swapped for G-R, H-P, L&N, etc. equipment, special tubes, manuals, military electronics. Engineering Associates, 434A Patterson Rd., Dayton, Ohio 45419.

HAM Discount House. Latest amateur equipment. Factory-sealed cartons. Send self-addressed stamped envelope for lowest quotation on your needs. HDH Sales Co., 170 Lockwood Ave., Stamford, Conn.

RTTY Gear for sale. Write for list. 88 or 44 mhy toroids, five for $1.75 ppd. Elliott Buchanan, W6VPC, 1067 Mandana Blvd., Oakland, Calif. 94610.

TELETYPE Machines, converters, R-388, R-390, R-390A receivers, mechanical filters for R-390A (455 IF). Alltronics-Howard Co., Box 19, Boston, Mass. 02101. Tel: 617-742-0048.

TUBES, Diodes, transistors wanted. High cash prices paid. Astral Electronics, Box 636, Elizabeth, N.J. Tel: 354-3141.

WANTED: Commercial or military, airborne or ground. Equipment and test sets. Collins, Bendix, others. We pay freight. RITCO, Box 156, Annandale, Va.

PARALLEL (2) 4-125As KW amplifier with all power supplies. CW and SSB with your xciter, $80. W9KXZ. 465 S. Edward, Decatur, Ill.

HALLICRAFTERS HT-33B 2KW final, mint condx, but needs final tube: $400. W2WCO, R. Streeter, 9 Popular Pl., Fanwood, N.J.

COLLINS: KWM-2 with Q-mult., 516-2 p/s, mobile mount, New-Tronics resonators, 10-80 M, Mike, mint condx, $900 or your best. R. Young, 4500 Conn. Ave., N.W. Washington, D.C. 20008.

BOOST Reception: 3.5-30 megacycle SK-20 Preselector kit, $18.98. Boost modulation AAA-1 clipper-filter kit, $10.99. Reduce noise: NI-7 Noiseiector, IF, wired, $4.49. Postpaid! Literature free. Holstrom Associates, Box 8640-T, Sacramento, Calif. 95822.

ADVENTURER, $20.00; Bill Rotecki, 19 W. 056 Rochdale, Lombard, Ill.

COLLINS 75A-4 owners! Don't trade up! Investigate our conversion that makes the 75A-4 a dream. Stankus, W2VCZ, 30 Pitcairn Ave., Ho-Ho-Kus, N.J.

SELL: 4X250B tubes. New condx. $6.50 each, $10.00 pair. Send check or money order. Will ship parcelpost prepaid in U.S.A. Everett Stidham, Jr., W5JLQ, 722 South 30th, Muskogee, Okla.

4-1000A linear shielded, metered, 3600 V, 1A supply, $375; PP-813 linear 1 KW DC continuous, $135; 75A-4, $400; GC1A, $80. Perera, K2DCY, 410 Riverside Dr., NYC, N.Y.

DRAKE TR-3, with AC-3 p/s, and RV-3 remote VFO in a like-new condx: $550.00. Mini-Products B-24 Mini-beam with rotator, in excint condx, $50. Arthur Zojot, W1SKQ, 82 Rockaway Ave., Marblehead, Mass.

WANTED: Aermotor tower with flat-top or similar tower. Will pick up. Also Courier. WA8AHG.

BUILDING? Fast service from the center of the nation! Bud, LMB, Triplett, Johnson, National and Air-Dux components, plus others. Electronics, Inc., 227 North Santa Fe, Salina, Kans.

WANTED: Hallicrafters S-37 in gud condx. State price and condx. WN9DZK, Don Peterson, 7900 LeClaire, Oak Lawn, Ill. 60459.

HALLICRAFTERS SX-101A with R-47 spkr, like new; Collins 32V2; TA-33-Jr; Heath HG-10 VFO. Make reasonable offers. Stu Ames, K3MZZ, 6909 Brook Mill Rd., Baltimore, Md. 21215.

FREE National NC-190 with Purchase of $150.00 xtal calibrator. Neidich, 65 Polk, Northport, N.Y. 11731.

FOR Sale: Clegg Venus w/A.C. supply, in mint condx: $460.00 or your best offer. Hallicrafters, excint, SR-150 w/A.C. Supply, $500.00. Estate of K3IHD. Will ship prepaid in original cartons upon receipt of certified check. Dave Miller, K3GMV, Eugene Drive, Harve de Grace, Md.

TELETYPE, Model 15, in excint condx, cleaned up, reworked. Won't ship, sry. Steve Aug, K2EOF, 275 Prospect St., East Orange, N.J.

10B, all coils, QT-1. Excellent condx: $80.00. K8HJI.

SR-150 Hallic. transceiver with AC supply. D-104 mike in excint condx. Sell for $425.00. K1CJW, 601 Textile Ave., Lowell, Mass. 4582125.

1 Collins 32S1 transmitter, $425.00; 1 Collins 75S-1 receiver, $300.00; 1 HM-11 reflected power meter, $20.00; 1-3000 volt variable power supply 275 lbs., $100.00; 1-1000-A 2 Kw. P.E.P. R.F. power amplifier, $200.00: 1 Mosley Towermaster, 40 ft. crank-up heavy-duty, guyed design tower with epoxy resin and white painted surface including CDR—AR-22 rotator and control unit, $225.00: 1-20 M. beam antenna with no sag 3-element 2" diameter wide spaced 30-ft. 3" diameter no sag boom; commercially built and light in weight (only 56 lbs.). Your neighborhood will be proud of its no-sag appearance, $150.00. J. D. Riggs, W7HAD, 135 Elm St., Bremerton, Washington. Tel: ES-8-8135.

VARIACS and other hi-power components. SASE list. Want: HQ-100. WA6YMY.

WANTED: Instruction manual for Model 324. Dumont oscilloscope. W6EH.

NATIONAL 183-D and speaker, in perf. condx, best offer over $125.00. QSTs, 1953 through 1964, make an offer. Will deliver within 200 miles of QTH. J. Herb, W3SHP, 123 S. Market, Selinsgrove, Penna. Tel: 717-374-0362.

COLLINS 75A-4, spkr and 2 xtals, Viking II, VFO, homebrew 400-W. linear, Johnson Matchbox. All for $600. W2IRV, Mario Cera, 47 East Bayview St., Massapequa, L.I., N.Y. 11759. Tel: 516-PY8-1694.

JOHNSON Ranger, $119.00: Vibroplex DeLuxe Original, $19.00; HRO-60. Best offer. E. Vogele, 136 Crowell St., Hempstead, N.Y. Tel: 516-IV3-9743.

SELL: SX-117 HA-10 tuner, extra xtals; five months old: $360.00. Ben Hassell, W8VPC, 4046 South Hagadorn, Okemos, Mich.

FREE! Blue Book List. Leo has over 1,000 bargains in used gear. KWM-2, $675; Galaxy 300, $215.10; Viking 500, $350.10; NCL-2000, $485.00; SX-101A, $229.50; Collins 62S-1, $625.00; King 500A, $259.00; SB-400, $299.95; SX-117, $260.10; Drake 2A, $189.00. Many more. Free 1965 catalog. We will pay cash or trade on popular, clean, unmodified amateur gear. World Radio Labs, Box 919, Council Bluffs, Iowa.

FOR Sale: Collins 75A-2, $160.00; National NC-183D, $100; Johnson Ranger I, $60.00. This gear requires minor repairs but is clean. We box, you pay shipping. WØEBE Memorial, Southwest Missouri Amateur Radio Club, Inc. P. O. Box 291, Springfield, Mo. 65801.

FOR Sale: SX-96 with speaker. First certified check for $110.00 gets it. Express collect. Al Nickel, WAØMOG, 2508 Meadow Lane, Topeka, Kansas.

COLLINS 75A-4 800 cycle filter, $45.00. Wanted: Calibrated output signal generator, Bird Wattmeter, Lampkin 105-B, H-14, Ballatine VTVM, W8RMH, 1910 Longpoint, Pontiac, Michigan.

BEST Deal you will find. First certified check takes TR-3, AC-3, RV-3, used just three months. Comes with 7 day guarantee. ppd in U.S.A. $400. Also a pair of 813s in homebrew G.G., same guarantee, with 3B28 rects. Picture on request: $150.00. WA4ACJ, D. Freeland, 2729 Robin Hood Dr., Greensboro, N.C.

