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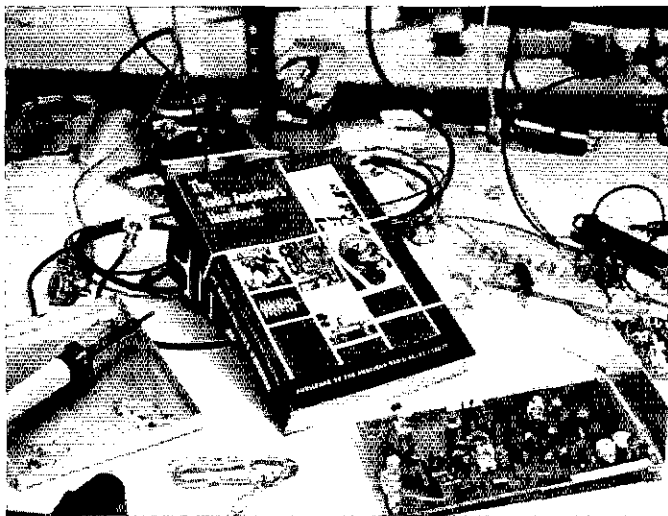
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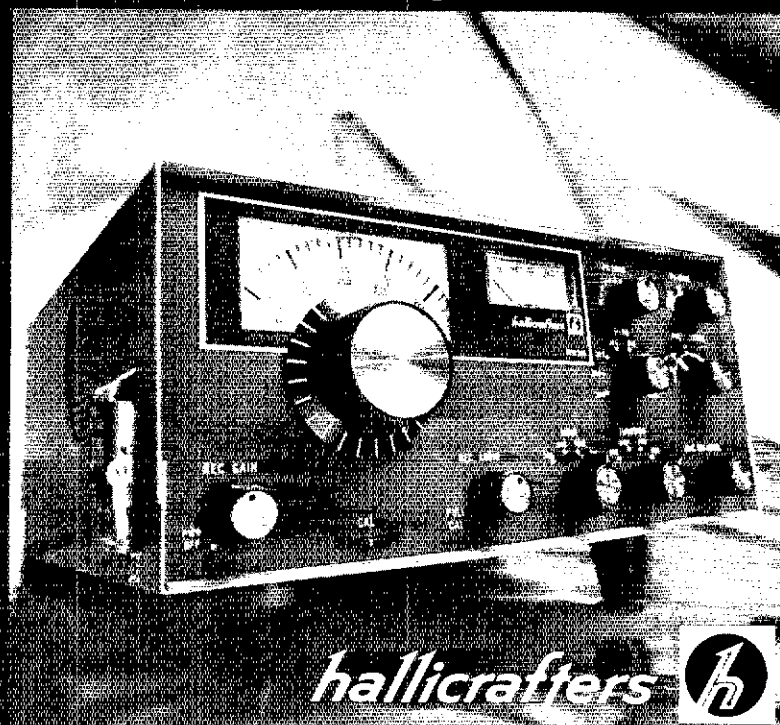
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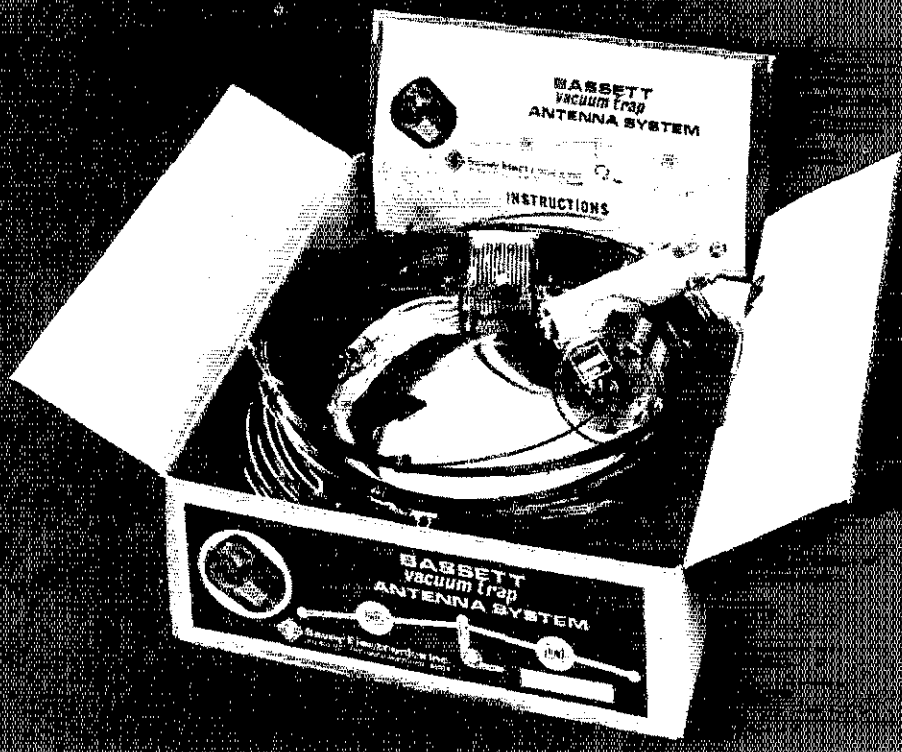
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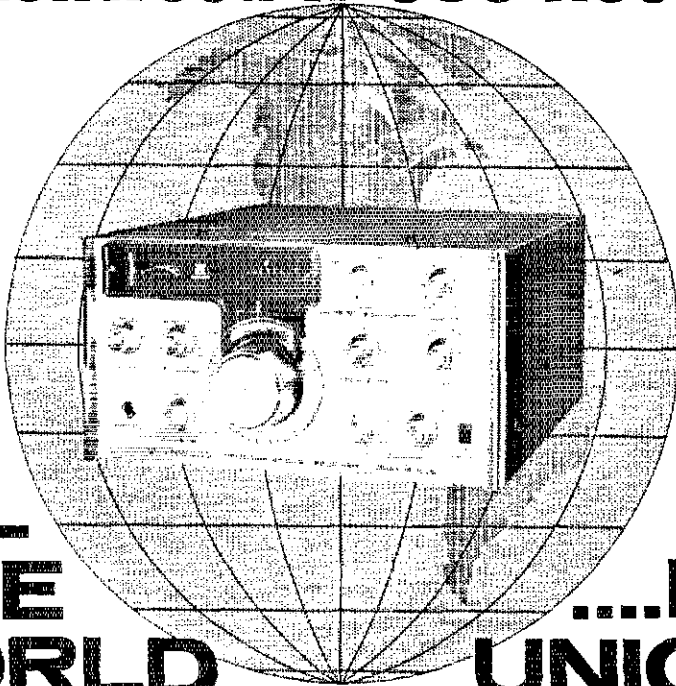


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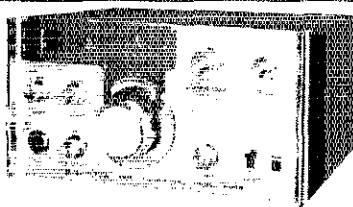
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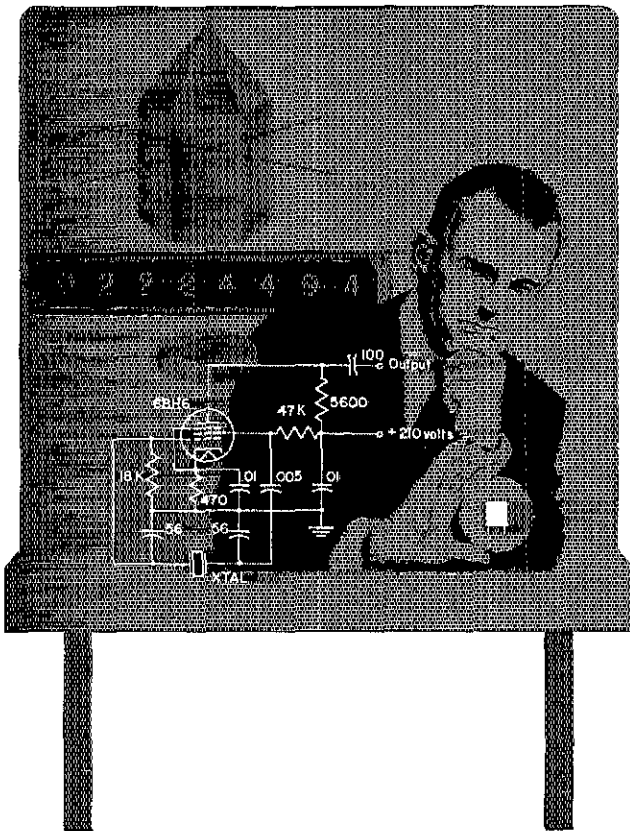
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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. 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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"It Seems to Us..."



SECOND BOARD MEETING

EVER SINCE the Board of Directors took on the character of an amateur radio Senate in 1924, with directors elected to represent fixed constituencies, the Board has met but once annually (with the rare exception of a few special second sessions to meet some unusual problem or urgent need). Commencing this year, however, a second meeting will be a regular feature. The dates in 1972 are July 20 and 21.

The January session is the true annual meeting, taking care of the legal and corporate formalities. Freed of these, the July gathering can be devoted even more fully to general amateur affairs, membership problems and desires, FCC regulations, internal ARRL structure, and the like. Committee reports will form the basis of much discussion; indeed, a principal objective of the new procedure for twice-yearly meetings is to provide for consideration of and action on committee reports and staff assignments without the customary year's delay.

But to serve its purpose fully, directors should be able to bring to the meeting as complete as possible an evaluation of current membership sentiment, and your needs and desires, along with any proposals for specific changes. The constructive utility of the second meeting can, therefore, be largely up to you. There is little purpose to be served by many directors (and vice directors) volunteering several additional days of their personal time, and spending not insignificant amounts of ARRL money, if there is no true membership need to be filled. So please see that *your* representative on the Board is kept informed of your and your club's views (see his address, page 8).

NEW TEXTS

This year seems to be an especially active one in the field of League publications. It is a work peak in our attempts to keep "The Radio Amateur's Library" up to the state of the art and — often more demanding — to meet the desire of our membership for complete, quality technical study and reference material.

First on the list: the *Handbook*. While of course a new edition is an annual feature, almost-daily bouquets in arriving mail confirm that under the guiding hand of W1K1K, the 1972 version came fairly close, at the least, to the target. Its appearance follows closely a thorough revision of *Understanding Amateur Radio*, a sort of "junior Handbook" — which through W1DF's skilled treatment does for the reader precisely what its title indicates. Together, these two mainstays of the library pretty well cover the modern field, from moderate to top level.

Digging extensively into pure basics is the approach employed for a rather drastic revision of that old workhorse, *A Course in Radio Fundamentals* (also by W1DF). Initiated during World War II as a study guide for use with the Handbook, the contemporary usefulness of its original training format has declined a bit each year. The new version, now in process, will be truly a course in fundamentals; you won't learn more about antenna systems or digital techniques or receivers than you knew before, but you can be an expert in the *why* of basic electronic component and circuit theory. You'll have to wait until later in the summer for this one.

Another which we expect will again achieve wide acceptance is the third edition of *The Radio Amateur's VHF Manual*, just coming off press. Primarily a project of VHF Editor Ed Tilton, W1HDQ, as a fitting climax to many major contributions in his more than 30 years on the staff (he's retiring shortly), its up-to-date treatment includes coverage of all aspects of activity in the world above 50 MHz, including a new section on fm repeaters.

And in the latter specialized field, another and completely-new manual is in the works — in response to Board of Directors request, reflecting membership desires — containing what you should know about repeaters, whether you're a licensee of one of the machines, or just an occasional user. We've held back on its completion awaiting

(Continued on page 81)

League Lines . . .

Those liberalized procedures in obtaining special-events call signs -- e.g., WX3MAS, WJ4JULY -- were perhaps too good to last. The volume of requests has burdened the FCC staff to the point where processing is seriously interfering with normal business. We don't want to lose this desirable feature entirely, so please avoid frivolous requests, and give second thoughts to any proposed project which is not outstandingly meritorious for its public impact. If you have a really sound idea for an operating event of true general interest, fine -- but make sure the request gets to FCC several months prior to the planned date of activity.

President Dannels has appointed KIABR and W3DTN to the VHF Repeater Advisory Committee; W2EIP to the Contest Advisory Committee; and W1BIH to the DX Advisory Committee -- replacing W6GDO, W0CXW, K1ZND and W1RAN, who have resigned. To the newcomers, welcome; to those departing, many thanks for taking your personal time to try to make ham radio a little better.

We've been called all sorts of names, good and bad, but a new one popped up the other day which suggests we all should take afternoons off -- an envelope addressed to "The A.M. Radio Relay League."

SCM WA6AUD notes "Recent observations at some club meetings indicate that many teenagers are getting started in amateur radio, apparently many more than for many years, and they are quickly turning up with Novice and General Class licenses clutched in their hands." They're joining ARRL, too; 50% of our new members are teenagers or younger.

Because of NASA weather satellite launch changes, the piggyback orbiting of Oscar 6 expected this summer should occur later this year. A change from the Itos D to Nimbus E mission is likely. More details in a future issue. Meanwhile, if you're not yet ready to use the high-in-the-sky repeater, check the QST articles in March (p. 58) and May (p. 69) for details.

ARRL's general purpose film, "The Ham's Wide World," sure gets around. It hasn't quite been DXCC yet, but there have been some exotic locations for showing -- e.g., Pitcairn, Trinidad and Tobago. But perhaps the prizewinner is Q21TL, in charge of education in the Republic of Nauru!

Have a good time Field Day (June 24-25)? Don't forget to send your summary and "dupe sheets" to Hq. by the end of the month. Even if your group's scores were modest, the totals are useful to the amateur service -- FD is our best opportunity to convince the public we're ready for emergencies.

Operating slow-scan television? The authorized frequencies in 80, 40, 20 and 15 are the same as the voice bands reserved for Extra and Advanced Class licensees namely: 3.8-3.9, 7.2-7.25, 14.2-14.275 and 21.25-21.35 MHz. Popular gathering spots for the visual cian are: 14,230 (primary), 3845, 7230 and 21,280 kHz.

Several matters of interest to amateurs appear to be ripening on FCC's vine. First news of Commission actions likely will be via WIAW's daily bulletins on phone, cw and RTTY.

Even if that new legislation to allow the news media to mention state-run lotteries goes through, it still will be advisable for amateurs to forego extensive discussion of these games of chance in the amateur bands.

Quote-of-the-Month, from ARNS "Bulletin" - G. B. Shaw once said, "A man without an address is a vagabond; a man with two addresses is a libertine." If he has a wrong address, he is a radio amateur. And if he refuses to give his address, he's a CB'er.

The Flashlight Sidebender

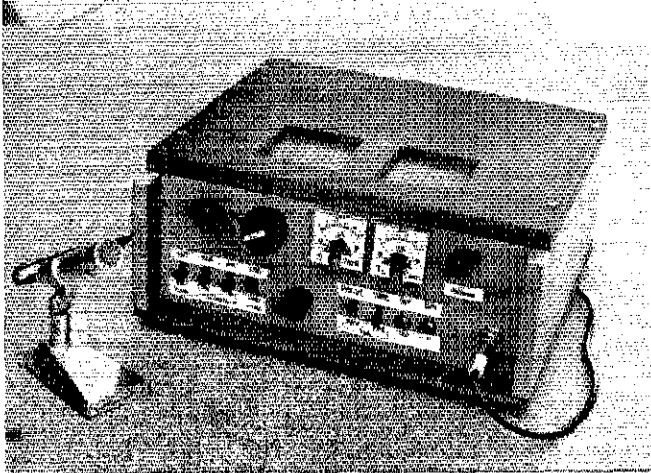


Fig. 1 — W2KQP's solid-state transceiver is housed in a homemade wooden cabinet. Imported meters and slide switches have been used to keep the cost down.

Part I

BY R. P. BURR,* W2KQP

SOME TIME AGO, as a partial result of summer vacations spent on an island off the coast of Maine, with no commercial power and therefore no ham radio, the author became interested in developing a transistorized, flashlight-battery-powered, single-sideband transceiver for the 75- and 80-meter bands. It seemed that a low-power transmitter would be useful for local contacts. In addition the project offered many opportunities to explore solid-state circuit technology and the potentialities of QRP operation. While considering how to begin, this writer came across an excellent article in January, 1970, *QST* entitled "Transistor Module for Ssb Transceivers."¹ The circuits and the signal-path arrangement described therein seemed ideal for a transceiver project.

The "flashlight sidebender" which finally evolved from this starting point is shown in Fig. 1. It is somewhat bigger than a large telephone book and includes a compartment for 8 size-D flashlight batteries. The receiver has an rf stage, electrical bandspread, amplified agc, and a 100-kHz/10-kHz calibration oscillator. Receive/transmit switching is accomplished without relays, using a VOX flip-flop and diodes.

The transmitter performance has been a pleasant surprise. About 2.5 watts PEP output is developed by a pair of inexpensive transistors with a peak dc input of about 4 watts. These numbers are about 60 times less than, or 18 dB down from, a conventional 150-watt PEP exciter.

Operating experience in the Northeast shows that, with a good antenna, the signal from the little rig is usually not more than 3 to 4 S units weaker than that of my Heath SB-401 transmitter. As a result, when band conditions are good and interference levels are low, it is possible to

communicate with almost any station that provides a healthy signal into the receiver. In short, the low power "gets out" just fine! The rig is a very portable station which has been fun to build and is now fun to operate.

General Arrangement

A block diagram of the transceiver system is shown in Fig. 2. The layout is quite similar to that employed by ON5FE. The transmitting and receiving signal paths share only the filter and the final tank circuit. The 9-MHz filter is transferred from one circuit to the other by means of switching diodes. The tank circuit is disconnected from the receiver input with a diode gate while transmitting and is not loaded by the final power-amplifier transistors when receiving because they are biased to cutoff.

There are three B-plus circuits in the transceiver, denoted +12, R, and T in the schematic diagrams. The +12-volt line is energized for both receive and transmit, the R line is switched on to receive, and the T line is on to transmit.

Most of the current QRP craze has involved the use of cw gear. For the ssb fans, the battery-powered 80-meter transceiver described here can be used as a complete station, at home or afield. Part 2 of the article will appear in a subsequent issue of QST. The construction techniques and the test-as-you-build approach used by W2KQP are applicable to any major construction project.

* R.D. 3, Lloyd Lane, Huntington, NY 11743.
1 Gillet, "Transistor Module for Ssb Transceivers," *QST*, January, 1970.

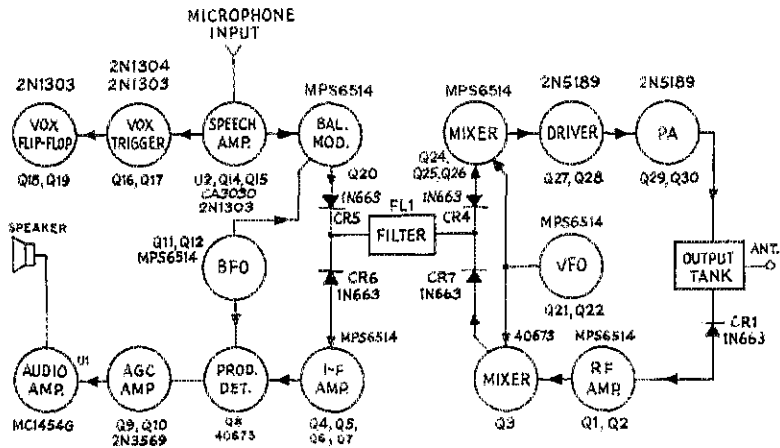


Fig. 2 — Block diagram of the transceiver.

The R and T circuits are driven from the VOX flip-flop, as in ON5FE's module. When the transceiver is operating in a ready-to-transmit condition, the battery drain is about 125 mA. A front-panel switch, described later, is provided to reduce the standby power when only monitoring is desired. With average usage about 100 hours of life may be expected from the size-D cells.

Exclusive of the calibrator, the transceiver circuit uses 30 bipolar transistors and 2 MOSFETs. All of these devices cost 75 cents each, or less, including the rf linear power-amplifier devices. Nineteen of the transistors must be high-frequency types; the rest may be general-purpose low-cost audio transistors. Twenty-two small-signal silicon rf diodes of the "two-for-a-nickel" variety are required, together with two 8-volt Zener and two varactor diodes. ICs are used for the speech amplifier and the audio power amplifier. Ferrite toroid cores are employed for most of the inductors. The most expensive single item was the KVG XF-9A filter and its associated pair of BFO crystals.

Construction Plan

Work on the transceiver was carried through without the aid of a signal generator. The key test instruments used were a wide-band oscilloscope capable of displaying a 9-MHz carrier envelope, a Q-meter which was extremely useful in measuring

or adjusting tuned circuits, and various circuit modules of the transceiver itself. The finished unit was more or less hoisted into a working state with the aid of its own bootstraps.

Each circuit section in the block diagram was initially breadboarded with a construction technique of the type shown in Fig. 3. Terminal strips were soldered, as needed, to hold the components to a piece of copper-clad laminate scrap or sheet tin cut from a flattened tin can. This breadboard chassis was then taped to the work bench and the circuit was wired up in a rough-and-ready fashion. One can usually get away with a good deal of haywire in transistor circuits because the impedance levels are relatively low. The wide-open circuits are, of course, much easier to debug.

When a working circuit was obtained as a breadboard version, it was transferred to a perforated board-and-clip module of the type shown in Fig. 4 and equipped with legs by soldering half-inch lengths of wire to clips near the corners of the board. The bottoms of the wire legs were then soldered by means of a small iron to the piece of copper-clad laminate which formed the chassis base of the finished assembly.

Some idea of the construction data can be obtained from Fig. 5. The chassis base is a piece of masonite which separates the wooden cabinet into upper and lower compartments. Copper-clad scrap sheets were fastened to both sides of the masonite with hot-melt glue. Holes were then drilled through

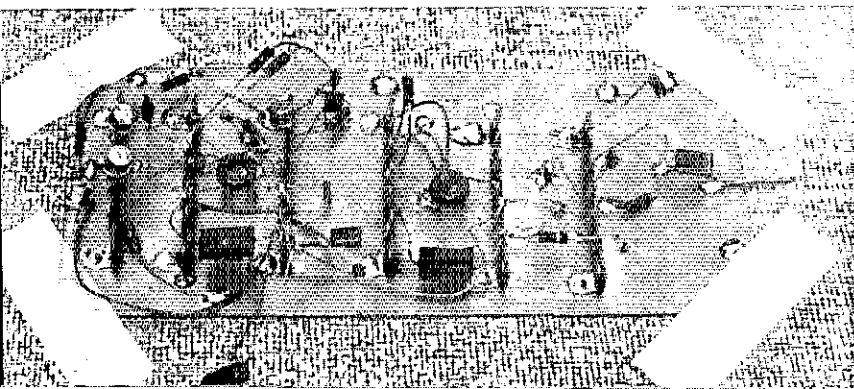


Fig. 3 — One of the breadboard circuits which is assembled on a scrap piece of pc board using lug strips as connection points.

Fig. 4 — Finished circuit module which is constructed on Vectorbord using push-in terminals.

the resulting three-layer sandwich to allow access from top to bottom. The front panel is another piece of copper-clad scrap with the clad side facing inward. The receiver circuits are on the bottom side of the chassis, and the transmitter modules are on the top side. The finished chassis-and-panel assembly slides into a homemade wooden cabinet.

The author's construction technique is lacking in elegance, but it is simple since the whole business is put together with hot-melt glue and a soldering iron. The result provides a combination of breadboard and finished assembly which can be modified easily but which is mechanically strong and presents a reasonably neat appearance.

BFO and Balanced Modulator

Having no signal generator, the first order of business was to build up the BFO and the balanced modulator of Figs. 6 and 7. ONSFE's diode-switching arrangement for lsb/usb was adopted for the BFO, and it works very well. The BFO delivers a 3.5-volt (pk-pk) 9-MHz signal from the emitter of Q13 to the balanced modulator and the receiver product detector.

The varactor balanced-modulator circuit (Fig. 7) works like a charm. It is difficult to understand why this circuit has received so little attention in amateur gear when one considers that:

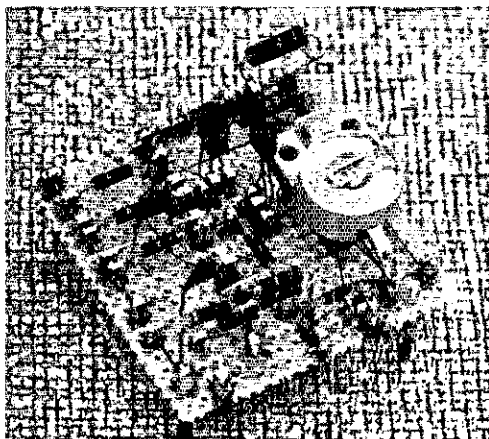
- 1) it is essentially unaffected by stray capacitance because it works by capacitance variation,
- 2) it presents a relatively high *single-ended* input impedance to both carrier and audio,
- 3) it shows good linearity, and
- 4) it uses simple components.

The only precaution to be observed is to minimize the capacitance coupling between primary and secondary windings on the toroidal-wound transformer. This is accomplished by placing the windings on opposite sides of the toroid core.

With 3.5-volts pk-pk carrier input, the modulator remains linear for audio inputs up to approximately 6 volts pk-pk. Accordingly, a value of 4 volts pk-pk was chosen as the maximum audio-input level. This input produces a 0.3-volt pk-pk double-sideband output at the collector of Q20. If this signal is observed on an oscilloscope whose horizontal sweep is provided from the audio input, a bow-tie² pattern will be seen. The bow-tie display was used extensively when using the dsb signal as a test input to other circuits because any nonlinearity could be easily seen.

² Grammer, "Sideband Scope Patterns," *QST*, August, 1964.

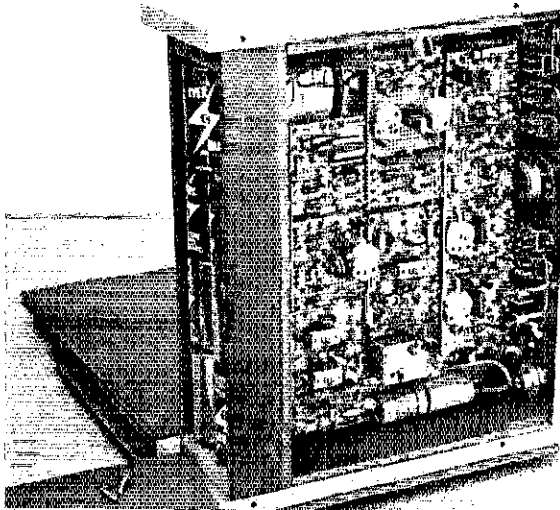
Fig. 5 — Bottom view of the transceiver. The size-D cells that power the rig are contained in a compartment at the rear of the unit. The VFO, carrier generator, crystal filter, and portions of the receiver can be seen in this view.



Receiver

The next step was to build a number of i-f stages and to check their gain, stability, and agc characteristics using the dsb test signal from the balanced modulator. The cascode arrangement shown in Fig. 8 worked well. As ONSFE points out, the circuit has good stability and it can be agc controlled without significant detuning so long as the emitter current is kept to approximately 1 mA, or less. Agc action is obtained from a positive voltage which moves negatively as the gain is reduced. The first i-f stage was followed by a second using an identical circuit and by a MOSFET product detector.

The agc system originally proposed by ONSFE is i-f operated. This was tried and discarded in favor of an amplified audio system. The circuit was evolved by keying an audio tone to the balanced modulator, slowly, using an electronic key and watching the gain-control action on the wave form of the recovered audio burst. A scope was connected to the volume control for this test. The signal strength was varied by sliding a clip lead



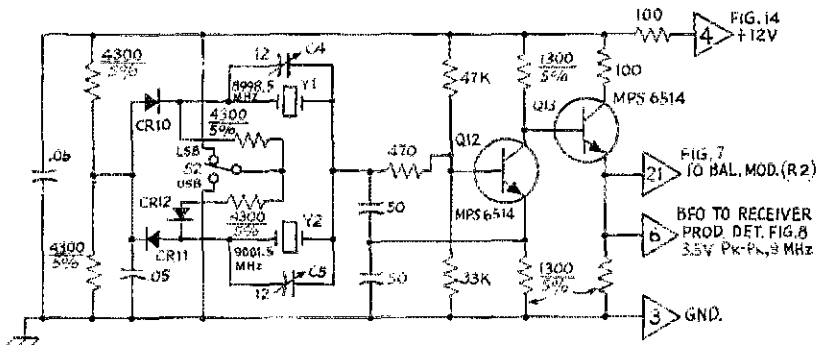


Fig. 6 - Schematic diagram of the BFO section. Unless otherwise marked, resistors are 1/4- or 1/2-watt composition and capacitors are disk ceramic.
 C4, C5 - 3- to 12-pF mica trimmer (Elmenco 420 or equiv.).
 CR10-CR12, incl. - Silicon diodes, 80 PRV, 100 mA (Texas Instrument 1N663 or equiv.).

- Q12, Q13 - Motorola.
 S2 - 3pst slide switch.
 Y1 - 8998.5-kHz crystal for KVG filter (available from Spectrum International, Box 87, Topsfield, MA 01983).
 Y2 - 9001.5-kHz crystal for KVG filter (Spectrum International).

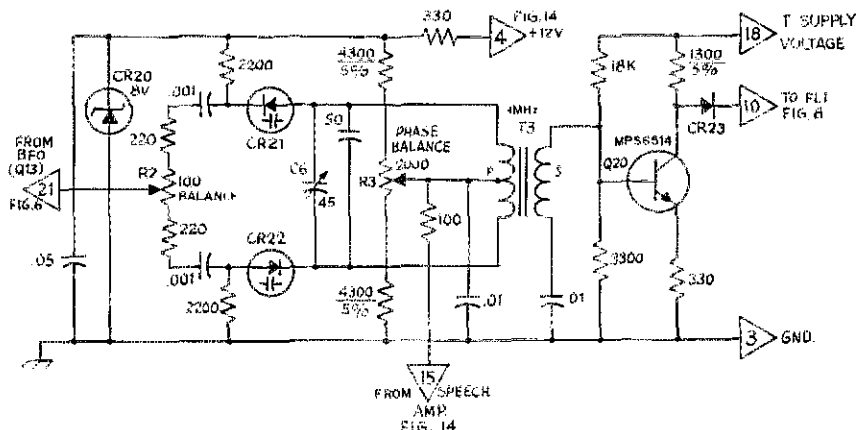


Fig. 7 - Balanced modulator. Unless otherwise marked, resistors are 1/4- or 1/2-watt composition and capacitors are disk ceramic.
 C6 - 7- to 45-pF mica trimmer (Elmenco 462 or equiv.).
 CR20 - 8.2-V Zener diode, 1 watt (Motorola 1N4738 or equiv.).
 CR21, CR22 - 20-pF (nominal) Varicap diode (Motorola MV832 or equiv.).
 CR23 - Silicon diode, 80 PRV, 100 mA (Texas Instrument 1N663 or equiv.).
 Q20 - Motorola transistor.

- R2 - 100-ohm, 1/4-watt, linear-taper composition control, pc mount (Mallory MTC12L1 or equiv.).
 R3 - 2000-ohm, 1/4-watt, linear-taper composition control, pc mount (Mallory MTC23L1 or equiv.).
 T3 - Primary, 28 turns No. 30 enam. wire, center tapped; secondary, 6 turns No. 30 enam. wire, wound on Amidon T-50-2 core (Amidon Associates, 12033 Otsego Street, North Hollywood, CA 91607).

connected to the balanced modulator output around on the top of the bench near the i-f input. R7 regulates the detected signal amplitude to 4 volts pk-pk at the volume control. C13 is selected to give a fast attack, while C14 determines the recovery time.

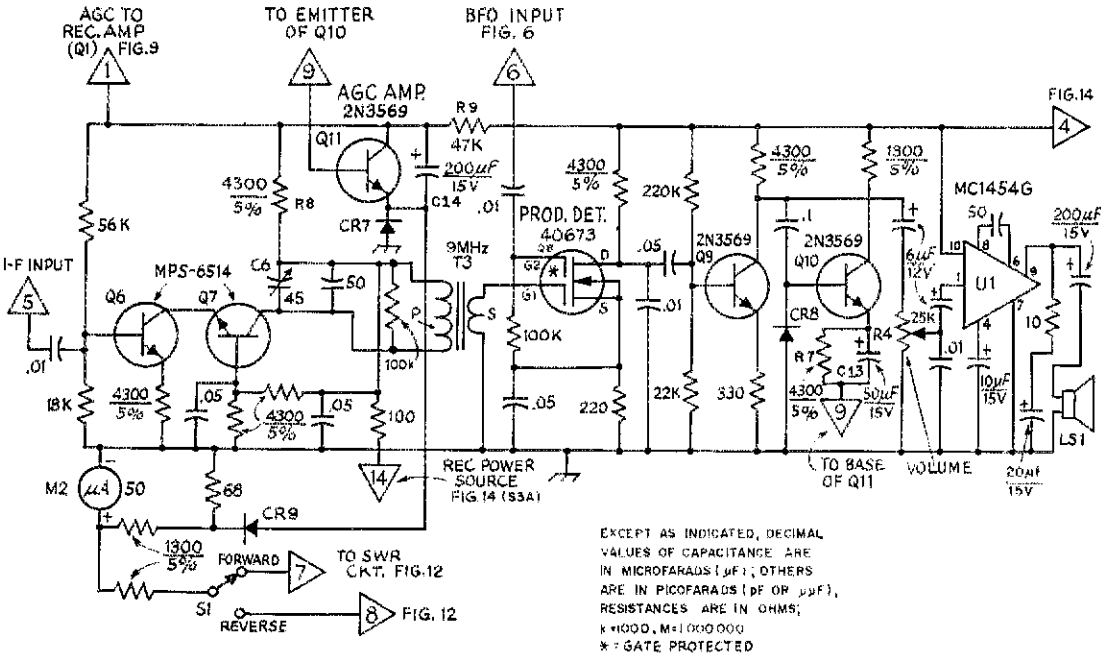
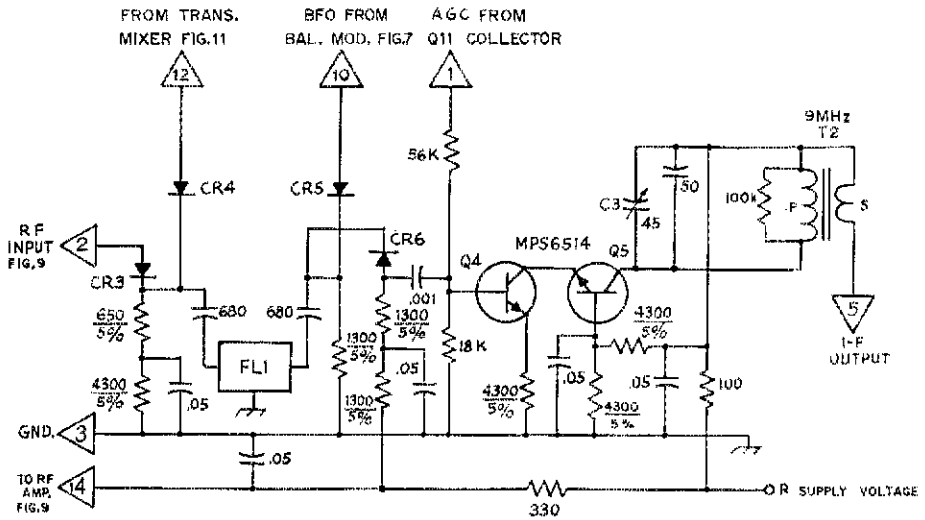
The 1-watt audio power amplifier is an MC1454G Motorola IC, which is similar to the HFPS93. It produces good audio quality into either an 8- or a 16-ohm load impedance.³ Two

3-inch-diameter 8-ohm speakers, connected in series, are used in the Flashlight Sidebander.

With the two i-f stages, product detector and audio amplifier connected together, enough gain is available to hear signals simply by haywiring a link from an antenna tank circuit into the base of Q4 and injecting a few millivolts of rf energy to serve as a local oscillator. This is a worthwhile experiment which serves to check progress on the construction of the receiver.

The i-f filter and the front end, Fig. 9, were then added to complete the receiver. The total gain

³ DeMaw, "A 1-Watt Solid-State Audio Module," *QST*, May, 1970.



EXCEPT AS INDICATED, DECIMAL VALUES OF CAPACITANCE ARE IN MICROFARADS (μF); OTHERS ARE IN PICOFARADS (pF OR μpF); RESISTANCES ARE IN OHMS; K=1000, M=1,000,000 * = GATE PROTECTED

Fig. 8 — Sideband filter plus the receiver i-f amplifier, product detector and audio-output circuit. Unless otherwise marked, resistors are 1/4- or 1/2-watt composition and capacitors are disk ceramic, except those with polarity marked, which are electrolytic.

- C3, C6 — 7- to 45-pF mica trimmer capacitor (Elmenco 462 or equiv.).
- CR3-CR9, incl. — Silicon diode, 80 PRV, 100 mA (Texas Instrument 1N663 or equiv.).
- FL1 — KVG XF9A 9-MHz crystal filter. (Available from Spectrum International, Box 87, Topsfield, MA 01983).
- LS1 — 16-ohm speaker (see text).
- M2 — Microammeter (imported type).
- Q4-Q7, Q9-Q11, incl. — Motorola transistor.

- Q8 — RCA MOSFET.
- R4 — 25k-ohm composition control, 1/4 watt, panel mount.
- S1 — Spdt slide switch.
- T2, T3 — Primary, 26 turns No. 30 enam. wire; secondary 6 turns No. 30 enam. wire, wound on Amidon T-37-2 form.
- U1 — Audio-amplifier IC (Motorola MC1454G or HEP593).

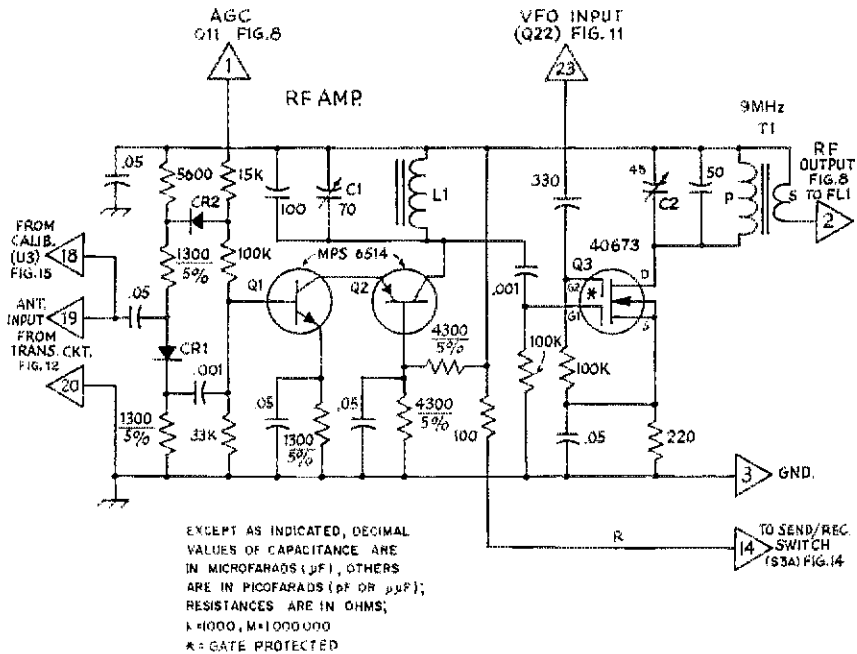


Fig. 9 — The receiver rf amplifier. Unless otherwise marked, resistors are 1/4- or 1/2-watt composition and capacitors are disk ceramic. C1, C2 — 7- to 70-pF mica trimmer (Elmenco 462 or equiv.). CR1, CR2 — Silicon diode, 80 PRV, 100 mA (Texas Instruments 1N663 or equiv.).

- L1 — 40 turns No. 30 enam. wire wound on Amidon T-37-2 toroid core.
- Q1, Q2 — Motorola transistor.
- Q3 — RCA MOSFET.
- T1 — Primary, 26 turns No. 30 enam. wire; secondary, 6 turns No. 30 enam. wire wound on Amidon T-37-2 toroid core.

available is high enough so that one of the i-f stages could be omitted. This is the reason for the emitter degeneration shown in the diagram of the two i-f stages. The surplus gain results from the fact that the author originally did not plan to use an rf stage but was forced to add one to get away from problems with i-f feedthrough and spurious signals caused by local broadcast stations.

The voltage source for the agc pull-down transistor, Q11, is derived partially from the R line and partially from the +12 line. R8 and R9 are proportioned so that the agc voltage moves toward a level which corresponds to an intermediate value of receiver gain during transmitting periods — i.e., while the R line is dropped. As a result, when the VOX flip-flop switches and the R line comes back on, signals are heard immediately, yet the initial system gain is low enough to avoid amplifying the switching transient to a level where it produces an objectionable "pop" in the speaker.

The silicon diodes in the emitter of Q11 and in the meter circuit act to isolate the S meter from the receiver while transmitting and to prevent pinning the movement in a negative direction when power is removed. It was decided to get double duty from the S meter by connecting it to read forward power from the SWR bridge.

The diodes in the filter circuit function as the transmit/receive switching devices. The diode in the base-signal path of Q1 isolates the receiver

input from the final tank circuit while transmitting. The diode in the bias network of Q1 furnishes agc delay by clamping the agc-derived bias voltage source for the transistor at approximately 4 volts.

It is worth noting that arriving at a working design for the receiver was surprisingly easy and the completed unit was completely free from instability problems. Readers with no previous experience should not hesitate to have a try at it. The key factors seem to be to take the job one step at a time and to refrain from going too far before you know that what you have done already is working. One should remember that a variety of designs is usable with today's semiconductor components.⁴ Since the filter provides essentially all of the i-f selectivity, the required gain can be obtained with either i-f or af amplification. The precise choices one makes on gain distribution are influenced by the need to provide an electronic gain change capability for agc purposes in some part of the system, and by the desirability of an rf stage to provide discrimination against image and spurious responses. (Part 2 of this article will appear in a subsequent issue of *QST*.)

⁴ Hayward, "A Second-Generation MOSFET Receiver," *QST*, December, 1970; Hayward and Bingham, "Direct Conversion — A Neglected Technique," *QST*, November, 1968; DeMaw, "More Thoughts on Solid-State Receiver Design," *QST*, January, 1971.

TO CHECK KEYING, an amateur needs an oscilloscope and an automatic device to key his transmitter.^{1,2,3} Those who own an electronic keyer have a suitable means to send high-speed dots as a test signal. Those hams who use a "bug" or hand key can build the simple test keyer described in this article.

The unit, called the Dit Ditter because it can only send dots, is shown in Fig. 1. It consists of a unijunction-transistor oscillator (which can be set to provide a keying speed between 25 and 50 wpm) and a multivibrator using two SCRs, Q2 and Q3. Control R1 determines the rate at which dots will be produced. Capacitor C1 charges through R1; when the base-breakdown voltage of Q1 is reached, the unijunction transistor fires, developing a pulse which is passed to Q2. When Q3 is activated, current flow will start through the coil of K1, closing the relay contact. Then Q2 will fire on the next pulse from the oscillator, turning off Q3 and allowing K1 to open. Power for the Dit Ditter may be obtained from a 12-volt dc source. One of the small ac-operated units sold for use with transistor bc radios (such as the Midland 18-112B) will do.

The only precaution necessary when using the test keyer is to assure that the contact rating of the relay is not exceeded. No problem should be encountered with rigs which employ grid-block keying, as the current to be switched is quite small. Cathode-keyed transmitters draw sufficient current through the relay contact to require a protection network. Table 1 lists suitable values.

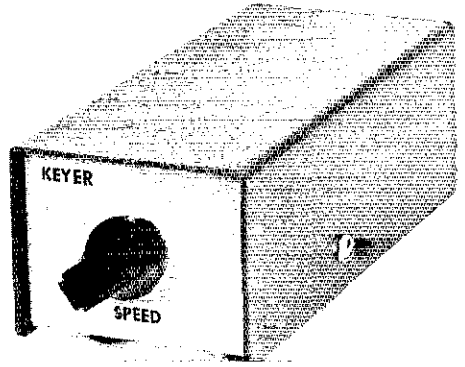
(Continued on page 51)

* Asst. Technical Editor, *QST*.

1 Grammer, "Why Key Clicks?" *QST*, October, 1966.

2 Grammer, "Low-Level Blocked-Grid Keying," *QST*, November, 1966.

3 Grammer, "Oscilloscope Setups for Transmitter Testing," *QST*, October, 1964.



The Dit Ditter

A Test Keyer for Cw Transmitters
BY DOUGLAS A. BLAKESLEE,* W1K1K

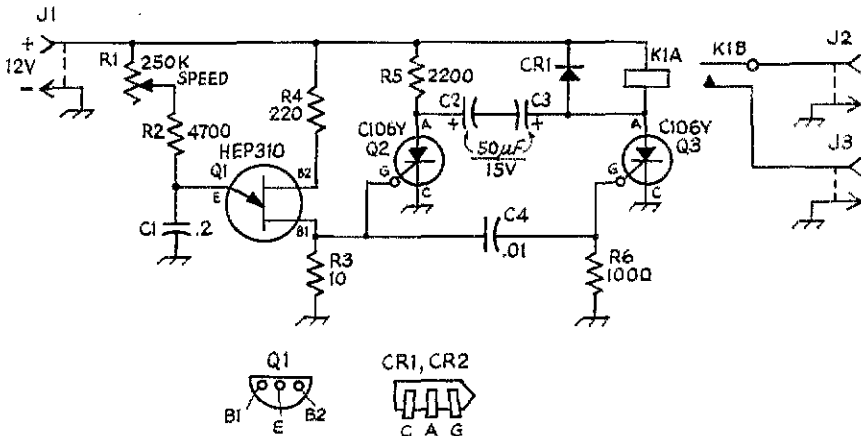


Fig. 1 — Schematic diagram of the keyer. Unless otherwise noted, resistors are 1/2-watt composition and capacitors are disk ceramic or mylar, except those with polarity marked, which are electrolytic. Component designators not listed below are for circuit-board location purposes.

J1-J3, incl. — Panel-mount jack, phono type.

K1 — Miniature spst reed relay, 12-V coil (Magne-craft W101MX-2 or equiv.).

Q1 — Motorola unijunction transistor.

Q2, Q3 — GE silicon-controlled rectifier.

R1 — Linear-taper composition control, 1/2 watt.

A 2-Meter Preamplifier for Repeaters

BY DOUG DeMAW,* WICER

THE PREAMPLIFIER used ahead of the repeater receiver must be based on something more than casual design if good performance is to be realized. Special attention must be paid to selectivity, and the noise figure should be low enough to assure the kind of sensitivity desired by most repeater operators — 0.2 μ V or less for 20 dB of quieting. Transient and rf-burnout protection represent the remainder of the criteria for successful use at the repeater site.

While some groups have had success with solid-state preamplifiers, others have decried the reliability of transistorized preamps, mainly because of overloading, IMD, and susceptibility to device damage from static discharges and line transients. Certainly tube-type equipment is less subject to catastrophic failure from the foregoing causes, but a properly designed solid-state preamplifier can hold its own when competing against a vacuum-tube equivalent. The unit treated here meets the design specifications of most amateur repeaters. Precautions have been taken to prevent the usual problems inherent in homemade preamps.

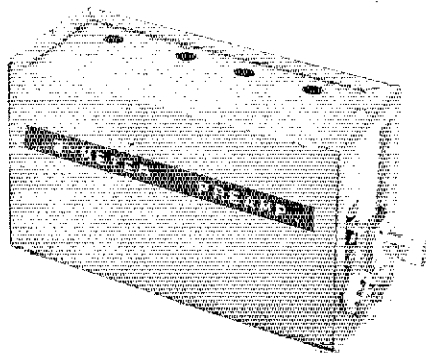
Problems at the Site

Repeater sites, especially in metropolitan areas, are usually bespiked with myriad commercial transmitting antennas. The site is shared in most instances, and if energy abounds on a host of frequencies above and below that of the amateur repeater. The net result is the probability of receiver desensing, IMD within the receiver front end, in the outboard preamplifier, or in both.

Since most repeaters are situated on high buildings or land masses, the equipment is more likely to be damaged by lightning strokes than it would be at some lower level. Also, if high-power commercial transmitters are being served by the same ac lines that feed the amateur repeater, line transients can occur frequently, resulting from switching functions at the commercial installations. If the transients are sufficiently high in magnitude they can destroy transistors instantly. These problems, then, must be considered when designing any equipment for use at the repeater site.

Design Philosophy

With reliability and good performance the keywords, FETs seemed like the best candidates for the equipment under discussion. JFETs were chosen over gate-protected MOSFETs because the former can sustain up to 80 volts pk-pk, gate to



source, before being damaged. Protected MOSFETs are rated at 10 volts maximum pk-pk. Furthermore, the employment of JFETs eliminated four resistors and two capacitors, all of which would have been required in the gate-2 biasing circuits of the MOSFETs.

In the interest of eliminating the need for those sometimes-tricky neutralization circuits, the common-gate configuration was chosen. Common-gate amplifiers provide somewhat less gain than do the common-source types — approximately 10 dB less gain per stage, but by using two stages in common-gate fashion the gain of the preamplifier is more than adequate for most applications. The circuit of Fig. 1 should exhibit a gain of between 15 and 20 dB, depending upon the transconductances of the two FETs picked from the supplier's shelf.

Motorola 2N5484s (MPF106) are used at Q1 and Q2. Alternatively, 2N4416s or 2N4417s can be used if one is willing to pay a bit more money. MPF102s would probably do a good job in the circuit of Fig. 1. Since the 2N5484s are designed for use into the 400-MHz region, they seemed like wise choices for low-noise operation. The noise figure of this preamplifier is somewhat less than 2 dB.

To assure good selectivity, and thereby offer reasonable immunity to nearby out-of-hand commercial signals, high- Q tuned circuits are employed. The section between Q1 and Q2 is a band-pass type, lightly coupled by means of a 2-pF silver-mica capacitor. Lighter coupling will provide greater selectivity, but with an attendant loss in gain. Aperture coupling can be used in place of the method shown. If so, the aperture size must be adjusted to establish the gain and selectivity desired by the user.

Source bias is used in each stage to prevent the amplifiers from saturating in the presence of strong signals. The sources are tapped down on their respective tuned circuits to prevent loading and to provide impedance matching.

As an aid to stability each stage has a 10-ohm resistor between its drain and the related tuned circuit. The photo shows the drains being tapped

* Technical Editor, QST.

down on the tuned circuits — an earlier method used to achieve stability. However, the gain of the preamplifier was somewhat less when using that arrangement. Better results can be had by using the 10-ohm resistors and connecting them to the stators of C2 and C4.

Decoupling networks are used between the stages (220-ohm resistors and .001- μ F bypass capacitors) to prevent interstage coupling along the 12-volt supply line. Filtering at rf is provided by using RFC1 and another .001- μ F feedthrough capacitor, thus helping to prevent unwanted rf from entering the preamplifier on the dc supply line.

Rf burnout protection is offered by two 1N914 diodes (back to back) connected from the source tap on L1 to ground. The diodes are located at an impedance point which is higher than that of the 50-ohm antenna tap. This means that the diodes will conduct sooner at the source tap because the rf-voltage level from static discharge or abnormally strong signals will always be greater at that point than at the 50-ohm terminal. No change in

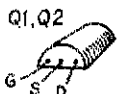
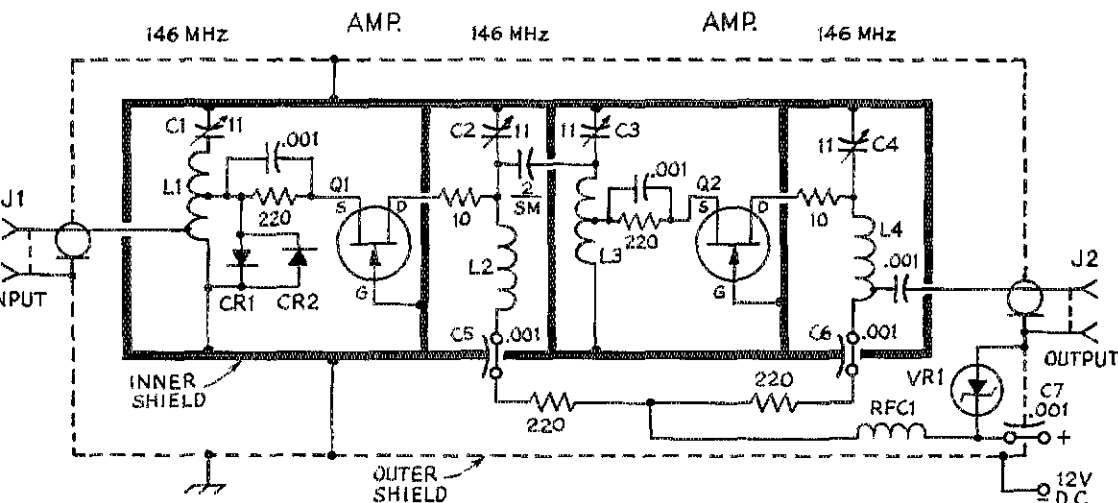
amplifier performance could be noted after adding the diodes.

Protection from any abrupt increase in supply voltage, brought about by ac-line transients, is afforded by the use of a 15-volt, 1-watt Zener diode (VR1) which is connected between the 12-volt supply line and chassis ground.

Construction Information

Examination of the photographs will show that two boxes are used in the construction of the preamp. The inner box is made from double-sided copper-clad pc board. It measures 4-1/2 x 7-7/8 x 1-1/4 inches. The box walls and the partitions are soldered in place by using a 100-watt soldering iron with a small-diameter tip. The metal surfaces of the pc-board sections are silver-plated, though the plating is not necessary as far as circuit performance is concerned. The plating does, however, retard tarnishing and makes soldering somewhat easier.

The input and output rf connections, and those between the compartments, are made by means of

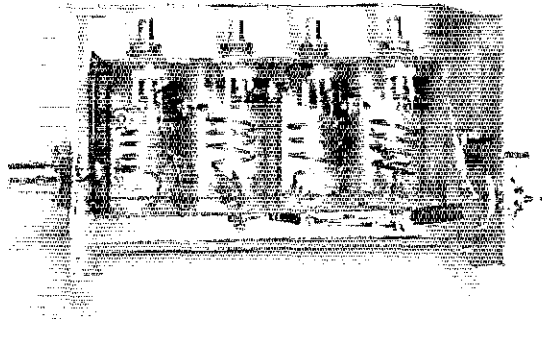


EXCEPT AS INDICATED, DECIMAL VALUES OF CAPACITANCE ARE IN MICROFARADS (μ F); OTHERS ARE IN PICOFARADS (pF OR μ pF); RESISTANCES ARE IN OHMS; k=1000, M=1000000

Fig. 1 — Circuit diagram of the preamplifier. Heavy lines indicate the pc-board shield box and dividers. The outer shield box is shown in dashed lines. Fixed-value capacitors are disk ceramic unless otherwise noted. S.M. indicates silver mica. Resistors are 1/2 watt carbon.

- L1, L3 — 3-1/2 turns No. 14 tinned bus wire, 1/2 inch ID X 3/4 inch long. Tap source at 1-3/4 turns from trimmer end. Tap L1 also at 1/2 turn from ground.
- L2, L4 — 3-1/2 turns No. 14 tinned bus wire, 1/2 inch ID X 3/4 inch long. Tap L4 1/2 turn above C6.
- Q1, Q2 — Vhf or uhf JFET (see text). Keep gate lead as short as possible, 1/8 inch or less.
- RFC1 — 144-MHz rf choke, approximately 2.7 μ H. (James Millen 34300-2.7 or equivalent. Alternatively, wind 20 inches of No. 30 enam. wire on the body of a 2700-ohm, 1-watt carbon resistor. Use pigtailed as anchor points for ends of winding).
- VR1 — 15-volt, 1-watt Zener diode.

- C1-C4, incl. — 11-pF subminiature air variable (E. F. Johnson 189-564). Piston trimmers or Johnson 160-0104-001 suitable also.
- C5-C7, incl. — Feedthrough capacitor.
- CR1, CR2 — High-speed silicon switching diode. 1N914 or equivalent.
- J1, J2 — Coaxial connector of builder's choice. (Type BNC used in this model.)



small Teflon push-in feedthrough terminals which were obtained as surplus.¹ The source-bias resistors and bypass capacitors are attached to Teflon standoff posts obtained from the same supplier. Satisfactory substitutes for the feedthrough bushings can be fashioned from short lengths of RG-59/U coax with the vinyl jacket and shield braid removed. Epoxy cement can be used to hold the homemade bushings in place.

Once the circuit is assembled in its pc-board enclosure the subassembly can be installed in a Minibox which measures 5-1/4 x 3 x 2-1/8 inches.

Adjustment and Use

Connect the preamplifier ahead of the fm receiver with which it is to be used. Apply 12 volts

¹The John Meshna Company, Box 62, E. Lynn, MA 01904 (catalog available).

The inner compartment is fashioned from double-clad pc-board sections (see text). The four coils are centered in their compartments. Q1 and Q2 are mounted by their leads, keeping the latter as short as possible. *Do not use pc-board sockets for mounting the JFETs.* The decoupling-circuit components are located outside the pc-board enclosure. Holes are drilled in the Minibox cover opposite each trimmer-capacitor shaft to permit adjustment when the box is closed.

dc to the preamp, then supply a low-level signal to Q1 via J1. Peak each tuned circuit for maximum response by observing the 1st-limiter-current reading of the fm receiver. The unit should then be ready to use.

This preamplifier was used ahead of a Motorola 5-pipe Sensicon receiver during all tests. The "barefoot" fm receiver provided 20 dB of quieting with a 0.4- μ V input signal. With the preamp installed it was possible to obtain 20 dB of quieting with somewhat less than 0.1- μ V of input signal. Measurements were made with an ac voltmeter calibrated in dB. A Measurements Corp. Model 80 signal generator with a 6-dB pad supplied the test signal.

Selectivity is such that retuning of the preamp is required when the receive frequency is changed 100 kHz or more. Excellent immunity to IMD and overload is assured by the use of FETs. **QST**



July 1922

... "Superregeneration - An Invention of Tremendous Importance to the Amateur": There was a heading to catch the eye! The prediction was premature; ten years were to go by before the superregen attained prominence in amateur work - and then in a field, vhf, not even thought of in that summer of 1922. Editor Warner had written the article immediately after attending Armstrong's presentation, and information on practical circuits was promised later.

... News of interest to all amateurs was that the first Hoover Cup, for the best all-around amateur station of 1921, was awarded Louis Falconi, 5ZA. 5ZA is described in detail. The rules stipulated that the station should be homemade - which may surprise those who believe manufactured gear is strictly of the present!

... The White Bill for regulating radio, pending before Congress, was printed in full. One section proposed fees for both station and operator licenses; for amateurs \$2.50 per year for the station, 50 cents for the operator. It was never adopted.

... Pictured are some items you can still see in the ARRL Museum: The famous English top hat Warner won because of Godley's success in the 1921 Transatlantics, and a British receiver with tubes and controls on a horizontal panel.



July 1947

... The big story is an account of amateur relief-communications work in the Texas-Oklahoma tornado and the devastating explosions in Texas City. Both disasters had occurred in April, separated by only one week. The article, based on on-the-spot observations by QST Managing Editor McKean, is illustrated by many pictures of ham emergency stations in action.

... The resistance-bridge SWR indicator makes its debut in an article by W2MYH, W2LV, and W2TW, under the title "A Standing-Wave Meter for Coaxial Lines." (The original Micromatch, described a few months earlier, had been designed primarily for balanced lines.) The same issue has a follow-up on the Micromatch, giving useful tips on improving the original version.

... May, traditionally the month for sporadic-E outbreaks on vhf, was unusually "hot" this year, as reported in "The World Above 50 Mc." New 6-meter records were made, more states were added to the accumulating roster of "worked," even international contacts had been managed.

... Appearing under the heading "Atlantic City Report" is the first of a series about "Atlantic City 1947," the outcome of which was to settle our international frequency assignments to this day. It's mostly about the organization of the conference work, no decisions having been reached in the first two weeks. - W1DF

Improving Cw Reception on the SB-303

BY MORT WATERS,* W2NZ

DESPITE THE already excellent performance of the Heath SB-303 receiver, I made it more to my liking with an easy-to-do modification which enables me to listen to cw signals at a much lower pitch than before. I also found a surprising improvement in another way that was completely unexpected.

In its stock form, a '303 equipped with a 400-Hz cw filter normally produces a beat note of about 1000 Hz when the desired signal is centered in the passband. This can, of course, be varied a couple of hundred hertz either way, merely by shifting the main tuning. Beyond these points, however, signal strength diminishes very rapidly as the signal slides off the filter's steep skirts.

The Circuit Modification

The '303 has one BFO crystal (Y604, 3396.4 kHz) for both upper sideband and cw reception. To lower the beat note for cw to one more

* 82 Boston Ave., Massapequa, NY 11758.

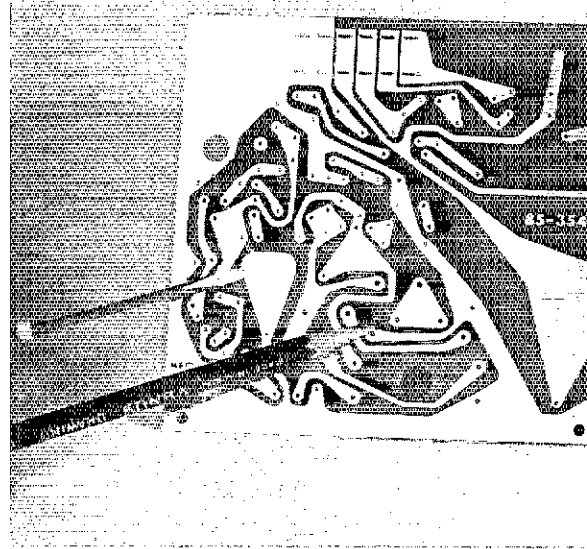


Fig. 1 — The BFO circuit board of the Heath SB-303 receiver. The pencil point indicates where the cw contact of the MODE switch is connected (both before and after modification) and the screwdriver point indicates where the additional crystal is placed during modification for improved cw reception.

pleasing to many ears, it would be necessary to change this frequency, while retaining it for upper sideband operation. It was apparent, therefore, that an extra crystal would have to be added, to be switched into operation in the cw mode.

I examined the BFO circuit board (Part No. 85-354) to see what could be done. A piece of foil in the shape of an equilateral triangle (indicated by pencil in Fig. 1) tied together two contacts on the switch wafer which were fed from the original crystal in both usb and cw. The corner of the foil nearest the pencil point was the cw contact; it had to be separated from the rest of the triangle. That was easy. I broke the continuity of the foil by grinding a narrow path through it with a tiny abrasive wheel in a Dremel Moto-Tool. The best location for the new crystal appeared to be in the area occupied by the balloon-shaped foil to the left of the triangle (indicated by screwdriver point in photo). This space was unoccupied on both sides of the board. I ground off most of the balloon, leaving only two small isolated pieces of foil where I then drilled holes for the crystal pins. A new 3396.4-kHz crystal was obtained from Heath, "plugged in" on the top of the board, then soldered to the little foils. A short length of insulated wire was added to connect one pin of the crystal to the switch contact just made available (see Fig. 2). The other crystal pin was jumpered to the adjacent foil, which is common to one pin of each of the three standard crystals.

(Continued on page 47)

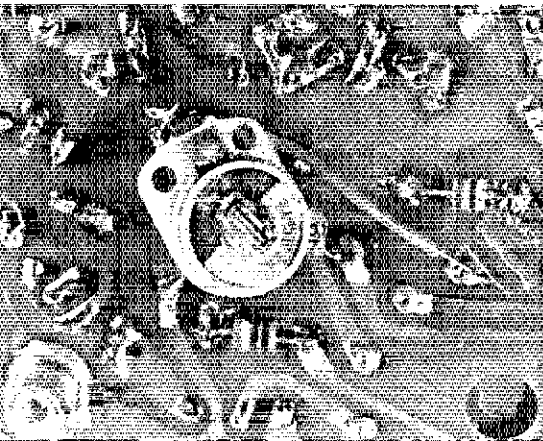
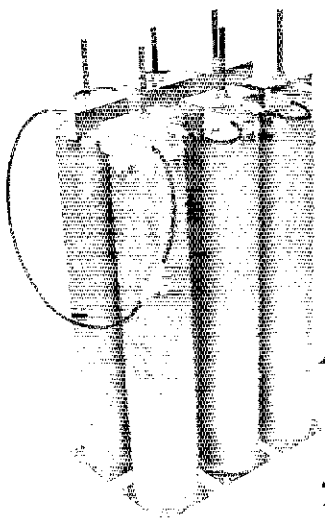


Fig. 2 — The modified BFO circuit board. The added crystal, mounted on the opposite side of the board, is connected in parallel with the trimmer capacitor shown in this view.



A Homemade Duplexer for 2-Meter Repeaters

Good Isolation at 600-kHz Spacing

BY JOHN J. BILODEAU,* WIGAN

ONE OF THE MAJOR technical problems encountered in putting a repeater on the air is obtaining sufficient signal isolation between the receiver and the transmitter. Many of the solutions to this problem involve a compromise in receiver sensitivity, transmitter power output, and imbalance between receiver and transmitter coverage. When a duplexer** is used, the compromise is in the form of insertion loss. Any disadvantage caused by the small insertion loss is more than offset by the use of one antenna for both transmitting and receiving, thereby assuring equal coverage for both.

Duplexers have been in use by many commercially operated repeaters for quite a number of years.^{1,2} Many of these systems use a frequency separation of 2-percent or more between input and output channels. Most amateur repeaters in the 2-meter band have a frequency separation of only 0.4 percent. The problem of providing good isolation gets more complex as the frequency separation decreases.^{3,4,5} The requirements for a

* 4 Ord Street Court, Salem, MA 01790.

** [EDITOR'S NOTE: A Duplexer is a device that will allow simultaneous transmission and reception while using the same antenna. A Duplexer will permit the use of two transmitters with a common antenna.]

¹ Bryson, "Design of High Isolation Duplexers," *IEEE Transactions on Vehicular Communications*, March, 1965.

² Tilston, "Simultaneous Transmission and Reception with a Common Antenna," *IEEE Transactions on Vehicular Communications*, August, 1962.

³ O'Brien, "Improving the Fm Repeater Transmitter for Amateur Use," *Ham Radio*, October, 1969.

⁴ Epp, "Plain Talk About Repeater Problems," *Ham Radio*, March, 1971.

⁵ Tilton, "A Trap Filter Duplexer for 2-Meter Repeaters," *QST*, March, 1970.

A six-cavity duplexer for use with a two-meter repeater. The cavities are fastened to a plywood base for mechanical stability. Short lengths of double-shielded cable are used for connections between individual cavities. An insertion loss of less than 1.5 dB is possible with this design.

duplexer can be summed up as follows: it must attenuate the transmitter carrier so that it does not overload the receiver and thereby reduce its sensitivity. It must also attenuate any noise or spurious frequencies from the transmitter on or near the receive frequency.^{6,7} In addition, a duplexer must provide a proper impedance match between transmitter, antenna, and receiver. Fig. 1 will help the reader to visualize these functions. Transmitter output on 146.94 MHz going from point C to D should not be attenuated. However, the transmitter energy should be greatly attenuated between points B and A. Duplexer section 2 should attenuate any noise or signals that are on or near the receiver input frequency of 146.34 MHz. For good reception the noise and spurious signal level must be less than -130 dBm (0 dBm = 1 milliwatt into 50 ohms). Typical transmitter noise 600 kHz away from the carrier frequency is 80 dB below the transmitter power output. For 60 watts of output (+48 dBm), the noise level is -32 dBm. The duplexer must make up the difference between -32 and -130 dBm or -98 dBm.

The received signal must go from point B to A with a minimum of attenuation. Section 1 of the duplexer also must provide enough attenuation of the transmitter energy to prevent receiver overload. For an average receiver, the transmitter signal must be less than -30 dBm to meet this requirement. The difference between the transmitter output of +48 dBm and the receiver overload point of -30 dBm must be made up by duplexer section 1.

One thing that many duplexers have in common is the use of high-Q coaxial cavities. The loaded Q of a cavity is affected by electrical conductivity

⁶ Gifford, "The Knee of the Nose," *IRE Transactions on Vehicular Communications*, June, 1954.

⁷ Shepherd and Smith, "The Gaussian Curse — Transmitter Noise Limits Spectrum Utilization," *IRE Transactions on Vehicular Communications*, April, 1958.

and dielectric losses. Surface loss can be reduced by silver plating, although clean copper is adequate. Air-dielectric cavities are the most practical for use in amateur duplexers.

The Circuit

A 1/4-wavelength resonator was selected for this duplexer design. The length of the center conductor is adjusted by turning a threaded rod, thereby tuning the cavity to frequency. Energy is coupled into and out of the tuned circuit by the coupling loops extending through the top plate. The cavity functions as a series-resonant circuit. When a capacitor or inductor is connected across a series-resonant circuit, an antiresonant notch is produced, and the resonant frequency is shifted. The addition of a capacitor across the cavity causes the notch to occur below the resonant frequency. Addition of an inductance will cause the notch to appear above the resonant frequency. The value of the capacitor or inductor will determine the spacing between the notch and the resonant frequency.

Fig. 2 shows the bandpass characteristics of the cavity with shunt elements. With the cavity tuned to 146.94 MHz, and a shunt capacitor connected from input to output, a signal at 146.34 was attenuated 35 dB. With a cavity having an inductance across it, and tuned to 146.34, the attenuation at 146.94 was 35 dB. Insertion loss in both cases was 0.4 dB. Three cavities with a shunt capacitor were tuned to 146.94 and connected with short lengths of coaxial cable. The attenuation of 146.34 was more than 100 dB, while insertion loss was 1.5 dB. Response curves for a six-cavity duplexer are given in Fig. 3. The schematic diagram for the complete duplexer is shown in Fig. 5.

Construction

Three parts for each cavity must be machined; all others can be made with hand tools. A small lathe for metal work will be adequate for the machine work on the brass top-plate, the threaded tuning-plunger bushing, and the Teflon insulator

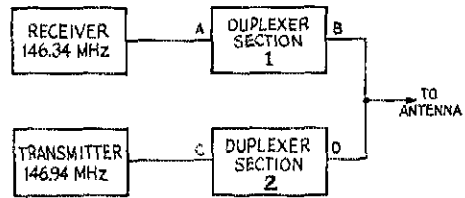


Fig. 1 - Duplexers are used to permit using one antenna for both transmitting and receiving. Section 1 prevents transmitter energy from interfering with the receiver, while section 2 keeps the received signal from reaching the transmitter.

bushing. The dimensions to which these parts must be machined are given in Fig. 4.

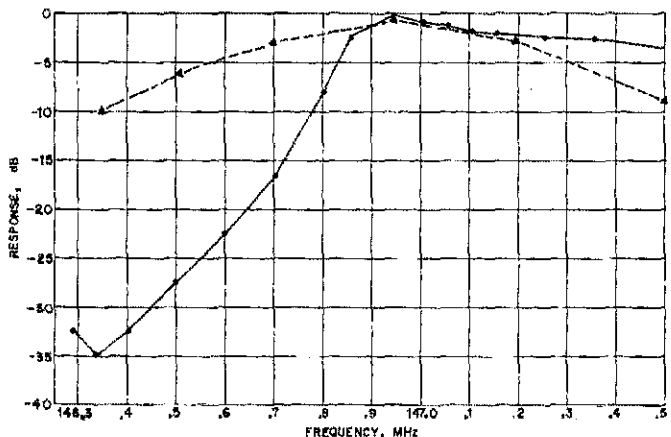
Type "DWV" copper tubing is used for the outer conductor of the cavities.[†] The wall thickness is .058 inch, with an outside diameter of 4-1/8 inches. At the time of purchase of the tubing, it would be wise to borrow a tubing cutter large enough to cut this size tubing to the correct length. The wheel of the cutter should be tight and sharp, and the cuts should be made slowly and with care so the ends will be square. The outer conductor is cut to a length of 22-1/2 inches.

The inner conductor is made from type "M" copper tubing having an outside diameter of 1-3/8 inches. A piece of 1-inch OD brass tubing, 6 inches long, is used to make the tuning plunger.

Soft solder is used throughout the assembly. Silver solder is not recommended unless the builder has extensive experience with its use. Eutectic type 157 solder with paste or acid flux will provide very good joints. This type has a slightly higher melting point than ordinary lead-tin alloy but has considerably greater strength.

[†] [EDITOR'S NOTE: The tubing types, such as DWV or M, are designations used in the plumbing or steamfitting industry. Other types may be used in the construction of a duplexer, but the builder should check the sizes carefully to assure that the parts will fit each other. Tubing with a greater wall thickness will make the assembly heavier, and the expense will increase accordingly.]

Fig. 2 - Typical frequency response of a single cavity of the type used for the duplexer. The dotted line represents one cavity alone, while the solid line is for a cavity with a shunt capacitor connected between input and output. An inductance connected in the same manner will cause the rejection notch to be above the frequency to which the cavity is tuned.





Two of the center conductor and top plate assemblies. In the unit on the left, C1 can be seen just below the tuning shaft. It is mounted by means of short straps made from sheet copper. The assembly on the right has L1 in place between the BNC connectors. The Miniboxes were fastened to the top plate by a single large nut in these examples. The method described by the author, that of using screws through the Minibox into the top plate, should be used for simplicity.

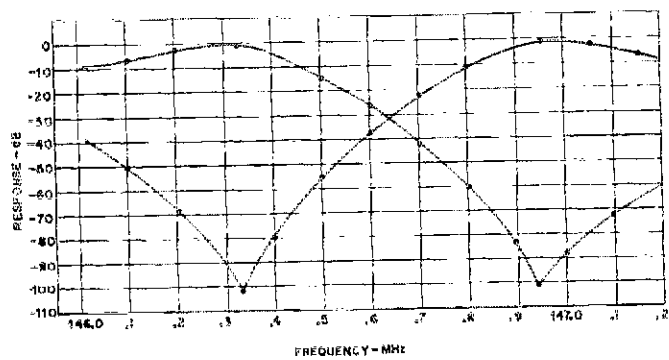
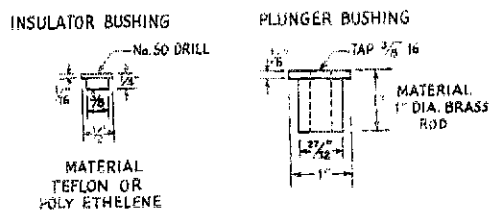
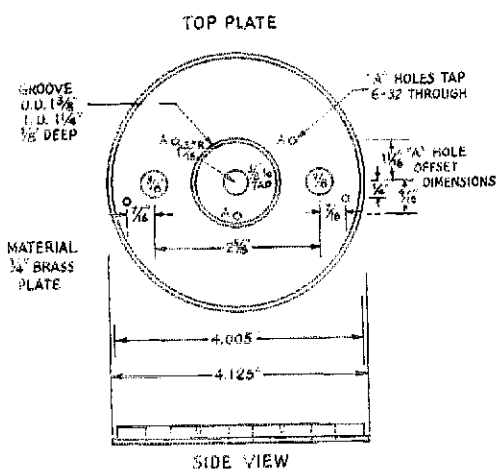


Fig. 3 - Frequency response of a six-cavity duplexer tuned for 146.34-MHz reception and 146.94-MHz transmission.



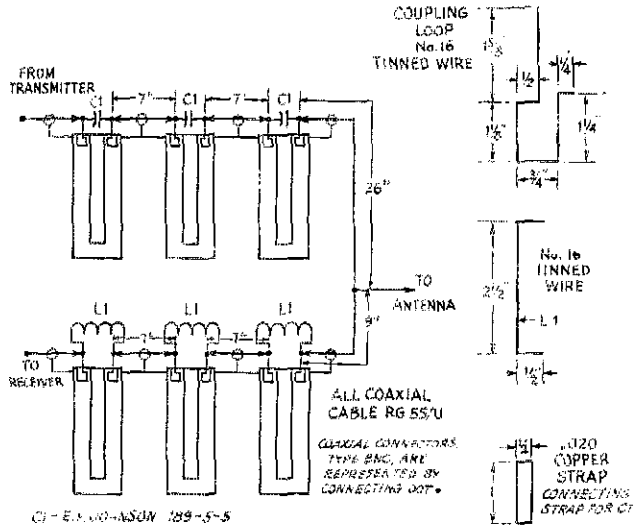
The inner conductor should be soldered to the top plate first. Then the finger stock can be soldered inside the lower end of the inner conductor, temporarily held in place with a plug made of aluminum or stainless steel. Do not allow the flame from the torch to overheat the finger stock while performing the soldering operation. The plunger bushing is soldered into the tuning plunger and a 20-inch length of threaded rod is soldered into the bushing.

Cut six slots in the top of the outer conductor. They should be 5/8-inch deep and equally spaced around the tubing. The bottom end of the 4-inch tubing is soldered to the square bottom plate. The bottom plates have holes in the corners so they can be fastened to a plywood base by means of wood screws. Because the center conductor has no support at one end, the cavities must be mounted vertically.

The size and position of the coupling loops is critical and the dimensions given should be followed closely. Both loops should be 1/8 inch away from the center conductor on opposite sides. A solder lug should be connected to the ground end of the loop and fastened to the top plate with a screw. The free end of the loop is insulated by Teflon bushings where it passes through the top plate to connect to the BNC fittings.

Fig. 4 - Dimensions for the three parts that require machining. A small metal working lathe should be used.

Fig. 5 — Diagram of the six-cavity duplexer. Coaxial cable lengths between sections are critical and should be followed closely. Double shielded cable should be used. The size and shape of the coupling loops, L1, and the straps for connecting C1 should be observed. C1 is set at 3/4 closed for initial alignment.



Before final assembly of the parts, they should be cleaned thoroughly. Soap-filled steel wool pads and hot water should do a fine job. The finger stock should be checked to see that it makes a firm contact with the tuning plunger. The top plate should fit snugly in the top of the outer conductor. A large hose clamp tightened around the outer conductor will fasten the top plate in place.

Tuning

The antiresonant elements, C1 and L1, should not be installed until the cavities have been checked for band-pass and insertion loss as shown by the curve in Fig. 2. The preferred method of tuning the duplexer requires the use of laboratory test equipment to obtain the most accurate measurements. A second method to be described uses a low-power transmitter with an rf detector and a VTVM. Fig. 6 shows the connections for both methods.

With the test equipment connected as shown in Fig. 6A, adjust the signal-generator frequency to the desired repeater input frequency. Connect a calibrated step attenuator between points X and Y. With no attenuation, adjust the HP415 for zero on

the 20-dB scale. The calibration of the 415 can be checked by switching in different amounts of attenuation and noting the meter reading. A small error may be noted at either high or very low signal levels.

Remove the step attenuator and replace it with a cavity that has the shunt inductor, L1, in place. Adjust the tuning screw for maximum reading on the 415 meter. Remove the cavity and connect point X to Y. Set the signal generator to the repeater output frequency and adjust the 415 for a zero reading on the 20-dB scale. Reinsert the cavity between X and Y and adjust the cavity tuning for minimum reading on the 415. The notch should be sharp and have a minimum depth of -35 dB. It is important to maintain this minimum reading on the meter while tightening the locknut on the tuning shaft.

To check the insertion loss of the cavity, the output from the signal generator should be reduced, and the calibration of the 415 meter checked on the 50-dB expanded scale. Use a fixed 1-dB attenuator to see if the error is less than 0.1 dB. Replace the attenuator with the cavity and read the loss. The insertion loss should be 0.5 dB or less. The procedure is the same for tuning all six

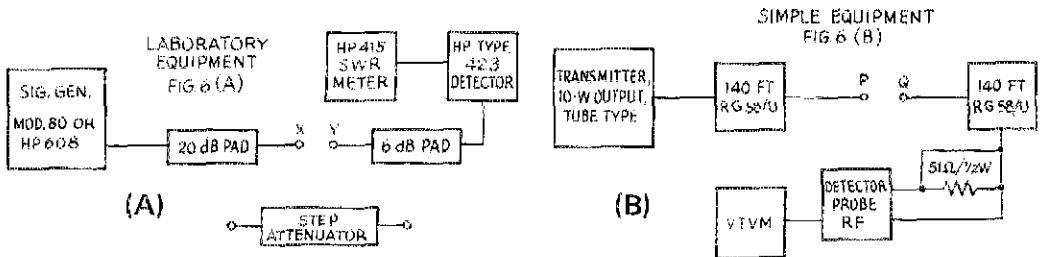


Fig. 6 — The duplexer can be tuned by either of the above two methods, although that of A is the more accurate. The signal generator output should be modulated by a 1000-Hz tone. If the simple equipment as in B is used, the transmitter should not be modulated and should have a minimum of noise and spurious signals. The cavities to be aligned are inserted between X and Y in A and between P and Q in B.

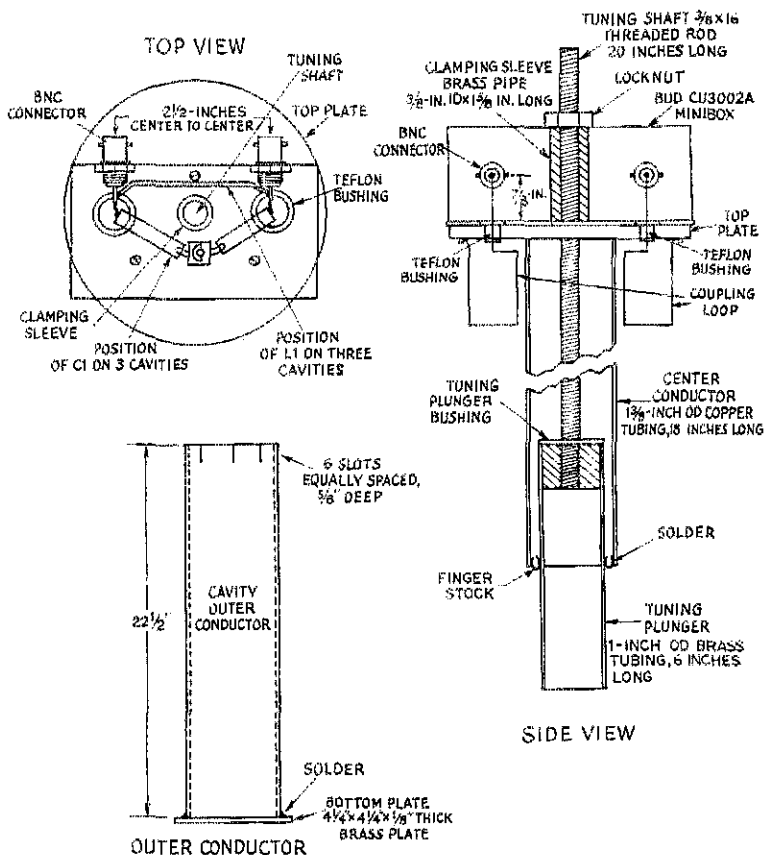


Fig. 7 — The assembly of an individual cavity. A Bud Minibox is mounted to the top plate by means of three screws. A clamping sleeve made of brass pipe is used to prevent crushing the box when the locknut is tightened on the tuning shaft. Note that the position of both C1 and L1 is shown, but that three cavities will have C1 installed, and the others will have L1 in place.

cavities, with the exception that the frequencies are reversed for those that have the shunt capacitor installed.

Adjustment with Minimum Equipment

A transmitter using tubes is preferred for this method of adjustment to assure a minimum of spurious signals that would cause false indications. The VTVM should be capable of reading 0.5 volt or less, full scale. The rf probe should be good to 100 MHz or higher. Sections of RG-58/U coaxial cable are used as attenuators, as shown in Fig. 6B. The loss in these 140-foot sections is near 10 dB and will help isolate the transmitter in case of mismatch during the tuning procedure. The transmitter should be set on the repeater input frequency and P connected to Q. Obtain a reading between 1 and 3 volts on the VTVM. Insert a cavity with shunt capacitors in place between P and Q and adjust the cavity tuning for minimum reading on the VTVM. The reading should be between .01 and .05 volt. Rejection in dB can be calculated by the formula $20 \log V1/V2$ and should be -35 dB, minimum. Insertion loss can be checked by putting the transmitter on the repeater

output frequency and noting the VTVM reading with the cavity in and out of the circuit. A 0.5-dB attenuator can be made from 7 feet of RG-58/U. This 7-foot section can be used to check the calibration of the detector probe and the VTVM. Cavities using a shunt inductance can be tuned in the same manner but with the frequencies reversed. Transmitter noise can cause the rejection readings to be low (less attenuation) if an attempt is made to tune two or more cavities connected together.

Results

At the time of this writing, there are at least 12 of these duplexers in operation in New England. Some of them are in unheated buildings and are subjected to extreme temperature excursions. No serious change in repeater performance was noted. One cavity was checked during a temperature change from 0 to +80°F (I could not fit the whole duplexer in the refrigerator). Rejection changed from -36 dB to -34 dB.

The duplexer is conservatively rated at 150-watts input, but it should be able to withstand up to 300 watts. Silver plating of the interior of

(Continued on page 47)

A Study

of the

DDRR

Antenna

BY ROBERT B. DOME,* W2WAM

I WAS VERY MUCH interested in the article "A 40-Meter DDRR Antenna," by W. E. English, W6WYQ, that appeared on pages 28-31 of the December, 1971, issue of QST. My analysis indicates that the main advantage of the DDRR is its low profile or inconspicuousness, but that the efficiency is rather low, as compared to conventional half-wave dipoles suspended high above the earth.

