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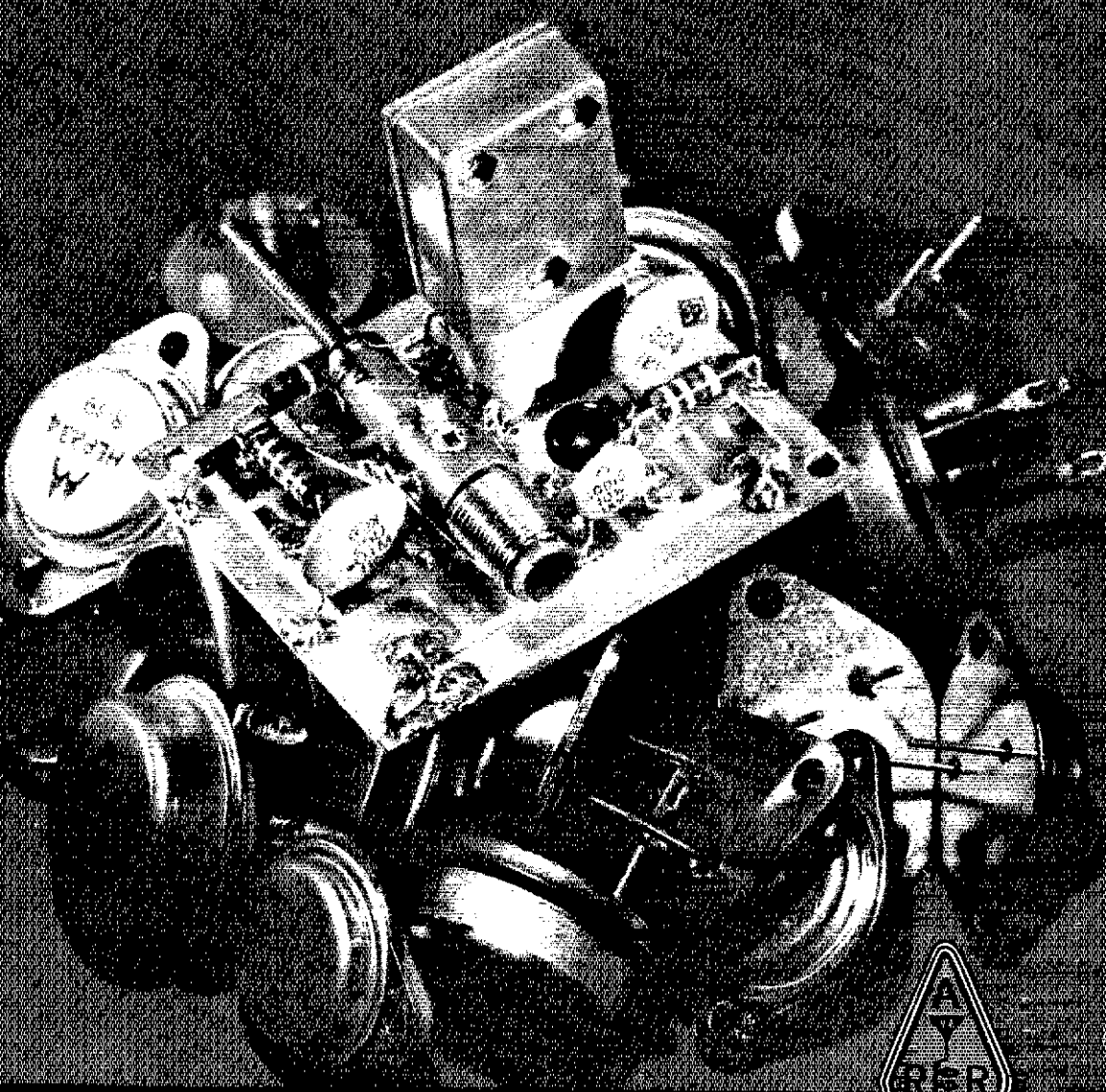