COLLINS 32V-3, in mint condx, low-pass filter, Ohmite dummy antenna, new Dow-Key coax antenna relay, extra set tubes, microphone, instruction book, balun. Will not ship, cash and carry, $300: Johnson Matchbox 250-23, $30.00. 75A-4 with instruction book, in mint condx, w/spkr; 24-hr electric clock, B&W coax antenna switch and SWR meter mounted on grill of speaker, reflectometer. One owner only. Three mechanical filters, 800 cycle, 6 Kc., 3 kc. Extra set tubes. Vernier dial. Cash and carry deal. Price: $500. Joseph Mullen, 101 Ferncliff Dr., Williamsburg, Va. Phone 229-6071.

JOHNSON 500, HQ-170-C, BC-221-Q, with original calibration book. All in excint condx. Make offer. William Boring, W7-YQI, 2103 N.E. 142nd, Portland, Oregon 97230.

HANGING 'Em up. Complete Collins station for sale: 75S-3, 32S-3, 30L-1, 312 B-4, 516F-2. All rack-mounted in Collins rack mounts, on 6ft in. Bud Deluxe relay rack with Trans-Aire blower mounted in top. Complete KW station, will roll right in closet. Not just good, but the best. A $2400 value! Best offer over $1800 f.o.b. Also KWM-2, MP-1, PM-2, CC-2, 351D-2, $1050. J .B. Holmes, Jr., P.O. Box 36146, Houston, Texas 77036.

FOR Sale: Viking Ranger II, $195.00. WB2ADW, 17 Fleetwood Ave., Spring Valley, N.Y. 10977, Tel: 914-E16-3489.

COLLINS 75A-3, $245.00; 312 B-4 speaker and assembly, console, $90.00; all in top condx. Cecil White, W5LVF, 1601 Dragon St., Dallas, Texas.

MOVING! Must sell all good ham gear. Write for details. WA2YQC, 111 Albernaty, Liverpool, N.Y.

LIQUIDATING Estate. NCL-2000 linear, new, in original packing, with guarantee card. $475.00. W2VH, 25 Upland Dr., Chappaqua, N.Y.

THEORY Test. Refresher for Technician, General exam. Your work corrected by licensed instructor and returned with comments. $3.00. Schoening, 10040 Brookside, Bloomington, Minn. 55431.

VIDEO Tape recorder for sale. Wesgrove VKR-500, ¼ in. tape, factory assembled $395. WB6ENY, P.O. Box 27881, Los Angeles, Calif. 90027.

COUNTRY Ham-Shack special, 500.000 Kc. crystal—FT243 holder, $1.00 ppd. W2RAA, Box 200, West Monroe, N.Y.

KWM-2 with 516F-2 power supply, in excint condx. $750. Hunter Bandit 2000A linear, $325.00; 60-ft. steel crank-up tower, $80.00; Mosley TA-33 beam, $60.00. J. R. Conant, W1ADQ, 19 Circle Dr., Middletown, R.I. Tel: 847-1513.

HAM Equipment: IG-102 RF generator; HD-11 Q-multiplier, GD-1 grid dipper; TE-29 xtal calibrator; TM-14 RF indicator; HFT-90 FM tuner. Make offer. Any part or all! K3SJZ, 4620 W. Barlind Dr., Pittsburgh, Penna. 15227.

G-76 with DC supply, $210.00. WA4VDN, 409 Court, Edenton, N.Carolina.

HEATH HX-30 6M SSB-AM-CW xmtr, $175.00; HA-20 6M linear, $90.00; Hammarlund HQ-170AC rcvr, $270.00; Johnson 250-39 TR switch, $15.00; ATCO Min-keyer Mod. 10A with tapes, $27.00; Gardiner Type S automatic sender with tapes, $19.00. All in little-used condx, excint. Will ship to first sender of payment for any item. Osgood, K1WZJ, Box 413, Windsor, Vt.

SALE: SB-300, new, $300. Will wire any kit reasonably, radio, hi-fi, etc. (20 year Navy experience, retired). Will repair any of your gear. Lan Richter, 131 Florence Dr., Harrisburg, Penna.

HG-303 Globe Transmitter and matching V-10 VFO, 80-10 mtrs. In excint condx, in original cartons. Best offer over $35.00 each. Tom Benewicz, WA2OBT, 11 Montrose, Allendale, N.J.

VIBROPLEX Bug (semi-automatic key) in real gud condx, only $11.75. W4SHL.

WANTED: One each, McCoy 9 MC, Collins 3.1 Kc filters. For sale: Excellent ARN-6 receivers 100-1750 Kc in 4 bands, $20.00. Olean, Rte. 111, Monroe, Conn.

SELLING: Eico 720, $40.00; Laf HE-56 6 meter conv., $20.00; commercial vidicon camera, $175.00, or your best offers. WB2OOK, 1129 Astor Ave., Bronx, N.Y.

SALE: All in excellent condx: 75A-4 #3006 3.1 manual, $425.00; HT-32B, late model, manual, $475.00; 75A4, #1632, 4.0, 3.1, 2.0, manual, $475.00; Tribander Hornet TB500, $35.00. Also some RTTY equipment. Model 15 printer with 60 wpm gears. Write for list on RTTY. All shipped prepaid. Hugh Langston, WA5CSI, General Delivery, Youngsville, La.

FOR Sale: Package, SR-160, AC and DC power supplies, band spanner ant. Cry. cal., PTT mic, used less than year: $350.00. Heath HO-13 Ham-Scan, $50.00. BC-221 with power supply and mod. original calibration book, $50.00. John S. Hollar, P.O. Box 966, Harrisburg, Penna.

SELLING Out: Tremendous bargains on equipment, tubes, parts. Stamp for list. W3CNS, Box 1, Rheems, Penna.

GONSET 2 Mtr. Sidewinder, in excint condx, $300.00. Also Gonset VHF 2 mtr. linear amplifier with spare 826 tubes, $100. Like new condx. Eico grid-dip meter $20.00. W2OQO, Joe Calvanico, 2951 Pearsall Ave., Bronx, N.Y. 10469. Tel: 212-OL-2-7376.

FOR Sale: Heathkit Marauder transmitter, $275.00; Mohawk receiver, $120.00; Warrior linear, $160.00. All equipment is in excint condx, professionally wired, used vy little. Will ship. Richard A. Hoppe, 139 No. Center, Plainfield, Ind.

SELL: HT-32, $295.00; TB-1000, $45.00; SX-62A, $190.00; 8 bamboo poles, $5.00; CDR rotor, $20.00. Parts for 4-400A linear, $300.00 NC-60 receiver, $25.00 RFD 66 direction finder, $10.00; HC-10 SSB converter, $75.00. Elenco speech compressor, $25. Joe, K9VAR, 1851 North Rutherford, Chicago, Ill. Tel: TU-9-7703.

COLLINS MP-1 DC supply, new condx, in factory packing. $135.00. K4ACJ.

WANT National XCU-27 xtal calibrator, in mint condx, reasonable. W7MKW 205 S.W. 102nd, Seattle, Wash. 98146.

COMPLETE Heath mobile/fixed AM/CW station. Cheyenne transmitter, Comanche receiver, Heath p/s, excint condx. Recently aligned. With mic, sokr, manuals, cables. Entire station for $125.00. WB2KDB, 351 Howe Ave., Passaic, N.J.

"CLIFF Dweller", 40/75 rotatable dipole. New, assembled, tested, never used. Take away for $85.00. A .E. Pearce, 222 Martling Ave., Tarrytown, N.Y.

DRAKE 2B, 2BQ, 2AC, bargain, complete, only $185.00. K2EGI.

FOR Sale: Collins 75A-4 receiver, three filters. $450.00. W7KV.

PARABOLIC dish ant., 10 ft. dia. Sell cheap or will trade. In excint condx. K9QYD, Box 19, Bismarck, N.D.

HQ-170C and speaker, $250.00; DX-60, $40.00; Eico 722 VFO, $30.00. Leland Kappel, 62 Crane, New Orleans, La.

DRAKE R4 receiver, $295.00; Collins 310-B with bandswitch 6146 final, $50.00; Elmac PMR8 and DC supply, $75.00; Electro-Voice 664 mike, $25.00; Vichter Transtenna 101, $20.00. Globe Vox 10, $10.00. Philip Schwebler, W9GCG, 4536 N 50 St., Milwaukee 18, Wis.