The DDRR antenna may be described in the more familiar terms as being a short grounded vertical antenna having a horizontal or flat-top extension to provide quarter-wave resonance. As such, the radiation resistance may be determined from existing technical sources. With the resistance known, and from a computation of the surge impedance, it is possible to compute the feed-point impedance, the open-end voltage, and the Q and bandwidth of the antenna. Any actual variation from the calculated impedance would indicate added losses and hence decreased Q, efficiency, and end voltage. It will also be shown that lengthening the vertical section will improve the efficiency. A word also will be given regarding the effect of a shunt-tuning capacitor at the end of the

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antenna and why its capacitance should be held at the minimum possible value.

Radiation Resistance

The radiation resistance is made up of two parts, namely, that owing to the vertical section and that owing to the horizontal section.

(a) Radiation Resistance of Vertical Section.

The antenna under study is one which is a quarter wave in overall length resulting in a current loop at the ground point. The radiation resistance of the vertical portion, referred to the base of the antenna, may be determined from *Electric Oscillations and Electric Waves*.¹ On page 475 is found Table I. For the quarter-wave antenna, the radiation resistance of the vertical portion is obtained by adding R_1 and R_2 because in eq. (107), page 474, for such an antenna length $q = \pi$ radians and $\cos q = -1$ and $\sin q = 0$; likewise $\sin^2\left(\frac{q}{2}\right) = 1.0$. Thus:

$$R_V = R_1 + R_2 \text{ ohms} \quad (1)$$

where R_1 = radiation resistance of the vertical portion. This is shown plotted as curve 1 on the accompanying graph as a function of vertical height expressed in degrees, where $90^\circ =$ a quarter wave.

It will be observed that this curve is a straight line for very short vertical lengths with a slope of 2 on the log-log paper used, thereby indicating that the resistance varies directly as the square (or second power) of the vertical length. For the straight line portion of the curve, the radiation resistance may be computed without reference to the curve by using the equation

$$R_V = 1578 \left(\frac{H}{\lambda}\right)^2 \text{ ohms} \quad (2)$$

where H = antenna vertical height in meters
 λ = wavelength of resonance in meters

Example: If a 40-meter antenna has a height of $H = 0.303$ meters, ($= 1$ ft), then

$$R_V = 1578 \left(\frac{0.303}{40}\right)^2 = .0902 \text{ ohm} \quad (3)$$

This height corresponds to an angular height of

$$\phi = 360^\circ \left(\frac{H}{\lambda}\right) = 360^\circ \left(\frac{0.303}{40}\right) = 2.72^\circ \quad (4)$$

¹ By G. W. Pierce, McGraw Hill Book Co., New York, NY, First Edition (1920).

Some newer amateurs may not recognize the author's name, so a few words about Robert B. Dome are certainly in order. W2WAM holds 115 patents in the fields of transmitters, receivers, and antennas. Perhaps his most famous circuit, and one of particular interest to amateurs, is the Dome phase-shift network, which was used in the early designs of ssb transmitters. If you have access to early issues of QST, you might look up Dome's article on increasing the efficiency of short antennas (September 1934). The paper treats top loading of verticals — still a standard method of improving short antennas. In this excellent analysis of the DDRR antenna, W2WAM points the way to increasing the antenna's efficiency from 2.75 percent to 25.8 percent to effect an increase of 9.8 dB in signal strength!

An inspection of the curves shows that at $H = 2.72^\circ$, $R_p = .09$ ohm, in agreement with the calculated value. Incidentally, the coefficient 1578 also agrees with the figure given in Terman's *Radio Engineers' Handbook*, page 795, eq. (26).²

Since a 40-meter wavelength in feet is 132, it is seen that in eq. (3) above that if H is measured in wavelengths, $H = (1/132)\lambda$ or $.00758\lambda$, which is, of course, a very short antenna. It can be shown that eq. (2) yields results correct to within 1 percent for $H \leq 8.55^\circ$ or $H \leq .0237\lambda$, which at 40 meters wavelength is 3.12 feet. At $H = 8.55^\circ$, the radiation resistance $R_p = 0.89192$ ohm from the Pierce reference, while from eq. (2) the result is 0.900 ohm, a 1 percent discrepancy.

(b) Radiation Resistance of Horizontal Section.

The horizontal section may be regarded as approximately half of a dipole in the horizontal plane and therefore will have radiation resistance. The radiation is directed upward and will not contribute to the field strength along the ground but may be useful to achieve short skip. The radiation resistance is obtained either from Pierce's Table II, page 475, or from his curves on page 476, Fig. 11. These data apply only to a straight run for the horizontal portion. It was more convenient to use the curves than to carry out the more tedious calculations involving r_2 , r_3 , etc. This was done accordingly and the resulting resistances were added to the vertical radiation resistance to obtain curve 2 of the graph. For very short vertical lengths, the total radiation resistance is given by the asymptotic equation

$$R_T = 2620 \left(\frac{H}{\lambda} \right)^2 \text{ ohms} \quad (5)$$

where $R_T =$ total radiation resistance and H and λ are as defined for eq. (2).

The results are in error by less than 1 percent if the vertical length $H \leq .0237\lambda$.

When the horizontal section is curved into a circle as in the DRR antenna, two effects cause the radiation resistance of the horizontal section to decrease. The first is the partial cancellation of the field from one side of the circle by the field from the side of the circle opposite the first. The second is the shortening of the overall length of the horizontal from a straight wire to a circle. The average current over a diameter may be expressed by

$$I_{avg1} = \frac{4I_0}{\pi - 2\theta_1} \left[\int_{\theta_1}^{\theta_2} \cos \theta d\theta - \int_{\theta_2}^{\frac{\pi}{2}} \cos \theta d\theta \right] \quad (6)$$

where the total horizontal wire length is

$$\frac{\pi}{2} - \theta, \text{ radians}$$

and $I_0 =$ the current maximum (at the ground point)

$$\text{and } \theta_2 = \frac{1}{2} \left(\frac{\pi}{2} + \theta_1 \right) = \frac{\pi}{4} + \frac{\theta_1}{2}$$

Integrating eq. (6), there results

$$I_{avg1} = \frac{4I_0}{\pi - 2\theta_1} \left[\sin \theta \right]_{\theta_1}^{\theta_2} - \left[\sin \theta \right]_{\frac{\pi}{2}}^{\theta_2} \quad (7)$$

Example: If the horizontal length is $\frac{\pi}{2}$, then $\theta_1 = 0$ and $\theta_2 = \frac{\pi}{4}$. Substituting these limits in eq. (7),

$$I_{avg1} = \frac{4I_0}{\pi} [0.707 - 0 - 1 + 0.707] = 0.527 I_0 \quad (8)$$

The average current in a straight horizontal wire is given by

$$I_{avg2} = \frac{2I_0}{\pi - 2\theta_1} \int_{\theta_1}^{\frac{\pi}{2}} \cos \theta d\theta = \frac{2I_0}{\pi - 2\theta_1} \left[\sin \theta \right]_{\theta_1}^{\frac{\pi}{2}} \quad (9)$$

with the same definitions as in eq. (6) for θ_1 and I_0 .

Substituting in the same limits as in eq. (8), namely $\theta_1 = 0$,

$$I_{avg2} = \frac{2I_0}{\pi} = 0.636 I_0 \quad (10)$$

In order to cause equal fields for the two examples, the current must be increased in the circular top by the ratio of

$$\frac{I_{avg2}}{I_{avg1}} = \frac{0.636}{0.527} = 1.21 \quad (11)$$

The radiation resistance of the circular antenna must be that of the straight wire divided by 1.21², or

$$\frac{R_{Hcircular}}{R_{Hstraight}} = \frac{1}{1.21^2} = 0.68 \quad (12)$$

As θ_1 increases from 0 upwards (as the vertical height increases), this ratio approaches 1.0.

The second effect requires that the current in the circular antenna be π times that in the straight wire because of the decreased "effective height," where π is the ratio of the circumference of a circle to its diameter; hence the ratio of the resistances is the square of π , or

$$\frac{R_{Hcircular}}{R_{Hstraight}} = \frac{1}{\pi^2} = 0.1013 \quad (13)$$

Thus for very short vertical lengths, the combined effect of eq. (12) and eq. (13) is

$$\frac{R_{Hcircular}}{R_{Hstraight}} = 0.68 (0.1013) = .069 \quad (14)$$

This gradually approaches 0.1013 (or eq. 13) as the vertical height increases. For example at $\theta_1 = 8.55^\circ$, eq. (8) yields

$$I_{avg1} = 0.515 I_0 \quad (15)$$

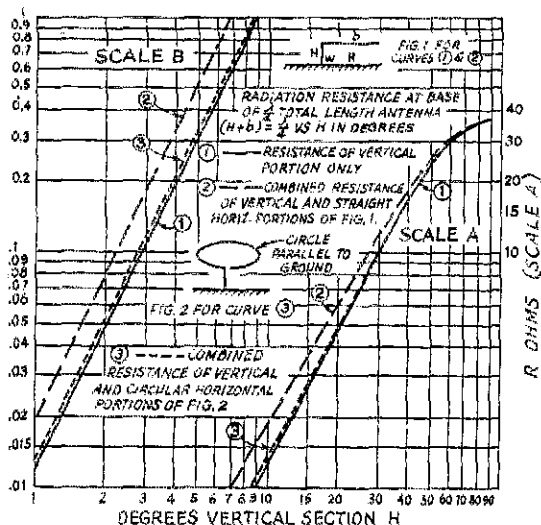
while eq. (10) becomes

$$I_{avg2} = 0.600 I_0 \quad (16)$$

and thus eq. (14) becomes

$$\frac{R_{Hcircular}}{R_{Hstraight}} = \left(\frac{0.515}{0.600} \right)^2 (0.1013) = .075 \quad (17)$$

² McGraw Hill Book Co., New York, NY, First Edition (1943).



Over the range from 0 to 8.55° for the vertical, an average of .072 may be used. The radiation resistance of the DDRR system may be approximated by the value of R_V in eq. (2) plus .072 times the difference between eq. (5) for R_T and eq. (2) for R_V , or

$$R_{H, DDRR} \approx [1578 + .072(2620 - 1578)] \left(\frac{H}{\lambda}\right)^2 \approx 1652 \left(\frac{H}{\lambda}\right)^2 \text{ ohms} \quad (18)$$

This radiation resistance is shown plotted as curve 3 on the graph.

Surge Impedance

The surge impedance is determined principally by the horizontal portion of the DDRR if the vertical length is kept short and the mutual effect of one side of the circle upon the other side is neglected. From transmission line equations the surge impedance is expressed by

$$Z_0 = 138 \log_{10} \left(\frac{2H - r}{r} \right) \text{ ohms} \quad (19)$$

where

H = height of center of conductor above ground and r = radius of the conductor (in the same units).

Thus from page 31 of the *QST* article, which gives $H = 12''$ and $r = 1''$,

$$Z_0 = 138 \log_{10} \left(\frac{2(12) - 1}{1} \right) = 138 \log_{10} 23 = 188 \text{ ohms} \quad (20)$$

Tap-Point Resistance

In matching a feeding transmission line to the DDRR antenna, it is important to know how far up from the ground a given resistance is encountered. The radiation resistance as seen from the open end of the antenna is given by

$$R_E = \frac{Z_0^2}{R_B} \text{ ohms} \quad (21)$$

where Z_0 = surge impedance
 R_B = total resistance at base of antenna including radiation- and ohmic-loss resistances and the antenna overall length = 0.25λ .

If ϕ is the angle from ground to the tap point and 90° is the total antenna length (0.25λ), then the resistance at ϕ is given by

$$R_\phi = R_E \sin^2 \phi \text{ ohms} \quad (22)$$

Substituting eq. (21) for R_E in eq. (22),

$$R_\phi = \frac{Z_0^2 \sin^2 \phi}{R_B} \text{ ohms} \quad (23)$$

Solving eq. (23) for $\sin \phi$,

$$\sin \phi = \frac{\sqrt{R_\phi R_B}}{Z_0} \quad (24)$$

But $\sin \phi \approx \phi$ for small angles; making this substitution in eq. (24),

$$\begin{aligned} \phi &= \sin^{-1} \left(\frac{\sqrt{R_\phi R_B}}{Z_0} \right) \approx \frac{\sqrt{R_\phi R_B}}{Z_0} \text{ radians} \\ &\approx \frac{57.3 \sqrt{R_\phi R_B}}{Z_0} \text{ degrees} \end{aligned} \quad (25)$$

Conversely, if ϕ is given (as by test or experiment) then R_B may be solved for in eq. (24) as:

$$R_B = \frac{Z_0^2 \sin^2 \phi}{R_\phi} \text{ ohms} \quad (26)$$

Q and Bandwidth of DDRR Antenna

The quarter-wave antenna may be regarded as consisting of a resistance R_B in series with an inductance L and a capacitance C where the reactive components balance out at resonance. The inductive reactance is given by Dome in the book *Television Principles*,³ page 104, eq. (5-10) as

$$X_L = 2\pi f_0 L = \frac{Z_{01}\pi}{2} \quad (27)$$

where f_0 is the resonant frequency and Z_{01} = surge impedance as found by eq. (20) above.

The Q of the antenna is thus

$$Q = \frac{X_L}{R_B} = \frac{Z_{01}\pi}{2R_B} \quad (28)$$

The antenna frequency bandwidth, BW , at the -3 dB points is given by

$$BW = \frac{f_0}{Q} = \frac{2f_0 R_B}{Z_{01}\pi} \text{ Hz} \quad (29)$$

where f_0 = quarter-wave resonant frequency in Hz.

Radiation Efficiency of DDRR Antenna

If the total base resistance is R_B and is made up of radiation resistance R_T and ohmic loss resistance R_L , then

$$R_B = R_T + R_L \quad (30)$$

If a certain power W is fed into the antenna system,

$$W = I_0^2 R_B = I_0^2 (R_T + R_L) \text{ watts} \quad (31)$$

where I_0 = antenna current at the base, in amperes.

³ McGraw Hill Book Co., New York, NY, First Edition (1951).

Of this power, the useful radiated power is $I_0^2 R_T$, hence the power efficiency is

$$\eta = \frac{\text{useful power}}{\text{total power}} = \frac{I_0^2 R_T}{I_0^2 (R_T + R_L)} = \frac{R_T}{R_T + R_L} \quad (32)$$

Expressed in decibels,

$$\eta = 10 \log_{10} \left(\frac{R_T}{R_T + R_L} \right) \text{ dB} \quad (33)$$

Expressed as a field strength ratio

$$\eta = \frac{E_B}{E_T} = \sqrt{\frac{R_T}{R_T + R_L}} \quad (34)$$

Voltage at Open End of Antenna

If the transmitter output power delivered to the antenna is W_0 and the open-end resistance of the antenna is that given by eq. (21), then

$$W_0 = \frac{E^2}{R_E} = \frac{E^2 R_B}{Z_0^2} \text{ watts} \quad (35)$$

where E = rms voltage across the open end

R_B = total base resistance $R_T + R_L$

Z_0 = surge impedance

Solving eq. (35) for E ,

$$E = Z_0 \sqrt{\frac{W_0}{R_B}} \text{ volts rms} \quad (36)$$

The peak voltage is $\sqrt{2}$ times the rms voltage, so

$$E_{\text{peak}} = Z_0 \sqrt{\frac{2W_0}{R_B}} \text{ volts (peak)} \quad (37)$$

If the power W_0 represents the carrier power of an amplitude modulated (a-m) wave, and the modulation factor is m , then the peak voltage is given by

$$E_{\text{peak}} = (1 + m) Z_0 \sqrt{\frac{2W_0}{R_B}} \text{ volts} \quad (38)$$

peak at modulation peaks

Performance of Ideal DDDR Antenna

The performance of an ideal DDDR antenna may be determined from various of the above equations assuming that the loss resistance is zero, i.e., that $R_L = 0$.

Assuming the antenna is designed for 40 meters, and that dimensions are as in the QST article except for the position of the tap point, and that the feed line has a surge impedance of 52 ohms and is matched to the antenna at the feed point, then with $H = 1$ foot and $\lambda = 132$ ft, the following may be calculated using the indicated equations.

$$(a) R_T = 1652 \left(\frac{1}{132} \right)^2 = .095 \text{ ohm (from eq. 18)} \quad (39)$$

$$(b) Z_0 = 188 \text{ ohms (from eq. (20) assuming conductor radius is 1")} \quad (40)$$

$$(c) \text{Tap point } \phi = \frac{57.3 \sqrt{52 \times 0.095}}{188} = 0.675^\circ \quad (41)$$

$$\text{(from eq. 25)} \quad (41)$$

$$\text{Distance above ground} = \frac{\lambda \phi}{360^\circ} =$$

$$\frac{132 \times 0.675^\circ}{360^\circ} = 0.248 \text{ ft} = 3 \text{ inches} \quad (42)$$

(d) Resistance at open end of antenna

$$R_E = \frac{Z_0^2}{R_B} = \frac{188^2}{.095} = 372,000 \text{ ohms}$$

$$\text{(from eq. 21)} \quad (43)$$

(e) Radiation efficiency

$$\eta = \frac{R_T}{R_T + R_L} = \frac{.095}{.095 + 0} = 1.0$$

$$\text{(from eq. 32)} \quad (44)$$

(f) Q of antenna

$$Q = \frac{Z_0 \pi}{2 R_B} = \frac{188 \pi}{2(.095)} = 3120$$

$$\text{(from eq. 28)} \quad (45)$$

(g) Bandwidth of antenna

$$BW = \frac{f_0}{Q} = \frac{7,200,000}{3120} = 2300 \text{ Hz}$$

$$\text{(from eq. 29)} \quad (46)$$

(h) Voltage at open end of antenna

Assume 1000 watts input to an a-m transmitter modulated 100 percent, or where $m = 1.0$. If the transmitter is 70-percent efficient, 700 watts carrier power is transmitted. From eq. (38) the peak voltage on positive crests of modulation becomes

$$E_{\text{peak}} = (1 + 1) 188 \sqrt{\frac{2 \times 700}{.095}} = 45,500 \text{ volts peak} \quad (47)$$

Performance of QST DDDR Antenna

Since the dimensions are the same as in the previous section, $R_T = .095$ ohm and $Z_0 = 188$ ohms.

Assuming that the feed tap is at the 52-ohm point or that $R_\phi = 52$, the following are calculated.

(a) The tap point per Table I in QST is at 18 inches or 1.5 ft from ground, or at an angle of

$$\phi = 360^\circ \left(\frac{1.5}{132} \right) = 4.09^\circ \quad (48)$$

(b) The base resistance R_B , from eq. (26) is

$$R_B = \frac{188^2 \sin^2 4.09^\circ}{52} = 3.45 \text{ ohms} \quad (49)$$

From eq. (30), the loss resistance is

$$R_L = R_B - R_T = 3.45 - .095 = 3.355 \text{ ohms} \quad (50)$$

(c) The open-end resistance is, from eq. (21),

$$R_E = \frac{188^2}{3.45} = 10,200 \text{ ohms} \quad (51)$$

(d) The efficiency is, from eq. (32) and (33),

$$\eta = \frac{.095}{3.45} = .0275 = 2.75\% \quad (52)$$

$$\text{or } \eta = 10 \log_{10} .0275 = -15.6 \text{ dB} \quad (53)$$

or the field strength ratio is

$$\frac{E_B}{E_T} = \sqrt{\frac{.095}{3.45}} = 0.166 \quad (54)$$

(e) The Q of the antenna is, from eq. (28),

$$Q = \frac{188 \pi}{2(3.45)} = 85.6 \quad (55)$$

(f) The bandwidth of the antenna is, from eq. (29),

$$BW = \frac{7,200,000}{85.6} \quad 84,000 \text{ Hz} \quad (56)$$

or 84 kHz

(g) The voltage at the open end of the antenna is, from eq. (38), assuming a carrier of 700 watts 100 percent modulated,

$$E_{peak} = (1+1)188 \sqrt{\frac{2 \times 700}{3.45}} = 7,600 \text{ volts peak} \quad (57)$$

Probable Causes of Losses

The fact that the total resistance referred to the base of the antenna appears to be 3.45 ohms whereas the radiation resistance is but .095 ohm leaves 3.355 ohms of loss resistance to be accounted for. The losses are probably divided between the ohmic losses in the antenna conductor and the losses in the ground system. The ohmic losses in the antenna conductor may be computed if the length, diameter, and metal of the antenna are known.

From Terman, page 35, eq. (7), the ac resistance of a copper rod or tube is given by

$$R_{ac} = \frac{83.2 \sqrt{f}}{d} \text{ ohms/centimeter length} \quad (58)$$

where f = frequency in hertz

d = conductor outside diameter in centimeters.

Using the dimensions of the DDRR antenna at 40 meters, $d = 2''$ or 5.08 cm, and $f = 7,200,000$, and substituting in eq. (58),

$$R_{ac} = 4.4 \times 10^{-5} \text{ ohms/cm} \quad (59)$$

Now the length of the antenna from ground to the far end is 10 meters or 1000 cm; therefore, multiplying eq. (59) by 1000,

$$R_{ac} = .044 \text{ ohm for the total resistance of the 10-meter-long copper tube} \quad (60)$$

If the metal used is something other than copper, and particularly if it is magnetic, the resistance may be quite a bit greater than .044 ohm. The following table has been calculated for several different materials based on the ac resistance being proportional to the square root of the resistance of a cubic centimeter of each material and also proportional to the square root of the magnetic permeability, μ .

Material	μ	R_{ac}	R_{ac} effective
copper	1.0	.044	.022
aluminum	1.0	.0562	.0281
brass	1.0	.0912	.0456
zinc	1.0	.0812	.0406
tin	1.0	0.1132	.0566
iron	1.0	0.1044	.0522
"	10	0.330	0.165
"	20	0.468	0.234
"	50	0.74	0.37
"	100	1.044	0.522
"	200	1.48	0.74
"	500	2.34	1.17

The last column in this table represents the resistance which when multiplied by the square of the current at the base of the antenna will yield the total loss in the antenna (neglecting insulator and capacitor dielectric losses). This may be arrived at by integrating the losses over the antenna length $\pi/2$ (or 90°) as follows. Assuming a sinusoidal current distribution so that the current at any point may be expressed as $I = I_0 \cos \psi$ where ψ proceeds from 0 to $\pi/2$, then the watts consumed is given by

$$I_0^2 R_{ac} \text{ effect} = \frac{R_{ac}}{\pi} \int_0^{\pi/2} I_0^2 \cos^2 \psi d\psi = \frac{2R_{ac} I_0^2}{\pi} \left[\frac{\psi}{2} + \frac{\sin 2\psi}{4} \right]_0^{\pi/2} \quad (61)$$

where R_{ac} = total ac resistance of line as in eq. (60)

and R_{effect} = effective resistance

Substituting in the limits,

$$I_0^2 R_{ac} \text{ effect} = \frac{2R_{ac} I_0^2}{\pi} \left(\frac{\pi}{4} \right) = \frac{R_{ac} I_0^2}{2} \quad (62)$$

Solving eq. (66) for R_{ac} effective

$$R_{ac} \text{ effective} = \frac{R_{ac}}{2} \quad (63)$$

The last column in the table is therefore one-half the value of the third column.

In the *QST* article it was stated that the material was steel. Now assuming a value of 100 for μ which seems reasonable, the resultant effective ohmic resistance becomes 0.522 ohm.

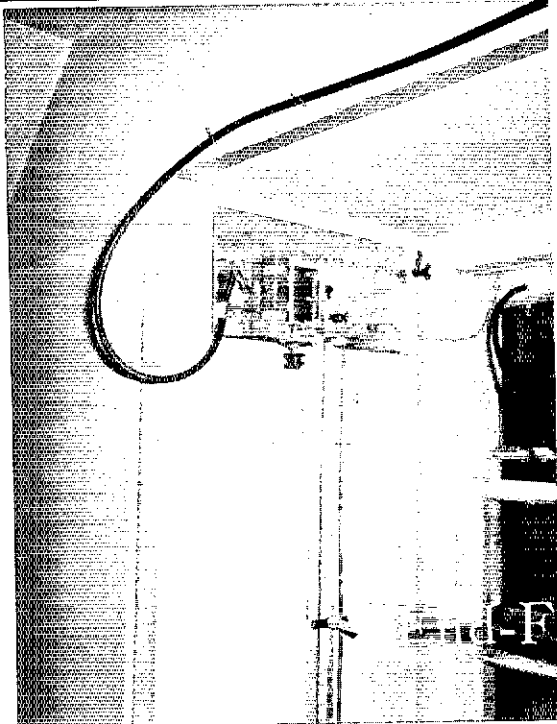
The remainder of the 3.355 ohms of ohmic resistances or 2.833 ohms probably is accounted for by the effective resistance of the ground system made up of chicken fence wire of fairly small individual conductors of iron with a zinc dip. Changing to a solid copper ground sheet would undoubtedly lead to a very much lower effective ground resistance.

Effect of Current Through the Tuning Capacitor

Any current that flows through the tuning capacitor from the open end of the DDRR antenna to ground is detrimental and should be minimized for this reason: If the current is assumed to be of like phase throughout (and it should be over one quarter wave from a current maximum), then the current flows upward at the antenna base but downward through the tuning capacitor leads. The opposing current directions cause the far field effect of the main vertical section to be partially canceled by the far field set up by the capacitor lead current.

It can readily be shown that the effective current causing radiation is thus

(Continued on page 36)



Here's a useful gadget for users of simple end-fed wire antennas.

A "Stretcher" for End-Fed Multiband Wires

The antenna "stretcher" mounted close to a window in the shack of W7MRX.

Maintaining Antenna Resonance on All Bands

BY HOWARD J. HANSON,* W7MRX

THE 80-METER end-fed half-wave wire (approximately 135 feet long) makes a simple and convenient antenna for higher frequencies as well. Such a wire becomes a full wavelength long on 40, two wavelengths on 20, three on 15, and four wavelengths long on 10 meters. Although the locations of the low-impedance points on the wire vary from band to band, the ends of this antenna are at high impedance on all bands.

A typical method of end feeding from a low-impedance source is shown in Fig. 1. The tuned circuit is resonant at the operating frequency, and is coupled to the low-impedance output of a transmitter by means of a low-impedance coupling link and coaxial line.

One problem in using this arrangement is that the transmitter loading is often better on some bands than on others. A glance at Table I shows one reason. This table lists the calculated lengths required for resonance at various frequencies. It can be seen that no one length is resonant at all frequencies, and may depart considerably from resonance on some frequencies. Furthermore, an antenna cut to theoretical formula length may be only approximately resonant at the design frequency, because of many factors that affect the resonant frequency of a practical antenna, such as its height above ground, its configuration, and objects within its immediate field. So, arriving at a

truly resonant length is usually a matter of cut and try.

The antenna "stretcher" shown in the photograph and in the sketch of Fig. 2 is designed to overcome this problem by inserting a variable length of wire at the feeding end. The antenna itself is cut to the shortest length (see Table I) in which you may be interested. Then the shorting slider on the stretcher is adjusted to resonate the antenna at frequencies requiring greater lengths.

TABLE I

Band	Freq. (MHz)	Calculated Resonant Length (ft)
80 m. (1/2 wave)	3.5	133.7
	3.6	130.0
	3.7	126.5
	3.8	123.2
40 m. (Full wave)	7.0	137.0
	7.3	131.4
20 m. (2 waves)	14.0	138.8
	14.3	135.9
15 m. (3 waves)	21.0	139.4
	21.45	136.5
10 m. (4 waves)	28.0	139.7
	29.7	131.7

* P. O. Box 848, Tacoma, WA 98401.

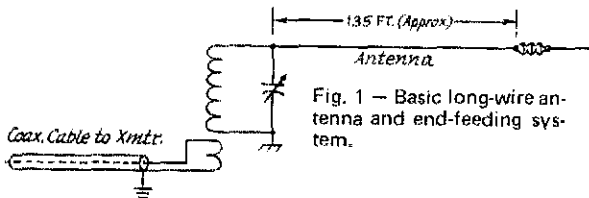


Fig. 1 - Basic long-wire antenna and end-feeding system.

With the dimensions shown, the stretcher will add up to 9 feet of effective antenna length.¹

Construction

Fig. 2 shows the constructional details of the stretcher. The coil and capacitor of the tuned circuit, and a coaxial receptacle, are mounted at one end of an 8 x 18-inch aluminum plate. An insulated binding post (or standoff insulator for higher power) is mounted at the opposite end of the plate as a terminal for the antenna.

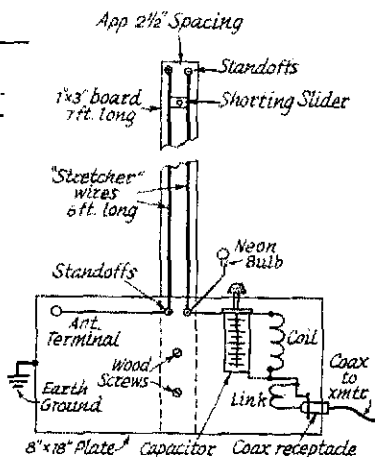


Fig. 2 - Sketch showing details of the antenna "stretcher."

TABLE II

Antenna-Tuner Coil Dimensions
(35pF Capacitor)

Band	Dia.	Coil	Link
80	2 in.	44 turns No. 16	7 turns No. 16
40	2 in.	22 turns No. 16	6 turns No. 18
20	1-1/2 in.	14 turns No. 16	5 turns No. 18
10-15	1-1/2 in.	9 turns No. 12	3 turns No. 16

The plate is fastened to one end of a 7-foot length of 1 x 3-inch board. The loading wires of the stretcher are 6-foot lengths of No. 12 electrical house wire with the insulation stripped off. Be careful not to nick the wire when removing the insulation, as this will make it difficult to slide the shorting bar along the wires. The wires are pulled straight and strung between standoff insulators. The shorting bar is made as shown in Fig. 3.

A short length of stiff wire should be soldered to one terminal of the neon bulb, and the wire fastened to the terminal of the stretcher connected to the tuned circuit.

Table II shows the coil dimensions that I used with a 35-pF tuning capacitor (a surplus dual-section capacitor, 70 pF per section, with the sections connected in series). I used plug-in coils, but a tapped coil and switch might also be used. Other combinations of inductance and capacitance may be used, so long as the circuit resonates at the desired frequencies.²

¹ [EDITOR'S NOTE: The folded configuration of the stretcher accounts for the fact that the effective length added is less than the actual length of wire inserted. The smaller the spacing between the two conductors the more pronounced this discrepancy becomes.]

² [EDITOR'S NOTE: An L-network can be used in place of the parallel-tuned circuit of Fig. 1 if desired. If this method of tuning the antenna is used, the variable capacitor of the L-network should be connected between the tuner side of the "stretcher" and ground. (L-network information is given in Chapter 20 of the ARRL Handbook.)]

Operation

The metal plate of the stretcher should be connected to an earth ground with the shortest lead possible. To adjust the stretcher, disconnect the antenna and stretcher from the tuned circuit. Adjust the transmitter to give some output (as shown by the transmitter's output indicator, or by a dip in plate current). Holding the key closed for only brief periods (to avoid possible damage to the final amplifier tube) adjust the antenna tuned circuit for maximum neon-bulb indication. Make a note of the antenna capacitor setting where maximum indication is obtained. Reconnect the antenna and stretcher. Adjust the slider on the stretcher until the point of maximum brilliance occurs as close as possible to the same setting of the capacitor as it did with the antenna disconnected. (Be sure to open the key before touching the antenna, or metal parts of the stretcher and slider. A contact with these while the key is closed will

(Continued on page 39)

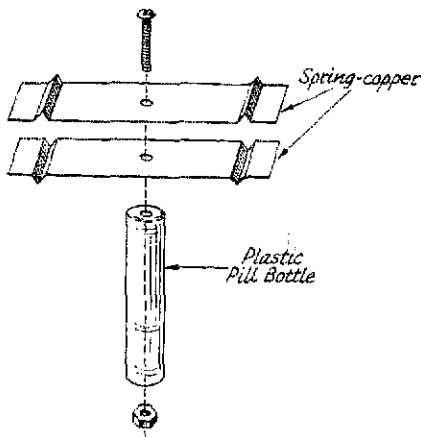
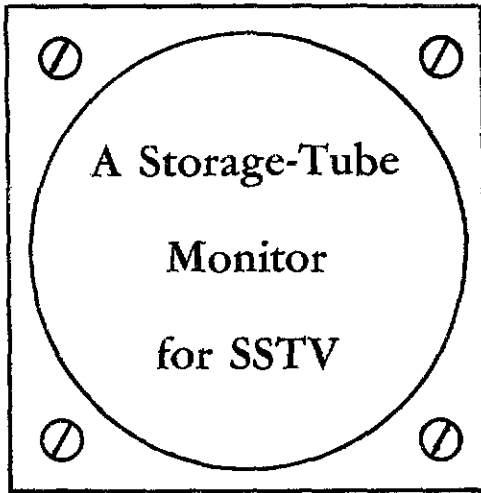


Fig. 3 - A simple adjustable shorting bar for the antenna "stretcher."



BY W. C. SMITH,* K6DYX

THE DISPLAY of slow-scan television, or fast facsimile, as it might better be called, suffers in the persistence of screens in CR tubes used at the present time in most monitors. The commonly used P7 phosphor has a purplish-blue fluorescence during excitation and a yellowish-green phosphorescence which persists for several minutes after excitation is removed. The initial decay of the phosphorescence is, however, very rapid, decreasing to 10 percent of its original value in a matter of five seconds. Thus, as the picture is drawn on the screen at the rate of one raster in 8 seconds, the top fades to quite a low intensity while the picture is still being drawn by a bright blue line at the bottom. A yellow filter or simply a sheet of yellow plastic may be used to remove the disturbing blue line, but nonetheless, most amateurs operate their monitors in a very subdued light to preserve the illusion of persistence.

Storage-type CR tubes operate on a principle that is ideally suited to slow-scan television. The author is presently using a Hughes Tonotron, type H-1192AP20, in a monitor with very satisfactory results. The picture is drawn in the normal manner; in fact the trigger, sweep, and video-detection circuits may be quite standard.¹ The picture appears, a line at a time, at full brightness with good gray scale and remains on the screen until erased. An erase pulse, generated by the vertical trigger pulse, completely destroys the picture when the next frame starts. An additional feature makes it possible to hold a picture on the screen for up to five or ten minutes.

Electrical and Mechanical Characteristics

The Tonotron (RCA type 6866 seems similar) is a five-inch, electrostatic-deflection CR tube,

* 67 Cuesta Vista Dr., Monterey, CA 93940.
 1 Macdonald, "A Compact Slow-Scan TV Monitor," *QST*, March, 1964. See also Tschannen, "A Solid-State SSTV Monitor," *QST*, March, 1971.

shorter than the 5ABP7, with a P20 aluminized phosphor having yellow-green fluorescence and phosphorescence. The useful screen diameter is 3.8 inches, only slightly less than for the 5ABP7. It has an integral magnetic shield and may be readily installed in a surplus Tektronix 511A CRO chassis. See Fig. 1. The electrode potentials are different from those of the 5ABP7 because of the principle of operation.

Video information is drawn by a writing gun and deflection electrodes on a storage surface exactly as in the case of the P7 CR tube monitors. Another gun, see Fig. 2, is used to project a collimated beam of electrons through the storage surface to a viewing screen. Areas of the storage surface which have not received electrons from the writing gun inhibit the passage of the low-energy flooding electrons. Areas which have been charged by the writing-gun beam permit the flooding electrons to pass through. They are then accelerated toward the viewing screen and cause it to glow brightly until an erase pulse, applied to a backing electrode of the storage surface, causes it to be charged uniformly to a slightly negative potential, thus blocking out the flooding electrons from the viewing screen. The retention time of stored information is limited by the slow dispersion of the charge written on the storage surface. Charge leakage is mainly caused by positive ions, which come from residual gas molecules within the tube. In practice this seems to limit the hold time to about five minutes.

The average deflection-electrode potential should be about 125 volts and the deflection factor is 35 to 45 volts per inch per kilovolt of accelerating potential of the writing gun. These

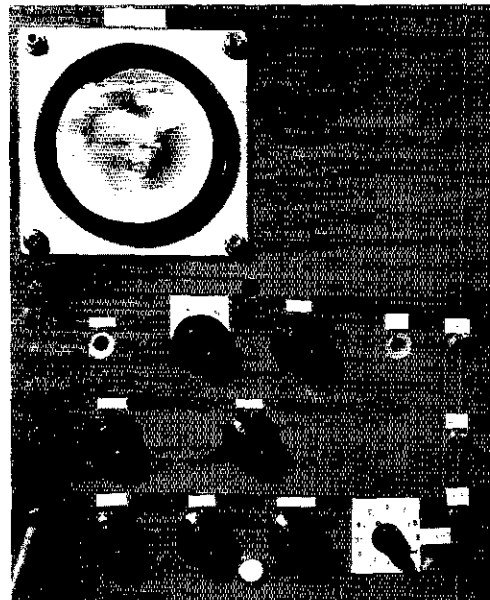


Fig. 1 — The author's SSTV monitor with storage tube. This photograph was made with available light and is not a time exposure, as the text explains.

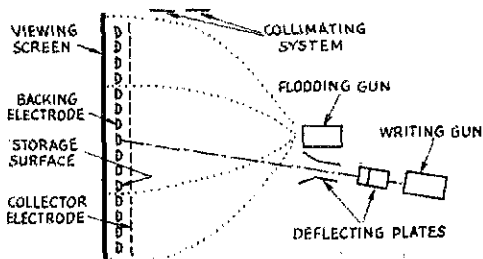


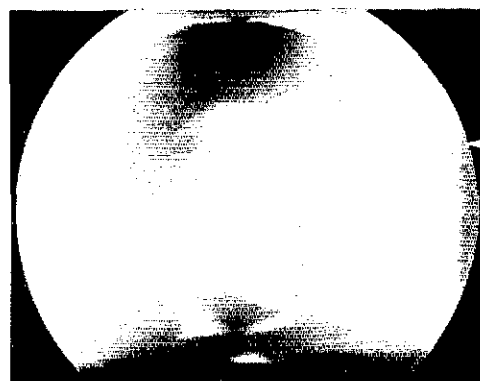
Fig. 2 - Storage-tube structure. See text for description of operation.



(A)

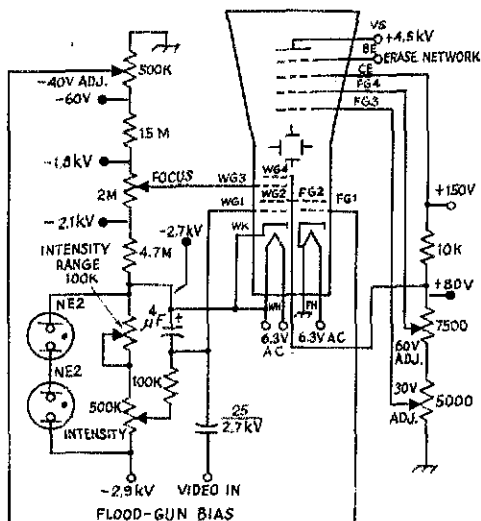


(B)



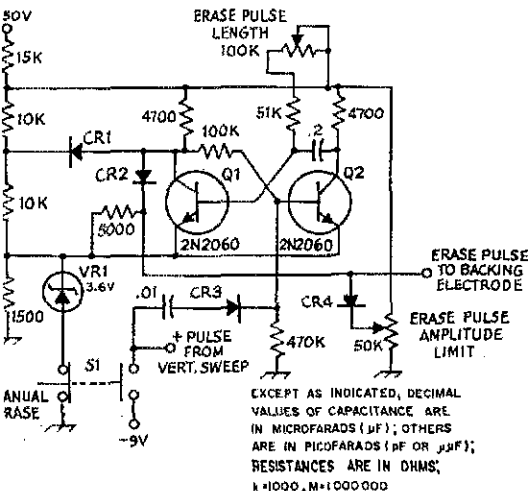
(C)

Fig. 5 - Storage-tube display with monitor on HOLD. At A is the initial presentation; at B, two minutes later; and at C, five minutes later.



EXCEPT AS INDICATED, DECIMAL VALUES OF CAPACITANCE ARE IN MICROFARADS (μ F); OTHERS ARE IN PICOFARADS (pF OR μ pF); RESISTANCES ARE IN OHMS; k = 1000, M = 1,000,000

Fig. 3 - Circuit for providing electrode potentials for the storage tube. VS - Viewing screen. BE - Backing electrode. CE - Collector electrode. WG - Writing gun. FH - Flooding-gun heater. WH - Writing-gun heater.



EXCEPT AS INDICATED, DECIMAL VALUES OF CAPACITANCE ARE IN MICROFARADS (μ F); OTHERS ARE IN PICOFARADS (pF OR μ pF); RESISTANCES ARE IN OHMS; k = 1000, M = 1,000,000

Fig. 4 - Erase circuit used by author. CR1-CR4, incl. - Any small-signal silicon diode. Q1, Q2 - Silicon npn transistor, 500 mW. S1 - Push-button type, momentary. VR1 - Zener diode, 1N747 or equiv.

figures are comparable to those for the 5ABP7. The electrode potentials used in my monitor are shown in Fig. 3.

Although the viewing screen may be operated at up to 11,000 volts, with resultant increase in brightness, I have found that the screen is bright enough for full daylight viewing and has a better gray-scale range with only 4500 volts applied. CR tubes with P7 phosphors exhibit a build-up to their phosphorescence which significantly affects their gray-scale sensitivity. This characteristic is not present with the storage tube. Consequently it is much more sensitive to writing beam intensity. The use of a lower-than-normal viewing-screen voltage seems to widen the range of gray-scale excitation.

Unique to the storage tube monitor is the erase operation. The circuit I use for this is shown in Fig. 4. The length of the erase pulse is more important than its amplitude, which must be less than 20 volts. My erase pulse is 0.4 second long at about 6 volts amplitude. This is generated when a vertical trigger pulse starts the vertical sweep. A push button on the front panel permits me to erase and

start over at any time. This is convenient since I use a vertical sweep which, once started, proceeds to the end in a little over 8 seconds, unaffected by noise or spurious trigger pulses.

The HOLD feature on my monitor is simply a relay that is operated by a negative fly-back pulse derived from the vertical sweep. I cock the circuit at any time during a vertical sweep. The frame being drawn will be completed and held, for when the relay closes it shorts the input and applies a "black" potential to the writing gun (video) grid.

Fig. 5 shows the gradual dissolving of the image when the monitor is on HOLD. The images shown in the photographs are not time exposures. They are, rather, snap shots of the images displayed by the playback of a tape recording made directly from my receiver. Fig. 1 was made at 1/5 second at f/8 using a Mamiyaflex camera and Plus X film with available light. Fig. 5 was made at 1/25 second at f/8 using a Polaroid oscilloscope camera. Thanks go to WIVRK and his superior signals which I taped.

Q57

DDRR Antenna

(Continued from page 31)

$$I_{eff} = I_0 - I_0 \cos \phi = I_0(1 - \cos \phi) \quad (64)$$

where ϕ = length of antenna in degrees

I_0 = current at antenna base

Now in order for the system to provide its rated field for a given power, the current at the base must be increased so that the new current, I_n , satisfies the equation

$$I_0 = I_n(1 - \cos \phi), \text{ or } I_n = \frac{I_0}{1 - \cos \phi} \quad (65)$$

From the law of the conservation of energy, the radiation resistance referred to the antenna base thus becomes

$$R_T^1 = R_T(1 - \cos \phi)^2 \quad (66)$$

Where R_T^1 = new radiation resistance (with capacitor)

R_T = original radiation resistance (absence of capacitor)

For example, if the antenna at some low frequency in a given band were 80° long ($\phi = 80^\circ$), the radiation resistance of .095 ohm as calculated by eq. (39), would instead become

$$R_T^1 = .095(1 - \cos 80^\circ)^2 = .095(1 - 0.17635)^2 = .0645 \text{ ohm} \quad (67)$$

The use of this antenna, in conjunction with the ohmic losses already discussed, would necessarily lead to even a still smaller efficiency than the 2.75 percent efficiency found by eq. (52).

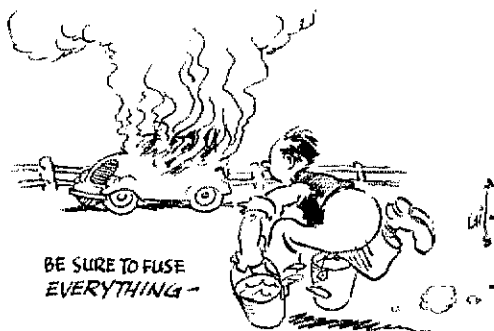
It is therefore recommended that the DDRR antenna be constructed to be no shorter than is required to tune with the tuning capacitor at its minimum when tuned to the highest frequency to be used in the band of interest.

Conclusion

This study of the DDRR antenna indicates that the advantages of the antenna over others are the compactness, low profile, and inconspicuousness of the installation. The disadvantages of the antenna are its relative low radiation efficiency and comparatively narrow bandwidth. The efficiency is low because the radiation resistance is very low (.095 ohm) so that conductor ohmic losses consume most of the available power. The narrow bandwidth necessitates the use of a variable tuning arrangement to bring the system to something approaching unity power factor.

It is suggested that increasing the vertical height could improve the efficiency very appreciably because the radiation resistance for short vertical heights varies as the square of the height. Increasing the height to 3-1/2 feet (instead of 1 foot) would raise the radiation resistance to about 1.16 ohms, which, coupled with a ground and conductor loss of the same magnitude as in the study (3.355 ohms) would increase the efficiency from 2.75 percent to 25.8 percent, or provide 9.8 dB increase in signal strength.

Q58



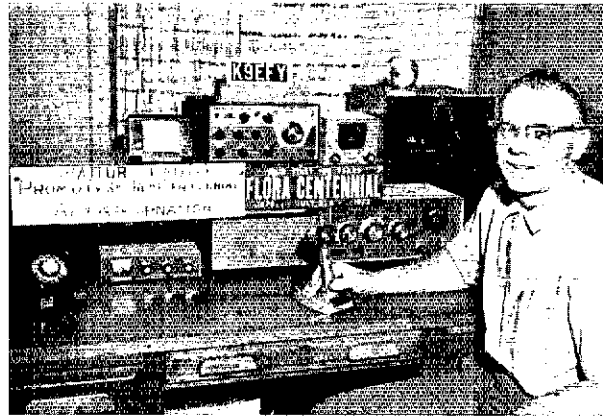
Strays



VE3GLX received his license on July 30, 1971 and within 4 months worked his last state for WAS (Wyoming, what else!). At the same time he qualified for WAC and is well on the way toward DXCC. A particular thank you from VE3GLX to U.S. hams for their OSL response.



W8JCG qualified for WAS in just seven and a half months (but it took another three and a half months to squeeze a card out of a WH6!). Chet had lots of fun in the chase, in spite of poor antennas (a 10 foot high long wire and a 6 foot high folded dipole for 15 meters!).



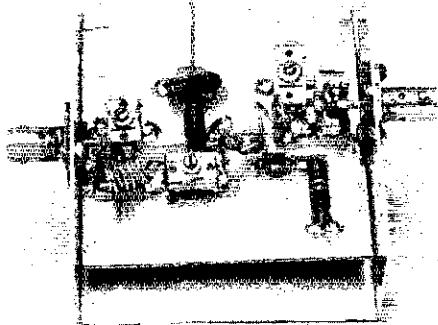
Amateur radio will play an important role in the promotion of the Flora Indiana Centennial Celebration through the efforts of K9EFY, shown in photo. Richard invites amateurs around the country to send via amateur radio, messages of congratulations to the citizens of Flora. They'll be posted in radiogram form at the fair grounds during the July 2-8 celebration. K9EFY will be available to receive such traffic daily in the Indiana Traffic Net on 3910 kHz.



This is the Adams family of Vermillion, South Dakota. Representing three generations are from left, WB0BVL, WN0BVJ, WB0FHT, WB0CDP, WB0BVK, and WB0CCT. Being held by WB0CCT is three-year old Thomas, not yet licensed.

The repeater groups from the Hartford (Conn.) area presented a 1972 ARRL *Handbook* to Gordon Pugh, W2GHR, with thanks for Gordon's work in repeater frequency coordination. The presentation was made Feb. 12th at a meeting of fm-ers in Shrewsbury, Mass., by *Handbook* editor W1KLK, as K2IEZ looked on.





The amplifier is mounted in a shield box bent from sheet aluminum. The transistor is located under the board, near the center. Connection to the 12-volt supply is via the lead from the junction of RFC2 and the two disk ceramic capacitors. J1, the input connector, is on the right.

A Pip-Squeak Follower

220
for ~~144~~ MHz

BY THOMAS McMULLEN,* W1SL

WORK ON A SERIES of solid-state amplifiers to be used with the Pip-Squeak two-meter exciter was well along when the excellent presentation by K7QWR appeared.¹ Rather than toss aside the result of a good many experiments and cannibalize for parts, the possibility of using the writer's amplifiers on 220 MHz was explored. Fortunately, the changes necessary to make the amplifiers work on the higher frequency were not extensive. An exciter was available to provide drive for testing,² so the development of the amplifiers continued almost as planned.

A quick look at the circuit in Fig. 1 would show very little difference between an amplifier for 144 and one for 220 MHz. The input and output matching networks on a good amplifier for 144 MHz are such that some gain will be provided upon application of drive on 220 MHz. The amount of power out of the amplifier will increase tremendously when these networks are designed for the higher frequency. A small decrease in inductance proved to be all that was necessary for the input and output networks. The only other item in question was the transistor. A look at the manufacturer's specification sheets revealed that the device was capable of reasonable gain at 220 MHz.

* Assistant Technical Editor, *QST*.

¹ Hejhall, "Some 2-Meter Solid-State Rf Power Amplifier Circuits," *QST*, May, 1972.

² McCoy, "Converting the Pip-Squeak to 220 MHz," *QST*, February, 1972.

Construction

The amplifier was constructed on a piece of pc board with small islands etched out for connection of the capacitors and inductances. If this board had not already been prepared, it would have been made by using the technique suggested by Hejhall, that of fastening small pieces of pc board on top of the main board. The transistor is mounted between the board and the heat sink (chassis), with the pins projecting through holes to make connection to the foil. At the power level this amplifier is capable of, there is no need for an additional heat sink other than the aluminum enclosure. The edges of the pc board are soldered to grounding lugs that are held in place by the hardware used to mount the input and output connectors. This method of grounding the board provides a direct rf path to the coaxial fittings, without relying on the chassis.

Tune-Up

Tune-up of the amplifier is so easy that a description of the procedure would seem almost superfluous. It is merely a matter of adjusting the input tuning capacitors for minimum SWR to the exciter and adjusting the output capacitors for maximum power output. The drive from the exciter should not be so high as to cause the amplifier to draw more than its rated collector current. Spurious signals from the exciter will cause the collector current to be unnecessarily high. To eliminate any such unwanted signals from the exciter, a helical-resonator filter was installed

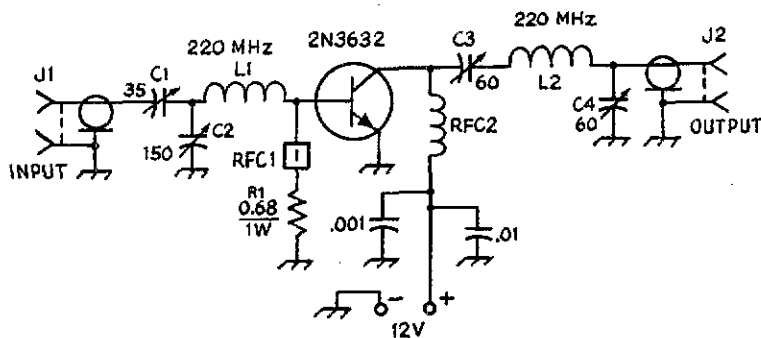


Fig. 1 — Circuit diagram of the 220-MHz amplifier. Capacitors are disk ceramic unless otherwise noted.

- C1 — 3- to 35-pF compression trimmer (Arco 403 or equiv.).
- C2 — 14- to 150-pF compression trimmer (Arco 424 or equiv.).
- C3, C4 — 8- to 60-pF compression trimmer (Arco 404 or equiv.).
- J1, J2 — Coaxial connector, BNC, panel mount.

- L1 — 2 turns No. 16 tinned wire, 1/4-inch ID X 1/2-inch long.
- L2 — 4 turns No. 16 tinned wire, 1/4-inch ID X 5/8-inch long.
- Q1 — Motorola transistor.
- RFC1 — 2 ferrite beads on 1/2-inch length No. 20 enam. wire (Amidon Assoc., N. Hollywood, CA).
- RFC2 — 12 turns No. 22 enam. wire, close wound on 3/16-inch dia plastic rod.

between the exciter and the amplifier. The turns of L2 can be squeezed or stretched slightly to make a small adjustment in the output network. Any increase in output power with a corresponding decrease, or no change, in collector current is a step in the right direction.

Results

Power output from the amplifier was in the range of 5 to 8 watts with many of the transistors tried. One "enthusiastic" 2N3632 provided 9 watts output while using a 12.5-volt supply. Some 2N3375s were tried in the circuit and the output power was similar to that obtained from the '3632s, but the lack of smoothness in output tuning indicated that the matching networks were not optimum for that transistor. For safe operation of an amplifier using the 2N3375 the emitter should be above ground by 0.1 to 0.2 ohm, with a

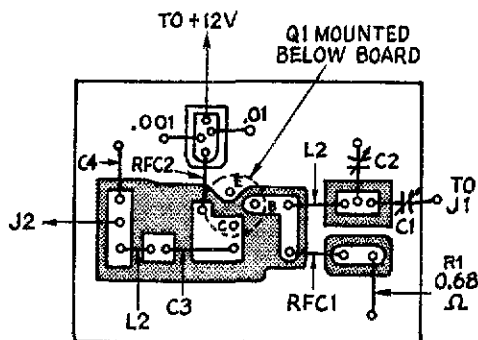
good rf bypass. Such construction would involve slightly different connections to the pc board.

The Next Step

A "Follower-Follower" is currently under construction that will provide output in the 18- to 20-watt range. The transistor being used is an HEP-S3007. The design is very close to the 25-watt 2-meter amplifier described by Hejhall and by the time this appears in print, it should be providing a respectable mobile signal into a local repeater on 221 MHz. QST

A "Stretcher"

(Continued from page 33)



FOIL SIDE OF BOARD

Fig. 2 — Parts location for the amplifier (not to scale). The pc board is 3-1/8 inches long and 3 inches wide. Portions of the board that are etched away are shown as shaded areas.

not give you an electrical shock, but may result in a painful rf burn.) If proper loading cannot be obtained by subsequent adjustment of the transmitter, reduce link turns to reduce loading, or increase link turns to increase loading, and repeat the procedure. Don't attempt to adjust loading by retuning the tuned circuit, once it has been set as described.³

For the benefit of beginners who may not be familiar with an antenna of this type, the antenna "length" is the total length of wire from the far end to the point where it connects to the stretcher. This includes, of course, any vertical or semivertical length that is required to connect the end of the horizontal portion of the antenna to the tuner.

³ [EDITOR'S NOTE: To avoid the need for disconnecting the antenna from the tuner, an SWR bridge can be inserted in the coaxial feed between the transmitter and the tuner link. All adjustments can then be made by observing the bridge indicator. The "stretcher" and tuner would then be adjusted for minimum reflected power.] QST

D-Layer Absorption During a Solar Eclipse

BY JIM KENNEDY,* K6MIO/WB4OUC, JOHN SCHAUBLE,*
JERRY ALLNOCH,* WA4TST, and DON ROBERTS,* WB4LSI

IT IS A well-known fact that, during the daylight hours, the earth's ionosphere becomes stratified into several distinct layers. These layers are commonly labeled as *C*, *D*, *E*, *F1*, and *F2*, in order of ascending height. The *C* and *F1* layers cause rather transient phenomena and hence, as far as daytime radio propagation is concerned, the *D*, *E*, and *F2* regions are the ones of most importance.

The effect of the *E* and *F2* layers is to reflect hf radio signals, making skip communications possible. On the other hand, the *D* region acts as an absorbing layer. Since it lies *below* the *E* and *F2* layers all skip signals must first pass through this absorbing *D* region and suffer a reduction of strength. This absorption is highest at lower frequencies. Below 10 MHz or so during the day the absorption is great enough to wipe out a long-skip signal. For this reason one finds that 80 and 40 meters are only useful for short hauls during the daytime. On the other hand this absorption above 10 MHz is not too important and one finds 20, 15, and 10 meters open for business as usual.

The reason that the *D* layer absorbs signals rather than reflecting them is that the *D* region is much denser. In fact, the density of neutral, nonionized particles, which make up the bulk of the matter in this region, is greater than that of the *E* layer by a factor of a thousand. If a layer is going to reflect, the number of neutral atoms must be small enough so that they do not frequently collide with the free electrons. However, in the *D* layer, on the average, any given electron will collide with an atom about 10 million times each second. The net effect is that the electrons are not given a chance to reflect signals, and absorption occurs instead.

Of course this effect is only noticeable during the day. At night one finds 80 and 40 meters open for much longer paths. This is a result of the fact that X-rays from the sun are responsible for creating the ions in the first place. After the sun sets the *D* layer disappears and no longer interferes with signals on their way up and down to the reflecting layers.

From a scientific point of view, the *D* region is very poorly understood. Among other things, it has a very complex chemical composition which is most difficult to explain. Evidently the *D* layer

interacts with the atmosphere above and below it, and also with the sun, in a very complicated way. These interactions have, in recent years, been the subject of considerable study.

One way in which this area can be investigated is by observing the effect of shutting off the sun's radiation. Of course, this very thing happens quite rapidly during a solar eclipse, which makes such occasions excellent opportunities to interrogate this mysterious region.

1970 Eclipse

During the solar eclipse of 7 March 1970, scientists at the University of Florida enlisted the aid of several radio amateurs in conducting a *D*-layer experiment. The object of the experiment was to observe the way in which the *D*-layer absorption changed during the progress of the eclipse. As the moon cut off the sun's rays, the *D* region should disappear and with it the daytime absorption. In short, for a while, nighttime propagation conditions should exist on 80 (and 40) meters.

The absorption change was to be measured by transmitting a signal through the *D* into the *E* or *F2* layer where it would be reflected back through the *D* and be received at a remote site. The strength of the reflected signal could then be monitored. It was decided to use a frequency at the low end of 80 meters since, while quite a large change in absorption was expected there, the basic daytime absorption was not so high that signals could not be measured before and after the eclipse.

The transmitter, a Heath running 75 watts, was set up at the QTH of WA4TST in Waycross, Georgia, directly on the path of the eclipse. The transmitter was operated on about 3.570 MHz by a special keyer which automatically sent a two-second dash every four seconds. Station identification was sent by hand at the required intervals. The dashes permitted easy positive identification of the signals and kept the transmitter cool by requiring only a 50-percent duty cycle. The receiving site was also established on the eclipse path, but some 190 km to the south at WB4LSI's QTH in Steinatchee, Florida. The receiver was a Collins 75S-1 which had been modified by disconnecting the agc. (By operating without agc, the receiver is more sensitive to small changes in

* Department of Physics, Williamson Hall, Univ. of Florida, Gainesville, FL 32601.

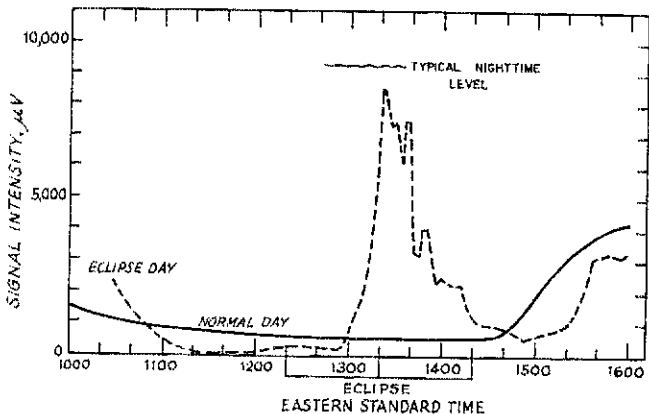


Fig. 1 — Received 3.57-MHz signal strengths at Steinhatchee, Florida from a 75-watt transmitter in Waycross, Georgia. The "normal day" and "typical nighttime" levels were obtained by averaging several readings.

signal.) The signal strength was read out by measuring the audio tone level on an HP 400A ac VTVM, taking advantage of the inherent linearity of the receiver's product detector.

In order to assure that the signal being received was entirely sky wave, an extra precaution was taken. Both the receiving and transmitting dipoles were oriented end to end. In this way very little or no signal could be either sent or received on a direct ground path. On the other hand, the reflected skywave is not diminished appreciably by this configuration.

In order to make any readings meaningful it was necessary to determine what the typical signal levels were on that path for an ordinary day. This was determined by actually conducting the experiment for several "normal" days in precisely the same manner as it was done on the day of the eclipse.

Data were gathered over a several-hour period each day by noting the amplitude of 10 consecutive 2-second dashes and taking the average. This procedure was repeated on a regular basis every 10 minutes or so. The only exception to this was during the time of the eclipse itself. Since rapid changes were expected, data were then taken at intervals of 1 to 2 minutes.

One further step was taken with respect to the normal day information. In order to construct an "average" day, the several days were added together at each point in time and the mean taken. It was also desired to determine how close to nighttime conditions the ionosphere would go, so additional measurements were made at night to determine the typical nighttime signal level.

Test Results

On the day of the eclipse the weather was cloudy over most of Florida and Georgia, so we were denied the spectacular sight of totality. But unlike our many colleagues who had gathered nearby for optical experiments, our results were

positive. In Fig. 1, the results of the eclipse day and the "average" day have been superimposed. It can be seen that the eclipse did indeed produce a startling increase in the signal level. In fact, the maximum change is nearly 17 dB. Conditions were, as expected, near those experienced at night.

Several interesting points are revealed by the signal plot. It is seen that the signal peak consists primarily of a steep rise, some fluctuation and then a steep drop. However, following the steep drop, the signal does not return to normal. It actually rises again and then trails off slowly, not returning to normal until an hour later.

The steep drop in the signal should correspond to the sudden increase in ionization as the eclipse ended. The signal rise that follows is difficult to interpret. It may mean that some of the electrons originally created were captured again by some other process, over a period of six or seven minutes. The slow decrease in signal level next seen may indicate that many electrons are produced by a second and much slower reaction which is different from that which caused the original ionization.

Another interesting feature is that the center of the main steep-sided hump in the signal curve occurs some 8 minutes *after* the shadow of the moon had passed the path midpoint. The shadow was, at that time, not even in between the two stations, having passed on to the north of Waycross.

To be sure, any attempt to explain all these various effects is difficult. An actual interpretation of the data requires considerable time comparing the results of the experiment with those predicted by various theories. But in any case, thanks to amateur radio, science has one more piece to the puzzle.

The authors wish to express their appreciation to Reavis Dixon and John Bridges for their vital assistance in setting up and operating the Waycross station. Without their help success would have been impossible.

• Beginner and Novice

RFI

BY LEW McCOY,* W1ICP

WHETHER YOU are a newcomer or an old-time amateur, one bug-a-boo that will probably be faced is RFI. Whenever an amateur operates his transmitter, the immediate area around his antenna and station is surrounded by a field of radio-frequency energy. Although this energy is being radiated on the desired amateur frequency, it can be the source of interference to many types of home-entertainment devices in the neighborhood. Included are TV sets, hi-fi gear, record players, tape recorders, p-a systems, a-m and fm broadcast receivers, and organs.

What is the responsibility of the amateur as far as interference is concerned? Actually, it is rather clear. The amateur is *only* responsible to the extent that the rf energy generated and radiated by his station is on the correct frequency. This does not mean he can ignore the complaints of neighbors. It should be made clear that the majority of owners of home-entertainment devices have no knowledge of what is happening to cause the interference. All they know is that when "that ham" goes on the air, they have interference. It is the amateur's responsibility to be helpful by explaining what is happening, and above all else, to be *diplomatic* about it.

The amateur's interference problem is primarily one relating to hi-fi gear. While TVI is, still a problem, its order of importance is far below that of hi-fi interference. The basic rules for handling TVI are covered in detail in *The Radio Amateur's Handbook* and won't be treated here. However, more and more information on curing hi-fi and

* Novice Editor, *QST*.

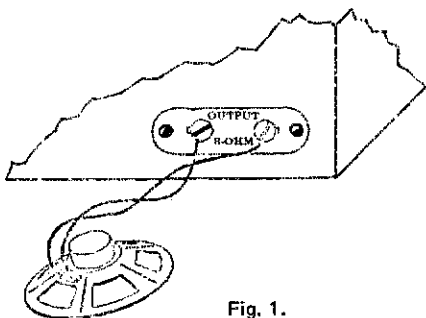


Fig. 1.

other interference has been discovered in the last few years, and it is hoped that this article will be of help to amateurs who have the problem. Here is a symposium of ways and means to cure such interference problems.

Hi-Fi Gear

Hi-fi gear can consist of a simple amplifier, with record or tape inputs, and speakers. The more elaborate installations may have a tape deck, record player, fm and a-m tuners, an amplifier, and two or more speakers. These units are usually connected together by means of shielded leads, and in most cases the speakers are positioned some distance from the amplifier, via long leads. When such a setup is operated near an amateur station, say within a few hundred feet, there are two important paths through which rf energy can reach the hi-fi installation to cause interference.

Speaker Leads

The most frequent path for RFI is along the speaker leads. Usually, the speaker is coupled to the amplifier by way of two wires, as in Fig. 1. These wires can act like an antenna to pick up the rf energy and feed it into the amplifier. (One

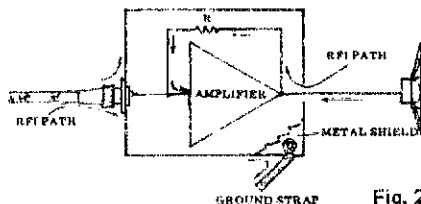


Fig. 2.

amateur who had a stubborn case of interference, but only when operating 15 meters, grid-dipped the speaker leads and found they were resonant on 21 MHz!)

Most high-fidelity sets use a feedback circuit in the audio amplifier and it is through this part of the circuit some of the unwanted signal may enter. Fig. 2 illustrates this path. With this type of RFI, you'll find that the audio gain control on the hi-fi unit will have no effect on the audible level of the interference. The reason is that the interference is getting into the set *after* the audio control, in the final stages of audio amplification.

A suggested method of effecting a cure is shown in Fig. 3. The first step is to bypass the speaker leads at the chassis with disk-ceramic capacitors from .001- to .02 μF . The .001- μF value would be used for vhf operation and the larger value for low-frequency work. Be sure to bypass *all* speaker leads even though one lead may appear to be grounded. In many amplifiers there is a feedback tap at the ground side of the output transformer. In stubborn RFI cases it might help to use shielded speaker leads. While Fig. 3 shows the shield grounded at both ends it might help to leave the shield ungrounded at the speaker end. This is because the equipment at each end of the connecting cable will always have some sort of

return to a common ground, and connecting the shield at both ends completes a loop which often will respond to magnetic fields. There is no hard and fast rule however, and it is wise to try various combinations.

If you should find that the interference exists only on one band it might help to try different lengths of speaker leads because of probability that the lead is a resonant length on the band in question. Sometimes rerouting the speaker leads will eliminate the interference.

Grounding

There is no set rule about grounding hi-fi equipment. Connecting the equipment to an earth ground such as a water pipe may not eliminate the interference. In fact, grounding the equipment could make the interference worse. The best procedure is to try grounding. See if it helps.

In one difficult solid-state hi-fi interference case, it was found that there were several etched-circuit boards in the unit. One board had not been connected to a chassis ground, and when it was bypassed to ground, all interference vanished.

Ac-Line Pickup

The second major path for RFI is via the ac lines. The lines act as antennas in a strong rf field, so the rf is brought into the hi-fi unit through the lines. There are commercial RFI filters available¹ that can be installed between the ac socket and the hi-fi equipment. A simple filter that some hams have found to be effective for suppressing this type of interference is an rf choke wound on a ferrite rod.² The choke is almost identical to the type used in grounded-grid amplifiers (to keep the filaments above rf ground). The ac line for the hi-fi amplifier is simply wound around the ferrite rod, using enough close-spaced turns to cover the length of the rod. Electrician's tape can be used to hold the turns in place. The ferrite rod and windings should be at the plug end of the ac line. This homemade assembly serves as an rf choke to help keep rf from entering the set. In addition to the rf choke, it may be helpful to install .001- to .01- μF bypass capacitors in the amplifier chassis from each side of the ac line to chassis ground. Be sure the capacitors are the type recommended for use with ac voltages.

Turntables and Tape Decks

In the more elaborate hi-fi setups, there may be several assemblies connected together by means of patch cords, Fig. 4. It is a good idea when checking for RFI to disconnect the units, one at a time, observing any changes in the interference. Not only disconnect the patch cords connecting the pieces together, but also unplug the ac line cord for each item as you make the test. This will help you determine which section is the culprit.

¹ Components Corp., available from Allied Electronics, Industrial catalog.

² Ferrite rods and beads are available from Amidon Associates, 12033 Otsego St., North Hollywood, CA 91607.

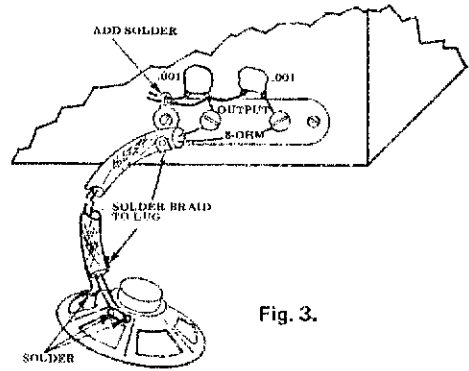


Fig. 3.

Patch cords are usually, *but not always*, made of shielded cable. The lines *should* be shielded, which brings up another point. Many commercially available patch cords have poor shields. Some have wire spirally wrapped around the insulation, covering the main lead, rather than braid. This method provides poor shielding and could be the reason for RFI problems.

Record-player tone-arm connections to the cartridge are usually made with small clips. The existence of a loose clip, particularly if oxidation is present, offers an excellent invitation to RFI. Also, the leads from the cartridge and those to the amplifier are sometimes resonant at vhf, providing an excellent receiving antenna for rf. One cure for unwanted rf pickup is to install ferrite beads, one on each cartridge lead. Check all patch-cord connections for looseness or poor solder joints. Inferior connections can cause rectification and subsequent RFI.

Tape decks should be treated the same as turntables. Loose connections and bad solder joints all can cause trouble. Ferrite beads can be slipped over the leads to the recording and play-back pickup heads. Bypassing of the tone-arm or pickup-head leads is also effective, but sometimes it is difficult to install capacitors in the small area available. Disk capacitors (.001 μF) should be used as close to the cartridge or pickup head as possible. Keep the capacitor leads as short as possible.

Preamplifiers

There are usually one or more preamplifiers used in a hi-fi amplifier. The inputs to these stages can be very susceptible to RFI. Fig. 5 illustrates a typical preamplifier circuit. In this case the leads to the bases of the transistors are treated for RFI with ferrite beads by the addition of RFC2 and RFC4. This is a very effective method for stopping RFI when vhf energy is the source of the trouble.

Within the circuit of a solid-state audio system, a common offender can be the emitter-base

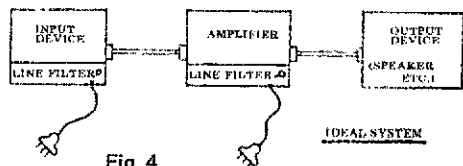


Fig. 4.

junction of a transistor. This junction operates as a forward-biased diode, with the bias set so that a change of base current with signal will produce a linear but amplified change in collector current. Should rf energy reach the junction, the bias could increase, causing nonlinear amplification and distortion as the result. If the rf level is high it can completely block (saturate) a transistor, causing a complete loss of any audible symptom. Therefore, it may be necessary to reduce the transmitter power output in order to pinpoint the particular transistor stage that is affected.

In addition to adding ferrite beads it may be necessary to bypass the base of the transistor to chassis ground, C1 and C2, Fig. 5. A suitable value is 100 pF, and keep the leads short! As a general rule, the capacitor value should be as large as possible without degrading the high-frequency response of the amplifier. Values up to .001 μ F can be used. In severe cases, a series inductor (RFC1 and RFC3) may be required, Ohmite Z-50 or Z-144, or their equivalents (7 and 1.8 μ H, respectively), Fig. 5 shows the correct placement for an inductor, bypass capacitor, and ferrite bead. Also, it might help to use a ferrite bead in the plus-B lead to the preamplifier stages (RFC5 in Fig. 5). Keep in mind that Fig. 5 represents only one preamplifier of a stereo set. Both channels may require treatment.

Similar treatment may be required in tube-type amplifiers. Fig. 6 shows an example of such a circuit with a series resistor, R1, and the bypassing recommended for a solid-state unit.

Fm Tuners

There is often an fm tuner used in a hi-fi installation. Much of the interference to tuners is caused by fundamental overloading of the first stage (or stages) of the tuner, effected by the amateur's signal. The cure is the installation of a high-pass filter, the same type used for TVI. The filter should be installed as close as possible to the antenna input of the tuner. The high-pass filter will attenuate the amateur fundamental signal, thus preventing overloading of the front end.

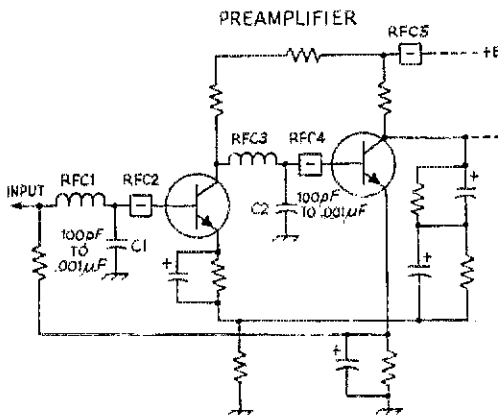


Fig. 5 - Typical circuit of a solid-state preamplifier.

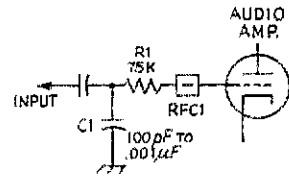


Fig. 6 - Tube-type amplifier.

Shielding

Lack of shielding on the various components in a hi-fi installation can permit rf to get into the equipment. Many units have no bottom plates, or are installed in plastic cases. One easy method of providing shielding is to use aluminum foil. Make sure the foil doesn't short circuit the components, and connect it to chassis ground.

Organs

Another RFI problem area is the electronic organ. All of the techniques outlined for hi-fi gear hold true in getting rid of RFI in an organ. Two points should be checked - the speaker leads and the ac line. Many organ manufacturers have special servicemen's guides for taking care of RFI. However, to get this information you or the organ owner must contact the manufacturer, not the dealer or distributor. Don't accept the statement from a dealer or serviceman that there is nothing that can be done about the interference.

P-a Systems

The cure for RFI in p-a systems is almost the same as that for hi-fi gear. The one thing to watch for is rf on the leads that connect the various stations in a p-a system together. These leads should be treated the same as speaker leads, and bypassing and filtering should be done at both ends of the lines. Also, watch for ac-line pickup of rf.

Telephone Interference

Telephone interference won't be covered in detail here because a recent article³ in *QST* treated the subject. What is important is that telephone interference, along with the other types of RFI discussed in this article, is *not* the fault of the amateur. The problem is caused by lack of protection against RFI in the manufactured product. It is not suggested that an amateur work on a neighbor's equipment, because if anything goes wrong the amateur must be prepared to assume the blame. However, and this is an important point, this article can be shown to the set owner and the serviceman to inform them about what must be done.

The FCC

The Field Engineering Bureau of the FCC has a bulletin that will be of help to the amateur in cases (Continued on page 47)

³ Bercovici, "How to Handle Telephone Interference," *QST*, May, 1972.



Hints and Kinks

For the Experimenter



ALTERNATOR NOISE SUPPRESSORS

Recently, while working on noise suppression after the installation of a mobile receiver in my car, I found a simple and easy way to protect the suppressor from the engine compartment environment, and provide a neat appearance also. The 4-ohm resistor and .002- μ F capacitor, series connected as suggested in the *ARRL Mobile Manual*, is encapsulated by the use of a hot-glue gun, an item which is in prominence these days.

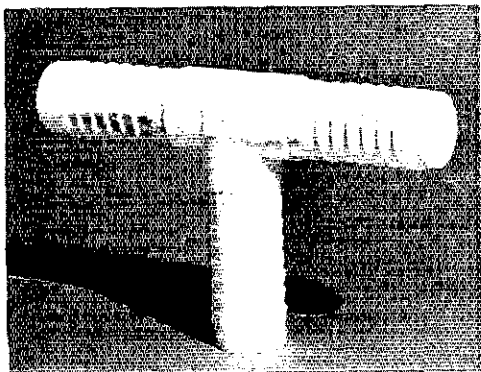
I have found that this filter works every bit as well as a commercially built unit did before it fell apart. My suppressor has not failed to work in weather where the temperature has dropped to -10° F, nor has the glue come apart as it did in the previous unit. — *Richard T. Pomerleau, WAØSTJ*

A CHEAP BOOM-TO-MAST FITTING

I have found a very strong boom-to-mast fitting at the local hardware store which cost me only 29 cents. The manufacturer, U.S. Pipe, sells it as a plastic plumbing "T," but as any amateur can readily see, it will work very well as a center insulator for small antennas.

The unit pictured here has an outside diameter of 3/4 inch and an inside diameter of 9/16 inch, making it acceptable for use with different sizes of antenna material if shim stock of some kind is used. The T has a wall thickness of about 1/8 inch and is very strong. Each of the three ends will extend for 2 inches into the boom or mast element.

My use of the T has been with the Two Toter (*QST*, July 1971), which now breaks in half rather than into thirds as suggested by Campbell (after all it's for two meters). Don't overlook the new plastic plumbing PVC material in your hardware stores when building new antennas. — *Bill Creany, W6OUN*

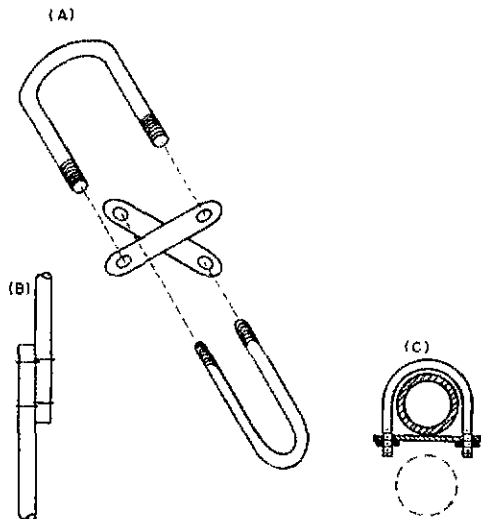


USING A TOUCH-TONE PAD WITH THE ML-2

The Drake ML-2 can be easily used with a Touch-Tone pad. Power for the pad is available from pin 3 on the mic jack, so no battery is necessary. Connections to the pad are shown in Fig. 14-34, 1972 *ARRL Handbook*. — *Roy L. Albright, W5EYB*

A QUICK SPLICE FOR MASTS

Pictured here is a quick and easy means of splicing masting or thin-wall tubing, such as electrical conduit or TV masting, which otherwise would not mate because of the difference in sizes. Each splice requires four U-bolts and associated parts which may be available in most hardware stores. I use the ones with a bright finish, which don't seem to rust too fast.



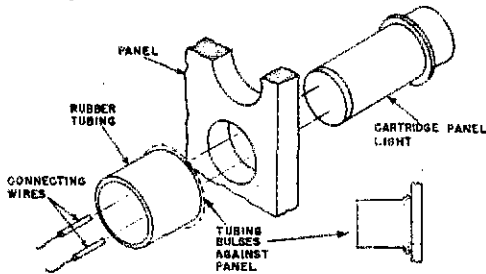
The idea is to interlock the clamps as shown in the drawing at A. With two pairs interlocked like this you can now pass the ends of the pipes through them as shown at B. Prior to tightening of the nuts, this arrangement will be very unstable but will become very rigid when the slack is taken out of the U-bolts.

With some sizes of pipe and U-bolts you may find that the threads do not extend down the shank far enough to effect a tight fit. An over-sized nut, as shown at C, may then be used as a spacer, which will provide extra threads and allow a good grip on the pipes.

This arrangement is used to support small antennas at a height of about 20 feet. Proper guying is important for a mast of this type. — *William L. Smith, K4RJ*

MOUNTING PANEL LAMPS

The use of rubber surgical tubing allows cartridge-type lamps to be mounted in close proximity to other lamps, and to be easily removed without damage. Such lamps can be mounted on digital displays, or other display panels, using this technique.



Shown is the method used to mount panel lamps as explained in the text.

A hole large enough to receive the cartridge lamp is drilled in the panel. The lamp is then inserted into the hole (see drawing). While pressure is applied to the outer portion of the lamp, a short piece of surgical tubing is slid over the part that extends through the hole. A slight bulging of the tubing at the panel secures the lamp and prevents vibrations.

The use of an insertion tool, made from a piece of metal tubing with an inside diameter slightly larger than the outside diameter of the lamp, is helpful in seating the rubber tubing. The lamp can be removed easily by withdrawing the rubber tubing and sliding the lamp from the panel. — *NASA SP-5906(03)*.

ELIMINATION OF RECEIVER AUDIO HUM

At one time I was troubled with hum in the receiver audio. The hum would mask weak stations. My comfortable, low-impedance, high-

fidelity headphones (with their low-frequency response) made this hum even more objectionable when attempting to copy weak stations.

While searching for a solution, I suspected that a filter capacitor had gone bad, but disconnecting the B+ proved to me that this was not the fault, for the hum remained. The source of the hum was found to be the proximity of the power transformer to the audio-output transformer. Of course, the answer to my problem then was to relocate the audio transformer as far as possible from the power transformer, which I easily accomplished by using extended leads.

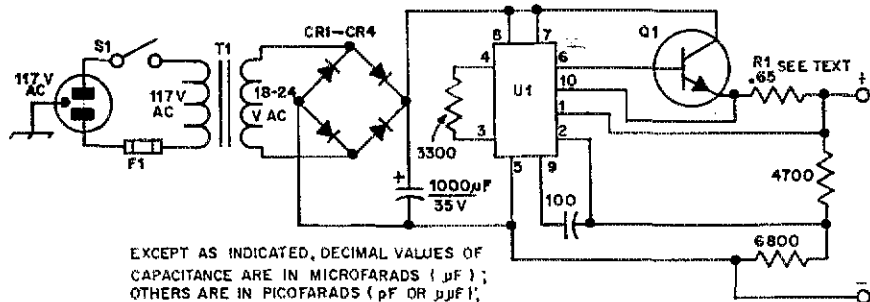
In some receivers this may not completely eliminate the hum, in which case you may do as I did — orient the audio transformer in various positions until a null is reached (af gain fully off). When the best position is found, the af transformer is secured to the chassis. The results have been great; I have a quiet receiver down to the shot noise in the tubes and an RST-539 signal is completely readable whereas before, it was hidden in the hum. Results have been the same with a pair of Signal Corps communication headphones. — *Herbert M. Rosenthal, K4SF*.

A 12-VOLT REGULATED POWER SUPPLY

After reading the November 1971 *QST* and *Ham Radio* (February 1972), concerning regulated power supplies for transistor projects, I was able to design a less expensive version of the 1-ampere supply. I found that all parts were readily available and if purchased new would come to less than \$7.

The heart of this supply is a $\mu A723$ voltage regulator. I found these as a part of a Radio Shack "Surprise Pak," number 276-611. You can easily tell if a particular pack contains these voltage regulators, since they have ten leads, whereas the other devices in the package have only eight leads. I've noted that there may be as many as two to six voltage regulators in each of the several packages that were inspected.

An 18-volt transformer would have been a better choice for T1, but the 24-volt type is sometimes more readily available. With the latter the ratings will not be exceeded. — *Henry R. Greeb, W8CHT*



EXCEPT AS INDICATED, DECIMAL VALUES OF CAPACITANCE ARE IN MICROFARADS (μF); OTHERS ARE IN PICOFARADS (μF OR $\mu\mu F$); RESISTANCES ARE IN OHMS; $k = 1000$.

The circuit diagram of the inexpensive 1-ampere power supply. Q1 should be mounted on a large heat sink. The current-limiting resistor, R1, is made from approximately 100 feet of No. 28 wire and provides about 0.65 ohm of resistance.

Improving Cw Reception

(Continued from page 21)

This modification should be of interest to owners of the SB-300 and '301 as well, as they also have a common crystal for usb and cw. The mechanics of modifying these receivers would be different, however, as their physical layouts are not the same as that of the '303. Only receivers having the 400-Hz cw filter will benefit from this modification.

Finally, a trimmer capacitor was soldered across the crystal pins to pull it to the desired beat note. I used one, I happened to have on hand. It was 7 to 45 pF, but you can also use a fixed-value capacitor (silver mica is probably best) in this range, choosing a value by substitution that will produce a beat note you like. With the trimmer at maximum capacitance, the beat note is about 500 Hz when the signal peaks.

Operation

The major fringe benefit of this modification, referenced earlier, is better copy under QRN conditions. I'm not really sure why this happens, but perhaps it's because the audio frequencies of static crashes are higher than the point at which the receiver is now peaked, and they simply don't come through as strongly after the modification.

The question arises as to what happens when you're using a modified '303 and transceiving with an SB-400 or '401. The answer is: nothing different than before. Since the receiver BFO is fed to the transmitter in the transceive mode, the outgoing signal will still be properly offset from the received signal to produce an audible beat note in the receiver of the guy at the other end of the QSO when he is listening on his own frequency. QST

RFI

(Continued from page 44)

involving RFI to audio devices. These bulletins are available from any of the field offices. The bulletin is addressed to the users of hi-fi, record players, public-address systems, and telephones. It clearly spells out the problem and the obligation of the owner of such gear.