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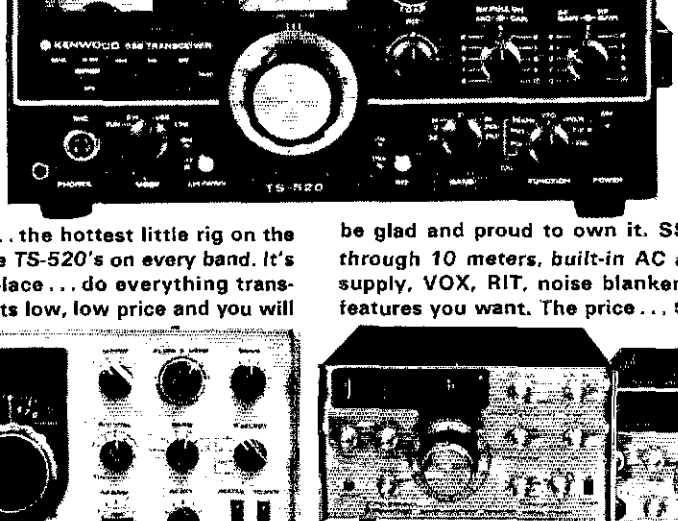

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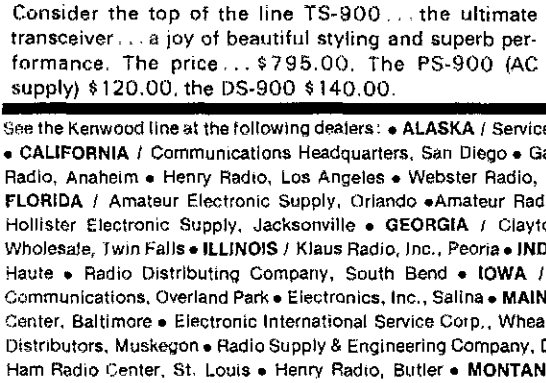

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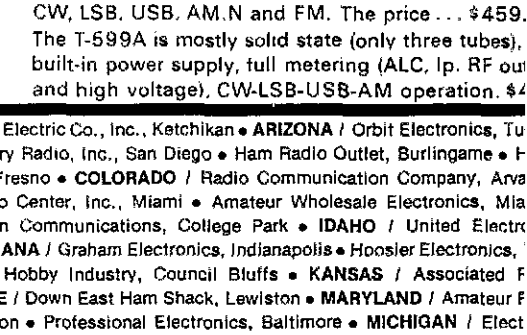

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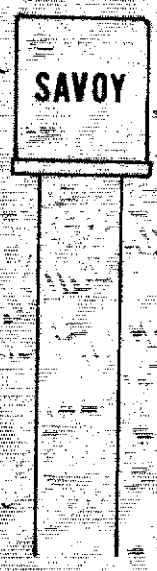

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April 1975

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OUR COVER Shown here is the completed oscillator stage for Part 1 of "Learning to work with Semiconductors." See page 21 for details.

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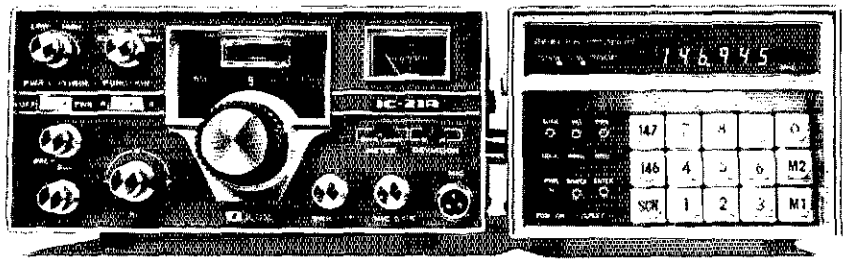

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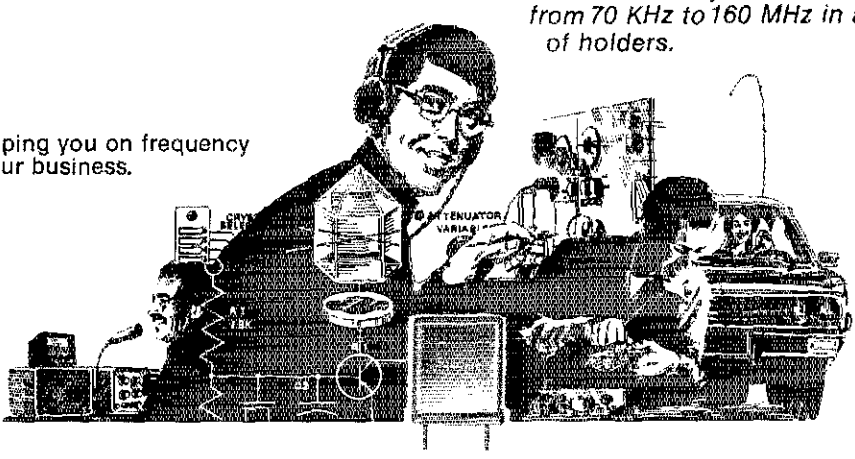