NEW 75A-4, new 75A-3, new 75A-2. This is no misprint! Each unit was carefully cleaned and factory-sealed in a heavy Plexiglass case with the cabinet removed. Each unit has attached the original final inspection OK ticket No. 1. This is no doubt the only "mint set" of amateur radio's most famous receivers that will ever be released. I will provide a copy of my invoice to prove origin of each model #1. Will take bids separately and as set to sell to highest bidder. R. E. Mann, 7205 Center Dr., Des Moines, Iowa.

DRAKE TR-3, $350.00; DC supply, $60.00; take both for $400.00. In immaculate condx. Perfect wkg. order. Also Eico 720 transmitter, $30.00. Heath HG-10 VFO; $15.00. Eric Jeltrup, Crystal Brook Park, Mt. Sinai, N.Y.

COLLINS KWS-1, $700; S1J4, $500.00. K5ELK, 1630 South Columbia, Tulsa, Oklahoma. A.C. 918-WE-6-2943.

FOR Sale: SX-96, $125.00; Valiant, $175.00; Communicator III 6m, $150.00; 5 kw, gasoline-generator, $250.00; Variacs 1.8 kca, $30.00; 2.4 kva, $38.00; Hammond organ amplifier, $85; set HDVL 10-160 with jackbar/link, $25.00; 304TLs: 4 new, $20.00 each; 2 used, $5.00 each. Pair 70TAs, new, $10.00; pair 4E27As, new, $30.00 pair, 4E27A used, $10.00; pair of plate xfrmrs, 2680 vct at 700 ma., $25.00 each. B&W CX40 butterfly, $20.00. Other tubes, xfrmrs. W8MTI, Box 68, Onondaga, Michigan 49264.

FOR Sale: Three complete stations. Cheyenne with HP-20 and Hallicrafters SX-140, or HW-12 transceiver with HP-10 and HP-20 or, Marauder with Drake 2B and 2BQ. Also have Eldjco keyer, Johnson TR switch, mobile tuning meter. Write for details. Pappy, W5HNF, Box N, Hamlin, Texas.

SALE Or trade: Scout DeLuxe 90-watt 6 thru 80 meter transmitter and V-10 matching VFO in perf. condx, $80.00. Or will trade in on Shawnee or other 6-meter transceiver. Richard Hennis, 3912 Cedar St., North Little Rock, Arkansas.

SELL: Estate of W5BQ. B&W 5100-B with SSB generator, $175.00; Collins 75A-4, 3 mechanical filters, $350.00; Loudenboomer with power supply, $300.00. F.o.b. Monroe, Louisiana, Mrs. W. L. Anspach, 4910 Bon Air Drive.

SELL: Hallicrafters SX-62 Run 2. In excint condx. Property of SWL. Used infrequently. $200 or best offer. You pay shipping. All offers answered. Scowcroft, W9HVK/1, Hearthstone Dr., Riverside, Conn. 06878.

BEST Offer takes Apache, SB-10, NC-183-D, C.E. slicer; Johnson T-R switch L-N freq. with calibr. book; QSTs since 1934. Antique Radio. H. H. Heinrich, W9KPG, New London, Wis.

HT-32A, $310.00; HQ-170C, $210.00; both in like-new condx for $490.00 F.o.b. Jorge A. Lugo, WA2DDV, 464 Fulton St., Farmingdale, N.Y. Tel: 516-249-6671.

WANTED: SBE linear (old model SB1-LA). Richard Kane, W3NAG, 410 Glenway Road, Philadelphia, Penna. 19118.

SELLING Out: DX-60, H9-10 VFO, SX-111, all in mint condx, $200. K3NSL/9, 104 Sunset Place, Lake Bluff, Ill.

COLLINS KWM-2 put on air new in December of 1964. Serial No. 13899; 516-F2 A.C. supply older than KWM-2 with 24 hour clock, $775.00. 30-L1 linear amplifier purchased with KWM-2 serial no. 15079, $365.00. M.O. or certified check. Tel: CE 2-5206. L. H. Gregory, 111 Coleman Court, Greenville, S.C. 29609.

NOVICE Station: Eico 723, Hallicrafters S-38C receiver, 18V antenna, antenna relay, six crystals. Whole rig or any part to the highest bidder. WN4UQZ, Michael Macy, Route #4, Clarksville, Tenn.

COMPLETE Station: SX-99 rcvr, DX-60 xmtr, antenna tuner, xtal calibr., 15M dipole, CPO, key, xtals, c.w. filter, KM-52, 1M-11 VTVM, misc. books es magazines, plus defective Q-multiplier es SWR mntr. $200.00. WN1CMG, 188-Tower Hill Rd., Osterville, Mass. 02655.

FOR Sale: HQ-170C, $200; Apache with SB-10, $250.00. All in xcint condx. John Green, W5MOG, 4929 Forest Lane, Dallas, Texas.

APACHE, in excellent condition, some spare tubes: $145.00, plus shipping. W2YNR.

HALLICRAFTERS S-108 for sale; barely used. Goes to best offer. Send offer to H. Leuchtman, 338 East 19th St., New York 3, N.Y. Call: 212-GR-5-5994.

FOR Sale: NC-270. Used about 30 hours. Best offer over $150.00. Will ship collect. Lyn Pratt, 441 Prospect St., Wethersfield, Conn.

COMPLETE Mobile/Fixed station for $490. In excint condx; less than one year old. Drake TR-3 with DC-3 and AC-3 power supplies, MS-3 speaker, SWR bridge, all accessories and Hustler mobile antenna. Barry M. Prentice, WA6COK, HQ. 705th Mnt. Bn. Ft. Carson, Colorado.

NCX-3 w/a.c. supply, $275; Signal Corps Mod. TV-7 B/U tube-tester, $75; Automatic Keyer, $30. All in excellent condx. WA2-LIM. Tel: 212-461-1779.

WANT: Two SP-600JX-17 receivers, set up for diversity/master oscillator operation. Shepherdheim, 99 Water, Millinocket, Me.

MUST Sell: College expenses. FW Valiant, $195.00, like new condx. I guarantee this extra clean. FW DX-100, perf., $115.00; SX-99 rcvr, $90. My equipment is in excint condx. Offers acknowledged. WA4CUI, 649 So. Center, Thomaston, Ga.

SELL: Perfect NCX-3, NCX-A, $350.00 or will swap for Drake 2B plus difference. Taubin, W2GCW, 36-25 Parsons Blvd., Flushing, L.I. 54, N.Y.

R391 receiver for sale: $795.00. Cash. E. Cheslow, 895 E. 54 St., Brooklyn, N.Y. 11234.

HOFFMAN Laboratories 201 receiver diagram or manual wanted. Write, giving price. Al Weed, Jr., 330 Harwood Ave., Satellite Beach, Fla. 32937.

WANTED: Manual for TS-64/MPN-1 oscilloscope. Jon, K8HTP, 505 E. Hoover, Ann Arbor, Mich.

SELL Hallicrafters HT-41 K.W. amplifier, $200.00 cash and carry. P. C. Elliott, K2HB, 18 Willets Lane, Plandome, L.I., N.Y. Tel: 516-MA-7-1211.

ATTN: 160 meter hams: Hallicrafters HT-20, 160 thru 10, 150W, unmodified, perfect, (2) extra final tubes, $150.00 plus shipping. Earl Kelsey, W9JDW, RR 1, Box 206, Losantville, Ind. 47354.

WANTED: Johnson KW Matchbox with SWR. W4IG, 1401 Hancock Ave., Alexandria, Va. Phone 703-549-8521.

WANTED: Hallicrafters HT-37. State condition es year. Quote price local area. WA2IZU, 18 Elm Road, Pompton Plains, N.J. Fone 835-3804.

R & K Model 500 tube-tester, $35.00; BC-221Q freq. meter with mod., original calibr.book, AC p/s, $95.00; Elmac PMR-6 mobile rcvr 500 to 30 Mc, with DC supply, $45.00; Gonset mobile converter, 3-14 Mc, $15.00. Gonset noise-clipper, $5.00. All are in xclnt condx. Ross Macaluso, W2CHM, 1716 Rue Mirador, Pt. Pleasant, N.J. 08743.

MUST Sell Anache transmitter. Professionally wired. In top condx. Best offer over $150.00. K9OMO, Easton, 1714 Asbury, Evanston, Illinois.