It is suggested that the amateur obtain copies of this bulletin, which is listed as *Attachment III, Bulletin, Interference to Audio Devices*. When the amateur receives a complaint he can provide the complainer with a copy of the bulletin. This approach will help put the problem in correct perspective.

Acknowledgements

Credit for much of the material in this article must go to the Washington (D.C.) Television Interference Committee and *Auto-Call* magazine, Sparta Electronics, an article that appeared in *Broadcast Engineering* January 1972, and to Bradley W. Wyatt, Jr., K6WR. Additional thanks goes to the many amateurs who have written to League Hq. with information concerning cures that worked for them. QST

A Homemade Duplexer

(Continued from page 26)

the cavities is recommended if more than 150 watts of input to the duplexer is planned. A duplexer using plated cavities has shown an insertion loss of under 1 dB, and a rejection of more than 100 dB. Unplated cavities should be taken apart every two years and cleaned thoroughly, then retuned.

Miscellaneous Notes

- 1) Double-shielded cable is a *must* throughout the system.
- 2) The VSWR from the antenna should not exceed 1.2 to 1 for proper duplexer performance.
- 3) Good shielding of the transmitter and receiver at the repeater is essential.
- 4) The antenna should have four or more wavelengths of vertical separation from the repeater.
- 5) Conductors in the near field of the antenna should be well bonded and grounded to eliminate noise.
- 6) The feed line should be well bonded and secured to the tower or mast.
- 7) Feed lines from other antennas in the near field of the repeater antenna should be well bonded and as far from the repeater as possible.
- 8) Individual cavities can be used to improve the performance of split-antenna or split-site repeaters.
- 9) Individual cavities can be used to help solve intermod problems.
- 10) The notch and pass frequencies of the duplexer are broad enough that two repeaters on adjacent channels could be run through one duplexer and antenna, with the addition of appropriate circulators.

Acknowledgements

The author wishes to thank Lew Collins, K4GGI, for review and comments on the manuscript and Fred Cunningham, W1DCD, for photography and corrections. QST

FEEDBACK

In the article by K2RIW, describing his 432-MHz kilowatt amplifier, April, 1972, *QST*, there is a slight error in the drawing, Fig. 6, page 54. The 4-3/4 and 2-1/4-inch dimensions on L2 should be measured from the left-hand edge, not from the centerline of the screw holes. There is an excess of 3/8 inch, as shown, which may make it difficult to resonate the amplifier grid circuit.

Thanks to the sharp eyes of W7JLF two errors were spotted in Fig. 3 of "A High-Performance Tunable Fm Receiver," *QST* for April 1972, page 47. Diodes CR1 through CR4, inclusive, should be 600 PRV instead of the 100-volt value shown. Also, the secondary of T1 should read 260 volts each side of center.

In the article "An Experimental Receiver," *QST* for February 1972, a .01- μ F bypass capacitor should be added from pin 9 of V2, Fig. 2, to ground.

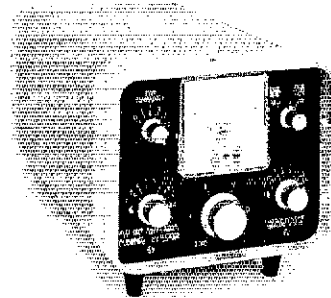
Recent Equipment

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

The KW Electronics

KW107 Supermatch

THE KW107 SUPERMATCH combines an antenna tuner, SWR meter, wattmeter, dummy load, and antenna switch in one package. Designed to operate from 80 through 10 meters, the unit will match impedances of approximately 30 to 2500 ohms on 10, 15, and 20 meters, and 30 to 1000 ohms on 40 and 80 meters. The Supermatch will handle 1 kW when the SWR is 1.8:1 or lower. The power input should be limited to a maximum of 350-watts PEP when feeding a high-impedance load such as presented by a voltage-fed long-wire antenna. Initial transmitter tune-up into a new antenna or at a new frequency should always be made into the dummy load. The convection-cooled 52-ohm dummy load will handle 1 kW for 5 seconds and 50 watts for 20 minutes. The wattmeter is calibrated in two ranges (0-100 and 0-1000) and tests indicate its accuracy to be within the specified 5 percent at full scale. The SWR meter is sensitive. It is possible to obtain full-scale deflection on 80 and 40 meters with 10 watts applied to the input connector. The large 3-1/4-inch-square meter allows easy readability.



Flexibility is the keynote with the KW107. A variety of switching arrangements is possible by following the manufacturer's suggestions for connections. As wired by the factory, the antenna-tuner portion of the Supermatch is always in the circuit (except when the selector switch is in the DUMMY LOAD position). With this configuration it is possible to connect the transmitter to 5 different antennas. There are 5 coaxial sockets mounted on the rear apron of the unit, as well as two pairs of terminals for use with balanced feeders. A typical arrangement is shown in Fig. 1. The desired antenna is switched to the appropriate band by means of the ceramic selector switch. When using balanced feeders for both an 80/40-

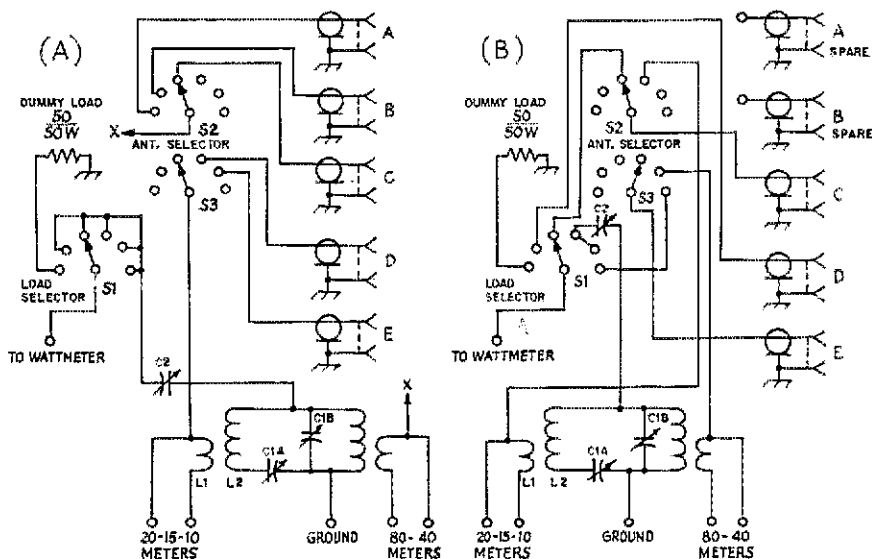
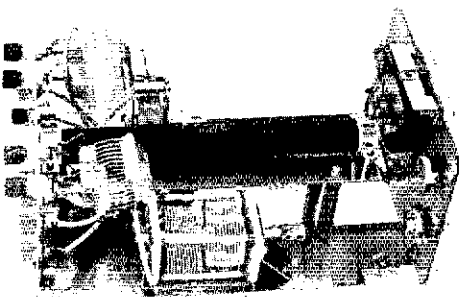


Fig. 1 — As shipped from the factory, the Supermatch is wired as shown in A. In that configuration the antenna-tuner portion of the Supermatch is always in the circuit except when the selector switch is in the dummy-load position. The circuit at B shows one alternative way of wiring the unit.

Inside view of the KW-107 Supermatch. The dummy load is shown at the center. Connections are provided on the rear apron for several antennas which may be selected by the front-panel antenna switch.



and a 20/15/10-meter antenna, external switches (dpst) must be used to disconnect the unused transmission line.

During tests, this writer found it easy to match a 270-foot center-fed antenna with 450-ohm open-wire line, on 80 through 10 meters. With 50-ohm line to the transmitter, an SWR of 1.1:1 or less could be obtained on all bands except 40 meters. On this band it was possible to obtain a reading of 2:1 over most of the band, the antenna and feeder combination apparently providing an impedance at the Supermatch which was just out of its range. The detailed and nicely illustrated operating manual fully explains the procedures to be followed for using the KW107 Supermatch. If the instructions are followed, the unit should prove to be a useful addition to any station. Although the KW107 is designed to operate with the KW2000A/B transceiver (and other KW Electronics products) the Supermatch, in its attractive gray cabinet, should make an eye-pleasing accessory in any setting. — W4WFL/1

KW107 Supermatch

Dimensions (HWD) and Weight:
7-7/8 × 7-7/8 × 13 inches, 7-1/2 pounds.
Price Class: \$140.
Distributor: KW Electronics, 222 Newkirk Road, Richmond Hill, Ontario, Canada. In U.S. 10 Peru Street, Plattsburg, NY 12901.

QST ————— QST ————— QST

The Heath SB-610 Monitorscope

THE SB-610 MONITORSCOPE is a revision of an earlier device manufactured by Heath and its operation was described by W1DF.¹ The uses of an oscilloscope for signal monitoring have been covered in detail previously, and therefore need not be discussed to any degree here.² Although the '610 performs similar functions as the older model HO-10, the outward appearance is quite different. The traditional "SB" styling has been incorporated to have the new Monitorscope match the decor of Heath's line of amateur ssb gear.

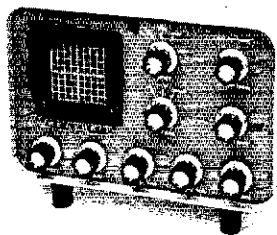
The most striking difference between models is the size. The '610 is 1-1/2 inches higher and 2-1/2 inches wider than its predecessor. This increased size consumes a bit more space on the operating table; however the large knobs and bold panel lettering are a welcome change.

The Circuit

Except for a few component value differences, the circuit of the SB-610 is the same as the HO-10. The power supply has been changed, however, to

¹ The HO-10 Monitorscope was reviewed in QST for December, 1963.

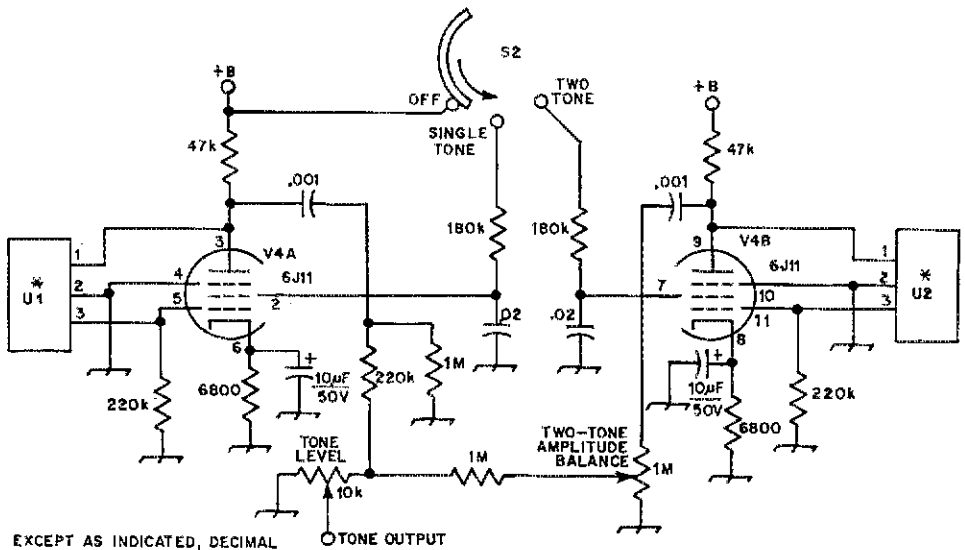
² Blakeslee, "A Scope Adapter for Transmitter Monitoring," QST, October, 1970.



include silicon diodes in place of the vacuum-tube high-voltage rectifier.

The two-tone oscillator is shown schematically in Fig. 1. Circuit designations are given in the manufacturer's numbers. V4A, along with its associated circuitry, generates a 1500-Hz tone; V4B performs an identical function at 1950 Hz. The two oscillator circuits are the same except for the phase-shift networks which determine the frequency. These networks produce a phase shift of 180 degrees from plate to grid at the proper frequency to sustain oscillation. The two tones selected are sufficiently high in frequency to assure that the second harmonic of each will fall outside the passband of most ssb transmitter filters.

The TONE GEN switch selects either a single 1500-Hz tone or a combination of 1500 and 1950



EXCEPT AS INDICATED, DECIMAL VALUES OF CAPACITANCE ARE IN MICROFARADS (μF); OTHERS ARE IN PICOFARADS (pF OR $\mu\mu\text{F}$); RESISTANCES ARE IN OHMS; K=1000, M=1000000

* U1 & U2 ARE AUDIO PHASE-SHIFT NETWORKS. SEE TEXT.

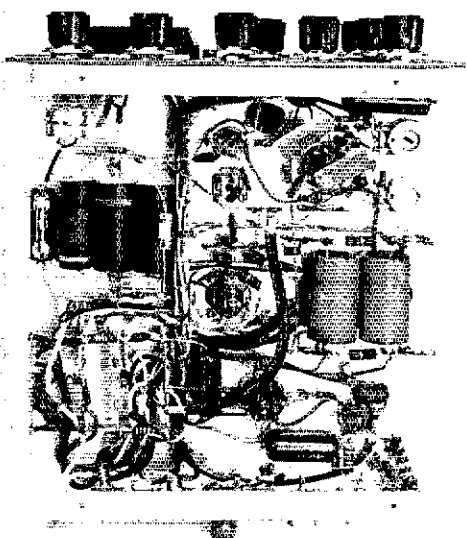
Fig. 1 — Circuit diagram for the two-tone oscillator.

Hz by applying screen voltage to the appropriate segment of V4. In the 2-TONE position, voltage is applied to both sections of V4. Potentiometers are provided for adjustment of both amplitude and balance. A rear-apron jack may be used to connect the audio tones to the transmitter input connector.

Receiver Signal Monitoring

One feature included in this model, and not available with the earlier one, is a vertical-amplifier

<p>Heath SB-610 Monitorscope</p> <p>Dimensions (HWD) and Weight: 6-5/8 x 10 x 11-1/8 inches, 9-1/2 pounds.</p> <p>Power Requirements: 105-125 V ac or 210-250 V ac, 50-60 Hz, 35 watts.</p> <p>Price Class: \$90.</p> <p>Manufacturer: Heath Company, Benton Harbor, MI 49022.</p>

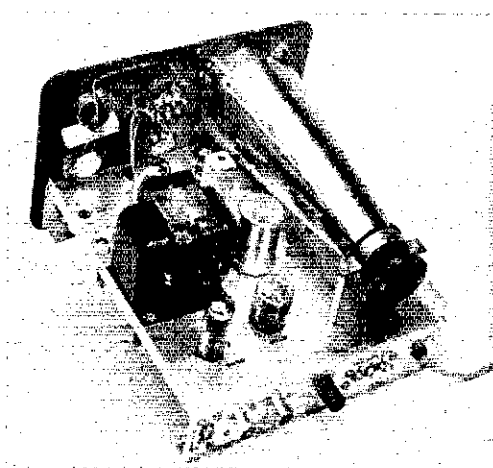


input circuit having several frequency ranges. Although this range is determined at the time of construction, it may be changed later should a different range be required. The vertical amplifier accommodates any receiver i-f between 455 kHz and 6 MHz; an alternate circuit may be used to monitor signals of 1 to 150 kHz for RTTY operation. This range also may be used with receiver intermediate frequencies from 50 to 150 kHz.

The operator is cautioned against using his Monitorscope to provide a critique of the other fellow's signal without a complete understanding of its use and operation. The instruction manual contains several pictorial diagrams of typical wave forms which may be compared with displays on the CRT. The scope pattern may be modified, however, by the receiver i-f characteristics, QRM,

Bottom view. The two-tone circuitry and V4 are located at the upper right.

Top view of the SB-610. The amplitude and balance adjustments for the two-tone oscillator are located in front of the power transformer. An electromagnetic shield over the CRT is a feature not included on the earlier Monitorscope.



and atmospheric noise. The point here is that wave-form displays of received signals depend on too many factors. A poor wave-form display does not mean necessarily that there is something wrong with a particular signal; it is merely an indication that the other operator *may* not have adjusted his transmitter correctly. This writer finds watching received-signal wave forms to be interesting, but the policy of keeping one's mouth shut is definitely in order! Monitoring the transmitted signal is the major purpose of this instrument. -- WIFBY

The Dit Ditter

(Continued from page 17)

When using the Dit Ditter, the only adjustment needed is to set R1 until the keying synchronizes with the oscilloscope sweep circuit and one or two dot wave forms are displayed. Sample wave-form photographs are given in the article referenced in footnote 2 (and in the 1972 edition of *The Radio Amateur's Handbook*) along with instructions for the analysis of keying wave shapes.

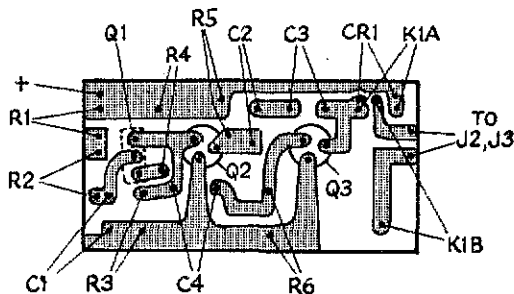


Fig. 2 -- Half-size pc-board template and parts-location diagram.

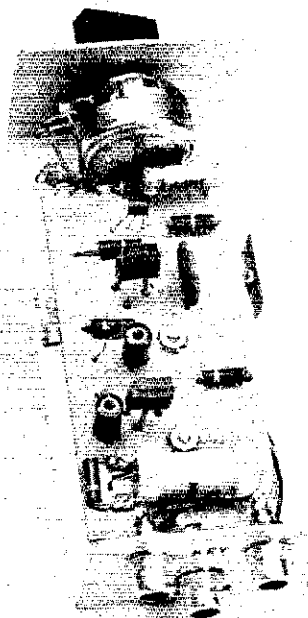


TABLE I

Volts	mA	VA	Capac.	Res.
100	50	5	.00022	820
100	100	10	.001	330
100	500	50	.022	27
100	1000	100	.1	10
250	50	12.5	.00022	680
250	100	25	.001	330
250	400	100	.015	68
500	50	25	.0022	1200
500	100	50	.001	560
500	200	100	.004	270

Resistor and capacitor combinations to be connected in parallel across the relay contacts for spark suppression. R-C combinations are chosen to fit the voltage and current to be keyed.

The test keyer is built in a 5 x 2-1/8 x 1-3/4-inch box made from two U-shaped sections of aluminum stock. A Minibox can be employed, if desired.

The Ailing Emporium

An Update on the Parts Procurement Crisis

BY DOUG DeMAW,* WICER

THIS DISCUSSION of procurement of components will not please the amateur who finds it distasteful to alter his methods of doing things. For it suggests a near future where a specialized line of conduct will be necessary, where traditional techniques may be discarded in favor of more realistic ones. Radio components just aren't stacked in neat little bins at the once-fertile "radio store around the corner." There is a growing chorus of ham voices — some plaintive, some obviously irritated, and others downright demanding that the League "do something about this mess." Regrettably, there is no simple ritual we can perform to correct the worsening parts-procurement situation. The antidote for Doomsday, fortunately, is within the reach of those of us who are willing to break stride and adopt new techniques when acquiring component parts for favored projects. It is ironic that we live in a time when state-of-the-art components abound, yet they are earmarked for the high-quantity commercial buyer. We can adopt a prosaic outlook, pack away the iron and solder, and buy commercially made equipment. Or, we can cast an optimistic glance in the direction of what seems to be an occluded horizon, changing our long-established practice of trying to buy parts locally and from two or three large mail-order distributors.

The Past

There is a certain amount of nostalgia to be enjoyed when reflecting on the Saturday conclaves once common at the local radio supply house. Meeting old friends over a cup of off-times too-strong coffee, dispensed from the "gratis" um

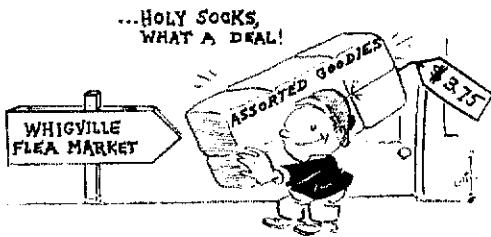
* Technical Editor, *QST*.

in one corner of the room, and shopping for the week's parts requirements, was something that fitted a ham's way of life. Then came an uncontrollable decline in the marketability of discrete components for ham radio transmitters, receivers, and related gadgets. The retrogression might be considered a monument to the lassitude of some amateurs who chose to purchase "store-bought" equipment in preference to parts which could be used to build homemade gear. Also, a contributing factor could well be the coming of a new technology in which semiconductors replaced the older and more familiar vacuum tubes. As solid-state circuits were developed, the need for vacuum tubes and the parts which complemented them lessened. Wholesale dealers maintained an inventory primarily to satisfy the needs of TV service shops and industrial customers. Highly specialized parts that appealed to amateurs — transmitting capacitors, high-power rf-amplifier tubes, parts for communications receivers and the like, and other so-called specialty items — became obtrusive by their very absence. The supply finally exceeded the demand, and no enterprising radio parts dealer wanted to be caught with an inventory that had too slow a turnover. So, quinine-flavored as it may be, we amateurs contributed in part to the present gloomy situation.

ARRL's Effort

League staffers have tried to encourage amateurs to "learn by doing." During technical talks afield, Hq. personnel laud the merits of home-construction practices, hoping to fan the fire that once burned more brightly in the hearts of those amateurs who made contributions to the art through personal workshop efforts. Each issue of





QST contains a selected lineup of articles meant to encourage amateurs, hopefully, along home-workshop lines.

The limits of technical growth have been extended by *QST*'s introduction and frequent application of etched circuits, and this has been a good sign. It is the staff's hope that if a better market exists for ham radio components, more parts houses will stock the items that are now difficult to locate. At least one concerned individual, W1KRD of James Millen Mfg. Co., has put forth a notable effort to encourage parts distributors to stock amateur components.

Members of the ARRL technical staff have done the same, both in personal contacts and by mail. Success will be realized only if a lot of missionaries communicate their feelings to the organizations that sell radio parts. It is unlikely that the sad state of affairs we now face is irreversible. ARRL will continue to beat the bushes. The amateur can do his part by using salesmanship each time he visits the parts counter of his local supply house.

In the Meantime

An earlier *QST* article on the subject of procurement,¹ treated the matter of garnering parts from other sources. It would be redundant to beat those drums again, but it is noteworthy that "scrounging" parts from surplus equipment and junked TV sets is still very much in vogue. Hamfest flea markets remain a primary source of supply for practically everything an experimenter/builder might need. (The writer was ecstatic over the proliferation of electronics hardware displayed at the Dayton Hamvention flea market in 1971. E.g., unused multiwafer ceramic rotary switches and going for 25 cents each! Transformers, variable capacitors, solid-state devices, tubes, and complete assemblies were being offered at similar bargain prices. Shades of the 1930s!) By planning ahead, or just on speculation, enterprising amateurs can stock up for future projects by taking advantage of such affairs. There are many events of this nature each year, and in all parts of the USA. The game is the same, but with different players. Whether it's called a flea market, swap-and-shop session, or a club auction, the largest variety of components and best buys of a lifetime can be found there.

The surplus dealer's marketplace spawns cost-saving "deals" that rank second to flea-market transactions. One should keep a perceptive eye on

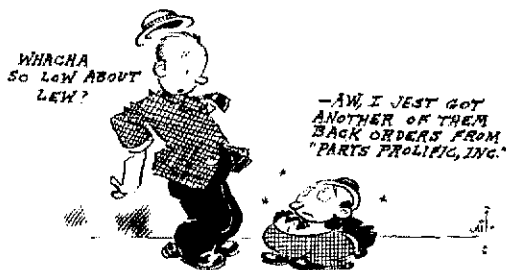
¹ "The Ham Builder's Nightmare," *QST*, October, 1971, p. 11.

the surplus ads in *QST* and other radio journals. Some equipment that is useless in composite form can be broken down to enhance the parts inventory in the ham workshop. It is not uncommon to glean many dollars worth of useful parts from an ineffectual electronics monstrosity that cost the ham but two or three dollars.

Ranking third in the cost-saving order is the import market. Stores that dispense individual parts from foreign sources provide the amateur a hartering place of considerable worth. The taint has long been removed from products made in the Orient. Competition and modern manufacturing processes have led to a product excellence that would be difficult to fault. Reduced labor costs overseas make possible U.S. prices on imported electronic wares that favor the radio amateur. It is therefore a wise shopper who explores the shelves of the import dealers when selecting parts for his pet project.

Be Your Own Purchasing Agent

Amateurs, on a dwarfed scale, must function as purchasing agents in these perplexing times. A properly equipped buyer maintains as complete a catalog file as possible. Many of the companies listed at the end of this article will provide free catalogs upon written request. Others may charge a small fee for catalogs. Mail ordering, especially for those distant from metropolitan areas, is today's means to the desired end when collecting component parts for an amateur project. Prices are, to some extent, competitive. A wise buyer will study the catalogs and select his merchandise accordingly.



A common imaginary tune that is sung by today's ham is entitled, "The Back-Order Blues" which can result in paranoia. The back-order enigma can be explained simply: some distributors operate on the "drop-ship" concept. Rather than invest capital in a large inventory they become distributors for a product line, but do not stock the merchandise. This technique permits them to collect commissions without committing their funds. When orders are placed with the wholesale outlet, the firm simply mails the order to the manufacturer and the item is shipped from the factory. Manufacturers who condone this line of conduct are not aiding the consumer.

One way to vanquish back-order problems is to state clearly in your order that you are

CHART I

A,H	Allied Electronics* 2400 W. Washington Blvd. Chicago, IL 60612	A,H	HAL Devices* Box 365 Urbana, IL 61801	A,H	Newark Electronics* 500 N. Pulaski Rd. Chicago, IL 60624
A	Allied/Radio Shack Stores* (See local phone directory)	A,H	Hamilton/Avnet Elect. 10916 W. Washington St. Culver City, CA 90230	N	Piezo Technology, Inc.* Box 7877 Orlando, FL 32804
F	Alltronics-Howard Co. Box 19 Boston, MA 02101	M	Hammond Transformer* 394 Edinburgh Rd. N. Guelph, Ontario CANADA	B,H	Poly Paks* Box 942 Lynnfield, MA 01940
D	Amidon Associates* 12033 Otsego Street N. Hollywood, CA 91607	A	Harrison Radio 20 Smith Street Farmingdale, L.I., NY 11735	A,B	Reliance Merchandising* 2223 Arch Street Philadelphia, PA 19103
A,B	Arch Electronics* 816 Arch Street Philadelphia, PA	A	Henry Radio 11240 W. Olympic Blvd. Los Angeles, CA 92801	G	Savoy Electronics, Inc. Box 7127 Ft. Lauderdale, FL 33304
F	Atlantic Surplus Sales 580 Third Avenue Brooklyn, NY 11215	G	International Crystal Co.* 10 N. Lee Street Oklahoma City, OK 73102	G	Sentry Mfg. Co.* Crystal Park Chickasha, OK 73108
A,B,C	Barry Electronics* 512 Broadway Street New York, NY 10012	G	JAN Crystals* 2400 Crystal Drive Ft. Myers, FL 33901	J	Skylane Products 406 Bon Air Avenue Temple Terrace, FL 33617
K	Bauman Sales Box 122 Itasca, IL 60143	E	Kepro Circuit Systems* 3630 Scarlet Oak St. St. Louis, MO	H	Solid-State Systems, Inc. Box 773 Columbia, MO 65201
A,B,C	Burstein-Applebee* 3199 Mercier Street Kansas City, MO	A,H	Kierulff Electronics 2585 Commerce Way Los Angeles, CA 90040	I	Spectronics, Inc.* 1009 Garfield Street Oak Park, IL 60304
E,H	Circuit Specialists Co. Box 3047 Scottsdale, AZ 85257	J	Kirk Electronics Div.* 134 Westpark Rd. Dayton, OH 45459	N	Spectrum International* Box 87 Topsfield, MA 01983
A,H	Cramer Electronics, Inc. 60 Connolly Plwy. Hamden, CT 06514	A,B	Lafayette Radio Elect.* 111 Jencho Tpk. Syosset, L.I., NY 11791	B,C	Star-Tronics* Box 17127 Portland, OR 97217
A	Dixie Radio Supply Co. 1900 Barnwell St. Columbia, SC 29202	I	Mann Communications* 18669 Venture Blvd. Tarzana, CA 91356	F	Teletype Corp. 3555 Touhy Avenue Skokie, IL 60076
A	Electronics Distributors, Inc.* 1960 Peck Street Muskegon, MI 49441	B,C	John Meshna, Jr.* Box 62 E. Lynn, MA 01904	O	Ten-Tec, Inc.* Highway 411, E. Sevierville, TN 37862
D	Elna Ferrite Labs, Inc. (Ferrocube Products) 9 Pine Grove Street Woodstock, NY 12498	A,H	Milgray Electronics, Inc. 191 Hanse Avenue Freeport, NY 11520	F	Typetronics Box 8873 Ft. Lauderdale, FL 33310
D,N	E. S. Electronic Labs Box 434 Excelsior Springs, MO 64024	A,K,L	James Millen Mfg. Co.* 150 Exchange Street Malden, MA	F	Van Slot, W2DLT 302Z Passiac Avenue Stirling, NJ 07980
B,C	Fair Radio Sales* Box 1105 Lima, OH 45902	A,K,L	J. W. Miller Company* 19070 Reyes Avenue Compton, CA 90224	B, H	Weinschenker, K3DPJ Box 353 Irwin, PA 15642
I	Gregory Electronics Corp.* 249 Rte. 46 Saddle Brook, NJ 07662				

CODING

- A -- New Components
- B -- Surplus Parts
- C -- Surplus Assemblies
- D -- Toroids and Ferrites
- E -- Etched-Circuit Board Materials
and Etching Supplies
- F -- RTTY Equipment and Parts
- G -- Transmitting and Receiving Crystals
- H -- Solid-State Devices
- I -- Surplus FM Gear and Parts
- J -- Antenna Hardware
- K -- Dials and Knobs
- L -- Variable Capacitors
- M -- Transformers
- N -- I-F Filters
- O -- Cabinets and Boxes

To the best of our knowledge the suppliers listed here are willing to sell components to amateurs in single-lots or small quantities by mail. An * indicates that a catalog or flyer is available on written request. Distributors with code "A" are suppliers of small parts listed under many of the other code symbols.

CHART II

SEMICONDUCTOR MANUFACTURERS

EEP (European Electronics Products Corp.)
101 50 W. Jefferson Blvd.
Culver City, CA 90230

Fairchild Semiconductor
464 Ellis Avenue
Mountain View, CA

General Electric Company
Building 1, Electronics Park
Syracuse, NY 13201

Hewlett-Packard Corp.
1501 Page Mill Road
Palo Alto, CA 94304

Motorola Semiconductor Prod. Inc.
Box 20912
Phoenix, AZ 85036

National Semiconductor Corp.
2900 Semiconductor Drive
Santa Clara, CA 95051

Plessey Microelectronics
170 Finn Court
Farmingdale, NY 11735

RCA Semiconductors
Radio Corporation of America
Electronics Components and Devices
Harrison, NJ

Signetics Corporation
811 E. Arques Avenue
Sunnyvale, CA 94086

Siliconix, Inc.
1140 W. Evelyn Avenue
Sunnyvale, CA

Teledyne-Crystalonics
147 Sherman Street
Cambridge, MA 02140
(Power FETs)

Texas Instruments, Inc.
Box 5012
Dallas, TX

This directory of semiconductor manufacturers will be useful to those amateurs who desire lists of stocking distributors, and wish to order application notes. Write to these firms for information on where *your* nearest outlet store is located.

unwilling to accept back orders. Request that a rebate be given you for items that can not be supplied in your shipment. This missing articles can be ordered from another supplier.

Delays in shipment can be lessened by avoiding the use of personal checks when ordering. Bank or postal money orders are preferred by most distributors. Personal checks often take a week to clear, thereby causing frustrating delays in the order reaching you.


Use Your Ingenuity

T.O.M. (The Old Man) would squirm fitfully were he aware of the decline in resourcefulness which affects many present-day amateurs. Our affluence and growing apathy has turned many of us into kit-oriented builders. The "young squirt" (and all too many old timers) have chosen to let the kit manufacturers do their thinking for them. It does have some advantages; but when the

desire arises to duplicate an item from the pages of the *Handbook* or *QST*, the prospective builder is confounded by the lack of a blow-by-blow description on how to assemble the circuit! Similarly, the constructor feels that a bag of parts must be supplied with specifications identical to those used by the author of the article.

Significant among the reasons for using a particular part for a routine application is that the writer may have had the component on hand at the time he constructed the equipment. Perhaps an encapsulated rf choke of, say, 10 μH was listed for RFC3. The builder may have taken the part from a surplus IBM board he picked up at an auction. Because the duplicating builder cannot purchase the identical part, he considers this a fearful impediment. Chances are that he could have used that 8- or 12- μH choke that was listed in the catalog, or he could have employed the 10- μH unencapsulated unit he had stored away in his workshop. He might even have wound his own rf choke, using a dip oscillator and an *ARRL L/C/F Type A Calculator* to determine the number of turns required. The same thinking applies to many parts called for in an article. Improvisation has no worthwhile substitute in amateur radio. Since the beginning of ham radio we have been known as inveterate experimenters. We have been inquisitive, inventive, and sometimes daring in our approaches to problems. Should we be thwarted by so simple a matter as *precise* duplication of another's craftsmanship? If we cease to exercise the foregoing virtues we may no longer qualify as contributors to the art, and the future of amateur radio will be in serious trouble.

And Now the Order Blank

Through energetic research we have compiled a list of suppliers who sell components to amateurs in small quantities. We cannot predict how long the list will be valid, because of the ever-changing economy in the U.S. and Canada. It has been our purpose to supply this information on a yearly schedule, and present plans call for another roundup of names in 1973. The Hq. staff would appreciate hearing from readers who know of supply houses that are not listed here, and which exhibit the kind of integrity that will qualify them for our annual listings. Distributors might well do some soul-searching during the next several months and ponder the question of single-lot sales to amateurs. A considerable small-parts market exists for someone who wants to serve amateurs. 

The League Headquarters building is open to visitors Monday through Friday, 8:30 to 4:30 on a "drop-in" basis, and at other times by appointment. The headquarters is on Main Street (Conn. Route 176 and 176-A) about a mile north of the center of town, and about 3 miles west of Conn. 15-U.S. 5, the Wilbur Cross Highway. (For WIAW visiting hours, see the schedule in "Operating News.") Closed July 4 and Sept. 4 for the holidays.

What is it good for?

A Look at the Potential of a Band Whose Time Has Come

BY EDWARD P. TILTON,* WHDQ

THE 220-MHz-BAND has had its ups and downs, in frequency as well as occupancy. Originally assigned by FCC as 224 to 230 MHz in 1938, when all bands were still harmonically related, it was changed to 235 to 240 MHz after the end of World War II. Interest in the new band was not aided, in this era, by the fact that this was a provisional assignment, to be changed to 220 to 225 MHz eventually. The move was actually made in April, 1948, but again with an activity-inhibiting provision. The new frequencies were to be shared with airborne distance-measuring equipment (military radar and allied devices). If amateur communication interfered with the 220-MHz DME, hams in the interference area would have to go back to 235 MHz.

Then there was the considerable problem of getting anything amateurs could build to work there. Better tubes, both transmitting and receiving, at least partially took care of this in the late '40s and early '50s, but by then the experimenter-type ham tended to be more excited by the challenging move to 420 MHz, rather than the smaller and simpler step to 220.

ARRL provided the tools. *QST* and the *Handbook* carried many articles on 220-MHz gear. Extra credit was given for contacts made on 220 MHz and higher frequencies in ARRL vhf contests. The author of these lines dug deeply for 220-MHz news, and reported any in full detail in "The World Above 50 Mc." at every opportunity.

A perceptible rise in 220-MHz interest developed with the advent of the Technician Class

* Vhf Editor, *QST*.

License, first made available in 1951. For its first few years, this ticket was usable only on 220 MHz and higher frequencies. Faced with the necessity of building his entire 220-MHz station himself, the Technician tended to use his license mainly as a renewable bridge between the Novice and General Class. Not until the 6- and 2-meter bands were opened to them did many Technicians actually get on the air. Then, having become active hams, prevented from going lower in frequency by the limitations of their licenses, they gradually moved higher, and today we acknowledge the beneficial influence of Technician interest in vhf and uhf experimentation. In retrospect, there is little doubt that the thousands of active Technicians helped markedly to launch and accelerate the practical use of amateur frequencies from 220 MHz up.

Equipment Factors

Mass-produced transistors for the higher frequencies helped the cause along in the 1960s. Before good vhf transistors were common, the difference in equipment performance, especially in receiving, between 144 and 220 MHz was an adverse influence on the higher frequency. Anyone who was on 220 before transistor front ends were common doesn't have to be told that low-priced vhf transistors and easy-to-build receiving converters have made this band come alive. Only quite recently has it been possible to see that any path that can be covered regularly on 144 MHz is usable on 220, with essentially comparable signal levels.

Progress in the antenna field has helped, too. Extensive antenna work by 420-MHz experimenters has shown that antenna performance need not fall off as we go higher in frequency, if something like the physical size of lower-band arrays is maintained. Large stacked-Yagi and collinear arrays that work as antennas should are helping to push up the reliable range on 220, as they did on 432.

Efficient power generation is perhaps the least important of the upgrading influences now showing up on 220. We've had efficient external-anode tubes for kilowatt amplifiers for nearly 20 years, but more of us are using them, and there have been worthwhile improvements in high-power amplifier design in the last few years.¹ But the

¹ Collins, "The K4GGI 220-MHz Kilowatt Amplifier," *QST*, February, 1970. Also, the strip-line amplifier described by K2RIW in *QST*, April and May, 1972. Though shown for 432, it has techniques adaptable for 220 MHz.

-GOSH, I'M
GETTING OUT AS
GOOD ON 220
AS I DID ON
2 METERS!
YOWIE!!



greatest opportunity for transmitter improvement on 220 is in the under-ten-watts department. Again, transistors have turned the trick, with the result that highly efficient rigs can be built to run economically from a car battery. The implications of this are not lost on the manufacturers of mobile fm gear. Mobile fm, with repeaters, works on 220 as effectively as this combination now works at 146 MHz. All over the country, repeater operators crowded for channels between 146 and 147 MHz are making the move up to 220. See the 220-MHz band plan suggested in June *QST*.² And remember, a 5/8-wave vertical, full-length variety, is only 33 inches long at 223 MHz.

Propagation at 220 MHz

As might be expected of a band only 50 percent higher in frequency than 144, 220 has turned up few propagation surprises. In fact, because of the leveling factors already discussed, we are finding that there is less difference than we once anticipated in the way signals travel on 144 and 220, over various distances.

For a brief period in the early '50s, the writer was coholder (with W8BFQ) of the DX record for 220-MHz communications.³ The 2-meter record had been 1200 miles or more for several years before this 450-mile contact was made. It is of some significance to recall that, at the very moment of the W8BFQ-WIHDQ QSO on 220, WØEMS was coming through from Adair, Iowa, over 1000 miles, on 144 MHz. We tended to assume then that this might well represent the difference in DX potential of the two bands, yet it was only a few years later that W6NLZ and KH6UK bridged the 2540-mile path from California to Oahu on 144 and 220 MHz, with stronger signals on the higher band!⁴

It has been shown theoretically,⁵ and borne out in practice that, with all factors equal, and in the absence of aiding propagation, there is probably no discernible difference in signal level to be expected, out to the limit of consistent range, somewhere around 450 miles. With tropospheric bending present, the beneficial effect may be somewhat greater on the higher band. Duct propagation, involved in tropo over very long distances, may occur a bit more often on 220 than 144. Conceivably just the reverse of what we expected in the record situation mentioned above, there might have been a 220-MHz path to WØEMS when there was not one on 144, or at least 220-MHz signals might have been a little stronger. Lack of activity, rather than propagation potential, might explain lack of DX, with the equipment potential we have on 220 today.

Known ionospheric propagation effects decrease with increasing frequency. Sporadic-E skip, a rarity on 144, may be all but nonexistent on 220,

² "220- and 420-MHz Band Plans," *QST*, June, 1972, p. 91.

³ "World Above 50 Mc.," *QST*, November, 1952, p. 46.

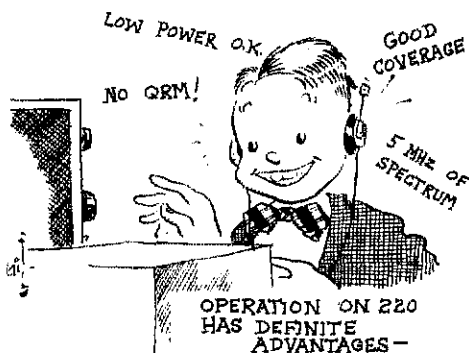
⁴ "World Above 50 Mc.," *QST*, August, 1959, p. 68.

⁵ Bray, "A Method for Determining Vhf Station Capabilities," *QST*, November, 1961.

but again, we need a lot more activity on both bands to prove or disprove it. TV DX on the high channels, that appears to tie in with E-layer openings on 50 and 144 MHz, has been observed.⁶ It may well be that, with today's equipment, countrywide activity on 220 would show occasional flashes of ionospheric DX.

The strength of aurorally propagated signals and the length of time that they are propagated from a given aurora decrease with increasing frequency also, but activity distribution has been the great inhibitor, to date. About the same situation prevails with meteor scatter; we have proved it possible, but we've not done too much with it, thus far.

Communication by reflection of signals from the lunar surface is an extremely difficult feat on



any frequency, with all experience and theory pointing to the need for the biggest antenna, the best receiver and the highest legal transmitting power as requirements for the successful EME station. Though only a few amateurs have achieved EME communication on 220, it is safe to say that equipment and antenna factors have not stopped others. With well-designed antenna arrays of roughly the same physical size as those used successfully on 144, 220 should work almost identically.

Where Do We Go From Here?

So there we have it. For all practical purposes, except for ionospheric propagation, 220 is good for anything that 144 is. There are frequencies close to 220 MHz that are in use all over the country, almost around the clock. For the vhf DX aspirant, KØCER recently discussed the use of signals from TV channels 7 through 13 for monitoring vhf propagation conditions.⁷ No, not with a TV receiver and a typical commercial TV antenna, but with a converter used with a communications Yagi for the TV frequency you intend to concentrate on.

(Continued on page 69)

⁶ Cooper, "Sporadic E on 220 Mc.?" *QST*, November, 1958.

⁷ "World Above 50 Mc.," *QST*, February, 1972.

AMATEUR RADIO —

PRIVILEGE AND RESPONSIBILITY

BY A. PROSE WALKER,* W4BW

SOME OF YOU might recall that I have been interested in the future of amateur radio for some time. Probably my background enables me to have a perspective not generally available to the average ham. If you can accept this premise, I hope you will permit me to discuss with you one of the major aspects of our common interest:

The basis and purpose of amateur radio
Its privileges and responsibilities
And how these matters relate to our future.

The initial statement of the "basis and purpose" of the Amateur Radio Service was first considered by the Commission twenty-three years ago. In the memorandum to the Commission supporting the adoption of what later became Section 97.1 of the rules, it was said that there is

. . . A need for a plan involving scope and direction which will provide for the immediate and long range development of the service as one in which new blood would be constantly infused and both newcomers and old-timers would be guided and induced constantly to seek self-improvement for themselves and advancement for the art generally.

There was considerable controversy over this approach. What finally resulted contained all but the last paragraph of Section 97.1. Subsequently, the Commission added the paragraph which provides for "continuation and extension of the amateur's unique ability to enhance international

* Chief, Amateur & Citizens Radio Division, FCC.

Addressing Dayton Hamvention participants, the new chief of amateur regulatory affairs discussed the basic principles of amateur existence and performance. W4BW's long experience as well as present position make his remarks especially pertinent.



good will." In addition to the basis and purpose, the Commission also adopted at that time provisions to initiate the Novice, Technician, and Extra classes of amateur licenses.

We are recognized as a radio service by the International Telecommunication Union (ITU). I should emphasize that this was a hard-earned tribute and resulted only after extensive discussion and persuasion by those representing the amateurs at numerous international conferences of the ITU. Perhaps it would not be amiss to refresh your memories on the fundamental reasons for the existence of amateur radio. Unless my logic has become confused through application of artificial intelligence and natural stupidity, our use of a portion of the spectrum is a privilege, not a right.

Justification for Existence

According to the general concept, frequencies in the radio spectrum are a part of the natural resources of any sovereign nation. They are placed in trust (allocated) to various individuals and groups (amateurs) who have qualified themselves to utilize them according to rules and regulations. The latter are formulated on both the national and international levels by reason of the various characteristics of different portions of the spectrum. The group with which we are mostly concerned is the Amateur Radio Service. It has a charter, known as the "basis and purpose" contained in Section 97.1 of the FCC rules. And if we subscribe to the basis and purpose of amateur radio, it should follow that the justification of our existence should be continuous, and on those premises.

In our many internal deliberations on amendments to the amateur rules, we often conclude that the best way to revise Part 97 is with an all-encompassing notice of inquiry. We frequently find ourselves trapped. When we make a temporary

revision in one portion we find ourselves "out of business" in another section of the rules. But the one section that has stood the test of time is Section 97.1, "Basis and purpose."

- A) Recognition and enhancement of the value of the amateur service to the public as a voluntary non-commercial communication service, particularly with respect to providing emergency communications.
- B) Continuation and extension of the amateur's proven ability to contribute to the advancement of the radio art.
- C) Encouragement and improvement of the amateur radio service through rules which provide for advancing skills in both the communication and technical phases of the art.
- D) Expansion of the existing reservoir within the amateur radio service of trained operators, technicians, and electronics experts.
- E) Continuation and extension of the amateur's unique ability to enhance international good will.

"Open and stir the earth a little about the roots of them" and see how we measure up.]

The key portions of paragraph (A) are **Voluntary, non-commercial communication service and particularly . . . providing emergency communications.**

Concerning the first, we find ourselves on the horns of a small dilemma at the present time. Amateurs are ready, willing, and anxious to provide a voluntary non-commercial communication service for the Red Cross, the Eye Bank, and other organizations in that category. But we find ourselves in somewhat of a quandary when we read 97.39 which relates to who is *not* qualified to be the licensee of an amateur station, and which also included the four words, "nor for its use." As interpreted, this means if the Red Cross, the Eye Bank, or other organizations of perhaps lesser accepted attributes are not qualified to hold an amateur license, neither can an amateur station be used on their behalf. This is not the main theme here, so let me merely recall that we had a Notice of Inquiry on the subject and received a great many thoughtful suggestions. I have my personal thoughts about the solution, but it would be better to discuss them on another occasion.

If we can solve this problem of 97.39, and I'm sure we can, then it is probably true that the service performed by the communication system is of maximum consequence . . . so long as it is non-commercial. We have all kinds of traffic nets. You probably know them more intimately than I. But I listen to a great many nets from time to time and sometimes I wonder whether a transcript of some traffic, which sometimes sounds like hair-brained, irresponsible frivolity, if read in the plenary assembly of the ITU, would assist us in justifying our use of the spectrum.

Emergency Communication

As far as emergency communication is concerned, our record is pretty good. But if a poll

were taken of licensed amateurs who have emergency equipment ready to operate, I suspect the percentage would be rather small. In my position dealing with both the Amateur and Citizens Radio services, I know that the CB boys are also willing and anxious to provide an emergency communication service. Regardless of the unpopular concept of them which perhaps some of you have, CB channel 9 is dedicated to nothing but emergency traffic. They work closely with many police departments throughout the country to assist in the reduction of crime. Their rules are different. I think that in some disaster situations in recent years, it might be considered somewhat of a race between amateur and CBers as to which group has provided the maximum assistance in communication. I won't attempt to judge.

Paragraph (B) of 97.1 says that we **should continue and extend our proven ability to contribute to the advancement of the radio art.**

What recent advancements can you think of off-hand, that can be attributed to amateurs? In vhf and uhf I think there are many amateurs engaged in fields which have led and could lead to further technical contributions. Some amateurs are working on their own, without the benefit of scientific laboratories or industrial organizations behind their efforts. I won't attempt a chronology of achievements here, but I have a feeling that we might be in difficulty if we had to prove our worth, on the basis of technical contributions alone.

Paragraph (C) of 97.1 says that the Commission should **enact rules which provide for advancing skills in both the communication and technical phases of the art.**

At the time this paragraph was written there was some discussion whether it should read ". . . rules which provide for *advanced* skills . . ." rather than ". . . advancing skills . . ." Someday perhaps I can devote time to an evaluation of the amateurs' and the Commission's stewardship over the years, in providing these aspects in amateur radio.

Repeater Rules

Momentarily, we are in the final throes of the report and order on the repeater rule making, Docket 18803. One of the aspects that we have tried to keep constantly in mind relates to this portion of 97.1. There is considerable known today about many advanced techniques in the vhf area. In writing the rules which relate to repeaters, we believe that to discharge our obligation to you, we should incorporate in the rules things which do in fact assist in advancing skills in this phase of amateur radio. Perhaps some of you will feel that we have been a bit too tough in the technical areas. We probably will require you to provide us in your application with such information as output power (not input), transmission line loss, vertical and horizontal characteristics of the antenna, gain in the horizontal plane, and the height of the center of the radiating system above average terrain



"... You can get through on cw..."

computed in a particular manner. It will mean additional work for those who wish to be licensees of a repeater station. We believe that in the end (this will require a few years) we shall have a good overview of the entire repeater picture in this country - and you, the amateur, will be better off for having perhaps advanced your skills in one area of communications engineering. I would rather you judge us by our deeds rather than our misdeeds.

I don't want to leave this subject without acknowledging the high degree of technical knowledge and skill exhibited by some amateurs in their submissions to the Commission. We are privileged to receive information and plans from a great many amateur organizations. I can tell you that some of them do not have to take a back seat to any industrial organization in the world. They are planning to use some of the most advanced, sophisticated communication techniques known, which will surely improve the operation of their repeaters in the area of public interest, particularly for emergency communication in time of disaster.

Paragraph (D) of 97.1 concerns the expansion of the reservoir of trained operators, technicians, and electronics experts.

We hear a lot today about the antiquity of cw, and its obsolescence as a useful mode of communication. Well, no one would attempt to equate manual telegraph with faster automatic modes of communication in terms of volume. But it probably is still true that conditions are really bad, you can get through on cw when you can't on RTTY or radiotelephone. There are systems which will work down into the noise level with all kinds

of error correction and redundancy, but generally that is not the type of communication available to amateurs. One can use a foreign language on cw when often, it would be hopeless with the spoken word. Then there is the matter of occupied bandwidth with which we always have to contend. If we had only 100 kHz in which to operate, which mode of emission would enable the most people to enjoy ham radio? Probably until we can obtain sufficient additional spectrum, bandwidth will always be a major consideration in the sub-allocation of our hf bands among the different modes of emission. In our deliberations on Docket 19162, the expansion of the phone bands, we must take this into account in its many ramifications for amateur radio, not only in this country but worldwide.

[How helpful it would be if we could see today with the eyes of tomorrow!]

The time-worn concept of the radio operator is changing, like all things in this world. Even the technician and electronic expert have different responsibilities than in previous years. Commercial equipment is built differently today than twenty years ago. It is now the general rule that when a portion of an equipment goes wrong, a signal light tells the technician which module to unplug and replace with a new one. When he puts the bad one on the work bench, a test set tells him what is wrong with it. So the concept of paragraph (D) will in time change to reflect the evolution of operating concepts, as the art of communication itself has evolved from semaphore to satellite.

People to People

Which brings us to the last paragraph (E) of the charter of amateur radio.

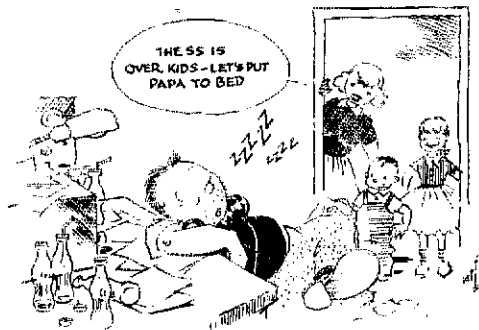
continuation and extension of the amateur's unique ability to enhance international good will.

I would like to discuss this paragraph in conjunction with all the others of Section 97.1, in an overall concept of the future of amateur radio.

Whenever we at the Commission do anything having an impact on amateurs world-wide, we either foster this concept or throw cold water on it. If the Commission does the right thing, then you are mainly responsible, through your conduct on the air, for the American amateurs' reputation - *throughout the world, among yourselves, and with others, particularly governments, and the ITU*, which, by the way, is an organization composed of governments, under the aegis of the United Nations.

Over the past 50 years, amateurs have achieved many wonderful accomplishments in the field of DXing - which is usually international communication - numbers of countries worked, a 10-second WAC, many 5-band DXCC certificates, contest scores which run into the millions of points - and all in good fun. Far be it from me to dampen DX enthusiasm. I enjoy it and keep weekly skeds with VK4YP and HB9AJI, and also chase new ones.

Maybe we should review the international aspects of amateur radio, whether it be contests or



"... During periods of intense contest activity..."

anything else, and evaluate the activity in terms of this paragraph of 97.1.

During periods of intense contest activity, do you ever wonder if non-contesters don't feel somewhat "put upon"? What is the international good-will aspect to such contests? Do they foster friendship among people of the various nations . . . or are they primarily for some other benefit? When we think about utilizing our hf bands, do we take into account the impact of our operations on those of other countries?

. . . or is our general attitude that because we have the most and the best of everything in amateur radio that we should have priority on whatever portions of the bands we want?

No, it is no longer possible to either think or act in an isolated manner. Signals in the hf portion of the radio spectrum are *per-se* international in character; they traverse national boundaries and because of this we have to take other countries' opinions into account. The work of the ITU is based upon this concept. And if amateurs do not learn to understand this, it could well be that we shall find ourselves in deeper trouble than we are now.

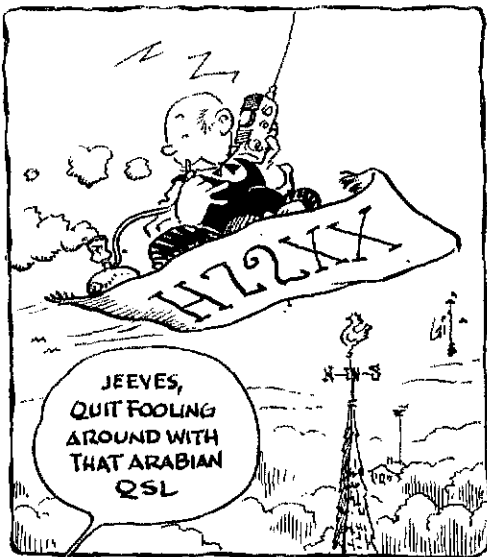
At the World Administrative Radio Conference on Space Telecommunication (WARC-ST) in Geneva last summer, we learned to our consternation that many countries, assumed to be friendly to amateur radio, were on the other side of the fence. Before we are faced with future conferences dealing with allocations, it would appear that there is tremendous work to be done, mending fences so to speak, and initiating actions to the end that there *will be* the cooperation of other countries of the world for amateur radio. Everything we do, therefore, which is international in nature should be done within the concept of enhancing international good will. This is a part of our charter.

Space Communications

At the space conference last summer, the ITU established the Amateur Satellite Service. Bob Booth, W3PS, whose motto is "Often in error, but never in doubt" says that if we do nothing but sit on it, we're sure to lose it, which is usually the case in allocations . . . and it *should* be. The ITU authorized this service to utilize frequencies in certain of our bands. It seems to me that this is a new and unparalleled opportunity for us to enhance international good-will.

About 6 weeks ago I had the opportunity to discuss the possibility of what I called a "professional" amateur satellite. Bill Eitel, W6UF, formerly the president of Fimac and active in the original Oscar organization, conceived the idea some years ago. His thoughts led to some additional thinking on the subject of a satellite which could serve all the amateurs of the world at one time or another . . . not a toy, but one which would slowly drift around the world in a near synchronous orbit. *Complex tracking would not be required; complicated orbit prediction would be unnecessary because the satellite is slowly drifting.*

If we could utilize modern technology and incorporate sufficient power and emission band-

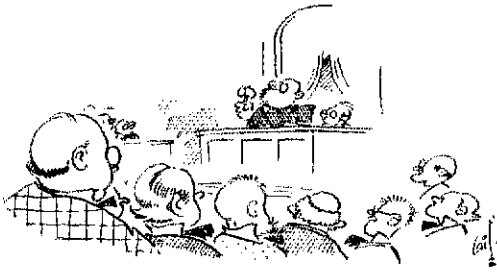


“ . . . a 'professional' amateur satellite, not a toy . . . ”

width in the equipment, we would have a "space repeater" that conceivably could remain in orbit for somewhere around 5 to 7 years. It would cost some money and require some rather tremendous effort on the part of many people to accomplish it.

It used to be that available *resources* brought about decision! Today, however, the decision, once made to accomplish a task, brings about the resource (in this case the hardware; the technology is already here). If the decision were made at the right level in our government (to have such a satellite for amateurs), I have a strong feeling that it would be accomplished. Bill Eitel has discussed it with individuals at some rather high levels of our government. There is serious consideration being given to the "decision" to have such a satellite. Only time will tell, but wouldn't it be a wonderful contribution if it were launched into orbit by 1976 in time to celebrate the 200th anniversary of the founding of our country!

Regardless of the configuration of the satellite or its orbit, there will be a large measure of self discipline involved in its use. In a wide-band transponder, translator, repeater, or whatever you wish to call it, the fellow with the strongest signal and the widest bandwidth will occupy the greatest share of the power of the satellite. If we are considering an fm signal and the emission bandwidth is 200 kHz, then we can accommodate about 10 fm signals, each occupying roughly 20 kHz. But if one of those signals is ten times as strong as the others, the equal apportionment of the satellite output will be lost and instead of being able to accommodate 10 signals, it will be somewhat less. So self discipline will be required of everyone who wishes to use it. There are many pertinent aspects of such a system of communication which would take too long to discuss here. But in relation to the charter of amateur radio, such a satellite would give us the opportunity to bring the concept of our "basis and purpose" up-to-date.



“ . . . to impress . . . the plenaries of the ITU . . . ”

What would we use it for? DXing . . . Rag-chewing . . . fostering international good will . . . why not all of the things contained in our charter specifically related to satellite communication rather than the more familiar aspects of the past? Probably one of the most appropriate uses would be for education, not only to train our own young people but also those of other countries, using the satellite for the exchange of information, advice as well as actual experience in satellite communication. The so-called new and developing countries of the world have not yet reached an acceptance of amateur radio as a worthwhile utilization of the radio spectrum. At one ITU conference I attended, amateurs were characterized as “little boys playing in their basements.” Perhaps if they could see a benefit such as this it would impress them with the tremendous promise that amateur radio can have in the development of trained people in telecommunication. In the plenaries of the ITU, I assure you, *we need their help.*

None of the currently utilized or contemplated satellite communication systems are specifically designed for use in the event of a natural disaster . . . epidemic . . . flood, tidal wave, hurricane, earthquake, and similar things which afflict mankind. The need for such a system has already been recognized by the ITU.

What of the Future?

Will the Amateur Satellite Service be competent to meet the challenge . . . in extending our charter? I ask the question not so much in relation to those of us who are active amateurs today (although we must launch the program) as those who will occupy our hands tomorrow. Are we doing what is right for future generations? Are we planning with sound judgement for the continued justification and expansion of our use of the spectrum? We hear a lot about growth, or lack of it, in amateur radio. In the U.S.A. the amateur population is more or less stable . . . not so in such countries as USSR, Japan, and some others. Moreover for a number of years our Novices have remained 8-1/2% of our total, Technicians 19%, Conditionals 11 1/2%, General class 34%, and Advanced and Extra 26%. Why are Novices only 8-1/2% and Technicians 19% of our total? How many of them go ahead and become full-fledged amateurs? Or are we looking at things with the wrong perspective? What is a full-fledged amateur today? Are we attracting a fair share of the youth of America to this greatest of all “hobbies”?

Granted there is more competition today from other interesting avocations. Perhaps young people today are just not thrilled by the same things that attracted us to ham radio. We could reminisce at length on past thrills, but then we might be accused of being like old men. I think it was Francis Bacon who said, “Men of age object too much, consult too long, adventure too little, repent too soon, and seldom drive business home to the full period, but content themselves with a mediocrity of success.”

Are we going through a revolution in amateur radio today? If so, the impact that comes to my attention relates to *an increase in illegal operation, an upsurge in foul language to be heard almost any night (especially on 75 meters), intentional interference and jamming, and a desire on the part of many to lower the qualifications for an amateur license.* But these things are not consonant with our charter, either in the old sense or in any new concept which might be reasonable.

Those of us who have a measure of responsibility for the future of amateur radio (and I include the Commission in this group) must present more of a challenge and program to those to whom we would extend the opportunity to carry on our traditions. Despite what the general trend seems today, enjoyment for the moment is not enough to ensure our future. We live in a fast-moving, complex, ever-changing society, almost impossible for an older generation to understand or keep up with.

Dr. Robert Hilliard of the FCC explains it this way: “At the rate at which knowledge is growing, by the time the child born today graduates from college, the amount of knowledge in the world will be four times as great. By the time that child is 50 years old, it will be 32 times as great and 97% of everything known in the world will have been learned since the time he was born.”

Although for a time we may partially continue in the same channels of the past, we must always be looking upward. The rung of a ladder was never meant to rest on, but only to hold a man's foot long enough to enable him to put the other one somewhat higher.

The frontier of amateur radio is in satellite communication. I believe that the Commission has an obligation to encourage amateurs in this direction. As a revised charter of amateur radio evolves, either in word or interpretation, we shall see a gradual lessening of past influences and a greater emphasis on those of the future. In the meantime, be assured that the Federal Communications Commission intends to not only permit, but to encourage amateurs to extend their performance in accordance with their charter.

This is a two-way street. We'll keep the roads open, and with your help, perhaps even build some new ones. For your part, see to it that those plotting the future course of amateur radio stay alert. In all things, success depends upon previous preparation, and without such preparation there is sure to be failure. Things do not just happen in this world, they are brought about. As long as we agree on the road to follow, let's not look back lest we might soon be heading that way. QST



How to Exchange QSL Cards with DX Stations

BY PHILIP R. POLING,* W4DNZ

are three methods commonly used to get your card to the DX station. These methods are as follows:

1. Via his bureau
2. Direct¹
3. Via another amateur who has volunteered to

answer QSL cards for the DX station. This volunteer is called a "personal QSL manager." If he says, "QSL via bureau," you have only one problem (other than filling out the card, of course). What is the address of his bureau? This is not a difficult problem because *QST* publishes twice yearly, in June and December, a list of the addresses for all QSL bureaus around the world. With this list you have all the information you need to send QSL cards to most of the DX stations you will work.

If the DX station says, "QSL via P.O. Box --," this likely means that he is asking you to QSL directly to his private post office box. He most likely has already given you the name of his city on the first transmission.

Some DX stations work so many U.S. amateurs that they have found it convenient to have a ham friend in the U.S. take care of their cards for Ws and Ks. If that is the case with a DX station you work, he probably will say, e.g., "QSL via KØHAM." Now, you must look in a *Callbook* and find out what address is listed for KØHAM, the DX station's personal QSL manager in this example. Or *QST* and other ham publications carry current QSL address information in their DX columns. Be sure to send the personal QSL manager a self-addressed, stamped envelope, in addition to your QSL card.

Receiving Cards Via Bureau

Most DX stations prefer to send you a QSL card via the ARRL QSL Bureau because they can put several cards in one envelope. Thus, they save both time addressing envelopes and money, too.

To receive cards via the bureau you must self-address an envelope, mark your call sign in large letters in the upper left-hand corner, stick enough stamps on it for 1 ounce of mail, then put this self-addressed stamped envelope (s.a.s.e.) in another envelope which is addressed to the ARRL QSL manager responsible for your call area. Who might that be? The name of your ARRL QSL Manager is published in most issues of *QST*.

(Continued on page 86)

¹ An "unofficial" list of DX-station addresses is shown each month in the "How's DX?" column in *QST*.

MANY NOVICES find quite a thrill in working DX stations, but it appears from listening to some of their contacts that additional information about exchanging QSL cards with foreign stations may be helpful.

U. S. amateurs interested in collecting foreign cards should consider problems encountered by the DX station, who gets a request for a card just about every contact. He can easily spend as much time filling out cards as he does working the rig. Also, the postage bill and the cost of QSL cards is an important item in his budget. Because there are so many Ws and Ks, our cards are not highly sought. Furthermore, the DX station is primarily there for the same reason as you and I — the enjoyment we receive from talking with other people. So he does not consider his primary role in life to be that of fulfilling the QSL requests of others. However, most DX stations will QSL if you cooperate by making it easy for them. How do you do this? Listen, carefully, and find out how he wants you to send your card. Be prepared to receive the card which he sends to you through the ARRL QSL Bureau. Or, if you want it sent directly to your home, furnish the DX station with an envelope which you have addressed to yourself, and an International Reply Coupon (IRC).

A QSL Bureau is really a clearing house which receives QSL cards from amateurs (or similar bureaus) in other countries, sorts these cards, and forwards them to the hams to whom they are intended. The bureau is generally operated by volunteers. In most cases, the amateur radio association of each country sponsors the QSL bureau in that country.

IRCs are available at any U.S. Post Office, and they can be exchanged in almost every country of the world, for sufficient postage to return your QSL by surface mail. U.S. stamps could not be used by a ham in another country for posting a letter to you. Also, his post office would *not* take U.S. stamps in trade for stamps of his country. But, they *will* exchange IRCs for stamps.

Sending Cards to DX Stations

Always listen for instructions from the DX station in order to find out how he wants you to send your card. Or, ask him, "How QSL?" There

* 414 Chevy Chase Rd., Mansfield, OH 44907.



Results

1972 ARRL

VHF Sweepstakes

K2OWR

REPORTED BY AL NOONE, *WA1KQM

WITH THE EXCEPTION of the sporadic-E opening on Sunday night, conditions for this year's VHF Sweepstakes (Jan. 8-9, 1972) were about normal. The only other recorded evidence of unusual conditions was a one-way exchange of information between K7VBF in Washington and W3QU in Maryland.

Entries received at Hq. were down, 851 to last year's 963. Some have attributed this to the feeling that the present exchange is too long and unwieldy for an activity of this type. Now might be a good time to mention that our ARRL Contest Advisory Committee is presently taking a close look at all vhf activities with an eye toward areas of improvement. Why not let them have your views?

Activity, as always, seems to have been good. K31PM, back again for at least the third-year running, led the pack with a final score of 52,632, 731 contacts, 26 sections. A close second shows K2OWR at 32,830, 469 QSOs, 25 sections just nosing out WB2WIK who stood at 32,097, 415 QSOs, 29 sections! The remainder of the TOP TEN are as follows: K2RTH 29,388-388-28; W3ZD 26,400-440-20; W2EIF 26,102-421-21; W3KKN 24,900-415-20; K3ZSG 22,944-360-22; WA3AXV 21,060-405-16 and W2BV 20,592-312-23. Canadian high-scorer was VE3ZZZ (VE3ASO, opr.) at 12,896-208-21.

Of the 87 competing multi-operator stations, WB2KKO/2, the 550 Radio Club, takes the lead with 28,544, 446 QSOs, 22 sections and here again, just manages to nose out the competition, WA1LFR/1, the Hampden Co. Radio Association who finished with 28,320, 443 QSOs, 22 sections. Just three contacts made the difference! To round out the TOP FIVE we have W8CCI 26,352-366-26; WB2LZD/3 25,164-351-26 and K8MMM 24,472-322-28.

*Asst. Communications Mgr., ARRL.

Some of you have asked, "When are we going to have that 220 MHz and above contest?" Well, member reaction so far has been far from encouraging. In fact, a total of six letters have been received since the idea was mentioned in December QST. If enough interest is shown, we'll be happy to give it further consideration. Let's hear from you!

Certificate awards are scheduled for a July 15th mailing. - WA1KQM

(Contest Advisory Committee: W1BGD, W2EIF, W3GRF chairman, W4UQ, K5TSR, W6DQX, WA9UCE, W0HP, VE2NV, KH6J.)

AFFILIATED CLUB SCORES

Club Score-Entries-Winner

Mt. Airy V.H.F. RC (Pa.)	570,168	68	KUPM
South Jersey RA	225,405	39	W2BV
Rochester V.H.F. Group (N.Y.)	190,146	90	K2YCO
Mobile Sixers RC (Pa.)	85,218	23	WAJMM
East Coast V.H.F. Soc. (N.J.)	81,794	4	
Interstate V.H.F. Soc. (N.J.)	66,729	7	WB2WIK
Suburban ARC (Pa.)	65,278	16	WA3IL
Hampden Co. RA (Mass.)	57,336	26	WA1GZ
1200 Radio Club (Mass.)	48,126	12	K1MUC
Potomac Area V.H.F. Soc. (Va.)	47,020	7	WA3NZL
Albany ARA (N.Y.)	47,012	30	W2CRS
So. Calif. V.H.F. RC	41,305	16	K6YNB/6
Warminster ARC (Pa.)	40,738	18	K3ZIG
Rock Creek ARA (Md.)	39,765	27	W3KMY
Six Meter Club of Chicago (Ill.)	37,514	22	WA9NM
Whitman ARC (Mass.)	33,632	22	WA1AGR
Greater Pittsburgh V.H.F. Soc. (Pa.)	24,700	16	W3BWU
York Radio Club (Ill.)	16,852	14	WA9RIJ
Jayton ARA (Ohio)	14,666	6	WABUB
Scioto Valley ARC (Ohio)	13,932	10	K8SUB
Parma Radio Club (Ohio)	11,123	12	K8NOW
M.I.T. Radio Soc. (Mass.)	10,200	3	
N.W. Univ. AR Society (Ill.)	8790	4	WA9KIO
Evendale AR Society (Ohio)	7822	4	WB8MI
West Park Radlrops (Ohio)	7240	4	K8YYK
Opeton Radio Soc. (W. Va.)	7107	3	
West Valley ARC (Calif.)	6200	6	WB6LLD
Ranococas Valley ARA (N.J.)	5962	4	WB2JN
Dutchess Co. V.H.F. Soc. (N.Y.)	5503	4	WB2HXZ
Warren ARA (Ohio)	5475	3	
Norwood ARC (Mass.)	4744	3	K1CHY
Queen City F. mer. Net (Ohio)	4452	3	WBHQK
Mid Island RC (N.Y.)	3817	3	WA2LXP
(BM ARA (Md.)	3676	3	WA4SVR
Antietam RA (Md.)	3338	4	W3SOA
Hantesters RC (Ill.)	3166	3	WA9XII
Dept. of State ARC (Md.)	1864	4	K4ITB
Five Flags ARA (Fla.)	1186	3	WA3ODA/4

1973 VHF SS

JAN 6-7

SOAPBOX

A sporadic-E opening to Florida provided a nice finishing touch at 11:30 Sunday night. I hope to make Ontario available on ABCDE in June. (VE3ASO, opr. VE3ZZZ) . . . It was good to hear other VEs on and I was pleasantly surprised at the activity on 50 MHz in general. (VE3FIB) . . . How about another contest, January to June is a long time between VHF contests. (WA3GSH) . . . Good strong signals from K3IPM on Sunday. Activity about normal. Too bad Monday night's aurora didn't come earlier. (VE2DFO) . . . Good contest, odd conditions. K7VBF in Spokane, Wash. popped in all of a sudden S7/8, I got all his info but when I finished he was gone. When are we going to have that "220 and above" test? (W3QU) . . . Scatter on 50 MHz very bad. Groundwave horrible, only 10 QSOs with Wis. (K3MTK) . . . Good amount of activity but we had great difficulty working into the Northeast. (WA3RZO/3) . . . Sure wish those W2s would turn their antennas West so I could get a few more multipliers! (WB9EBL, opr. W9HHX) . . . Heard W5/Ø on bursts! (K4ROM) . . . Thought it was a lost cause until we had an opening to the Northeast. (WA4JQS/4) . . . This was the first outing for the Lainerland ARC of Gainesville, Ga. under our new call W4IKR. (W4IKR/4) . . . Too much information to pass for scatter QSOs. (W4OJU)

DIVISION LEADERS

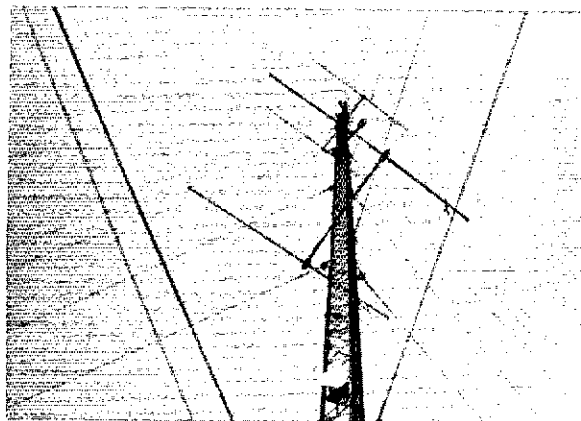
<i>Single Op.</i>	<i>Division</i>	<i>Multtop.</i>
K3IPM	Atlantic	WB2LZD/3
K9HMB	Central	W9BGX
WBØELN	Dakota
WB4JGG/4	Delta	WB4KMK
K8LEE	Gr. Lakes	W8CCI
K2OWR	Hudson	WB2KKO/2
KØMST	Midwest	WBØBBC
K1GYT	New Engl.	W1LFR/1
W7ZSL	Northwestern	W7VE/7
K6GSS/6	Pacific	WA6JUD/6
W4AAU	Roanoke	WA4TFZ/4
KØGHC	Rocky Mt.
WA4NJP	Southeastern	W4IKR/4
K6YNB/6	Southwestern	WB6JLV
WA5OPY	West Gulf	K5LZJ
VE3ZZZ	Canadian



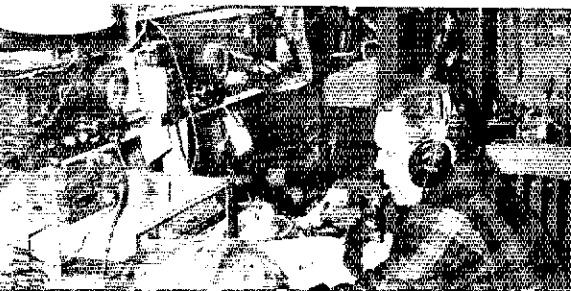
Wayne, K8LEE ran up 261 QSOs on 50 MHz for a final score of 20,358 and Great Lakes Division leadership.



Here's WB2KKO/2, the club station of the "550 Radio Club" with WA2UPK (l.) operating 144 MHz and WA2BJX (r.) assisting. Below you'll find their 165-foot tower holding antennas for 144, 220 and 432 MHz.



Here's WA1DRO operating the 144-MHz position at W1QXX. Their 220/432 MHz is visible in the rear.



. . . Moderate to good scatter conditions provided the high-power boys with some additional sections. (KØLCB) . . . More mountain toppers than I have seen for a January contest in quite a while. (WA6GYD) . . . Operate from atop 4000 ft. Mt. Hamilton. (K6GSS/6) . . . As you can see, we had no band openings but all things being considered, we enjoyed it very much. (KP4DFH) . . . Groundwave conditions excellent, heard no scatter signals from California. (W7ZSL) . . . Activity on 432 MHz poor, probably due to lack of a special multiplier for UHF QSOs. (W6FZJ) . . .

SCORES

In the tabulation to follow, scores are listed by ARRL sections within W/VE call-areas. Unless otherwise noted, the top scorer in each section receives a certificate award. An asterisk denotes a Hq. staff member, ineligible for an award. Columns indicate final score, number of contacts, number of different sections worked, and bands used. A represents 50 MHz, B 144 MHz, C 220 MHz, D 420 MHz, E 1296 MHz and above. Multioperator stations are shown at the end of each section tabulation.