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors.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

IARU FIFTIETH ANNIVERSARY

"AS THIS ISSUE of *QST* goes on the press there will be convening in Paris a congress of delegates from the national radio societies of the world, meeting in accordance with a proposal made by the ARRL a year ago, to form an International Amateur Radio Union." Thus began an editorial in May, 1925, *QST*, commenting on the progress being made toward an organization to guard the interests of the radio amateur at the international level. This month, we mark the fiftieth anniversary of the adoption of the first Constitution of the IARU by this congress.

In 1925, two-way transatlantic amateur communication had been an accomplished fact for little more than a year. Already it was apparent that radio was by its very nature an international medium, and that there was need for a corresponding organization to represent the amateur. As it happened, the founding President of the ARRL, Hiram Percy Maxim, had a business trip to Europe scheduled for early 1924. Such an excursion was quite an undertaking in those days, involving as many days on an ocean liner as overseas trips today involve hours on a jet. Ever mindful of economy in the management of the League's affairs, the Board of Directors asked him to represent the League in fostering international relations between amateurs while he was abroad. This, of course, he was delighted to do.

An informal meeting of distinguished amateurs representing nine nations was called for March 12, 1924, in Paris, to discuss the formation of an international organization of amateurs. There was considerable enthusiasm for the idea, and agreement was quickly reached on the name and on the calling of an International Amateur Congress during the Easter holidays of 1925 for the purpose of creating the Union. The full story of the congress is told in *QST*s of the period and in *Two Hundred Meters and Down*, by Clinton B. DeSoto, the definitive historical work on the early days of amateur radio.

This IARU anniversary is especially significant for two reasons. First, we are on the verge of another general World Administrative Radio Conference which will examine *all* of the international Radio Regulations of the International Telecommunication Union affecting *all* services, including amateur. The all-important Table of Frequency Allocations which establishes our "ham bands" will be subject to revision, ostensibly to bring it into line with technical developments since the last general WARC in 1959. It is for just such a conference that the IARU was created, to provide a framework in which preparations can be made *before* and on-the-spot participation by observers can be provided *during* the conference.

Second, the IARU has just adopted a newly-revised Constitution which recognizes a comparatively recent development in its structure: the regional organization. Three such organizations now exist, representing the interests of amateurs in the three regions of the world which the ITU uses for allocations purposes. The organizations were discussed in some detail in *QST* for July, 1974, page 82. The advent of the regional organization has contributed significantly to the ability of the IARU to fill the varying needs of its member-societies around the world and has made it possible for delegates to participate in face-to-face meetings that would never be practical on a world scale. The Region I Division, encompassing Europe, Africa, the Middle East, and the USSR, is itself celebrating an anniversary this year – its twenty-fifth.

That we can enjoy amateur radio on the scale we do today is due in no small part to the efforts of the far-sighted men who met in Paris just fifty years ago this month to ensure that the radio amateur would have a firm, stable, and durable voice at the international level. It is appropriate to pay them tribute at this time, and to remind ourselves that the existence of amateur radio in years to come is not a foregone conclusion; its health and fortune in the future depend on what *we* do *now*, just as we have depended on the work of those pioneers. The problems we face today are different, but are no less compelling. — *KIZND*

League Lines . . .

Just as this page was being sent to the printer, we received word on the outcome of the FCC meeting to discuss Class E CB which was mentioned on page 11 of last month's QST. The Commission, recognizing that Docket 20120 (Class D expansion) and Docket 20282 (amateur restructuring) involve related issues, decided to defer action on the Class E matter (Docket 19759) until later in the year in order "to fully develop the requirements and alternative solutions" which are needed. Also, further discussions with Canada are needed relative to Class E frequencies along the border. We're not out of the woods yet, but FCC recognition that the three Dockets are related and that the Canadian objections cannot be dismissed lightly are somewhat encouraging.