TELEVISION Camera, Dage model 103B. Compact studio vidicon camera with viewfinder and rack focusing. In gud condx, with manual: $195.00. Model 102, RF output also, $225.00. K4GYO, 430 Island Beach, Merritt Island, Fla.

WANTED: Heathkit SB-10 Sideband adapter. Also Heath HO-10 monitor 'scope. Dick Van Hooft, WB2MBI, 57 Fuller Road, Albany, N.Y. 12203.

COLLEGE Bound: Clegg 99'er in perfect shape, worked 30 states, $90.00. Telrex 3-el. beam and 100 ft. of polyfoam coax, $15. Alliance rotor, $10. Take all for $110.00. WB2DRE.

EICO: Grid dip, used once, $25.00. J. Bright, 131 Nugent St., New Hyde Park, L.I., Tel: FL 2-0088.

SELLING Out: Collins 32S3, 516F-2,75S3, 75A4 late ser., C-E 600L, Eldico 100-F keyer and many other items. Stamp for list. W9IQW, 930 Second St., Port Edwards, Wis.

SELL, swap: Globe Scout 65A xmtr, $50.00; VF-1 Health VFO, $12.00; Heath stereo hi-fi preamp, SP-2, $35. All $80 or swap for 'scope, signal generator. C. F. Jackson, K2JWB, Samsonville, N.Y.

RETIRING To smaller QTH. For sale: Not up-to-date but all in gud shape and working: Lysco 600 transmitter and 400 modulator, mike, Hallicrafters Skyrider 23 and Hallicrafters S-20R, 10-in. Collins spkr, Elmac AF-67, mike, Gonset G-66 receiver and power supply, battery-operated Grebe superhet receiver, Atwater-Kent tuner, Variometer, det. 2-stage amplifier units. QST run: complete 1943 to 1946, also 1949, 1950; CQ March 1947 to July 1960; large variety of components and tubes, other magazines, etc. Local deal preferred. Asking $300, including unlisted material. Inspection welcomed. Tel: Webster 9-0356, 73 Uhlandt St., East Rutherford, N.J. Vitale, W2UZC.

KWM-2, 516F-2 power supply with speaker; Waters Q-multiplier, incremental tuning, never mobile, superior condx: $825. W2OZQ, Chapel Gate Lane, Glen Head, L.I. N.Y. Tel: (Days) 516-MA-7-3336; (Evenings) 516-MA-6-1099.

DRAKE 2-B. 2BQ; 2AC, $200; HT-37, $260.00, in mint condx. Cartons, manuals. WA2KHV, Steve, 408 Bradford St., Brooklyn, N.Y. Tel: DI-5-3040.

SELL: $50: LPA1 KW linear and LPS1 power supply, brand new, never used. L. J. Maggora, 575 Pierce St., San Francisco, Calif.

SELLING excess gear and components: SX-101A with R-48 speaker, in xclnt condx, $195.00; Super Pro with p/s, $75.00; Bolex B8L camera with 8-40mm pan Cinor zoom lens (trade?) case and accessories (worth $175); fixed and variable vacuum capacitors to 450 pf and 40 kv., coils and large coil forms, insulators, power supplies, capacitors, transformers, tubes, etc. Send for list. Need: S/Line gear, Panadaptor, 60 ft. tower, rotator. A. J. Geia, K5UNX, 3249 Southwestern, Dallas, Texas, 75225.

INSTRUCTOGRAPH wanted. Also want Ham-M rotor and 3-element Triband beam for a Kw. WA0IUF, 308 North Park, Independence, Kans.

SPECIAL While the supply lasts: Brand new Hallicrafters SR-150 transceivers, $395.00; P-150 AC supply, $79.00; P-150 DC supply, $79.00. Large stock new and reconditioned equipment. Write for lists. Henry Radio, Butler, Mo.

COLLINS 75A-4, No. 2076, $379; KWM-1, expanded 40-20-15-10, AC supply, $350.00; noise-blanker, $60.00; Adcom DC supply, $350.00; noise-blanker, $60.00; Adcom DC supply, $75.00; C-E 100V silicon rectifiers, $379; Johnson Super Thunderbolt 3000V, $279.00. F.o.b. K6GHU, 762 Juanita, Santa Barbara, Calif.

FOR Sale: Heath Warrior HA-10 linear amplifier, $165.00. Also Heath Marauder, HX-10, $265.00. Both factory wired and in exclnt condx. Thordarson plate transformer 3000 VDC 650 Ma. CHT series 15P21. Have Don Chesser's DX Bulletins No. 23 to 213 inclusive. A. Martinka, 3723 Magnolia Ave., Chicago, Ill. 60613.

PEIRSON KE-93, Ham, B.C., Marine bands, 6,12,115 volts, cost $345.00. Will sell for $135.00. DX-40 and VF-1, phone and c.w., $55.00. K9HDP, 6380 N. Park, Indianapolis, Ind. Tel: CL 1-4621.

RANGER II, FW, PTT, $200.00. Throw in coax relay, Johnson bug, HQ-170 AC, $250.00. Throw in speaker, 6 meter preamp. Everything in mint condx. F. S. Eggert, 11833 Wisconsin, Detroit, Mich. 48204.

WANTED: A copy of "Sim Barton, Girl Radio Operator" by Helen Cloutier. David R. Russell, 2 Vine Lane, Berkeley, Calif. 94708.

SELL: Heath HW-32, $100; HP-13, $47.00; VFO HG-10, $25.00; SB-10, $60; Telco SB-50 six meter transverter, $80; Kleinschmidt TT-4G, $75.00. F.o.b. Joseph Sever, 27 High St., Carbondale, Penna.

NOVICES. Hallicrafters HT-40 xmtr, Knight Star Roamer rcvr, and Heath HD-11: Q-multiplier, $90.00. All in gud condx. Shipped RR xpres collect. WA4URA, Rte. 4, Clarksville, Tenn.

FOR Sale: Viking 500 with TVI filter. In exclnt condx $325.00. Richard North, WA6EEJ, 18253 Swarthmore Dr., Saratoga, Calif. 95070.

TEKTRONIX 511A oscilloscope, $275; ship REA. Vibroplex Lightning Bug, $16.00; Hallicrafters R-47 speaker, $11.00. WB2-RVL, Pomeranz, 36 Lawrence St., New Hyde Park, L.I., N.Y. Tel: 516-FL-4-4674.

COLLECTORS item! National SW-3 in exclnt condx. Vy gud condx. HQ-129X, schematic, matching spkr. Will ship. Write: Coan, WB6NNJ, 835 Alta Vista Dr., Barstow, Calif.

MCINTOSH MR-71 tuner. Want SBE SB-34. Consider receiver, transmitter?? Prefer to trade even but would pay up to $100 difference if necessary. Leo Severe, 916 N. Kankakee, Wilmington, Illinois.

WANTED: Surplus manual Navships 91136, 91502, 91474, 91124, 91833, 91684 Army pamphlet 310-4 and 310-25. Robert Ireland, Pleasant Valley, N.Y. 12569.

FOR Sale: Galaxy V with power supply, hamfest prize, sealed in original cartons. Best offer over $400. You pay the freight. Frank C. Caswell, 450 Lowell St., Lexington, Mass.

FOR Sale: Heath HX-11 Novice trans. All bands 80-10 c.w. only. Easily converted by add. ext VFO (plug-in) plus seven xtals. Price $30.00 for all, you pay shipping. Walt Paulick, WA2YQV, 921 Peconic St., Ronkonkoma, N.Y. 10 8-2857.

HEATH HR-20 SSB-CW-AM receiver with ac supply, 80-10 meters, exclnt performer, in mint condx. Never mobile. Built by holder of First Class telephone license. Going Heath SB line. $115.00. Andy Hock, WA2RTL, 84-50 Austin St., Kew Gardens, N.Y. Tel: VI 9-3352.

COMPLETE Hallicrafters station. Won at Swampscott Hamfest: SX-117, HT-44, P-150 AC, in original boxes, never used, $655.00. H. A. Hutchinson, W1EV, 90 Dogwood Dr., New Britain, Conn.

FOR Sale: HT-37 and Drake 2B. Both are virtually unused: $500.00, complete with mike, headphones, etc. Contact Neal Graham, 44 Broadway, Lawrence, N.Y. Tel: FA 7-0036.

NCX-3, NCX-A, NCX-D, 75 M Hustler, mike, bumper mount, spkr, $400.00. Package deal only, sry. Will ship. K5DPH, 713 Alice Dr., Lafayette, La.