VE		Quebec		W1JVL		W1JHLJ		W1JBLZ		W1JDF		W1JHTN		W1JTOT		W1JNZQ		W1JLZO		W1JALP		W1JQXX (5 oprs.)		W1JDC/1 (5 oprs.)		W1JTOFG/1 (W1JLSD MSK)		W1JMX (3 oprs.)		W1JMHN (10 oprs.)		W1JNPO (3 oprs.)		W1JEXN		W1JTOUB		W1JWSM		W1JLFSZ		W1JWSX		W1JLJO (4 oprs.)		W1JWICP		W1JNINTF		W1JLGED		W1JLFFG		W1JEGYT		W1JLXKN		W1JLPUGH		W1JLDEX (+W1JLSD MAG NAM)		W1JLJGZ		W1JLRC/1		W1JLWIK		W1JLWMTV		W1JLKNJC		W1JLWIFAB		W1JLJLJ		W1JLJGZO		W1JLTPDJ		W1JLKBZM		W1JLWRDC		W1JLW1CJX		W1JLW1LKJ		W1JLW1SJR		W1JLW1LEPI		W1JLW1LAL		W1JLW1JGVV		W1JLW1UCB		W1JLW1LDT		W1JLW1HYL		W1JLW1WLE		W1JLW1KBN		W1JLW1OQB		W1JLW1KZKU		W1JLW1PPA		W1JLW1LUDH		W1JLW1MDM (+W1JLSD XN)		W1JLW1W2RSY		W1JLW1W2RZ		W1JLW1W2R3		W1JLW1W2R4		W1JLW1W2R5		W1JLW1W2R6		W1JLW1W2R7		W1JLW1W2R8		W1JLW1W2R9		W1JLW1W2R10		W1JLW1W2R11		W1JLW1W2R12		W1JLW1W2R13		W1JLW1W2R14		W1JLW1W2R15		W1JLW1W2R16		W1JLW1W2R17		W1JLW1W2R18		W1JLW1W2R19		W1JLW1W2R20		W1JLW1W2R21		W1JLW1W2R22		W1JLW1W2R23		W1JLW1W2R24		W1JLW1W2R25		W1JLW1W2R26		W1JLW1W2R27		W1JLW1W2R28		W1JLW1W2R29		W1JLW1W2R30		W1JLW1W2R31		W1JLW1W2R32		W1JLW1W2R33		W1JLW1W2R34		W1JLW1W2R35		W1JLW1W2R36		W1JLW1W2R37		W1JLW1W2R38		W1JLW1W2R39		W1JLW1W2R40		W1JLW1W2R41		W1JLW1W2R42		W1JLW1W2R43		W1JLW1W2R44		W1JLW1W2R45		W1JLW1W2R46		W1JLW1W2R47		W1JLW1W2R48		W1JLW1W2R49		W1JLW1W2R50		W1JLW1W2R51		W1JLW1W2R52		W1JLW1W2R53		W1JLW1W2R54		W1JLW1W2R55		W1JLW1W2R56		W1JLW1W2R57		W1JLW1W2R58		W1JLW1W2R59		W1JLW1W2R60		W1JLW1W2R61		W1JLW1W2R62		W1JLW1W2R63		W1JLW1W2R64		W1JLW1W2R65		W1JLW1W2R66		W1JLW1W2R67		W1JLW1W2R68		W1JLW1W2R69		W1JLW1W2R70		W1JLW1W2R71		W1JLW1W2R72		W1JLW1W2R73		W1JLW1W2R74		W1JLW1W2R75		W1JLW1W2R76		W1JLW1W2R77		W1JLW1W2R78		W1JLW1W2R79		W1JLW1W2R80		W1JLW1W2R81		W1JLW1W2R82		W1JLW1W2R83		W1JLW1W2R84		W1JLW1W2R85		W1JLW1W2R86		W1JLW1W2R87		W1JLW1W2R88		W1JLW1W2R89		W1JLW1W2R90		W1JLW1W2R91		W1JLW1W2R92		W1JLW1W2R93		W1JLW1W2R94		W1JLW1W2R95		W1JLW1W2R96		W1JLW1W2R97		W1JLW1W2R98		W1JLW1W2R99		W1JLW1W2R100															
VE2DFO	2200-44-15	B	W1JBLZ	472-18-2	AB	W1JDF	338-13-3	A	W1JHTN	242-11-1	B	W1JTOT	270-10-1	BD	W1JNZQ	120-5-2	D	W1JLZO	110-5-1	D	W1JALP	88-4-1	B	W1JQXX (5 oprs.)	20,272-362-18-AB/CD	W1JDC/1 (5 oprs.)	7452-163-13-	AB	W1JTOFG/1 (W1JLSD MSK)	6864-143-14-	AB	W1JMX (3 oprs.)	5000-125-10-	AB	W1JMHN (10 oprs.)	4200-100-11-	ABD	W1JNPO (3 oprs.)	2670-89-5-	AB	W1JEXN	1380-31-13-	A	W1JTOUB	4888-95-16-	A	W1JWSM	4131-77-17-	B	W1JLFSZ	2875-58-15-	ABD	W1JWSX	476-77-4-	A	W1JLJO (4 oprs.)	16,632-308-17-	AB	W1JWICP	1700-50-7-	A	W1JNINTF	1456-52-4-	A	W1JLGED	234-8-4-	B	W1JLFFG	168-6-4-	AB	W1JEGYT	13,940-170-31-	AB	W1JLXKN	1675-35-15-	H	W1JLPUGH	1292-34-9-	A	W1JLDEX (+W1JLSD MAG NAM)	4160-104-10-	AB	W1JLJGZ	3680-92-10-	AB	W1JLRC/1	1458-91-9-	AB	W1JLWIK	2880-72-10-	AB	W1JLWMTV	2208-69-6-	AB	W1JLKNJC	1938-57-7-	AB	W1JLWIFAB	1456-52-4-	AB	W1JLJLJ	1428-51-4-	AR	W1JLJGZO	1080-45-2-	AB	W1JLTPDJ	1050-35-5-	AB	W1JLKBZM	980-35-4-	B	W1JLWRDC	840-35-2-	B	W1JLW1CJX	840-35-2-	B	W1JLW1LKJ	728-26-4-	A	W1JLW1SJR	720-30-2-	A	W1JLW1LEPI	672-28-2-	B	W1JLW1LAL	672-28-2-	B	W1JLW1JGVV	610-25-2-	B	W1JLW1UCB	576-24-2-	ABC	W1JLW1LDT	504-21-2-	B	W1JLW1HYL	432-18-2-	AB	W1JLW1WLE	408-17-2-	B	W1JLW1KBN	388-12-2-	B	W1JLW1OQB	288-12-2-	B	W1JLW1KZKU	264-11-2-	B	W1JLW1PPA	184-7-3-	A	W1JLW1LUDH	120-5-2-	B	W1JLW1MDM (+W1JLSD XN)	1634-43-9-	AB	W1JLW1W2RSY	32,830-469-25-ABCD	W1JLW1W2RZ	32,097-415-29-	AB	W1JLW1W2R3	13,800-276-15-	AB	W1JLW1W2R4	9384-204-13-	AB	W1JLW1W2R5	9108-207-12-	AB	W1JLW1W2R6	5434-143-9-	AB	W1JLW1W2R7	4475-90-15-	AB	W1JLW1W2R8	2992-88-7-	B	W1JLW1W2R9	2860-72-10-	AB	W1JLW1W2R10	2822-83-7-	AB	W1JLW1W2R11	210-87-5-	AB	W1JLW1W2R12	2608-62-7-	B	W1JLW1W2R13	1360-40-7-	AB	W1JLW1W2R14	1312-41-6-	AB	W1JLW1W2R15	1204-43-4-	AB	W1JLW1W2R16	560-20-4-	AB	W1JLW1W2R17	540-15-8-	AB	W1JLW1W2R18	48-2-2-	B	W1JLW1W2R19	28,544-446-22-	AB	W1JLW1W2R20	15,704-305-16-	AB	W1JLW1W2R21	8800-200-12-	AB	W1JLW1W2R22	8190-195-11-	AB	W1JLW1W2R23	2400-75-6-	AB	W1JLW1W2R24	26,102-421-21-ABCD	W1JLW1W2R25	20,592-312-23-	AB	W1JLW1W2R26	11,872-212-18-	ABD	W1JLW1W2R27	9154-199-13-	AB	W1JLW1W2R28	6960-174-10-	AB	W1JLW1W2R29	6528-136-14-	ABD	W1JLW1W2R30	5580-155-8-	AB	W1JLW1W2R31	4760-140-7-	AB	W1JLW1W2R32	4320-135-6-	AB	W1JLW1W2R33	4320-20-8-	AB	W1JLW1W2R34	4158-99-11-	AB	W1JLW1W2R35	3840-128-5-	AB	W1JLW1W2R36	3836-137-4-	ABD	W1JLW1W2R37	3660-122-5-	AB	W1JLW1W2R38	3578-126-4-	AB	W1JLW1W2R39	3500-125-4-	ABD	W1JLW1W2R40	3444-123-4-	AB	W1JLW1W2R41	3416-122-4-	AB	W1JLW1W2R42	3094-119-3-	AB	W1JLW1W2R43	2992-88-7-	A	W1JLW1W2R44	2772-99-4-	AB	W1JLW1W2R45	2704-104-3-	AB	W1JLW1W2R46	2704-104-3-	AB	W1JLW1W2R47	2616-109-2-	AB	W1JLW1W2R48	2574-117-1-	AB	W1JLW1W2R49	2424-101-2-	AB	W1JLW1W2R50	2400-100-2-	AB	W1JLW1W2R51	2304-90-2-	AB	W1JLW1W2R52	2136-89-2-	A	W1JLW1W2R53	2090-95-1-	AB	W1JLW1W2R54	2016-84-2-	AB	W1JLW1W2R55	1968-82-2-	AB	W1JLW1W2R56	1968-82-2-	AB

WB2VPK	1950-75-3-	B	W3KKN	24,900-415-20-ABCD	K3JST	2080-80-3-	A	W3CWC (WA3LOU, opr.)		
WB2YKQ	1900-50-9-	B	K3ZSG	22,944-360-23-ABCD	WA3NYZ	2078-78-3-	A		840-28-5-	AB
W2RBT	1896-79-2-	A	WA3AXV	21,060-405-16-ABCD	WA3MPO	1992-83-2-	AB	W3UUV	806-31-3-	B
K2CRQ	1872-78-2-	A	K3FYX	17,748-261-24-AB	WA3MNB	1980-66-5-	A	WA3KUM	780-26-2-	B
WA2IVN	1872-72-3-	AB	WA3NCW	17,748-261-24-AB	WA3JMT	1872-72-3-	AB	K3UIN	768-32-2-	AB
WB2QXB	1826-83-1-	AB	W3CL	17,480-380-13-ABC	W3LUW (WA3PL, opr.)			K2QBW/3	744-31-3-	B
W2ECH	1824-76-2-	AB	K2KMN/3	16,200-340-14-ABC				K3BA	728-26-4-	B
WA2BKV	1690-65-3-	AB	K3IUU	15,650-313-15-ABCD	WA3IC	1716-66-3-	AR	W3ALA	702-27-3-	B
WB2KWZ	1608-67-2-	AB	WA3INH/3	14,300-325-12-AB	WA3HHM	1680-72-2-	AR	WA3JPG	702-27-3-	B
WB2RIB	1608-67-2-	A	K3IJJ	14,136-372-9-ABCD	WA3HET	1596-67-4-	A	WA3JRU	600-25-2-	B
W2RPO	1584-44-8-	AR	K3FOD	13,734-327-11-ABC	WA3NQY	1560-60-3-	A	WA3OIB	576-24-2-	B
WA2EJY	1584-72-1-	AB	K3BPP	13,398-324-11-ABCD	K3UYA	1392-58-2-	A	W3JON	540-23-2-	B
WB2JGV	1484-53-4-	AB	W3HK	13,244-301-12-ABC	K3VFO	1274-49-3-	BC	WA3KNP	528-22-2-	AB
W2FHX	1474-67-1-	AB	W3CJU	13,080-327-10-ABCD	WA3NAO	1248-52-2-	AB	W3FNU	504-21-2-	B
W2LW	1452-66-1-	AB	WA3NGK	12,100-275-12-AB	K3DLS	1224-51-2-	BC	WA3LUV	504-21-2-	B
K2LDU	1392-58-2-	ABD	K3SEF/3	11,781-281-11-ABCD	K3AA	1209-47-3-	A	E3LZX	480-20-2-	AB
W2OWF	1368-57-2-	AB	K3UUD	10,298-271-9-ABCD	WA3KSK	1200-50-2-	A	WA3OYU/3	360-15-2-	B
WB2JNN	1352-52-3-	AR	WA3DNC/3	10,143-242-11-AB	WA3OYU	1200-50-2-	A	WA3OHG	338-13-3-	H
W2YBK	1342-61-1-	AB	W3GEW	10,116-281-8-ABC	WA3RZK	1144-44-3-	AB	WA3PNQ	234-8-4-	A
K2SOL	1210-55-1-	AB	K3GAS	9480-237-10-ABCD	K3GZT	988-38-3-	AB	WA3KRA	192-8-2-	B
WA2TJS	1176-49-2-	AB	W3ELX	9432-262-8-AB	WB9AIU/3	960-40-2-	AB	W3GN	44-2-1-	B
WB2FAN	1176-49-2-	A	WA3MDF	9408-224-11-AB	WA3OIR	936-39-1-	AB	K3IVO (11 opr.)		
W2CNS	1166-53-1-	B	WA3JMM	9120-240-9-AB	W3NSI	864-36-2-	CD		12,400-248-15-	AB
WA2EKN	1104-46-2-	A	W3PQD	9000-225-10-ABC	W3IA	696-29-2-	AB	Western Pennsylvania		
WA2ATV	1100-50-1-	B	W3CCX (W3SAO, opr.)		WA3MDP	696-29-2-	AB	W3BWW	4452-106-11-	AB
WB2ZJY	1100-50-1-	A		8864-277-6-ABC	WA3OUC	696-29-2-	AB	WA3ANO	2330-85-9-	AB
K2OEF	1078-49-1-	AB	W3AJH	8626-277-9-ABC	W3ZRR	648-27-2-	AB	K3YXI	2700-75-8-	AB
WB2RVV	1056-48-1-	AB	W31ZU	8484-202-11-ABC	WA3HMW	624-26-2-	A	W3IOT	2684-61-12-	A
W2WGL	1012-22-13-	B	K3GQJ	8358-199-11-ABC	WA3JFL	552-23-2-	A	WA3PHD	1904-56-7-	AB
WB2DKI	1008-42-2-	AB	W3TMY	8340-278-5-AB	WA3MRU	494-19-3-	A	WA3PQQ	1785-53-7-	A
WA2ZLR	968-44-1-	AB	K1JDF/3	8211-197-11-A	K3JHM	456-19-2-	A	W3JPT	1568-49-6-	AB
WB2JST	946-43-1-	B	W3ETB	8096-253-6-ABC	WA3NEV	456-19-2-	AC	W3JFM	1440-48-5-	A
WA2JUB	924-42-1-	B	W3SMK	8092-238-7-AB	K3VCR	360-15-2-	B	K3KFN	1428-42-7-	A
W2UAD	902-41-1-	B	K3KTY	7980-190-11-ABC	WA3FYL	120-5-2-	B	K3NOA	1344-42-6-ABC	
WB2LJG	840-35-2-	A	K3MXM	7000-250-4-ABC	WA3H1M	110-5-1-	AB	K3AKR	1134-32-8-	A
W2SRP	768-32-2-	B	K3ATL	6780-170-10-AB	WA3RZQ	110-5-1-	A	WA3MQX	1080-30-8-	AB
WA2BFB	704-32-1-	A	WA3JFL	6776-242-4-ABC	WB2LZD/3 (5 opr.)			WA3OJD	1065-36-5-	AB
WA2MXL	704-32-1-	B	W3BBC	6669-176-9-AB	K3MTK (4 opr.)	25,164-351-26-	AB	WA3NLQ	858-33-3-	A
WB2LFG	704-32-1-	A	K3EPB	6510-217-5-ABC	K3PGB (+WA3AANI)	17,603-304-19-	AB	K3FJW	780-30-3-	A
WB2YJH	704-32-1-	A	W3PST/3	6020-215-4-AB		14,560-260-18-	A	WA3GSH	690-24-5-	AB
WA2YSD	682-31-1-	B	K3GXC	5874-208-4-AC	K3VFD (4 opr.)			K3ISO	676-26-3-	AB
WA2JLF	624-26-2-	A	W3AWA/3 (K3ATL, opr.)			13,840-346-10-	AB	W3TDY	672-28-2-	AB
WA2OTE	624-26-2-	A		5796-161-8-AB	W3RZO/3 (WA3MIX PR)	8018-211-9-	AB	K3QBI	648-27-2-	A
K2JHO	578-17-7-	B	WA3JH1	5796-207-4-AB	W3HZU (4 opr.)			K3WOD	550-25-3-	A
WB2GQB	550-25-1-	A	K3DMA	5304-204-3-AB				W3VW/3	132-6-1-	A
K2YRU	480-16-5-	A	K2ZIG	5250-175-5-AB	WA3QUU (+WA3NAF)	6528-205-6-	AB	W3EYV (5 opr.)		
K2AIB	440-20-1-	A	WA3JDF	5226-201-3-AB	K3HC (73 (5 opr.)				5019-121-11-	AB
WA2DIF/2	396-18-1-	B	K3OBY	5160-172-5-ABD	W3HWG (+K3SWG)	5280-120-12-	AB	WA3PTV/3 (+WA3PKU)	825-28-5-	B
WA2DIF	374-17-1-	AB	K3NUB	5020-126-10-A	K3WGI (+K3SWG)	2756-106-3-ABC		W3KVS	88-4-1-	A
WB2HTH	352-16-1-	B	WA3AJA	4998-179-4-A				W3EYV (5 opr.)		
WB2LYH/2	352-16-1-	B	W3JMM	4800-150-6-A	W3HZU (4 opr.)				5019-121-11-	AB
WB2SMD	308-14-1-	B	WA3FSP	4704-168-4-AB					825-28-5-	B
K2UCI	286-13-1-	A	W3CXU	4624-136-7-ABC	K3WGI (+K3SWG)	2756-106-3-ABC		WA3PLG (+K3STIM)	392-14-4-	A
WB2WbZ	242-11-1-	B	W3BRU	4470-149-2-AB						
WA2GPO	198-9-1-	R	WA3JGX	4264-164-3-AB	K3WGI (+K3SWG)	2756-106-3-ABC				
WB2FDZ	198-9-1-	A	WA3HDQ/3	4212-117-8-ABC						
W2MYN	192-8-2-	B	K3JMN	4140-138-5-ABC	WA3KXT (+WA3HHM)	2600-102-3-AB				
W2OW (7 opr.)			K3ZAC	3920-140-4-A	W3KWE (5 opr.)	1660-49-7-	A			
	8343-155-17-	AB	W3S8W	3752-134-4-AB						
WA2LIX (+WB2KAO, WB9DP)			WA3HOW	3744-144-3-AB						
	6960-174-10-	AB	WA3JKE	3586-136-3-AB						
WB2FJH/2 (+WA2YCD)			WA3MCK	3523-136-3-AB						
	4860-81-20-	AB	WA3MTB	3458-133-3-A	WA3NZL	13,804-238-19-	AB			
WB2EDT (multi)			K3GQZ	3432-132-3-AB	K3DJA	10,816-208-16-	AB			
	2424-101-2-	AB	WA3FYD	3360-112-5-A	W3KMY	8640-180-14-	AB			
WB2MMD (+WA2MXL)			K3BOY	3332-119-4-AB	W3LUL	5450-109-15-	AB			
	2336-73-6-	AB	WA3JFB	3328-129-3-A	W3HJB	4221-101-11-	AB	WA4NJP	4984-89-18-	ABD
WA2IKO/2 (+WB2MXS)			WA3LGC	3224-124-7-AB	W3CJX	4048-92-12-	AB	K3L RH	2484-55-13-	AB
	1088-32-7-	A	W3YXF	3080-110-4-AB	W3OTC	2632-94-4-	AB	W4SHL	102-46-1-	B
WA2OAU (+WA2SSU)			WA3PNW	3060-85-8-AB	W3PIH	2496-78-6-	AB	W4JSS	576-18-6-	AB
	1056-48-1-	B	WA3F0F	3040-95-6-AB	W3QO	2413-64-9-	AB	W4IKR/4 (13 opr.)	2784-87-6-	AR
WA2SSU (+WA2OAU)			W31GQ	2970-99-5-A	W3KUH	2324-83-4-	AB			
	1034-47-1-	B	WA3HDV	2860-110-3-A	W3PZK	2044-73-4-	AB	K4TBY	6760-169-10-	AB
WB2VPY (3 opr.)			WA3GNV	2782-107-3-AB	W3MSN	1980-66-5-AB	AB	WB4YH	1533-37-1-	AB
	741-29-3-	A	WA3OBI	2688-112-2-A	WA3RKT (K3LZL, opr.)			WA4UCG (+WA8YTY)	4080-102-10-	AB
WA2YZW/2 (+WA2MXL)			WA3PKL	2640-110-2-A						
	374-17-1-	B	WA3RLW	2626-101-3-A	WA3NAN (W3HXF, opr.)					
			W3GOA	2624-82-6-A						
			W3NHX	2520-105-2-AB	K3IXD	1620-54-5-AB				
			WA3JUV	2508-66-9-AB	W3OEP	1512-54-4-AB				
			K3MUA	2422-87-4-AB	W3CPM	1430-55-3-AB				
WA3QPK	13,275-269-15-	AB	W3WU	2400-80-5-A	K3MDN	1352-52-3-	B			
WB3HG	3496-76-13-	B	W3GBH	2340-90-3-A	W3BNL	1222-47-6-	B	K4LWZ	3624-77-14-	A
W3CGV	2646-74-8-ABCD		WA3PUL/3	2314-89-3-A	W3WQI	1184-37-3-	B	WB4LDO/4	2714-59-13-	AB
			WA3JNF	2288-88-3-A	W3SQA	980-33-5-	AB	K4ROM	2337-62-9-	A
			WA3JSR	2236-86-3-AB	WA3LJQ	984-41-7-	B	WB4LDP/4	1092-26-11-	AB
			K3ZKO	2212-79-4-ABD	W3QBC	910-35-3-	B	WA4WZQ (5 opr.)		
			K3KUR	2208-69-6-AB	K3GMB	864-36-2-	AB	W4ZZ/4 (+K4MUMOU)	4400-100-12-	AB
									2888-76-9-	AB

South Carolina			Orange			W8HQK			2768-87-6-AB			K9DTB/9			1740-58-5-AB			
K4PKV	780-26-5	ABD	K6YNB/6	10,621-280-9	ABC	W8B0B	2720-85-6	AB	WA9NRI	1690-65-3	B							
K4VAA	336-12-4	A	WB6RAL/6	3450-115-5	ABC	WB8GZL	2722-71-6	A	K9DNW	1584-72-1	AB							
WB4NXY	288-12-2	A	WB6ASR/6	3232-101-6	ABC	W8K0B	2196-62-8	A	WB9BOH	1464-61-2	A							
WB4TSB	288-12-2	AB	WB6RJV/6	3030-101-5	ABC	K8MPR	2080-65-6	A	WB9FRX	1464-61-2	AB							
Tennessee			WB6MWT/6	1300-50-3	A	WB8GZM	2040-68-5	A	WA9YVZ	3290-43-5	AB							
WB4JGG/4	4108-81-16	A	Santa Clara Valley			WB8JRN	2002-77-3	AB	WA9LEJ	1166-53-1	B							
WB4LHD	3900-78-15	A	K6GSS/6	5083-150-7	ABCD	W88KRN	1709-50-7	A	WA9OHU	1122-51-1	B							
WA2FYH/4	3388-77-12	A	WA6GYD	3030-101-5	ABCE	W80IW	1620-54-5	AB	W9DJZ	984-41-2	B							
WB4KMK (+WB45 CXC LSK)	2740-56-10	AB	W6VMY/6	3000-100-5	ABC	WA8LYF	1530-51-5	AB	WA9PYY	924-42-1	B							
W4GZX/4 (5 ops.)	1392-44-6	AB	K6DTR	2100-70-5	ABC	WA8RLV	1500-50-5	AB	WB9AXH	888-37-2	B							
			K6QAX	1428-51-4	ABC	WA8MVV	1496-44-7	B	K9K0R	850-25-7	B							
			WB6DVJ	1428-51-4	B	WB8GOT	1440-45-6	A	WA9GUE	770-35-1	AB							
			WB6JNN/6	1222-47-3	B	WA8WMP	1410-47-5	AB	WA9KIE	748-34-1	AB							
			WB6LLD	1170-45-3	BC	K8ZES	1258-37-7	BD	W9JZR	738-26-4	B							
W4AAU	9200-202-13	ABD	WA6UAM	1144-44-3	BCD	WA8OZB	1248-59-6	AB	K9FNF	660-30-1	AB							
K2UOP/4	7770-185-11	ABD	W6RME	616-22-4	BC	WB8BBB	1233-44-4	AB	WA9MSZ	624-26-2	B							
W4UCH	7084-154-13	ABCD	WB6TUS	546-21-3	B	K8LUC (WA8STX, opr.)			W9KBU	572-26-1	B							
KH6FLD/4	3108-74-11	AB	WB5TUT	384-16-7	B	WB8CFN	1111-51-1	AB	WB9ASX	506-23-1	B							
WB4BJ	2592-108-2	B	W6FZJ	240-8-5	D	WB8ZVY	1100-50-1	AB	WA9NTA	440-20-1	A							
K4LHB	2584-76-7	AB	W6PIY/6 (3 ops.)	2340-78-5	BCF	WB8KSE	1092-39-4	AB	W9NFB	407-23-1	B							
WB4WLW	2002-77-3	AB				WA8KOO	1040-40-3	B	K9VGN	374-17-1	B							
W4PBA	1808-57-6	AB				WB8CHT	1008-36-4	AB	WA9SGC	352-16-1	B							
WA45VR	1564-46-7	AB	San Francisco			W8MLV	896-28-6	A	K9SZT	330-15-1	A							
WB4UGD	1320-53-2	A	WA6PYN	1472-46-6	A	WA8MMF	810-27-5	A	W9ZYL	330-15-1	B							
K4ITB	1274-36-7	AB	K6HWT	896-32-4	B	WA8CAC	704-32-1	A	WA9RHU	310-15-1	B							
K4FTO	1054-32-7	B				WB8STX	676-26-3	AB	K9ONA	308-14-1	A							
W4WYL	816-34-2	B	WB6NFT	1530-51-5	AB	WA8OSZ	624-26-2	AB	WA9IRZ	308-14-1	A							
W4KFC	216-9-2	B	W6FFE	532-19-4	BC	WA8SSI	576-26-2	A	WA9IQE	288-12-2	AB							
W6QGD/4	88-4-1	B	WB6JAX	252-9-4	A	WA8SVX	572-26-1	A	K9DKT	264-12-1	A							
WA4TZ/4 (6 ops.)	4464-93-14	AB				WB8GSD	532-19-4	AB	WB0QA/9	220-10-1	B							
			Sacramento Valley			WA8PZJ	484-22-1	A	K9YST	132-6-1	B							
			WB6NKO	1110-37-5	ABC	WA8R0K	396-18-1	A	WA9WDE	132-6-1	A							
			Western Florida			WA8JW	384-16-2	AB	WA9LKE	22-1-1	B							
WA30DA/4	812-29-4	AB				WA8KUR	360-15-2	B	W9BQC (6 ops.)			7888-232-7	AB					
WB4JHQ	198-9-1	A	Hawaii			K8WLP	352-16-1	B	K9YHB (4 ops.)			6480-180-8	ABD					
WB4KGW	176-8-1	A	KH6HOY	110-5-1	B	W8WYMY	330-15-1	A	K9YHB (4 ops.)			6480-180-8	ABD					
						WB8AZM/B	154-7-1	A	WA9DBJ (+W9NGKM)			2142-77-4	ABD					
			West Indies			W8SUS	110-5-1	AB	K9BAG/9 (+W9RML)			132-6-1	B					
KP4DKE	880-40-1	A				W8WYV	96-4-2	B	C									
KP4DFH	836-38-1	AB	WA7NGK	2125-63-7	A	W8FCG	22-1-1	A	C									
			WA7JEI	308-11-4	AB	Oregon			Indiana									
						W8LGI	22-1-1	C	W9JBD			4452-106-11	A					
						W8RQV	22-1-1	C	K9UVJ			3328-104-6	AB					
						W8CCI (12 ops.)			W9CUI			1170-39-5	A					
						W8CMM (+W88II)	26,352-366-26	AB	K9UNM			560-18-6	B					
						W8RIB (5 ops.)	24,472-322-28	AB	WB9AOU			481-20-3	B					
						WA7ELI	1800-82-1	AB	WB8HUC/9 (6 ops.)			6378-143-13	A					
						WA7NTF/7	1204-50-2	A	WB9EFK (+WB9IGG)			636-21-6	A					
						WA7PVE	1144-44-3	A	W9HXX (W9EFL, opr.)			960-32-5	A					
						W7GLS	864-36-2	AB	W9DI			176-8-1	ABC					
						WA7IPR	407-19-1	A	10									
						W7FIM	44-2-1	A	Colorado									
						W7VE/7 (7 ops.)			K8GHC			572-26-1	AB					
									Iowa									
									K8MST			9568-184-16	AB					
									W9BZW			8150-163-15	AB					
									WA8UPS			1110-37-5	AB					
									WA8OON			650-25-3	AB					
									WA9ATY			616-22-4	AB					
									W9M00			330-11-5	A					
									Kansas									
									W9WCTO			48-2-2	B					
									K8WFN			22-1-1	A					
									WB8BBC (+WA9VJF)			4796-114-12	AB					
									Missouri									
									K8LCB			720-30-2	AB					
									WA8JHB			216-9-2	A					
									W8K0C			96-4-2	AB					
									South Dakota									
									WB8ELN			44-2-1	AB					
									Check Logs									
									W1EVJ, W1GAA, W1POB.									

1972 ARRL INTERNATIONAL DX COMPETITION — High-Claimed Scores

Following are high claimed scores of entries received by May 1. Read (left to right): total score, multiplier, contacts. If you note what appears to be an error, please let us know pronto! Final results will appear in (or near) October (QST: please don't ask for DXCC credit based on log confirmations until the adjusted scores make the scene!) — *WA/KQM*

DX — CW

Single Op.		Multi-Single	
XETIJ	4,979,088-284-5844	WA8JUN	2,047,770-373-1830
VP2A	4,456,782-297-5002	WBUM	1,860,804-381-1628
KH6RS	4,395,634-292-5019	K6FBB	1,652,640-313-1760
KH6IJ	3,567,474-273-4246	WA3HGV	1,426,368-391-1216
4M5KL	3,420,315-263-4335	WA1NRY	1,398,096-304-1533
CP6FG	2,315,088-233-3312	WASRXT	1,163,646-297-1306
OZ1LO	1,900,242-229-2766	K2MME	1,160,628-287-1348
16BQI	1,659,585-215-2573	W1FLM	1,076,412-271-1324
OH8RC	1,520,544-188-2696	WA1JUY	1,026,006-271-1262
KR6AY	1,462,455-207-2355	W6ITY	1,002,540-245-1364
DL5BR	1,405,107-209-2241	<i>Multi-Multi</i>	
13ASE	1,388,376-198-2339	W4BVV	5,674,872-476-3974
OX3YY	1,383,120-226-2040	W3WJD	4,864,128-478-3392
P19JT	1,365,150-190-2395	K31ZY	4,271,238-414-3439
9Y4VU	1,361,565-237-1915	W3GM	4,115,964-454-3022
JA2JW	1,300,824-203-2136	W1MX	3,512,145-415-2821
PA0LOU	1,161,806-214-1880	K1VTM	2,556,972-363-2348
ZL1AMO	1,147,512-204-1876	W6ANN	2,510,922-346-2419
PY2FCJ	1,099,366-204-1798	W3SS	1,482,048-332-1488
OZ5DX	1,049,040-186-1880	WA3ATX	1,473,849-323-1521
KL7BCH	1,012,018-149-2264	W5KFL	1,428,838-326-1464
<i>Multi-Single</i>		W4KXV	1,286,100-300-1429
KG6ALV	1,986,804-241-2748	W3MWC	1,215,800-325-1248
LU2DKG	1,865,019-221-2813	K2FL	1,103,702-358-1023
VP2GVW	1,728,222-226-2549	<i>DX — PHONE</i>	
VP2LAT	1,395,360-255-1824	<i>Single-Op.</i>	
DJ9JF	1,210,422-201-2013	XI1JJ	6,903,117-277-8307
JA9YBA	1,026,840-199-1720	KH6RS (K2SIL, opr.)	6,587,672-287-7651
<i>Multi-Multi</i>		KG4CS	4,584,490-278-5485
OH1AD	1,929,624-212-3256	VP2LAT	4,387,350-275-5318
SK3BP	1,333,497-187-2641	H1IRF	4,180,800-268-5200
<i>W/VF — CW</i>		KP4DLW	4,069,392-272-4987
<i>Single-Op.</i>		KH6IJ	3,979,008-264-5024
K1ZND	2,509,359-379-2207	KZ5J1	3,873,420-270-4782
W7RM (K7VPF, opr.)	2,216,604-338-2186	KFLLS	3,113,028-258-4044
K1LPL/3	2,101,248-342-2048	YV5CVE	2,853,552-273-3497
K1NOL	2,024,565-355-1901	CT1BH	2,797,920-232-4020
K4GSU	1,983,888-368-1797	9Y4VU	2,538,270-238-3555
W1BPW	1,886,760-360-1748	VP2AAC (WB4GGA, opr.)	2,148,562-229-3126
W6MAR	1,839,672-334-1836	ZS6DW	2,128,395-235-3019
WB4YOJ	1,773,252-351-1684	VP2AAP	2,037,377-239-2981
W6RR	1,767,606-302-1951	IP1MOL	2,001,492-212-3147
W5WZQ	1,595,751-331-1607	DL6WD	1,915,431-197-3241
WA6IVN	1,503,186-326-1537	W0YYA/YV5	1,832,454-191-3198
WASJMK	1,498,695-341-1465	8P6DR	1,756,548-236-2481
K6SDR	1,452,987-293-1653	16FLD	1,707,356-217-2624
W7IR	1,387,905-335-1381	TG0AA (TG9GI, opr.)	1,570,920-195-2685
W3VT	1,350,420-355-1268	11AYP	1,591,005-205-2591
W2GGE	1,333,395-315-1411	191JT	1,554,390-190-2727
W2DXL	1,323,510-314-1445	CT2BG	1,542,084-214-2402
W1YK (WA1JLD, opr.)	1,311,822-306-1429	EA1FD	1,498,336-224-2231
W6DGH	1,287,000-286-1500	EA3NA	1,376,820-180-2556
WA6DKF	1,248,528-296-1406	KG6SL	1,239,929-189-2187
W9FVC (WB9BJR, opr.)	1,235,316-292-1216	VP2MY	1,219,050-210-1935
W1FBY	1,206,792-302-1332	G3OT	1,214,400-200-2024
VE7ZZ/W7	1,177,428-262-1498	XE2LLX	1,186,770-221-1790
W9REB	1,164,660-295-1316	KS6DJ	1,113,900-158-2350
K4THA	1,161,543-313-1237	DJ4ZR	1,108,584-178-2076
W1NOQ	1,160,640-310-1248	DL8PC	1,062,534-187-3894
W1DAL	1,134,312-302-1252	<i>Multi-Single</i>	
K2KNV	1,121,736-308-1214	KZ5ZZ	5,840,115-295-6599
W4NQA	1,068,720-292-1220	G4ANT	3,079,092-236-4349
K9CUY	1,052,100-300-1169	F6KAW	2,795,968-224-4178
W2YT	1,027,884-286-1198	9G1WW	2,234,400-196-3800
WB9BPG	1,024,414-293-1166	DL5JF	2,222,442-222-5337
W3GRF	1,011,160-288-1169		

IP1ONT	2,148,824-211-3513
WA2BVU/4X	1,431,540-198-2410
VP2GVW	1,279,692-204-2091
KG6ALV	1,125,528-184-2039
18KB1	1,081,584-174-2072

Multi-Multi

KH6HCM/KH6	5,469,372-278-6558
OH2BO	1,305,243-171-2567

W/VF — PHONE

Single-Op.

W7RM (K7VPF, opr.)	3,055,941-333-3059
WA1JHQ	2,202,627-371-1979-ABC-75
W3CRF	2,183,730-415-1754
K1VTM	2,038,575-385-1765
WA6IVN	1,900,014-314-2017
K8YBU	1,764,792-386-1524
W6MAR	1,755,810-315-1858
K1THQ	1,706,928-344-1654
WB4YOJ	1,633,170-385-1414
W9ZRX	1,603,689-409-1307
W2YT	1,410,750-330-1425
W5WU/5	1,335,150-345-1390
W2MB	1,334,613-343-1297
W6RR	1,294,419-371-1163
K1LPL/3 (WA3HTQ, opr.)	1,273,590-318-1335
W6KG	1,214,451-259-1563
W4LBP	1,155,059-331-1163
W3VT	1,142,640-360-1058
W4WSL	1,139,484-353-1073
W4OCW	1,149,000-383-1000
K9CUY	1,140,156-324-1173
WB4UYD	1,116,192-308-1208
W3EZI	1,094,184-334-1098
KR1DE	1,089,035-341-1045

W5QBM	1,071,986-314-1138
K6SV1	1,009,201-232-1450

Multi-Single

W7S1A	2,784,564-342-2714
W1LBY	2,371,968-426-1856
WA8JUN	2,192,736-416-1757
W4FDA	2,146,416-388-1844
WA3HGV	1,816,848-444-1364
W51QT	1,635,600-376-1529
WA1KZI	1,451,124-344-1398
W6HX	1,234,530-258-1595
K6AN	1,192,412-258-1538
W1ETG	1,157,970-290-1331
W0EZH	1,138,800-292-1300
W1MX	1,104,111-317-1161
W8NGO	1,082,916-331-1084
W8BVI	1,026,300-311-1100
W4QAW	1,013,934-347-974

Multi-Multi

W3WJD	4,356,144-454-2864
W3GM	4,264,608-496-2866
WA2LNX	4,247,760-440-3218
W9Y1	3,965,643-451-2931
W3GM	3,260,160-480-2264
W4BVV	3,091,411-317-1611
K3HTZ	2,630,496-424-2068
WASJMK	2,170,950-410-1765
WA3ATP	1,939,604-404-1617
WA3ATX	1,855,635-383-1615
WA1JUY	1,488,405-335-1481
W3MWC	1,483,872-377-1312
K2UOT/2	1,428,108-349-1364
K6FBB	1,403,262-301-1554
K3TGM/3	1,341,768-334-1339
W6OAT	1,252,092-302-1382
K2L	1,141,788-386-986
WA6QQW	1,108,419-293-1261
W3SS	1,088,000-325-1116
WA6BVY/6	1,082,196-276-1307

220 — What is it good for?

(Continued from page 57)

A good converter for this purpose can be built up by utilizing information supplied for 144- or 220-MHz converters, with only minor modifications. Same for antennas for the TV channels. Such a setup will be many decibels more sensitive than the best TV receiver in the world. Properly equipped, you should be able to hear TV stations regularly over distances up to 400 miles or more. Then, when anything favorable comes along you'll know it!

Even monitoring TV signals in this effective way is no real substitute for heavier occupancy. No amount of DX observed on nearby TV frequencies will do us any good on 220 unless there are other amateur stations within range. Better-distributed amateur activity is what we really need. When we have it 220 should match lower and higher bands, whether for reliable communication under all conditions, or for catching the occasional flashes of DX that nature is sure to offer the persevering vhf man.

With both 146- and 450-MHz fm experiencing growing pains, 220 is taking its place in the sun. After years of unstable occupancy, surely this is now a band "whose time has come."

AMATEUR RADIO PUBLIC SERVICE
NTS RACES AREC
In the Public Interest, Convenience, Necessity HRH

CONDUCTED BY GEORGE HART,* WINJM

EMERGENCY POWER

IN THE RECENT SET one of the features was a period of operation when only emergency power could be used. That is, the simulation was to provide that during some period of time all commercial power went out and only stations with power independent of commercial lines could operate.

Many ECs and most net managers didn't even follow the instruction to make this a part of the exercise, knowing it would be hopeless, that nobody would be on. Of those who did try it, many found themselves alone as other participants followed instructions and went off the air *because they did not have emergency power!* This is not too good a commentary on our preparedness; but what is worse is that not having emergency power didn't seem to bother anybody, particularly. After all, it was only a test, eh? If it were the real thing, some kind of emergency power could be obtained. Why shucks, you can rent a generator at the rental place down the street at a moment's notice. Besides, the commercial power never fails; oh, maybe for a few minutes at a time in exceptional circumstances, but never long enough to matter.

With all due respect to the commercial power companies, most of which do an admirable job of supplying the megakilowatts needed for today's living and industry, we recall a certain November about six years ago when the whole northeast area blacked out, some of it for days, and for a panic-stricken few minutes there seemed to be some danger that the entire bi-nation complex of power grids would be affected. Prior to that occurrence it was widely believed in the industry that it couldn't happen. It wasn't likely then and it isn't likely now, but it *can* happen. No doubt additional safeguards have been adopted by each company to get themselves off the grid fast enough

*Communications Manager, ARRL.

to avoid damage in the event of a sudden overload, but if a really large plant should go out of action for *any* reason, things are going to happen and someone is going to be without power. There just isn't that much reserve, with today's demand.

While the likelihood of an entire generating plant going out of action is not great, many other things can happen locally to cause outages - fires, floods, earthquakes, storms. They do happen frequently, and when the power goes off all rental generators are quickly snapped up. Generators you were able to borrow for Field Day from your plant or the fire department or the Red Cross are being used, not available. So there you are, with a roomful of beautiful equipment and *you are off the air, OM!* You are at the mercy of the power company. They will tell you when you can operate.

Unless, of course, you have your own supply - one perhaps not large enough to run the whole house with its refrigerators, freezers, air conditioners, burners with electric starters (or maybe your house is heated by electricity!) - and, of course, lights - but one large enough to power a moderately-powered station, which takes little power compared to most of the above. For example, the power drain of a modern communications receiver, with all its transistors, is practically infinitesimal - less than 100 watts certainly, and in some cases the pilot lamps take more juice than the rest of the receiver combined. The rig can be moderately-powered for emergency purposes (forget about that two-gallon-pep linear!) and consume not more than 300-400 watts at full steam. So what do you have? A 500-watt genny you can practically carry in one hand to power a 150-watt sideband rig along with a receiver and enough light to see by. It can be done. How come more of us don't do it?

The answer to this is probably that most of us don't perceive that we'll get that much use out of



The New York State Phone Traffic and Emergency Net Policy Committee held a meeting on April 29 in Syracuse, N.Y. Pictured left to right, standing: W1BU, W2CFP, WB2QAP, WB2YEM, WA3QFA, K2HOH, WB2YEE, WA2RSP, WB2ASK. Sitting, left to right: WB2VBK, K2VCZ, WB2HLV, WB2QKQ. (Photo by WB2HLV)

Pictured here is WA8STX. John was only one of a number of Southwest Ohio AREC members who supplied communications for a state high school track meet in Sharonville, Ohio on April 8.



such a little genny, since it will be so seldom needed, so why invest in it? And the more complacent we get about the prevalence of commercial power, the more we're going to suffer when that something that *hardly* ever happens does happen.

How about mobiles? These are emergency-powered rigs, but they have limitations. Those on the HF have to compromise with low-efficiency antennas and cramped operating quarters. Those on vhf have rather limited range — lengthened, it is true, by repeaters. But does the repeater have emergency power? Probably not many of them do (more of them should!), but one thing the repeater craze has done is to make many more mobiles and hand-carried rigs available that can operate effectively over short distances on simplex even if the repeater is QRT because of power outage. And some amateur groups are getting set up with portable repeaters that can be set up on a strategic mountain-top, a high building or other structure, or just about anywhere so it can go into operation to best effect in an emergency situation. The possibilities are limitless.

So let's do some thinking about emergency power and make sure *you* don't have to go off the air when or if the power company stops pumping unlimited amperes through your house outlets. And if you belong to a repeater group, take steps to see that the repeater can continue operating in such an eventuality — because if the repeater is operative, the mobile and hand-carried rigs that operate through it have almost whatever range is necessary.

Specialists and Modes

Our amateur bands are populated largely by amateurs who can communicate effectively by only one means — the spoken word. Worse than that, many of these know little of what goes on behind the front panel of their purchased rigs and/or have deliberately restricted their amateur horizons in one way or another. Too many amateurs spend their entire amateur lives on a single mode, or on one band, or in one part of the spectrum, or performing one kind of function or engaging in one kind of activity. We are a bunch of specialists, each of which feels its "thing" is the only thing, and most of whom have little understanding of or sympathy with other specialists. If the headquarters, in its operating or technical programs or its directed policies fails to give adequate recognition (and whatever recognition given is never adequate) to each one, it is accused of being asleep in its provincial or isolated corner.

But by far the greatest number of amateurs operate by a voice mode of one kind or another — sideband, am, fm, hf and vhf. All kinds of

communication have to be handled through the spoken word, which those capable of only voice insist can be transcribed into writing just as efficiently and in some cases more quickly than by other modes. The cw buffs would give them an argument, and so would the RTTY enthusiasts. And now WA9UQP suggests that SSTV is even more efficient because it can give you a whole page of traffic at a time.

Shouldn't we get some sense into our public service operating and stop all this bickering about which mode is best because it's the only one we can use or the one we prefer? How about this: voice for informal or "command" purposes; cw or RTTY for written communications; SSTV for graphic or visual communications. This is ideal, of course, but each mode has advantages peculiar to itself. Voice is universal and *can* accomplish any of the above; if it's all there is, it has to do. But let's not deprive ourselves of the other modes just because we are too lazy to acquire them or too limited in vision to appreciate them. — WINJM.

West Virginia Flood Emergency

When a dam on Buffalo Creek in Logan County, West Virginia, burst on Feb. 26, amateurs in West Va., Va. and Ohio were on the job assisting with communications problems. Our reports come from W. Va. SEC WA8NDY and Army-MARS Newsletter "QRZ," written by Asst. Editor (also ORS/OPS) W8DUV.

WA8NDY reports that there were problems elsewhere in the state after prolonged heavy rains during February, but the worst disaster was in Logan County. An informal-type emergency net was called, with amateurs throughout the state taking turns as NCS. All normal communications in the area were out, and WA8EKC in Martory was the main disaster zone station, averaging better than 16 hours per day with relief operators. Very little formal traffic was handled, most communications being health and welfare "informals" for individuals. FCC was alerted to clear a disaster frequency, but this proved unnecessary.

The net operated for more than a week, handling untold numbers of messages, both "in-

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for Apr. Traffic

Call	Orig.	Recd.	Ret.	Del.	Total
W3CUL	223	1050	973	41	2287
K9ONK	115	590	572	8	1275
K9ZSQ	1	459	468	-	928
E5TEY	1	412	412	-	825
W7BA	3	362	358	31	759
WA#VAS	107	283	17	266	673
W3VR	165	230	192	14	601
W4BETX	59	273	265	-	597
N9PIV/4	28	264	198	53	543
W3EML	41	295	182	-	518

BPL for 100 or more originations-plus-deliveries

WA2EPI	175	W4ILE	129	W2OE	104
K9YFK	158	WB6VTK	128	K8NQW	104
W4KFC	145	W8QCV	114	W4EYY	101
K8ONA	144	W3LQV	113	K3HR	100
K9UYK	139	W3EHLF	109	W8FNC(Mar.)	112
WA4JOS	130	W4LYT	110	W3LQV(Mar.)	119
W3TN	129	W4BAZ	109	DJ1US/W1(Mar.)	170
		W8IBX	106		

BPL Medallions (see July, 1968 QST, p. 99) have been awarded to the following amateurs since last month's listings: WAIKZE.

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 originations 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.

formal" and real emergency-type, but mostly the former, most of which were moved to another frequency for handling so the main frequency could be clear for emergency traffic. Lists of survivors were read frequently on the net and emergency communications were handled for the Salvation Army, the National Guard, State Highway Department and State Police, supplementing or augmenting their own communications systems.

At the request of state civil defense, on Feb. 29 the Cabell County C.D., 70 miles to the northwest, began to mobilize a communications support group. By nightfall an 80 meter station and a two-meter circuit were operational via the Huntington repeater. These facilities outperformed most of the other services in the area. The SEC requested all W. Va. stations not to solicit or encourage outside aid without official approval, since too many persons and supplies were coming in and could not be handled.



A link to state CD headquarters was established through amateur stations in St. Albans, and later a portable station was set up at the Charleston C.D. office, enabling officials to talk directly with personnel in the stricken area. Still another link was established between a communications van atop a 4000 foot hill at Logan and the portable 75-meter station located at the assembly/distribution point, using 146.94 simplex. These facilities were used primarily to communicate directly with persons at the scene of the disaster, but whenever things were quiet outgoing messages were accepted, given a proper heading and put into NTS or other outlets.

Worthy of note were the large number of listening stations. A few called in to let control know of their presence (an unnecessary practice if control knows what he's about), but most listened and transmitted only if a need developed for someone in their area. All control had to do was call for assistance in a certain place, and more often than not someone was there, listening. Kudos to those who listen, are tuned up and ready to go, but do not transmit during an emergency operation. One novice, W8SLAI, logged more than 30 pages of the operation, including call letters, identifying the bulk of participants. Between our two reports, 80 different stations actively participated. Hundreds of others were standing by, ready.

Another good job of public service rendered by amateurs in this West Virginia disaster.

Public Service Diary

Another report of the devastating tornado that struck Vancouver, Wash. on April 5 comes from K7SUX, trustee of the Clark Co. ARC.

Within minutes after the tornado struck, W7BG, past president of the Clark Co. ARC was contacted by Red Cross officials. Enroute to the Red Cross Center, W7BG notified K7SUX of the disaster and suggested that he report to the radio club with his mobile rig. K7SUX in turn contacted WA7KCC on the Northwest Amateur Monitoring Service operating on 3970 kHz. WA7KCC proceeded to set up a disaster net control station from his home on 3960 kHz as the radio club's station was temporarily inoperative. A few hours later the Clark Co. Radio Club, W7AIA, was on the air using a transceiver loaned by club member W7IOU. WA7KCC and WA7OAS put in a number of hours handling health and welfare messages. Over two thousand messages were handled in a three-day period.

The Northwest Amateur Monitoring System, Washington Amateur Radio Traffic System, Orange Emergency Net, and the Columbia Basin Net cooperated in handling the health and welfare traffic. Additionally, the Columbia Basin Net and the Wash. Post Office Net volunteered to suspend their normal operations in order for the emergency operations to continue on 3960 kHz.

WA7OAR, WA7OAS, and W7EEA were active on two meters and handled a number of Red Cross messages in and round the disaster area.

Scenes like this were common place after the West Virginia flood disaster in February. (Photo courtesy of the Herald Advertiser, Huntington, W. Va.)

Twenty-one stations in the disaster area were active in the emergency including eight mobiles. All were awarded certificates attesting to their performance by the local chapter of the American Red Cross. Those receiving the award were: W7s IOU BG AZN EEA MDM SNU DYX RQG ZDR RCM, K7s SUX SUR TAR SUQ, WA7s KKC KMW OAS OAR MQC HYV LTR. - (K7SUX)

A severe storm hit Joliet, Ill., on the evening of April 7, rendering the WA9EAT repeater inoperative which indicated that the hospital in which it is located did not have emergency power facilities. Hospital electronics technician K9PRB was immediately called out. K9PRB established a two-meter communications link from the hospital to WA9OXY, who had power and telephone facilities available. This link was maintained throughout the evening and contact was made with the Plainfield Civil Defense and other local agencies. At about 2130 local time K9PRB requested WA9OXY to locate flashlights for the hospital as their power was still out. After making several telephone calls, WA9OXY located a large discount store that willingly donated all of their flashlights and batteries to the hospital.

It was later learned that the storm involved a double tornado that caused extensive damage but only one serious injury. Other stations participating were: W9s DBJ RCJ, WA9RCO, K9YXX. - (WA9OXY)

K1DEU, mobiling along Route 7 in Lanesborough, Mass., on April 16, came upon a serious accident involving two automobiles in a head-on collision. At that time no assistance had arrived at the scene. K1DEU immediately called for help on the K1FFG repeater. W1LUX responded and phoned the police. The occupants of one car were hospitalized with serious injuries. The timely action by these amateurs may have saved the victims' lives. - (W1KZS, EC Berkshire Co., Mass.)

On Feb. 17, K5LZJ of Cleveland, Texas, was in contact with W5YZJ when W5FBI/mobile broke into the QSO requesting assistance in notifying the San Jacinto Co. Sheriff's Office of a robbery that had just taken place and added that the person who committed the crime was on foot and probably still in the area. The deputy sheriff was on the scene in minutes and the thief was apprehended with the stolen property in his possession. - (K5LZJ)

On April 18, K4TQR was the first to arrive at the scene of a serious accident on Airport Highway in Birmingham, Ala. He put out a call on two meters and was answered by WB4JVY who, upon learning of the situation, notified the police. A police cruiser arrived within a minute after the call. One man was injured and one of the two cars involved was demolished. - (K4AOZ)

During the W2FCL/WA2RAA operation at the Camp Aheka (N.J.) BSA Olympics on April 22, WA2JNO was traveling from the camp when he spotted a car that had run off a deserted road and into a ditch. Using the WA2UYS repeater, WA2JNO called the club station and requested emergency assistance. WB2RUM called the local police and a wrecker for the damaged car. - (WA2RIN)

On April 28, 29 and 30 the Hams Amateur Mobile Service of Everett, Wash., set up their

communications van at the Fire Mountain Boy Scout Camporee under the club call of WA7LAW/7. The van was manned around the clock by members of the club.

On Saturday afternoon a thirteen year old scout suffered second degree burns on the leg from spilled grease. An emergency call was put through from the van to the base station in Everett which notified a local hospital and had a doctor stand by for the arrival of the boy. After treatment, the

Public Service Honor Roll April, 1972

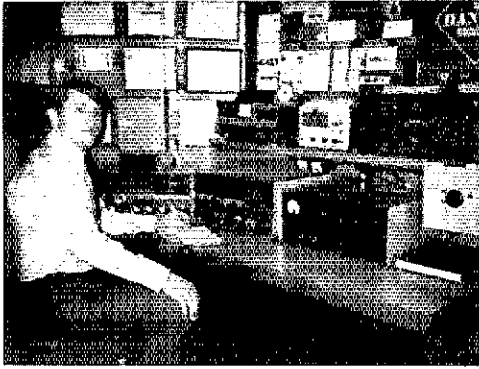
This listing is available to amateurs whose public service performance during the month indicated qualifies for 30 or more total points in the nine categories below. A delineation of the points awarded for each function is given in the category key at the end of the Honor Roll listing. Please note maximum points for each category. Those making fewer than 45 points are listed with point totals only.

Category Max. Pts.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Totals
WA8FTX	10	10	12	12	12	2	3		5	66
WA3QOZ	10	10	12	12	12				5	64
W6UE	10	10	12	12	20					64
K7CTP	10	10	12	12	20					64
K8PIV/4	10	10	12	12	12		3		5	64
WA2EPI	10	10	12	12	12	5	3			63
WB8BMV	10	10	12	12	12				5	63
WA8UPI	10	10	12	12	12	2			5	63
W3E2T	10	8	12	12	12				5	62
WA4VYR	10	10	6	12	12	12				62
WB2AEH	10	10	12	12	12				5	61
WB4KDI	10	10	12	12	12				5	61
WB4PNG	10	10	12	12	12				5	61
WB4SVH	10	10	12	12	12				5	61
W6LRW	10	10	12	12	12				5	61
W3FCS	6	10	12	12	12	2			5	59
WA3JGM	10	10	12	12	12	3			5	59
W7BO	10	10	12	12	9				5	58
WA2UOO	10	9	12	9	12				5	57
WB4SON	10	10	12	12	12	1			5	57
WA0VAS	10		12	12	12	20	3			57
WB2OYV	10	10	12	12	12					56
WA3LQV	10	10	12	12	12	4	3		5	56
K4ZNP	10	10	9	12	12	3				56
WB4VOS	10	10	12	12	12					56
WB8KVT	10	10	12	12	12					56
K9BAD/4	10	10	12	12	12					56
W43NAZ	10	10	12	10	12					54
WB5DFK	10	10	12	9	12					53
WB5EIN	10	10	12	9	12					53
W7OCX	10	5	8	12	12				5	52
W8LT	5	10	12	12	12	1				52
VE6YL	10	10	6	12	12					50
W7OE	10	10	9	12			3			49
W6LRU	10	10	12	12	12				5	49
VE3DPO	10	10	12	12	12				5	49
WA8NOQ	10	10	12	12	12	4				48
WB4PTH	10	10	12	12	12	2				46
K8NQW	10		12	12	12	4	3		5	46
W9HR9	10	7	12	12					5	46
K1QXD	10	5	12	12	6					45
WB8JEL	10	10	12	12	12	1				45
WB0CCB	10	10	9	12	4					45

W1BVR	44	W4ZJY	39	K4EAC	34
WA2AFL/4	44	WA8VKF	39	WB6PKA	34
WB4IMH	44	VF3GFN	39	W7LRK	34
WA4RMZ	44	WA2QNT	38	WA8ETW	34
K4ROZ	44	W4UQ	38	W9QLW	34
WA6DEI	44	W6INH	38	VE3AIA	34
WB9AHJ	44	W7PI	38	VE3AWE	34
VE3ERU	44	W3TN	37	WB2IKL	32
VE3SB	44	WA6DEI	37	WA3DUM	32
VE4EA	44	WB8BPY	37	WB4SQA	32
W2TPV/4	43	W1MVK	36	W8IMI	32
VE3NO	42	WB8ALU	36	VE3EWD	32
K3BR	40	WB6KV	35	VE3FQZ	32
W9GHT	40	W1CE	34	VE3FKI	32
WB8CWD	40	K1SSE	34	VE3GBR	32
W3LOS	39	W3OKN	34	K6ASK	31
K3MVO	39	W3YA	34	VE6FK	31
W3NEM	39		34	W6LYY	30

* Denotes multioperator station

Category Key: (1) Checking into cw nets, 1 point each; (2) Checking into phone/RTTY nets, 1 point each; (3) NCS cw nets, 3 points each; (4) NCS phone/RTTY nets, 3 points each; (5) Performing assigned liaison, 3 points each; (6) Legal phone patches, 1 point each; (7) Making BPL, 3 points regardless of traffic total; (8) Handling emergency traffic directly with a disaster area, 1 point each message; (9) Serving as net manager for entire month, 6 points.



This attractive station belongs to WA3PLP of Peckville, Pa. George is currently serving as a PAM from E. Pa. He's also net manager of the Eastern Pennsylvania Emergency Phone and Traffic Net.

scout returned to the campsite and was able to participate in the rest of the activities. The hospital is located in a small community and a doctor is not normally on duty. By calling the hospital ahead of time the chances of complications of the boys injuries were narrowed. — (W7IEU)

Seventeen members of the Glens Falls Area (N.Y.) AREC provided starting and timing communications for the Kayaderosseras Creek Clean Water Derby on April 8, a kayak and canoe race along the Kayaderosseras Creek between Rock City Falls and Balston Spa, N.Y. Three portable stations equipped with six and two meter equipment were set up located at the starting line, the expert finish line and the novice finish line. About 225 boats took part in the race. Six meters was utilized for transmission and reception of the timing signals and two meters was used for back up and a chatter frequency. Asst. ECs WA2PCK, WB2GCN, and WB2FRV headed up the crews manning the lines and Asst. EC WB2RPL ran a mobile unit between the operating positions to transfer personnel and equipment as needed. — (K2RYQ, EC Glens Falls, N.Y.)

The Blue Valley (Nebr.) Amateur Radio Club provided communications for the "Miles for Development" walk on April 8. The amateur participants were all AREC members. A computer repairman who was on the hike was located when his company's computer broke down. Amateurs also picked up people who dropped out of the hike and KØIBG and WAØFEH manned a check point for a while when the organizers ran short of help. Other amateurs participating were: WØs DOU ZWG VGH ZOU, WAØs DUI KHK, WBØs BOX EQX. — (WØDOU, EC Seward Co., Neb.)

On April 26, twenty-two members of the Miami Valley (Ohio) FM Association assisted the Dayton, Ohio, Chapter of the American Cancer Society in pick-up of funds from 49 collection spots. All operations were controlled from the Cancer Society's downtown office through the Association's repeater, WB8CKQ. A simplex channel was used for final delivery instructions and coordinations at the depository. — (W8KKF)

Thirty-seven SEC reports were received for the month of April. This compares with thirty-six

reports received last month, but is four fewer than the number received for April 1971. Total reported AREC membership stands at 12,507 compared to 13,914 at the same time last year. Sections reporting: Colo, Conn, Del, EFla, EMass, ENY, Ind, Iowa, Kans, La, Mich, Mont, Neb, Nev, NLI, NC, NTex, Ohio, Okla, Oreg, SV, SBarb, SDgo, SD, Tenn, Utah, Va, Wash, WVa, WFla, WMass, WPa, Wis, Alta, Ont, Sask. Don't find your section listed here? Next time you see your SEC why not ask him "How come?"

Traffic Talk

All this talk about the necessity for including telephone numbers on messages, and some stations and nets refusing traffic if such info is not included — did you know that you can get a telephone number anywhere in most parts of the U.S. and Canada free by dialing 1-(area code)-555-1212? Usually you don't even need the person's address, just name and city. Of course if the telephone is listed in some other name, you could be in trouble. In that case, the address probably would help. If your net or the station you want to send the message to insists on a telephone number, oft-times you can get it and add it to the address.

K4GTS points out a few other things that could help prevent garbles. For example, an area code with a second digit other than Ø or 1 is incorrect. You can check this out in your own telephone directory. Also, a 7-digit telephone number cannot begin with Ø, because in dial exchanges this calls the operator. In places set up for direct distance dialing, the first number of a 7-digit number cannot be 1, because this would connect you to an out-of-area trunk, and the second number cannot be either 1 or Ø because the second number of all area codes is either 1 or Ø. Interesting? Usually, you can correct such numbers by using the procedure described in the first paragraph above. You say we have preached that nothing should be corrected except the *form* of a message? True, but in a case this obvious . . .

Speaking of obvious cases, we frequently hear of messages being sent "around the horn" in NTS despite the fact that at one point toll-free telephone delivery is possible. The classic example is a message originating in, say, Richmond, Va. destined for Washington, D.C. The originator knows that it can be delivered by toll-free phone by a station in Arlington, so he reports it in as a message for D.C. Logically, the NCS would dispatch this message to the Arlington station (if he's on) for immediate delivery. It would go to the 4RN station only if there is no such outlet. Let's not be ridiculous, and send it from VN to 4RN to EAN to 3RN to MDD to a Washington area station for delivery.

Of course in normal NTS procedure such a message might not be reported in as a DC message at all, but, since its destination is out of section, as a "thru" message, in which case it would willy-nilly go around the horn anyway. The point is, when you receive a message you can deliver by toll-free telephone, for goodness sake *deliver* it, whether it's for your section, your state, your region or not. And in order to keep from possibly confusing the NCS, it may even be helpful to report the traffic into the net as destined for the place from which it can be toll-free phoned. For example, a message for Phillipsburg, N.J., might be reported into the EPA net as one for Easton; a message for Phila. in NJN might be reported as one for Camden; a

message in QMN for Windsor, Ont., might be reported as one for Detroit. And similar. It's fine to be systematic, but let's not be ridiculous.

K4GTS also points out that most post offices can supply you with a list of government post offices, including zip codes. Thus, if you suspect a garbled place name and the zip is included, you can check and possibly correct it. Also, if both the city-state and zip are included, you can often tell at a glance if something is screwy, because the first digit of the zip code has geographic significance. The List of Post Offices publication can help you straighten out a lot of such things that can reduce the garble factor in our amateur message handling.

National Traffic System. The Eastern Area Staff of NTS held a meeting in Syracuse, N.Y., on May 6-7, to discuss a number of NTS-related matters. Present were 1RN Manager W1EFW, 2RN Manager W2FR, 3RN Manager W3NEM, 8RN Manager W8CHT, ECN Manager VE3ERU, EAN Manager K2KIR, TCC-Eastern Director W3EML, Member-at-Large W1BJG and, in the chair, Member-at-Large W4UQ. Absent were 4RN Manager W4SHJ and Member-at-Large W8RYP. Also present as a participating observer was ARRL Communications Manager W1NJM. There were also three guest observers: WA2ICU, WA2BAN and WA2UOO. The staff was in session from 9 A.M. until late afternoon, then again the following day from 10 A.M. until just before noon.

The proposed Daytime NTS came in for a considerable amount of discussion, resulting in no official recommendation. A proposal for additional section net sessions operating in the ENTS was then discussed at length and certain modifications made; this proposal will be submitted to other area staffs for comment prior to being officially recommended for action. The routing of APO-NY traffic was thoroughly aired, with a recommendation that an official outlet for such traffic within the system be sought. Ways and means of testing the efficiency of the system were discussed at length, in connection with some reports of unreliability. Contents of the Eastern Area Journal, put out voluntarily by W1BJG, were discussed. The SET received a postmortem airing, the general feeling being that the procedure used in 1972 was much more satisfactory than previous overloading procedures and just as effective as far as NTS was concerned; keeping all NTS nets open their maximum time during SET, regardless of whether traffic on hand had been cleared, was proposed. There was some back-and-forth on the subject of ability and experience levels required at various NTS net levels, with some differences of opinion on this. Methods for "impeachment" of EAS members were quickly disposed of, since machinery for this already exists and is deemed satisfactory by most. The EAS also talked about the advisability of holding meetings away from central locations, especially in areas where NTS was not strong, but no specific proposals came out of this. Other matters discussed without action: the current CD Bulletin poll (the EAS went on record as being in favor of the proposal regarding message originations) and use of repeaters and the AOC in NTS functions.

April Reports: Congratulations to W7BQ on his tenth anniversary as manager of RN7. Bill announces that he will retire as manager of RN7 as soon as a suitable replacement can be found. Whoever he is, he'll have some mighty big shoes to fill. Bill will remain active in NTS, however.

K2KIR's arm cast was recently removed but you can't notice the difference over the air. Hah! W0INH reports traffic on a downward trend in the Central Area. Looks like the summer slump is setting in. W2FR issued 2RN certificates to W2FZK, WA2ICU, WA2UOO, and WB2VPR.

Net	Sessions	Traffic	Rate	Avg. Rep. (%)
EAN	30	1721	1.372	57.4 98.3
CAN	30	867	.859	28.9 100.0
PAN	30	1093	.867	36.5 100.0
1RN	60	549	.392	9.1 94.7
2RN	61	551	.715	9.0 100.0
3RN	60	394	.400	6.5 97.2
4RN	49	514	.375	10.5 80.0
RN5	60	718	.442	11.7 94.4
RN6	60	667	.467	11.1 100.0
RN7	58	243	.302	4.2 73.0
8RN	61	607	.460	10.0 91.8
9RN	57	369	.364	6.5 84.2
TEN	60	571	.518	9.5 88.0
ECN	52	275	.300	5.3 80.0
TWN	46	278	.236	6.0 56.0
TCC Eastern ¹	120	674		
TCC Central ¹	90	457		
TCC Pacific ¹	120	849		
Sections ²	2451	11719		
Summary	3225	23116	EAN	14.8
Record	2804	23426	1.421	19.1

¹TCC functions not counted as net sessions.

²Section and local nets reporting (72): AENB, AEND, AENT (Ala.); NCN, SCN, OrgCo40 (Calif.); CCN (Colo.); NVHF, CPN (Conn.); DEPN (Del.); VEN, FMTN, GN, QFN, TPTN, FAST, FPTN, QFTN (Fla.); GSN (Ga.); ILN (Ill.); KTN (Ky.); LAN (La.); SGN (Me.); MDCTN (Md.); WMN (Mass.); MNN, PAW, WSBN, QMN (Mich.); MSN, MIN, MSPN (Minn.); WEN, MSN (Mo.); NJSN, NJN, PVTEN (N.J.); NMRTN (N.M.); NLJ, NYS (N.Y.); NCNN (N.C.); CNE, CNL (N.C. & S.C.); APRMN, BN, OSSBN, BNR, SC2FMEN, SSEN (Ohio); GCRRN, WPA, PTTN, EPA (Pa.); TN (Tenn.); TEX, TTN (Tex.); BUN (Utah); VSBN (Va.); PSEM, WSN (Wash.); WVNN (W.Va.); BEN, BWN, WSSN, WSBN, SW2RN (Wis.); AFPSN (Alta.); MTN (Mant.); GBN, OQN, OPN (Ont.); WQV/UHF (Quebec).

Transcontinental Corps. W3EML of TCC Eastern reports traffic down a bit compared to April of 1971 but the number of successful functions up. Not much news, TCC wise. All indications are that things are running smoothly.

Area	Functions%	Successful	Traffic	Out-of-Net Traffic
Eastern	120	95.0	1851	674
Central	90	97.7	924	457
Pacific	120	94.0	1698	849

The TCC roster: Eastern Area (W3EML, Dir.) - W1s BJG, EJJ, NJM, QYY, YNE, K1SSH, W2s FR, GKZ, WA2s ICU, UWA, W3EML, K3MVO, W4s SOQ, UQ, K4s KNP, VDL, W8s IBX, PMJ, RYP, K8KMQ, W8PIM. Central Area (W0LCX, Dir.) - W4s OGG, ZJY, WB4KPE, W5s QU, MI, SMB, K6KCB/5, W9s CXY, DND, YB, W0s HI, INH, LCX, ZHN, WA0s MLE, IAW, K0AEM. Pacific Area (W6VNO, Dir.) - W5RE, K5MAT, W6s BGF, EOT, IPW, MLF, RSY, VZT, MNY, WA6s DEI, LFA, W7s BQ, EM, KZ, PJ, DZ, XKB, GHT, W0LQ, K0JSP.

Independent Net Reports (April)

Net	Sessions	Traffic	Check-ins
East Coast Teenage Traffic	27	96	295
7290 Traffic	40	607	1720
Early Eighty Free	29	180	273
40 Meter CW Traffic	26	70	158
Eastern Area Slow	30	103	271
75 Meter ISSB	30	366	1247
IMRA Traffic	25	346	1003
Clearing House	25	309	369



ARRL QSL Bureau

The function of the ARRL QSL Bureau is to facilitate delivery to amateurs in the United States, its possessions and Canada, of those QSL cards which arrive from amateur stations in other parts of the world. All you have to do is send your QSL manager (see list below) a stamped, self-addressed envelope, about 4 1/4 by 9 1/2 inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

Cards for stations in the United States and Canada should be sent to the proper call area bureau listed below. Recent changes are in bold face.

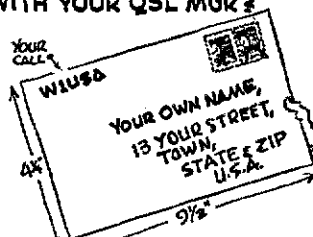
- W1,K1,WA1,WN1¹ - Hampden County Radio Association, Box 216, Forest Park Station, Springfield, MA 01108.
 W2,K2,WA2,WB2,WN2 - North Jersey DX Assn. P.O. Box 505, Ridgewood, NJ 07451.
 W3,K3,WA3,WN3 - Jesse Bieberman, W3KT, RD 1, Box 66, Valley Hill Rd., Malvern, PA 19355.
 W4,K4 - North Alabama DX Club, P.O. Box 2035, Huntsville, AL 35804.
 WA4,WB4,WN4¹ - J. R. Baker, W4LR, P.O. Box 1989, Melbourne, FL 32901.
 W5,K5,WA5,WB5,WN5 - Kenneth F. Isbelt, W5QMJ, 306 Kesterfield Blvd., Enid, OK 73701.
 W6,K6,WA6,WB6,WN6¹ - No. California DX Club, Box 11, Los Altos, CA 94022.
 W7,K7,WA7,WN7 - Willamette Valley DX Club, Inc., P.O. Box 555, Portland, OR 97207.
 W8,K8,WA8,WB8,WN8¹ - Columbus Amateur Radio Assn., Radio Room, 280 E. Broad St., Columbus, OH 43215.
 W9,K9,WA9,WB9,WN9 - Northern Illinois DX Assn., Box 519, Elmhurst, IL 60126.
 W0¹ - Reggie Hoare, W0OYP, P.O. Box 115, Mitchellville, IA 50169.
 K0,WA0,WB0,WN0¹ - Dr. Phillip D. Rowley, K0ZFL, Route 1, Box 455, Alamosa, CO 81101.
 KP4 - Alicia Rodriguez, KP4CL, P.O. Box 1061, San Juan, PR 00902.
 KZ5 - Lee DuPre, KZ5OD, Box 407, Balboa, CZ. Box 407, Balboa, CZ.
 KH6,WI6 - John H. Oka, KH6DQ, P.O. Box 101, Aiea, Oahu, HI 96701.
 KL7,WL7 - Alaska QSL Bureau, Star Route Box 65, Wasilla, AK 99687.
 VE1 - J. J. Fader, VE1FQ, P.O. Box 663, Halifax, NS.
 VE2 - A. G. Daemen, VE2IL, 2960 Douglas Avenue, Montreal 301, PQ.
 VE3 - R. H. Buckley, VE3UW, 20 Almont Road, Downview, ON.
 VE4 - D. E. McVittie, VE4OX, 647 Academy Road, Winnipeg R3N 0E8, MB.
 VE5 - A. Lloyd Jones, VE5JL, 2328 Grant Road, Regina, SK S4S 5E3.
 VE6 - D. C. Davidson, VE6TK, 1108 Trafford Dr. NW, Calgary 47, AB.
 VE7 - H. R. Hough, VE7HR, 1291 McKenzie Rd., Victoria, BC.
 VF8 - Yellowknife Centennial Radio Club, P.O. Box 1944, Yellowknife, NWT, Canada.
 VO1 - Ernest Ash, VO1AA, P.O. Box 6, St. John's, NF.
 VO2 - Goose Bay Amateur Radio Club, P.O. Box 232, Goose Bay, LB.
 SWL - Leroy Waite, 39 Hannum St., Ballston Spa, NY 12020.

¹ These bureaus prefer 5 x 8 inch or No. 50 manila envelopes.

QSL Bureaus for other U.S. Possessions and for other countries appear in the June and December issues of QST.

Note: First-Class mail in the U.S. and Canada is now 4¢ an ounce. QSL Bureau users should send their manager enough two-cent stamps to cover the envelopes on file.

IS YOURS ON FILE WITH YOUR QSL MGR?



Silent Keys

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

- Ex-1AET, Edward T. Stubbs, Sanford, ME
 Ex-W1BSO, Russell H. Staples, Kennebunk, ME
 W1DMO, Elvin G. Hodges, Bridgeport, CT
 W1DRO, Seth S. Card, Salem, MA
 W1ERZ/W1WXX, Herve W. Lamothe, Worthington, MA
 K1FF, Venson G. Blaisdell, Melrose, MA
 Ex-W1FPX/Ex-1EMJ, Clyde P. DeLancey, Framingham, MA
 WA1GEQ, Jeffrey F. Weed, West Hartford, CT
 W1KBL, Earl L. LaMarche, Teaticket, MA
 WA1KRE, Charles S. Barton, Southboro, MA
 Ex-W1MT, Percy Matheson, Sanford, ME
 W1QE, Joseph E. Reegan, Lexington, MA
 W1ZTS, Kenneth I. Hallet, Pepperell, MA
 W2AFQ, James W. Knapp, Brockport, NY
 W2BL, Martin Bender, New Rochelle, NY
 W2DIT, Ernest R. Sandanton, Linden, NJ
 W2LZ, Peter A. Jasko, Jamesburg, NJ
 W2MFP, Harold E. Clendaniel, Babylon, NY
 W2OXA, Victor Czarniewski, Madison, NJ
 W2PLV, Elton Sockwell, Bridgeton, NJ
 WA2WAX, Charles M. Fournier, Garden City, NY
 WA2ZBH, Louis Fischer, Deer Park, LI, NY
 W3DAP, George E. Marshall, Silver Spring, MD
 W3JEW, John J. P. Brogan, Wilmington, DE
 W3KGT, Ralph L. Reynolds, Grove City, PA
 W3LIS, Wilfred A. "Al" Fields, York, PA
 W3PSP, Kenneth S. Teeple, Baltimore, MD
 W3QDV, Frederick E. Glaser, Bethesda, MD
 WA4AMM, Albert E. Hill, Estill, SC
 W4EBE, John W. Jacobs, Jacksonville, FL
 WB4EZX, Harry A. Taylor, Bradenton, FL
 W4HW/Ex-W4AYA, Robert H. McBroom, Graham, NC
 WB4ISI, Richard F. Torrence, Rock Hill, SC
 WB4ITN, Samuel C. Milbourne, Huntsville, AL
 W4MRH, Vincent J. Vastano, Winston-Salem, NC
 W4NZI, G. Douglas Rice, Plantation, FL
 WB4FXP, Norman G. Dunning, Pinellas Park, FL
 WA4SUQ, Mildred E. Wright, Orlando, FL
 W4UGQ, William Q. Setcliffe, Port Charlotte, FL
 W4VSI, Lowell K. Powell, Aoshke, NC
 W4YEM, Lewis N. Jones, Sr., Parrish, AL
 W4ZFC, Charles L. Moss, Spartanburg, SC
 WN5BLA, Terry W. Jones, De Soto, TX
 WA5EFL, Moritz O. Shollmier, Little Rock, AR
 WA5NYL, John D. Pisani, III, Morgan City, LA
 W5OIG, Robert J. Stark, Grapevine, TX
 Ex-W5SW, Thomas E. Fink, Oklahoma City, OK
 W5WKK, William F. Ragland, Ore City, TX
 WA6AAK, Homer L. Wadhams, Creston, CA
 W6BKX, John N. Stewart, Laguna Beach, CA
 W6CIS, Kenneth E. Hughes, Merced, CA
 K6DT, Carl W. Clement, Millbrae, CA
 W6FBA, James T. Chatterton, Lafayette, CA
 W6GB, Walter A. Knight, Garden Grove, CA
 WB6HZI, Henry F. Schlutz, San Diego, CA
 W6KEQ, Kearn H. "Jack" Rothman, Paradise, CA
 K6VTZ, Howard M. Ames, Jr., Chino, CA
 W7EJ, Wayne E. Gurley, Cascade Locks, OR
 W7GFC/Ex-W0MTH, Kenneth I. MacKnight, Sun City, AZ
 W7GPZ, Clare D. Newman, Lincoln City, OR
 WA7JIF, Willard C. Topping, Portland, OR
 W7JLN, Robert E. Maichle, Caliente, NV
 *W7PB, Milton W. Rice, Portland, OR
 Ex-W7QE, Howard P. Masterson, Spokane, WA
 W7QXM, Lester M. Hill, Capt. USN, Retired, Kirkland, WA
 W8BAH, Harry A. Tummonds, Cleveland, OH
 K8BI, Douglas F. Duvall, Clarkston, MI
 K8BT/Ex-8BOI, Arthur E. Kaul, Parma, OH
 W8DXM, John T. Blakeslee, E. Lansing, MI
 W8GK/Ex-W8DJP, Richard S. Shoup, So. Charleston, WV

(Continued on page 80)

Hamfest Calendar

Arizona - The 33rd annual summer hamfest of the Amateur Radio Council of Arizona is planned for July 29-30 at Ft. Tuthill. For complete details write the Council at PO Box 6602, Phoenix, AZ 85005.

Delaware - Delmarva Hamfest is August 13 at the State Fairgrounds, Harrington, Del., 10 A.M. until 4 P.M.

Illinois - The Quad-Co. Amateur Radio Club, Inc. will sponsor its 15th annual hamfest of the "Breakfast Club" on July 15-16 at Terry Park, 3/4 mile east of Palmyra. Groups are invited to meet at the hamfest giving prior notice to the committee. Campers welcome from Friday afternoon until Monday morning. Saturday night features dancing and movies. Throughout the two days, activities include games, contests, golfing, fishing, and equipment swap. Mobile talk-in Saturday noon until 11 A.M. Sunday on 3973 kHz. Admission \$1.50 (prior to July 7, \$1). Write "Hamfest," c/o Quad-Co. ARC, Box 81, Chatham, IL 62629.

Illinois - The 15th annual hamfest of the Six Meter Club of Chicago, Inc., is Sunday, August 5, at the picnic grove on U.S. 45, one mile north of U.S. 30, Frankfort, Ill. Food, soft drinks, swap and shop section. Advance registration is \$1.50; admission at the gate, \$2. Talk-in station will be on 50.4 and 146.94 MHz. For tickets and further info contact Al Bagdon, K9YJQ, 7804 West 66th Place, Argo P.O., IL 60501.

Illinois - The Hamfesters 38th hamfest and picnic is Sunday, August 13, at Santa Fe Park, 91st and Wolf Rd., Willow Springs, southwest of Chicago. Exhibits for OMs and XYs and the famous "swappers row." Information and tickets available from Joseph W. Poradyla, WA9IWU, 5701 S. California Ave., Chicago, IL 60629.

Illinois - The Shawnee Amateur Radio Association hamfest is in Johnston City Park, August 13. For details write Bill Johnson, W9ERI, 502 W. Kenicott, Carbondale, IL 62901.

Indiana - The 25th annual vhf picnic of the Wabash Valley Amateur Radio Association is Sunday, July 30, at Turkey Run State Park, near Marshall. Registration (\$1.50) opens at 9 A.M. Campgrounds and playgrounds, free bingo games for XYs beginning at 1 P.M., and an open flea market. Talk-in will be on 52.525 and 146.94 MHz. Free coffee and donuts for early arrivers.

Kansas - The Kansas-Nebraska Radio Club will hold its annual hamfest on August 6, at the Moose Club, 113 West 5th, Concordia. Registration begins at 9 A.M.

Minnesota - Arrowhead Radio Amateurs will sponsor a picnic at Chambers Grove Park, Duluth (Highway 23 at Pon du Lac) beginning at noon, Sunday, July 23. Registration \$1. Games will be organized for children. Talk-in through the WØGKP (34/94) repeater. For more info write Bob Peterson, 1302 Arlington Ave. South, Duluth, MN 55810.

Mississippi - The Jackson hamfest is July 29-30 at the famous Hotel Heidelberg. Tickets for the Saturday evening banquet are \$6 per person. Write Charles Rogers, WA5FII, P.O. Box 8371, Jackson, MS 39204.

Missouri - The Zero-Beaters ARC hamfest will be held on Sunday, August 6, at Washington City Park. Write Zero-Beaters ARC, Box 24, Dutzow, MO 63342.

Nebraska - The Central Nebraska Amateur Radio Club's annual steak fry is Sunday, July 30. A camp-fire wiener roast will take place the preceding night, July 29. Camping facilities available. For advance registration contact L. D. Dunbar, WAØLWK, Box 34, Milburn, NE 68857.

Nevada - The annual Sierra hamfest is Saturday, August 5, at the California Building, Idlewild Park, Reno. Further information may be obtained from George Lyle, K7ZAU, 1047 Mark Way, Carson City, NV 89701.

New Jersey - The East Coast Vhf Society's 14th annual hamfest, with antenna measuring contest and flea market, is the first weekend of August. Send a self-addressed stamped envelope to the club at P.O. Box 61, Morris Plains, NJ 07950 for complete details.

Pennsylvania - The 35th annual hamfest of the South Hills Brass Pounders and Modulators is August 6 from noon until dusk at St. Clair Beach, McMurray, five miles south of Mt. Lebanon on Route 19. Activities include a swap and shop, picnic space for the family, and mobile check-in on 29.0 and 50.4 MHz. Pre-register at \$1.50 per person (\$2 at door) with Lou Cowan, 26 Graper St., Pittsburgh, PA 15227.

Pennsylvania - The Mt. Airy Vhf Radio Club (Pack Rats) will hold the 17th annual family day and picnic, Sunday, August 13 (rain date August 20) at the Fort Washington State Park, Flourtown. The event features games, entertainment, and free soda. Talk-in stations will be on 50.25 and 145.2 MHz. Admission is \$2 per family.

Texas - The Texas Vhf-Fm Society will hold its annual summer convention August 11-13 at the Villa Capri Motor Hotel in Austin, Texas. Technical sessions, manufacturers' displays, and ladies' activities will be featured. Talk-in will be through the Austin 34/94 repeater. For more info write to Larry Higgins, W5QMU, 2522 Old Hickory Trail, San Antonio, TX 78704.

Vermont - International Field Day sponsored by the Burlington Amateur Radio Club is Sunday, August 13, at the Old Lantern, Charlotte. Features include camping facilities, a flea market, contests, demonstrations, and ladies' events. Refreshments available throughout the day. A Saturday night happy hour will start at 6 P.M. Registration at the gate is \$3.50 - \$3 in advance. Write to Al Snow, K1SLU, 12 Dutchess Ave., S. Burlington, VT 05401.

Virginia - The Shenandoah Valley annual hamfest is in Winchester, August 5-6. Tickets for the Saturday evening dinner are \$5. The hamfest begins 10 A.M. on Sunday at the Winchester National Guard Armory. For further info, write the Shenandoah Valley Amateur Radio Club, Inc., P.O. Box 139, Winchester, VA 22601.

Wyoming - The annual Wyoming hamfest is July 15-16 at the Holiday Inn, Thermopolis. Activities include MARS meetings, two-meter talks, a swap table, and ladies' programs. Banquet Saturday evening. For early registration contact Joe Ernst, W7VB, 502 Ryan, Thermopolis, WY 82443.

COMING ARRL CONVENTIONS

July 1-2 - West Virginia State, Jackson's Mill

August 5-6 - Michigan State, Sault Ste. Marie, Michigan

October 14-15 - Pacific Division, San Mateo, California

October 20-22 - Hudson Division, Tarrytown, New York

October 20-22 - Southwestern Division, Santa Maria, California

NOTE: Sponsors of large ham gatherings should check with League Headquarters for an advisory on possible date conflicts before contracting for meeting space. Dates may be recorded at ARRL Hq. for up to two years in advance.

Happenings of the Month

CANADIAN RULES CHANGES

The long-expected change in Canadian amateur rules, to eliminate the minimum age of 15 years for amateur operator certificates, was made official by amendments to Part II, General Radio Regulations in the *Canada Gazette* of April 12, 1972. A similar change covering amateur station licenses became effective on April 26.

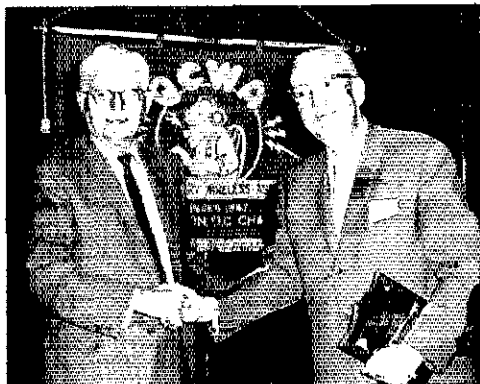
The April 12 order also made official the revised schedule for use of 1.8-2.0 MHz (see page 78, November *QST*), and deleted the remaining segment of the 11-meter band, 26.96-27.00 MHz, which Canadian amateurs had been able to use.

STAFF NOTES

We're pleased to welcome aboard, as an assistant secretary, David G. Sumner, K1ZND. Dave was a National Merit Scholar who graduated from Michigan State in 1970 and was active there from W8SH. A well-known cw contest operator, Dave has been serving on the Contest Advisory Committee. He also chases DX; maintains an interest in vhf, both "weak signal" and fm mobile; follows SSTV; and is a member of AMSAT. Dave is a past president and past vice president of both the Norwich (Conn.) Free Academy and MSU amateur radio clubs, and currently serves as secretary of the Talcott Mountain Uhf Society. He previously put in two summers working for the Communications Department and several months for the Technical Department here at Hq. He'll be signing letters on membership service matters now and seeing you at club meetings later on.

WISCONSIN EXEMPTS HAM GEAR

Amateur radio equipment has been added to the list of personal property exempt from general property taxes, through signature by Governor Lucy of Assembly Bill 976. The bill was filed May



Ed Redington, W4ZM, presents a plaque to ARRL Treasurer David H. Houghton, marking his 50 years of service to the League. The award was made at the annual banquet of the Washington Chapter, QCWA.

26, 1971, by Assemblyman Lary J. Swoboda at the request of Lyle Henry, K9DKW.

The committee report contained this interesting paragraph:

This bill is desirable as public policy. Amateur radio equipment and household equipment such as bench saws, lawn mowers, etc., are basically similar to other personal items in this section, for instance bicycles, firearms, etc. Generally, household equipment is excluded *de facto* from taxation. Its detection by an assessor is difficult and, in the aggregate, its value of slight significance. It is basically similar to other household items exempted and should be added to the list of property legally recognized as outside personal property taxation.

QST thanks the present and previous SCMs of Wisconsin, Joseph A. Taylor, W9OMT, and S. M. Pokorny, W9NRP, for keeping us posted on this measure - and of course K9DKW for taking the initiative on behalf of all Wisconsin amateurs.

FLORIDA CBERS GET PLATES

Operators in the Citizens Radio Service in Florida now can get their calls on automobile

Baton Rouge, Louisiana, observed amateur radio week simultaneously with its annual hamfest the first weekend in May. The Hon. W. W. Dumas (at right), mayor of Baton Rouge and president of East Baton Rouge Parish (county), presents the proclamation to Richard Garcia, WA5VMW, Baton Rouge Amateur Radio Club president, while John Dobbs, WA5OLU, hamfest chairman, stands by.



The Hampden County (Massachusetts) Radio Association celebrated its Silver Anniversary at a dinner March 25 in East Longmeadow. Paul Caputo, K1PKZ, club president, receives a Certificate of Merit on behalf of the association from ARRL New England Division Director Robert York Chapman, W1QV.



license plates for a fee of \$5 per year, after passage of SB-278 in the legislature.

An early report has it that ham tags also were going up to \$5, but the June issue of *Florida Skip* says: Not so - its still \$1 for amateurs. Amateurs had successfully opposed the measure in earlier years - primarily because it would have raised the tariff for ham plates. In its final form, however, SB-278 really falls outside the amateur sphere of interest.

GANT NEW VICE DIRECTOR

Jack D. Gant, W5GM, of Ardmore, Oklahoma, has been appointed as vice director from the West Gulf Division by ARRL President Dannals, replacing Leon Vice, W5VCE, who resigned. Jack is emergency coordinator for Carter County and is general chairman of the 1972 Hamarama. In addition to the Extra Class license, he also holds Radiotelephone First Class, Radiotelegraph Second Class, and private pilot licenses. A member of QCWA, he was earlier the holder of W5EGR.

Minutes of EXECUTIVE COMMITTEE MEETING

No. 340 May 6-7, 1972

Pursuant to due notice, the Executive Committee of The American Radio Relay League, Inc., met at the Bellemont Motor Hotel, Baton Rouge, Louisiana, at 11:02 A.M., May 6, 1972. Present: President Harry J. Dannals, W2TUK, in the chair; First Vice President Charles G. Compton, W0BUO; Directors Victor C. Clark, W4KFC, Noel B. Eaton, VE3CJ, John R. Griggs, W6KW, and Robert B. Thurston, W7PGY; and General Manager John Huntoon, W1RW. Also present were General Counsel Robert M. Booth, Jr., W3PS, Atlantic Division Director Harry A. McConaghy, W3SW, Dakota Division Director Larry Shima, W0PAN, Delta Division Director Max Arnold, W4WHN, West Gulf Division Director Roy Albright, W5EYB, and Delta Division Vice Director Frank Cassen, W4WBK.

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

Albert Einstein High School Radio Club, Kensington, Md.; Amateur Radio Association, New York Inst.

of Technology, New York, N.Y.; Brill Gremillion Memorial Radio Club, Newman, Ga.; Brebeuf Preparatory School Radio Club, Indianapolis, Ind.; Buffalo Area DX Club, Buffalo, N.Y.; Christian Brothers Amateur Radio Club, Lemay, Mo.; Columbus Amateur Radio Club, Columbus, Ind.; Crawford Amateur Radio Society, Meadville, Pa.; Dalton Amateur Radio Club, New York, N.Y.; East Granby Jr.-Sr. High School Radio Club, East Granby, Conn.; Eden Amateur Radio Club, Eden, N.C.; Hams For Christ Amateur Radio Club, Spokane, Wash.; Hardin Amateur Radio Emergency Service, Savannah, Tenn.; Harry B. Thompson Jr. High School Amateur Radio Club, Syosset, N.Y.; Humble Employees Amateur Radio Society, Houston, Texas; Jefferson Jr. High Amateur Radio Club, Champaign, Ill.; Lakeview Amateur Radio Association, Chicago, Ill.; Libertyville and Mundelein Amateur Radio Society, Libertyville, Ill.; Milford High School Amateur Radio Club, Milford, Ohio; Mississippi Coast Amateur Radio Association, Gulfport, Miss.; Mountain View High School Radio Club, Mountain View, Calif.; New River Community College Amateur Radio Club, Dublin, Va.; Northrop Radio Club, Hawthorne, Calif.; Ole Virginia Hams Radio Club, Inc., Manassas, Va.; Parkway West Sr. Hi Ham Radio Club, Ballwin, Mo.; Radio Club & Society of Brooklyn Technical High School, Brooklyn, N.Y.; Radio Society of Greater Brooklyn, Brooklyn, N.Y.; Ramona High School Amateur Radio Club, Riverside, Calif.; San Diego State College Amateur Radio Club, San Diego, Calif.; Saunders County Amateur Radio Society, Inc., Malmö, Neb.; Sylvania High School Amateur Radio Club, Sylvania, Ohio; Tulsa Repeater Organization, Inc., Tulsa, Okla.; WLWC Amateur Radio Club, Columbus, Ohio; W. W. Holding Technical Institute Amateur Radio Society, Raleigh, N.C.; West Boylston High School Amateur Radio Club, West Boylston, Mass.; Woodbridge Wireless Society, Woodbridge, Va.

Two centuries-plus of service to ARRL at Hq. are represented by: Leitha Phillips, Doreen Cromarty, Treasurer Dave Houghton, Cecilia "Sis" Hatch, Circulation Manager Joe Moskey, W1JMY, and Marion Bayrer, who posed during a meeting of the Ten-Year Club. There were another 24 members of the club present with another 585 years of service. The occasion marked the 50th anniversary for Treasurer Houghton; the 25th for Miss Phillips and Miss Cromarty; and the initiation of Rita Tilley (not in photo) who compiles "Station Activities" for *QST* each month for the Communications Department, at the ten-year mark.





H. H. Rugg, VE2HN, (center) earned the February *QST* Cover Plaque Award with his article, "The VE2HN Digital CQer Using NAND Logic." Noel Eaton, VE3CJ, presented the plaque at a meeting of the Montreal Amateur Radio Club, Jerry Hall, K1PLP, (left) assistant technical editor of *QST*, who prepared the article for publication, was guest speaker at the meeting.

On motion of Mr. Thurston, unanimously VOTED to grant formal approval of the Georgia State Convention in Atlanta on June 10-11, 1972, and the West Virginia State Convention in Jackson's Mill on July 1-2, 1972.