Final reminder -- questionnaires were sent to all U.S. members of the League concerning input to League directors on the FCC restructuring proposal, Docket 20282. If you received yours -- have you returned it yet? If you have not received one -- have you asked Hq. for another? Survey results must be tabulated and in the Directors' hands well in advance of the May 15 Board meeting at Hartford.

Speaking of questionnaires, the National Bureau of Standards had one in March, 1975, QST, page 103-104, asking users of WWV and WWVH to rate the services available from these stations. These forms are due at Boulder, Colorado by May 1. A good response will help NBS evaluate which of its services are most useful and which, if any, are less necessary.

License fees went down March 1 -- now they're $4 for new, renewed, modified-and-renewed, or upgraded; $3 for modification; $2 for duplicates and $25 for only those special call requests provided for in section 97.51 of the amateur rules.

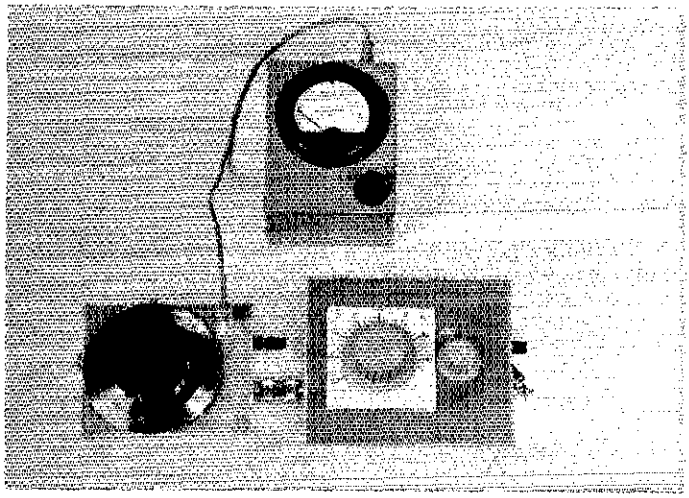
The amateur rules have been amended to delete references to citizenship or nationality with respect to eligibility for amateur license. See "Happenings" this month for the details.

Travel time is just around the corner; if you find yourself in central Connecticut, why not plan to stop at ARRL headquarters? Meeting a couple of the staff and peeking into the offices will take a half-hour or so; office hours are 7:30 to 5:00 local time, Monday through Friday, but we'll be closed on the holidays of March 28, May 26, and July 4. A visit to W1AW, on the same premises, should be scheduled according to the hours listed in the box on page 81. Bring your FCC license and -- bulletin and code practice schedules permitting -- you'll be able to operate the station.

Remember the Walker Tompkins adventure stories based on ham radio? They are now available in paperback from the League for $2 per copy, all three for $5. The titles are: SOS at Midnight, CQ Ghost Ship and DX Brings Danger. Teenage ham Tommy Rockford, K6ATX, gets into and out of all sorts of peril, but meanwhile explains amateur radio and makes it exciting for the under 20 set. Good way to get your favorite niece or nephew hooked on hamming!

2450 members applied for Life Membership during the last five months of 1974, no doubt chiefly to avoid the dues increase and escape the further effects of inflation. What is more interesting is that the rate at which applications came in increased geometrically as the end of the year approached. The three-month period of August-October saw 542 applications arrive, while 627 were received in November, and a record 1281 in December. The yearend figures showed 7599 either fully paid up, or paying toward Life Membership on the quarterly plan.

We've heard that there is some confusion as to whether contributions to the ARRL Foundation are tax deductible. They are!



Setup for making antenna impedance and resonance measurements: basic impedance bridge, lower left; add-on L/C network for 40, 80, and 160 meters, lower right; and 50 μA meter, with shunt multipliers, top.

SIMPLE RF BRIDGES

Instruments and Methods for Use with Vertical Antennas

BY JERRY SEVICK,* W2FMI

WITH THE WIDESPREAD use of commercial rigs, kits and antennas generally designed for 50-ohm operation, the SWR meter has probably become the most popular measuring instrument in the amateur's repertoire. But for vertical-antenna measurements, where ground losses and impedance values for matching purposes are important, the SWR meter leaves much to be desired. Its accuracy is generally not sufficient to detect small changes in ground losses when adding radials or ground rods. It doesn't lend itself to convenient measurements at the antenna terminals. Use of an SWR meter requires radiating appreciable power to obtain useful readings. And it isn't particularly suitable for ascertaining resonant conditions. The antenna impedance bridge is far more useful, but most units described have required special components or setups, discouraging their use by the average amateur.