SELL: HA-1 keyer with El-Key, like-new condx, both for $47.50. Postpaid W3KWO, Schatitz, Box 900, Sharon, Penna. 16147.

SPECIAL Gear made up to order. 26 years commercial, technical experience. Now retired (Hi!). W5KRU, Morgan, Keithville, La. 71047.

SOLDER Problems? New multi-metal Bonding Alloy. Bonds similar and dissimilar metals: aluminum, brass, copper, cadmium, galvanized, stainless steel, silver and others. Flow temp. 383 deg., tensile strength 63,460 psi. Solve your bonding problems, send $3.98 for package solder and complete instructions. Bonding Alloy, 4411 Highland Ave., Oxnard, Calif. 93031.

DRAKE 2B receiver, 2BQ, Q multiplier, 2 AC calibrator, excellent condx, $200. Brian Kassel, K3LSB, 976 South Hills Blvd., Pottstown, Penna.

PARADISE For sale: My ham's dream 4 br home, on top of hill. 100 ft. rotary pole. All utilities underground. 310 countries worked. 15 min. to Oakland. 30 min. to SF. $5000 down, $168 per month. W6KG.

TEKTRONIX Mod. 531 'scope w/wideband pre-amp, flat DC-14 Mc. Can easily see 30 mc; wks perf. Sell or trade for Collins gear or gud SSB gear; SX-111, $145.00; DX-40 w/v&o, $45.00; Millen 50-w. rack mtd. xmtr, perf. condx. Also Millen 500w. linear. KØJBD, 9148 Vincent Ave., So., Minneapolis, Minn. 55431.

WILL Take best offer fr: Hallicrafters SX-110; Ameco CN-144 2-meter Nuvistor converter; Eico 729-730 revr/xmtr; Heathkit HW29A 6-meter and mobile vibrator power supply. All in mint condx. Hugh Flick, WA2MEY, N. Helderberg Pkwy, Slingerlands, N.Y.

NCX-3, $225.00; 304TL, $20.00; 416-A, $10.00; 4-1000, $50.00; General Radio 821-A impedance bridge; D-104 mike, $12.00. 6 Kc mech. filter, $15.00; Webster Band-spanner, $20.00. Write for list. W4VZQ, Rte. 1, Box 113, Rustburg, Va.

PHILADELPHIA Area: 250-watt 813 AM/CW 80-10 meters, home brew, professionally built. Many extras. Phone W3PUV, LFhigh 2-7137.

COMPLETE Ham Station. Hammarlund rec. HQ-110, Johnson Viking xmtr, Heath VFO, Astatic mike; CDR roto-ant., six-element beam. All set to go, complete, hardly used: $365.00. Call after six Mondays, Thursday, Fridays, or write to Phil Laspina, 137 Sunset Ave., Newark, N.J. Tel. ES-47986.

ART-13, $25.00; ART-13 28V, 10A 400V supplies, manual, $65.00; Vibroplex key, $5.00. Edward Haskins, 132 Lacey Ave., Battle Creek, Mich.

HALLICRAFTERS SX-100, NC-300 speaker, in exclnt condx, orignal cartons. Very low usage by SWL. $175.00, plus transportation. Richard Thorp, 851 Garfield, Aurora, Ill.

GONSET G-76, 12 vdc power supply, in exclnt condx: $22.00 includes all for mobile use, antenna. K1LJJ, Simsbury, Conn. Tel: 658-6428.

SELL: G-76 transceiver, matching AC PS/spkr. In gud condx. $279.00. Will ship. Ross, WAØMSV, 20 Tamma Lane, Hazelwood, Mo. 63042.

SELL: Viking Ranger and Viking Challenger: Elmac AF-67 and PMR7 with 12V and 120V P.S. All like-new condx. Various panel meters, transformers and misc. items. List free. WØZOB, Box 273, Coleraine, Minn. 55722.

COLLEGE-Bound. Must sell: NC-300 receiver, perf, working condx; Globe Chief DeLuxe 90W xmtr, Globe 755A VFO; R-55 revr. WA4MRE, 19431 N.E. 19th Ct., Miami, Florida, 33162.

NEED Money for College! HQ-110C, gud condx, new clock, $145.00; Vibroplex Original Bug, in mint condx, $15.00. Will pay shipping charges. Howard Steinman, WB2FOI, Otesaga Hotel, Cooperstown, N.Y. 13326.

GONSET G-76 transceiver, matching AC and DC supply, Turner 350C microphone, under dash and floor mounting brackets, mobile speaker, 40m and 20m heliwhips, instruction manual. Will demonstrate. $400.00. K4DJN, Roy J. Durso, 775 Second St. Merritt Island, Fla. 32952.

FOR Sale: Factory wired Viking Ranger, like new condx, $100. Goodsell McCoy, Rte. 2, Waverly, Ohio.

SELL: DX-60, $65.00; HG-10, $30.00. Perfect condx. 56 Carver Terrace, Yonkers, N.Y. Tel: 914-SP-96636.

CRYSTALS: C-W Crystals will be on vacation during August. See previous QST ads for information. We wish to thank our many amateur friends for their support. CU in Sept. C-W Crystals, Box 2065-Q El Monte, Calif.

SELL: DX-100B, SX-99, in gud condx, plus mic, relay, low pass, $225.00. K3MCY, 200 Timber Lane, Wilmington, Delaware.

DRAKE TR-3, both p/s, like new condx, best offer. W2PSG, phone 716-2844305. 822 The Circle, Niagara Falls, N.Y.

NCX-5 transceiver, brand new, factory-sealed box. $555.00. W2ORA, Joe Duffin, 247 Kings Highway, West, Haddonfield, N.J.

FOR Sale: 4-1000A filament transformers 7.5 VCT @ 21 amps, psi 110, 117, 125 VAC 60 cps, fully enclosed unit fits under 4" chassis, net wt. 9 lbs., $12.00. Write us for free estimates on any of your transformer needs. Peter W. Dahl Co., 401 4th St. S. E., Minneapolis, Minnesota 55414.

HEATH DX-60 and HG-10. Both mint condx. $95.00. WB2NQK, R. Coulehan, 13 Allen St., Dobbs Ferry, N.Y.

CHANCE OF a lifetime: Drake transceiver TR-3 with matching speaker and power supply, all in mint condx. Write Randy Linde, WB6DJE, 715 North Arden Dr., Beverly Hills, Calif., 90210.

SELL: Mosley 10-15-20-40-80 V5A vertical unused, $80.00; TH-3, $45.00; Hy-Gain balun 13-30-Mr., $7.00; AR-22, $15.00. W3-AFM, 5800 Hillburne, Chevy Chase, Md. 20015.

WANTED: AN/SRT 14 transmitter or RFO 07275 for same. Also, need units 2, 3, 4, 7 and 12 for RFO. Also want unmodified Prop Pitch motor. Must have magnetic brake. John P. McDermott, Box 8, Stratford, Conn. 06497.

HW-32 Heath 20-meter Monobander, built this May and HP-13 mobile power supply, $175.00. WA4ITK, 4031 Woodridge Rd., Miami, Fla.

IMMACULATE: HQ-170 AVHF 4 months old, 20 hours' use, $350.00; Navy ZB2 432 Mc. converter, $12.50; 15 Kv. 30 Ma. transformer, $12.50; Pacemaker Mono hi-fi amplifier, $15.00; Ameco AC-1 transmitter, $17.00; Eico 955 capacitor, checker, $17.50; all are in xclnt condx. Jim Baughman, WA8PLK, 4219 Manor, Royal Oak, Mich. (Area Code 313) 549-1231.

COLLINS 30L1 linear amplifier in A-1 condx, $350.00. W9ATU, 1206 Fremont, Belleville, Ill.

FOR Sale: Gonset Type GSB-201 linear amplifier, 1500 watt P.E.P. input, like new, $190.00; Model 15 teletype trans/receiver page machine, clean and in excellent condition, with table, $125.00; Type CV-71 RCA made for Navy, new surplus, radioteletype receiving terminal unit, $185.00; all equipment guaranteed. Will ship as requested. S. E. Hernandez, W2BSA/1, River Road, RFD #1, Essex, Conn. Tel: 203-SO-7-1410.