On motion of Mr. Compton, Life Membership was unanimously GRANTED the following applicants:

Leon A. Aberasturi, WA2NHC; Richard Earl Ahrens, W3WJC; Bruce B. Allen, W7TSD; Ralph V. Anderson, K0NLI; Robert E. Anderson, K1IOS; Robert V. Anderson, W3ZUE; Luther E. Atwater, WA4NIT; Charles A. Baker, K5MWZ; Andrew Balint, W9IE; Robert W. Beadles, K4EOU; Gene G. Beckwith, K2SFP; Carroll A. Belt, W3WPH; Willis G. Bills, W2CDZ; Byron E. Blanchard; Richard J. Blum, W2AYM; John H. Boston, III, WB4RUA; Kenneth M. Bourne, K9GHR; Paul F. Braden, W8DSN; Donald C. Brooke, WA2ELD; John W. Bruemmer, W5LVE; Raymond Burge; David A. Bushnell, W2DKP; Ian Cable, MP4BBW; Howard H. Campbell, W6DSD; Gary J. Carroll, WB2YKL; Chuck R. Ceremello, WB6VUO; Milton E. Chaffee, W1EFW; Frank R. Chapel, Jr., K9PSN; Westley M. Chatellier, W5DPM; Aileen T. Clark, W7YTN; Orville M. Clark, Jr., K4VKF; Lewis D. Collins, K4GGI; Harvey F. Columbine, W2MLO; Leon W. Couch, II, K4GWQ; Robert F. Dannals, WB2UZU; Robert E. Davies, VE3ERD; Stewart C. Davis, K1KTB; Herbert P. Dean, WA1IBN; Joseph L. Dearth, K9BPT; Robert H. Ditworth, III, W4LQE; James E. Dodson, K8HSU; Stanley Domorod,

W1AKG; Richard A. Drew, K9PJB; John M. Eaton, VE3DJE; Othello Charles Elfers, WA5OUV; Richard W. Fish, W2OWF; C. Lars Forsberg, SM0BDS; Parker W. Fritschle, K0CPO; Robert S. Gaye, K2LGJ; Arthur J. Globman, W2MOY; James H. Gordon, W5GXH; James A. Guida, W3KE; Robert J. Hajek, W9QBH; Frank C. Haley, VE6KF; E. Foster Hammonds, W3BUX; Keith L. Hansen; Emile G. Haro, 3rd, WA5RIO; George W. Hasslinger, WB2CGI; Jay Hauger, K7UKP; Raymond W. Haynes, K6SX; Peter S. Heins, K1FJM; George Hellebrand, W2FLN; Lyle C. Henry, K9DKW; John G. Hipp, K1EJO; Leonard Hofstad, W0LP; John M. Hollywood, W1SK; Alan Horowitz, WA2FDG; John Ippolito, WA6BBI; Vir N. James, W0EY; Jan David Jubon, WA2REM; Alan N. Kimble, VP7ND; Carl B. Kinell, III, WA5KND; W. D. Kinghorn, K7GSC; David C. Kochendarfer, K4DC; Byron H. Kretzman, W2JTP; Richard A. Krotz, WB9DEF; Kenneth Kruger, WB8AAX; Richard H. Lachenauer, W2JYF; Charles D. Larus, III, K4AL; William G. LeLacheur, WN8LYA; Theodore I. Leonberger, K3RCI; Dennis H. Luther, K0WXX; John H. Madden, WA1KVC; Wayne S. Manly, WA4JCF; John A. Mason, W5NSQ; Joseph E. McCausland, W8HHN; Ernest R. McGuire, WA8RZM; William D. McMurray, K4SG; Clayton H. Merrell, W4LE; Abel G. Michel, K5AJK; Daniel F. Michnay, K9UVJ; Edward G. Miller, W5EXI; George T. Miller, Jr., K4LEM; Richard H. Miller, WA4ECJ; John Mirocha, WA9DDO; Leonard A. Morgan, K5BGG/WA7PYQ; Thomas W. Morris, K8BCJ; Thomas H. Morrison, WA3GBU; John F. Morse, WN0GVR; Joseph L. Mueller, WA2HSF; Louis A. Muhleisen, Jr., WBSAEH; Leslie H. Murphy, K4ZCP; John C. J. Nicholson, VE3EYN; Milton Noble, K4BGP; William H. Nolte, WA7KJD; Gregory A. Olsen, W6HJP; Stephen H. Olster, W2MKN; William E. Owen, W5WG; Karl S. Paecht, K1UCW; Richard V. Palmer, W7DNN; Don B. Payne, K4ID; John Pellowe; R. Bruce Peters, WB2LRS/6; John H. Pluister, VE3FGL; Arthur L. Pond, Jr., W4JLV; Arthur E. Powers, K2OHG; Rabindranath Ramperasad, 9Y4EH; Edward L. Raub, Jr., W1RAN; W. O. Reed, Jr., WB4FNS; Louis D. Ross, Jr., K5RSH; Harry A. Roylance, W7RZY; Robert F. Sass, W9VQP; Robert H. Sawyer; Erick Schumacher, WB6KCN; Philip E. Shaw, Jr., K1GAX; Walt Short, WB4TBO; James V. Smith, K9MHU; Panos M. Sourlangas, SV1CH; J. C. Sprott, K4BOM; James A. Standish, WA4VAE/WB8FDP; T. E. Stephenson, W1SCO; Richard Lee Stevens, W4KVS; Donald B. Sturtevant, K7MMT; John D. Sublette, K4BHG; Robert E. Suek, VE5AG; Philip Scott Sullivan, W3AIC; John W. Taylor; Raymond E. Terkoski, WA3IAQ; Charles C. Thompson, K4PHY; Jon H. Thompson, WB4CWO; Galen E. Toms, K8WFI; Theodore C. Tsucalabs, K2ODU; Robert G. Unsworth, W6MTJ; Robert B. Vallio, W6RGG; George L. Vance, WA6LAI; George S. VanDyke, Jr., W3HK; Alfred H. Watson, Jr., K1ABP; John J. Watson, Sr., WA8UVU; Paul I. Wells, WA4FFG; Joseph Q. Wheeler, K5EVK; Marvin W. Wheeler, WB4JBS; Julian Whetsell, WA4GMP; Larry A. White, Jr., WB5CVT; James P.



Governor Daniel J. Evans (seated) of Washington State has proclaimed amateur radio week for September 10-17, 1972, mentioning amateur cooperation with Civil Defense and the Red Cross as examples of service to the public. Left to right: WA7GVB, W7BUN, ARRL Director W7PGY, WA7KKC, WA7HKD, W7OS, and W7LFA.

QST for

Whytock, VE6AGY; Russell G. Wicker, W4ZXI; Arthur B. Windsor, W8AUR; Joseph V. Wing, K8AMU; Allen F. Wingate, W5CEW; Laird M. Wise, W7CE; Wayne H. Yarnall, K3CQQ; Allan J. Zadiraka, WA8VWX; Raymond W. Zeh, W8RQI; Henry F. Zimmerman, K4FU/W8YJE.

On motion of Mr. Eaton, unanimously VOTED that Diane Heath is authorized to sign disbursement checks on League funds in behalf of the Treasurer, and to sign documents in connection with the League's several savings accounts.

The Committee was in recess for luncheon from 12:35 P.M. to 1:50 P.M.

President Dannals announced the appointment, based on a recommendation from Director Albright, of Jack D. Gant, W5GM, to fill the vacancy as Vice Director, West Gulf Division. He also announced the resignation, because of his many other duties and responsibilities in League organization, of John Griggs, W6KW, as liaison director for the VHF Repeater Advisory Committee, and the appointment of Roy L. Albright, W5EYB, to fill that post.

At this point Director Eaton reported on developments at the triennial conference of the Region II Division of IARU, held earlier in the month in Rio de Janeiro.

The Committee recessed at 3:55 P.M. to participate in activities sponsored by the Baton Rouge Amateur Radio Club, reconvening at 11:05 A.M. May 7, 1972.

On motion of Mr. Eaton, after discussion, unanimously VOTED that the General Manager should report to the Board each year a breakdown of the divisional expenditures by directors.

On motion of Mr. Eaton, after discussion, unanimously VOTED that where director travel to a major amateur event in a neighboring division is desirable for membership contact purposes, reimbursement of expense will be made if advance approval is obtained from the President.

At this point General Counsel Booth reported briefly on regulatory developments affecting the implementation of Board requests for amateur



A. Prose Walker, W4BW, is "pinned" as a Life Member by ARRL President Harry J. Dannals, W2TUK, at the annual QCWA dinner in Washington.

rules changes covered in Minutes 11, 25, 30 and 79 of the 1972 annual meeting.

(During the course of its meeting the Committee discussed, without formal action, advertising in QST, scope of public relations activity, the EIA proposal for CB use of 220 MHz, and legal aspects of amateur towers.)

There being no further business, the Committee adjourned at 11:20 A.M.

Respectfully submitted,
JOHN HUNTOON, W1RW
Secretary

QST

"It Seems to Us . . ."

(Continued from page 9)

final word from FCC on what the regulations will be; hopefully that will be known soon — perhaps even before this issue reaches you. In that event, watch for the new manual shortly thereafter (meaning, considering the mechanics of the printing process, a couple of months).

Yes, it's a busy year, with more than normal amounts of overtime by the Hq. crew. If the results meet your approval, it will be more than worth it. If they don't, we'll try harder next time. Please let us know — either way!

QST

SWITCH TO SAFETY!



Strays

We regret to report the recent passing of Harry Tummonds, W8BAH. Harry founded the Amateur Radio Editors Association to promote publicity and better public relations for amateur radio. He had written the "Ham Antenna" column for the *Cleveland Plain Dealer* for more than 10 years. A naval reservist, W8BAH was called to active duty in 1939 and was a radio instructor at Cornell and Harvard. Later he was a lieutenant commander in charge of the Pacific Fleet Schools in Pearl Harbor. After the war he returned to operate his own radio sales-and-service business and was one of the early distributors of TV sets in Cleveland.

Did you know that you can make poetry with cw? An acquaintance tells me that he learned how while he was an Army cw operator. Just send the phrase "best bent wire" very smoothly at about 13 wpm. You may have to practice a little to get the swing of it. Try it. It's fun. — WSPAG



Correspondence From Members-

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

FM STANDARDS

● My compliments to John Mason for his excellent article on national standards for two-meter fm. You might want to add the Wyoming Amateur Repeater Society as another group that goes along with this plan.

Unfortunately, the publishing of these standards by *QST* is long overdue. It has taken the League some time to realize that vhf-fm is not another specialized mode of operation such as RTTY or moonbounce, and that it deserves attention similar to that given by the League to 80-10 meter ssb. Vhf-fm operation is too widespread, and the need of national standards is too important, to allow any group other than the only "national" ham organization to endorse and promote "national" operating standards.

I strongly urge prompt action by the ARRL Repeater Advisory Committee, in cooperation with the other magazines, in determining and publishing these needed national standards for vhf-fm operation. — *Bob Rule, WA7EGK, Laramie, WY*

● Call me hard-nosed if you like, but I feel that we are making a mistake in trying to change a long-established national frequency. 146.94 has been advertised in *QST* for years and most new equipment comes equipped with 94 simplex crystals.

The Southeast Repeater Association standardization plan allows very nicely for the retention of 94 simplex, while still permitting 34 input to repeaters. Rarely, if ever, will an area use all 12 pairs available for repeaters in an area small enough to cause inter-repeater problems; therefore, the loss of the 34/94 pair should not cause a hardship.

I feel that the ultimate solution, however, should not come from one geographical area. A national repeater frequency standardization committee is a must. This committee should be composed of active fmers from all over the country and their findings should be ratified by the Repeater Associations, Societies, and Clubs. — *George W. Murray, WB4DYQ, Forest Park, GA*

● I disagree regarding the proposed allocation of frequencies within the two megahertz commonly used for two-meter fm activity. It seems to me that entirely too much emphasis is being placed on repeater activity — indeed, over 80% of the useable spectrum, given the premise of 30-kilohertz channel separation. Of the 67 available "standard" frequencies between 146 and 148 megahertz, the article (and from that, I assume the "Texas Plan") allows for but 13 frequencies to be protected from repeater activity — to be maintained as simplex frequencies. It appears to me that this allocation would tend to suppress individual operations in favor of communal, special-interest-group activities. — *C. Michael Hall, WB9DUD, Downers Grove, IL*

● Let's do the job right! Adopt the Texas Plan! — *Jack Holt, K1VFQ, Woodbury, CT*

HAM VS CB

● If there is any hard feeling between the amateurs and the CBers, and I am not sure there is, it might help to alleviate the condition if the amateurs realize how the CB buff got into his predicament.

In the majority of cases I feel that he was lured into CB by misrepresentation all the way down the line. Before he finds out that there is a heavy FCC foot standing on his mouth he has laid out a couple of hundred dollars for a rig and a fantastic license fee. He probably expects to do everything the amateur does but without going over the code hurdle.

The radio store salesman doesn't tell him about the rules. All he says is, "Don't transmit until you get your license; the application form will be in the carton." Nothing happens for several days, except listening. He is honest and wouldn't go on the air without a license. But he wonders why nobody signs with call letters and why they use such quaint names as Rattler, The Old Man, Daisy May, *ad infinitum*.

Finally comes the license and the FCC book of restrictions. It is like a bolt of lightning. You may say *this*, but you may not say *that*. Operators must not discuss their equipment. No chit-chat allowed. If it is going to be fun, forget it; the fine may be two hundred dollars.

Our friend has two courses of action he may follow. He can operate illegally as thousands upon thousands of others are doing. Or he can put his junk on the shelf and go fishing.

The country could certainly stand a little more friendship among the masses. Why make the code a requisite? I know the code but never use it. It's too slow and inefficient, gone with the horsecars. — *H. J. Hasbrouck, ex-2HJ, St. Petersburg, FL*

● Dr. Copeland's two letters (*Correspondence, QST, January and April, '72*) and the other letters printed in reply have been very interesting. I think it takes a lot of courage to apologize in print. Also, I think Copeland has pointed out a real problem. Lots of hams are antagonistic toward CBers. Let's try to understand them a little better.

Most CBers buy their sets fully intending to use them as a hobby. No one tells them that hobby activities are forbidden by law. The CB magazines promote CB radio as a hobby. How many really learn the FCC regulations? The salesman at the store tells them not to worry. "I can tell you all you need to know. Just fill in this card and . . ."

Even when someone reads the regulations, he has already spent his money, and not many people would just put the radio in the closet. What would you do?

What is needed is a regulation requiring that no equipment be sold to a person unless he has a license. There should be a license examination by mail, covering the FCC regulations. The test could even be "open book." At least the applicant would have to look up the answers. This would educate

prospective Cbers as to the law before they invest in a radio. I feel this would help the Citizens Radio Service.

As hams, we need to present the advantages of ham radio to our CB friends. Contests, legal DX, numerous modes (cw, a-m, ssb, fm, RTTY, SSTV, etc.), and unlimited possibilities for experimentation are a few we could mention.

Let's not hate the Cber, let's just spread the word to anyone interested in a radio hobby that ham radio is "where it's at." — *Allen Gilchrist, Jr., WB5BSB, Bryan, TX*

● We accuse Cbers of using high power, phony calls, and skip. "There's more skip on 11 meters than 10," we cry. They are operating illegally, but where are we? Why, we are right on good old 80, 40, and 20. No wonder they want 220! Who would be giving it up? Only a few hardy hams! The "American Dream" for many hams is a full gallon, more phone, less cw, and sit on hf to your dying day. After all, almost any 12 year old can pass Tech Class: why isn't almost everyone over 18 Extra? How about looking at ourselves before cutting down anyone else? — *Mike McKay, WB4SDH, Jesup, GA*

● I have been a Cber for over 13 years, mainly because I never knew of any ham radio training going on in my area.

About a year ago, I got together a bunch of Cbers who were interested in knowing more about ham radio. The vocational-technical school got a class started, with Jim Jorgensen, K7RHJ, as our instructor (and a mighty good one at that!). Out of a class of 13, half are hams at present, are working hard at being good operators and seeking higher classes of license. So why don't you good hams create some interest in your area and get something going?

As for the Cbers getting the new frequencies, it would be another big goof on FCC's part, just like 11 meters. — *Jim E. Spencer, WN7SAA, Orem, UT*

● If ever a Cber approaches a ham and asks earnestly for assistance in obtaining his ticket, the antagonism melts into helpful enthusiasm. Nothing warms the heart of a ham more than to help make a "convert." — *D. E. Person, WB2DXV, New Windsor, NY*

● I am an ex-CB operator, licensed as KDO 7039. I am also an ex-Pierce County Fire policeman, operating as KR2 2086, Traffic 10 and 31, under a license held by the Pierce County CD and a local fire department.

In the Tacoma area channels 9 and 11 thru 14 are about the only channels that one can hear "legal" communications in progress, and as of late even these channels are under attack by the "hobby people" and the mobile home movers, who will do as they will. Bonafide emergency communications carried on between the Fire Dept. base station and various traffic units on channel 6 were willfully jammed. These communications involved the safety of lives, yet they were met with a broadside of high-powered carriers and vile threats.

Those of us who got fed up are selling our CB gear. I am not stopping there; I will try for my Novice ticket as soon as my speed is up to par. I have built a receiver from a kit — and it works. There are many clubs offering assistance to up-and-coming Novices and even the Old Timers.

I am not giving up public assistance either. I will soon be monitoring 146.34 and 76, and as soon as I can get my General Class I will be on frequency waiting for your call for assistance. — *Daniel L. Steinhoff, Tacoma, WA*

REPORTS OF OUR DEATH . . .

● Collins Radio Company has produced a distinguished line of amateur equipment over a period of many years. In fact, one of our early technical achievements was the communication with Admiral Byrd at the South Pole in 1933 within the amateur frequencies. Present products continue to find a market among discriminating amateurs and various government agencies in both the domestic and international sectors. There are no plans to discontinue our dealer or service organizations. — *J. D. Nyquist, Senior V.P., Collins Radio Company, Cedar Rapids, IA*

EDITOR'S NOTE: Mr. Nyquist's statement is in response to a recent QST inquiry on behalf of a number of League members as to Collins' future plans in the amateur equipment field.]

CONSIDERATION PLEASE!

● I wish to express much thanks for changing code practice to the General portion of the band. The Generals are more considerate than the Extras. Copy is difficult no longer. — *Johnny Correll, WN4WLK, Norfolk, VA*

● I am gratified to see WIAW finally leave the Extra Class sanctum sanctorum and move up with us unworthy ones. Since the name-of-the-game seems to be "Let's QRM WIAW at Every Opportunity," I think it only fitting and proper for the Advanced and General Class lids to have their chance to join in all the fun. I do, however, think it would have been even more sporting if WIAW had moved to 3725 kHz so all lids everywhere could have a crack at the joy of becoming "WIAW QRmer of the Year." Initial observations indicate that a good time is being had by all, except those poor souls trying to copy code practice. — *Albert M. Johnston, Jr., W6MKU, Golden Valley, MN*

● As a newcomer, WIAW is 90% responsible for my progress in learning the Morse code.

However, when I hear QRM it makes me wonder who would hinder a project that does so much for amateur radio? Surely not amateur radio operators! — *Carl N. Sheff, WN8LTN, Cincinnati, OH*

● I would like to thank all those nice gentlemen who regularly tune up and transmit right on top of code practice from WIAW.

After all, we Novices are not accustomed to hearing one clear signal; and if we were permitted to listen to WIAW without a lot of junk on top of it, we might all faint from shock. We wouldn't want that to happen, would we now?

So to all you high-minded gentlemen, I say thanks. Thanks a lot. Thanks a whole lot. — *Evelyn Tileston, WNØELD, Craig, CO*

● I have a question to ask. What has WIAW done to make so many enemies? I know they must have done something terrible, because it seems like every ham in the country just has to use the same frequencies they use for code practice, at exactly the same time! Don't these guys know that this is about the only good practice some of us country boys can get?

I surely hope this does not reflect the attitude of most amateur radio operators. If it does, I don't think I care to go any farther. — *F. M. Kelly, WN5DYR, Dewey, OK*

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

IARU News

INTERNATIONAL AMATEUR RADIO UNION, THE GLOBAL FEDERATION OF NATIONAL NON-COMMERCIAL AMATEUR RADIO SOCIETIES FOR THE PROMOTION AND CO-ORDINATION OF TWO-WAY AMATEUR RADIO COMMUNICATION

DENNISTON ELECTED IARU PRESIDENT

As reported in this column for March 1972, the ARRL Board of Directors nominated Robert W. Denniston, WØDX, to continue as president of the Union. This action has now been confirmed by vote of the IARU membership. Mr. Denniston served for six years as president of both ARRL and IARU.

RRAF ELECTED TO MEMBERSHIP

In other IARU action, the *Romanian Radio Amateur Federation* has been admitted to membership. The RRAF, with 1300 members, brings the total membership of IARU to 86. The results of both of these elections were reported in the June issue of the IARU *Calendar*, a bi-annual newsletter for IARU societies.

OLYMPIC GAMES VISITOR LICENSES

Foreign radio amateurs visiting Germany for the Olympic Games between June 1 and September 30, 1972, will be granted short-term licenses simply by showing their home license to the local telecommunications authorities in Munich or Kiel. Assigned calls will be of the type W1RW/DL, and will be granted free of charge. The Oberpostdirektion (OPD) offices are located at Dienststelle 25-1, Arnulfstrasse 60, Muenchen and Dienststelle 25/26-2, Stresemannplatz, Kiel. Office hours are 0800-1200 and 1400-1600 Mondays through Fridays.

A special events station in the Munich OPD building will be open for operation by visiting radio amateurs.

CARIBBEAN SCOUT JAMBOREE

In commemoration of the fourth Caribbean Scout Jamboree to be held from July 27 to August 8, 1972, the *Amateur Radio Society of Barbados* will operate a station with the special call 8P6CSJ/4 from the Jamboree site.

QSL BUREAUS OF THE WORLD

For delivery of your QSLs to foreign amateurs, simply mail cards to the bureau of the proper country as listed below. Cards for territories and possessions not listed separately may be mailed to the bureau in the parent country: e.g., cards for VP8s go to RSGB in Great Britain. W, K, VE and VO stations only may send foreign cards for which no bureau is listed to ARRL. See "How's DX?" for QSL information on specific stations.

Algeria: ARA QSL Service, P.O. Box 2, Algier R.P.

Angola: LARA, P.O. Box 484, Luanda

Antarctica: Dave Porter, K2BPP, Mountainside Rd., Mendham, NJ 07945

Argentina: RCA, Carlos Calvo 1424, Buenos Aires, BA

Austral/French Antarctic Lands: via Malagasy Republic

Australia: VK1 QSL officer, VK1ACA Canberra Radio Society, P.O. Box 1173, Canberra City, A.C.T. 2601; VK2 QSL officer, WIA Hunter Branch, P.O. Box 134, Charlestown, N.S.W. 2290; VK3 QSL Bureau, E. Trebilcock, 340 Gillies Street, Thornbury, Vic. 3071; VK4 QSL officer, P.O. Box 638, G.P.O. Brisbane, Qld. 4001; VK5 QSL Bureau, Mr. Geo. Luxon, VK5RX, 27 Belair Road, Torrens Park, S. Aust. 5062; VK6 QSL Bureau, Mr. J. Rumble, VK6RU, Box F319, GPO Perth, W.A. 6001; VK7 QSL Bureau, P.O. Box 371D, G.P.O.; Hobart, Tas. 7001; VK8, VK9, VK0, Federal QSL Bureau, 23 Landale Street, Box Hill. 3128 Victoria.

Austria: OeVSV, Box 999, A-1014 Vienna

Azores: via Portugal

Bahama Islands: BARS, Box 6004, Nassau

Bahrain: (All MP4) Ian Cable, MP4BBW, P.O. Box 425, Awali

Barbados: ARSB, Highgate Signal Station, Flagstaff Road, St. Michael

Belgium: UBA, Postbox 634, 1000 Brussels

Bermuda: RSB, Box 275, Hamilton

Bolivia: RCB, Casilla 2111, La Paz

Brazil: LABRE, P.O. Box 2353-ZC OO, Rio de Janeiro/GB

Bulgaria: CRCB, Box 830, Sofia

Burundi: via Congo (9Q5) QSL Bureau

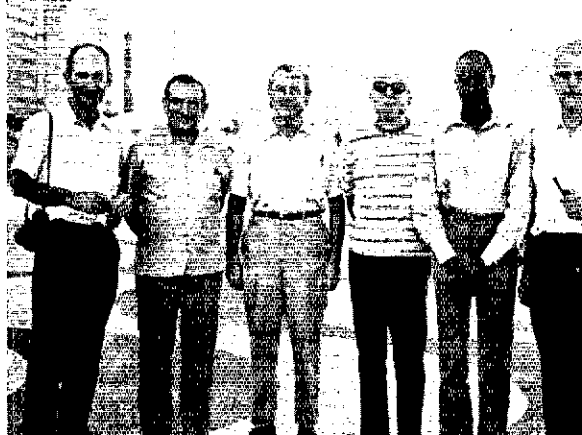
Canada: See ARRL QSL Bureau in this issue

Canal Zone: Gloria N. Spears, KZ5GS, Box 407, Balboa

To mark his feat in confirming QSOs with 100 different VP9s, Vic Politi, W1NU, was recently presented a plaque by the Bermuda Director of Tourism, Mr. W. James Williams. Pictured here are *Radio Society of Bermuda* awards manager VP9DC, W1NU, VP9L, and Mr. Williams.



The Executive Committee of the *Union Interamericana de Radioaficionados* — IARU Region 2 met in April in Rio de Janeiro to discuss matters affecting amateur societies in the Americas. From left are LU3DCA, OA4AV, W0DX, XE1CCP, HP1CH, and VE3CJ.



Cape Verde Islands: RCCV, CR4AA, Praia, Sao Tiago

Ceylon: RSC, P.O. Box 907, Colombo

Chagos: via Mauritius

Chile: RCC, P.O. Box 13630, Santiago

Colombia: LCRA, P.O. Box 584, Bogota

Congo: (TN8) QSL Bureau, P.O. Box 2239, Brazzaville

Congo: (9Q5) UCAR, QSL Bureau, P.O. Box 1459, Kinshasa, Elizabethville

Cook Island: ZK1 QSL Bureau, %Radio Station Rarotonga, Rarotonga

Costa Rica: RCCR, Box 2412, San Jose

Cuba: ANRAC QSL Bureau, P.O. Box 6996, Havana

Cyprus: CARS QSL Bureau, P.O. Box 216, Famagusta

Czechoslovakia: CRC, Box 69, Prague 1

Denmark: EDR QSL-Central, Harry Sorensen, OZ6HS, Ingstrup Hovdegaden 51, DK 9480-Lokken

Dominican Republic: RCD, P.O. Box 1157, Santo Domingo

Ecuador: GRC, P.O. Box 5757, Guayaquil

El Salvador: CRAES, P.O. Box 517, San Salvador

Faeroe Islands: OY-QSL Bureau, P.O. Box 184, 3800 Torshavn

Fiji Islands: QSL Bureau, P.O. Box 184, Suva

Finland: SRAL, Box 10306, Helsinki 10

France: REF, Boite Postale 70, 75560 Paris Cedex 12

French Oceania: RCO, P.O. Box 374, Papeete, Tahiti

Germany: DARC, Box 86-03-20, D8000 Munich 86

Germany: (British Forces only) J. T. Worrall, 3090 Verden Aller, Am Alten Pulverschuppen 80

Ghana: GARS QSL Bureau, P.O. Box 3773, Accra

Gibraltar: RAF Amateur Radio Club, New Camp, RAF

Great Britain: (and British Commonwealth): RSGB QSL Bureau, G2MI, 29 Kechill Gardens Bromley, Kent BR2-7NH

Greece: RAAG, P.O. Box 564, Athens-107

Greece: (SV0 only): Signal Officer, Hqtrs. JUS-MAGG, APO, New York, NY 09223

Greenland: via Denmark

Greenland: (U.S. Personnel) OX5A-E via MARS Director, XP1AA, 1983 Comm. SQ., APO New York 09023. OX4F-H via MARS Director, XP1AB, 2004 Comm. Sq. APO NY 09121

Guam: MARC, Box 445, Agana, USPO 96910

Guantanamo Bay: GARC, Box 12, FPO, New York, NY 09593

Guatemala: CRAG, P.O. Box 115, Guatemala City

Haiti: RCH, Box 943, Port-au-Prince

Honduras: RCH, Apartado 273, San Pedro Sula

Hong Kong: HARTS, P.O. Box 541

Hungary: HSRL, P.O. Box 214, Budapest 5

Iceland: IRA, Box 1058, Reykjavik

India: ARSI, QSL Bureau, P.O. Box 534, New Delhi 1

Iran: ARSI, Box 1000, APO New York NY 09205

Ireland: IRTS, QSL Bureau, P.O. Box 462, Dublin 9

Israel: IARC QSL Bureau, P.O. Box 65, Herzlia

Italy: ARI, Via D. Scarlatti, 31, I-20124 Milan

Ivory Coast: ARA1, B.P. 20036, Abidjan

Jamaica: JARA, Red Cross Bldg., 76 Arnold Rd., Kingston 5

Japan: (JA): JARL, Box 377, Tokyo Central

Japan: (KA only): FEARL-M, HQ SAF, Box 1414 APO, San Francisco, 96525

Japan: (KA6 only) KA6 QSL Bureau, ORC, Ft. Buckner, APO, San Francisco 96331

Johnston Island: KJ6BZ, % MARS Stn., Det. 1, 1957 Comm. Gp., APO, San Francisco 96305

Kenya: RSEA QSL Bureau, P.O. Box 30077, Nairobi

Korea: KARL, Central Box 162, Seoul

Korea: (HL9) HL QSL Bureau, Signal Section, USFK/EUSA, APO, San Francisco 96301

Kuwait: Alhalf Nasir H. Khan, 9K2AN, P.O. Box 736, Kuwait, Persian Gulf

Laos: Houmphanh Saignasith, XW8AL, P.O.B. No. 46, Vientiane

Lebanon: RAL QSL Bureau, P.O. Box 8888, Beirut

Liberia: LRAA, Post Box 1477, Monrovia

Liechtenstein: via Switzerland

Luxembourg: R. Schott, 35 rue Batty Weber Esch-Alzette

Macao: via Hong Kong

Madeira Islands: via Portugal

Malagasy Republic (Madagascar): QSL Bureau, P.O. Box 587, Tananarive

Malawi: P. A. Conway, 7Q7BC, Police Hq., P.O. Box 10, Lilongwe

Malaysia: QSL Manager, MARTS, Box 777, Kuala Lumpur

Malta: R. F. Galea, 9H1E, "Casa Galea," Railway Road, Birkirkara

Mariana Islands: see Guam

Marshall Islands: KX6 QSL Bureau, via KX6BU, Box 444, APO, San Francisco 96555

Mauritius: Paul Caboche, VQ8AD, Box 467, Port Louis

Mexico: LMRE, P.O. Box 907, Mexico, D.F.

Midway Islands: KM6BI, Box 14, FPO, San Francisco 96614

Monaco: ARM QSL Bureau, Pierre Anderhalt, 3A2CN, 41 Bd du Jardin Exotique

Mongolia: JT1KAA, Box 639, Ulan Bator

Morocco: AAEM, P.O. Box 299 Rabat

Mozambique: LREM QSL Bureau, P.O. Box 812, Laurencio Marques

Netherlands: VERON, Postbox 400, Rotterdam

Netherlands Antilles: VERONA, P.O. Box 383, Willemstad, Curacao

New Zealand: NZART, P.O. Box 489, Wellington

Nicaragua: CREN QSL Bureau, Apto. 925, Managua

Nigeria: NARS QSL Bureau P.O. Box 2873, Lagos

Northern Ireland: via Great Britain

Norway: NRRL, P.O. Box 21, Refstad, Oslo 5

Pakistan (West): LARS, P.O. Box 65, Lahore
Panama, Republic of: LPRA, P.O. Box 9A-175,
Panama 9-A

Papua: Via VK9 QSL Bureau.

Paraguay: RCP, P.O. Box 512, Asuncion

Peru: RCP, Box 538, Lima

Philippine Islands: PARA QSL Bureau, P.O. Box
4083, Manila

Poland: PZK QSL Bureau, P.O. Box 320, Warsaw 1

Portugal: REP, Rua de D. Pedro V., 7-4, Lisbon

Puerto Rico: Alicia Rodriguez, P.O. Box 1061, San
Juan 00902

Rhodesia: RSSR, P.O. Box 2377, Salisbury

Romania: CRC, P.O. Box 1395, Bucharest 5

Rwanda: Box 663, Kigali

Samoa (American): Utulei High School Amateur
Radio Club, % Director, Pago Pago, Tituila,
96920

Samoa (Western): Director of Post Office and
Radio, Post Office, Apia

Scotland: via Great Britain

Senegal: Ch. Tenot, 6W8BF, P.O. Box 971, Dakar

Singapore: SARTS, P.O. Box 2728, Singapore 1

South Africa: SARL, P.O. Box 3037, Cape Town

Spain: URE, P.O. Box 220, Madrid

St. Vincent: QSL Bureau, P.O. Box 142, St.
Vincent, West Indies

Surinam: QSL Manager (PZ1AR), SARL, P.O. Box
240, Paramaribo

Sweden: SSA, Fack, S-12207 Enskede 7

Switzerland: USKA, Sonnenrain 188, 6233
Bueron/LU

Syria: TIR, P.O. Box 35, Damascus

Tanzania: Via Kenya

Trinidad and Tobago: T&TARS, P.O. Box 1167,
Port of Spain

Uganda: Via Kenya

United States: See ARRL QSL Bureau in this issue

Uruguay: RCU, P.O. Box 37, Montevideo

U.S.S.R.: CRC, Box 88, Moscow

Vatican: HV1CN, Domenico Petti, Radio Station,
Vatican City

Venezuela: RCV, P.O. Box 2285, Caracas


Virgin Islands: Graciano Belardo, KV4CF, P.O.
Box 572, Christiansted, St. Croix, V.I. 00820

Wake Island: Jack A. Chalk, KW6EJ, P.O. Box 7,
Wake Island 96930

Wales: via Great Britain

Yugoslavia: SRJ, P.O. Box 48, 11001 Belgrade

Zambia: RSZ, P.O. Box 332, Kitwe

Late News: The *Union Zairoise des Radios
Amateurs* wishes to inform all amateurs that the
address of the 9Q5 QSL Bureau (formerly Congo)
is: UZRA QSL Bureau, B. P. 1459, Kinshasa I,
Rep. of Zaire. 

Fifty Years of ARRL

A bound 152-page reprint of the gold-edged historical articles which appeared in the 1964 issues of *QST* is available from the ARRL for two dollars postpaid. Titled *Fifty Years of ARRL*, the book covers the highlights of ARRL and amateur radio history during the fifty years from 1914 to 1964, and will make a companion piece to the classic *200 Meters and Down*, a reprint of which is also available from the ARRL for two dollars.

Silent Keys

(Continued from page 76)

WA8IXU, P. Bernard Spitzer, Bowling Green, OH
K8JTY, Donald M. Goubeaux, Russia, OH
WB8KOR, Vincent E. Burke, Detroit, MI
E8LGI, H. L. Connor, Clarksburg, WV
W8NZ, Wayne A. Schaefer, Battle Creek, MI
W8PXT, Harvey T. Bartrem, Lansing, MI
W8QQM, David R. Southwell, Eaton Rapids, MI
K9CXJ, LaVerne N. Wolfe, Williamsfield, IL
WA9ENM, George Thuma, Brookfield, IL
W9JZN, Hibbard E. Bannard, Northfield, IL
W0CUC, Charles H. Cravaack, Sioux Falls, SD
W0GSP, E. David Hughes, Littleton, CO
K0GTJ, Hubert O. Miller, Kansas City, MO
K0IRV, Dr. Morse A. Gates, Jr., Overland Park, KS
W0KA, Joseph E. Emmer, St. Louis, MO
K0KJP, Joseph Westman, Hay Springs, NE
W0NUC, Leo E. Olney, Des Moines, IA
W0PAV, Arnold H. Manke, Selby, SD
EX-W0POM, Joseph C. Morris, Salina, KS
W0QOR, Clarence A. Huffman, Wichita, KS
K0SGK, Bartley V. Eckholm, West St. Paul, MN
K0TCZ, Elmer L. Kreger, Ralston, IA
EX-W0WUV, Vianne Wickboldt, St. Paul, MN
VF3PJ, H. Eric Clogg, Midland, ON
VE3EB, Reginald M. Brophy, Claremont, ON
VE4BC, Robert A. McKinney, Manitow, MB
VE7BMB, Leo Rimmer, Kelowna, BC
VE7SK, Vern C. Harding, No. Vancouver, BC
VK4KB, Patrick James Kelly, Camp Hill, Queens-
land, Australia
VPA8X, "Reggie" Pitman, Scotts Hill, Somerset,
Bermuda
YV5AO, Carlos Fejera, Caracas, DF, Venezuela
YV5AP, Gustavo D. Nouel, LaCarlota, Miranda,
Venezuela
* Life member

How to Exchange


(Continued from page 63)

If you have an envelope on file with your ARRL QSL manager, he will forward all DX QSL cards which are intended for you. There is no charge for using the services of the ARRL QSL Bureau. All it costs you is the time to address a couple of envelopes and to affix a few stamps.

Having an envelope on file with the ARRL QSL Bureau is easy, and it also relieves you of the time-consuming and sometimes difficult task of sending your address over the air to the DX station. Frankly, asking the DX station to send the QSL directly to your home probably will not get results, because this method takes the most time for the DX operator and it also costs him more in postage than it does to send you a card via the bureau.

Receiving QSL Cards Direct

Although the bureau is the best way to receive QSL cards, it does have the disadvantage that it is not the fastest. To receive a particular card faster than it can be handled by the bureau, send your QSL to the DX station promptly, and also enclose a self-addressed envelope and an International Reply Coupon. Each IRC costs 22 cents at your local post office. You may want to invest in a foreign *Callbook* so that you will know where to send self-addressed envelopes and IRCs.

With this information, you should be able to get a QSL from most of the stations you work. Here is wishing you best DX, not only in the number of stations you work, but also in the number of QSL cards you receive. 

The World Above 50 Mc.

1215-1300 2300-2450 3500-4700 4750-5925 10,000-10,500 21,000-22,000 30,000-9

CONDUCTED BY BILL SMITH,* KØCER

Business commitments kept your writer occupied this past thirty days and therefore we will dispense with the usual lead this month. Nevertheless, much has been happening on the vhf bands, especially six meters which appears headed for a healthy sporadic-E season.

50-MHz sporadic E got off to an early start with most all areas of the U.S. reporting good April and May openings, some over paths that don't normally open until later in the E season. By call area, and several weren't represented in reports received, here's the story.

WA3KFT, Pa., reported May 4 and 7 openings to Florida. WB4BSZ says the first major opening of the season from the Pensacola area was May 3 with stations from New York to Iowa workable. WASIYX/5, San Antonio, reported several minor E sessions in April, but Pat's log shows 11 F2 openings on eight April days to South America. Pat says this April past was the best F2 April since 1970 — this after many DXers had given up on 50-MHz F2 for Cycle 20. During April, Pat noted also 14 E openings on seven days and says, "better than 1971, but nothing like 1970." May E openings, through the 13th, were noted at WASIYX/5 on the 3rd (good opening in the Midwest also), 8th from the Midwest to multi-hop W6, 9th which included most U.S. areas working all directions on single-hop, 10th which again included most of the U.S. and multi-hop from the Southwest to New England, and May 11, 12, and 13 over single-hop paths to Arizona and California.

Also in San Antonio, KSZMS/5 reported many of the same openings plus a W4-to-W6 opening May 15. In April, Ray enjoyed South American F2 DX including contacts with Argentina and on the 23rd with CE4CP in Chile. Ray also worked some April E. That April 23 F2 opening to South America lasted 2 hours at WASHNK, Houston, from where Joe worked a half dozen LUs and XE1PY on backscatter. Joe says the opening was the best F2 of the spring with strong, steady signals. May 4 was the first major E opening of the season from WASHNK including multi-hop to W1 and W2. At Bellaire, Texas, WSSXD comments about the 23rd, "another weekend of F2." Dick casually mentioned contacts with five LUs and backscatter contacts with XE1PY plus "lots of W and K."

* Send reports and correspondence to Bill Smith, KØCER, ARRL, 225 Main St., Newington, CT 06111.

From Los Angeles, WA6HXM says there was at least some E on most every April day including multi-hop to Florida on the 8th and a seven-hour-long single hop opening April 21 and a five-hour session on the 30th. WA6HXM wonders if any station in Delaware and New Hampshire would arrange schedules during multi-hop openings. W6DPD, Fresno, worked VE7s April 16 as did W6YKS, Stockton. W6YKS says he first noted E May 13, an early start for the season.

K7BBO, Tacoma, is working E with a new kilowatt final while K7GSE, Seattle, worked 6s and Arizona April 14. K7QFW says, "best April E in 5 years" as he worked throughout the Southwest.

In rare Wyoming, WA7SFK reports from Ethete he created a 20-meter style pile-up May 11 while working 8s, 9s, and Ø during a 2-hour opening. Ken will leave Wyoming in July.

At Lisbon, Iowa, WØMOQ worked San Antonio area stations April 9. WAØVJF, Kansas, says the May 4th opening was excellent to W4 and that he also heard COSCI, Cuba, near 50.4.

Rusty, XE1PY, says "one of the best F2 seasons ever with Argentina." Between March 1 and April 25, Rusty enjoyed South American dx every day without a break — 56 consecutive days! Rusty worked Argentina, Uruguay, Chile, and Colombia and was reportedly heard in Brazil.

144 MHz is the favorite of the fm clan and apparently many of the DXers have switched to fm judging from the few 2-meter reports received over the past several months. Perhaps the return of warm-weather tropo will signal the return of DX reports. K3CEA, Pa., has finished an 829B final which had its first test in the June contest. K7BBO, Tacoma, had apparently one of the few



Pete Veia, K5YLU, left, registers a big smile as he receives the Golden Triangle Repeater Group Recognition Award, for his efforts in promoting and maintaining interest in 2-meter repeater activities in the Gulf Coast area of Texas. Award was presented by J. W. Goodridge, WA5HGH.



The Bay Area Communications Society, BAYCOM, licensed as WA6YCV, operates one of the oldest fm repeaters on the West Coast. The site is atop a mountain near San Jose serving the entire Bay Area for a decade. Included in the totally remote-controlled system are 1000 command channels, 200 of which are active in some function on 146, 440, and 2300 MHz. The latter is a TV channel permitting remote visual inspection of the WA6YCV antenna system and site. Pictured left to right are BAYCOM officials K6KUM, SM5UR (a visitor to the site), K6UEY, 6SHDO, W6ZRJ, and WA6MIA.

Lyrids meteor shower contacts working W6YKM April 21 on ssb, K9KQR, near Chicago, reported April 28 and 29 aurora as he worked Wisconsin, Minnesota, and South Dakota. WA0TRO, Smith Center, Kansas, says tropo was good April 6, 10, and 11 on fm where Kansas activity is increasing. WA0WJX reported similar success on fm channels.

CAREN, the Central Arkansas Radio Emergency Net is seeking new members for their 144- and 440-fm repeater. Write them at CAREN, P.O. Box 2844, Little Rock, AR 72203.

Hawaiian 2-meter frequency coordinator, KH6FOX, welcomes vacationing fmers to use island facilities. At Waikiki, KH6EQF offers 146.28/88 and is linked to KH6EQK on Mount Haleakala giving 146.34/94 coverage throughout the islands of Maui and Molokai and parts of Oahu and Hawaii. In Honolulu, 146.20/80 is the primary frequency. HK6EQL, KH6EQN, and KH6FOX are local-area repeaters on 146.16/76 used mostly when the primary channels are busy. There are no tone-access requirements on any Hawaiian repeater.

220-MHz is still gaining in New England, according to Bob, K9AQP/1. He has noted 220 QSB to be more pronounced than on 144 and 432 over similar paths to the Montreal area. Bob says he has no good explanation for the cause. Delaware may be rare on 50 MHz, but W2EIF says it is well represented on 220 by WA3QFX, W3CGV, WA3BAO, and K3MPX. W2EIF runs up to 500 watts. K6KH seeks information on a Navy-issue equipment labeled "MAR Radio Equipment." It covers 225 to 390 MHz. Anyone knowing about this equipment or having a schematic could give K6KH a hand. K7BBO, Tacoma, got a 20-second burst but no contact from K6IBY during the April Lyrids meteor shower. Dave has completed some changes on his 160-element moonbounce collinear and is contact ready.

420 MHz is an interesting band, offering much to be yet explored. Some say that current development of 3/4 meters is similar to that of 2 meters ten years ago, aside from moonbounce. Certainly low-noise receiving devices, high power, and large, efficient antennas are opening the lowest uhf band. K2RIW, author of the 432-kilowatt article earlier this year in *QST* which is being widely duplicated, reached 18 states worked thanks to the DXpedition efforts of K2QVS operating atop Mount Equinox, Vermont. K2RIW will journey to that mountain-top vhf favorite later this summer equipped for 432, 1296, and 2304. WA2EUS has worked 10 states with 24 watts of a-m, including contacts with 120 different stations.

WA6HXW, enjoying exceptional moonbounce success, will schedule OZ7UNI, Denmark, this

summer, and others. Also hearing moonbounce from California is W6FZJ sporting a 128-element collinear array in his San Jose backyard. The bird roost is a favorite of his charming wife! Joe has developed a pre-amp with a noise figure under 1 dB - more on this later. Chuck, WA6EXV, is continuing his difficult mountain-path schedules with W6FZJ having good results.

W9NTP says 75 amateurs attended a May meeting of the Indiana Amateur TV and Uhf Club in Indianapolis. The club plans to publish an ATV handbook next year and WA9NZQ welcomes contributions. Anyone wishing to join the club may contact W9HRO or W9NTP.

Also in the Midwest, W5ORH was heard testing on 432 from Oklahoma City and will be active this summer, as will W5WAX. A new 432 station in Nebraska is W0NGG at Lincoln with a 4X150 and long Yagi. At Kansas City, W0YZS is active, as is W0WY7, Colorado. W0LER, Minneapolis, is well pleased with his K2RIW-style kilowatt and array of four Yagis vertically stacked. K0CER, South Dakota, is active with 500 watts and 80-element collinear seeking schedules.

1215 MHz and Up will come under further exploration this summer. K9AQP/1, Mass., has a 40-inch dish and 32-element collinear working and is conducting tests with K4GGI/1. K2RIW, K2QVS, and K2LCK worked several stations on 432 and 1296 during a spring venture to Vermont. A 12-foot dish and 15-watt output transistorized transmitter provided contacts on 1296 with WA1JR, Rhode Island, and WA2LTM.

OZ9CR, according to W3KE, has received special permission from the Danish government to use 1296 where he has a 26-foot dish and 375 watts. Hans will be running summer moonbounce schedules with the group at W2NFA. VK3AKC, Australia, has a 26-foot dish and VK3ATN also hears 1296 moonbounce status.

New Repeater Directory

There is no repeater update listing this month, as all registrations received recently are being processed into the new edition of the *ARRL Repeater Directory*. Indications are that the new issue will more than double in size. Directories will be available by the end of July. Those desiring a copy are requested to send a 10 x 12-inch self-addressed envelope, with 36 cents in stamps affixed, to Communications Department, ARRL, Newington, CT 06111.

WA6UAM, San Jose, is working on 1296 receiving gear and developing a 1296 Yagi. WA6EXV recently completed a converter and undoubtedly will be running schedules soon from the southern California desert.

Late Wrap-Up

Particularly at this season, interesting news and column deadlines seem to arrive simultaneously, so we'll add this postscript to include news received at Headquarters too late for passing on to KØCER. It will be brief, and somewhat random, on that account.

WA7SFK, Ethete, Wyoming, says that his DX reported for May 11 was only a prelude of better things to come. On the morning of the 13th the band was open in all directions, and it stayed good until about 4 P.M. Ken worked 82 stations in 6 call areas and VE7, with 20 states included. Stations as close as Idaho were worked. All this with 125 watts and a 4-element Yagi only 20 feet up. "Wyoming" always was worth at least 10 dB, Ken!

Lightning Enhancement on 1296

We've heard of signal bursts on 432 coinciding with lightning along the paths. Now a similar effect is reported by K4QIF, Hobson, Va., and confirmed by K2UYH and WA2LTM, at the northern end of the circuit. K4QIF says that WA2LTM was running S2 on their nightly sked, between 0230 and 0245 GMT, May 16, but there were S7 bursts. These were mostly about one second duration; the longest about 5 seconds. In nearly a year of nightly work on 1296, this is Rusty's first instance of such enhancement.

50-MHz A-m DX!

If, at times, you feel that a-m phone no longer has a chance, consider the good fortune of WA2MZH, Whitestone, N.Y. The night of May 23, Kim was about to give up. The QRM just above 50.1 was overwhelming, what with everyone gunning for the North Carolina and Virginia stations coming through on ssb and cw. Then Kim moved up around 50.3 to give a-m a try and was amazed to hear a Spanish-voice CQ, near his frequency. It was LU8PE, Mendoza, Argentina, and Kim raised him on the first call. The UJ was in for about a half hour. When he faded out, Kim checked on the activity near the low end, and the ssb DX was gone, too. We'd be interested to hear more about this one, as South American DX has not been reported in northeastern U.S.A. for a very long time.

May Ends in Blaze of Glory

Having spent half a lifetime observing Es on frequencies above 50 MHz, the undersigned is sure of only one thing: no two seasons are alike. Take the matter of "double hop" — or whatever term you like for 50-MHz DX beyond normal single-hop range. Some years it is a distinct rarity. In others it becomes almost commonplace. 1972 seems headed for the latter category.

The long holiday weekend, May 26-29, surely rates as one of the wildest periods of 50-MHz DX in all vhf Es experience. It began in the Northeast with a flash opening to FPØCA, around 1500 GMT. Then Minnesota signals for a few minutes preceded what must be one of the best Northeast-to-Northwest Es ever. With signal levels reminiscent of F2 openings of the late 1950s, Oregon, Washing-

220- and 420-MHz STANDING

220 MHz

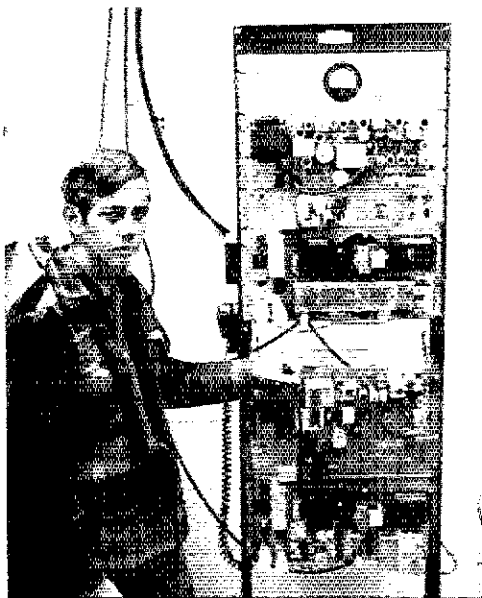
WA1MUG	15	5	450	W2CNS	14	6	525
W1HDQ	13	5	450	K2OVS	14	5	600
K1JIX	12	4	600	WA2EUS	10	4	280
W1AZK	10	3	375	K3IUV	18	5	720
K1BFA	10	3	225	W3RUE	17	7	850
K2CBA	19	7	2650	W3UJG	9	4	400
W2DWJ	15	5	740	K4QIF	21	7	1065
W2CRS	14	5	600	W4FJ	21	7	995
K2RTH	13	5	960	K4EJQ	19	7	800
K2DNR	13	5	600	W4HJZ	15	5	560
W2SEU	13	5	325	K4SUM	15	5	462
W3UJG	14	5	460	W4VHH	15	4	750
W3RUE	11	6	480	K4GL	11	3	720
K3IUV	11	4	340	K4NTD	9	2	835
W4UCH	9	5	543	K4IXC	4	2	800
K4IXC	5	3	1115	W4AWS	4	2	750
K4GL	4	2	485	W5RCI	19	6	880
W5RCI	10	5	910	W5ORH	13	4	700
W5AJG	3	2	1050	W5AJG	7	3	1010
W5LO	2	2	660	W5UKQ	6	2	590
W6NMT	8	4	2650	W5SXD	5	2	850
W6WSQ	6	4	1142	W5GVE	3	1	365
W7CNK	6	3	923	W6DQJ	4	2	360
W7JRG	5	3	959	WA6HXW	3	3	7500
K7ICW	4	2	250	W6FZJ	2	2	310
K7HSJ	3	2	400	K7ICW	4	2	225
W8PT	11	6	660	W7JRG	2	2	420
K9HMB	12	8	1070	K8DEO	23	7	675
W0EYE	11	5	950	W8YIO	22	7	650
WAØQLP	4	2	923	K8REG	21	7	700
VE2HW	5	2	225	W8HVX	16	8	660
VE3AIB	7	4	450	W8CVQ	13	7	625
				W8MNT	13	7	600
				K8UQA	10	6	800
				W8ROI	10	6	425

420 MHz

K1PXE	18	7	1210	W8VHG	8	6	625
K1HTV	17	5	610	K8BBN	7	6	425
W1AJR	16	5	680	W8FWF	7	4	450
WA1MUG	15	5	740	W9WCD	22	9	1725
K3EAV/1	14	6	700	WA9HUV	17	7	780
K1BFA	13	5	710	W9JY	15	6	550
K1JIX	12	5	620	W9AAG	15	5	800
W1SL	11	5	400	WA9NKT	13	6	850
WA1JTK	11	4	715	K9AAJ	12	5	425
W1HDQ	11	4	380	K9CNN	12	5	
K2ACQ	24	8	925	WØDRL	23	8	1210
K2CBA	20	8	2670	WØLCN	13	4	700
K2UYH	20	6	840	WØLER	12	4	709
W2CLL	20	6	790	KØTLM	10	5	700
K2RIW	18	6	812	WØYZS	8	4	650
K2VDK	18	6	750	WØEYE	7	2	702
WA2EMB	18	6	720	VE2HW	6	3	750
WA2FGK	17	6	745	VE3DKW	19	7	940
K2ARO	17	6	740	VE3AIB	9	5	600
W2BLV	17	6	732	VE3EZO	7	5	510
W2DWJ	16	4	570	VE4MA	2	1	420
K2CEH	14	7		VE7BBG	1	1	1125
K2YCO	14	6	675				

The figures after each call refer to states, call areas, and mileage of best DX. Revised July, 1972.

ton, and VE7 roared into New England for some three hours. In the 90 minutes or so of this observer's log, Washington (mainly the Seattle area) predominates, though one Oregon station was worked and several others heard. The closest station heard was W7MD, Great Falls, Montana. VE7s were worked throughout the Northeast, and



Bryon Gunnerson, WB0CZA, president of the Broomfield High School Radio Club of Broomfield, Colorado, shows off the group's 146-MHz and 440-MHz repeaters. A 52-MHz repeater will be added to the system soon. Frequencies are 146.01/146.61 and 449.40/44.40. The GE transmitters and receivers are surplus items obtained from United Air Lines. The club group at the school, 9 licensed amateurs, has added a Touch-Tone autopatch, off-frequency indicator, tape recorder, and automatic identifier. Other equipment at the club station includes two 1-kW hf stations, and equipment for RTTY and SSTV. The boys work under the guidance of Bob Klawuhn, W0VIV, the electronics instructor at the school. Some people will tell you how difficult it is to set up a repeater, but leave it to a group of high school students to prove that anyone can do it, with a little hard work.

there are rumors of KL7 being heard. When one or more KL7s are worked via Es we'll take more stock in this path's having been open! The session ran until about 1800 GMT, ending with the more common skip to W4.

There was some Es activity almost around the clock for several days. During the evening of May 27, the big news was provided by XE1PY, who was worked by so many stations that any reasonable summary is impossible at this writing. More long-haul excitement came around midday the 28th, with W7ZKL, Hunter, Utah, providing that long-sought state for several Easterners.

If May was this good, K0CER is going to have his hands full with June! You can help by getting reports of unusual contacts and reception in as soon as possible, and by skipping the "rumors." There will be more than enough interesting facts, from present indications. And let's watch 144, and even 220, closely for Es openings. If June tops May in the usual manner, June, 1972, could set some new Es records on the higher frequencies.

Apollo 16 Reception by K2RIW

June QST carried a detailed description of equipment used by K2RIW and W4HHK to listen

to Apollo 15. Results with Apollo 16 were even better. Dick and his associates have about ten hours of voice tape of the Command Service Module (CSM). They listened to the carrier of the Lunar Module (LM) but could not get the audio, the signal being too weak because of failure of the LM's high-gain antenna system. By observation of the Doppler they were able to tell when the LM landed on the moon's surface.

Dick had asked Houston for the frequencies used for talking to the mission, in the hope that they might be able to hear Houston by EME. Houston supplied the frequencies (2106.4 MHz for the CSM uplink, 2101.8 for the LM uplink) but doubted that EME reception would be possible. Both were received, with interesting and potentially useful characteristics. The level varies widely, but the frequency remains almost constant. Some of the LM uplink phone (30-kHz subcarrier) during the time of LM liftoff from the moon is readable. The tapes show all the EME qualities that 2300-MHz moonbouncers will have to cope with.

Next, they found the 1-watt signals from all four ALSEP packages, left on the moon by Apollo missions. These are on 2278.5 (Apollo 12), 2279.5 (14), 2278.0 (15), and 2276.0 MHz (16). At some 3 dB above the receiver threshold, they are probably the best weak-signal sensitivity testers we're likely to have for 2300-MHz work, since they are nuclear-powered, presumably for some 10 years of life. They run 24 hours per day, and are available whenever you can see the moon. If your antenna gain minus system noise figure is 32 dB, you can hear ALSEP — and you have enough for voice reception from the lunar vehicles, CSM, LM, and Lunar Rover. You have until December to find out!

DX-Pedition to Mt. Whitney

WB6WKC and WB6WRH are working on an expedition to Mt. Whitney for the September Vhf Party, Sept. 9-10. They will have a Comcraft 2-meter a-m/fm transceiver and possibly a similar rig for 220. Gain antennas will be used. These fellows have made the 10-mile hike from Whitney Portal before, and have considerable back-pack experience in Field Days and Vhf Parties at lower elevations. Mt. Whitney, at 14,495 feet asl, the highest point in the contiguous 48 states, should have reliable coverage to most of California, and parts of Arizona, Nevada, and Utah. — W1HDQ

EME Two-Way Records

50 MHz: No reported contact
 144 MHz: SM7BAE — ZL1AZR
 11,055 miles — March 4, 1969
 220 MHz: WB6NMT — K2CBA
 2650 miles — March 16, 1970
 420 MHz: WA6HXW — VK2AMW
 7500 miles — April 19, 1972
 1215 MHz: WB6IOM — G3LTF
 5492 miles — April 27, 1969
 2300 MHz: W3GKP — W4HHK
 810 miles — October 19, 1970



The West Coast Vhf Conference was held May 6-7 in Santa Clara, California with more than 125 attending. On this page are photographic highlights of the conference. Left to right, top row: Conference chairman W6FZJ won the 1296 antenna-measuring contest with a 32-element collinear. K6MYC, WB6NMT, and WA6HXW discussed moonbounce techniques. K6UQH addressed the conference on 1296 solid-state techniques. Above: K6KSY, WB6WAX, K7ICW, and WA6HXM exchanged tales about 6-meter DXing. K6HCP is well known for various vhf activities. Always popular is the noise-figure contest conducted by WA6EXV, seated. Bottom row: W6UOV is soon to be heard from on 144 moonbounce. W6VSV again this year did the measuring at the antenna-gain contest. W6VMY and WA6GYD must be credited with much work fostering 220 activity. W6VMY has helped more than 50 stations become active while WA6GYD edits the *220 Bay Area News*. Next year's conference is scheduled for the Los Angeles area and is a must for any serious vhf man. (KØCER photos)





How's DX?



CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

Popular misconception is that DX must have to do with an obsessive numbers game, kilowatts and dogfights over rare countries. And that to be DX a W/K must tote his transceiver overseas or guest-operate from remote points along the tourist-trap circuit. This may hold pretty well over most of our high-frequency ham bands but the term DX is, as we now point out, happily relative.

The urge to become DX, to be the sought instead of the seeker, runs strong. Most of us crave to be desirable, shrinks say, a need surely not fulfilled for lowly W9s at the bottom of 14-MHz pile-ups. Yet would you believe that even WB2s in Bronx basement apartments can be good DX? Imagine, Chicago W9s or NYC WB2s receiving PSE-PSE-QSL requests! It happens. How? Quite simple and loads of fun.

Just gave my 1970 *Handbook* and a *License Manual* to an eager 13 year old. Got my own first used *Handbook* from W8JEI or W8OHU, co-sponsors of a local YMCA radio club. Let's all get our unneeded ham literature out where it will do some good. (WSOPN) . . . My Elmer encouraged me in a most devious way. Kept teasing me that I'd never make it in ham radio. I just had to prove him wrong! He's well known as W1BB and, though I've been away from One-land for sixteen years, Stew is still like a second father to me. (K0DCF) . . . W1GCU helped me with advice, spare gear, and the push to get on the air again after a 35-year layoff. (WN5ERI, ex-W1AIB) . . . I was lucky enough to have two Elmers, VE7s OF and YB. Steve, the former, has been helping beginners get their licenses for almost forty years with code and theory lessons every Tuesday night. Dusty's specialty is managing to get a nervous newcomer's gear working and on the air. (VE7BBL) . . . My biggest helpers in getting licensed were W4KFC, K3WUW, and WA4KJR. Good team to teach the finer points of contest operation, I might add! (WB5EEN, ex-KX61Y)

Being a very busy doctor didn't keep WA4UHI from qualifying me for my Novice ticket. Always finds time to help out with building and antenna problems, too. (WN4WLK) . . . During my senior high school year I often tuned the old Hallicrafters receiver set up in the basement workshop of W0BMJ. Ted kept it available for any student who cared to listen. In time my code speed reached 10 wpm and I obtained my Novice license, all due to W0BMJ. Unfortunately Ted passed away last summer so I can no longer pester him with questions on antennas, receiver muting, amplifier loading, etc. Some day I hope to have the opportunity to interest some youngster in ham radio, picking up where my fine Elmer left off. (WN0ELM)

This Elmer business doesn't always go the traditional oldtimer-to-youngster route. Former W8K1 writes, "My son finally talked me into becoming a happy ham again." Got your own Elmer on record yet? We know you haven't forgotten the ham(s) most responsible for your entry into this king of hobbies, the hobby of kings. Who was it for you?

What:

Now that you've survived another (ouch) Field Day you might as well take it easy before the next big DXpedition comes along. Put your feet up and let's fan the DX breeze about good old

Guess by now you've heard about KV4FZ's 24-hour 1.8-MHz "WAC" and DL9KR's three-day ditto. K1PBW, HB9CM, OK1ATP, and others also nabbed final continents on tap band recently. One-sixty WACs are still rare achievements but getting less so. WASs? Still hungered for overseas but the locals approach 50-state weekend contest sweeps. Culling W1BB's indispensable 160-meter DX newsletters and "How's" mail on the subject from Ws 1HGT 2BP 3IN 4DFR 4YOK 5SBX 6AM 9PNE, WB9BUV, and ZL3OX we find 1971-'72 action straddling a broad January peak with 1.8-MHz QSOs featuring folk like CO2s AA QR, DJs 1BP 0YD, DLs 9KR 0PG, FIs 8H 9J, EL2CB, EP2BQ, FQ0ADT/RS, FM7ADT, FP0CA,

1722 DORRITY ROAD

TOLEDO, OHIO 43618



Age 9
KEVIN L. GRAALMAN

WN8MLV

1ST CONTACT

RADIO W. 9 BRD CONFIRMING OUR QSO ON
DATE: 1/21/72 AT 0800
OUR CALL: AMBASSAD SIGNALS WERE FIRST
TRANSMITTER: 632 RECEIVER: 2X17A
ANTENNA: 1/2" S. REMARKS:
SEE QSL 1/19/72

How many first-contact QSLs in your collection? We were proud to break the ice for this collectors' item. At the same time we naturally became (temporarily!) a nine-year-old's best DX.

One just visits the 80- or 40-meter Novice subbands now and then, preferably during hours of lowered activity, for some careful fishin'. Try your luck on, say, a weak WN6 with a freshly issued call sign. Your answer to his eager CQ may be rewarded with an enthusiastic FIRST W9 or MY BEST DX. Now somebody actually wants your QSL!

Remember way back to your very first unscheduled QSO? Well, in this little game you sooner or later luck out to be No. 1 in somebody's log. That kind of rare "new one" really tickles. Next time overseas-style DX goes flat for a spell, spice in your old straight key and see what we mean. Slow and easy, patience does it.

On-the-air personalized code practice for newcomers is one modest way to play Elmer (page 91, March '71 QST and thereafter) but let's check on the real thing. Some Elmer notes and nominations from the recent "How's" mailbag:

*c/o ARRL, 225 Main St., Newington, CT 06111.

fifty-odd Gs, GM3s IAA KMG WDF YCB YOR, GWs 3VPL 3YGL 4AEC, HB9s AJU ANW CL CM DD NL UD YL, HKs 1AHK 1QQ 0AA 0BKX, HR2HH, HSSABD, JAs 1RQA 1YAC 3AA 3UI 3ZP 7AO 8AUD 8EBH, JH1s BRB 1KH, KSCIT/KH6, K8AG, KQ4s CE EO, KH6s HCM UJ RS, KL7s CL GKY HEE GKY, KR8CF, KP4CBI, KV4FZ, KZ5ZZ, MP4BJI, OA8V, OE1KU, OHs 3XZ 0BG, OKs 1ATL 1ATP 2BMH, OLs 1ACH 1AOH 1AXH 6ALY 5ANJ 6AMI 8ANI, PA0PN, PJs 2VD 9JT, PYs 1DVG 1MCF 2BJH 2BKO, T12CF, VK2s BMS 3ABR 3CZ 3QI 5BC 5KO 5LO 6HD 6NK 9GN, VOs 1FB 2AF, VPs 1BA 2A 2AA 2DAE 2LH 2MAD 2SAM 5RF 9BO 9EW, VS6DO, W4BRB/V/P7, W9UCW/HKQ, WB9AOX/HKQ, XEs 1KS/2 2NA 2VB, Y1CWF, YV1OB, ZC4IK, ZDs 8AY 9BM, ZL3s OX RB, ZP9AY, ZS1MH, 3C1EG, 5M4AAS, 4S7s DS GV and 8P6DR. . . . Many a 160-meter-country total nears the century mark aided by increasing DXpeditionary output. Some figures noted: W1BB 112, W2EQS 79, W9PNE 60, W4BRB 55, W2BP 44, and W0NFL 40. The main obstacle to running up 1.8-MHz countries is, of course, the fact that the band is not authorized ham territory in many overseas regions. Anyway, some of the lads heard enjoying top-band sport on our side are W1s BB BVP/7 GGB HGT SG WQC WY, W2s AZQ BP DDR EQS HXI IU QD UEZ ZBG, W3s GM IN PA, W4s BRB BSB DFR EX JZC KFC KXV QCW VZQ YQK YWX ZQ, W5s OG RTQ SUS, W6s AM HT NUT RW YY, W7s DL DZO GZL JRG RM RT SFA UBI, W8s AH ANO BT FRA GDQ HID KFX NSF VLN, W9s DL EU KYW PNF UCW YT YYG, W0s AIH BE DRE/J GBY NFL PSF RHS, Ks 1KSH 1PBW 2ANR 2GAL 2GNC 2LWR 3MBF 3NPV 3RUQ 4CIA 4GSU 4UCQ/5 5DFG 5FIQ 5SOR 6DDO 71DX 7LDZ 7ZIA 8RNE 9YWO 0DCE, WAs 1UDN 4XPX 4SGF 5KYY 6IVM 6UZA 7ILC 7OFH 9UET 0JVS, WBs 2MOL 4PVJ 6LJL 9BUV 9CSJ, VEs 1ASJ 3BMV 3DU 3EK 5XU 7HQ 7UZ and VESOK. . . . Antennas for DX on top band? Top-loaded verticals with ground radials, radials and more radials continue to gain favor. High-as-possible horizontal half waves or long-wires (!) come next, often paying off in better signal-to-noise ratios in reception. Temporary balloon-supported semiverticals are always tempting when winds are light and no power-line menace and small boys with BB-guns are present. K9SKX (W9YYG) lofted one to the 5/8-wavelength level, knocking off thirteen countries and 47 states in one contest period. GM3IGW also tried a floater and quickly grabbed nine U.S. call areas plus KV4 and 8P6. But others are loading up 20-meter beam towers, 80-meter zepps and other unorthodox radiators with surprising DX results. Then there are those fortunate individuals with big back yards who dote on low, long Beverage receiving wires for crucial extra signal-to-noise dB. . . . Increasing 160-meter popularity among casual rag-chewers threatens to shut the European 1825-1830-kHz DX window when the long bounce is in. Courteous QSY requests usually help, but that five-kHz "bare spot" is now mighty attractive to proliferating CQers and nets. . . . Commercials WCC at Chatham on 2036 kHz, WNU of New Orleans on 2048, KPH near San Francisco on 2054, WIAW's scheduled 1805-kHz transmissions, and Germany's DHJ on 1830 kHz are still handy DX conditions indicators. . . . Now that 160 is rapidly becoming just another popular DX band thanks to improved techniques and a sunspot decline, W1BB wonders if the traditional annual World-Wide and Transatlantic Tests have, at least for the present, outlived usefulness. That is, you no longer have to beat the bushes with an organized posse to flush

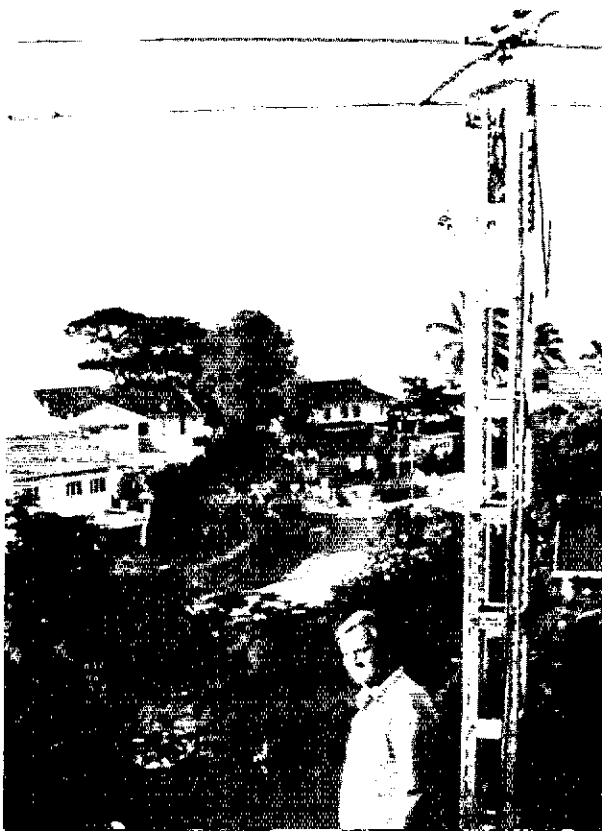
DX QSOs. Stew will appreciate your views on this. There's no doubt that the Tests approach keeps the 1.8-MHz DX ball rolling during lean years. HW NW? . . . Just about all this top-band DX work under discussion is QRS telegraphy, you know, but more and more of the flock successfully switch to single-sideband when conditions peak. However, steadily increasing occupancy of a very narrow fragmented band poses practical limits to DX results with the broadened bandwidths required for satisfactory voice two-ways. The so-called DX window, for example, would become only about two signals wide. . . . Hot and humid WX up our way with attendant atmospherics now but that doesn't mean there's no DX around. Last July 4th's memorable transatlantic opening produced eleven goodies in W1HGT's log. W0PSF clicked with VK3ATN June 20, 1971, ZL1AYG a month later. In fact late July brought a series of DXciting VK/ZL breakthroughs to W/K/VE-land that continued through August into September. Watch those nights that are quieter than usual! . . . Newcomers to our highly intriguing 160-meter band should be aware that FCC-authorized frequency ranges and power limits vary checkerboard fashion throughout the land. Pages 76-77, April '71 QST explain this in detail. Also, if you're in Ohio or South Dakota, check the "Stray" on page 87 of the May '71 issue. Good fishing, and keep W1BB or your favorite DX periodical informed on 1.8-MHz developments at your end.

† † †

Where:

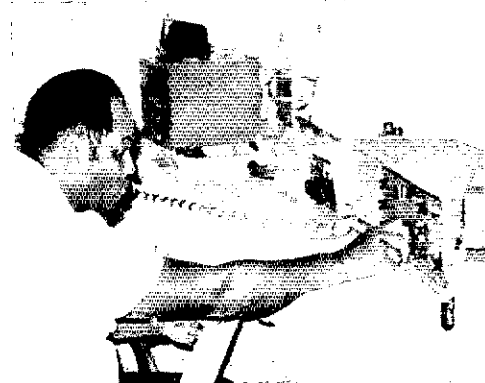
HEREABOUTS - There seems to be a mad rush to further confuse Amateur Service station identification around the world, W/K/VE prefixes included. (CARA) . . . More careful editing and proofreading of DX QTHs listed in ham publications seems needed. Let users beware! (WWDXC) . . . I'm closing my QSL managerial

9M2DQ hands out plenty of Malaysia DXCC credits near 21,355 kHz from his lofty QTH of the Month. On a clear day Jim can see the mountains of southern Thailand eighty miles away. (Photo via W2CTO)



books on HS3s AM GG, KA2AI, KC6EJ, KW6s FO GA, PZ1DC, VK9RA, VQ9s DH GA, ZDs 8GA and 9BL. (WA6AHF) . . . OverQSLing! One of my "problems," of all things, is receipt of duplicate QSLs, even triplicates. (WAINAE) . . . Reminder: W2AZX now is in charge of the mint foreign postage concession formerly run by W2SAW. (WB4TUP) . . . In lieu of the condensed DXCC Countries List, ARRL Logbooks will now include a list of international prefix blocks on inner back covers. (W1YL) . . . K3RLY's VP2DAE QSL management includes only QSOs by operator WA3HRV in December, 1971. W2BP will do his own VP2DAE QSLing for QSOs this April. (WA3HRV) . . . Friends tell me by 90-percent-plus QSL returns are amazing but I merely follow instructions given by operators at the DX end or as indicated in "How's." If he is an American in government or military service I send s.a.s.e. (self-addressed stamped envelopes) via his APO/EPO address. Yank civilians overseas without such QTHs are a good part of my 10-percent failures, also the Russian slowboat (W4WQW) . . . I confirmed more than ten thousand QSOs from Guantanamo Bay, earning 5BWAS No. 85 in the process. At least twenty stations have QSLs for working me on six bands. Those with QSL inquiries can now reach me at K4CSY. (KG4CS) . . . "QSLers of the Month" A2CAY, A35FX, B2VAA, C21TL, C1UEU, CR7FR, CT1BH, DU1s MAT MR, EAs 1AB 6BJ 9FO, EL8I, FSIN, H18XGM, HK0BKX, I1TLA, IT9JT, JA7s OWL PCH, JDIACH, JHIFEL, KG6s HPE SW, KG6ALV, KS6DY, OY7JD, OZ9VR, PZ1DR, SV0WU, TU2DO, VPs 2GVW 2KF 2LAT 2VAG 8ME, VRIW, W5RER/VPS, XUIAA, YAIOS, YB0AAN, YO9s HT KAG, ZDs 3Q 8MG, 7Q7AA, and 9G1WW, plus QSL tenders Ws 3GJY 3HIZ 5EGH 6CUF 7VRO 7YBK, Ks 7DVK 9FYD, WAS 5FWC 6AHF, VE2DFY, JH1HWN, OZ3PO, SM5BGK, and ZL2AFZ, are all commended for quick QSL comebacks in "How's" mail from W2HIU, Ks 2QHT 6UGS, Was 6TMO 7ICB, WBS 4SXX 5FIU 9DRE, WN6PZW, VE7s BAF and BZY. Care to quote a few commendables from your recent collection? . . . Halp! The following parenthesized petitioners plead for leads toward QSLs for holdouts mentioned: (W5SOO) JZ0A; (W8WUU) ZM2VF; (K0DBN) CE5 6BJ 7DW 8AE, VK9FH, WA2NGK/TF; (WA3ERG) VP1AV; (WA9VCK) AP5HQ, CO2YN, HI9PAR, IS1BDO, SV1AB, VU7s KV SL, 9M2B; (WA9ZWL) CMIAR, CP5ES, EA8BK, HR5MFA, KR6JT, PZ1DB, VK2LX, VP2MT, VU2SL, YS2RAR, ZD8RR all of 1969 or '70; (WB4SXX) VS9PIV, 3D6AW, 5Z4MO, 6Y5GS, 9Q5BV; and (WB5FIU) HC2HM, PJs 1AA 9AL, W6DDM/KB6, 9J2DT. Any 'alp? . . . W4WQW, DKSJA, HK7s ASC and BDA offer to perform as QSL managers for overworked ops at the rarer DX end.

OCEANIA - Concerning comments on lax QSLing by KS6s, I've sent out nearly 1500 cards in



my fourteen months of operation in Samoa and have started on my seventh ARRL Logbook. Friend KS6DH says he has issued 12,000 QSLs in thirty months. We encourage our newer Conditional KS6s to QSL and to be honest about QSLing; "Don't promise them if you can't produce." Myself, I answer each received card accompanied by self-addressed envelope, or s.a.s.e. with International Reply Coupon, within the week. QSLs are filled out in response to other incoming cards and batched via appropriate call area bureaus at least once monthly. W/K/VE/VOs should make sure they have s.a.s.e. on file at their local ARRL QSL Bureau branches! Incidentally, similarity between our former ZIP and that of Guam caused mail problems so ours is now changed to 96799. (KS6DY) . . . Those complaints about KS6 QSLing should be considered with regard to what procedures were used by complainants. No one should expect fast direct QSL response from reasonably rare DX without supplying s.a.s.e., or, when appropriate, s.a.s.e. plus IRCs. (KH6AQ) . . . I'm QSL manager for KH6EDY of Kure for QSOs between January 1, 1961, and February 14, 1972. KL7GFM, now at KH6EDY, writes to say they'll handle their own confirmations for contacts after the February date. (KH6BZF) . . . VK9LV says he will be back at G5RV this month attending to QSL matters. (CARA) . . . DUs employ the DX prefix now and then for local fetes. DX0PAR a recent example. (DXNS) . . . Although I QSL'd my DU1POL QSOs 100 percent via bureaus only a few cards reached me at Manila. I'll be glad to answer further inquiries from my new Colorado QTH. (WSQKO/0)

ASIA - Sorry to see the old KR6 prefix retired. I had five thousand KR6X QSOs, all QSL'd via bureaus. Anyone still needing a card should apply to my New Jersey address. (W2GSZ) . . . Some HS-bound QSLs meant for K4WHK erroneously came my way. (W4WHK) . . . JT0AE QSL manager OK1AQW answers cards via bureaus for necessary economic reasons but I can help those requiring direct reply. Incidentally, OK1AQW still awaits QSLs from two thousand of the three thousand W/Ks he has worked. PSE QSL! (OK3BG) . . . Old China hand AC2MJ of 1931-'33 now signs W4EEV in Virginia. (W1YL) . . . Numerous QSLs are received here for BY stations but we have no information or means for forwarding. Also, ZD0C and VS6SX are unknown in Hong Kong. (VS6FE-G3HCJ) . . . I'm getting QSLs for recent QSOs with "Hank" of 9K2CA but the Hank whose cards I managed left Kuwait some time ago. Sorriv! (K9CSM) . . . Bangladesh was assigned prefix block S2-S3 by the International Telecommunication Union. G3XEC, manager for MP4MBC, says QSLing will soon be cleared. (DXNS)

EUROPE - Czechoslovakia's OK1-2-3 prefixes are used by stations in Bohemia, Moravia, and Slovakia respectively. Novices use OL1 through OL5 in Bohemia, O1.6-7 in Moravia, and OL8-9-0 in Slovakia. OK4s are shipboard, OK5-6s and OMs are specials, OK7s are experimental specials, and OK8s are noncitizens. Such call signs as OK1AA/SP1AA would mean that OK1AA is being operated by SP1AA. (CRCC) . . . Our June-July Isle of Man QSOs will be confirmed via our home addresses. (G-GD3s F1Q GKF 1WJ XMW) . . . PA6KM, active each summer for our National Fleet holiday, QSLs 100 percent via bureaus. (PA0HTR) . . . Imperial College Radio Society (G5VC) will have C31DZ on the air through July 6th and promises thorough QSLing direct or via bureaus.

VP2MA, popular Montserrat DX target, maneuvers carefully through heavy 20-meter traffic. Doctor Joe was recently visited by VE3GCO, contributor of this photo, who frequently signs various DX calls during Caribbean travels.

VQ9DM, a 14-MHz sideband regular on Mahe, calls Scotland home. Don finds a simple vertical sufficient to attract all the DX customers he can handle. (Photo via VQ9N)



(G3ZQZ) . . . My QSL managership for CT2BG is effective May 5, 1972. (WA2BCK) . . . Those Russian "50" anniversary call signs passed sequentially through the UR prefix last month. (K3CUI) . . . The USSR uses the "m" suffix to indicate Antarctic; e.g., UA1GZ/m of Vostok base on 14.266 kHz at 0700 GMT. UPOL-19 on 20 phone or cw at 0300-0600 and 1300-1600 GMT represents Russian north polar ice station No. 19. U4L was a club special by UK4LAA around May 1st. (DXNS)

AFRICA - A2CAB's logs no longer arrive by air due to excessive cost so confirmations may be slower. QSLing will be 100 percent though delayed. (W2RHK) . . . I am managing QSLs for ET3JH contacts dating after May 1, 1972. (WB8ICV) . . . No 932JN logs for almost a year so W2RHK is unable to confirm recent contacts. (LIDXA) . . . I've joined the Air Force and so must terminate my management of 9G1DY and 9Q5LY QSLing. (WA2GZC) . . . Note that QSLs for ET3USA-9E3USA-9F3USA now go via W4NJF. I'll retain only logs for K3BSY's 9F3USA operation from April 7, 1971, through January 19, 1972, and logs for ET3USB from August 14 through November 6, 1971. (VE3IG)

SOUTH AMERICA - XOs 6EW 8AO, etc., were SCFs 6EW and 8AO, etc., signing a variant Chile prefix in April and May. Likewise HK4RCA occasionally becomes 5J-5K4RCA. (DXNS) . . . CPIAP prefers his QSLs via the Bolivian bureau. (K3CUI) . . . Surinam authorities affirm that there is no PZ1DX on record. (WB4OVX) . . . Let's turn our attention to the month's crop of individual specifications, mindful that each item is necessarily neither accurate, complete, nor "official":

- CO7ET, Box 52, Camaguey, Cuba
- CR6PV, Box 100, Luanda, Angola
- DUI1MAT, 1730 Indiana St., Manila, P.I.
- ex-DUI1POL, J. Harder, W5QKO/ø, 461 Oswego St., Aurora, CO 80010
- DU6BG, Box 200, Iloilo, P.I.
- EL4B, Sayed Catholic Mission, Box 11, Harper, Liberia
- EP2CB, C. Bowers, 1820 Crenshaw St., San Diego, CA 92105
- EP2CQ, E. Phinney, AVCO, U.S. Army Eng., Dist., APO, New York, NY 09038
- ET3USD, USA StratCom, Box 339, Det. 3, APO, New York, NY 09843
- FL8DJ, B.P. 157, Djibouti, T.F.A.I.
- GD3s FTQ GKF 1WJ XMW (to G3s FTQ GKF 1WJ XMW)
- HB0s XJK XJL (to DJ2BW)
- HC8sCT DX (via DL2CG)
- HI8XEM, G. McConnell, U.S. Embassy, APO, New York, NY 09899
- HP1HP, O. Alvarez, Calle 39, No. 4-48, Apdo. 1385 Z-1, Panama, R.P.
- HR3AC, P.O. Box 47, La Ceiba, Honduras
- ISARI, Box 511, Florence, Italy
- JA4BLY/3, H. Naramoto, 32-2 Daigo, Higashi Alba, Fushimi-ku, Kyoto 601-13, Japan
- JD1s ACK ACM (via JA3GZN)
- JY9VQ, Box 5089, Amman, Jordan
- K6UNT/KL7, L. Payne, Box 487, Fairbanks, AK 99701
- ex-KC6s WS YL (to W5SZV)
- ex-KR6JX, Capt. T. Drake (W2GSZ), Box 216, Sec. 72-5B, OSD, USASCS, Ft. Monmouth, NJ 07703
- KS6DY, D. Earnest, Box 1618, Pago Pago, U.S. Samoa 96799
- KX6JC, Box 508, APO, San Francisco, CA 96555
- ex-MP4BJI-VP9GJ (to G3PQA)

- OD5GT, P.O. Box 2068, Beirut, Lebanon
- OXSBA, Box 353, APO, New York, NY 09023
- SV1XX, P.O. Box 1442, Athens, Greece
- SV0WCC, U.S. NavComSta, FPO, New York, NY 09525
- TU2DO, P.O. Box 1712, Abidjan, I.C.R.
- UPOL-19 (via CRC attn. UW3HY)
- VE8CD, A. Duncan, Haines Jctn., Y.T., Canada
- VU2BK, Maj. Gen. R. Z. Kabraji, AVSM (ret.), 55 Anand Colony, Aundh, Poona 7, India
- VU2DK, Zal R. Kabraji, 55 Anand Colony, Aundh, Poona 7, India
- W5ZIS/YV1, L. Weathers, Sr., Apdo. 698, Maracaibo, Venezuela
- WA2CRD/3Dø (to WA2CRD)
- WA7TFQ/VE8-WB4ZIR/VE8, c/o USCG Stn., Clyde River, NT, via Montreal AMF, PQ, Canada
- YV7IE, P.O. Box 72, Parlamar, Isla de Margarita, Venezuela
- 5B4ES, English School, Nicosia, Cyprus
- A2CRD (to WA2CRD)
- A35JH (via WB5BHN)
- CUI1DZ (to G3ZQZ)
- CR3RY (to CUI1HY)
- CT2BG (via WA2BCK)
- DX0PAR (via PARA)
- EL2AU (to WB2AQC)
- EL2AV (to WA2BAV)
- EP2MH (to DK8MH)
- ET3JH (see text)
- ET3USB (via VE3IG)
- F0DH (to F9RM)
- FM0ADT (to W2BP)
- F00WR (to DJ5RT)
- G3MUL/CE (via RSGB)
- HC8GI (via KZ5SD)
- HW5UIT (via F9QE)
- IH9I.AW (to IT9GAI)
- JA2AJA (via WA6TMO)
- JW2IK (to LA2IK)
- KG4CS (to K4CSY)
- KH6EDY (see text)
- KL7HIV (to K3OAR)
- KR6RH (to WA3NPW)
- KZ5HA (to W6WHA)
- LI1IAZO (via W2GHK)
- LIU3AU (to WA3HRV)
- ex-SV0WO (to W4CQI)
- SX0E (via SV1FN)
- TJ1BF (via WB2WOU)
- TN8BK (via JA4BLY/3)
- VB1AA (via VO1FX)
- VB2KOC (via VO2AJ)
- VE8RG (via VE8CD)
- VP2DAE (see text)
- VP2GAE (via K3NEZ)
- VP2MAJ (to W2BP)
- VP8LE (via G3NOM)
- V55PW (via DK5JA)
- XQ6EW (see text)
- ZC4BK (via CARS)
- ZD3R (to WA2BAV)
- ZD3S (to WB2AQC)
- ZD8MG (via K9FYD)
- ZS3AW (to DL8LP)
- ZS5PG (via K6AQV)
- 5B4CDN (via VE2BUIP)
- 5K4RCA (see text)
- 5Z4PN (to DJ0PN)
- 7X2BK (via W5LUJ)
- 7X2GM (via ARA)
- 9G1DY (see text)
- 9I2HI (to WA2CRD)
- 9L1EP (to WA2BAV)
- 9L1GC (to WB2AQC)
- 9M2MN (via JA7IF)
- 9M6AB (via JA2KLT)
- 9Q5LW (see text)

For these we're grateful to Ws IBB 1YL 6GSV 9RJM, Ks 2QHT 4SD 6SE 6UGS 8PYD, Was 1NAE 1PEL 6TMQ 7JCB, Wbs 4SXX 9DRE, WN6OSS, Ves 6AUD 7BAF 7BZY, PA0HTR, ZL2AFZ, Columbus Amateur Radio Association CARAScope (W8ZCQ), DX News-Sheet (G. Watts, 62 Bellmore Rd., Norwich N. 72F, England), Far East Auxiliary Radio League (M) News (KA2LL), Florida DX Club DX Report (K4KQ), Inter-



W6FSC discusses DXpeditionary itineraries at a recent Calgary dinner meeting. Darlene has concentrated on Central and South American matters of late after successful sweeps in the Pacific and Africa. She may soon settle down as an HC2. (Photo via VE6MC)

national Short Wave League *Monitor* (E. Chilvers, 1 Grove Rd., Lydney, Glos., GL15 5JE, England), Japan DX Radio Club *Bulletin* (JA3GZN), Long Island DX Association *DX Bulletin* (K2KGB), Newark News Radio Club *Bulletin* (J. Heien, 3822 Marshall Ct., Bellwood, IL 60104), Nigeria Amateur Radio Society *News* (5N2ABG), North Texas DX Association *Bulletin* (W5SZ), Northern California DX Club *DXer* (Box 608, Menlo Park, CA 94025), Southern California DX Club *Bulletin* (W6EJ), VERON's *DXpress* (PA@s INA TO), West Coast *DX Bulletin* (WA6AUD), and Western Washington DX Club (W7YBX). Come again and often!