The instruments described here are simplified versions of the rf bridge for use in coaxial lines, shown in recent editions of *The Radio Amateur's Handbook*, Chapter 17. The differential capacitor in the *Handbook* bridge was replaced by a fixed-value capacitor and a simple variable one, a trade-off in reduced range for increased accuracy in measuring resistance. There is still adequate range for most antenna work.

Accurate reactance measurements are difficult with simple hf bridges, but such devices can be calibrated in approximate values of antenna length above and below resonance, which greatly aids one in tuning. Reactance values for antennas can vary greatly with conductor size, and thus may be somewhat misleading to the uninitiated. But at resonance, when the antenna presents a pure resistance to the bridge, the accuracy of measurement can reach 2 or 3 percent in absolute values, and 1 percent in reproducibility. Such accuracy is quite necessary in determining losses in ground systems and matching networks.

Several versions of, and additions to, the simplified bridge are described. These include L/C networks for tuning purposes, dc amplifiers for work with low power, solid-state designs for complete portability, and a network for use with balanced loads.

Bridge Principles

The bridge principle has been known nearly 150 years. Probably its first practical application was by Wheatstone, in 1843, in the comparison of resistances. The familiar network is shown in Fig. 1A, in which R1 is the resistance to be measured, R2 is a variable resistance, and R3 and R4 are equal resistances. No current flows through the galvanometer when points B and D are at the same potential. Because the detecting instrument is bridged between these points the connection BD was originally called "the bridge." In time the whole network became known as the *Wheatstone*

* 22 Granville Way, Basking Ridge, NJ 07920.

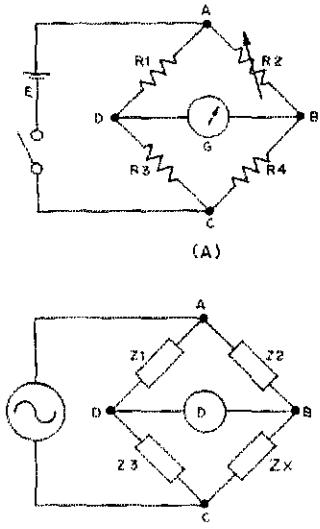


Fig. 1 — Simple resistance and impedance bridges. The dc (Wheatstone) bridge is at the top. The same principles are used for ac and rf measurements of impedance and radiation resistance, in bridge B.

Bridge, and the four resistive branches became the *arms of the bridge. Many great names appear in the* history of developing applications for this basic idea. Eventually Max Wien laid down the principles which are, for all practical purposes, used in the modern ac impedance bridge, Fig. 1B.[1]

Alternating-current bridges have been used in a vast range of industrial and scientific measurements, but impedance bridges for use at 3 to 30 MHz have been noticeably scarce, because of problems inherent in their design and use. These frequencies are too high to permit neglect of parasitic inductance, capacitance, and losses, and too low for use of transmission-line circuit techniques. The bridge of Fig. 1B is composed of four impedances having complex values Z_1, Z_2, Z_3, and Z_x, *the last being the unknown.* If *the bridge* is balanced, no current flows through the detector, D, resulting in the relationship

$$Z_1 \cdot Z_x = Z_2 \cdot Z_3$$

Since complex quantities are equal only if magnitudes and phase angles are equal to each other respectively, it follows that two adjustments are necessary to satisfy the conditions of balance. But if Z_x and Z_2 are pure resistances (R_x and R_2) and Z_3 and Z_1 are pure capacitances, (C_3 and C_1) the relationship *can be rewritten*

$$R_x = R_2 \frac{C_1}{C_3}$$

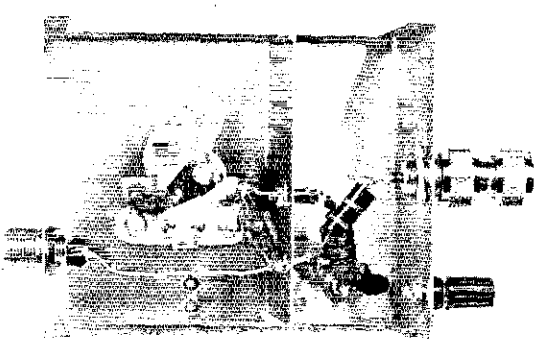
There are other bridge configurations which contain only capacitive elements, or require only one *adjustment for any complex value of impedance*, and thus have advantages over the bridges described here, but if one does not require a high *degree of accuracy in measurement of the reactive* component, and makes measurements of impedance under resonant conditions, the simple bridges described here approach the accuracy of professional hf bridges.