"HOSS TRADER" Ed Moory offers demonstrator equipment "factory warranty", Swan 350, $339.00; SBE-34, $329.00; SB-2 linear, $299.00; Galaxy V, $319.00; KWM-2, $895.00; TR-4, $499.00; New TH-6 DX beam and demonstrator Ham-M rotor, $189.00; one left at the old price, NCX-5, $586.00; NCL-2000, $585.00; SR-500, $339.00; Reconditioned gear: SB-33, $219.00; HT-37, $249.00; 200-V, $439.00; 2-B, $195.00; factory reconditioned KWS-1, $649.00; Drake R-4, $265.00; Swan 350, $279.00; GSB-100, $189.00; HT-32, $269.00; 20-A, $109.00; Johnson Ranger II, $179.00; Viking Valiant, $159.00; Swan 240, $229.00; PL-259 Connectors, 39¢; new TR-44 rotor, $48.95. Branch office: Ray Coker Electronics, 724 Lawrence Road, Jackson, Miss. Home office: Ed Moory Wholesale Radio, Box 506, DeWitt, Arkansas. Tel: WHitney 6-2820.

TOOOOBES, Transmitting, special purpose, new, boxed. Guaranteed. 6CW4, $1.40; 614B, $4.75; 417A, $3.95; 826, $6.90. Free catalog. Vanbar Dist., Box 444, Stirling, N.J. 07980.

HALLICRAFTERS, HT-40 xmtr, MA-5 VFO and SX-111 rcvr with matching speaker. All with manuals and in mint condx. Will ship U.S.A. $250 cash. Will separate. Wolf Zeitlin, WA9-NOD, 3417 South Park Ave., Chicago, Ill. 60616.

WANTED: An instruction book for the MB-560A mobile rig. G. W. Chittenden, W9CMM, 3408 S. Parnell, Chicago, Ill. 60616.

AF-67 transmitter, 10 tube, 10-40-75 receiver with power supplies, $75.00. Sideband 40-watt, all-band exciter. See QST June 1958, $35.00. Walter M. Kenyon, W6UA, 1695 N. Point, San Francisco, Calif.

SELL: Best offer over $390. Buys either Drake TR-3 with AC power supply or National NCL 2000 linear. Both in mint condx. F.o.b. M. Luce, W2PTQ, RFD, Cutchogue, N.Y.

NCX-3: Absolutely like new with matching DC supply: $330.00; R. Jones, W2AEV, 111 Hillside, Farmingdale, N.Y.

GONSET G-33, 40M and 80M ARC-5's converted with power supply. Incomplete 6M rig, misc. extras. Best offer. All or part. Howard W. Miller, 49 Venedia Dr., Wyandanch, N.Y.

STAMP Collectors: Will swap stamps (your choice) for amateur and military radio equipment, supplies, tech manuals, etc. Jack Reilly, 35-19 167th St., Flushing, L.I., N.Y. 11358.

QSTS, 238 issues, 90 from Feb. 1931 to July, 1952. Complete issues from September 1952 to Dec. 1964. CQ, 214 issues, 7 from Oct. 1945 to Jan. 1948. Complete from March 1948 to Dec. 1964. Popular Electronics: every issue from Vol. I, No. 1, to latest, complete file. 132 issues. Best offer on each separate run or group, or all 584 together. Most like-new condx. Can't sell single copies. W8DVY, F.o.b. Cincinnati or will deliver in that area. W8DVY, 3971 Drew, Cincinnati, Ohio 45211.

KWM-2 ser. 1388 with noise blanker. All latest modifications and front panel AM model added: $800.00; 312B-5 external VFO and watt-meter, $250; PM-2 light-weight AC power supply, Ser. 11809, $85.00; 516E-1 12 volt mobile power supply, $95.00; mobile mount, $50.00; 30S-1 kilowatt linear amplifier, $1000; all in prime condx. Frank A. Hayes, K2VVL, Red Hill Road, Middletown, New Jersey. Cash and carry deal only, sry.

WANTED: Director and/or reflector element or entire Gonset #3220 Triband antenna. WA5CFB, 121 Seal Dr., Arabi, Louisiana 70032.

NCX-3 with A.C. power supply, hardly used. Asking $300. K2-VBL, 69-39 198th St., Flushing, 65, L.I., N.Y. Tel: 212-GL-4-0647.

COMPLETE Station, Drake 2-B, Eico 720, VF-1, TR switch, $250.00. Must sell. Going to College. WA9EQJ, Jack Jereb, 306 Hayden, Oglesby, Ill.

SUMMER Sale! 75S-1:—$295.00; Thunderbolt—$260.00; Courier—$149.00; 5100—$125.00; SW240—$235.00; DX100—$85.00; less than one year old. Drake TR-3 with DC-3 and AC-3 power SX101 III—$149.00; HT37—$249.00; Ranger—$99.00; Invader—$290.00; 75A-1—$130.00; HQ129X—$99.00; SX100—$175.00; HC10—$79.00; LSA-3 W/d.c.—$199.00; 2A—$169.00; SX42—$99.00; New Equip; HT37—$395.00; SR160—$299.00; NC270—$179.95; TCU—$69.00; HA6 W/A.C.—$299.00; Free List. Howard Radio, Box 1269, Abilene, Texas 79604

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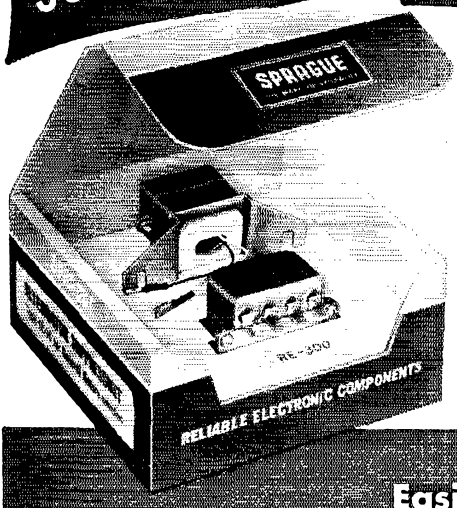
SUPPRESS RFI IN YOUR MOBILE RADIO GEAR!



NEW! SPRAGUE SUPPRESSIKITS FOR VEHICLES WITH ALTERNATOR SYSTEMS

Easily installed on cars or trucks with citizens' band, amateur, industrial, or public service mobile radio equipment

★ Three different Suppressikits to choose from —Type SK-10 for Chrysler Corp. cars and trucks, Type SK-20 for Ford Motor Co. vehicles, and Type SK-30 for General Motors Corp. equipment.

★ Designed to fit most newer vehicles through the 1965 model year. (for older vehicles, see the SK-1 Suppressikit, below.)

★ Well-engineered L-C Networks and/or heavy-duty Thru-pass Capacitors handle the hash and eliminate the siren-like whine caused by the alternator output.

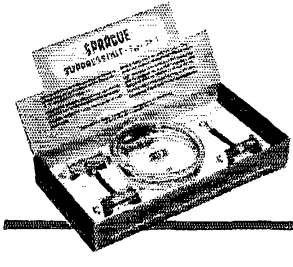
★ Extremely easy to install—no cutting, no soldering, no wiring harnesses. All components are neatly marked and packaged, and come complete with comprehensive step-by-step installation instructions.

★ Provide really *effective* interference suppression through 400 mc, at moderate cost.

★ Will stand up under continuous operation in hot engine compartments.

★ Permit faster, more readable, less tiring communication at greater ranges.

TYPE SK-1 SUPPRESSIKIT FOR VEHICLES WITH D-C GENERATORS



Designed for simple but effective installation. The generator capacitor is built for continuous heavy duty 257°F (125°C) operation. A full 60 ampere current rating plus the high rated operating temperature provide an extra factor of safety against expensive generator burnouts, unlike many suppression assemblies containing general-purpose capacitors. Effectively suppresses RFI through 400 mc. Includes easy-to-follow installation instructions.

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and saves you $200!

HALLICRAFTERS HT-44 SSB/CW/AM

- FIVE Bands, 80 thru 10. (10 and 15 DX is starting into FB sun-spot cycle!)
- Full 200 Watt input on CW and SSB, 50 Watt AM.
- VOX, CW break-in, and PTT included.
- Direct VFO control (or, transceive with an SX-117 receiver).
- Amplified ALC.
- Compact! Cabinet only 7⅛" x 15" x 13"

JOIN THE FUN ON 6 METERS!

For only $120 extra, we will include a brand new Hallicrafters HA-6 TRANSVERTER and matching P-26 pack. (Original Ham net price $449.00!)