† † †

Whence:

AFRICA . Enjoying amateur radio more and more each day! After 12,000 QSOs my current project is 5BWAS. KH6 and KL7 will decide the issue. XYL Tara managed 361 QSOs in YLRL's YL-OM Contest as 9G1YA. U.S.A. operators seem to be improving, only three or four lids out of 3800 Stateside contacts. I'd like to try SSTV and an Oscar session. (9G1WW) . . . TU2DD continues to help 5BDXCC aspirants on 75 and 40. (K2QHT) . . . TU2DO, who recently fired up a transceiver at Abidjan, is S9-plus in San Francisco on his tape-measure dipole. (K6UGS) . . . TU2DI, 9I2LL, and 9L1VW are often found on the 14,332-kHz ISSB net. (WB2ZHM) . . . Flights were unavailable to the Gambia so XYL WA2BAV and I took a taxi from Dakar to Bathurst where we signed ZD3s R and S in April. Next came Sierre Leone, 9L1s EP and GP, where we had the pleasure of meeting 9L1s GC MF and RP, followed by our operation as EL2s AV and AU with visits to EL2s CB and DF. At the QTH of TU2BX we signed TU4s AB and AC. Then came a session at SVZYH and a stopover with 9G1s WW and YA. How's DX? Just great! (WA2AQC) . . . EL2CB does quite well on slow-scan television, and YL SU1M's ten-watter is found Sundays around 2000-2100 GMT near 14,032 kHz. (W3HNK) . . . As an avid ham-band listener in Mbabane may I observe that W/K operation in the pile-ups is usually superb, good timing and smooth contacts. Their main fault is chattering on frequency. "You hear him, Jack?" "Yeah, but only S5 so you call first." And so on. Another gripe is the "listen for my friends" routine. I heard one W6 intrude a couple dozen fellow club members on MP4MBC. What sort of DX achievement is this? The age minimum for Swaziland amateur licenses is eighteen; I'm fifteen so I have a three-year wait unless more reasonable regulations come along. (Karl Muller, P.O. Box 283) . . . 9X5VA is heard almost daily at 1800 GMT, 21,350 or 21,380 kHz. (K8PYD) . . . Added African oddments courtesy the aforementioned DX press: FL8MH intends October visits to 4W, 9K, and JY acreage. . . .

Reunion FR7s frequently travel to such outlying isles as Tromelin for stays of several weeks. . . . There's an African net on 21,360 kHz at 1800 GMT, and the Arabian Knights meet 1900 Mondays on 14,290, 1500 Thursdays on 21,355, and 0730 Fridays on 14,190 kHz. . . . EI3CB, EL2BA, and 9G1ED are new Nigerian Amateur Radio Society members. . . . EA7II is said to be accompanying a two-month amphibious safari slated to traverse Africa from Atlantic shores to the Red Sea.

ASIA - JD1ACH, an April DXcursion to Ogasawara, logged 9500 QSOs with 120 countries. (JA3GZN) . . . Next month I leave Korea for Florida. Meanwhile I observe that 10 has interesting but undependable Stateside openings at 0300-0600 GMT, 15 is drying up a bit, 20 is good to the U.S. at 0800-1500, 40 is great for JAs and the Pacific, and 80 is pretty well smashed by noise. I'm usually on 7015 or 14,070 kHz with my HW-16 and dipoles, also 28,600 with a KWM-2 and 30L-1. The QTH is Mangif San along the Yellow Sea. (HL9WU-WA9QVT) . . . JT0AE (OK1IAI) has another thirty months to go in Mongolia. He prefers fast cw near 14,030 kHz, also 21 MHz at times. Pavel naturally favors QSOing (Czechoslovakia but his first 1500 contacts included 800 W/Ks. After returning from European holiday this month JT0AE may be ready for ssb and 160-meter DX. About five other JTs are active, mostly on 40 cw. (OK3BG) . . . JA2AJA needs Delaware, Maine, Nebraska, South Dakota, and West Virginia for WAS. Hiroshi hangs out around 14,045 kHz. (WA6TMO) . . . Okinawa's reversion to Japan alters requirements for such JARL certifications as WAJA, JCC, and ADXA as of May 15, 1972. S.a.e. with IRCs, please, for details. (JH1DNC, JARL) . . . Russia's *Radio* magazine reports UA0's BAD BAE, UK0s BAC BAD, and UV0AB active on cw and a-m from Dikson Island. UK0BAC also has ssb. (K3CUI) . . . EP2PR was my No. 100 during the ARRL Test. (WA0YLN) . . . Third-party traffic no longer is authorized to and from the Ryukyus. They are now under the administration of Japan which prohibits such activity. (KA6XL) . . . Particularly interested in the mainland China DX situation after working a "BK7" on 15 cw. (WA4BA) . . . New or renewed memberships are claimed by KA5 2AK (WA7MZY), 2AS (K0SVW), 2AX (W6UUX), 2BE (W4MKE), 2BL (K0FOH), 2DR (K5DIY), 2HT (K9VAM), 2IQ (WB6PKV), 2JG (W0LWC), 2MU (W7CMU), 2OM (WA3JBH), 2PJ (K0JWX), 2RG (WA6BDM), 2WC (K5SJJ), 5EE (K4ZLE), 7GH (W7GH), 7SO (WA7SQD), 8RO (WA1POZ), and 9AG (K1AAG). Current club brass includes KA2s QW pres., SF veep, MU secy., AD treas., OO, observers coordinator, RG awards mgr., SF OSL mgr., and LL News ed. (FEARL) . . . Oriental addenda thanks to DX literature: BV2AB is reported back in action after a traveling hiatus. . . . YA1GNT spent a month in Florida before returning to Kabul. . . . YA1RG, founder of the Camel Drivers Radio Club in 1969, returned to Germany at the end of a six-year Afghanistan tour. . . . OH2SF joined V02AH briefly at the XUIAA console in Phnom Penh. . . . North Dakota will wrap up ARRL's WAS diploma for VS6DR. . . . Amateur TVI/BCI problems get increased press attention in Japan. . . . K3JXO, at the U.S. embassy in Rangoon till November, may head next for Nepal. Dick says would-be and ex-XZ amateurs yearn for ham literature old or new. □

YL news and views

CONDUCTED BY LOUISE RAMSEY MOREAU,* WB6BBO

DX Chasing

WHEN MARCONI sat in Newfoundland and listened to those three dots coming through the receiver, that first and very famous DXpedition opened the door to the most exciting, satisfying, sometimes frustrating part of radio - chasing DX. Of the many types of amateur radio activities probably none has a sweeter siren song, or demands more skill than this one.

The fever begins the first time that we hear a call with what is (then) an unfamiliar prefix. That first one is just about the biggest thrill because we are as excited as if it were our first date. We zero in on the signal making sure we have the call exactly right. With hand trembling on the key like a hunter with "buck fever" or voice thick with excitement we begin to answer only to hear the roof fall in, and we swear that every amateur in the U.S. was listening and faster than greased lightning. But we have the virus, and right then all the W and K calls lose a little brightness because we *have* to have that DX contact. When at long last we hear that strange prefix coming back to us with a report and we know they really did hear us, it is a greater satisfaction than anything since we first went on the air. But, as the show business saying goes, "It's only the beginning."

Back in 1901, the only way Poldhu found out that Marconi heard them was by a cablegram, for QSL cards were yet to be invented. In fact, "QSL" wouldn't even be in the language of radio for eleven more years. Although we know the official

* YL Editor, *QST*. Please send all news notes to WB6BBO's home address: 1036 East Boston St., Altadena, CA 91001.



definition, to us QSL means cards, and that lovely proof that we were heard in another country starts to pile up, building towards the first hundred for DXCC, and the listing on that exclusive Honor Roll. And always, before our eyes is the goal of hanging the 5BDXCC on the wall.

It is possible, as W2QHH proved not long ago, to add a different type, for Howie was the first to work DXCC-YL. There is the special "for-YLs-only" award of the DX-YL certificate that is available when we have worked 25 women in DX countries. The WAC, WAC-YL awards can take us towards the big one for each card only increases the desire for more.

Strangely enough, it is work, and it takes skill and know how. It takes patience to jump into a pileup and stick with it until that as yet unacquired contact answers our call. It requires knowledge of the bands and when they will be open, and in what direction. And it takes that ability to listen, and tune, and listen again, to answer a weak signal that almost is not there, because we think it might be a new one. And it also takes the understanding of the entire family when we let out a very unladylike "whoop!" because it was new, and we got it.

Under all the shining tangles of cards, pins, certificates, and plaques, is the special pleasure of DXing. The contact with a ZS gal that grows into a regular sked, close friendships with people we may never meet, and the challenge of reaching out just a little farther. And DX is the special bond of the amateur radio fraternity that enables someone still in high school to chat with another YL her age, or the head of a country, for, when the bands are hot, and the DX is rolling in, all we need do is throw a switch and say with the Count of Monte Cristo, "The world is mine!"

YLRC/LA 1972-73 Officers

The 1972-73 officers of the YLRC/LA were elected at the May meeting of the club. The following were elected: President, Esther Gardner, WA6UBU; Vice-president, Mary Baker, W6LBO; Recording Secretary, Nell Devitt, WB6ERF; Corresponding Secretary, Violet Barrett, W6CBA; Treasurer, Joan McDonnell, WA6QKC. Because of vacation plans, the installation of the new officers will take place at the September meeting of the club.

Kathy Kuslusi, WB8LOZ, not only became interested in radio but passed the Technician Class last December. Kathy is nine years old and will be attending General code class in September. (WA8YIT photo)

Helen Robinson, WN6HZQ, received the WAS award after six months on the air as a Novice. She is a member of a real "ham" family with OM, WA6ZLV; one of their daughters is WA6HZP, and the other daughter and her husband are WN0FNO and WB0FNN.



1972 YL-OM Contest Results The Winners

YL Phone		YL Phone	
KP4CL	122,080	WSJM	108
WA6OET	44,821	WB8FRO*	2.5
W1RLQ	41,208	W9LNO*	2980
<i>OM Phone</i>			
K5MDX*	6600	W9NLF*	1511.25
W9LNO*	2980	WA9NPM	555
WA1CJR*	2728.75	WA9SUU*	195
<i>YL cw</i>			
WB6KVG	42,891	WB9AQC*	5
WA6OET	39,270	WA0VBV*	1316.25
WA6IRT/6*	24,050	WA0TDO*	1147.5
<i>OM cw</i>			
W4CHK*	2232.5	WA0OHL*	641.25
W5WZQ*	2127.5	W0KSC*	570
K4IEH	1240	WB0AEW*	525
<i>YL Phone</i>			
W1RLQ	41,208	WA0TKJ*	432
K1QFD*	665	W0KCG	399
K2OYG*	2890	JA9LJ*	1.25
K4RHU*	8780	VE3GCO*	546.25
WB4NKO	6255	VE4SW*	90
W4PPO*	1110	VE6AYU*	90
K4LMB*	1100	VP4VAN*	25
W5VBE	4050	WA2LLX	132
WA6OET	44,821	YU1NOL	25
WB6QVD	3652	YV5BPG	420
K3TFR*	3277	<i>YL cw</i>	
K8ONV	17,290	K1QFD*	20,387.5
K8NGR	15,594	W1RLQ	20,160
K9LUI*	32,250	K1NEI	16,300
WA7MKQ/9	11,786	W2JBX*	9170
WA9E2P*	4387.5	WA2WHE*	7777.5
W0JUV*	14,790	WB2PYI	5900
WA0YNC*	11,340	W2OYG	5335
WA0XUO	9280	W3SLS*	1653.75
W0RAW*	2103.75	K4VDO	4059
KP4CL	122,080	K4RHU*	3783.75
SP9KR*	2356.25	W4PPO*	3562.5
VE5FK	665	K4LMB	1128
VK3KS*	26,370	WB6KVG	42,891
YV5CKR*	3478	WA6OET	39,270
9G1YA	25,270	WA6IRT/6*	24,050
<i>OM Phone</i>			
WA1CJR*	2728.75	K7TLP	8268
W1HOZ*	688.75	K8ONV*	17,922.5
W1BNS	391	WA9TVM	11,408
K2PXX	667	WA0KVL*	23,378.75
W2QJX	500	WA0YNC	7436
W2IP*	123.75	DJ9SB*	1250
K3NEZ*	1470	11M0*	1427.5
WA3EXX*	600	IT9GCV	10,036
K4BNC*	2250	OH2BE*	1.25
W4AZU*	2040	OK2BBI*	460
W4OZF*	1460	SP5YL	396
K4GSX*	1377.5	VK3KS*	13,623.75
W4CHK	1148	YV5CKR*	14,748.75
W4IEH	638	<i>OM cw</i>	
W4UJ*	570	W1HOZ	924
K5MDX*	6600	W1PEG	720
K5MAT*	427.5	W1DMD*	682.5
W5OB	418	W1BNS	255
WA5PGB*	1190	W2AAU	1080
W6RQZ	494	K2IFG*	937.5
WB6BWG	360	W2RUK	255
WB6QVE	25	W2IP	110
WA7OEO*	1075	K2DNN*	20
W7AHZ/7*	123.75	WA3EXX*	937.5
		W3ADE*	495
		K3NEZ*	337.5
		W3GVX*	25
		W4CHK*	2232.5
		K4IEH	1240
		W4OZF	687.5
		K4BNC*	682.5

W4KMS	450	JA1SR*	70
W4UJ	156	OH2BAD	30
W5WZQ*	2127.5	OH2FS	25
W5OB	1044	OK1DVK*	11.25
K5MAT*	776.25	OK2QX	208
W5SY	288	PZ1AV	304
WA3GBU/5	272	SP6DMJ*	31.25
WB5BHN	121	SP8HR*	61.25
WB6OYJ*	577.5	SP8MJ	9
WB6IEH	399	VF1AE*	380
W6GBY*	381.25	VE2CO*	517.5
W6CLP	342	VE4MG	924
W6RQZ	340	VE4UA	30
W6WLV*	318.75	VE6UP	480
K7JRE*	495	VE7BBL*	60
WA7HHX	304	YU1NOL	9
WA8RDW*	315	YU1SF*	45
W8BJ*	90	<i>Confirmation Logs:</i>	
W8MXO*	70	WB2YBA,	W3MDJ,
W9DYG*	1196.25	WA0ELO,	VE3GJG,
W9NLO*	968.75	WA6ZRA,	OK1JDI,
W9NLF*	906.25	SP6CZ.	
W9RKP	418	* means low-power multiplier.	
W9DU	357	If the call has been omitted, the contest log was disqualified.	
W9WR	288	Congratulations to the winners. The next YL-OM will be February and March 1973.	
W9TCU*	195	See August "YL News and Views" for dates.	
WB9AQC*	37.5		
WA0ZZM*	380		
WA0TKJ	342		
WA0OHL	255		
W0KCG	121		
EA2HR*	31.25		
HP1AC	70		
16B0J*	1480		
ITIAGA*	180		

SOAPBOX

An OM, K2LFG, summed up the feelings of most of the OMs who participated when he wrote: "Either my receiver is going bad, or my ears are losing their sensitivity, but it seems that there are fewer and fewer YL cw stations each year. Guess the girls prefer ssb. Thank goodness for the YLs in California and Minnesota. They kept it going, but it seems that New Jersey has some very quiet cw YLs, and New York is almost as bad. In spite of it all I'll be back next year."

VE3GJH, Cathy Hrischenko

The OM got his ticket first, for Cathy was too busy with five children and the demands of a family. Finally she qualified for her first ticket and two years later received her Advanced License from the DOT.

Most active on 20 and 15 meters, Cathy handles a large amount of traffic and phone patches for ships at sea, or persons in isolated places. Once each week she has a class from a neighboring school in her home to learn about other areas



Cathy Hrischenko, VE3GJH



Hunting for a YL in Iran? Try these gals whom you may have worked under their other calls: (from left) Karla, EP2KH, JY9AC, WB6PBY; Helga, EP2WA, DL2WA; Rosie, EP2YL, JY3YL, K3ZZS. (Photo courtesy EP2WB)

through amateur radio. Through prearranged schedules the children ask questions about geography, farming, industry, and the history of the place to which they are talking. In turn they answer the same questions about their locality. Through this method of learning about people from the people themselves, they also have had to know more about their community in order to be prepared for their side of the story.

A member of YLRL, Scarboro ARC, TOT where she is at present publicity manager, vice president, and supply chairman of CLARA, Cathy has done the work of updating the 1972 supplement of the *Canadian YL Directory*.

There are two YL-OM combinations in her family, and all the other members are interested in amateur radio and are studying for their licenses.



GEORGIA PEACH CERTIFICATE

Georgia Peaches 1972 Officers

The officers for the Georgia Peaches YL Club for the year 1972 will be: President, Jeanne Hunting, K4RHU; Vice-president, Hilda Andrew, W4HWR; Secretary, Nancy Hickman, WB4NTW; Treasurer, Meg Hennon, K4HSC. The Georgia Peach YL Net meets every Thursday at 1400 GMT, on or near, 7277 kHz. Business meetings are held on the first Thursday of each month. The net also meets each Wednesday morning at 7:30 Eastern Local Time, on 3933 kHz. The net certificate is awarded for working 10 members of the club. For details write the custodian, Carrie Lynch, WA4BVD.



RULES FOR LIFE MEMBERSHIP

1. A paid-up Life Membership in the League shall be available to any Full or Associate Member, other than a Family Member, upon payment of a fee twenty times the annual dues rate, and upon approval of the application by the League's Executive Committee.
2. The Life Membership fee for U.S. applicants is currently \$150, for Canadian applicants \$170, and for other applicants \$180, all in U.S. funds.
3. An applicant may choose an alternative time-payment plan of eight quarterly installments (\$18.75 for U.S. applicants, \$21.25 for Canadians, and \$22.50 for others), to be completed within a two-year span. In such instance, he will be provided an interim two-year Full Membership certificate. Upon completion of the payments, Life Membership will be granted.
4. Life Memberships are non-transferable, and dues payments are non-refundable. In the event an applicant is unable to complete payments on the installment plan within the two-year span, he will be given a term of membership, at the annual dues rate, commensurate with payments received.
5. Other licensed amateurs in the same family, and at the same address, of a Life Member may retain or obtain Family Membership upon payment of the annual dues of \$2, but without receipt of QST. The dues of the Family Member may be prepaid for any number of years in advance, but there is no special rate.
6. Life Membership is also available to blind amateurs upon payment of a fee of \$40, without the receipt of QST.

Operating News

GEORGE HART, WINJM
Communications Manager
ELLEN WHITE, W1YL
Deputy Communications Mgr.
ROBERT L. WHITE, W1CW; DXCC
GERALD PINARD, *Training Aids*
ALBERT M. NOONE, WA1KQM; *Contests*

Another Pitch for Appointment. Some months ago we started, in this column, to describe the functions and requirements of the various SCM "station" or individual appointments. We progressed through Official Observer (July '71), Official Bulletin Station (Aug. '71) and Official VHF Station (Sept. '71), and stopped there because we didn't know whether ORS and OPS belonged in this column or in ARPS — also because we had a lot of material on hand for *both* columns. Although no sudden surge of OO, OBS or OVS appointments seemed to follow on the heels of the above writeups, it is the intention here to complete the series by describing the remaining two appointments, after which we shall get into the so-important *leadership* appointments of SEC, EC, RM and PAM.

The Official Relay Station. This appointment goes back at least to the early 20's, when mention of it suddenly started appearing in a 1922 *QST* to the effect that 610 ORS appointments existed. That's about half as many as we have now, and ORS is still the most numerous of all "station level" appointments. It was in 1922 and still is a cw traffic-handling appointment, requiring a minimum of 15 wpm code speed, conditional class license or better and standards of excellence in setting the example in proper cw traffic handling procedures.

The ORS is appointed by the SCM, usually at the recommendation of the route manager having jurisdiction over the activity concerned. In former years an on-the-air test was required of all ORS applicants, and some RMs still insist on this prior to recommending. Things to be considered are keying ability, copying ability, knowledge and practice of handling messages in standard ARRL form, net procedures, meanings of Q signals, standard and commonly-used cw abbreviations, and other factors contributing to his general stature as a cw traffic-handling amateur. All cw traffic handlers aren't ORS, not by a long shot, but

Are You Proud of Your Town?

Many ssb amateurs make a standard practice, when trying to contact a specific geographical area, of first tuning across the band and listening. But without a call book, unless they hear the location of a transmitting station voluntarily given, they have no way of telling if the station is near where they want to reach or over a thousand miles away. For example, two stations both in the 4th call area could be 1100 miles apart; using the 5th call area, 1300 miles; in the 6 area, 1200; in the 7th, would you believe 1500? Even in the one-state 6th area the stations could be 850 miles apart.

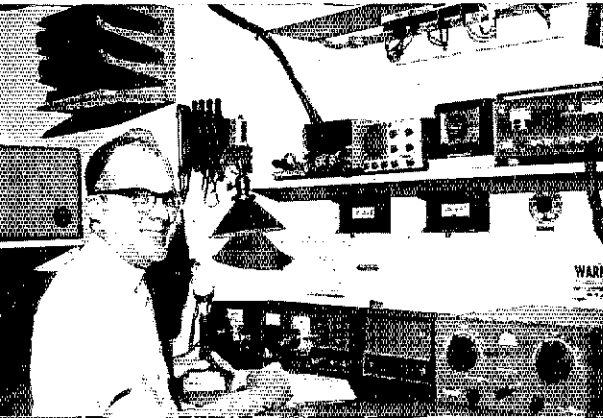
If each station concluding a QSO or a call would add the name of the city or community it would help amateurs who may be looking for a station in their area (and also reduce the number of directional CQs, maybe). Let's be proud of our towns and name them on the air. — W4CVO, Orlando, Fla.

those who are should set the example for those who are not and, perhaps, inspire them to seek the appointment. Of course ARRL membership is required, as for all such appointments.

A question that never used to arise but now seems to quite often is, "Why should I seek appointment as an ORS?" There is only one answer to a question like that, because only one type of person will ask it. That answer is "To enhance your status among amateurs." ORS appointment is something you have to work to achieve and keep on working to hold. Nobody gives it to you because you're a nice guy. You can't

Meet Your SCM

Colorado SCM Clyde Penney, WA0HLQ, was born in Colorado Springs. He holds a Master Engineer of Metallurgy degree from the Colorado School of Mines. It's no wonder to find that a prime "extra" hobby includes mineral collecting and gem polishing, along with photography! He is currently an engineer of tests for the Denver and Rio Grande Western Railroad. Clyde's amateur interest goes back about ten years. He is an Assistant Director and member of the Denver Radio Club and Rocky Mountain League. His favorite band/modes 2-10-15 a-m/fm.



WIAW SPRING-SUMMER SCHEDULE

(April 30–October 29)

(The specific frequencies shown below are approximate and indicate general operating periods)

The ARRL Maxim Memorial Station welcomes visitors. Operating-visiting hours are Monday through Friday 1 p.m.–1 a.m. EDST, Saturday 7 p.m.–1:00 a.m. EDST and Sunday 3 p.m.–11:00 p.m. EDST. The station address is 225 Main Street, Newington, Conn., about 7 miles south of Hartford. A map showing local street detail will be sent upon request. If you wish to operate, you must have your original operator's license with you. The station will be closed May 29, July 4, and September 4.

Times/Days GMT	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
0000	← CW BULLETIN ¹ →						
0020-0100 ⁴			3.7 Nov. ⁵	14.080	14.080	7.15 Nov. ⁶	14.080
0100	← PHONE BULLETIN ² →						
0105-0130 ⁴			3.990	50.190	145.588	1.820	21.390
0130	← CODE PRACTICE ¹ (35-15 wpm TThSat, 5-25 wpm MWFSn) DETAILS BELOW →						
0230-0300 ⁴			3.580				3.580
0300	← RTTY BULLETIN ³ →						
0310-0330 ⁴			3.625	14.095	7.095	14.095	3.625
0330	← PHONE BULLETIN ² →						
0335-0400 ⁴			7.290	3.990	7.290	3.990	7.290
0400	← CW BULLETIN ¹ →						
0420-0500 ⁴			3.7 Nov. ⁵	7.080	3.990	7.15 Nov. ⁶	3.580
1300	← CODE PRACTICE ¹ (5-25 wpm MWF, 35-15 wpm TTh) DETAILS BELOW →						
1700-1800		21/28cw ⁷	21/28ssb ⁸	21/28cw ⁷	21/28ssb ⁸	21/28cw ⁷	21/28ssb ⁸
1800-1900		14.290	14.080	14.290	14.080	14.290	14.080
1900-2000		7.080	7.290	14.095	7.290	7.080	
2000-2030		21/28ssb ⁸	21/28cw ⁷	21/28ssb ⁸	21/28cw ⁷	21/28ssb ⁸	
2030			CW BULL. ¹		CW BULL. ¹		
2100-2130		7.15 Nov. ⁶	21.1 Nov. ⁶	7.15 Nov. ⁶	21.1 Nov. ⁶	7.15 Nov. ⁶	
2130			RTTY BULL. ³		RTTY BULL. ³		
2200		CPN ⁹	7.095 ⁴	3.625	14.095 ⁴		CPN ⁹
2300			6N ⁶		RTTY BULL. ³		CN ⁶
2330	← CODE PRACTICE (10-13-15 wpm) DETAILS BELOW →						

¹ CW Bulletins (18 wpm) and code practice on 1.805, 3.580, 7.080, 14.080, 21.080, 28.080, 50.080 and 145.588 MHz.

² Phone Bulletins on 1.820, 3.990, 7.290, 14.290, 21.390, 28.590, 50.190 and 145.588 MHz.

³ RTTY Bulletins sent at 850 Hz shift, repeated with 170 Hz shift, on 3.625, 7.095, 14.095, and 28.095 MHz.

⁴ Starting time approximate, following conclusion of bulletin or code practice.

⁵ WIAW will tune the indicated bands for Novice calls, returning the call on the frequency on which called.

⁶ Participation in section traffic nets.

⁷ Operation will be on one of the following frequencies: 21.02, 21.04, 28.02, 28.08 MHz.

⁸ Operation will be on one of the following frequencies: 21.270, 21.390, 28.590 MHz.

Maintenance Staff: W1s, Q1S, W1R, YNC.

WIAW CODE PRACTICE

WIAW transmits code practice according to the following schedule. Approximate frequencies are 1.805 3.58 7.08 14.08 21.08 28.08 50.08 and 145.588 MHz. For practice purposes the order of words in each line may be reversed during the 5-13 wpm transmissions. Each tape carries checking references.

Speeds	Local Times/Days	GMT
10-13-15	7:30 PM EDST dy	2330 dy
	4:30 PM PDST	
5-7½-10-	9:30 PM EDST S nTThS	0130 MWFSn
13-20-25	6:30 PM PDST	
5-7½-10-	9:00 AM EDST MWF	1300 MWF
13-20-25	6:00 AM PDST	
35-30-25-	9:30 PM EDST MWF	0130 TThS
20-15	6:30 PM PDST	
35-30-25-	9:00 AM EDST TTh	1300 TTh
20-15	6:00 AM PDST	

The 0130 GMT practice is omitted four times a year on designated nights when Frequency Measuring Tests are sent in this period. To improve your fist by sending in step with WIAW (but not over the air!), and to allow checking the accuracy of your copy on certain tapes, note the GMT dates and QST practice text (from the issue 2 months previous) to be sent in the 0130 GMT practice on the following dates.

- July 10: It Seems to Us
- July 13: Correspondence
- July 28: League Lines
- Aug. 1: ARPS

The subject of practice text for the following sessions is *Understanding Amateur Radio*, First Edition.

- Aug. 2: Feeder Length, p. 278
- Aug. 4: Other Dipole Systems, p. 281

buy it or sell it. When you have it, it belongs only to you, it's not transferrable. It has privileges (such as a handsome certificate, eligibility for a blue-background ARRL pin, participation in the quarterly CD Parties) and it also has responsibilities (those mentioned above, plus monthly reporting to your SCM and regular on-the-air activity), and the average ORS wears both with quiet pride and dignity.

Yes, club stations are eligible for ORS appointment, in which case the trustee is the responsible person and the nominal appointee, although each member of the club is responsible for upholding the qualifications of the appointment when he operates the station.

Participation in CD Parties is a privilege of ORS appointment (or any other kind of appointment, for that matter), not a duty. Appointees who think

they are fulfilling their responsibilities by participating in CD Parties alone, and who do not fulfill any of the other functions, stand to lose their appointments.

If you are a cw man and interested in traffic handling, you *should* be an ORS. It is not required

that you belong to the (or a) section net or any other net, or NTS. Just handle some traffic each month, do it properly, report it to your SCM, keep up your ARRL membership, maintain your codespeed and keying quality and your ORS appointment will be renewed year after year.

DX CENTURY CLUB AWARDS

Radiotelephone listings follow the general-type "New Member" and "Endorsement" listings.

April 1-30, 1972

New Members

K6HN	299	W1BMR	135	MP4TDM	109	F6AAx	104	WA6QHQ	102	K8LJQ	100
VE3GMT	295	SP9WY	131	YO2BS	109	JA5MG	104	W7GYP	102	OK1DVK	100
WA9ZCP	243	DJ5JT	127	11DST	108	KL7GSC	104	WA1NRV	101	WA1KKT	100
EA3NI	222	K6BAZ	124	W0HHB	108	W4EQR	104	WB2DYG	101	WB2CDP	100
LA1UH	198	JH1HDB	120	K5KNA	106	DJ7WOA	103	WB4PAB	101	WB4OXD	100
DJ8UG	163	W6IRD	114	WA3JRG	106	WA1LFH	103	WA5NBM	101	WB4TUP	100
W0QWS	161	YU3TSM	113	WB0ALF	106	WA6CIL	103	WA7KEF	101	W5HFN	100
SP9ABE	150	WA5EMH	112	OE5OA	105	WB0CQJ	103	W9LJL	101	W9YEG	100
SM6AYG	146	K7AUZ/5	111	DK1FC	104	6W8GE	103	F6BJR	100	YO2QY	100
YU5XAG	137	MP4BHM	111	DM4XXH	104	W6QPF	102	K4CR	100	9V1QA	100

K6RMM	272	EA3NI	215	WB4SLJ	119	K6JAD	106	KH6HDA	102	F6AOY	100
K4BYM	259	KZ5JF	206	W5HFA	119	DM2BUD	106	W3IHY	102	WA3FEU	100
GM3CSM	233	W6LOC	201	W6IRD	114	WB4NVH	106	WA3RCE	102	WB4NKO	100
WA9ZCP	232	TI2GI	187	WA6FLO	113	DL7DG	105	WA6QHQ	102	W6JGL	100
7X0AH	223	WA9OFF	144	MP4TDM	109	W42AA	104	WA7HCQ	101	W8OEM	100
		JH1MTR	132	WA5EMH	109	GC3YIZ	103	CF3AB	100		

Endorsements

In the endorsement listings shown, totals from 120 through the 249 level are given in increments of 20, from 250 through 300 in increments of 10, and above 300 in increments of 5. The totals shown do not necessarily represent the exact credits given but only that the participant has reached the endorsement group indicated.

W4EEE	335	K6POC	290	JAI10D	250	W7IYW	220	K5LMG	160	WA7GOA	140
W5NMA	330	KH6GLU	290	YV5BNR	250	W8WZ	220	PY1CZR	160	WB8ICV	140
KH6J	320	W4FPW	290	W5FL	250	HP1AC	200	SM5BRS	160	W1DRN/9	140
W6CUF	320	W4SYL	290	WB8EUN	250	LA8SJ	200	W2FHY	160	WA9MAG	140
W9CH	320	OH2BAC	280	WA9UCE	250	SP5AFL	200	WA2MDR	160	WA9VCK	140
K4TWK	315	WA5VDH	280	ZL1AMO	250	W7QNI	200	WA5QFQ	160	WA9ZAK	140
W4OFL	310	W6AEM	280	K6LQA	240	DJ4VU	180	WA5ZNY	160	ZL2ASM	140
W0PAH	310	W8GMX	280	K6OVJ	240	DJ4VX	180	WB6VZI	160	K2FJ	120
PA0VO	305	GM3CSM	270	K6YUJ	240	K2JFE	180	W8IIT	160	E9VFA	120
SM5FC	305	K0EKR	270	KP4DKZ	240	E0ZXE	180	WA8TYF	160	K0SGJ	120
WB2WOU	305	PY5ATL	270	PY1BQO	240	SP5HS	180	W9HE	160	SM5BZQ	120
W6BUO	305	W7YBX	270	VE3MZ	240	W1PEG	180	K4IQJ	140	W1MEW	120
W6EJ	305	W9EXE	270	VE4KJ	240	WB2VFT	180	OK1DH	140	WA2AFM	120
W0JW	305	W9LNQ	270	W7ETZ	240	W4GIW	180	VE3WW	140	WA2DNY	120
SH6CKU	300	W9PIO	270	K3SEW	220	W5UNF/6	180	W1CYB	140	WA2DZU	120
VE3GCO	300	K8TVO	260	K4PFK	220	W4RYFW	180	W4HLE	140	WB2ZQV	120
W1MDO	300	K9PQG	260	W4HY	220	W01F	180	WB4SIJ	140	W4QF	120
W9AG	300	W4JD	260	W6DR	220	WB2DZZ	160	WB4UYD	140	W5MDP	120
JA1DFQ	290	W4YUJ	260	W6HRB	220	DJ8EQ	160	W5HIC	140	WA8NNK	120
K1KNQ	290	WA9UFR	260	WB6WIW	220	K3SLP	160	W5VZU	140		

W4EEE	335	JA1DFQ	260	K6YUI	220	WB2CDF	180	W6EHA	160	WA9ZAK	140
K2IRK	320	W7GOC	260	KP4DKZ	220	W4GIW	180	W7FSF	160	G3YJI	120
IT9GAI	305	DL7OD	250	VF4SD	220	WA5WEY	180	W9RKP	160	K9DZE	120
SM5FC	300	K9PQG	250	WB6WIW	220	W4BYFW	180	ZL1AMN	160	K0SGJ	120
W1CGX	300	KH6GLU	250	WB8EUN	220	K4BNC	160	CT1RR	140	W2MSV	120
SM6CKU	290	VE7HP	250	CR7IK	200	K6PO	160	K4IVJ	140	WA3LRJ	120
W9ICF	290	W6SI	250	K2DNL	200	K6SX	160	W1CYB	140	WA3NAV	120
K1KNQ	280	W7YBX	250	K3GZE	200	K9DJO	160	W1RYB	140	WA4HHW	120
WA2HSU	280	DL9SV	240	K4GHR	200	LA7AJ	160	W2TQK	140	W8MXO	120
EA8GZ	270	W3MDJ	240	W2EHB	200	W1TPJ	160	W3MDO	140	WB9FAQ	120
W4SYL	270	W9EXE	240	W3IF	200	WA5QFQ	160	W4QQ	140	W0JF	120
YV5BPU	270			W8AQF	200			WB6KGG	140		

Staff Change. We don't seem able to keep a public service coordinator on the staff. At *chez W1CW/W1YL* on May 23, the CD staff bade farewell to Frank Connelly, WA1PMD/WA7GWL, who is returning to his home state of Washington with intentions of going back to school. This is our third PSC since the "big switch" in February of 1967. At this writing, selected previous and new applicants are being contacted and interviewed. The amateur we need for his position must be out there somewhere. — *WINJM*.

APRIL CD PARTIES

High-Claimed Scores

The following are high-claimed scores; they read, from left to right: appointee, total score, number of QSOs, number of sections. Final adjusted scores will appear in the April CD Bulletin. — *WA1KQM*.

W6DGH	286,005-	822-69	K5TSR	103,700-	336-61
WB9AWY	255,150-	729-70	W4KFC	102,660-	317-63
VE7BDJ	251,160-	721-69	W8TZZ	101,115-	316-63
W1LLKX	231,540-	675-68	K1ZND/8	101,060-	319-62
K0DDA/0	221,145-	636-69	K0AZJ	100,750-	321-62
W2SZ (WA2EUX, opr.)	218,400-	667-65	W4NQA	100,595-	335-59

PHONE

W3IN	214,200-	624-68	W2SZ (WB2FAJ, opr.)	132,680-	428-62
K4BAI	211,830-	607-69	WB5CPG	105,525-	335-63
WB6ZVC	206,380-	602-68	WA3RDU	91,665-	287-63
K4PUZ	203,345-	600-67	W6DKQ	77,290-	262-59
WB5BHN	190,060-	555-68	K3HXS	76,095-	267-57
WA2SRQ	180,230-	533-67	W3FCS	75,000-	246-60
WA9AUM	174,200-	530-65	W5QGZ	68,400-	221-60
K4VFY	173,400-	504-68	W6DKF	66,795-	212-61
WA2MPC	171,700-	500-68	W6DGH	65,250-	218-58
WA7MEO	171,600-	518-66	VE7AAR	61,040-	211-56
W6BIP	158,780-	460-68	WA3QFN	59,290-	240-49
W7GHT	151,140-	452-66	W6RIP	55,440-	191-56
K4JM	147,550-	424-65	W7GHT	55,390-	185-58
K7LTV	145,080-	461-62	WB4SGV	54,400-	179-48
W4WHK	142,230-	426-66	WB4SGV	52,440-	180-57
WB4RUA	139,920-	419-66	W6CPB	44,280-	161-54
K1SSH	139,260-	396-66	W3IN	43,095-	163-51
K45XD/4	137,020-	436-62	WA6CPP	42,380-	159-52
W3GRM	136,500-	415-65	W6MAR	41,750-	160-50
K5ABV	135,630-	406-66	W4OZF	41,565-	158-51
WA6DEL	132,995-	391-67	W5RF	39,520-	149-52
WB4SVX	132,990-	424-62	W5NCB	38,690-	141-53
K1VFN	130,680-	392-66	W9YB (WB2RKK, opr.)	36,750-	143-49
WB4SGV	130,325-	395-65	WB9GVT	36,015-	143-49
W6DKF	130,325-	394-65	W1AX	35,500-	135-50
WA3QOZ	128,050-	390-65	W8TZZ	35,250-	136-50
W1DAL	123,950-	363-67	W8NHQ	35,100-	130-52
WB4FEC/4	123,830-	400-61	W8AP	34,750-	132-50
W5RF	122,200-	378-64	K4FU	34,540-	150-44
VE3GFN	118,625-	365-65	WB4RUA	31,680-	127-48
W1BGD/2	114,075-	344-65	WA3HCG (WA3JBN, opr.)	31,605-	143-43
K4FAC	110,220-	327-66	K4VFY	29,680-	106-53
W8IYP	108,850-	350-61	W6KYA	29,645-	117-49
W6MAR	107,665-	346-61	K6KWN	28,435-	121-47
WB9GVT	106,950-	341-62	W6YKS	28,380-	123-44
WA1PID	105,525-	332-63	WA2FAH	25,520-	110-44
K4FU	105,270-	312-66			
W9YB (WB2RKK, opr.)	104,895-	326-63			

MAY 13 FMT RESULTS

The May 13 ARRL Frequency Measuring Test brought in a total of 105 entries representing 1778 individual measurements. Entries received after the announced date of May 24 are not listed (that's the day W1AW started carrying the results of the test). The umpire measured frequencies for the early run at 3542.430 and 14110.663. Due to transmitter problems, there was no 40 meter test. The late run checked out at 3537.118 7062.328 and 14,081.879 kHz. Interested in an appointment as ARRL Official Observer? If so, check with your SCM (see page 6). Plan now to participate in the September 10 FMT, full rules to appear in the Operating Events section of August QST.

HONOR ROLL

This top listing is the standing of the frequency measuring leaders. In consideration of the minimum possible error due to doppler and other unavoidable factors, we accredited as of equal merit all those reports computing 4100ths parts per million (or higher) accuracy. A participant must submit a minimum of 2 measurements to qualify for this listing.

W1BGW WA1NIG W1PLJ K1VHO W2FWK W3BFF W3CPR W3GEX W3PT WA4YVQ WSQLO W6GAAL W6BEW W6BXR W6CBF W6CBX W6FZE/I K6MZN W6NBS W6RQ W7WM W8MDL W8NWU W9JGV W9MNY W0AIG W0CFY W0MVF VE5DP Ireland.

In the following tabulation, error percentage can be determined by moving the parts-per-million decimal point (the figure shown in parentheses) 4 places to the left. Class I OOs must demonstrate an average accuracy of better than 71.4 parts per million. Class II OOs must show at least 357.2 ppm.

(.5) K0ZOD, (.6) W2SAS W3WZ W5TAD, (.8) K4RTA K9KFP K9WGN, (.9) W0PHY, (1.0) WA2MQX, (1.1) W9BCY, (1.3) W4HU W0WHE, (1.4) WB4PAG, (1.8) WA0DOZ, (2.0) W3FYK K6HV, (2.3) W2AIQ, (2.7) K6LC, (2.8) W5COS, (3.1) WA4JQS W9LIA, (3.4) W1IG, (3.6) W6AUC, (3.7) K9BCL, (4.0) W1DDO, (4.8) W4AST K9WMP, (5.1) W6RSI, (5.3) W1AYG W5LJW, (5.5) W3GN, (5.7) K6CL, (6.0) WA7SDL, (6.3) K0JPI, (6.5) W4SJS, (6.6) W6EJ, (7.3) W7FIS, (7.9) W3ADE, (8.4) W9MKL, (8.5) W3QFK, (8.6) WA6SLU/5 VE6MJ, (10.9) W0RCY, (11.6) WB2NMH K6GG, (12.8) W5YX, (12.9) VE3FVW, (13.0) W4WBK, (14.1) W1OV, (14.9) K4TXJ, (16.5) WA3BGC, (16.6) W2JDC, (16.8) W7LBK, (18.8) K4JK, (19.0) K0CQA, (20.2) WA2CCF, (23.7) K2HBA/4, (24.7) W86UAX, (26.9) W6TDZ, (27.1) W4UCL, (27.3) WA7OBH, (36.3) W8LOK, (37.1) W5QNY, (43.2) WA6JZZ, (47.9) W8TZZ, (49.8) K3NEZ, (52.1) K0VQM, (52.4) W2BFS, (64.9) WA3IYS, (71.2) WNSFYL, (78.9) WN4TDI, (128.8) WA1PHE, (199.7) WASRJO, (277.1) James W. Pierce, (403.5) WB2YOD.

Strays

100 QSLs = 500 QSOs = 100 Countries, by W1AX

Quite a few people have qualified for 5BDXCC (170 at the time of this writing, for example), but these generally represent QSOs with pretty close to 500 different stations. A pet "side goal" of W1AX has been to work the same station on 5 different bands representing 100 different countries. Roger says the cards range from a 5-bander with CM9AB in March of 1959 to one with VR1AA in March of this year.



Operating Events

de W1V1

JULY

4 **WJ4ULY operation** by the Columbus AR Assn. the full 24-hour GMT period. Operating frequencies around the clock will be: 3510 3570 3810 3910 7010 7040 7210 7270 14010 14050 14230 14280 21010 21070 21260 21320 28010 28510, Novice 3725 7175 21150. QSL via WSTO, 280 E. Broad St., Columbus, Ohio 43221 with an s.a.s.e.

6 **W6OWP Qualifying Run** (W6ZRI, alternate) 10-35 wpm at 0400 GMT on 3590/7129 kHz, 10-35 wpm. This is 2100 PDST the night of July 5. Underline correct minute of highest speed copied, certify copy made without aid and send to ARRL for grading.

10-13 **Democratic National Convention, W4AUSA**, 10 am - 10 pm daily, EDT. Freqs.: 7072 7272 14072 14317. QSL with s.a.s.e. to W4AUSA, P. O. Box 501, Miami Springs, Florida 33166.

14 **WIAW Qualifying Run** 10-35 wpm at 0130 GMT on 1.805 3.580 7.080 14.080 21.080 28.080 50.080 and 145.588 MHz. This is 2130 PDST the night of July 13. Underline one minute of top speed copied, state no aids used (typewriters OK), sign and mail to ARRL with your full name, call (if any) and complete mailing address.

15-16 **"Open" CD Party** cw, p. 70 June. **Space Net VHF Contest, S.C. QSO Party**, p. 105 June.

22-23 **"Open" CD Party** phone, p. 70 June.

23-29 **100 Year Centennial of Bismarck, N.D.**, p. 105 June.

29-30 **CW County Hunters Contest**, p. 105 June.

29-31 **Kentucky QSO Party**, sponsored by the Bluegrass ARC starts 2000Z July 29 and ends at 0200Z July 31. Exchange QSO no., RST(C) and county (for Ky.), all others send state, province or country. A station may be worked once per band per mode. Ky. stations may work each other for QSO and multiplier credit. Score 1 point per complete QSO. Ky. stations use states, provinces or countries for multiplier, others use the no. of Ky. counties worked. Appropriate awards. Suggested freqs.: phone 3910 7265 14285 21360 28600, cw 60 kHz up from the lower band edge. Logs must be mailed by Sept. 5. Send to: W44SUJ, P. O. Box 5433, Lexington, Ky. 40505. Enclose an s.a.s.e. for a copy of the results.

AUGUST

9 **W6OWP Qualifying Run.**

12-13 **Maryland-D.C. QSO Party**, sponsored by the Maydale ARC, starts/ends 2200 GMT. A station may only be contacted once on each band/mode. Separate logs must be submitted for each mode across logs should be kept to eliminate duplicate QSOs. Md.-D.C. stations send QSO no., RST(C) and county. Independent cities of Baltimore and Wash., D.C., count as separate counties. All other stations use ARRL section or country for location. Md.-D.C. stations count 1 point for each no. sent and one point for each no. received, multiplied by each different ARRL section or country. Other stations use the no. of Maryland counties or independent cities for multiplier (25 total). Appropriate awards. Readable log with all info. should be sent promptly to Carl Andersen, K3JYZ, 14601 Claude La., Silver Spring Md. Each entry must include the name and address of the operator in block letters, along with the usual statement. Enclose an s.a.s.e. for a contest summary. Suggested freqs.: cw, 3575 7075 14075 21075; phone, 3920 7275 14275 21325; novice, 3735 7175 21110; techs. 50.75 and 145.175.

15 **WIAW Qualifying Run.**

19-20 **New Jersey QSO Party**, sponsored by the Englewood AR Assn., 1900 Aug. 19 to 0600 Aug. 20 and from 1200-2300 Aug. 20, open to all amateurs. Phone and cw are considered the same contest. A station may be contacted once on each band - phone and cw are considered separate bands. N.J. stations may work other N.J. stations. Suggested freqs.: 1810 3555 3740 3940 7060 7170 7270 14075 14280 21100 21375 28575, 50-50.5, 144-146. Phone activity is suggested on the even hours. Exchange QSO no., RST(C) and QTH (ARRL section or country, N.J. stations send their county). Scoring: out-of-state stations multiply no. of complete N.J. QSOs times the no. of N.J. counties worked (maximum of 21). N.J. stations; W/VE QSOs count 1 point, others count 3 points. Multiply total points times the no. of ARRL sections (including N.N.J. and S.N.J., max. 74). KP4, KH6, KL7, KZ5 count both as 3-point DX contacts and as section multipliers. Appropriate certificates. Logs must show GMT time/date, band, emission. They must be received not later than Sept. 16. The first contact for each claimed multiplier should be indicated. Include a check list of QSOs and multipliers. Note multiplier operator entries by indicating calls of all participants. Logs and comments go to the Englewood AR Assn., Inc., 303 Tenafly Rd., Englewood, N.J. 07631. A no. 10 size s.a.s.e. should be included for results. Stations planning active N.J. participation are requested to advise the FARA by Aug. 5 to aid in planning for full

coverage. **SARTG World-Wide RTTY Contest** starts 1500 Aug. 19 and ends 1800 Aug. 20, 80-10 meters. The same station may be worked on each band for QSO and multiplier credits. Classes: single op. up to 100 watts, single op. over 100 watts, multiop./single transmitter (any power), SWL. Exchange QSO no. and report. QSOs with one's own country worth 5 points, other country same continent 10 points, other continents 25 points. Bonus of double point value for QSOs with Scandinavians. Multipliers are each country worked and each district in W/K, VE/VO, PY, LU, VK, ZL, JA. Logs must contain band, date/time in GMT, calls, exchanges, multipliers and points. Separate logs for each band. Enclose a summary with your call, name, address, classification, scoring. Send by Sept. 18 to Bo V. Ohlsson, SM4CMG, SARTG Contest Mgr., Box 1258, S-710 41 Fellingsbro, Sweden. Appropriate awards.

21-24 **Republican National Convention, W4AUSA**, 10 am - 10 pm daily, EDT. Freqs.: 7072 7272 14072 14317. QSL with an s.a.s.e. to W4AUSA, P. O. Box 501, Miami Springs, Florida 33166.

26-27 **Ohio QSO Party, All-Asian Contest**, cw only, from 1000 GMT Aug. 26 to 1600 Aug. 27. Exchange RST plus age (YL send 00). Contact only Asians, each worth a point. Multipliers of one for each prefix of the Asian country. (Note, J1J1 Ogasawara is Asia but J1J1 Minamitorishima is Oceania.) Single band single op., multiband single op., and multiband multiop. single transmitter classifications only. In logging, use GMT, fill in prefix/country on the first time it is contacted. Use a separate sheet per band and a separate summary. No crossband. Contacts with KA stations not permitted. Appropriate certificates, and medals. Usual rules for disqualification plus duplicates in excess of 2% are grounds for disqualification. Logs must arrive by Nov. 30 and go to the IARL Contest Committee, Central Post Office Box 377, Tokyo, Japan. **S.C. QSO Party**, sponsored by the Low Country ARC from 1800 GMT Aug. 26 through 1800 Aug. 27. Full or part-time operation permitted. All bands, all modes and the same station may be worked on different bands/modes for extra points. Exchange QSO no., RST(C) and state, province or country. S.C. stations send county for QTH. Score 1 point per complete QSO and multiply by the no. of different S.C. counties worked. S.C. stations count S.C. as only one multiplier. Appropriate certificates and plaques. Suggested freqs.: cw, 1810 3590 7060 14060 21060 28060; ssb, 3975 7260 14290 21375 28650. Logs showing date, time, band, mode, locations with claimed score to be mailed no later than Sept. 15 and goes to Contest Chairman, Box 5026, Low Country ARC, Inc., No. Charleston, S. C. 29406. Please do not send your original log. All logs will be kept as club property.

26-28 **Delta QSO Party**, open to all, from 2000Z Aug. 26 to 0200Z Aug. 28, no time or power restrictions. Contact between non-Delta amateurs and Delta-Division hams (Arkansas, Louisiana, Mississippi, Tennessee). Exchange QSO no., RST and QTH (ARRL section for non-Delta, county and state for Delta hams. Logs must include date/time, stations, exchanges, bands, emission and multipliers. Stations may be worked on each band/mode and portables/mobiles may be reworked if they change counties. Suggested freqs.: 3550 3990 7050 7290 14050 14290 21050 21390 28050 28590, Novice 3775 7175 21125. Scoring: Delta Division no. of QSOs times no. of sections; outside stations no. QSOs times no. of counties (max. 316). DX stations may be worked but do not count as multipliers. Appropriate awards. Any station disrupting a working Delta Division traffic net or whose log exhibits obvious irregularities will be disqualified from award consideration. Logs must be postmarked no later than Sept. 25 in order to be eligible for award consideration. They will be returned, if requested. Send logs to: Malcolm P. Keown, W5RUB, 213 Moonmist, Vicksburg, Mississippi 39180.

SEPTEMBER

7 **W6OWP Qualifying Run.**

9-10 **VHF QSO Party.**

10 **Frequency Measuring Test.**

13 **WIAW Qualifying Run.**

20-22 **YLRL Horsey Days.**

23-24 **VE/W Contest.**

26 **WIAW Morning Qualifying Run.**

November 11-12, 18-19: Sweepstakes.

December 9-10: 160-Meter Contest.

**SWITCH
TO SAFETY!**

All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

DELAWARE — SCM, Roger E. Cole, W3DKX - SEC: WA3DUM. RM: W3EBE. PAM: WA3GSM. The Delmarva Hamfest Committee reports the 1972 Delmarva Hamfest will be held at the State Fairgrounds in Harrington, Del. on Sun. Aug. 13 from 10 A.M. to 4 P.M. The Mason-Dixon Pirate Radio Society, a group of former WA3GAY staff members, announces WA3GOY as pres.; WA3IID, secy.-treas.; WA3GSM, act. mgr. W3KET has made a rapid recovery from a serious heart attack suffered in Mar. WA3GLG is the new treas. of the First State ARC. WA3BAO has turned over the Del. 2-meter (am) NCS spot to WA3OYA. All hams are welcome to this net. Mon. at 7:30 P.M. local time on 145.26 MHz. WA3GSM and WA3FRV are new SBE 34s mobile. DEPN reports QNI 63, QTC 19, sessions 147 minutes. PSHR: WA3DUM 32. Traffic: WA3GSM 66, W3FEB 62, W3DKX 42, K3TVV 14, WA3DUM 8, K3KAJ 8, WA3FRV 5, K3NEZ 4, W3HKS 3.

EASTERN PENNSYLVANIA — SCM, George S. Van Dyke, Jr., W3HK — SEC: W3PFB. RMs: W3EML, K3BR, K3MVO, WA3AFI, K3PIE, W3CDB. PAMs: K3BHU, WA3PLP. OBS reports were received from WA3KFT, WA3AFI, K3BHU, K3SLG, WA3QOZ, W3ID, W3CBH. OVS reports from WA3KFT, W3CL, K3VAX, W3ZRR. OO reports from W3BFF, K3RDT, W3NNC, K3NSN. BPLs: W3CUL, W3VR, W3EML, K3BR. PSHR: K3BR, WA3OGM, WA3QOZ and K3MVE.

Net	kHz	Time/Days	QNI	QTC	RM/PAM
EASN(Mar.)	3726	6:30 P Dy	246	75	WA3JSU/1
EASN(Apr.)	3726	6:30 P Dy	271	103	WA3JSU/1
PTTN	3610	6:00 P Dy	92	42	WA3AFI
EPA	3610	6:45 P Dy	412	304	K3BR
EPA&PTN	3917	6:00 P Dy	453	140	WA3PLP
PFN	3960	5:30 P M-F	479	506	K3BHU
EEFN	3733	6:30 A Dy	265	217	WA3QOZ

New officers at U of Penn ARC are WR2FWW, pres.; WA2AAN, vice-pres. Lafayette College ARC: WR2VUF, pres.; WA2BCY, vice-pres.; WA2IUR, secy.-treas.; WA3FPM, trustee. WA3QOZ puts out a nice bulletin for the Early Eighty Net. W3BUR back from an FB cruise in the Caribbean, QRP but had a battle with S.A. broadcast stations on 3610 kHz. W3BNR travels three weeks out of four. WA3OGM going to update EPA directory, any changes give them to him. W3GMK looking for interested RITY traffic boys for a net Sun, mornings 8:30 A.M. Watch for Ham-O-Rama by the Mt. Airy VHF Club. Flea Market, Auction Food Demonstrations. It is hoped that this will be the stepping stone to an Atlantic Division Convention in the Delaware Valley in '76. Oct. 1, 1972 Warwick, Pa. Contact W3ZD for details. W3CUL and W3VR are back from Fla., best winter yet they say! A real successful EPA dinner was sponsored by the PFN. K3MVO says broadcast sked interferes with his traffic skeds. EPA and PTTN are moving to new net times as follows: EPA 7:00 P, PTTN to 6:30 P; this is to relieve interference with dinner hours and gardening! W3ADE got the SB-102 going, now for the linear! WA3CFU going all battery on FD. W3LC has new SB-300 building SB-401 and linear. W3EU teaching code to his grandchildren. W3ID reports he is now retired and will be adding to the QRM. K3VAX working on a repeater on 2 meters for Lancaster Co. WA3PTU reports that he and K3DIN, WA3GPM, WA3JST and WA3QLR provided communications during the Lebanon Society March of Dimes, tied in with the local police and CD. Traffic: (Apr.) W3CUL 2287, W3YR 601, W3EML 518, WA3OGM 358, WA3QOZ 325, K3BR 244, K3MVO 112, WA3ATQ 62, WA3AFI 50, WA3QFN 37, W3ADE 41, WA3QLG 33, W3VAP 28, W3YR 25, W3HK 23, W3CBH 17, WA3CFU 12, WA3KKM 12, W3CL 11, W3BNR 7, W3OML 7, W3FPC 6, W3BUR 5, K3KNL 5, WA3BJQ 2, W3ID 2, W3LC 2, WN3QWP 2, K3EOB 1, W3EU 1, W3GMK 1, K3VAX 1, W3YPF 1. (Mar.) W3VAP 15.

MARYLAND-DISTRICT OF COLUMBIA — SCM, Karl R. Medrow, W3FA — RM: W3EZT. PAM: W3FCS. W3TN and WA3LQV made BPL in Apr. There are 5 PSHR men this month. The Mar. activity report of WA3LQV was lost by air. The annual section traffic-men get-together is Aug. 6 at Patapsco State Park, area 66, Glen Ardney, MDD, MDCTN and MEPN will be out in force. W3BHE reports the Mountain ARC passed 7 Novice licensees and training more. He says the PO net is active Thur. 5:15 local on 3907. WA3IYS has it narrowed to 2 schools for next fall. WA3PIG is 90% complete for a return to the fray with the new rig. W3ABC reports Goddard's ARC Apollo 16 call W3GSPC brought in many QSL cards. W3OKN continues to cover the northeast. WA3RDU made it big in the CD, W3FCS and XYL WN3PLY vacationing in Ireland. W3ZNW keeps Willows on the map regularly. W3EOV has prospective trip to AK and NM in June. W3ECP works both cw and fone. W3TN has a busy cw schedule. WN3OYP did it big for traffic and WN3RCI votes to make HPH. K3NCM and the Hagerstown gang were at the Potomac area VHF Hamfest in Westminster. WA3OHF has visions of a beam now that the folks are moving out of the apartment and into a house. Another new happy home owner is K3TNNM. After all the honors of 50 years W3CDO is just plain hamming and taking it easy. W3MSN continues to enjoy SSTV. WA3GXX retired in May and joins the Airstream Caravaners. WA3IIV is lined up for the Va. Caravan. Look for both of 'em portable. The Maydale ARC announces the MDC QSO party 2200 GMT Aug. 12, 13. Same rules as last year. Up 75 from the low end except 3920 on 80-meter fone and 3735, 7175, and 21110 for Novices: 50.175 and 145.175 for technicians. WA3EOP reports Antietam RC station W3CWC will be communications center for the local scouts Keep America Beautiful Day. Club mobiles plus Cbers will participate. The MEPN toppers were W3ADQ, W3DKX and WA3EJK. K3KMO was heard on 2 meters getting into the repeater, no less. W3JQN is back with new sb gear. MDCTN has 49 messages in 18 sessions with 14 stations per session. K3UAV took that fateful step into matrimony. W3LDD is trying to get those last few counties before they disappear. W3LBC says the 13th annual B&O/C&ORR ARC banquet was a good one. New officers are W3QOH, pres.; K3CKC, vice-pres.; W3LBC, secy.-treas.; W3VMF, act. mgr. Traffic: (Apr.) W3TN 231, W3OKN 172, WA3LQV 164, W3ABC 71, WN3OYP 65, W3FCS 52, W3FA 43, WA3MSW 32, K3BA 30, K3GZK 24, W3EOV 20, W3ECP 14, K3QDC 13, W3FVZ 12, WA3IV 12, K3TNNM 8, WA3RDU 6, WA3OHF 5, W3ZNV 5. (Mar.) WA3LQV 156.

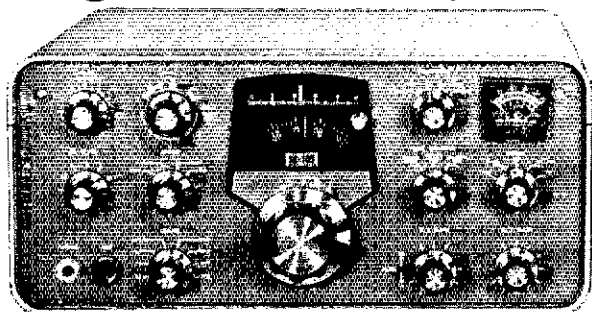
SOUTHERN NEW JERSEY — SCM, Charles E. Travers, W2YPZ — SEC: W2LVW. PAMs: WB2FJE, WB2HMU. RM: W2JI.

Net	Freq.	Time(PM)/Days	Sess.	QNI	T/c.	Mgr.
NJPN	3930	6 Su	5	57	17	WB2FJE
ECTTN	7290	4:30 M-Su	27	295	96	WB2HMU
Mc VHF	145.9	8 F	2	5	0	W2YPZ
NJN			30	600	480	WA2UOO

Gloucester Co. RC reports W2FBF as winner of the W2SUA Award for high score in the 1972 ARRL DX Contest. A recent OPS appointment renewal is WA2KWB. W2ORS reports several stations with bad key checks and chirps. If you can assist in any way, please consult W2ORS. A most successful Emergency Exercise in the state RACES program was held Thur. May 4 from 7 P.M. to 11 P.M. This was a statewide exercise sponsored by the N.J. CD and Disaster Control. Congratulations and thanks to all who took part. The following were NCS for the State EOC: W2DNF, W2JI, W2YPZ, W2KWE and W2OHF. Traffic: WB2VEJ 198, WA2FGS 61, WB2HMU 48, W2ORS 46, W2ZQ 42, WB2FJE 19, W2JF 17, W2YPZ 10, WB2SFX 4.

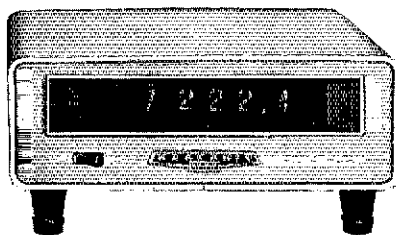
WESTERN NEW YORK — SCM, Richard M. Pitzeruse, K2KTK — Asst. SCM: Rudy M. Ehrhardt, W2PVI. SEC: W2CFP. Section Nets appear in Apr. Station Activities. PLEASE fellas, take note of my address on page 6 of this QST and be sure your records show the house number 407. The Buffalo Area DX Club provides an outgoing QSL service for members. NYS reports handling 380 messages with 787 check-ins for Apr. WA2OMN is active in the Intruder Watch. WA2PZD finally hooked Asia for his WAC. all on 20 cw with less than 100 watts. Congrats to WB2YQH on receiving his A-I Op. WA2DHS will attend Cornell this fall. WA2EKW has a new

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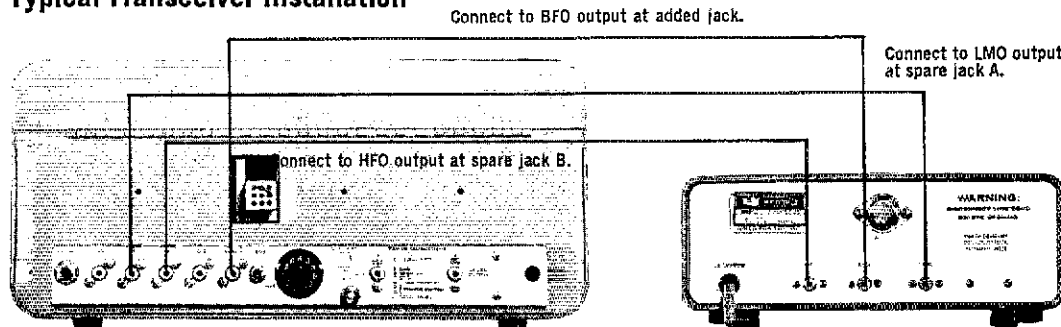
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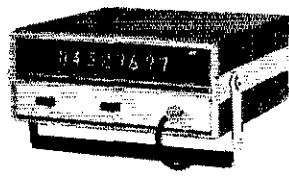
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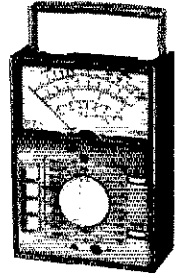
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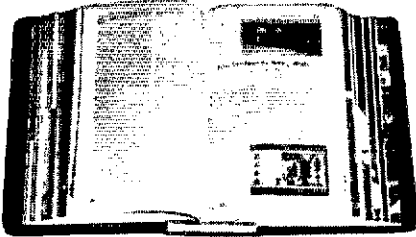
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FTDX-570. WA2HJL visited PY and likewise WA2DHG for 8P6. The Suny at Buffalo offered an attractive certificate to those who worked club station WA2NPQ during Amateur Radio Day at that College. The Rochester gang under the leadership of new EC WA2EDT did a fantastic job of providing phone patch contact with the USS Hope off the coast of PY during a "Walk for Hope" marathon held in that city. W2GLB as /W6 and W7 transplant does an FB job as NCS on the NYPON. Sorry to have lost W2AFQ to Silent Keys. STARS will hold a Hamfest-Flea Market Sept. 16. Contact WB2HCL for details and or tickets. RAGS and the Syracuse VHF Club are still go for the Syracuse Hamfest Oct. 7. Contact W2ABV for details on that one. Congratulations to W2RQF and WA2PZD on being two of the top OOs in the country as per the ARRL year-end report. K2PPK tries his luck at mobile. WA2SFU has a fine signal with his new 270B. According to W2OZR, RAWNY is in its 50th year. Congrats to an FB organization. Novices interested in becoming topnotch operators would do well to contact W2RUF concerning her training nets. Some real FB operators have developed with her guidance. K2QIW relocated to Auburn from Hion and is proprietor of the Pine Hill Grocery. He invites vacationers to QSO. Welcome as an ARRL affiliate to the Buffalo Area DX Club. WA2CDV is trying his luck at DX on the normal 5 hf bands. WA2AYC joins the HW-101 set. 6PL: W2OE. Traffic with the ^ indicating PSHR: (Apr.) WA2ICU* 351, W2OF* 314, W2FR* 202, W2RUF* 200, WA2ELD* 193, K2QIW 116, K2JBX 106, W2MTA 78, W2FZK 76, WB2LQP 71, W2RQF 70, WA2EWC 65, WB2NRK 61, K2UIR 58, WA2SIR 56, WN2PUU 55, K2KTK* 52, W2BU* 51, W2MSM 47, K2CC 43, W2EAF 30, WB2EEX 29, WN2AEB 27, WB2VND 27, K2OFV 24, WN2SIS 22, WN2SIY 19, WA2TLB 19, K2DNN 17, WN2EDU 14, WA2PZD 13, W2GLB 11, WA2OMN 11, WA2NPQ 8, WA2ICB 6, W2PNW 6, W2CFP 5, WA2LUF 5, WA2MPC 5, W2PVI 5, WB2FAW 4, WB2FTG 4, K2IMI 4. (Mar.) WA2LUF 24.

WESTERN PENNSYLVANIA - SCM, Robert E. Gawryla, W3NEM - SEC: W3KPI. PAM: K3ZNP. RMs: W3LOS, W3KUN, WA3PU. WPA CW Net meets daily on 3585 kHz at 7:00 P.M. KSSN meets Mon. through Fri. at 6:30 P.M. on 3585 kHz local time. The Penn State ARC WA3HCG, has a new slate of officers for the coming year - WA3JH, pres.; WA3JBN, vice-pres.; WA3GYT, secy.-treas.; WA3HK, station dir.; WA3NLO, WA3FYR, WA3HZP, exec. board. QUA-RAE (Radio Amateurs of Erie) honored K3AKS as Ham of the Month. The monthly transmitter hunts of RAE have been resumed. Interested parties contact WA3HSR of Erie for details. RAE also issues the Lake Erie Award. Contact them for further information. W3YDP and W3RYC are again back in the mobile gang around the Pittsburg area. The Steel City ARC honored W3ZDW as their Ham of the Month. WN3SPG is a new Novice in the Greensburg area. WA3SQN is now a General Class licensee. The youngest son of W3NEM is now WN3SMB and hopes to make it WA3 in June. He says he would like to work K3SMB one of these days. Otto what say? The PSHR for Apr. is as follows: K3ZNP 56, WA3NAZ 55, W3LOS 39, W3NEM 39, W3YA 34. WPA CW Net had 39 sessions in Apr. with 361 stations QNL, and handled 167 messages. Traffic: W3NEM 177, W3YA 131, W3LOS 128, W3KUN 75, WA3NAZ 71, K3EXE 58, K3ZNP 51, W3MJ 50, W3ATQ 36, WA3MDY 33, WA3IYA 30, WA3PXA 18, K3SMB 16, WA3HSR 13, W3IDO 2, WA3PMI 1.

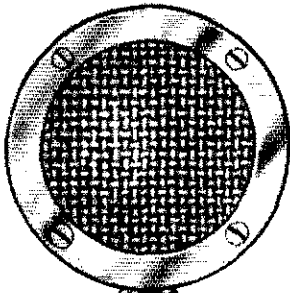
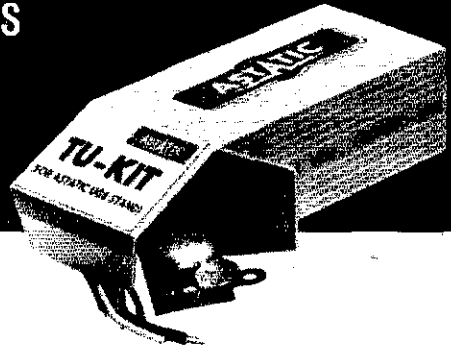
CENTRAL DIVISION

ILLINOIS - SCM, Edmond A. Metzger, W9PRN - SEC: W9RYU. PAMs: WA9CCP and WA9PDI (vnr). RM: WA9ZUE. Cook County EC: W9HPG.

Net	Freq.	Time(Z)/Days	Tye.
IEN	3940	1400 Su	no rpt.
ILN	3690	2330/0300 Dy	131
NCPN	3915	1300/1800 M-S	93
III PON	3915	1430/2245 M-F	466
III PON	148.5	0200 MWF	24
III PON	50.28	0200 M	10

WA9ZUF would like more check-ins on the ILN. Please contact him on 3690 at 2330/0300Z. Our sympathy to the families and friends of W9LIU and W9RWL who have joined the ranks of Silent Keys. WN9JSN of Homewood would like to correspond with Novices interested in starting a Novice Chess Net. Mark your calendar for Radio Expo '72, July 8 and 9 at the Lake County Fair Grounds. W8GIZ now is W9MMZ, his QTH is Harrington, Ill. W9IDY's antenna is down for repairs. WB9AUR received his WAS certificate. W9KKB now is an Advanced Class licensee. WA9ZAK qualified for 5BWAS No. 104. K6YRA is now W9RYA. W9HPG was guest speaker at the Apr. meeting of the Rockford ARA. WINJM, W9PRN and W9HPG were guests of the Decatur, Springfield and Streator Radio Clubs prior to the Starved Rock Hamfest. The newly

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formed 10-meter NARC net meets at 9 P.M. Fri. at 28.9 MHz. Check with WA9LEQ for further details. New Novice heard was W9YIKT in the Chicago area. Coming Hamfests: Breakfast Club, July 15 and 16; 6-Meter, Aug. 6; SARA Picnic and the Hamfesters Picnic, Aug. 13 and the Peoria Hamfest, Sept. 17. WB9FCW of Streator is a new General Class licensee. Traffic: K9AVQ 195, WA9ZUE 170, W9NXG 137, W9DOQ 93, W9JXV 81, W9FLF 69, W9HOT 45, W9LNO 45, W9FHI 38, WA9LDC 38, WB9FHI 37, WA9RTB 37, WA9OBR 26, WB9ELP 16, WA9NZF 11, W9PRN 11, WB9AWY 8, W9FDY 4, W9LDU 1, W9TAL 86.

INDIANA - SCM, William C. Johnson, W9BUQ - SEC: W9FC. RMs: W9ANT, WB9EAY, W9FC, W9HRY, WA9ZKX. PAMS: K9CRS, WA9OHX, (vhi) W9HWR, W9PMT.

Net	Freq.	Time(Z)/Days	T/c	Mgr.
ITfcN	3910	1330-2300 Dy 2130 M-S	378	WA9OHX
QIN	3656	0000-0300 Dy		WB9ANT
IPON	3910	1245 Su 1830 S-S	27	WA9UMH
IPONVHF	50.7	0200 T-T	25	WA9TIS
IPONCW	37.40	0400 Dy	55	WB9AHJ
Hoosier VHF			18	W9PMT

W9BTZ is new EC for Noble Co.; WB9DNT new EC for LaGrange County. K9LSB has Allen County. W9BDP renewed as EC for Fayette Co. WVARA of Terre Haute, Ind. has worked out an agreement with the Red Cross to install an amateur radio station in their new Bldg., with the call of W9IUIU. WA9VJD is an Extra Class licensee. Repeater input and output Michigan City 146.37-146.97; Indianapolis 146.10-146.70; 146.16-146.76, 146.04-146.64. The Ind. TV & UHF Club had their meeting May 6 with W9NTP as host. W9NTP was awarded the Outstanding Amateur award at the Dayton Hamvention. W9DUU gave a talk on using UHF Converter for 420 MHz. WA9HJC talked on the High Frequency feed line. EC WA9YXA for 7 Co. in Southern Ind. has been checking the Ohio river for recent flood conditions. WA9OYL has his WAC and WAS certificate, K9RWJ is Editor and certificate custodian of the LARKS publication Finteachers. The Flora, Ind. 100th Year Centennial Celebration is July 2-8. All messages will be received by K9EFY for this occasion. WB9AHJ is a Marconi-Commemorative station for the 75th Anniversary of the Marconi-Kemp Test - 1897 to 1972. IPON SSB net is on 50.200 every Wed. at 0200Z. Gibson Co. AREC Net, traffic 4. Traffic: (Apr.) WA9WJA 290, W9QLW 140, W9HRY

125, WB9GVT 104, WA9OHX 97, WB9EAY 93, W9FWH 61, W9BUQ 58, K9CXY 49, WB9AHJ 27, WA9GIZ 27, WA9AXF 26, K9EFY 26, W9PMT 26, WA9CHY 25, K9YBM 25, K9OPL 23, W9DZC 22, K9RPZ 20, WA9TIS 18, W9RWB 17, W9MGC 17, K9DIY 16, K9IQY 15, WA9YXA 14, K9APH 12, W9IRT 12, WA9ULW 12, W9RTH 11, W9UFM 11, WA9WME 11, WA9WMT 9, K9ILK 8, K9RWQ 8, WA9OAD 7, WA9OKK 7, K9KFM 6, W9RDP 4, W9HWR 4, K9VFE 4, WA9BVL 2. (Mar.) K9OPL 78.

WISCONSIN - SCM, Joseph A. Taylor, W9OMT - SEC: W9NGT. PAMS: K9FHI, WA9OAY, WA9OKP, WA9PKM. RMs: W9KQB, K9KSA, WB9DXK.

Net	Freq.	Time(Z)/Days	QNI	QTC	Mgr.
WSBN	3985	2300 Dy	1314	142	K9FHI
WIN	3662	0015 Dy			WB9DXK
BEN	3985	1700 Dy	730	84	WA9QKP
BWN	3985	1145 M-S	554	325	WA9OAY
WSSN	3662	0100 TTS		6	K9KSA
SW2RN	145.35	0130 Dy	156	8	WA9PKM
WI-PON	3925	1701 M-F	349	79	W9EMC

K9GSC reports the WRN had 21 QNI with 5 sessions in Apr. In an effort to standardize fm operation within the section most repeaters have adopted the "Texas Plan" as outlined in May QST. Green Bay's 28-88 is in operation and the Rib Mountain group has elected officers with WA9SQN as pres. Their machine will be on 34-94. Thanks to K9DKW for his efforts in the passage of AB 976. The Neenah-Menasha Club had a fine turnout for their May 6 banquet and the WVARA had ex-ETSUD show slides at their May meeting. W9ROM operated portable 4 in Pensacola for two weeks and had nice article in Wausau Record Herald magazine section on his amateur activities. W9UCR's note loud and clear with new SB-102. W9WYL mobiled 6500 miles in the SW. Congrats to WB9FWK on his General and to WB9ELH on the Advanced Class license. K9LGU operated portable with emergency antennas in Stevens Point for Apr. CD phone party. Congrats to the following for new or renewed appointments: WB9EJA EC for Fond du Lac Co.; K9JPS EC of Marathon Co.; W9UCR and K9GSC, ORSs and WA9ZAZ OPS. Traffic: K9CPM 339, W9CXY 332, WA9ZAZ 133, W9DND 82, K9FHI 82, WB9ABF 76, W9MMP 51, W9UCR 48, W9ESJ 41, W9IHW 33, K9JPS 30, WA9OAY 30, WA9BZW 27, W9KRO 27, W9BCH 21, W9KMF 17, WA9SUU 17, K9KSA 15, WA9PKM 11, W9WYL 10, W9DXV 9, W9NRN 8, K9UTQ 6, K9LGU 1.

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DAKOTA DIVISION

MINNESOTA - SCM, John H. Halstead, K0MVF - SEC: K0LAV. RMs: W0ZHN and WA0YAH. PAMs: K0FLT and WA0HRM. K0ZGF is a Silent Key. WN0GKH and WN0FNA are starting a net in the Novice portion of 80 meters. Frequency is 3742 kHz and time is 2300 GMT - 6:00 P.M. on Mon., Wed. and Fri. Everyone is welcome and Novices will be tuned from 3700 kHz to 3750 kHz. Novices can send their crystal frequency to WN0GKH, Mitchel Schultz, Route 2, Janesville, Minn. 56048. Traffic: (A pr.) WA0VAS 673, WA0YVT 214, W0ZHN 171, K0ZRD 135, WB0CMM 118, WB0DZA 114, K0PIZ 100, W0WFA 68, WB0BRG 67, WA0ONE 57, WA0TTC 57, WA0YVA 57, K0ZBI 43, K0FLT 39, WA0VYB 38, WA0YAH 38, WA0DCQ 25, WA0WWT 22, WB0DVP 21, WA0HRM 21, W0BOB 17, W0FHH 16, W0KNR 13, WB0DDH 9, WA0MMV 9, WA0RKE 9, WA0YGE 9, WA0JPR 7, K0WXH 7, WN0GKH 6, WB0CAP 5, K0ICG 5, WB0FMR 4, K0SKX 3, W0UMX 2. (Mar.) WB0CAP 7. (Jan.) WA0JPR 31.

NORTH DAKOTA - SCM, Harold L. Sheets, W0DM - SEC: WA0AYL. OBS: WB0ATB. OO: W0BF. RM: WA0MLE. Hope you made plans for the International Peace Garden Hamfest July 8, 9. WB0BMC and WB0BMH at Rugby have new tickets and are on with the Drake line. WN0HIN is a new Novice. Congrats to all of you. The Theodore Roosevelt Club met at the home of W0ZTL. WBSWNZ/0 reports a class of Novices and K0PYZ/0 reports another class in the offing. Congrats to WA0RWL who was selected as the first alternate to the National Science Fair from ND. 2 meters is picking up with the coming up of the repeater station. WA0ALP has a Regency HR2 and worked W0PHD 61 miles away. WA0MLE and WA0ELO put in 30 and 26 hours respectively on TEN for Mar. They also do a nice job on NDN. The Mid-Nite Cowboys are going at it again. Join them after 2100 CDST on about 3995 kHz.

Net	kHz	CDST/Days	Sess.	QNI	UTC Mgr.
Goose River	1990	0900 Su	5	74	1 W0CDO
YL WX	3995	0730 M-F	10	122	145 WA0CRX WA0MND
PON	3996.5	0900 Su 1830 S-S	15	454	24 WA0SJB
RACES	3996.5	1730 M-F 1830 M-F	40	825	46 WA0ATJ
ND CW	3642	2200 MWFS	17	157	32 WA0MLE WA0ELO

W0TSB had major surgery and will now have a chance to be on the air more often. WA0MLE reports for the PSHR award. More should try for it. See QST for details. Traffic: WA0MLE 276, WA0ELO 174, WA0AAD 67, WA0SUF 60, W0DM 30, W0WUL 30, W0CDO 14, WA0JPT 10, WB0FTH 6, W0MXF 3, WB0CCA 2, W0HSC 2.

SOUTH DAKOTA - SCM, Ed Gray, WA0CPX - An amateur radio club is starting in the Aberdeen area. If you are interested contact W0JUY. A state FM Repeater Newsletter will be printed four times a year. Your SCM will put it together from news notes received from hams around the state. If you have news please send it to your SCM and if you are interested in receiving the newsletter let me know. The Prairie Dog ARC announces they will be holding a picnic for South Dakota hams as well as other states Aug. 19 and 20 at the Isaak Walton building on Lewis and Clark Lake. Net reports: WX Net closed Apr. 14, average 19 QNI/day; Morning Net 250 check-ins, 12 formals; NIQ 214 check-ins, 9 formals; Early Evening 699 QNI, 23 formals; Late Net 1230 QNI and 22 formals; SDN CW 193 QNI and 64 formals. Traffic: W0ZWL 269, W0MZI 115, WA0UEN 82, W0HOJ 58, WA0ROK 39, K0CER 27, WA0NZA 25, W0DVB 16, K0GSY 12, W0SMV 2.

DELTA DIVISION

ARKANSAS - SCM, Jimmie N. Lowrey, WASVWH - SEC: WBSCEL. RM: WAS7LS. PAM: WAS0MQ. WASBQI is now DAZER until May, 1973 and is on each Sun. 1500Z on 21.375 MHz. A West Memphis Boy Scout Amateur Radio Club has been formed with WBSCLE as pres. WNSEMEX is planning a trip to KL7 for this summer while WBSBUQ is planning to give up his WBS call for a KL7 sometime in the future. Progress is continuing on a 2-meter repeater for Monticello. New officers for the North Arkansas Amateur Radio Society for 1972-73 are: WSWE, pres. WASZKE, vice-pres.; WNSDQG, secy-treas. WBSBID has worked almost 200 countries while having his General for only about 2 months. WBSCEL is the new SEC for Ark. and I am sure he will appreciate any help that can be given to help him with the job.