This superbly engineered broad-band unit changes your transmitter's 10 meter SSB, CW or AM output into a stable, powerful 6 meter signal. Up to 120 watts input, for real sock!

It also converts the received 6 meter signal to 10 meter input to your receiver.

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. . . you can enjoy the powerful performance of this most popular **five** band, SSB, CW and AM transmitter. Read the specs, listen to proud owners' FB signals on all bands, then rush your order in for your HT-44!

Each one is brand new, latest production, in sealed carton, and comes complete with matching PS-150 AC power supply/speaker. Fully guaranteed by both Hallicrafters and Harrison.

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☐ I also want to have fun on 6 meters, so include an HA-6 and P-26 for only $120 more.

Enclosed is $_____

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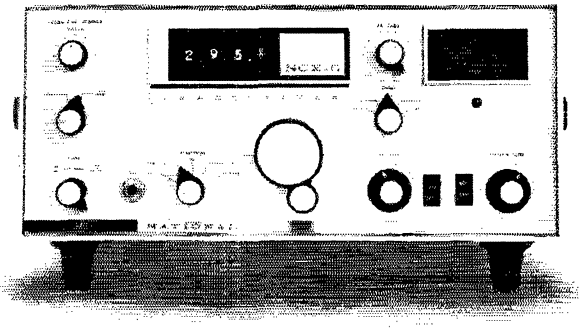

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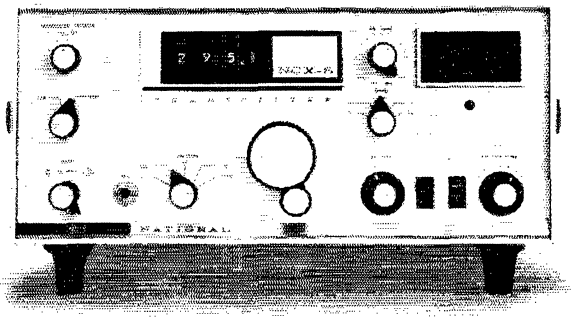

One thinks long and hard before making a change in a rig like the NCX-5 — after all, it has proven itself as the finest transceiver ever offered the amateur at any price. But we have designed a new balanced modulator circuit which offers such high performance that we felt it should be incorporated in new NCX-5 production. The new balanced modulator is a solid state ring-type device which is totally unaffected by external or magnetic influences, on-off cycling, aging, or warm-up time. Minimum carrier suppression is 50 db through all of these variables, and typically can be adjusted to provide even 65 or 70 db! In fact, the circuit cannot be unbalanced far enough, using the carrier balance control, to provide sufficient carrier for AM or CW operation of the NCX-5. We therefore replaced the carrier balance control with a new Carrier Insertion control to provide a gradual increase in carrier as the control is turned clockwise. Carrier is also now inserted automatically in the AM or CW positions of the NCX-5 mode switch. "Carrier balance" has become an internal factory adjustment which need never be touched.

The new NCX-5 is designated Mark II, and is identical in appearance to previous units. The superb dial calibration, stability, selectivity, and all other maximum performance features of the NCX-5 are, of course, unchanged (including the remarkable price of only $685).

When we make performance improvements during production we try to make certain that owners of earlier units can similarly improve their equipment, if they wish. So our Customer Service Department has a Mark II kit available for satisfied NCX-5 owners so that they can become satisfied NCX-5 Mark II owners. The NCX-5 is the finest transceiver on the amateur market, proven in operation by amateurs the world over. The Mark II NCX-5 is even better.

NATIONAL RADIO COMPANY, INC.

37 Washington St., Melrose, Mass. 02176./World Wide Export Sales: Auriema International Group, 85 Broad St., N.Y.C./ Canada: Tri-Tel Associates, 55 Brisbane Rd., Downsview, Ontario.

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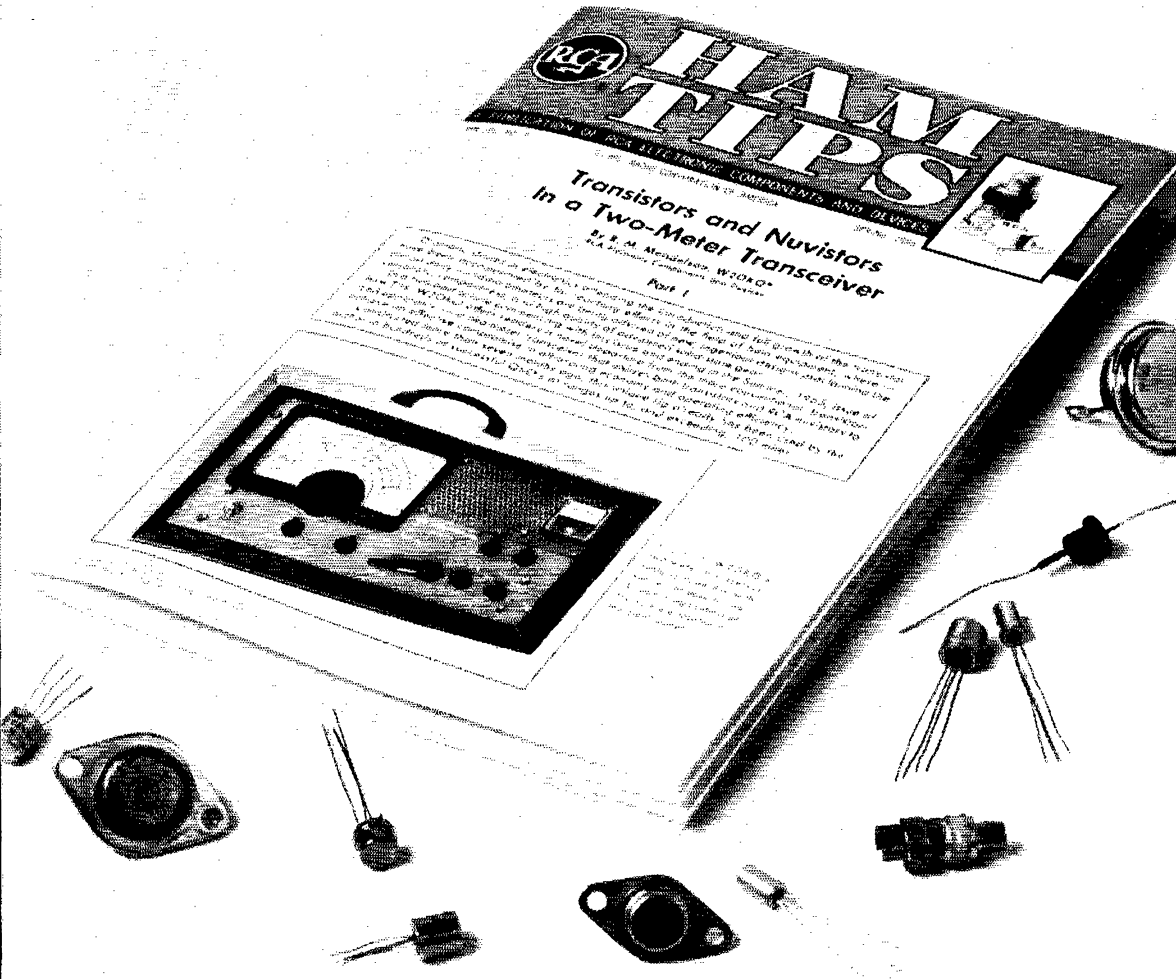

RCA TRANSISTORS AND NUVISTORS IN A TWO-METER TRANSCEIVER

economy and overall efficiency

Here's a unique two-meter transceiver design which utilizes both transistors and nuvistors to achieve an effective compromise in all-'round economy and operating efficiency.

The addition of a versatile power transformer will enable you to operate this transceiver from either a 12-volt automobile battery, or from a 117-volt line source. Also featured in its design is a fixed-tuned 144 Mc receiver front-end, which eliminates troublesome tracking problems. In addition, its design features an extremely stable transistor oscillator using the RCA-2N371, and a stable transistor buffer—the RCA-2N384—which prevents overloading of the oscillator.

W2OKO offers this novel ham rig design in a two-part article starting in the Spring 1965 issue of HAM TIPS. Get your copy from your RCA Industria Distributor. Or write Commercial Engineering, Section H-37-SD, RCA Electronic Components and Devices, Harrison, N. J. 07029.

RCA® **The Most Trusted Name in Electronics**

AMATEUR MESSAGE FORM

Every message originated and handled should contain the following component parts in the order given:

1. **PREAMBLE**
   - a. **Number** — *beginning with 1 each month or year*
   - b. **Precedence** (*R, P2, P or Emergency — see below*)
   - c. **Handling Instructions** (*see detail below*).
   - d. **Station of Origin**
   - e. **Check** — *number of words or groups in the text*
   - f. **Place of Origin**
   - g. **Time filed**
   - h. **Date**
2. **ADDRESS**
3. **TEXT**
4. **SIGNATURE**

C.W. Example: NR 1 R HXA W1AW CK 8 NEWINGTON CONN 1830Z JULY 2 DONALD R SMITH AA 164 EAST SIXTH AVE AA NORTH RIVER CITY MO AA PHONE 733 3698 BT HAPPY BIRTHDAY X SEE YOU SOON X LOVE BT DIANA AR.

On C.W.: note that X, when used in the text as punctuation, counts as a word. The prosign AA separates the parts of the address, BT separates the address from the text and the text from the signature. AR marks end of message; this is followed by B if there is another message to follow, by N if this is the only or last message. It is customary to copy the preamble, parts of the address, text and signature on separate lines.

On *RTTY* — Same as c.w. format above, with following exceptions: (1) Use TO before address. (2) Separate parts of address by an extra space instead of AA. (3) Use SGD preceding the signature. (4) Add a "CFM" line under the signature, consisting of all names, numerals and unusual words in the message, in the order transmitted.

On *Phone* — In general, *say* the meanings of all procedural signals. The above message on phone would go something like this: "Number one, routine, HX Alpha, W1AW, check eight, Newington, Connecticut, one eight thuhree zero zulu, July two, Donald R (as in Romeo) Smith, one six fower East Sixth Avenue, North River City, Missouri, phone sev-ven thuhree thuhree, thuhree six niyen eight, happy birthday X-ray see you soon X-ray love, Diana, end of message, no more." Speak in measured tones, emphasizing *every* syllable. Spell out phonetically all difficult or unusual words, but do *not* spell out common ones.

Precedences

EMERGENCY — Any message having life and death urgency to any person or group of persons, which is transmitted by amateur radio in the absence of regular commercial facilities. This includes official messages of welfare agencies during emergencies requesting supplies, materials or instructions vital to relief of stricken populace in emergency areas. During normal times, it will be *very rare*. On c.w., this designation will *always* be spelled out. When in doubt, *do not* use it.

PRIORITY — Important messages having a specific time limit. Official messages not covered in the "Emergency" category. Press dispatches and other emergency-related traffic not of the utmost urgency. Notification of death or injury in a disaster area, personal or official. Use abbreviation P on c.w. Inquiries as to the health or welfare of someone in the disaster area are handled after the above are cleared and are designated "priority two" (P2).

ROUTINE — Most traffic in normal times will bear this designation. In disaster situation, traffic labeled "Routine" (R on c.w.) should be handled *last*, or not at all when circuits are busy with emergency or priority traffic. Most traffic handled on amateur circuits in normal times will fall in this category.

The precedence will follow the message number. For example, on c.w., 207 R, or 207 EMERGENCY. On phone, "Two Zero Seven, Routine (or Emergency)" on phone.

Handling Instructions

HXA — (Followed by number.) Collect landline delivery authorized by addressee within.....miles. (If no number, authorization is unlimited.)

HXB — (Followed by number.) Cancel message if not delivered within.....hours of filing time; service originating station.

HXC — Report date and time of delivery (TOD) to originating station.

HXD — Report to originating station the identity of station from which received, plus date and time. Report identity of station to which relayed, plus date and time, or if delivered report date, time and method of delivery.

HXE — Delivering station get reply from addressee, originate message back.

HXF — (Followed by number.)Hold delivery until..... (date).

This prosign (when used) will be inserted in the message preamble before the station of origin, thus: NR 207 R HXA50 W1AW CK 12 . . . (etc.). If more than one HX prosign is used, they can be combined if no numbers are to be inserted, otherwise the HX should be repeated, thus: NR 207 R HXAC W1AW . . . (etc.), but: NR 207 R HXA50 HXC W1AW . . . (etc.). On phone, use phonetics for the letter or letters following the HX, to insure accuracy.

ARRL Communications Department Operating Aid No. 9a

Special ARRL QN Signals For C.W. Net Use

QNA* Answer in prearranged order.
QNB* Act as relay between.....and.....
QNC All net stations copy.
I have a message for all net stations.
QND* Net is directed (controlled by net control station).
QNE* Entire net stand by.
QNF Net is free (not controlled).
QNG Take over as net control station.
QNH Your net frequency is high.
QNI Net stations report in.*
I am reporting into the net. (Follow with list of traffic or QRU.)
QNJ Can you copy me?
Can you copy.....?
QNK* Transmit messages for.....to.....
QNL Your net frequency is low.
QNM* You are QRMing the net. Stand by
QNN Net control station is.....
What station has net control?
QNO Station is leaving the net.
QNP Unable to copy you.
Unable to copy.....
QNQ* Move frequency to.....and wait for..... to finish handling traffic. Then send him traffic for.....
QNR* Answer.....and receive traffic.
QNS Following stations are in the net.* (Follow with list.) Request list of stations in the net.
QNT I request permission to leave the net for .....minutes.
QNU* The net has traffic for you. Stand by.
QNV* Establish contact with.....on this frequency. If successful, move to.....and send him traffic for.....
QNW How do I route messages for.....?
QNX You are excused from the net.*
Request to be excused from the net.
QNY* Shift to another frequency (or to.....kc.) to clear traffic with.....
QNZ Zero beat your signal with mine.

* For use only by Net Control Station.

C.W. Abbreviations and Procedure Signals

AA Separation between parts of address or signature
AA All After
AB All Before
ADEE Addressee
ADR Address
AR End of transmission.
End of message
ARL Indicator denoting use of an ARRL numbered message in the text.
AS Wait
BK Break; break me; bk in
BN Between
BT Double dash (separates text from address and signature).
C Yes; correct
CFM Confirm; I confirm
CK Check
IMI Question mark; repeat
K Go ahead; invitation to transmit
N No; negative
NR Number
PBL Preamble
R Received solid
SIG Signature
SK End of QSO
TU Thank you
WA Word after
WB Word before

INTERNATIONAL Q SIGNALS FOR TRAFFIC HANDLING

QRU Have you anything for me? I have nothing for you.
QRV Are you ready? I am ready.
QSG Shall I send.....messages at a time? Send.....messages at a time.
QSK Can you hear me between your signals? I can hear you between my signals.
QSL Can you give me acknowledgment of receipt? I give you acknowledgment of receipt.
QSM Shall I repeat the last message I sent you? Repeat the last message you sent me.
QSP Will you relay to.....? I will relay to.....
QSZ Shall I send each word twice? Send each word twice.
QTA Shall I cancel number.....as if it had not been sent? Cancel number.....as if it had not been sent.
QTB Do you agree with my check? I do not agree with your check. I will repeat the first letter of each word and the first figure of each number.
QTC How many messages have you to send? I have.....messages for you (or for.....).

Notes on the Use of QN Signals

1. The QN signals listed are special ARRL signals for use in amateur c.w. nets only. Other meanings that may be used in other services do not apply.

2. Some QN signals are for use by net control stations only; these are marked with an asterisk (*). Others have slightly different meanings when used by the NCS and net stations; in this case the NCS meaning is marked with an asterisk (*).

3. Some QN signals have two meanings, the difference depending on how or by whom used. *Examples:* (a) QNC, when used as a preface to transmission of a message, carries its first meaning; when used by a station reporting into the net (e.g., W9NCS DE W9NET QNI QNC), it carries its second meaning. (b) QNI, when used by the NCS, is a request for stations to report in; when used by a net station, it means that this station is reporting in. (c) QNJ, when used alone, has its first meaning; when followed by a call, it has the second meaning.

4. QN signals are *never followed by a question mark*, even though the meaning may be interrogatory.

5. Do not use QN signals on phone nets. Say it with words.

6. Use QN signals in nets only. They are not for use in casual amateur conversation.

7. Make frequent use of standard international "Q" signals in traffic nets, for meanings not covered by QN signals. *Examples:* QRU, QRV, QSV, QTA, QTB, QTX, etc. (See *Operating an Amateur Radio Station.*)