Net	Time(GMT)/Days/Freq.	Mgr.
OZK	0000 Dy	J790
Ark Phone	1100 M-S	3437
Ark Teenage	2000 SS	3475
Ark P.O.	2130 M-F	3925
		WAS7LS
		WSVEU
		WASZKE
		WSOEO

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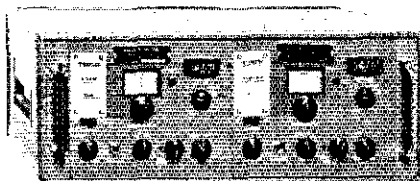


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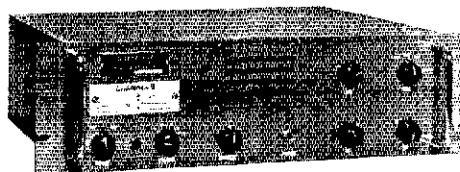


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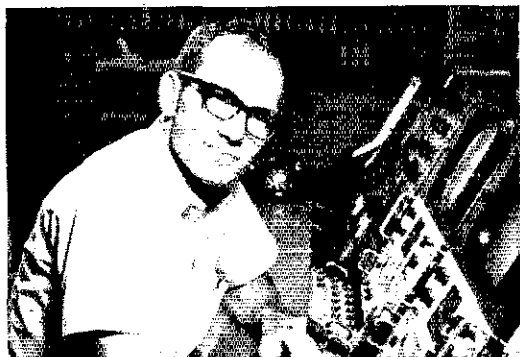
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DX Info 2345 M 3995 WA5YMW
CAREN 0100 Th 146.34/94 W5RXU

Repeaters: WASSNO Fayetteville, 32.550/53.020, 146.16/76
WB5FKF Forrest City, 146.16/76; WASYUT Fort Smith
146.34/94; WSDI Little Rock, 146.34/94; W5RHL Jonesboro
146.34/94.

MISSISSIPPI - SCM, Walker J. Coffey, W5NCB - SEC: WA5IWD. RMs: WASYZW, WB5DEK. PAMS: W5JHS, WA5KEY, K5MDX. Appointments: WASIMU, WB5EIN as ORSs; WB5EIN as OPS; WB5DEK as OBS. WB5EIN and WB5DEK made PSHE Congrats to: K5WZF now Extra; WB5APQ, WB5EPX and WB5GM now General. Glad to have new hams WN5: GMV, GNU, GNV, GNX, GPE, GOK, GOM, GOS, GRI, GRM, URN, GRO, GRR and GRY. Thanks to K5YPV pres. NE Miss. ARC for newsy letter. Club members go for 2 meters. W5TMC is away on Guard training. Novice Net Bulletin full of news, 30% of our Novices are ARR members. WB5EIN is active in 15 nets-participation yes. Jackson Hamfest will be held July 29, 30 at Hotel Heidelberg. W5AF general chm. There are Novices near you who need your help get on the air. How about it?

Net	Freq.	Time(Z)/Days	QNT	QTC	Mgr.
MTN	3665	2345 Dv	122	92	WASYZW
MNN	3733	2300 MWF	40	28	WB5DEK
GCSBN	3925	2330 Dy	-	-	W5JHS
CGCHN	3935	0100 Dy	1743	101	WA5LZB
MSPON	3970	2345 M-S	94	36	WA6GVO
MSBN	3987.5	0015 Dy	1107	174	WASTWI

Traffic: (Apr.) W55BM 284, WA5YZW 189, WB5DEK 178, W5NCB 94, W5EDT 84, WB5EIN 71, W5WZ 57, W5AMZ 40, WB5BUE 2, K5YTA 29, K8YUW/S 27, WB5EIN 12, K5TIG 8, W5RUB 8, W5SCKK 1. (Mar.) WB5BUE 10, WA0GVY/S 7.

TENNESSEE - SCM, O.D. Keaton, WA4GLS - SEC: WB4ANZ. PAMS: W4PFP, K4MOQ, WA4EWW. RM: W4ZJY.

Net	Freq.	Time(Z)/Days	Scss.	QNT	QTC	Mgr.
TPN	3980	1145 M-F	30	1581	34	W4PFP
		1300 S-Su				
ETPN	3980	1040 M-F	20	504	20	WA4EWW
TCN	3980	0100 Th	4	39	1	WB4MUI
TN	3635	0000 Dy	28	267	154	W4ZJY
KVHFEN	50.7	0100 T	4	23	0	WB4MUI
MTTMM	28.8	0100 T&F	8	51	0	W4PFP
ETTMN	28.7	0100 W&F				WA4QX
HARCN	7285	0030 W&F	8	73	2	WB4ON
EVVHFEN	50.4	0000 TTh&S	11	60	0	WB4IC
EVVHFEN	145.2	0000 W&F	8	37	0	WB4IC
TSSBN	3980	1130 M-S	25	1028	35	K4MO
TPON	3920	1100 Dy	27	104	35	WB4US
	3980	1130 S				WB4BH

Remember to attend the Crossville Hamfest on July 15 and 16. 1st recipient of the prize at the Knoxville Hamfest was WA4YF. Final results of the Tenn. QSO Party are as follows: First place Tenn., K4PUZ; First place out-of-state, W4YWK; First place club mobile, Middle Tenn. Amateur Radio Society, WB4KHW, K4QQ; WB4SUJ; First place club portable, Oak Ridge Radio Operator Club, W4SHK, W4YAC; 88 of the 95 counties were covered. 1st Honor Roll for Apr. were W4ZJY, 34 points; WB4YCV, 29 points; W4YAC, 28 points; K4CNY, 28 points; WB4USG, 25 points. Traffic: K4CNY 119, W4ZJY 113, WB4YCV 82, WB4USG 5, WB4NLR 44, WA4GLS 32, WB4MYZ 24, W4PFP 20, W4CYL 1, W4WBK 16, K4MLC 14, WB4ANX 13, WB4FEC 13, WB4DYJ 1, W4VZC 8, K4SJV 7, W4ATWL 7, K4MOA 6, WB4MPJ 5, K4UM 4, W4SGI 3, WB4TPS 3, WB4MSS 2.

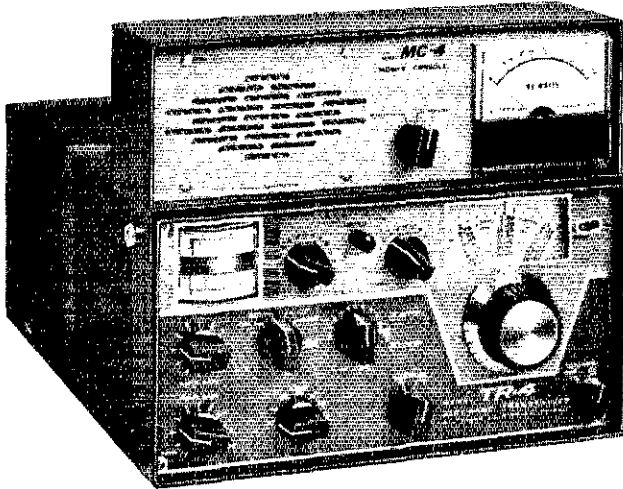
GREAT LAKES DIVISION

KENTUCKY - SCM, Ted H. Huddle, W4CID - SEC: K4YZ. Endorsements: W4OYL, WB4KPE and WB4FDK as ORSs; WB4AU and WA4GHQ as OPS; W4EWM and WA4GHQ as ECs. BPL: W4BAZ and WA4JOS.

Net	QNT	QTC	Net	QNT	QTC
KRN	357	20	KNTN	397	17
MKPN	579	39	KPON	72	12
KYN	223	207	KYN	1202	16

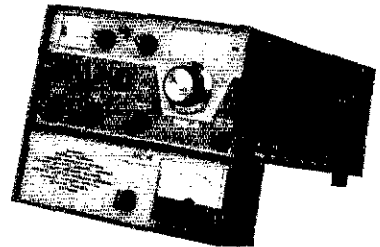
The Owensboro group participated in recent emergency as result a river barge explosion. Operations used 75 and 2 meters extensively. Active were: W4OYL, K4UDZ, W4TOY, WB4YI, WA4FMY, WB4MQR, WA4MXD, W4EWL, WB4PVC, W4LUB and W4EWM. Two meters in Eastern Ky. is expanding with many stations using the Huntington, WV repeater and the proposed installation of a new repeater at Black Mountain. K4AXE a W4YGS have new tribanders. W4OXM, W4CID and K4PGA have new 2-meter mobiles. W4YGS is looking for some 10-meter group

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- MMK-3 Mobile Mounting Kit . . . \$ 6.95
- AC-4 115/230 VAC 50/60 Hz
Power Supply \$ 99.95
- DC-4 12 VDC Solid State
Power Supply \$125.00
- 34PNB Noise Blanker \$100.00

TR-4 SPECIFICATIONS: • Frequency Coverage: Full coverage on all amateur bands 10 thru 80 meters, in seven 600 kHz ranges: 3.5 to 4.1 MHz, 7.0 to 7.6 MHz, 13.9 to 14.5 MHz, 21 to 21.6 MHz, 28 to 28.6 MHz, 28.5 to 29.1 MHz, 29.1 to 29.7 MHz. • Solid State VFO: Has linear permeability tuning. Tunes 4.9 to 5.5 MHz for all ranges. • Dial Calibration: 10 kHz divisions on main tuning dial and 1 kHz divisions on the tuning knob skirt. • Frequency Stability: High stability solid state VFO tunes same range on all bands. Drift is less than 100 cycles after warm-up, and less than 100 cycles for plus or minus 10% line voltage change. • Modes of Operation: SSB Upper and Lower Sideband, CW and AM. • Misc: 20 tubes including voltage regulator; two transistors; 8 diodes, 100 kHz crystal calibrator built in; Dimensions: 5 1/2" high, 10 3/4" wide, 14 3/4" deep. Weight: 16 lbs. . . TRANSMITTER: • Single Sideband: 300 watts P.E.P., input power, VOX or PTT. Two special 9 MHz crystal filters provide upper or lower sideband selection on any band, without the necessity of shifting oscillators. • CW: Power Input 260 watts. Carrier is shifted approximately 1000 cycles into one sideband, and mixer and driver are keyed. Grid block keying is free from chirps and clicks. Automatic transmit/receive switching when key is operated. CW sidetone oscillator for monitoring. • AM: Controlled carrier AM screen modulator is built-in. 260 watts P.E.P. input. Low carrier power increases 6 times to 50 watts output at maximum modulation. This system is compatible with SSB linears, VOX or PTT. Diode detector used for receiving on this mode. Product Detector can be used by switching manually. . . RECEIVER: • Sensitivity: Less than 1/2 microvolt for 10 dB S/N • I. F. Selectivity: 2.1 kHz at 6 dB, 3.6 kHz at 60 dB. • Antenna Input: Nominal 50 ohms. • Audio Response: 400 to 2500 cycles at 6 dB. • Audio Output Power: 2 watts. • Impedance: 4 ohms.

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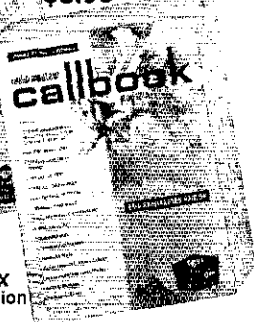
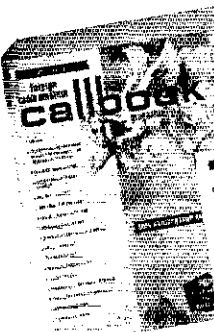
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W4CID 85, K4UNW 64, WA4VZZ 64, W4OXM 55, WB4EGR 48,
K4QCO 42, WB4KPE 40, WB4AUN 39, K4DZM 30, W4OYT 27,
WA4FAF 26, WA4GHQ 24, WB4PVC 24, WA4AGH 22, WA4AVV
19, WB4TFP 16, K4LOL 15, W4BTA 12, WA4ENH 10, W4IOZ 9,
K4TXJ 9, K4AVX 8, WA4MXD 5, WB4GCV 5, K4HOE 4, WB4ILF
3.

MICHIGAN — SCM, Ivory J. Olinghouse, W8ZBT — Asst. SCM:
H. Peter Tremi, W8KBZ. SEC: W8MPD. RMs: W8IYA, W8WVL,
W8RTN, K8KMQ, W8GLC. PAMs: K8MJK, K8PVC, W8KHB.
VHF PAMs: K8AEM, W8WVV.

Net	Freq.	Time/Days	QNI	QTC	Sess.	Mgr.
OMN	3663	2300 Dy	992	390	90	W8IYA
WSSB	3935	0000 Dy	647	114	30	K8PVC
BR/BIEN	3930	2230 S-F	830	70	35	W8KHB
OPEN	3920	2230 Dy	556	50	30	K8MJK
GUETN	3932	0130 Dy	727	48	27	W9KHK
PON	3955	1600 Dy	881	340	30	K8LNE
PON/CW	3645	2400 M-S	169	39	25	VE3DPO
MI-6M	50.7	0000 M-S	316	18	25	W8BDXE
Mi-NOV	3720	2100 Dy	103	62	28	W8BJAD

Oakland Co. AREC Net held 4 drills with QNI 56 and QTC 5, as
reported by W8MHQ. SW Mich. VHF nets had QNI 106 and QTC 3
in 8 sessions. It is with regret I report W8PX, K8CBK, K8ASF,
W8RPO and W8OZW as Silent Keys. The Tin Lizzie ARC (FARL)
elected W8ZWS, pres.; W8SHN, vice-pres.; W8SCHE, treas.;
W8NQ, secy. BR/MEN officers for '72 are W8KHB, mgr.; W8NDI,
asst. mgr.; W8FJU, secy.-treas. The Michigan Council of Amateur
Radio Clubs have voted K8ETU, pres.; W8CRP, secy. for 1972. The
Post Office Net reports W8BDKO as Amateur of the Month and the
Special Award to K8ODY. W8MKU is new Tech. in Monroe Co.
W8IIC is now on ssb. W8FZ has moved back to the Detroit area.
W8AGE is now back on the air. W8GB now at Largo, Fla. W8LCS
is back in Saginaw after 15 years and looking for his old friends.
W8YEW picked up a TR-4 and is on ssb. W8BDTJ now has
2-meter mobile in operation. New appointments for Apr. are
W8KHB as PAM and OPS; W8NDI OPS; W8BEUN OPS; W8SHQS
as OPS and QVS. W8IBX again made BPL; that makes five months
straight. The Monroe County Red Cross Disaster Unit went to
Adrian to assist in the apartment house fire which caused four
deaths and thirty-one injuries. Hams assisting were W8YIO,
W8YMB, W8YZB, K8LYY, K8OSH, W8BEFK, W8BOEZ,
W8LPV, W8UWQ, W8DVB. Lenawee Co. ARC does not have a
disaster unit. Traffic: W8IBX 362, W8WZF 332, K8DIY 215,
K8KMO 201, W8SQC 164, W8PIM 140, W8IYA 139, W8BBPY
119, K8LNE 111, W8LXY 109, W8ZBT 85, W8BJAD 73, W8GLC
66, W8NOH 66, W8SIMI 64, K8PVC 56, W8VXE 37, W8MO 36,
K8MJK 33, W8BDTJ 32, W8EU 31, W8SFBG 30, W8BBP 29,
W8TZZ 29, W8BBJ 27, W8DT 26, W8BBY 25, W8SOJ 25,
W8LDJS 24, W8WVV 24, W8WEN 23, W8KHB 23, W8NDI 23,
W8NMJ 23, W8BHP 18, W8ACW 15, W8SDKO 15, W8BETB 15,
W8IUC 15, W8SONZ 15, W8BFEZ 13, K8KCF 13, W8UFS 12,
K8JED 11, K8IHA 11, W8TBP 11, K8CPW 10, W8DCN 10,
W8FWQ 10, W8FZL 9, K8GOU 9, K8WRJ 9, W8SANR 8, W8BEU
8, W8BFXR 8, W8SHOS 7, K8ACO 6, W8ACUP 6, K8WLE 6,
W8BEZ 5, W8FX 5, W8UM 5, W8FLK 4, W8HKL 2, W8NJA 2.

OHIO — SCM, William E. Clausen, W8IMI — Asst. SCM: Kenneth
L. Simpson, W8KIX. SEC: W8OUU. RM: W8WAK. PAM:
K8UBK. VHF PAM: W8ADU.

Net	QNI	QTC	Sess.	Freq.	Time(Z)	Mgr.
OSBNN	3114	922	81	3972.5	1430/1245	K8UBK
BN	708	556	61	3577	2300/0200	W8WAK
OmMTrN	447	48	61	50.61	2300	W8ADU
				50.16	0100	
OSN	265	69	30	3577	2225	W8WAK
BN RTTY	183	109	29	3605	2200	W8SZU

BPLs for Apr. went to W8ETX, K8NQW, K8ONA and W8QJL.
W8BFC earned BPL in Mar. New appointees are W8ETW,
W8MKZ, ORSs: W8MHQ, W8JGW, W8QZK, OPSs: W8DNZ,
W8KVI, OPSs and ORSs. W8BBY has been appointed M for
Champaign and Logan Counties. Buckeye Net RTTY has new mgr.,
W8SZU. W8KKI announces the formation of an Ohio Novice
Traffic Net, meeting on 3720 kHz, Sun., Tue. and Thur. at 2145
GMT. ARRL's 1971 Annual Report recognizes our active OOs
K8NYN, who sent 461 notices and K8DIL, 114 notices. The Ohio
QSO Party is scheduled for Aug. 26, 27 under the sponsorship of
the Ohio Council of ARCs with K8EHU as contest chmn. The fifth
annual Ohio Traffic Nets Picnic will be held Aug. 6 at Hickory
Grove, Blendon Woods Park, near Columbus, sponsored by the
Buckeye Net. Contact W8WAK or any section net mgr. for details



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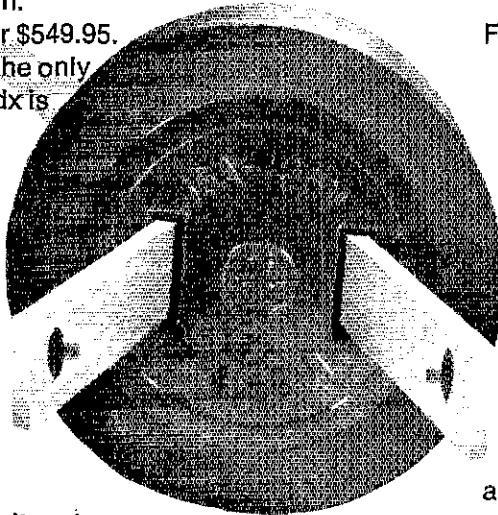
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SN7476N	SN7472N, with preset & clear	0.55
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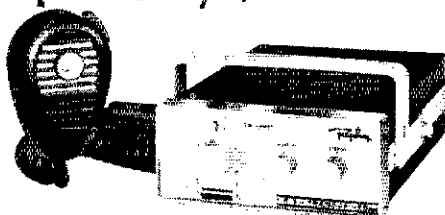
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Mobile Unit. Includes microphone, mounting bracket, tx and rx crystals for 146.94 MHz

for all your 2 Meter FM needs



Model HR-2MS 8 channel Transcan™ with signal search reception and 15 watts minimum output. \$319.00 Amateur Net.



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and a map. K8ONA succeeds the late W8BAH as writer of the Cleveland Plain Dealer ham radio column. Support is growing for 146.46 MHz as a statewide AREC and emergency frequency. Congratulations to new Advanced Class W8SIFP and new Extra Class W8BWU. Public service activities included SW Ohio AREC, United Clothing Drive; Central Ohio AREC, Cancer Drive and March of Dimes; Apricot Net, Loyalty Day Parade; Goodyear ARC, benefit telethon for retarded children; Queen City Emergency Net, Cancer Drive; NW Ohio AREC, Cancer Drive. Dayton ARA reports that Hamvention attendance hit an all time high of 5500. Canton ARC's headline reports W8DKD has organized a program of ten-meter mobile transmitter hunts in Stark and Summit Counties. K8ORL replaced W8OSM as pres. of the Goodyear ARC. The IRC News Bulletin reports the Mansfield club station moved to the new Community Services Bldg. Congratulations to W8NCV, W8OUU and W8SVU, who were inducted into the Greater Cincinnati AR Hall of Fame. Columbus ARA's annual ARRL Night featured W1RW, W8WC and W8ETU. W8EWW, writing in Toldeo's Ham Shack Gossip, described the area's severe weather network on six and two meters. The Ohio Section Emergency Plan is three years old this month and is ready for review, revision and expansion. Traffic: (Apr.) W8BETX 597, W8MCR 340, W8BJEL 279, K8NOW 244, W8BWK 229, K8ONA 224, W8PMJ 192, W8QCU 173, W8LUP 165, W8AZSM/8 157, W8RKYU 152, W8JMD 132, W8LIT 131, K8BFX 121, W8MI 119, W8NALU 113, W8VIT 112, W8FNC 100, W8FQW 96, W8QFK 96, K8UBK 94, W8YLV 93, W8GED 85, W8DQU 79, K8CMO 75, W8RCWD 74, W8OZK 67, W8ID 65, W8HHG 63, W8GVX 62, W8SFD 59, W8RKK 58, W8FAH/8 58, W8ETW 58, W8FSX 54, W8BHU 52, W8UDG 48, W8YXB 48, W8VWH 45, W8DWL 44, K8MZ 44, K8DHD 43, W8FCT 42, W8FXD 39, W8ASD 37, W8UC 36, W8FCU 35, W8BIN 35, W8WEG 35, W8BHL 32, W8RNO 29, W8VKF 29, W8MHI 27, W8ETU 25, W8UPD 25, W8MOK 23, W8AJZ 22, W8WPO 21, W8GNL 18, W8UX 18, W8NAL 17, W8PBS 17, W8BLH 16, K8BYR 16, W8OE 16, W8PNP 16, W8BAYC 14, W8GO 14, W8JGW 14, W8BCSH 13, W8SZU 13, W8YTB 13, W8DDG 12, K8DII 10, W8GRT 9, K8IDI 9, W8KPN 9, W8OUU 9, W8ARW 8, W8SSI 8, W8BCX 7, W8IRM 7, W8LAM 7, W8ORQ 7, W8MKZ 6, W8DOV 5, W8MHO 5, K8MLO 5, W8ZNC 4, W8BDN 3, K8CKY 2, W8JBP 2, W8ZLC 2, W8FGD 1. (Mar.) W8BFNC 156.

HUDSON DIVISION

EASTERN NEW YORK - SCM, Graham G. Berry, K2SIN - Asst. SCM/PAM: Kenneth M. Kroth, WB2VJB. SEC: W2URP. RM: WA2VYS. VHF PAM: WB2YOU. All Section Nets see last column for days/times. Additional net: NYR (RTTY) 2330Z nightly on 3.613 kHz; Net Mgr. K2DN. Join in - net has 2RN liaison into NTS. With the clubs in Apr.: Schenectady Club (SARA) watched making of PC boards at commercial W8MT by W2GRL. Albany ARA heard Hq. Rep. WISL, held annual Dinner Dance (busy month!) Harmonic Hills ARC Annual Dinner to be at W1LOFF's QTH. Westchester Club (WARA) heard W1NTH from Hq. Overlook Mt. (OMARC) featured film night. Communications Club of New Rochelle had first official visit from Dir. K2SJO since his promotion. W2SZ (RPI) Club lists 7 new members. AREC notes: During ecology re-cycling day, W2URP, WA2FSV, W2ODC, WB2NWI and WB2DHQ all helped with communications. SEC W2URP plans summer hiatus except for actual emergencies - needs county level FC volunteers from Orange, Greene, Ulster, Putnam, Dutchess and Columbia Counties. Get in touch now - and use summer for organizing your section! Picnic time: NYS on Aug. 12; NYSPT&EN at Glimmer Glass State Park on Aug. 19 - near Cooperstown. Details from W2MTA or WB2HLV respectively. Individual activities: W2VP on 2M/FM via W2CVT repeater. K2FW on road operating from Maritime Provinces. K2BK after last few 80 meter stations for 5BDXCC, looking around 3.5 to 3.8. WA2HHO now Extra. WB2LXC Advanced. WB2CFE is QRT from home, operating club station W2ZXX. Newcomer WN2EUE seems to have two bits missing from his call - try it on your key. If magazine reaches you in time - Field Day note: look for SCM via K2YUJ/2 as usual with FD message traffic. Everybody keep the news and notes coming for the column as your SCM starts his third term in June. Without your help, no column. Thanks for past help - and keep it up. Traffic: (Apr.) WA2VYT 63, W2URP 48, WA2CNE 47, WA2VLS 47, WA2FBI 42, K2FW 36, W2SZ 35, K2SIN 19, WB2AEO 13, W2ODC 7, W2URW 6, W2UC 5, WB2VJB 5, WA2WGX 5. (Mar.) WA2VLS 40.

NEW YORK CITY AND LONG ISLAND - SCM, Fred J. Brunjes, K2DGI - SEC: K2HTX. RM: WA2UWA. HF PAM: WA2UWA. VHF PAM: WB2RQF. The following are major AREC Nets, check in!

WHICH ANTENNA WINS THE CONTEST ?

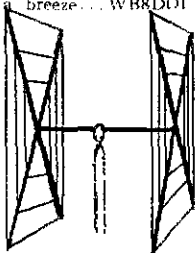
In open competition against thousands of commercial and home-brew antennas, WA1JFG won the New England championship with a Gotham beam, by a margin of 5,982 points! WB2JAM won the sectional award for the Sweepstake contest in 1969 and 1970 with a Gotham 4-element 15-meter beam! Hundreds of unsolicited testimonials from grateful hams are our proof that Gotham antennas give you the best design, and the best materials. Forget our low prices — rely on the results of open, competitive contests. Ask yourself: Why do Gotham antennas win?

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QUADS Totally satisfied with quad. Worked DK4VJP, SM7DII, XE1AB, DM4SEE, FL8SR, F6AUM, HK7YB in few hours. Instructions a breeze... WB8D01

CUBICAL QUAD ANTENNAS

— these two element beams have a full wavelength driven element and a reflector! the gain is equal to that of a three element beam and the directivity appears to us to be exceptional! ALL METAL (except the insulators) — absolutely no bamboo. Complete with boom, aluminum alloy spreaders; sturdy, universal-type beam mount; uses single 52 ohm coaxial feed; no stubs or matching devices needed; full instruction for the simple one-man assembly and installation are included; this is a fool-proof beam that always works with exceptional results. The cubical quad is the antenna used by the DX champs, and it will do a wonderful job for you!



10/15/20 CUBICAL QUAD SPECIFICATIONS

Elements: A full wavelength driven element and reflector for each band.

Frequencies: 14-14.4 Mc.; 21-21.45 Mc., 28-29.7 Mc.

Dimensions: About 16' square

Power Rating: 5 KW.

Operation Mode: All.

SWR: 1.05:1 at resonance.

Boom: 10' x 1 1/4" OD, 18 gauge steel, double plated, gold color.

Beam Mount: Square aluminum alloy plate, with four steel U-bolt assemblies. Will support 100 lbs.; universal polarization.

Radiating elements: Aluminum wire, tempered and plated, .064" diameter.

X Frameworks: Two 12' x 1" OD aluminum 'hi-strength' alloy tubing, with telescoping 3/8" OD tubing and dowel insulator. Plated hose clamps on telescoping sections.

Radiator Terminals: Cinch-Jones two-terminal fittings.

Feedline: (not furnished) Single 52 ohm coaxial cable.

Now check these startling prices — note that they are much lower than even the bamboo-type:

10-15-20 CUBICAL QUAD. \$37.00

10-15 CUBICAL QUAD. 32.00

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FIFTEEN METER CUBICAL QUAD 26.00

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(all use single coax feedline)

How to order: Send money order only (bank, store, or United States) in full.

We ship immediately by REA Express, charges collect. DEALERS WRITE!

GOTHAM, 1805 Purdy Ave, Miami Beach, Fla. 33139

BEAMS "Just a note to let you know that as a Novice, your 3-EI. 15 Beam got me RI Section Winner and New England Division Leader in Novice Round-up. See June QST, p. 57 for picture of ant. (below). Tnx for a fine working piece of gear. 73s, Jay, WA1JFG"

Compare the performance, value, and price of the following beams and you will see that this offer is unprecedented in radio history! Each beam is brand new! full size (36' of tubing for each 20 meter element for instance); absolutely complete including a boom and all hardware; uses a single 52 or 72 ohm coaxial feedline; the SWR is 1:1; easily handles 5 KW; 3/8" and 1" aluminum alloy tubing is employed for maximum strength and low wind loading; all beams are adjustable to any frequency in the band.

2 EI 20. \$21	4 EI 10. \$20
3 EI 20. 27*	7 EI 10. 34*
4 EI 20. 34*	4 EI 6. 20
2 EI 15. 17	8 EI 6. 30*
3 EI 15. 21	12 EI 2. 27*
4 EI 15. 27*	
5 EI 15. 30*	

*20-ft. boom

ALL-BAND VERTICALS

"All band vertical!" asked one skeptic. "Twenty meters is murder these days. Let's see you make a contact on twenty meter phone with low power!" So K4KXR switched to twenty, using a V80 antenna and 35 watts AM. Here is a small portion of the stations he worked: VE3FAZ, TI2FGS, W5KYJ, W1WOZ, W2ODH, WA3DJT, WB2FCB, W2YHH, VE3FOB, WA8CZE, K1SYB, K2RDJ, K1MVV, K8HGY, K3UTL, W8QJC, WA2LVE, YS1-MAM, WA8ATS, K2PGS, W2QJP, W4JWJ, K2PSK, WA8CGA, WB2-KWY, W2IWI, VE3KT. Moral: It's the antenna that counts!

FLASH! Switched to 15 c.w. and worked KZ5IKN, KZ5OWN, HC1-LC, PY5ASN, FG7XT, XE2I, KP4-AQL, SM5BGK, G2AOB, YV5CLK, OZ4H, and over a thousand other stations!

V40 vertical for 40, 20, 15,	
10, 6 meters.	\$14.95
V80 vertical for 80, 75, 40,	
20, 15, 10, 6 meters.	\$16.95
V160 vertical for 160, 80, 75,	
40, 20, 15, 10, 6 meters.	\$18.95

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● Available in the form of a rubber stamp for use on QSL cards, correspondence or any other place you want to indicate your League membership. Same size as the illustration above.

● With both gold border and lettering and a black enamel background, the League Emblem is available in either a lapel-type pin (with safety clasp) or screw-back button.

● Special colored emblems in the pin type only, are available to League Appointees: Red for SCM; Green for RM, PAM, EC, SEC; Blue for OO, ORS, OPS, OBS, OVS.

● The Emblem Cut is a logotype (solid cast metal) 5/8" high for use in printing letterheads, cards, etc.

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Bronx	28.64 MHz	50.35 MHz	146.17 MHz
Brooklyn	28.64 MHz	50.35 MHz	146.26 MHz
Richmond			146.88 fm
New York	29.50 MHz	50.48 MHz	
Queens	29.50	50.20 MHz	145.62 MHz
Nassau	28.72 MHz		146.10 MHz
Suffolk	28.73 MHz	50.46 MHz	145.59 MHz
			147.21 fm

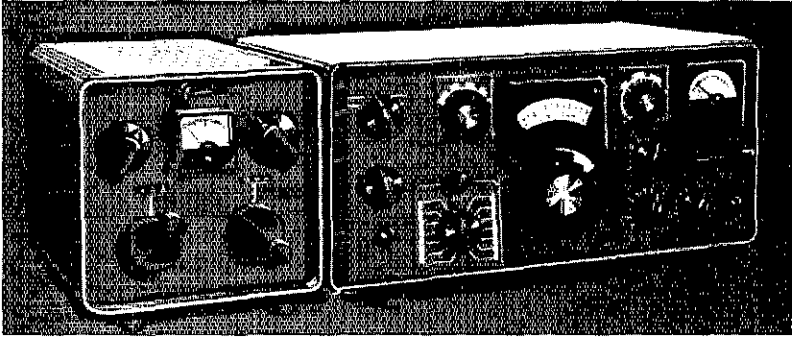
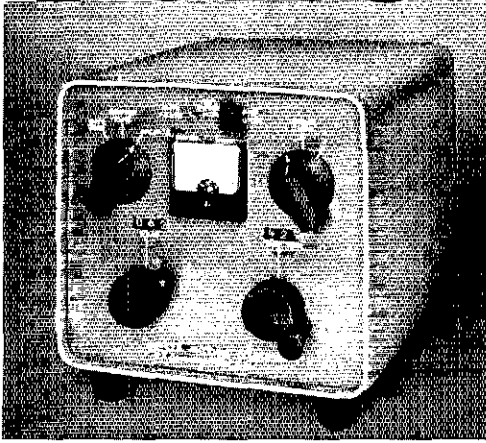
Note: Nets usually open 2000 local, Mon. Well, its all over for another year! Hope you all survived the sore throats, aching ears, skinned knees, burned out rigs, smashed antennas, and what have you; that was Field Day! I'm a little discouraged to find the trend going to higher power each year. Seems we only are able to or desire to copy only S9 signals, and let the peanut whistles go by the way of just QRM. Should an emergency really come about, I'm afraid the only real signals that we will be hearing will be the peanut whistles, so we should train ourselves to pull them out of the mud. That is what Field Day is really all about, this real purpose seems to have gotten lost along the way as of late! In the News department: the Telephone ARC of Manhattan (TARCOM) has new officers for '72: W2JZQ, pres.; WB2ZDL, vice-pres.; WB2HMF, secy.; W2PFP, treas. The Hertscheater is installing a 450 MHz fm repeater for club members at the club house, The Trumbull, Conn. repeater W1KGE, which serves the L.I. area should have changed frequency by now to 146.10 in and 146.70 out. This change has been approved by the Northeast Repeater Assn. WN2PCS now sports a new General Class ticket! W2RID has upgraded to Advance Class while visiting in Fla! WA2MDX has recently joined the Intruder Watch program! Even WA2SCJ has something new, a jr. op. Congratulations to everyone! WB2CHY hosted the NLI traffic/AREC meeting in May. Many things were discussed and some new things were developed. W2ODB has taken up residence in Lakeworth, Fla., and now is K4HAR. K2SJO, Hudson Division Dir. presented the Staten Island ARA with a fine plaque commemorating the club's 50th anniversary as an ARRL affiliate. My thanks to host W2YKF and the SLARA members and guests for a fine evening and ARRL support for years to come! Congratulations to the following Radio Clubs on their recent ARRL affiliation: ARA N.Y. Inst. of Tech.; Dalton Amateur Radio Club; Harry B. Thompson, Jr., H.S. ARC; Radio Society of Greater Brooklyn; Radio Club & Society of Brooklyn Tech. H.S. ARRL Life Membership is growing and particularly in our section. The following have been granted Life Membership at the last Board meeting: K2JFP, WB2YKL, WB2UZU, W2JTP, WA2NHC. Congrats! Have you made plans yet for the Hudson Division Convention? Have you ordered your tickets yet? If not, and its not too early, contact ARRL Convention, 303 Tenefly Rd., Englewood, N.J. 07631 or see your local parts distributor for a Convention flyer with information! Traffic: WB2LZN 469, WB2WFI 94, WB2OYV 88, WB2YNK 38, W2EC 36, WA2PLI 28, WA2MDX 27, WA2HMM 17, W2DBQ 14, K2JFE 12, WA2LJS 12, WB2CHY 8, W2PFP 8, WA2GTK 2, WB2FJX 1.

NORTHERN NEW JERSEY - SCM, Louis J. Amoroso, W2ZZ - SEC: K2KQD, RMs: WA2BAN and WA2UOO, PAMs: K2KQD and WA2TAF.

Net	ΔHz	Time(±M)/Days	Sess.	QNT	Tfc.	Mgr
NJN	3695	7:00 Dy	30	427	263	WA2UOO
NJN	3695	10:00 Dy	30	173	70	WA2UOO
NJSN	3740	8:00 Su				WA2FVH
NJEPIN	3950	8:00 Dy				WA2TAF
PVETN	145710	7:30 Dy				WA2JNQ
ECTN	145800	8:30 Dy				WB2LTW

New appointments: WA2UOO as RM for NJN. Endorsements: Over fifty for the past month. Also cancelled out ten because of no reporting. Please check and send them in if they are due. W2WOJ reports his son WN2COV passed his General. WN2RYD also reports passing. Congratulations to both. W2PEV and WB2FJE are conducting a new swap net every Sun. morning on 3950 kHz at 0945 local time. This is the place to get rid of the extra gear. WA2EPI is now chasing DX with a new TH-3 Mark 3 Tr-Bander on 15 and 20. WA2FUJ reports about 250 to 300 people participated in their county CD drill including W2FDO and WB2GFS. W2MS and W2HZY added to the list of members of NJDXA using the W2JT repeater. K2AGH built a new Heath 1C calculator. WB2CJL and WB2RJ both on 2-meter fm. W2CVW building the Heath Monitor Scope for ssb. WB2AEH is working on the RTTY station. WA2SRC finished his homebrew Transmatch. WA2CCF is collecting information on portable operation for the NJ QSO party. If you plan to operate portable please contact him. We are again trying to have all counties covered for this event. Traffic: (Apr.) WA2EPI 317, WB2DDQ 312, WA2QNT 157, WB2RKK 123, WB2AEH 118, W2ZEP 108, WA2UOO 100, K2KQD 92, WA2FUI 91, W2CU 81, WA2IKL/2 78, WA2SRQ 61, K2DEL 59, WB2LTW 49, WA2CAF 43, WB2NOM 42, WA2NLP 40, WA2CCF 31, W2ZZ 29, W2CVV

Tuneup



Every time you tune up, you'll be glad you have an RF-675 (the compact, efficient Antenna Coupler for military, commercial, or professional users of 100- to 200-watt PEP SSB transceivers).

You'll be glad because the 675 has a built-in dummy load to accurately tune up your transceiver. You'll also be glad because there's a built-in 8-dB attenuator that keeps VSWR to a safe level . . . protecting your valuable equipment during tuning.

That's reason enough, aside from the fact that it simplifies and speeds up the job of getting you on the air at a wide range of frequencies, with a wide variety of antennas: whips or wires of 15 feet or more (between 3.4 and 30 MHz), wires of 50 feet or more (between 2 and 30 MHz).

Operation is extremely simple; LOAD and FINE TUNE controls have digital readouts so you can log your settings and find them again. The meter reads: Forward Power, Reflected Power, Transmitter Output Power.

Styling is two-tone gray to complement today's popular continuously tuned transceivers, such as the KWM-2/2A. Size is $10\frac{1}{2} \times 7\frac{1}{2} \times 7$; weight is under 9 pounds.

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22, WB2YPO 20, WB2KNS 18, W2IGL 15, K2EQP 10, W2WOJ 10, WB2CFT 7, W2ABL 4, (Mar.) WB2AEH 120, WB2LTW 84, WA2SRO 42, WB2NOM 21, WA2FVH 18, W2WOJ 16, WB2WNZ 3.

MIDWEST DIVISION

IOWA - SCM, Al Culbert, KØYVU - SEC: KØLVB. Congratulations to WNØEFG and WBØAAM who recently passed their General Class exams. Best wishes for speedy recovery to WØNZJ who underwent surgery in Mason City. May was a very special month this year for WØAXH who celebrated 25 years as a ham and 40 years in the priesthood. WAØPUJ hopes to be on the bands more after graduating from Iowa State U. this spring. Results of the 75-meter net election are as follows: Net Control Stations - KØLVB, WAØVZH, KØKAQ, WAØSRM, KØDDA and KØJGI; Net Dir. - WBØAVW, KØLDN, WAØDAG, KØAJN, WØKJZ and WØLFF with KØQKI getting the nod as secy-treas. Cedar Rapids fellows are in the process of locating their receiving and transmitting antennae for the Cedar Rapids repeater on the KCRG-TV tower. WBØDQH is spending the summer days tending greens at the Charles City golf course and pounding brass on a cw-only rig at night. WØDSP is getting ready for his annual pilgrimage to the land of the Muskellunge. WBØDTD is a new OPS appointee. Didn't get a chance to operate nutch in the Apr. CD Party, but did hear a few fresh calls representing the section, why don't some of you non-appointees take a crack at the open-CD Party in July, see rules June issue.

Net	QNI	QTC	Mgr.
Iowa Phone (noon)	145.3	85	KØLVB
Iowa Phone (eve)	1040	44	WØYLS
TLCN (cw)	148	93	KØAZJ

Traffic: WØLCX 483, KØAZJ 122, KØDDA 107, WAØAUX 104, WØMOQ 75, WAØYJW 26, KØJGI 15, WAØVZH 15, KØYVU 13, WØBW 9, WØIO 8, WAØAIW 5.

KANSAS - SCM, Robert M. Summers, KØBXF - SEC: KØLPE. RM: KØMRI. PAM: KØJMF. VHF PAM: WAØTRO. The Mid-States Mobile Monitor Service reports another fine month - 1740 fixed stations and 121 mobiles for a total QNI of 1861, 94 QTC, 101 phone calls or patches. Kans. welcomes WAØKDO who has been in Sweden for a year. WBØABE left for IRAN in June. Speaking of trips, KØFRH of Tri-State ARC recently took the long walk - to the Altar. WØINH informs us that the Central Area net operation has

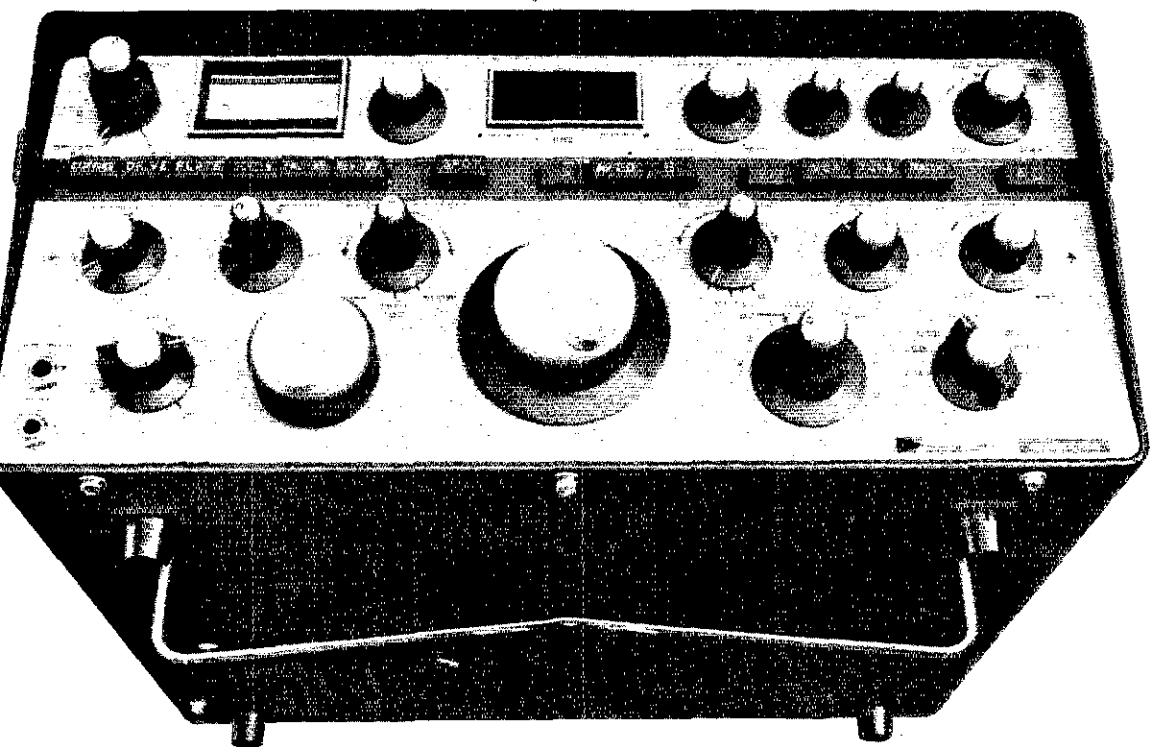
changed frequency for the summer months to 7090 kHz. The private air line of the Hiawatha ARC got a recent work out when it made a trip to the Dayton Hamvention with WAØKEC, WAØKDE, WAØUHW, WAØUQA and WAØOZP. WØPB, WAØLLC and KØNL drove to the Hamvention. Members of the KVRRC in Topeka, supplied communications Apr. 8 for the March of Dimes Walk-A-Thon, 15 mobiles and 5 personnel at WØCET maintained 10 check points along the 20-mile route and the State House. KØJMF is EC of Zone 4. AREC membership stands strong at 605. Newest EC is WAØDSJ for Zone 10B. Net activity for Apr.: K8BN QNI 995, QTC 75 in 25 sessions, KPN QNI 297, QTC 24 in 17 sessions, KWN QNI 431, QTC 134, 30 sessions, KEC QNI 32, QTC 2, 3 sessions, QKS QNI 465, QTC 172 in 60 sessions. Traffic: KØMRI 282, WØIH 211, WØINH 169, KØJMF 87, KØBXF 70, WBØBY 61, WØCHJ 60, WAØLLC 60, WØBGX 59, WØGCI 57, WØMA 49, KØLPE 43, KØZHO 35, WAØYMK 27, WAØZTW 18, KØGH 16, WØPB 15, WAØRYK 15, WAØJFC 11, WAØQWH 10, WBØBBC 8, WØSOE 8, WØMCH 7, WAØTAS 6, WØFDJ 4.

MISSOURI - SCM, Robert J. Peawler, WØBV - SEC: WØENW. Appointments renewed: WØBV as ORS, QVS; WAØITU as GVS. With deep regret I report WØVZT as a Silent Key.

Net	Freq.	Time(Z)	Days	Sess.	QNI	QTC	Mgr.	
Mo(C)/CW	3531.5	1400	Su	5	17	3	KØRPH	
MNN	7040	1800	Dy	30	127	48	WØGBJ	
MoSSB	3963	2300	M-S	25	956	48	KØRPH	
MON	3585	0900	Dy	30	100	44	KØAEM	
MON2	3585	0245	Dy	30	108	90	KØAEM	
PHD	50.45	0030	T	4	87	11	WAØKUH	
MSN	3703	0030	M	9	36	28	EØBIX	
WEN		2330	Th					
		28.6	0130	M	4	19	3	KØBIX

The Mid-Mo Club has concluded its Novice licensing session, with several persons receiving licenses. The club also provided communication for a 20-mile march to raise money for the handicapped; nine amateurs participated. The repeater operated by the Mid-America FM Assn. proved to be most valuable when 28 amateurs provided communications for the 20-mile March of Dimes Walk-a-Thon. Congratulations to: WBØQJM and WAØZES, who passed Advanced Class exam; to WNØDQW, who passed General Class; and to new Novice WØHHH. WAØZUJ is joining the Air Force. WBØGAD is retiring shortly and expects to be more active in operating amateur radio. Traffic: KØONK 1275, WØBV 124, WBØCXN 118, WØNTW

A room full of gear ...right here.



These days, in advertising lingo, it seems everyone is claiming they "put it all together" in their product.

Well, when we say put it all together in signal/one's CX7A, we really mean it. And we can prove it. Because here's a rig that combines a room full of gear in one compact desk-top unit.

To duplicate the CX7A with conventional equipment, you'd need an extra receiver, an RF clipper, a built-in power supply, a linear amplifier, an electronic keyer and much more.

Not to mention a transmitter and receiver.

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Just think what that room full of disjointed, often incompatible gear would cost you.

But in the CX7A, it's . . . all together. Affording you your finest hour as an amateur. And most any serious amateur can afford that when he wants the best . . . and wants to be the best.

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HY-GAIN TH3JR	\$275
HY-GAIN DB10-15A	\$285
HY-GAIN HY QUAD	\$285
HY-GAIN TH3MK3	\$295
*TR-44 rotor w/cable add:	\$ 35
HAM-M rotor w/cable add:	\$ 65

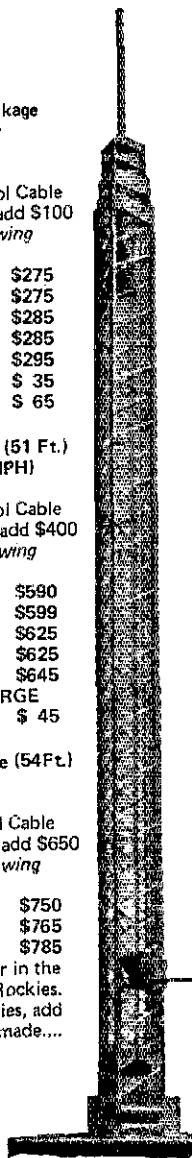
LAE W51 "DELUXE" Package (51 Ft.)
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CDR TR-44 rotor*
100 ft. RG58/U Coax & Control Cable
Substitute 67 ft. free standing, add \$400
Complete with one of the following
antennas:

HY-GAIN DB 10-15A	\$590
HY-GAIN HY QUAD	\$599
HY-GAIN 204BA	\$625
HY-GAIN TH3MK3	\$625
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Free stdg. base incld. NO/CHARGE	
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LAE LM354 "SUPER" Package (54Ft.)
(16 Sq. Ft. - 60 MPH)
CDR HAM-M Rotor
100 ft. RG8/U Coax & Control Cable
Substitute 70 ft. free standing, add \$650
Complete with one of the following
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HY-GAIN TH6DXX	\$785
Freight PREPAID to your door in the Continental USA west of the Rockies. For shipment east of the Rockies, add \$15.00. Substitutions may be made... write for prices.	

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12, K0PCK 6.

NEBRASKA - SCM, V.A. Cashon, K0OAL - Asst. SCM: Velma
Sayer, WA0GHZ, SEC: K0ODF. New appointments: W0LCE as
ORS; K0FERU and W0LCE as OPs. Endorsements: WA0KGD as
OO; WA0SOP as EC and K0FERU as ORS.

Net	Freq.	GMT/Days	QNT	QTC	Mgr.
NSN I	3982	0030 Dy	1258	13	WA0LOY
NSN II	3982	0130 Dy	1000	30	WA0LOY
Neb. 160	1995	0130 Dy	182	141	WA0CBJ
NEB	3590	*0300 Dy	138	33	W0TOD
NMN	3982	1330 Dy	1369	29	WA0JUF
WNN	3950	1400 M-S	578	27	W0NIK
AREC	3982	1430 Su	243	0	W0IRZ
CHN	3980	1830 Dy	967	31	WA0GHZ
DEN	3980	2100 M-F	368	6	WA0AUX

With deep regret I report K0KJP, W0VGH, and W0GQ as Silent
Keys. The following are Asst. Dirs. to K0NL: W0s BV, CY, FZO,
HG, YZV, K0s BXF, OAL, WA0s GHZ and JOG. WA0BOK reports
2-meter activity has increased in the area. Speedy recovery to
W0UFZ in the Hot Springs V.A. Hospital. W0BDSL is mgr. of new
Neb. Teen Net started Sun. May 7 on 3982 kHz at 3 P.M. CDT.
W0LCE busy erecting antennas. Box Butte Co. 2-meter ARC Net
reports QNI 22, QTC 1. Ak-Sar-Ben RC code/theory classes proving
quite successful. Don't forget the Central Nehr. ARC Steak-fry Sun.
July 30 at Victoria Springs. *Neb. CW Net (NEB) meeting time has
been changed to 0215Z. Mgr. W0TOD will appreciate your support.
Traffic: (Apr.) WA0SCP 105, WA0QEX 52, WA0CBJ 42, W0LOD
37, W0TOD 28, W0LWS 21, WA0XB 20, WA0YCG 20, K0FERU 12,
WA0HWR 15, W0VEA 15, W0NIK 14, W0BCAU 12, K0ODF 12,
WA0BK 10, K0OAL 9, W0SGA 9, W0FOP 8, WA0JKN 8, W0MW
7, WA0CHN 6, WA0GAT 6, K0HNT 6, W0HOP 6, WA0PIF 6,
K0DVG 5, K0JFN 5, W0YFR 5, W0DMY 4, WA0EEI 4, W0HTA 4,
W0BCWD 3, K0FJT 3, WA0PC 3, W0ZNI 3, W0BFTS 2, WA0JUF
2, WA0LOY 2, W0SWG 2, W0GEQ 1, WA0GHZ 1, WA0RZF 1.
(Mar.) W0LOD 65.

NEW ENGLAND DIVISION

CONNECTICUT - SCM, John McNassor, W1GVT - SEC:
W1HHR. RM: K1EIR. PAM: K1YGS. VHF PAM: K1SXF.

Net	Freq.	Time/Days	Sex.	QNT	QTC
CN	3640	1900 Dy	60	561	298
CPN	3965	1800 M-S	30	497	163
VHF 2	145.98	2200 M-S	20	106	35
VHF 6	50.6	2100 M-S	20	111	5

High QNT: CN - WA1GFH, W1MPW, W1CTT, W1KLV and K1EIR.
CPN - W1GVT, W1MPW, WA1OPB and K1SXF. SEC W1HHR
would appreciate Field Day messages and hope many will operate
mobile or portable, also use emergency power - don't overlook
bonus points for publicity. Dir. W1QV regrets lack of time for more
eyeball QSOs at Tri-City Hamfest - sincere thanks to all who came.
ARRL well represented and we were especially honored by the
presence of ARRL Pres. Harry Darnall's W2TUK. With deep regret
we add W1KQY to the list of Silent Keys. Ed was the first RM for
Conn. CPN members extend best wishes to W1YBH who is moving
out of state. He was PAM for 15 years and an inspiration to all who
aspire to outstanding operating practices. Murphy's Marauders new
officers are W1FLM, pres.; W1BGD, vice-pres.; K1GUD, act.
K1DPB, secy.; W1FBY, FD chmn. New QTH members inform
W1HOL for Summer Bulletin, W1WEE suggests more interest on
2-meter am working for All Conn. Towns Award. OOs consider
"positive reporting" per May OO Bulletin. W1DQJ welcomes all
stations on Norwalk City Net 9 P.M. Wed. 145.65. Congratulations to:
WA1OSG for General Class Field Day is here - hope all clubs
will participate - best of luck to all! Traffic: (Apr.) W1EFW 359,
W1MPW 163, W1CTT 113, WA3JSU/1 100, K1SXF 89, WA1NTR
83, WA1GGN 69, WA1KVI 66, WA1GFH 65, WA1NES 53, K1YGS
47, W1GVT 43, W1KLV 42, W1KV 38, W1AW 33, WA1OPG 32,
WA1PHR 29, W1WHR 24, W1QV 21, W1RML 17, W1YBH 16,
W1BDI 11, WA1NYU 11, W1CUB 8, W1DGL/1 8, WA1OPB 6,
WA1JGA 3. (Mar.) W1LXV 23.

EASTERN MASSACHUSETTS - SCM, Frank L. Baker, W1ALJ
- SEC W1AOG received reports from ECs: W1s HAB, LE, FUR,
K1s NFW, DZG, ZUP; WA1s DIXI, MPP, DMC, WINN, W1KBL and
Silent Keys. The Tower Net had its 5000th session. W1TV moving
to Yarmouth. W1QV, W1ALP attended banquet of Norfolk Co. RA
W1WTF in Honolulu. NCRA reports W1XI pres.; W1PNL, vice
pres.; W1JJA, secy.; W1SYC, treas. K1AFF moving to Nova Scotia
Officers of T9 RC: W1TTP, pres.; W1TYP, vice-pres.; W1ISX, treas.

Wanted to Know

about SSTV

could ask ...

with inter... tones. See... of 1200... (ultra...) are used to... rical and horizontal sync pulses. A... ms duration is used for horizont... nchronization, and of 30-ms durat... nch.

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1900
2100
2300

SSTV SCENE

Reminds one of the early days... Remember when there were... a few SSB'ers, and they gathered... at specific frequencies? Remember... stations first started appear... ing, the "Quacking," the "Dit... ing" pileups? The resemblance... the start of SSB and the start... is phenomenal. If this is any... of things to come, SSTV... will be as popular, or more... than SSB. And why not?... TV replaced radio to a... extent, did it not? Soon "just... guy will be a muddle of... by more and more of... paid for the first time... dark... talking with in... ac pick... that's... courtesy ...

THE YEAR 1966, there were only five U.S. amateurs who were active below 30 MHz on scan television (SSTV). Those five were W1NLO, W7FEN, W9NTP, W3LJV, and W0ITB, operating on 20 meters under special temporary authorization granted by the FCC. Because that group of amateurs demonstrated successfully that high-quality pictures could be transmitted thousands of miles in a voice-bandwidth channel without causing adjacent-channel interference, the FCC in 1968 acted to authorize the use of reduced bandwidth scan TV. Since the carrier is constant, the same carrier on the band will withstand this perturbation for a few seconds; thus cut-off frequency is the logical limit. Some of the chaps on slow scan TV have built their own power and camera, and some have purchased the EKY Video Vision kit route, get the point of the ops have gone first class. The Robot monitor and camera are the platoon of the chap... a kilobuck and...

Robot Research Model 70 SSTV Model 80 Camera

acquaint you with the technical features of... EASY... There was a thing that... ally built that I could just go... A few weeks later I did see... 's in one of the ham maga... about... ham...

conversion fr

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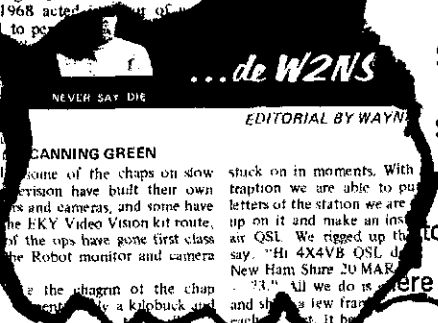
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Scan conve

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to get on ss

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Every day finds more and more amateur radio operators converting to SSTV. There's been nothing like it since the advent of single side-band equipment. Operators report that Slow Scan Television has renewed their enthusiasm and fascination with amateur radio as much, or more, as when they first got their ham ticket.

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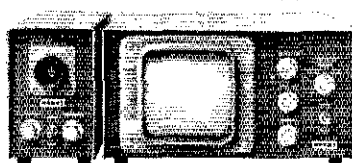
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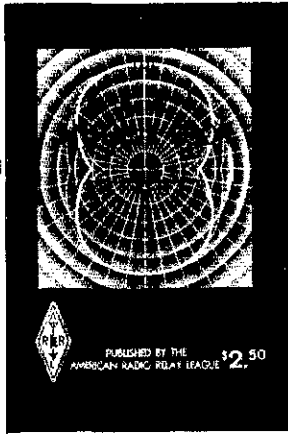
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WIMNK, secy. WN1QFW XYL of WA1MSB. WB5ARE/1 on 75, Ft. Devens. OOTC reports a luncheon at Mildred's Chowder House and QCWA had one at Lord Wakefield. WA1QAI on 2. WIGDP has Advanced ticket. W3FKP/S, Ark., has sked with W1WK. WA1MWN has a trio TR-2200 for 2-meter fm. The Pea Soup Net reports 100 sessions, 66 QNIs. WA1AKR is Whaling City Chapter head 10-10 Net Tue., on 28.7 0000 GMT. K1FWA in Medfield. WA1OZI on 2. WINCK back from Calif. WA1JHY is an Advanced Class licensee and WA1PDM is General Class. WN1OML on 2 in Westwood parade. WIWFO was at MIT helping the Apollo 16 astronauts during their cruise toward the moon. K1DRB on his way to Kwajalein. WA1CEC on 75 and 15. W1EUIJ has high power for vhf. W1AEC in RMN. WINF says it was 70 years ago that he heard his first wireless signal from Dr. Pickard and Dr. Kolster, still has Coherer RX. WA1NNT on 75. W1CRO/2 on Governors Island, NY. Endorsements: K1OKF as PAM for 6; W1s AEC, AAR, BB, AOG as OPSs; W1s AEC, BB, MNK, FJJ as ORSs; W1PST, K1ZUP as ECs; W1ALP as OBS; W1AOG, WA1DFL as OVSs. K1UMP is new EC for Whitman; WA1OMM new OBS, OPS. WA1MYK built Ultimate transmatch from QST. WA1EAT back on air. WA1OMM says he QSOed a sinking ship off the Bahamas. WA1GZQ hearing VK3s while mobile on 20. WA1FNM in VT. PON. WA1PNX has his General. A1 Op. WA1EMN was code instructor and WA1GSF gave the theory at a class of the Chelmsford ARA; WN1s QAA, QAB, QAC were in the class. W1s DPD, HH gave a talk on 2-meter operation. WA1GSF built a repeater. Massasoit ARA had a show by members of South Shore Radio Control Club. The MARA hired a bus and visited ARRL Somerville ARC. WA1MHN have a repeater on 2 and the WA1KGS repeater also on 2. K1s BTF, AIJ gave a talk on 2-meter fm at Framingham RC. W1CE, WA1MYK made PSHR. W1s DEC, DED on the Cape for the summer. W1s AX, PL gave a talk at the Quannapowitt RA on Technical and Legal aspects of antennas. The EMN FEED-THRU held in Ashland was arranged by K1GNW, a nice dinner and a rag chew period was held. W1FJJ got married.

Net	Freq.	Time/Days	QNI	QTC	Mgr.
EMN	3660	1900 Dy 2200	541	330	W1QYY
EM2MN	145.8	1900 Dy	157	99	WA1OWQ
NEEPEN	3945	0830 Su	98	2	K1EPL
NEEPEN(Mar)	3945	0830 Su	86	9	K1EPL

Traffic: (Apr.) W1OJM 314, WA1EYY 311, W1QYY 268, W1PEX 261, WA1MSK 246, WA1NNL 226, W1CE 144, WA1MYK 91, WA1OMM 76, WA1MWN 75, WA1OWQ 74, W1DOM 71, WA1MYA 65, K1PRB 57, W1AEQ 45, W1EMG 45, W1UX 44, WA1OTE 29, WA1IFE 22, W1ABC 19, K1UAF 18, W1ATX 17, WA1GZQ 13, K1EPL 12, WA1FNM 12, K1PNB 6, W1MNX 5, WA1DFL 1. (Mar.) K1GNW 112, WA1OMM 92, W1FJN 33, W1AEQ 23, K1EPL 16, K1UAF 13.

MAINE - SCM, Peter E. Sterling. K1TEV - SEC: K1CLF. PAM: WA1FCM. RM: W1BJG. WA1FCM thanks all who helped him in his past 2 years as PAM. Don't forget this year's gathering at Abbott, QTH of WA1GRA, Aug. 13. Hope to see you there. WA1PEN is our new PAM. WA1LDQ is on the air with a new TH6-DXX beam. W1AE is back from the sunny south and is quite active on the Barnyard Net. New hams in Maine are WN1QCS, WN1QAP. K1MTJ is home from Guam and out of the Navy. WB4ODU/1 active on fm will soon be transferred. The Loring Amateur Radio Club wishes to announce its foundation composed of hams stationed at Loring AFB and civilians from surrounding central Aroostook communities. Club officers are WA1PTT, pres.: K6MST/1, vice-pres.: WA2WPA/1, secy. The club meets on the 2nd Sun. of the month at a members home. On the air meetings are proposed for Mon. at 1900 local time on 145.08 MHz (A.M.) and Wed. at 1900 local time on 28.640 kHz (USB). Northeast Area Barnyard Net reports 25 sessions, 606 check-ins, 3 traffic for Apr. Traffic: WA1FCM 245, K4BSS/1 62, WA1PEN 22, K1TEV 13, WA1JCN/1 7.

NEW HAMPSHIRE - SCM, Robert C. Mitchell, W1SWX - SEC: K1RSC. RM: W1UBG. Welcome new appointees WA1FSZ as OVS and W7TML/1 as OO. W1EVN is back from his winter retreat. K1POV again is active with a new Ranger 2. W1FZ lists WN1PTV and WN1PTW as results of his ham radio classes. K1YSD has a new Drake MN-2000. Watch out for DJ1US/W1 traveling through our state on a ten speed racing bike. WA1JSD has a new YAESU FT-101 transceiver and his DXCC total is now 116. Welcome new hams WN1QBV, WA1QBY, WN1QCC, WA1QBA, WA1QDU, WN1QEA, WN1QDZ, WN1QED, WN1QEV and WA1QEW. The Kearsarge Amateur Radio Club blood drive netted 150 pints and 32 new donors thanks to K1VXX, WA1PTF and K1BCS. From Guam, WA1JTM reports he will be there for a while and W1DXB will be his QSL Mgr. W7TML/1 was active in the last CD Party with 350

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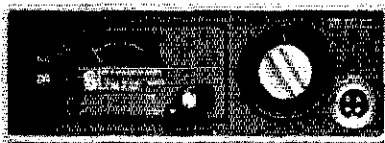
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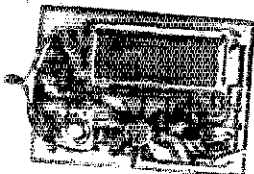
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contacts in 9 hours. WIUBG reports 142 check-ins and 120 traffic on the NHVT Net. Your SCM just returned from Fla. and enjoyed the famous southern hospitality from WB4QKE, WA4DRU and K4BHG. Traffic: (Apr.) WIUBG 136, DJ1US/W1 125, K1YMH 103, WA1PTF 44, K1CTQ 17, K1POV 14, W1EVN 5, W1SWX 4, W1BYS 2, W1DXB 1. (Dec.) DJ1US/W1 283.

RHODE ISLAND — SCM, John E. Johnson, KIAAV — SEC, WIYNE. PAM: WITXL. VHF PAM: K1TPK. RM: W1YKQ. RISP reports 30 sessions, 459 QNI, 62 traffic. The Newport County Amateur Radio Club is all prepared for Field Day, operating from Goat Island in Narragansett Bay. As a dress rehearsal, the club operated from King's Park on June 3 and 4 as an activity associated with Rhode Island Amateur Radio Week. The club hopes to better its score this year. WIJFF of the club reports the Newport Club has become the most active in the state. All clubs have been getting their equipment ready for F.D. WIAQ reports their club will be located at the North Central Airport as in prior years and all equipment checked out and ready to go. Now that summer is approaching do not forget to drop the SCM a note telling about your summer ham activities. Traffic: (Apr.) WIYNE 134, WITXL 42, K1QFD 12. (Mar.) WIYNE (24), WITXL 49, K1QFD 21.

VERMONT — SCM, James H. Vicle, WIBRG —

Net	Freq.	Time(Z)/Days	QNT	QTC	Mgr.
Vt. PO	3909	2100 Su	86	21	W1BQB
Carrier	3945	1300 M-S	432	16	WA2EAN
VTSB	3909	2200 M-S	474	75	K1YGI
		1130 Su			
NHVT	3685	2300 Dy	142	120	WIUBG

Congrats to new amateurs WAIQBI(G), WNIQCW and WAIQCF(G). K1SLU is new treas. of the Burlington Amateur Radio Club. VT amateurs did fine job furnishing communication for Vermont Green Up. WA2UYJ repeater will become WA2NVT in memory of Dave Stewart. This repeater group is also setting up a repeater crystal bank. If you have surplus repeater crystals, let me know and I'll get them listed. Anyone with information of interest to Vt. amateurs please send it in. Traffic: K1BQB 137, K1GYI 30, K1OXD 44.

WESTERN MASSACHUSETTS — SCM, Percy C. Noble, WIBVR — SEC, WA1DNB. CW RM: WIDVW. VHF UHF PAM: WIKZS. The SEC reports that WMEN held 5 sessions with a QNI of 45 and traffic 4. West. Mass. AREC membership now has 36 full members, 39 limited. WMN held 30 sessions with QNI of 144 and traffic 85. After six months of operations and recuperating, WIDVW has resumed as CW RM as of May 1. Top 5 in attendance on WMN were WIBVR, WAILNF, WAIOSK, WISTR and WITM. WA1FBF is working on 450 MHz rig as control station for WAIKHC repeater. WIKK has a Drake TR-22 for 2-meter repeater work. W1EOB worked JD1ACP for country number 300. OO WAILPR sent out 20 notices during the month! CMARA reports the Worcester Area Mobiles invite all to join them Mon. evenings on S1.5 at 9:00 P.M. HCRA reports Apr. speaker was W1OFV on the subject of Transistorized equipment. MARC says W1FVM is now a General. VARC reports WAILGU worked Costa Rica and New Zealand using an Argonaut 5-watt ssb-cw transceiver. Quote of the month: "Hans never make the same mistake twice. It's usually about five or six times." Mt. Tom ARA reports pres. WAILNV is moving to Ind. WAINWX has moved to Ireland. WM AREC Repeater Assn. reports KC W1CSF thought his electric bill was running high (found he had left an arc welder running since last Sept.) Club members have decals and arm-bands designed by WAILGU, WAIKFX, injured on Mt. Snow, obtained help by use of a handie-talkie. The Northern Berkshire ARC says many club members have banded together and are buying 10-ft. sections for the new 100-ft. tower for the Mt. Greylock repeater. Traffic: K1SSH 126, WIBVR 91, WAILPJ 57, WAILNF 49, WIKK 30, WITM 23, WIZPB 13, WISTR 12, WIDVW 6, WAIMJE 5, W1EOB 4, WA1FBF 2, K1VPN 1.

NORTHWESTERN DIVISION

ALASKA — SCM, Kenneth R. Klopff, KL7EVO — KL7AG (ex-AEQ) and KL7AZJ enjoyed their Colorado River raft trip through the Grand Canyon. Somehow 14,292 came through with information on their whereabouts when we least expected it. KL7EWH had to come back to the States for medical reasons. Hope she is back up here when you read this. Get in touch with her, she is a great gal. KL7HEL is back in 8-Land and getting his 160-meter antenna farm staked out. June saw the Arctic ARC take to the water on a Tazuna River trip from Fairbanks to Nenana complete with radio gear. Visitors to Alaska don't forget the 2-meter repeaters in Anchorage and Fairbanks; both are fm 34/94 vertically polarized setups. Sourdough Net is on 3915 0400Z local daily and pretty

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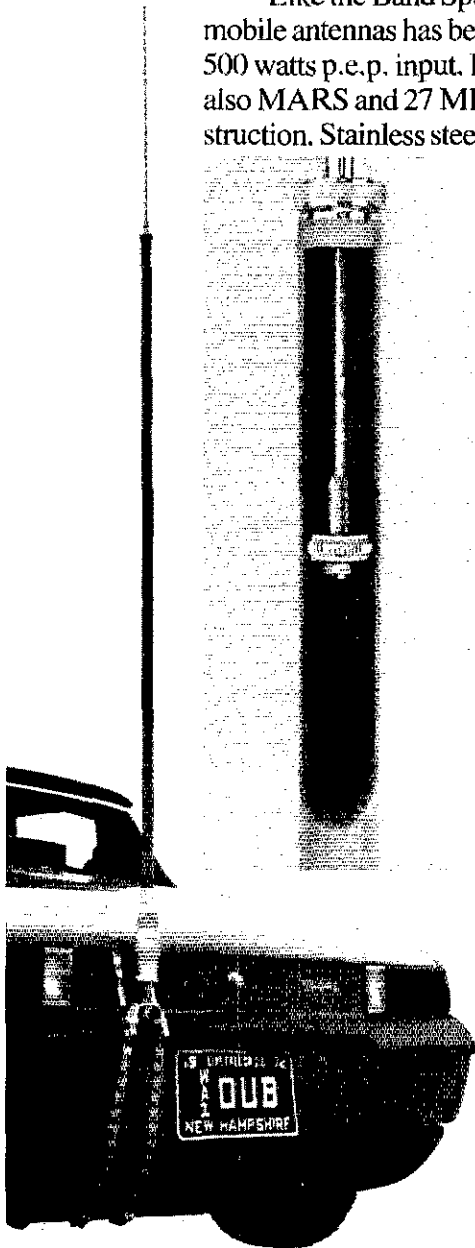
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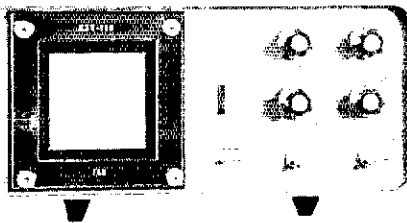
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good monitoring between times. Code practice on 3735 0500Z TT Sat, with Interior QRP rigs also inhabiting that frequency. Half-wave dipoles with clip-on feedlines seem to be most practical for quick setups and compact storage on spools. Average height generally turns out to be five feet.

IDAHO - SCM, Donald A. Crisp, W7ZNN - SEC: WA7EWV, K7ORA was elected FARM Net Mgr. The FARM Net continues to meet at 0200 GMT during the summer (now 8 P.M. MDT) on 3935 kHz each day. A new Idaho RACES net is being organized and will meet Mon. at 0130 GMT on 3990.5 kHz. NCS is W7JJA and is for Idaho RACES licensees only. The morning RACES net continues to meet at 1415 GMT on 3990.5 kHz week days and will accept check-ins from non-RACES amateurs. Idaho Falls amateurs and members of the Eagle Rock Club are making plans for the WIMU Hamfest to be held at Mack's Inn, Idaho in early Aug. W7ZLO, WIMU chmn. reports the hamfest the biggest and best ever is located near the West entrance to Yellowstone Park in a beautiful scenic area. Motel accommodations are available, be sure to get your reservations in early. Camping and camper facilities are also available. FARM Net report: 30 sessions, 982 check-ins, 89 traffic. Traffic: W7GHT 74, WA7BDD 49, W7ZNN 22, W7FIS 3.

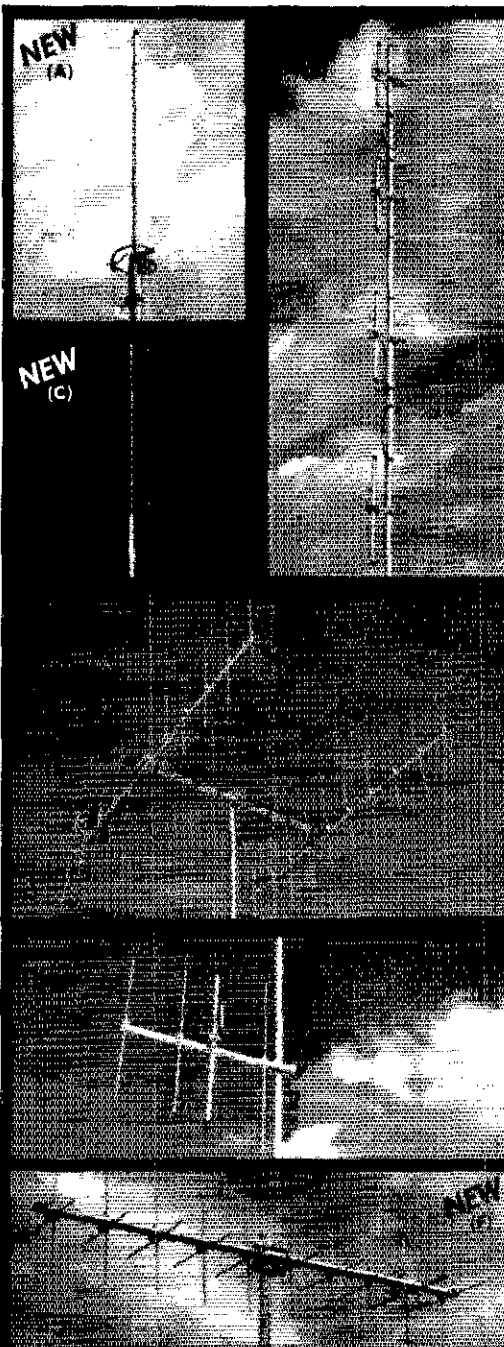
MONTANA - SCM, Harry A. Roylance, W7RZY - Asst. SCM: Bertha A. Roylance, K7CHA. SEC: W7TYN, PAM: WA7IZR. WA7MKY has been reappointed as EC for Anaconda; W7DB as OVS and WA7IZR as PAM. New ham in Laurel is WN7TMI, NYL of W7FJR. The Silver Bow County Emergency Net meets Sun. on 3920 at 1700Z. WA7HAG and W7RZY are new Life Members in the League. The Montana PON had 457 check-ins, handled 42 formal traffic and 30 sessions. Two-meter repeaters operating in Montana are Great Falls area 34-94; Bozeman 16-76; Butte 34-94; Helena 16-76; Missoula 16-76. If you plan a 2-meter repeater inform WA7IOS, chmn. of the Montana VHF advisory committee. The EOC in Townsend is in operation under the direction of W7CWW. Traffic: WA7IOS 194, K7EGJ 24, WA7KMP 17, WA7IZR 16, WA7OBH 14, W7ISA 8, W7LBE 6.

OREGON - SCM, Dale J. Justice, K7WWR - SEC: W7HLF. RM: K7GGQ, PAM: K7RQZ. WA7GTX reports for the AREC Net (Mar.) check-ins 328, traffic 17, contacts 31, maximum counties 12. (Apr.) check-ins 338, traffic 11, contacts 34, maximum number of counties 13. The Six-Meter Net meets Sun. mornings at 9 A.M. on 50.25. Plenty of DX QSLs are being for an SASE from intended Seventh call area recipients to Willamette Valley DX Club, P.O. Box 555, Portland, 97207. W7LT is busy working for DXCC, with 59 confirmed countries. Traffic: K7QFG 169, WA7IFS 44, WA7BYP 30, K7WWR 25, WA7NWV 20, WA7MOK 17, W7LT 15, W7HLF 14, WA7KRH 7, W7IWN 3.

WASHINGTON - SCM, Arthur Henning, W7PT - SEC: W7UWT. RM: W7GYF. PAMS: W7GVC, W7MCW. VHF PAMS: K7BBO, K7LRD. New appointments: K7VAS as EC Yakima and Kittitas Counties; WA7QYI as OPS. WA7LQV achieved WAS. K7GGD has 49.

Net	Freq.	Time(Z)	QNT	QTC	Secs.	Mgr.
WSN	3590	0145	232	86	30	W7GYF
NSN	3700	0200	346	115	30	WA7OCV
NTN	3970	1830	1114	121	30	K7VAS
NWSSB	3945	0130	1057	40	30	K7KPC

Mt. Baker ARC demonstrated their Bunny Hunt expertise by capturing first at Skagit Hamfest which had big turnout of 400 registered, 352 dinners served, 219 prizes distributed. Puget Sound Council of ARC Ham-of-Year Award went to W7OS, recognizing his 56 years service to amateur radio. K4ZDK/7 Island Co. EC now on tour of duty off coast of South Vietnam wishes he could run DXpedition over there. At Clark County ARC spring banquet the Red Cross awarded citations for Club's work in Vancouver tornado situation and W7BQ received Club's award for Ham-of-Year. WTKZ is resuming FCC station "T" sked after his vacation. W7PGY, Northwest Division Director returned from Baton Rouge, La. executive committee meeting of ARRL. Mt. Baker ARC with CD men supplied communications for Boy Scouts and Rotary Club in litter cleanup drive around town. HAMS of Everett provided communications for Fire Mountain Boy Scout Camporee and also for March of Dimes Walkathon. W7QCV and WA7HKD demonstrated A4(FAX) transmissions for Boeing Bears Club. I will be on vacation from May 17 until about June 20. As soon as possible after May 31, please send May reports and other information normally sent to me to Robert Thurston, W7PGY, 7700 31st Ave., N.E., Seattle, Wash. 98115. Traffic: W7BA 759, W7PI 255, K7VAS 253, K7CTP 134, W7KZ 126, W7GYF 77, WA7OCV 75, W7BCV 67, W7MCW 62, K7OZA 60, K7OXL 47, WA7KNW 46, WA7LQV 40, WA7QYI 32, W7BUN 29, W7JEY 26, WA7AVI 23, W7FQE 23, K7LRD 19, W7AXT 14, W7FIM 12,



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PACIFIC DIVISION

EAST BAY - SCM, Paul J. Parker, WB6DHH - W6RGG has final amplifier power supply and receiver audio fixed; should be back on the air soon. WN6QDD is a new Novice in Alameda, thanks to W6RO. W6HF busy traveling to Ariz. for family gathering. W6ITD novice class produced 2 Tech. and 5 Novices. FB Bob. W6ITD also received 5BWAS No. 73, congrats. WA6LYB recently operated CD cw party. W6CBF also working CD party on phone. W6IPW is again enjoying and handling traffic for another month. How about you? Check into NCN, 3630 kHz, daily at 7 and 8:30 P.M. W6TTS busy working DX and building new Health digital frequency display. W6BB, Univ. of Calif. at Berkeley is back on the air with WA6RGC and WB6RSS busily handling traffic. Traffic: W6IPW 210, WB6VEW 36, W6BB 20, W6HIF 10, WA6LYB 5.

HAWAII - SCM, Lee R. Wical, KH6BZF - Asst. SEC: KH6BZF. RM: KH6AD. PAM: KH6GJN. VHF PAM: KH6GRU. QSL Mgr.: KH6DO. I regret to report the death of former district engineer-in-charge FCC and Honolulu amateur KH6SL. It is with deep regret that we record his passing to a Silent Key. A full listing of Hawaii repeaters will be in the soon-to-appear ARRL Repeater Directory. Watch for the announcement. This listing will conform with the Tex. VHF-FM Society standard 2-meter plan as presented to the ARRL VHF Repeater Advisory Committee (VRAC). See pgs 64-68 May '72 QST. It appears that our local repeater group(s) conform to this widely adopted National Plan. Noel Thompson is our regional VHF-FM freq. coordinator. Perhaps the best achievement locally was that of the Emergency ARC, KH6GG, KH6GGG and company, moving the 146.20/.80 frequency out of Diamond Head to Tripler General Hospital. Thus a more capable operation of Diamond Head 146.28/.88 linked with Mt. Haleakala's 146.34/.94, both National Standard frequency pairs, Kudos guys. KH6GKD has a new Tri-Ex tower. KH6GMP reports he replaced his '37 crank-up with a 60-Ft. SS Rohm tower. He also has a new YAESU EL-2500. KH6HGV has a new YAESU FT-2F. KH6BYO is on with a new Collins S/Line. KH6GLU reports big DX plans brewing. KH6ISC is back from his tour in HI 9-Land. KH6HLK reports a new Hy-Gain 204-BA antenna and a Homebrew kw linear to go with that SB-102. KH6HC has applied for AREC. KH6BZF is attempting 220 Tropo with the West Coast gang WB6NMT and company. Keep your reports coming. Traffic: (Mar.) KH6HHG 11, WH6HJE 7. (Feb.) KH6HHG 10, KG6JAR 2. (Dec.) KH6GPV 1.

NEVADA - SCM, L.M. Norman, W7PBV - SEC: L.L. Mike Blain, WA7BEU, 560 Cherry St., Boulder City, NV 89005, W7JLN is a Silent Key. SNARS reports growing membership. WA7KCD and WA7QPX have instructions for mounting 2-meter fm antennas backward. W7ILX looking for cw traffic. K7ZOK is now a member of QCWA. A 2-meter fm 28/88 auto-patch repeater is ready for installation on high Potosi Mountain elevation about 8500 msl about 20 miles SW of Las Vegas. K7ZAU and crew have the Sierra Hamfest on Aug. 5 in Reno ready for a big crowd. W7PBV, W7PRM and K7RBM attended the Hualapai ARC meeting. Check-ins to the Nev. RACES nets is holding up good on Mon. night, additional information may be secured from W7IDV. W7JU has gone fm after 30 years of cw and am on 2 meters. Pacific Division Convention Oct. 14 and 15. W6QIE chmn. W7YKN and W7ITK active on RITTY. Traffic: W7ILX 27.

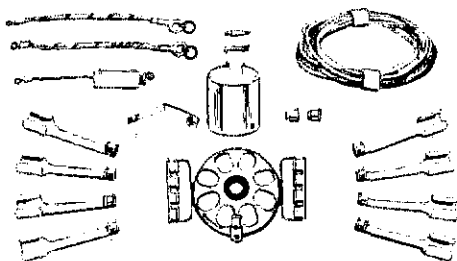
SACRAMENTO VALLEY - SCM, John F. Minke, III, W6KYA - SEC: W6SMU. New appointee is K6SG as OO and OPS in Carmichael. K6YZU in Dunsmuir was reappointed as ORS. Welcome new Novice WN6QMS of Chico. K6KWN of Lake Almanor participated in the CD party to give out SV. Nice to have someone else in there besides W6NKR and W6KYA. K6VT recently gave a talk on amateur radio from the early days to Explorer Post No. 873, whose specialty is amateur radio. The post is sponsored by the North Hills Radio Club. OK1WC reports he is looking for those rare Calif. counties for the WACC award. He says his operating frequency is 14.076, although W6KYA worked him on 14.014 at 0500Z. How about helping out our DX friends with those rare counties? Start planning now for the Sierra Hamfest and the Pacific Division Convention. Traffic: (Apr.) K6KWN 42, WA6FGU 18, K6YZU 8. (Mar.) WA6FGU 27.

SAN JOAQUIN VALLEY - SCM, Ralph Saroyan, W6JPU - The 30th Annual Hamfest was held in Fresno at the Hilton Hotel with 306 in attendance. WB6UAX won the SBE Transceiver. W6OWL won a power supply. New officers of the Bakersfield Radio Club are WB6RAC, pres.; WB6ZWG, vice-pres.; W6IMB, treas.; WA6BBE, secy. WA6SCE and WB6ZWG in their spare time, teach code and

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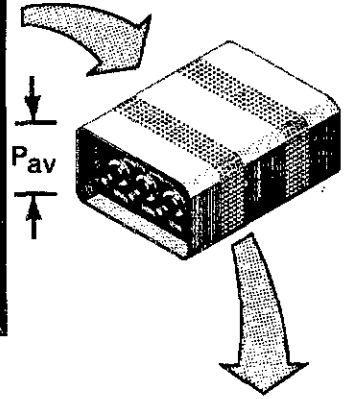
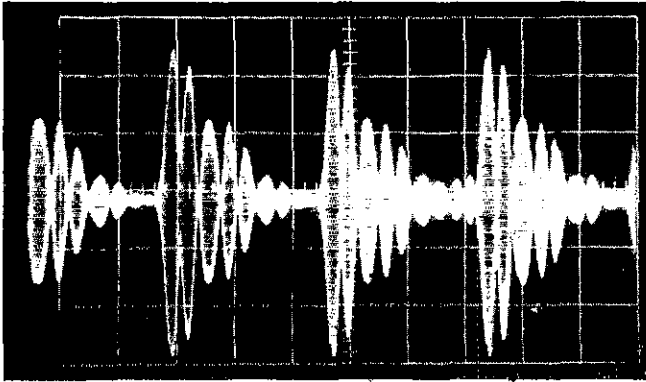
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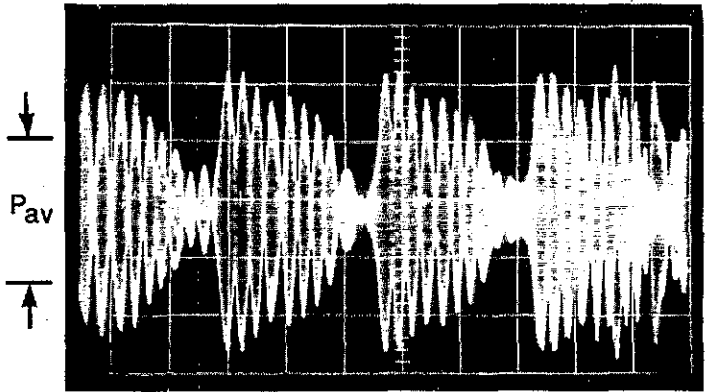
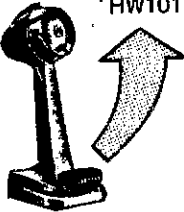
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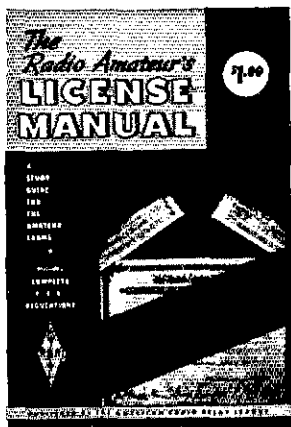
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theory, and the last class graduated 22 Novices. K6LKJ is on 432 MHz. W6GMN was a visitor at the Hamfest. W6RJE was visiting the Hamfest. The Trowel Radio Club had 38 in attendance at their breakfast. WA6CPP, WA6JDB and W6YKS were active in Apr. CD. The Stockton ARC is ready for PD. WA6CPP has Worked All Counties in Delaware. WA6JDB is moving to new QTH in Pinedale. W9OTD was a recent visitor in Fresno. W6BRZL retired from the Forestry Service and is going to travel. WA6BUH has a Ham Scanner 2-meter rig. W6PSQ is building a sweep tube kw amplifier. W6BJI was seen at the Fresno Hamfest. W6FIR is heard on 20 sub. W6OWL has a twenty-element 2-meter beam. NCN net meets at 8:30 P.M. on 3630 kHz. Traffic: WA6JDB 32, WA6CPP 6, W6BRZL 1.

SANTA CLARA VALLEY - SCM, James A. Hauser, WA6LFA - SEC; WA6RXB, RM: W6BVB. Welcome back from KH6-Land to W6LFB. W6AUC continues as secy.-treas. for local QCWA Chapter and also is NCS for 9 A.M. QCWA Net Sun. at 3950 kHz. W6RFF is active on NCN and working sub DX. W6NLCG is busy with OSL Bureau and working with the ARC, he would like to go 2-meter fm if he could find a low cost rig. W6JQU, W6KZJ are active on NCN. W6RSY, W6YBV, W6BVB and W6NW report activity at various levels of NTS. W6DEF reports much net activity and keeping K6OTR, the local Red Cross station active in the emergency nets. W6GFI is swamped between OSL Bureau, DX hunting, work and school. WA6UAM is active on 220 and 1296 MHz. NCN meets daily 0200Z and 0330Z on 3630 kHz. If your CD net is not listed here please inform me of time and frequency so that it may be included in next column. Traffic: W6RSY 438, W6YBV 176, W6BVB 145, W6NW 137, W6DEF 78, W6LFB 76, W6AUC 75, W6RFF 28, W6KZJ 24, W6JQU 14, W6NLCG 9, W6GFI 4.

ROANOKE DIVISION

NORTH CAROLINA - SCM, Chuck Brydges, W4WYZ - SEC; W4EVN, PAM: WB4JMG, RM: WB4PNY. Election returns made the traffic flow and all of those who participated deserve a vote of thanks. K4MC was the guiding force and the work load was on several nets. WA4UQC is EC in four counties and also is Asst. Dir. WA4WZQ and his vhf contesters remain active with warmups for VHF contests. The Raleigh ARS has been issued W4DW, a memorial to Col. Caveness who was very active in the 1929 to early 1950s period, serving as SCM and Dir. K4RJ showed his breadboard counter at 3rd Army MARS meeting. WA4KWC also attended. K4MPE now on 3rd shift and getting DX on other two shifts with 315 total. K4TTN says he had great time in CD Party. WB4QQY reports 7 Novices awaiting tickets and 2 more studying. The Cape Fear ARS News was nine pages long and K4ZXX, W4EHF, WB4QQY, WB4MTG are editors; congrats to the Fayetteville bunch. First Class Radiotelephone tickets were earned by two Wilson ops WB4KPD and WA4ZLK. Congrats. WB4NXS, Wilson FC, changed QTH's. The Central NC Traffic Net (CNCTN) is covering 11 counties through W4EXU repeater. 28 in/RR out. K4GHR is Net Mgr. and K4QDM is asst. Net Mgr. K4QDM also tickles the repeaters during daylight hours with 1-watt job. K4GCN, ex-W4PNM is doing a fine job pushing traffic. A 10-meter mobile project is under discussion by the Carteret-Craven ARC. If your QTH or county doesn't have an EC write me or SEC W4EVN and we will help in any possible way to get you started. Traffic: (Apr.) K4GCN 335, WB4PNY 124, W4EVN 123, W4WYZ 62, WB4QQY 61, WB4TNC 46, WB4SPC 29, W4OFO 20, WB4JMG 19, W4ACY 17, K4EZH 12, WB4CES 10, K4GHR 8, WB4HGS 7, K4MC 6, WA4WZQ 6, K4TTN 4, WA4JCS 2, WA4KWC 2, (Mar.) K4EZH 3.

SOUTH CAROLINA - SCM, Elizabeth Y. Miller, WA4EFP - SEC; WA4ECL, Asst. SEC: W4WQM, RM: K4LND, PAM: WB4KNE. WB4NRI is trying to find someone who can read Polish to assist him with the two nuc certificates he won in a Polish DX Contest. W4NTO says he'll miss the first FMT in ten years because of business trip to the Midwest. Also from Spartanburg we welcome a new Novice. W4ZHT. W4EZF is back on the air after having his gear repaired. Two-meter activity is on the increase in SC. Our net activity is again picking up now that our boys are out of school for the summer. SC SSBN, 2300Z daily on 3915; CN, 2300 and 1200Z daily on 3573; SCPN, 1600 M-Sat. 1230 and 1930 Sun. 3930. Traffic: W4NTO 34, WA4RMZ 32, WB4PDQ 30, WB4RKU 5, W4JA 2.

VIRGINIA - SCM, Robert J. Slagle, K4GR - Asst. SCM: A.E. Martin, Jr., W4THV. SEC: WA4FBG, Asst. SEC: WA4JFF, WB4CVY. RMs: WA4EJL, WB4NNO, K0PIV/4, W4SEJ. PAMs: WA4FGC, WA4YXK. WB4DRC/8 promises activity after graduation. W8VDA/4 reported on Dayton Hamfest. Weather and golf influencing BPL of WB4FIK. Night shifting influencing activity of K4FEY. W4UO planning hamfest travel. W4YZC reports highest

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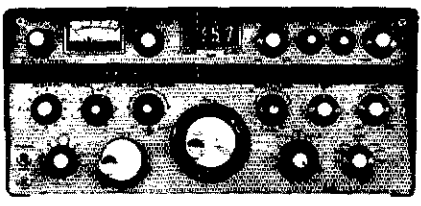
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traffic count in years. WB4FDT walked away with a tempo 1 from Westminster this year. K0PIV/4 finally came away with BPL! W4DM 2-metering and CD partying. Our Director also made BPL — he participated in ARRL Planning Committee meeting in San Francisco. WB4DRB has integrated circuit 1U-FSK in the works. The Eastern Shore ARC, WB4ZDG, is looking for a club location. W4KX devoting full time to moving QTH of WFVA. WB4KBJ trying to raise antennae out of trees. Business priority with W4THV. WA4WQG reports 3004 counties. K4JM is celebrating his 40th ham anniversary!

VSMN	3947	0715 & 1630 Dy
YSBN	3945	1800 & 2200 Dv
YSN	3680	1830 Dy
VN	3660	1900 Dy
VFN	3947	1930 Dy
VRN	3625	2000 Dy
VPON	3905	2215 T

Traffic: (Apr.) K0PIV/4 543, K4KNP 347, W4YZC 338, W4UQ 232, WB4FJK 227, WBVDA/4 164, W4KFC 152, WB4KJT 89, K4KA 80, WA4FGC 71, WA4PBG 46, K4FSS 34, WB4KBJ 31, K4GR 28, K4FEY 26, WB4PCK 24, WB4FDT 21, WA4WQG 19, WB4RDV 18, WB4SSE 11, K4JM 10, W4OKN 10, W4OP 8, W4MK 7, K4MLC 7, WB4RZV 5, W4THV 5, K3VIV/4 3, K4CGY 2, W4DM 2, K4LMB 1. (Mar.) K4JM 9, W4THV 4.

WEST VIRGINIA — SCM, Donald B. Morris, W8IM — SEC: WA8NDY. RM: WB8BBG. PAMs: W8DUW, W8IYD, K8CHW. Phone Net Mgr.: WA8POS. CW Net Mgr.: W8BCYB. I regret to report the passing of W8WSL. New officers of QCWA are W8BT, chmn.; W8HZA, vice-chmn.; W8NR, secy. QCWA members manned the ARRL booth at the State Convention. WA8NDY, WA8WCK, W8JM and WN8LAJ attended LO meeting, Greensboro. W8BFVL reports Wood County Emergency Net, Sun. noon on SU.250. WVN Phone net now operating at 2230Z handled 62 messages with 335 stations in 30 sessions. Novice Net with 8 members and 3 sessions passed 6 messages. W8IYD spoke at Kanawha ARC meeting on state-wide 2-meter tm operation. Black Diamond ARC Ham picnic will be held in Bluefield on Aug. 27. West Va. State Radio Council now incorporated and has applied to FCC for call W8WVA on a permanent basis. W8CCN inactive — changing locations. W8BBMV again made PSHR. Congrats. Governor Arch Moore, Jr., proclaimed week of June 25 to July 1 as "Amateur Radio Week in West Va." W1YL represented ARRL at the W. Va. State ARRL Convention. Traffic: WA8PUS 74, W8BBMV 23, W8JM 20, W8DUV 19, W8BCYB 18, WA8ORG 18, WA8KCI 10, WA8IFW 10, K8QEW 7, W8PCU 5, WA8NDY 4, WA8EC 3, WN8IFU 3, WN8II 3, K8ZDY 3, W8A+B 1, W8AKR 1, W8BBG 1, W8BBMW 1, W8CKX 1, W8BDQX 1, W8BEKG 1, W8BFRO 1, W8BFYR 1, WA8WCK 1.

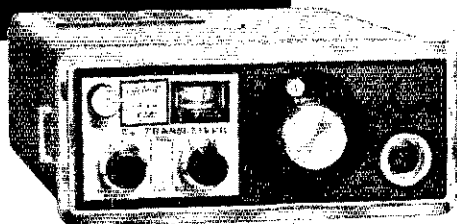
ROCKY MOUNTAIN DIVISION

COLORADO — SCM, Clyde Fenney, WA0HLQ — SEC: WA0QY. RM: W0LRN. PAMs: W0AWG, W0CXW, W0LRW, WA0WYP. Newly elected officers of the recently organized Castle Rock Repeater Group are W0JGL, pres. and treas.; W0CJX, vice-pres.; W0ERR, secy. The technical committee is comprised of WA0HJX, W0CJX, WA0SIK, K0SUH and W9GBD. The technical advisors group consists of WA0SLM, WA0ZPJ, WA0INI and WA0TMA, with alternates W0WSK, WA0FFA, W0SIN and K0MPV. A recently organized net in the Rocky Mountain Division is the Amateur Radio Operators Net of the American Assn. of Retired Persons (ARO of AARP). This net was established Aug. 1, 1971 as a special net for assistance to members and Chapters of the AARP. It operates daily at 1700Z on frequency 14.277 MHz. K0SPR is Colo. coordinator for this net. Net traffic: (Apr.) Hi-Noon QNI 1026, QTC 43, informals 107, phone-patches 30, time of 859 minutes. Columbine QNI 1085, QIC 69, informals 181, 27 sessions. CTN QNI 336, QTC 64, informals 87, time of 699 minutes. SSN QNI 224, QTC 113, informals 27, 30 sessions for time of 639 minutes. CCN QNI 248, QTC 99, 30 sessions. (Mar.) SSN QNI 245, QTC 118, informals 42, 31 sessions for time of 746 minutes. Traffic: (Apr.) K0ZSO 938, W0WYX 372, K0YFK 316, W0LO 154, W0AXW 104, K0SPR 102, W0IW 93, W0CCB 90, W2TPV/0 71, W0LRW 70, K0JSP 65, WA0WYP 64, W0LRN 58, W0LLA 49, W0SIN 45, W0BSS 33, WA0ZPP 28, W0BDNY 17, WA0NFO 10, W0LAE 9, WA0HLQ 7, W0COJ 6, WA0TMA 6, K0IGA 4. (Mar.) K0JSP 64, W0BDNY 41, WA0SIG 36, W0CCJ 8.

NEW MEXICO — SCM, James R. Prine, W5NUI — The La Mesa bean feed was very successful and many returns on K5ECQ's chili. W0SIN's visit to the activity was much appreciated. W5SBHN has completed WAS and WAC, with progress on DXCC. The New Mexico Net has been discontinued for lack of participation leaving the section without a cw net. Suggestions for termination of the

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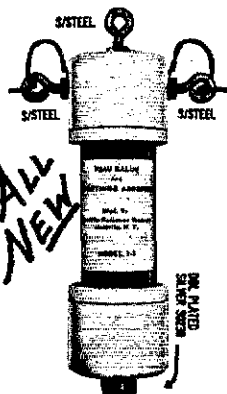
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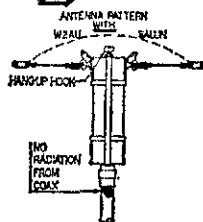
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station activity column must be valid based on the lack of information submitted. Traffic: W5UH 199, W5AXC 57, K5DAB 50, W5MYM 36, W5DAD 9, W5QHH 9, W5BWV 6, W5SMY 5, W5SBHN 4.

UTAH - SCM, Carroll E. Soper, K7SOT - It is with regret that I have to report W7HST as a Silent Key. W7DHL, on air at Sleeping Guest Ranch, Fruitita. W7NIB on air with Swan 350. WN7QIA new Novice in Salina. WA7JW back on the air after completing two year mission. W7BLP, W7YPC and K7GRZ attended dedication of Capitol Reef National Park. WA7MXZ and WA7MBL both operating RTTY for traffic. WA7MEL received Colo. High Noon net certificate. Ogden Amateur Radio Club will furnish radio communications for the Powder Puff Derby in July. The Beehive Utah Net operates daily on 7272 kHz at 1230 MST; Apr. QNI 941, QTC 44 with an average time of 13.33 minutes. Traffic: W7EM 143, W7OCX 43, W7IOU 30, WA7MEL 10, WA7HCO 8, WA7MXZ 6, W7GPN 5, WA7LES 4, K7CLO 3, W7HCK 2.

WYOMING - SCM, Wayne M. Moore, W7CQL - SEC: K7NOX. RM: W7GMT. PAMs: W7TZK, K7YUG. OBSS: K7NOX, W7SDA, WA7HIA, K7YUG. Nets: Pony Express, Sun. at 0800 on 3920; YO daily at 1830 on 360K; Jackalope Mon. through Sat. at 1215 on 7260 (alt. 3.920); Wx Net Mon. through Sat. at 0630 on 3920; PO Net 1900 Mon. through Fri. on 3950. Another new Novice in Laramie is WN7TNX. K7VVA was active during Apr. when a telephone outage hit the Tensleep area. Some of the Casper 2-meter buffs were active in furnishing communications for the road rally the first part of May. A ham on in Rock Springs is K7ORA. Don't forget the hamfest this year at Thermopolis at the Holiday Inn, July 15,16. W7VB is doing a great job of planning so I know everyone will enjoy it. Traffic: K7VWA 136, WA7AUV 128, W7TZK 121, W7HNI 84, W7GSO 76, W7SDA 60, W7BHH 58, WA7NHP 24, K7WNF 22, K7WRS 7, K7TWK 4, W7BKI 2, WA7MNC 1.

SOUTHEASTERN DIVISION

ALABAMA - SCM, James A. Brashear, Jr., WB4EKJ - SEC: W4DGH. RM: W4HFU. PAM: W4WLG. Net activity seems to be dropping off a bit and W4HFU reports activity way down on AENB. Congratulations to K4MG who recently became a member of QOTC; to W4WLF who received the annual Citizenship award at the Birminghamfest; to the AENM net on receiving a certificate from the Dir. of Disaster Services of the Ala. Red Cross for communications provided during emergencies; to the Huntsville ARC for receiving the 1971 Field Day winners plaque; to the Birmingham ARC for an outstanding hamfest. The Mobile ARC is making final preparations for their hamfest and don't forget the North Ala. Hamfest to be held in Huntsville, Aug. 20. The Explorer Post 21 ARC, WB4YAK, set up and operated Novice and General Class stations at Birmingham's new Civic Center during the 1972 Boy Scout Exposition. Operators were WN4ZOW, WN4ZKA, WN4VEZ, WN4UUX, WB4THY, WB4TCH and WB4PIZ. Various hams in North Ala. participated with Military and Civic organizations in providing communications in the Tenn. Valley during "Keep America Beautiful Day." K4IK still active as usual, he reports that WA4OGT has a "banging" quad. Another for K4IKR? Enjoyed a short eye-ball recently with W4WHN, Delta Division Dir. while he was in town for a dog show. Our thanks to W4DQD, Vice-Dir., SE Division who attended the Birminghamfest. A hearty welcome to the following in our section: WN4s ZBQ, ZCG, ZDO, ZEA, ZFJ, ZHE, ZFF, ZFG, ZFU, ZHL, ZHI, ZHK, ZHM, ZHU, ZHX, ZHY, ZIC, ZID, ZII, ZIJ, ZIK, ZIL, ZIP, ZKA, ZJR, ZJU, ZJX; WB4s ZDI, ZIU, ZIV, ZIY, ZEK. WB4NFW appointed OPS. Traffic: WB4SVH 201, WB4EKJ 117, WB4KDI 80, WB4SON 68, WB4SVX 65, K4AOZ 56, WB4MH 44, WB4NLK 38, WA4VEK 34, WN4YQX 21, WB4BDW 12, WB4VEW 8, K4HJM 6.

EASTERN FLORIDA - SCM, Regis K. Kramer, W4ILE - SEC: W4IYT. Asst. SEC: W4SMK. RM: WB4OMG. PAMs: W4SDR 40, W4OGX 75, Jacksonville Training Net (JTN) meets 2330Z on Mon. 21.120 MHz. Fla. Crown AREC Net meets 2330Z Wed. simo-cast 146.94/28.690 MHz. This is a Duval Co. Net. WB4QFH has DXCC-140. WN4ZSE, 10 years old, QNIs off IN (and reports his traffic.) An E. Fla. EC appointment list is available from W4ILE or W4IYT/W4SMK. The St. Pete Hamfest was well attended and enjoyed by all, W4DOS and W4ILE reported on League and Communication Dept. activities. WB4AID demonstrated Ham Radio to 15 members of their daughters "Singles Dance Club." Appointment renewals: WA4HDI, WB4FLW, W4IYT, W4BKC, WA4OWG, W4OZF, WA4WBM and W4SDR. New club of Gold Coast FM Assn. is WB4QFY, trustee WB4TFL. W4BUB publishes their monthly Newsletter. W4IYT made RPL. W4MML is working on AREC/RACES in western Palm Beach Co. WB4PNG leads the PSFR recipients of WB4VOS, WB4PTH, WA2AFL/4, K4FAC and

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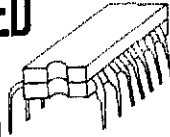
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WB4SOA. With two national political conventions stations in man, the Dade County ARPSC will be QRL and looking for volunteers to help with these two special events stations. Contact K4FMA or WB4OYA. Fla. RTTY traffic and coordinating activities are being encouraged. For a starter look for action on 7125 daily at 11 A.M. With the ever increasing fm mobile and fm base station activity we need PAMs in each of the major metropolitan vhf repeater areas to work with the FCCs of these respective areas to coordinate this most important aspect of the ARRL ARPSC. Contact your SCM for an appointment. For ONTs through Mar. Tropical Phone Traffic Net (TPTN) certificates were issued to WB4JSE, WB4NCH, WB4PTH, WB4VOS and WA4WBM. Restructuring of Fla. (sectioning) will be put to Fla. ARRL membership vote in the not too distant future. Be sure and send in your ballot promptly when received. Traffic: (Apr.) WA4JH 460, K4SCL 427, WA2A1L/4 312, W4ILE 278, WB40MG 271, WB4VOS 131, WB4PTH 130, W4FFF 125, W4IYT 122, WA4NBT 118, WB4PNG 117, WB4JHW 104, WA4SCK 102, K4FAC 98, WB7Y/4 96, W4SDR 88, W4DVO 87, W4NGR 77, W4IJK 71, W4VWP 61, WB4SKJ 59, W4DQS 54, WB4AID 49, W4IA 48, W4BM 42, WB40AA 40, WB2NG/4 38, W4YPA 38, WB4AIW 35, K4GJ 34, K4BLM 33, W4AGD 32, WB4SOA 32, K4EYN 30, W4RCK 30, WA9JSX/4 30, WA4BGW 29, W4LSR 29, W4SMK 29, W4GDK 27, K4LEC 26, WB4SMA 25, WB4BNH 21, W4LDM 20, W4NTE 20, W4OGX 20, WB40ID 19, WB4RLU 18, W4YXP 18, WA4VCK 17, W4KJG 16, WA5BRJ/4 16, W4FXH 14, W4OOH 12, WA4VZF 12, K4EZE 11, WA4HED 11, K4OER 11, WA4UQU 11, W4BCZ 10, W4EIH 10, W4GLJ 10, K4LPS 10, WB4MIQ 10, W4DDW 8, WB4ICD 8, W4MML 8, WN4RCQ 7, W4VLK 7, WA4WBM 7, WB4WYX 7, K4EJF 6, W4SCY 6, K4SJK 6, K4IWT 5, WB4ONR 5, W4TJM 5, WB4TPJ 5, K4FTV 4, W4LK 4, WB4OXA 4, W4DO 3, WA4JA 3, WB4NTH 3, K4GFW 2, W4RHA 2, WN4ZSE 2, K0ECC 1, WN4WBI 1, WA4YRU 1. (Mar.) WA4UQU 5, K4GFW 3, K4KQ 2.

GEORGIA — SCM, A. J. Garrison, WA4WQU — Asst. SCM: John T. Laney, III, K4BAL. SEC: WA4VWV. RMs: K4BAL, WB4SPB.

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Ga. Cracker	3995	1200 Su	—	—	WA41QU

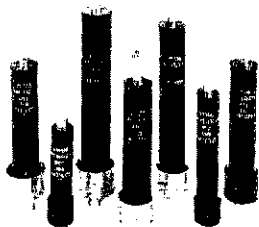
W4LRR reports that a 2-meter repeater in Griffin is operational, 146.10 in, 146.70 out. It is complete with touch tone auto-patch, call, WB4RYO. The Newnan 2-meter repeater should now be operational. Vice-Director, W4DQD operated from W4IZ/KV4 during recent contest along with hams from Fla. and Ala. Traffic: (Mar.) WB4RLU 112, K4BAL 89, W4LEP 78, W4AMB 42, WA4RAV 39, WB4SPB 37, WA4WQU 37, W4CZN 36, W4RNL 36, W4PIM 21, W4UVP 14, W4IM 10, W4JFDN 7, W4REL 7.

WEST INDIES — SCM, Pedro J. Piza, Jr., KP4AST — OO: KP4PO, KP4DJF bought a CX-7 and is very happy with it. KP4CPG, KP4ACQ, KP4QM, KP4PO, KP4QV, KP4DDS, KP4LC, KP4DDB, KP4CPP, KP4ZC, KP4CC, KV4FZ, KP4FC, KP4AM are heard on 40 meters. Keep it up boys. KP4ES, KP4RD, KP4ACO, KP4QM, KP4AST, KP4PO, KP4GN, KP4BX, KP4AN are heard daily on 3830 at 7:00 P.M. AST. KP4DHW operated from the Ponce Institute of Technology during their Open House. KP4ACO, KP4FS, KP4ZC, KP4ES, KP4BIX, KP4AAM are among the most active mobiles. Traffic: KP4WT 158, KP4AST 4.

WESTERN FLORIDA — SCM, Frank M. Butler, Jr., W4RKH — SEC: W4IKB. RM: K4LAN. RTTY: W4WEB. PAM: WA4IZM. VHF: WB4KGW. Pensacola: I regret to report WA4BYI as a Silent Key. WB4DHL has a 6-meter fm repeater going; 51.965 in and 52.525 out. K0BAD/4 made a club interest survey of all IFARA members; results published in the W4UC News. Milton: New club officers are K4HOX, pres.; plus K4OOJ, WB4JRP and K4BDF. Meetings, 1st Mon. of each month at PJC Milton Center. The Whiting Field Club, ex-W4POY, is being reactivated as W4QGT. K7ZCK/4 reports a new S-Line and TA-33 beam. Ft. Walton/Eglin AFB: WB4KLT repeater frequencies were changed from .34/.76 to .19/.79 to avoid co-channel interference and be compatible with national repeater standards. W4BPJ recovering from a heart attack. K4CLM, W3ZBW, W3ZVT, K4UBR, WB4PIV and WB4VUP provided communications on 2-meter fm for a 2-day sports car rally. WB4ZKK is a new ham Shalimar. Panama City: New graduates of K4AHV's classes are WN4YXE, WN4ZFY, WN4ZHR, WN4ZMP and WN6QE/4. K4VFI is Net Mgr. for QFN. Tallahassee: WB4GTY reports that hams may continue to get call-letter tags for \$1.00 extra, even though the CB tag bill passed. A new code and theory class is in progress at the Red Cross Bldg. WN4VPL is active on QFTN. Traffic: K4VFI 225, K0BAD/4 103, WB9FUZ/4 29, W4RKH 13, WB4NIH 4.

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HVK1110/872	1.25	10.0	12.0	60	14.10	
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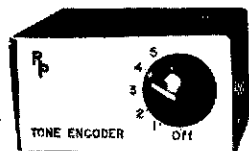
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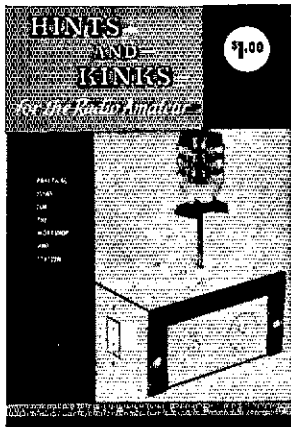
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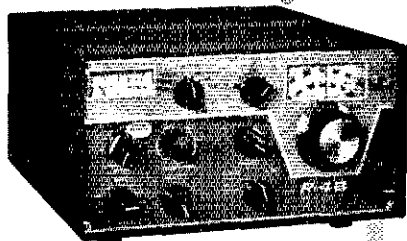
ARIZONA - SCM, Gary M. Hamman, W7CAF - Make your plans to attend the Ft. Yuthill Hamfest, July 28, 29, 30, five miles south of Flagstaff. Sat. activities will be technical sessions, report on the July ARRL Board Meeting by W6UEI, entertainment, and swap tables. Sun. will bring transmitter hunts, pot-luck lunch and prize drawings. The Old Pueblo ARC will provide a talk-in station, W7GVJ7, on 3.992 and 146.94 MHz. The Hamfest is sponsored by ARCA and co-chairmen are WA7NMI and W7WGW. The Southwest Ham Roundup held in Tucson on Apr. 29, 30 was attended by 250 hams. Attendees had a great time and the Old Pueblo AKC plans to have another one the first week end in May, 1973, also under the direction of W7MGF. The Cover Plaque Award was presented to K7OWR for his article in Mar. QST at the May 15 meeting of the Scottsdale ARC at which he gave an interesting talk on Linear IC's. K7HQF has his log periodic beam installed atop a Sky Needle Tower so he can continue his phone patches with Okinawa on MARS frequencies. With regret, W7MPO and WA7FEG were added to the Silent Keys. Stations earning section net awards were WA7HIT, WA7JCK, WA7KQE, W7OUE, K7MTZ, K7RLT, WA7QVN, W7WGW, K6MLU. Traffic: K7MTZ 195, K7NHL 175, K7NTG 133, W7DQS 45, WA7TFU 33, WA7QVN 30, W7WGW 30, K7RLT 27, W7CAF 18, WA7KQE 15, WA7JCK 11, W7PG 7, WA7XC 6, W7OUE 4.

LOS ANGELES - SCM, Eugene H. Violino, W6INH - Asst. SCM: Archie Willis, W6LPI. SEC: WA6QZY. RMS: W6LYY, W6BZVC. The OCWA had their Spring Banquet at Rudi's with about 134 attending. Present were W6MAB, W6HS, W6AM, W6FO, W6BA, W6MLZ and a very fine group of others. It was a gala affair. The Fresno Hamfest was its usual pleasant affair with approximately 600 at the banquet. Very nice all around affair with W6ZRJ as speaker, K6KA still working on Intruder Watch with good success. WA6BZX is the proud owner of a new SBE-36. K6BLU passed the 150 countries worked, and looking for more. San Gabriel Valley RC had annual June installation dinner the 10th at the Bonnie Rae's. WA6MVO is their FD chmn. WA6MOD attended RACES drill at San Dimas sheriff station and his father WB6MKC passed Advanced Class exam. W6USY is new Grandpa. Congrats. WN6OYN while listening on 40 meters Novice band heard QRR from stations in Ft. Smith area where the tornado hit. W6MDQ just out of hospital and doing fine going to all the ham doings. The San Fernando Valley Club had a very successful AREC operation Apr. 23 with total of 14 check-ins. WA6AJJ having good luck with new 1B-AVT hi-gain. K6QPH made big score in the DX test both phone and cw. WA6MEM building SWR Bridge and is County information operator for RACES. K6AEH was at the Fresno Hamfest, demonstrating 220 MHz equipment. The PARC had annual dinner May 13 with W6BVN as guest speaker. W6OAW, W6MDN, W6GHS and W6KOL were present at the Fresno Hamfest with Western Public Service group, considerable business was conducted at this time. The JPL Radio Club is considering meetings off-Lab because of work pressure at noon-time meetings. They also plan to set up a 220-MHz repeater on Mt. Wilson. Congrats to WA6AAW on achieving 5BWS; Dave is the first General Class on the West Coast to have earned the award. K6INY won the 1 kw dummy load at Fresno. W6PAV monitoring WESCARs for interference; W6AM mobilizing and working DX with kw mobile transmitter. W6D working on new Quad, hopes to get it up soon. W6IVC wants more check-ins on RATTs which meets 8 P.M. on 3620 kHz. K6KSG has new rig on the air. W6LYY teaching code class for Northrup Radio Club on Wed. nights. W6PZY passed his Extra Class exam after long studies and work. WB2FEH/W6UEH now active on 160 meters plus SCN. W6PZY preparing for his yearly trip to Tahiti. WB6PKA recovering from operation after stay in hospital. Traffic: W6INH 435, K6UYK 263, W6BBO 151, W6LYY 137, K6KSG 91, W6IVC 68, WA6KUR 64, W6OEO 63, W6USY 34, WA6ZKI 33, WB6KKG 32, K6EA 9, W6FD 9, K6ASK 7, WA6DHM 6, WB6ZIT 6, WB6UGL 5, W6AM 3, K6QPH 3, W6HUJ 2, K6QPH 2.

ORANGE - SCM, Jerry L. Verduff, W6MNY - Asst. SCM: Richard W. Birbeck, K6CID. SEC: WB6CQR. PAM: K6YCI. RMS: WB6AKR, W6BNX. Mission Trail Net pres. K6YCI has accepted appointment as PAM. W6VTK again makes BPL after a tour in sick bay. W6BUK is commencing his 51st year as a League member. LC W6WYS has an AREC net organized for Inyo County - the Inyo Emergency Net which meets each Mon. at 1430 on 3920 kHz. WB6JOT now has his TA-33 90-ft. high. WA6NDA reports that the Boys Town of the desert area needs old ham gear for a new club station. Donations can be made through the Beaumont school district. We regret the passing of W6YJP of Beaumont who spent many hours running overseas phone patches. OQ W6VOZ now spends 12 hours a day in the ham shack. OBS W6RAM has moved his 3580 kHz bulletin transmissions to 1945 local time in order to

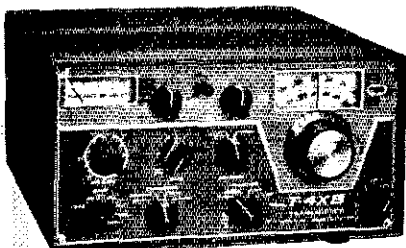


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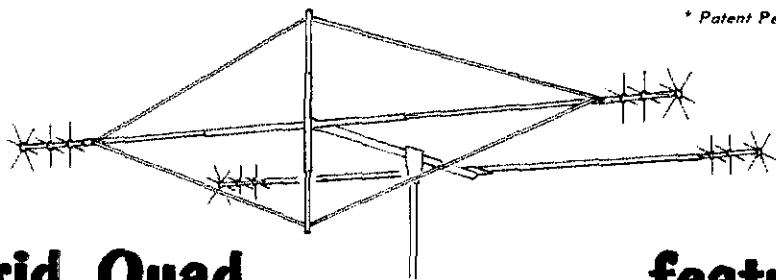
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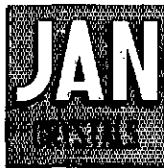


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avoid the tail end of WIAW's code practice. WB6ASR is working on a 50 MHz solid state fm amplifier. W6QBD has joined Navy MARS and is N9USO. New members of the Citrus Belt Amateur Radio Club are WB6ZIR, WN6PAO, WN6PAM and WA6CIM. WA6QHB and WB6WOO are conducting rode and theory classes (novice through general class) at Orange County Red Cross Headquarters. Support your local club and AREC net. Public Service Honor Roll: WA6TVA 46, WB6JOT 42, WB6AKR 40, W6MNY 35, W6CPB L. Traffic: (Apr.) WB6VTF 152, WB6AKR 111, W6ISC 43, W6WRJ 39, W6MNY 32, WA6TVA 30, K6GGS 28, WA6YWS 28, W6QBD 12, WA6BJO 2, WB6JOT 2, WA6NDA 2, (Mar.) WA6BJO 2.

SAN DIEGO - SCM: Paul C. Thompson, W6SRS - Asst. SCM: Art Smith, W6INL. SEC: W6TAL, RMs: W6BGF, W6LRU. After a year in office I would like to say that it is certainly a pleasure to work in such close harmony with the amateurs in this section. We have made some great strides this year through your efforts. Your work and participation in the section activities is what makes this SCM position rewarding. Growth of our AREC program, local radio clubs, League, San Diego Council and individual activities are most impressive. My congratulations for a job well done. Club activities: El Cajon held their annual "Ladies Nite", SDDX discussed testing of antennas using models. SOBARS program was on new ssb in Maritime service. North Shores held a breakfast get-together. SDFM has been busy at the Otay site. Palomar's meeting was on the subject of antennas. New Council officers are W6SLB, chmn.; K6ST, vice-chmn.; W6GIC, secy.; K6LC, treas. Station activities: K6SDR appointed as OO; K6QM handled 55 patches with Apollo recovery ship; New OBS WA6DMB; K6PM attended convention in La Paz, Mex.; WB6YKV is NCS on KN6; W6CN received SBDXCC No. 149; W6QJW is back on ARCC. PSNR: W6LRU 49, WB6YKV 35. Traffic: W6VNO 427, WB6YKV 276, W6JOU 132, W6LRU 106, WB6HMY 84, W6YKF 38, W6SRS 12, K6PM 4, K6CXR 1, W6TAL 1.

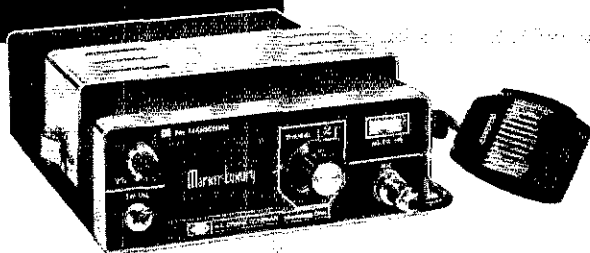
SANTA BARBARA - SCM, D. Paul Gagnon, WA6DEI - SEC: W6JTA, RM: W6UJ, PAM: K6EVO, WA6PFF and WA6HELY helped the boys at St. Mary's Seminary in SB to get their rig on the air. The SBARC also is helping a crippled fellow in a wheel chair to get his license. WB6MXM has built a photo darkroom. W6MQF has a new FT-101 and is mobile with it from his new OTH in Camarillo. His CPA has his Henry linear working again. WA6FUA received his CP-25 code certificate and is studying for Extra Class. WA6TMO is a member of Intruder Watch and reports mostly on 15- and 75-meter intruders. Ralph has worked over 600 CAs in two years and received the "AJD" award. W6DKQ, K6YHK, WB6UAX and several others from the Central Coast went to the Fresno Hamfest. WB6UAX brought home an SBE SB-36 transceiver. The Conejo Valley ARC made a trip to the VOA station at Delano. W6SUN gave a talk on Quads at their May meeting and SW Div. Dir. W6KW spoke at the Apr. meeting. WA6KRA and W6EKO are using horizontal quads on 75 and they sure have big signals. Ventura Co. EC K6VBX met with his assistants K6CFJ, WB6BOQ and K6VLQ and developed an AREC emergency plan. Heard in the Apr. CD parties were W6DKQ, WA6FUA, W6MUL, W6JTA and WA6DEL. New officers of the MAKRAC are WA6DEL, pres.; W6MUL, vice-pres.; K6PYE, secy.-treas. An installation dinner was held at the Wagon Wheel restaurant in Oxnard. Wanted: a RITY station to send Official Bulletins. WB6LLT fixed his Mime printer. WA6JOX built a 6-meter ssb rig. W6OAL is a new ARCC member. PSNR: WA6DEL, Traffic: (Apr.) WA6DEI 143, W6JTA 84, WB6MXM 59, WA6FUA 17, WA6PFF 6, WA6KRA 3, W6MQF 1, (Mar.) WA6JOX 4.

WEST GULF DIVISION

NORTHERN TEXAS - SCM, L.E. Gene Harrison, W5LR - Asst. SCM: Frank A. Sewell, W5IZU. SEC: WA5VJW. PAM: W5BOO. SCM on vacation, report prepared by W5IZU. Appointment for ORS W5BFX approved. W5EJ and W5GM have been recommended for appointments. WASMER and K5VJK recovering nicely from recent surgery. WA5UNK new Life Member ARRL. The Amarillo-Canyon repeater is now located in Amarillo on 22-28. On Apr. 8 a group of 23 met in Arlington with Dir. Roy Albright to discuss league business. Representatives from San Antonio, Waco, Dallas, Tyler, Fort Worth, Richardson and Arlington were present. K5HEN reports nice visit with W5LR. W5YK/6 reports he will be QRV at Lake Mexia in July. W5WDW reports the Temple Club is planning on a new permanent meeting place. Congratulations to the Ft. Worth Kilocyte Club on their fine new home provided by W5JDL. The Lubbock "Cars" Newsletter has quite a number of schematics along with interesting technical information. WA6SLU has been busy; he reports total of 8 Official Observations. Understand our SCM, W5LR recently received his 50-year certificate from Q.C.W.A. IZANE, a blind operator in Italy is being sponsored for

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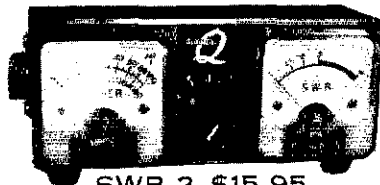
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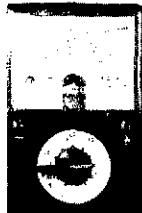
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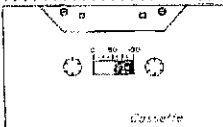
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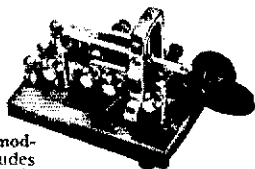
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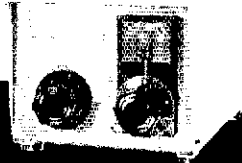
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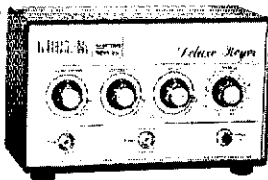
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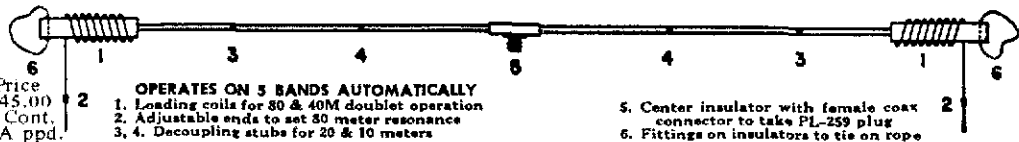
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Sept. 16 and 17 are progressing well. The site will be the Silver Slipper at the Exhibition Grounds. VE6ARH is in the hospital - heart attack. Congrats to VE6AMC on earning his Advanced Class ticket. VE6XC finds recovery from the flu rather slow. VE6YL and VE6AGU continue to give us good liaison with NTS. Alberta's switch to DST has caused some problems. At the moment APSN is staying at 0130Z time. We are playing it by ear and will adjust for the best possible conditions for the net. OVS VE6MX reports the March for Man will be covered by vhf mobiles and RTTY. EC VE6EM is busy with the March and attendant Bike-A-Thon. VE6AYU we hear is up for an Oscar after his appearance on a ham radio presentation of CH 10 TV. Traffic: VE6YL 85, VE6AGU 36, VE6FK 30, VE6HN 8, VE6FV 7, VE6YV 7, VE6FS 5, VE6SS 5, VE6AXH 2, VE6AZQ 2, VE6QY 2, VE6WN 2, VE6AFX 1, VE6VF 1.

BRITISH COLUMBIA - SCM, H.E. Savage, VE7FB - OO VE7GG spends several hours a week listening to VE7s and where needed helps them with their transmitter problems. We should be proud of our self policing of our frequencies. VE7TH, 85 years young, had to finish teaching the code and theory class before going in for an operation; all is OK. Burnaby ARC held a successful cold and wet outdoor auction. British Columbia Public Service Corp Net, 3755 kHz 0200 GMT (1900 Daylight time), B.C. Emergency Net, 3560 kHz 0300 GMT - Slow Speed Net 0345 GMT Mon-Fri, 3650 kHz. Two more old timers back after years of absence - VE7AU and VE7MC. VE7BBC is off to South America to work. "VE77" a handy hook listing VE7s to their towns, etc. for the touring mobile amateur, has landed on my desk; edited by VE7NC and VE7CAM. Traffic: VE7BLO 100, VE7LL 85, VE7AXL 30, VE7BLS 11, VE7TT 4.

MANITOBA - SCM, Steve Fink, VE4FO - Don't forget the Hamfest at the Peace Gardens July 8, 9. The WARC Library is now located in the St. James Public Library and a Winnipeg card allows withdrawals. Additional queries to VE4AQ, VE4MG recently worked the North and South Poles on 20 the same day. MTN now meets Tue., Thur., Sat. and Sun. during the summer. VE4BY is a new YL, ex-VE1EH from PEI, while K3ZVH is back /VE4 for the summer. Congrats to VE4SW on his engagement. BARC now meets monthly on the first Tue. MTN reports 24 sessions, 92 QNI, 56 QTC, MEPN 30 sessions, 994 QNI, 25 QTC. Call letter plate applications go to VE4SE. Traffic: VE4RO 70, VE4EA 48, VE4JA

16, VE4HR 9, VE4CR 8, VE4NE 7, VE4BM 5, VE4HA 4, VE4PA 4, VE4PG 4, VE4XN 4, VE4OP 3, VE4FU 2, VE4YC 2, VE4XO 1.

MARITIME - SCM, W.D. Jones, VE1AMR - ROs: VO1CA, VE1RO, PAMs: VE1YO, VO1FX. A hearty welcome to new amateurs VE1s APX, AQU, ARD, ARV, AUD, ATB, ATG, ATU, ATW, ATZ, AXD and AXF. Congratulations to VE1UY on new Advanced certificate. CW activity from Prince Co., Prince Edward Island will increase with six new amateurs thanks to efforts by VE1UD, VE1BN, VE1ARG and VE1UE. Keep the Nets active over the summer by calling into the WX Net at 1000 GMT on 3770; The PL Net at 1215 GMT on 3780; The White Cane Net at 2100 GMT on 3770; The Nfld. Net at 2130 GMT on 3786; The Maritime Net at 2200 GMT on 3750. Congratulations to VO1CA and VO1GZ who were picked as the outstanding VO Amateur of the Year and were awarded the Bob Lewis Award. VO1HI was the winner of the Fred Ezekiel Trophy. New VO amateurs include VO1s BR, HS, JQ, JW, JX, JZ and KB in the Cornerbrook area; VO1s JU and JY in the central Nfld. area; VO1s JS, JV and JR in the St. Johns area. The St. Johns 2-Meter repeater has a new antenna installed. VB1AA has been issued to SONRA for the period of May 1 to Dec. 31, to commemorate the discovery of Newfoundland by John Cabot. APN reports QNI 87, QTC 155, in 30 sessions. Traffic: VE1ARB 202, VE1RO 140, VE1AMR 63.

ONTARIO - SCM, Holland H. Shepherd, VE3DV - On Apr. 29 your SCM had the privilege and pleasure of attending the Renfrew ARC sponsored convention of the Champlain Regional Repeater Association (VE3STEP). It was reminiscent of some of the conventions I attend way back when. A highlight of the convention was the first public viewing of the here-to-for closely guarded initiation into the Society of the Black Book, or as it is called by it's select members, The Society of the HUNG WOUFE. Under the critical eyes of the Supreme Potentate (VE3PG longtime NTS member) appropriately garbed in his robes of office set off by a four foot conical hat with a beacon and lavishly festooned with tubes of a gone-by era, VE3SB (one of our most active ORSs) was painfully (?) conducted through the many pitfalls of the ritual to become a full fledged member of this ancient order amidst the tumultuous cheers of the viewing public. VE3DPO longtime mgr. of the GBN now is on sabb and is checking into ONTARS. VE3CQS has had to resign as the KWARC EC because of commitments and his place has been taken by VE3FFJ. VE3CQS was responsible for the formation of the very

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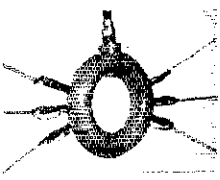
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fine Emergency Communications system for Waterloo Co. 1w Silent Keys are reported in Stan Soyder late of the KWARC an VE3GMH, Ottawa. Our sincere sympathy to their families. No that FD has gone for another year I would like to ask, "how man took advantage of all those nice easy bonus points"? Traffic VE3SB 359, VE3FXI 183, VE3EHF 158, VE3DPO 128, VE3FPY 104, VE3GFN 97, VE3AIA 81, VE3AWE 76, VE3BFC 4; VE3ATR 35, VE3EWD 35, VE3GT 34, VE3NO 29, VE3GBR 2; VE3ASZ 24, VE3EHL 20, VE3FRG 19, VE3FGV 18, VE3GJG 1; VE3GBR 27, VE3DOC 8.

QUEBEC - SCM, Joe Unsworth, VE2ALE - ARCs VE2RM an VE2CWR to combine in amateur radio presentation from Aug. 3 to Sept. 4 at the Fairview shopping center, Pointe Claire, Que. It groups require assistant operators, if you can, please help on VE2AWS active newcomer and is on 20 meters. VE2OY steady o Que. net. VE2AUH is recovering from illness and VE2QV he renewed his equipment. Regret to report VE2IL as a Silent Key. VE2OJ attended the Renfrew VE3STP Hamfest in late Apr. A power line leak made operating impossible for most of the month for VE2UJ and VE2RT. VE2DM handles the KW series of Ham gear in the Montreal area along with VE2XX. A newcomer to 45 Mhz is VE2BEN. Endorsement of ORS to VE2DLG. Summer activities are planned by VE2RM and the MARC. VA2UN continues to be the heavy traffic handler as per reports received. VE2DM daily skeeds VO1-Land. VE2ADZ's main rig is the FTDX-400 but working on the vio for his DX-60 to clean up ac ripple and he contacted W7-Land on 20 meters using only the VFO Ht. Most Quebec stations are taking part in the QR Net. Ice storm dropped power lines in Apr. to repeater sites and it took Hydro about 2 hours to make the necessary repairs; remote site repeaters need it solid state gear to operate from batteries during these failure PSHR: VE2APT 29. Traffic: VA2UN 78, VE2DR 66, VE2EC 4; VE2BP 68, VE2DLG 24, VE2OJ 22, VE2ALE 17, VE2APT 1, VE2UJ 2.

SASKATCHEWAN - SCM, Barry Ogden, VESBO - Summer again and an up-surge of mobile activity with converters being hastily installed in that new vehicle. Experienced 2-meter operation in Waterloo, Ont. and was favorably impressed by the range obtainable via the repeater. Prince Albert Hospital Disaster Committee updating their plans, including AREC on their official list. SLEVESCU reports a close working arrangement with new EMO Dir. M reports re Slow-Scan or RTTY. VESUS very active on VHF. H VESDP doing an FB job as OO. Remember the Hamfest in Moo. Jaw. Traffic: VF5GL 80, VESPD 14, VESBO 13, VESHP 1, VESDN 5, VESIX 5, VF5GF 4, VESSN 2, VF5XG 2.

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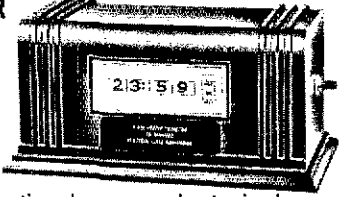
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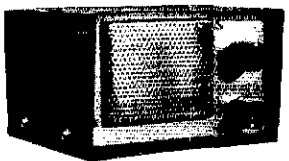


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(6) A special rate of 15 cents per word will apply to advertising which, in our judgement, is obviously non-commercial in nature. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 15-cent rate. Address and signatures are charged for, except there is no charge for zipcode, which is essential you furnish. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 50-cent rate. Provisions of paragraphs (1), (2) and (5) apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions. No checking copies can be supplied.

(8) No advertiser may use more than 100 words in any one advertisement, nor more than one ad in one issue.

(9) Due to the tightness of production schedules, cancellation of a Ham-Ad already accepted cannot be guaranteed beyond the deadline noted in paragraph (5) above.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QCWA Quarter Century Wireless Association is an international non-profit organization founded 1947. Any Amateur Radio Operator licensed 23 or more years is eligible for membership. Members receive a membership call book and quarterly news. Write for information. Q.C.W.A. Inc., Box 394, Mamaroneck, NY 10643.

PROFESSIONAL CW operators, retired or active, commercial, military, gov't, police, etc. invited to join Society of Wireless Pioneers - W7GAQ/6 Box 530, Santa Rosa CA 95402.

A.W.A. National Historical Radio Conference, Smithsonian Institution, Washington, D.C., Sept. 23. Further details in August QST.

EDITING a club paper? Need public relations help? You should belong to Amateur Radio News Service. For information contact Rose Ellen Bills, WA2FGS, Secretary, 17 Crag Pl., Pennsville, NJ 08070

FREE sample copy Long Island DX Assn. bulletin. Latest DX news. Business size s.a.s.e. to K2AFY, Box 532, West Hempstead, NY 11552

WARREN, Ohio ARA's Family Hamfest - Aug. 20. Giant flea market, swimming, archery, etc. Free. Day and night mobile check-in. Camping available. Yankee Lake, Rt. 7 near I-80. Details: QSL W8VTD

HAMFESTERS 38th Hamfest and picnic Sunday, August 13, 1972. Santa Fe Park, 31st and Wolf Road, Willow Springs, Illinois. Southwest of Chicago. Exhibits for OMs and W/As. Famous Swappers Bow. Information and tickets, Joseph W. Forayda, WA9IWU, 5701 So. California Ave., Chicago, IL 60629

CINCY Stag Hamfest: Attention hams: mark this date. Sept. 24, for the 1972 Cincinnati 35th annual STAG hamfest, the one big Stag Amateur Radio Event of the 72 year. At the all new Stricker's Grove, Ross (Venice), Ohio. New location. More details later. Hamfest Secretary, John Bruning, W8DSR, 6307 Fairhurst Ave., Cincinnati, OH 45213

HOT as a firecracker! That's the upcoming ARRL Hudson Division Convention, Hilton Motor Inn, Tarrytown, N.Y. October 21-22 are the happy days. So spend your July 4th weekend anticipating exhibits, lectures, 2-meter fm, RTTY, contests, exhibits, New York sightseeing, fun, food and a blast! Write Dave Popkin, WA2CCF, 303 Tenafly Rd., Englewood, NJ 07631. He'll fire off the info to you

WANTED: Teletype machines, parts Models No. 28, 32, 33, 35, 37. Cash or trade for Drake equipment. Alltronic-Howard Co., Box 19, Boston MA 02101. (Tel: day or night 617-742-0048)

VERY interesting! Next 6 big issues \$1. "The Ham Trader," Sycamore, IL 60178

QSLs?? "America's Finest"!!! Samples 25c. DeLuxe 35c. Religious 25c. (Refunded). Sakers, W8DED, Box 218-A, Holland, MI 49423

TRAVEL-PAR QSL Kit - Send call and 10c; receive your Call sample kit in return. Samco, Box 203, Wynantskill, NY 12198

QSLs. Second to none. Same day service. Samples 25c. Ray, K7HLR, Box 331, Clearfield, UT 84015

PICTURE QSL, cards of your shack, etc. from your photograph. 50c. \$12.50. 1000. \$16.25. Also unusual non-picture designs. Generous sample pack 25c. Half pound of samples 50c. Kaum's, 4184 Fifth St. Philadelphia PA 19140.

QSLs, samples 10c. Fred Leyden W1NZJ 454 Proctor Av. Revere MA 02151.

CREATIVE QSL cards. Personal attention. Imaginative new designs. Send 25c. Receive catalog, samples and refund coupon. Wilkins Printing Box 787-1, Atascadero CA 93422.

SAMPLES 20c. Harry Sims, 3227 Missouri Ave. St. Louis MO. 63118.

QSLs 3-color glossy 100, \$4.50. Rutgers Van-Typing Service. Free samples. Thomas St. Riegel Ridge, Millford, NJ 08848.

QSLs 300 for \$4.65, samples dime, WBSKR, Ingleside, IL 60041

RUBBER stamps \$1.50 includes tax and postage. Clint's Radio, W2UDQ, 32 Cumberland Ave., Verona, NJ 07044.

QSLs "Brownie" W3CJ1, 3111 Lehigh, Allentown PA 18103. Samples 10c. Catalog 25c.

DELUXE QSLs, Petty, W2HAZ, PO Box 5237, Trenton NJ 08638. Samples 10c.

3-D QSLs - Far more spectacular. Little more cost. Samples 25c (refundable). 3-D QSL Co., Monson 3, Mass. 01087

DON'T buy QSL cards until you see my free samples. Fast service, economical prices. Bolles, Little Print Shop, Box 9848, Austin TX 78757.

QSL, SWL, WPE cards. Samples 25c. Log books, file cards, decals. Malgo Press, Box 375 Toledo OH 43601.

QSLs, SWL, WPE samples 15c. Nicholas & Son Printery, PO Box 11184, Phoenix AZ 85017

FRAME Display, and protect your QSLs with 20 pocket plastic holders. 3 for \$1, 10 for \$3.99, prepaid and guaranteed. Tepacco Box 198T Gallatin TN 37066.

QSLs - Thin dime brings samples. Alkanprint, Box 3494, Papago Station, Scottsdale, AZ 85257

QSL, SWL cards that are different. Quality card stock samples. 20c. Home Print, 2416 Elmo Ave., Hamilton, OH 45015

Excellent QSLs, reasonable. Samples 25c. W9CL Press, R.R. 1 Box 811, Carmel, IN 46032

QSLs, 3 color glossy, globe, eagle, straight key, ham with earphones on front, report form on back, 100 - \$4.75 postpaid. Rusprint, Box 7875, Kansas City, MO 64116

POST card printers \$19.95. L. M. Hamilton, Box 4373, Torrance, CA 90510

QSLs 300 for \$5. Samples stamp. Mark, W8BCKO, 2534 El Tomas Way, Carmichael, CA 95608

QSLs 300 for \$4.35! Samples 10c. Colourcard, Box 326, Topanga, CA 90290

QSLs - custom QSLs, brochure 25c. W1FLX QSL Designs, 20 Bolton St., Pittsfield, MA 01201

EXCITING, beautiful QSL and SWL cards from the plates of the late Warren Rogers. K9AAB. Samples 25c. Jim Pattison, 3013 North Victoria, St. Paul, MN 55113

QSLs - See our new leatherfinish cards before you buy. Samples 10c. Practical Products, Box 1366, Pittsfield, MA 01201

WANTED: All types of tubes. Top prices paid for Vamax & Elmec. Jaro Electronics Corp., P.O. Box 414, Orlando, Fla. 32802. For fast action call Toll Free: 800-327-7799. Ask for Bob Hoffman

We buy tubes. Maritime International, 834 Hemlock St., Franklin Square, NY 11010

CASH paid for your unused tubes and good ham and commercial equipment. Send list to Barry, W2LMI, Barry Electronics, 512 Broadway, NY 10012.

WIRELESS sets, parts, catalogs, bought, traded. Laverty, 118 N. Wycombe, Lansdowne PA 19050.

WANTED: An opportunity to quote your ham needs. 33 years a ham gear dealer. Collins, Drake, Galaxy, Tempo, Kenwood, Ten-Tec, Hy-Gain, and all others. Also \$25.00 inventory used gear. Request list. Chuck, W8UCG, Electronic Distributor, Inc. 1980 Peck St. Muskegon MI 49441. Tel: 616-726-3198

HAM ticket - Amateur radio license course for Novice, General, Advanced, Extra Class. Write for information. Clayton Radio Co. 220 Mira Mar Av. Long Beach CA 90803.

SPIDERS for boomless quads. Helare welded aluminum. 81' Antennas, 1339 So. Washington St., Kennewick, WSN 99336

We buy electron tubes, diodes, transistors, integrated circuits, semiconductors and resistors. Astral Electronics, 150 Miller St., Elizabeth NJ 07207. Tel. 201-454-2420

TRANSFORMERS rewound, Jess Price, W4CLJ, 507 Bachn, Orlando, FL 32806

PEORIA Hamfest - September 17, Peoria, Illinois, same place as last year. For details, see September issue of QST Hamfest Calendar. Banquet Saturday, Sept. 16 at V Junction. \$5.50 per person. Door prizes for men and women, cocktail hour 5:30 to 6:30, dinner 6:30. Two motels within walking distance. Reservation deadline Sept. 4, cancellation Sept. 11. 150 maximum so get those reservations in early. Hamfest ticket distribution \$1.50 advance. For either banquet tickets or advance Hamfest tickets write: Wendell McWilliams, WN9DVJ, Box 1, Rome, IL 61562.

FIFTH Annual Radio Society of Ontario Convention - Kitchener, November 3 and 4, 1972. Canada's biggest - excellent forums for OMs and XYLs. Write R.S.O. Convention, Kitchener Waterloo Amateur Radio Club, Box 603, Kitchener, Ontario, Canada

WANT wireless (early) magazines and equipment for W4AA historical library. Wayne Nelson, Concord, NC 28025

CAPACITORS - Brand new aluminum electrolytics, 275uFd at 500vWDC. Ten for \$19.50. K4HP, 6835 Sunnybrook Ln., NE, Atlanta 30328

TV camera kits, plans, parts. Go ham TV the easy, economical way. Catalog 25c. ATV Research, Box 453-Q, Dakota City, NE 68731

CASH or trade for pre-1925 radios for personal collection. Carl Osborn, W8RXP, 15816 Calvert St., Van Nuys, CA 91401

NOVICE Crystals. Free flyer. Nat Stinette Electronics, Umatilla, FL 32784

TELETYPEWRITER machines, parts, bought, sold. S.a.s.e. for list. Teletronics, Box 8873, Ft. Lauderdale, FL 33310

NOVICES: Need help for General ticket? Complete recorded audio-visual theory instruction. Easy, no electronic background necessary. Write for free information. Amateur License, PO Box 6015, Norfolk VA 23508.

WANTED: tubes, transistors, equipment, what have you? Bernard Goldstein, W2MNP, Box 237, Canal Station, New York, NY 10013

TOWER climbing safety belt/ansard \$21.50, prop pitch rotor \$65, T/R 175 frequency meters \$45, 2M handtalki \$50, coax of switches multiplication \$16-\$48. Free list. Link, 1000 Monroe Tpk., Monroe, CT 06468

WANTED: SB303, SB401, SB220, HM102, SB610, Hy-Gain TH6DX, W2UGM, 66 Columbus Ave., Closter, NJ 07624. 201-768-1884.

WANTED: Collins mechanical filter F 455 J-21. Frank McJannet, 11597 Evamston N. Seattle, WA 98133

WANTED: Collins 136A-1 noise blanker. Excellent condition with manual. Joe Paterson, W7MG, 8011 North Washburne Ave., Portland, OR 97217. Telephone: (503)285-3477

PREPARE for FCC exams! You need Post-Check. Original, expertly devised, multiple-choice questions and diagrams covers all areas tested in FCC exams. Keyed answers, explanations. IBM sheets for self-testing. All newly revised and up-dated. General Class, \$4.25. Advanced Class \$4.50. Extra Class \$4.75. Each applies to its own class only. First class mailing included. Add 25c each copy for air mail. Send check or money order to Post-Check, P.O. Box 3564, Urbandale, Des Moines, IA 50322

BUYING? Selling? Trading? Don't make a move until you've seen our 24 page bi-weekly bulletin with hundreds of ads. Free sample copy! Six issues \$1. Ham Ads, P.O. Box 46-653B, L.A., CA 90046

DISCOUNTS! Standard, Sonar, Clegg, Robyn, Mosley, Cush Craft, others. Also Marine gear. Write stating needs, Arena Communications, Dept. C, 1169 N. Military Hwy., Norfolk, VA 23502

AMATEUR paradise vacation. Livingstone Lodge, Mascota Lake, N.H. Cozy cabin for two weekly \$65. Swimming, fishing, boats, sports, ham radio, hot showers, fireplaces, light housekeeping. Children half, camp sites, literature. A. Q. Livingstone, W2LA

2-meter fm, brand new, Inoue IC-20, 1 & 10 watts, 12 channels, w/mike, cable, mobile mount, \$259.50. Bob Brunkow, 15112 S.E. 44th, Bellevue, WA 98006. Phone: 206-747-8421

KILOWATT Health station. SB-101, cw filter, HP-23A supply, SB-600, HD-15, Turner #2 mic, Waicox coax switch, SB-200, TA-33 Sr., Ham-M rotor, plenty of cables and coax. Complete \$750. Mark Kramer, W9AHQ, 1140 Grunt, Fennimore, WI 53809

CASH for sbb gear in need of repair. State condition and price. W9HF, 6005 Indiana, Ft. Wayne, IN 46807

WANTED: Collins 32S3; Wanted Collins 32S3; Wanted Collins 32S3. Chas. Henry, 39 Beaconsfield Blvd., Beaconsfield, Quebec, Canada. 514-695-6442

FANTASTIC DX-vhf QTH - LI 20 miles east NYC. 40-20 beams 365 ft above sea level. Nearly 5 acres, 5 bedrooms. Nearest house 400 ft away. Florida bound. Ray, W2BK, 516-626-1584

COLLINS: 32S3 transmitter w/pwr supply - \$650; 75S3 receiver - \$450; 312E4 control unit w/phone patch - \$100; Acrotor tower N.W.P. 5, 70' 9" triangular free standing - orig. \$870 for \$300; Mosley TA-33 10-15-20M beam - \$75; Ham-M rotor w/control - \$80; B&W L.P. filter, 75 ohm, Mod. 426 - \$12; 10M grid. plane unipole ant. - \$25. All above in like new condition complete with manuals and installation drawings. Fictel Ant. K9BQD, 120 W. 3rd St., Roxana, IL 62084. 618-254-0087

MECHANICAL filters: 455 kHz, 2.1 kHz \$18.95. 300 Hz \$22.95. J. A. Fredricks, 314 South 13th Ave., Yakima, WA 98902

DRAKE R-4B - MS-4 - mint condition; Drake SC-6 6 meter converter; Drake CPS-1 power supply, never used; 10 extra crystals. \$375. Edward Cholerton, 770 Kings Highway, Cape May Court House, NJ 08210. 609-263-8533

A5 Magazine: The all new ATV publication covering all modes of ham TV. Subscription \$2.50 per year. Bi-monthly. P.O. Box 6512-C, Philadelphia, PA 19138

WANTED: Drake 2B w/speaker/Q-multiplier. Prefer mint cond. W4WFL, 225 Main St., Newington, CT 06111

DX engineering if speech processor; plugs into any Collins 32S-3; essentially unused. \$65. Write to E. Myers, 225 Main St., Newington, CT 06111.

TOROIDS 88, 44, and 22 ohm - can of five for two (\$2) dollars post paid. M. L. Buchanan, P.O. Box 74, Soquel, CA 95073

TRADE old walrus player piano (Cable Nelson) mint shape. Trade for KWM-2 and ac or an S-line or what have you? Richard Shark, 417 North Ferry, Otumwa, IA 52601. Phone: 515-682-5741

3 UNUSED PL-172 tubes \$65 each; 2 new sockets (PL 172) \$15 each. Paul Beavin, WB6NLT, 1 Adams Ct., Novato, CA 94947. 415-897-8843

SB101 cw filter, HP-23: \$325. SB-301 cw filter, SB-401: \$395. Spaulding 48 power, TR-44, Tri-Band spider quad: \$120 plus shipping. Heath HW-22, HP-13, SA-100-1, RA-10-1, GH12, bumper mount: unused \$85. SCR522 (2 meters), power supply, HG-10 VFO: \$35. 14 AVQ, Shure 444, Vibroplex original, HD-15 patch. Must sell; take best offer. WB6SCM, 656 High, Santa Cruz, CA 95060

QST from 1935 for sale. \$25 plus postage. W. A. Fischer, 7 White Birch Ct., Rotterdam, NY 12306

FOR SALE or trade for Robot No. 70 monitor, all mint cond.: Heath SB-110 6M xcr complete with all crystals (8) plus MARS (1) & manual - \$325, SB-610 - \$85, SB-620 - \$125, Will ship shipping costs. KH6HMA, W. Orin, P.O. Box 135, Lawai, HI 96765

KENWOOD twins, T599, R599; SB-200 linear; like new. \$695. No shipping. Alan, tel: 7148309821

SELL: Hammarlund HQ-170AC, \$190; Valiant I, \$75; with manuals, F.O.B. All offers considered. Greg, WB2ZSH, 108 Valley Dr., Watchung, NJ 07060

6146 transmitter tubes #2, 2/\$3.50 6-B. Aaron Thoroman, Rt. 2, Spencerville, OH 45887

MOTOROLA two meter fm equipment T53GKD, two frequency receive, three frequency transmit, 12 volt dynamotor supply, 60 watts, with control head, cables, speaker and mike \$100. T43GGV, two frequency transmit and receive, 30 watts, vibrator supply, 12 volts, with accessories \$80, without \$75. You pay shipping. George P. Adams, W5KLB, 102 Gayosa Ave., Natchez, MS 39120

TRADE Turner 454-C sbb mic for Vibroplex. WA0YED

CANADIANS: For sale Heath DX 60 with HG 10 VFO Lafayette HA 350 receiver - All \$225. VE2DJA, Herb Frank, 334-8362, Montreal

FOR SALE: ground post for E-Z tower RBX50 \$100 or best offer. Frank Belina, W2IBR, (201)353-5509

GALAXY GT-550A and ac supply \$425, includes VOX and 25 kHz calibrator. Mint, have original shipping cartons. James Powell, 200 Andrews, Cleveland, MS 38732

SWAN 500C transceiver, 117XC power supply, VX-2 VOX. Mint condition. First \$450 takes all. Will ship and prepay transportation in 48 states. K3TFZ, Syd Rodin, 130 Nelson St., Clarks Summit, PA 18411

SELL: Touchcoder II (QST July 1969) typewriter keyboard sends clean code the lawman's way \$150 or what will you offer? S.a.s.e. for details. Stuber, W8PJH, Amherst, OH 44001

TEKTRONIX 345A 30 MHz scope with CA dual-preamp, scope/mobile, X10 and ac current probes. \$375. WB6MNL, 5565 Coral Reef Ave., La Jolla 92037

SELL: QST, January 1949 through December 1970; CQ, March 1957 through December 1970; 73, most since May 1963. About 500 issues. Make an offer - my wife wants the space. Bob Park, W3PKI, RD2, Moscow, PA 18444

FOR SALE: NC-270 receiver \$100. WB2BQE, 443-83-ST, Brooklyn, NY 11209

NEED schematic for Transcom SBT-3. Will pay for copy. WA5IYK, P.O. Box 968, Bellaire, TX 77401

WANTED: Gonset Comm IV 2 meter and 220 MHz, in working condition, state price, W6BQN, 15021 Ragus, La Puente, CA 91744

SALE: Complete mobile station, SBE-33, mobile power supply, binder antenna with four coils and mount. \$150. Claude Cook, 13115 Memory Lane, Fairfax, VA 22030

TRADE: R388-5113 with mechanical filter plus 3.1, 1.4 filters - for - 75A2 with manual & calibrator plus HRO50T with calibrator, coils A thru D and manual. Even trade only. Equipment in good operating condition. WA4YSG, 2929 S. Rouse, Springfield, MO 65804

SWAN 500, 117XC power supply, 410 external VFO \$500. Johnson Thunderbolt KW linear \$250. Hy-Gain dB 10 and 15 meter antennas \$50. Want: two Eimac 3-500Z tubes. Have manuals. Pick up only. Wallace Heckman, W1AA, 45 Andrew Ave., Hull, MA 02045

FOR SALE: Drake R-4B A1 condx. \$375. William Sigalove, 130 Meadow Dr., Elyria, OH 44035

TELETYPE TT/335/TG (similar to TT/4/B) brand new with fiber-glass carrying case and special transport chest, manual, two rolls of paper, and extra motor. For RTTY operation a 400 Hz 115 V power supply is needed or a 60 Hz motor of the proper speed (available from Kienschmidt, the manufacturer or surplus). Recently married, need the money. \$180. Mike Towers, Box 604, Midland, TX 79701

WANTED: Collins 75S-3, 32S-3, 516F-2 or Drake R4B, T4XB, AC-4 - up to \$600. W6LTY, 406 Bayou View Dr., Seabrook, TX 77586. 713-3343396

SELL QST 1922 thru 1959. M. C. Zervantian, W6DIS, 6561 Dohm Circle, Huntington Beach, CA 92641

SELL: Telex Tribander, the big one - six months old - \$386 dollars. Wanted: Collins 62S1, K2W2 with rotund emblem, 516F2, 312B4. Contact Barry Forrest, WA2BPT, 347 Beach 43rd St., Far Rockaway, NY 11691, 212-327-4952 - phone.

HW-32 Sonar mobile supply antenna mount microphone \$150. W62QFB, 55 Howard Ave., Copiague, NY 11726

HEATH SB-100, HP23 power supply, in perfect condition. \$295 prepaid. Trade for 2 meter equipment. Cline, W6BLX/7, Box 6127, Salt Lake City, UT 84106

HAMMARLUND HC170AC - vhf mint condition \$250. Bob Kaufman, 10804 Harvey Dr., Fairfax, VA 22030. 703 273 2252

SELL: NC-270 receiver - \$94. T-60 transmitter - \$35. Very good condition. Rich Mandelbaum, Quinn Rd., Briarcliff, NY 10510

COLLINS "G" line, 75S3, 32S3, power supply, speaker, phone patch, miscellaneous station equipment. Selling to settle estate. No reasonable offer refused. Benjamin Fogarty, 17 Sunset Dr., High Bridge, NJ 08829. 201-638-8414

WANTED: Heath SB600, SB610, W8ZRF, 6691 Ford Rd., Yonkers, MI 48197

LAF HA410 \$75. Jackson 5" scope, wide band high sens. \$75. 32PYC, P.O. Box 108, Plymouth Meeting, PA 19462

WANTED: F tower sections for model 500 Kwick-climb by Jontz. Richard Berg, 201 Pemberton Rd., Rochester, NY 14622. 716-544-5088

HEATH SB-101, HP-23 ac supply, SB-600 speaker, manuals and cables. Some spare tubes and parts. \$360. W2AAV, C. S. Yerman, 604 Cherry Rd., Syracuse, NY 13219

1 kW 144 MHz power amplifier complete with two 4CX300A tetrodes, meters, blower. Deluxe \$105. W6HB, P.O. Box 937, Menlo Park, CA 94025

SELL: Heath HW32A \$85, HW12A \$85, HP13A \$55, HP23A \$45, HA14 Kilowatt Kompact ac/dc p.s. \$185, HX20 (FW) \$75. VF-1 VFO \$12. All excellent condition, plus shipping. W8V0E, T. R. Troike, 909 Fifth St., Sandusky, OH 44870

WANTED: recent SB640. Send price, condition. Tom Seevers, 1116 Cold Spring, Lincoln, NE 68512

KNIGHT T-60 xmit, a-m-cw, 60 watts on 6 bands, you ship. \$30. T. J. McNulty, 33 Moculitt Circle, Sacramento, CA 95831

NEW condition - DX-60B, \$60; HR-10B, \$60; HG-10B VFO, \$30. A. Wilson, East Brewster, MA 02640

SELL: Complete matching Galaxy GT-550 w/cal: AC 400 p.s.; SC-560 spkr; RV-550 VFO, 300 Hz wr filter; all manuals. Like new cond. Best offer over \$400. KQONU, James W. Woodman, 521 Belair Dr., Jefferson City, MO 65101

QSTs 1947 through 1970 \$50. Missing Aug. 48, Nov. 50, Jun. 51, Aug. 52, Dec. 53, and May 58. Some covers slightly damaged. P. Harford, W2GQM, 450 Watson Dr., Indianapolis, IN 46201

SELL: Collins 75A4 w/matching spkr \$350; xmit Eldico sbb 100A w/PTT make \$125; Hallicrafters SR-150 transceiver w/PTT mike, wtr supplies 117vac and mobile 12 vdc, mounting bkis, \$350. W6QGD/4, 2709 North Brandywine St., Arlington, VA 22207

FOR SALE: BTI-LK 2000 perfect operation and appearance only \$390 FOB. W1DBS, John Savonis, 410 Blake Rd., New Britain, CT 06053

SELL QSTs excellent condition 1938 to 1969 very reasonable. Write for list. WA9LIB, 10417 Spring Garden Dr., St. Louis, MO 63137

NEW components: transistors: 2N2222A, 2N2907A, Trippots-Bourns 329P-5Kohms all \$.75 ea (Have about 500 of each). Circuit board drill press: Dumore 16-011, like new \$95. E. C. Reich, W6FQA, 9 Eastport Pl., Plano, TX 75074

SELL: Heath HW-32A/ac & dc power supply, EV 664 desk mic, Shure 414 mobile mic, Hm-1 SWR bridge. No reasonable offer refused. C. Novak, 110-48 72 Ave., Forest Hills, NY 11375

FOR SALE: complete mobile rig minus antenna Swan 240 175. W6MDQ So. Cal. only. Hawthorne, CA 90250

FREE: will give 10 meter mobile set GE 4 G 1R2 to church, radio club, or group that can show need for it. Write Paul Mills, 620 Corby St., Woodburn, OR 97071

WANTED: Heath Kompac linear with or without power supplies. W4SAR, 1030 So. Perry Ave., Jupiter, FL 33458

NOVICES: Heath HX-11, Allied A-2515, ant relay, SWR, treve, relay, \$100; Panasonic cassette RQ-209AS \$30; Knight sig. gen. \$20. Bill Jacobs, RFD-1, Columbia, MO 65201

SELL: HW22A - \$85, HP23A - \$45. Mint. W3DGU

APACHE new amplifier tubes, \$65. R-100A, \$50. Stephen Lloyd, 116 Osman Pl., Ithaca, NY 14850

SELL: 32S-3 - immaculate, w/ps, \$550. Mike Coulter, K4GUC, 1133 SW 7th St., Boca Raton, FL 33432

HEATH SB-101, HP-23A, well wired - make offer. Steven Korn, WA2FKE, 12 Sanderson, W. Caldwell, NJ 07006. 201-226-3083

"HOSS Trader Ed Moory" says he will not be undersold on cash deals! Shop around for your best price and then call or write the "Hoss" before you buy! New Regency HR-2A two meter fm transceiver, 15 watts, immediate shipment, amateur net, \$229; New Rohn 50 ft foldover tower, prepaid, \$239; New Mosley CL-35 and demo Ham-M rotor, \$205; Used equipment: HT-37, \$149; CE 100V, fair condition as is, \$189; Galaxy GT-550A, \$349; TR-22, \$149; ML-2, \$239; KWM-2, \$595; Ham-M, \$89; TR-4 w/3ANL, \$499; R4-B, \$345; T4-XB, \$359; Ed Moory Electronics Co., P.O. Box 506, DeWitt, AR 72042. Tel: 501-946-2820

FACSIMILE transceivers, only \$9.95 ea. See our ad in this issue. Newsome Electronics, P.O. Box 176-T, Trenton, MI 48183

SALE: C.I.E. Second Class license course. Like new \$35. Will ship. WA8WOA/J, 312 Angus Ave., Rio Grande, NJ 08242

COLLINS 75A3 rev. \$210; Hallicrafters HT32 sbb xmit \$160; Valiant xmit \$80. W2GUG, 489 Clinton Ave., Wyckoff, NJ 07481. 201-TW1-3729

ESTATE selling: 75A4 (No.1120) \$350; CE 100V \$225; HT41 k/W linear \$160; mint cond. Ham-M rotor; Mosley tri-band k/W 40' steel tower, best offer. W3UWN deceased. Tel: (215)ML6-1726

QUAD W2AU vinyl covered \$45, homebrew 811A kilowatt linear \$85, Marudor HX11 150, Digkey Keyequipment: HT-37, All good condition. WA2GUVJ, McDonough, NY. 607-647-5537

WANT: Telex 20 mtr beams, Sell x(mrs): 3600-0-3600 1 amp \$25, 1.7 amp \$40 with 120/240 pn & fob. W0AIIH, Paul Bittner, 814 4th St. S., Virginia MN 55129

REGENCY HR-2A, new cond. xmit 34/94/82, revc 94/85/70, Mosley 5/8 whip, \$210 postpaid, LM-10 freemeter, p/a, calib. book. \$40 postpaid. K6SGQ, 6500 Bacarro, Long Beach 90815

SB-301, one of the best you can find, factory aligned, excellent controls \$225. Send cny check \$200. I will ship. Bob, WA9UZH, Box 326, Goldfield, IA 50542

WANTED: National SW-3. State condition, coil sets, and price. Sell or swap: Squeeze keyer, solid state, large a.s.a.s. for details. Ed Kennedy, W9IDL, RR No.1, Far View Rd., Elburn, IL 60119

WANTED: T-4XB, AC-4. Write K2ARO, Edna Dr., Hyde Park, NY 12538

WANTED: Collins 312B-5, K2QDE, Martin. 2011 Ocean Ave., Bklyn, NY 11230. 212-998-2029

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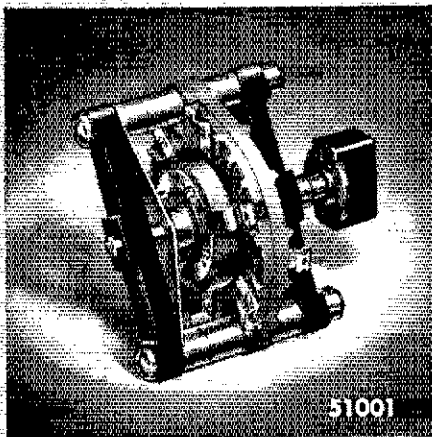
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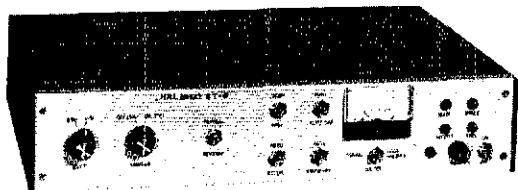
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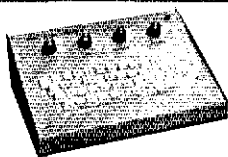
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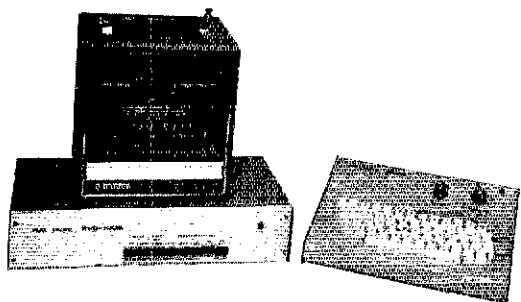
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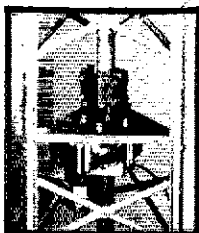
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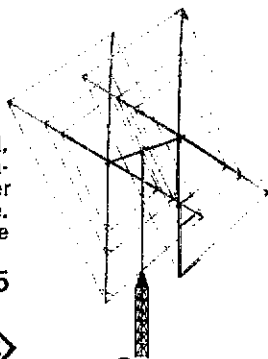
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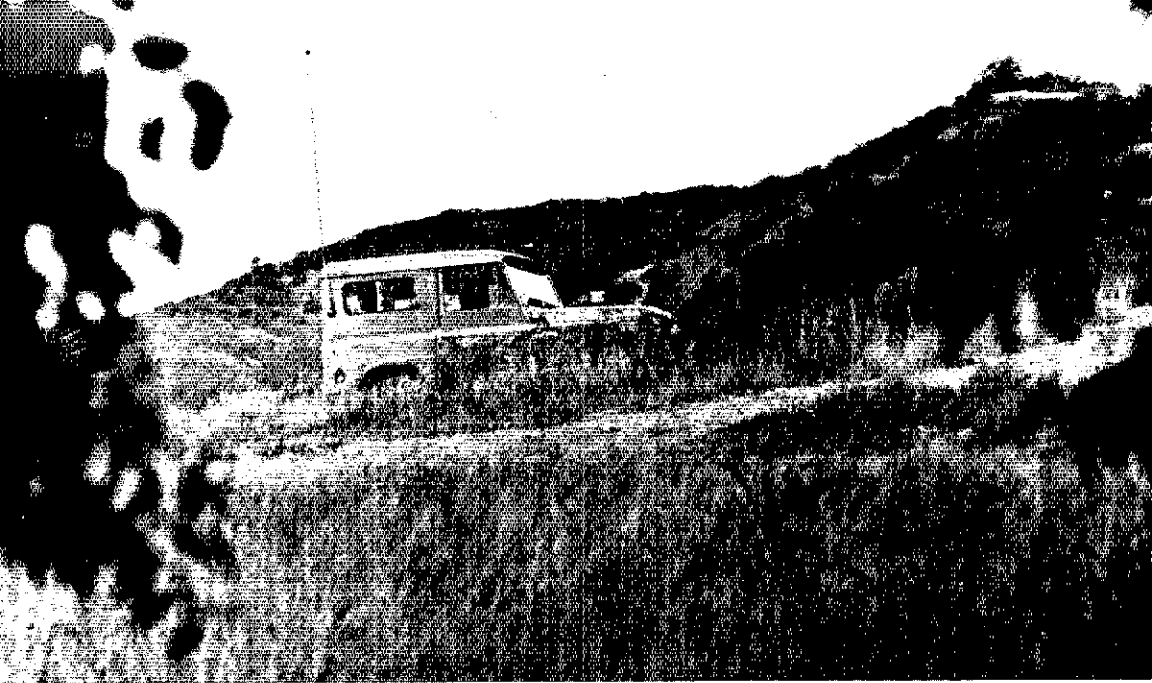
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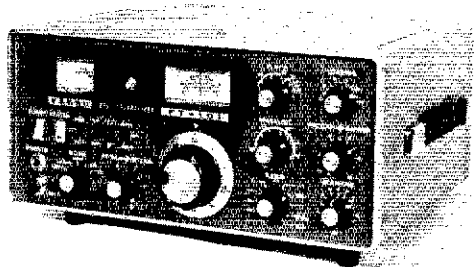
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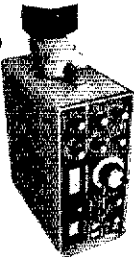
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