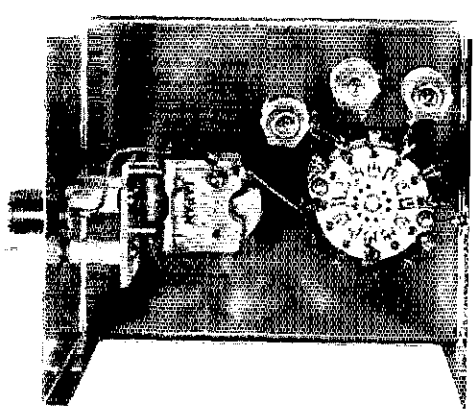
Practical R/C Bridges

A simple rf bridge is shown in the upper portion of Fig. 2. The values of C1, C2, C3, C4, and the standard resistor, R1, were chosen to obtain a range in measurement of about 10 to 150 ohms. For *lower than 10 ohms, either* C1 *or* R1 can have a lower value, or a broadband 4-to-1 balun can be connected to the output terminals. The meter can be in the range of 50 to 200 μA full-scale, if 500 mW of power is available as a signal source. A differential amplifier can be used, as shown in Fig. 3, to permit use of a low-power oscillator (10 to 50 mW) as a *signal source.* Obviously the latter gives better portability.

[1] For an extensive review and comprehensive list of references to original work, see Hague and Foord, *Alternating Current Bridge Methods*, Pitman Publishing, 6th edition, 1971.

Interior view of the basic bridge and add-on L/C unit for 40, 80, and 160 meters, shown schematically in Fig. 2.





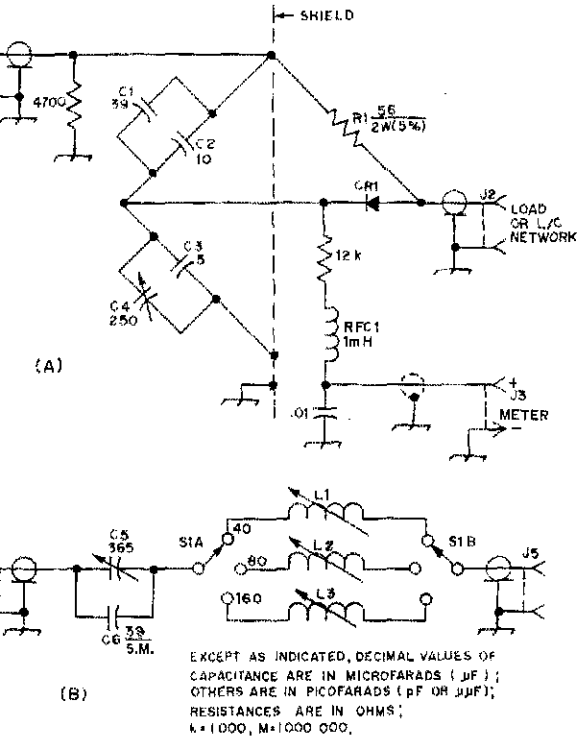


Fig. 2 — Schematic diagrams and parts information for a basic rf bridge and an add-on L/C unit for 40, 80, and 160 meters. These units are shown in the first photograph. The circuit of the bridge with L/C circuits for 10, 15, and 20 meters is similar, except for minor differences described in the text. Resistors are 1/2-watt, 10-percent tolerance, unless specified otherwise.

C1, C2 — 39- and 10-pF silver micas in parallel.
C3 — 5-pF silver mica.
C4 — 250-pF straight-line-wavelength variable (Hammarlund MC-250M).
C5 — 365-pF miniature variable (Archer-Allied 695-1000).
CR1 — Germanium diode.
J1, J2, J4, J5 — Coaxial receptacle.
J3 — Phono jack.
L1 — 15 turns No. 24 enamel close-wound on Miller 66A022-6 form (purple slug).
L2 — 30 turns like L1.
L3 — 63 turns like L1, but scramble-wound.
S1 — 2-pole 3-position wafer switch.

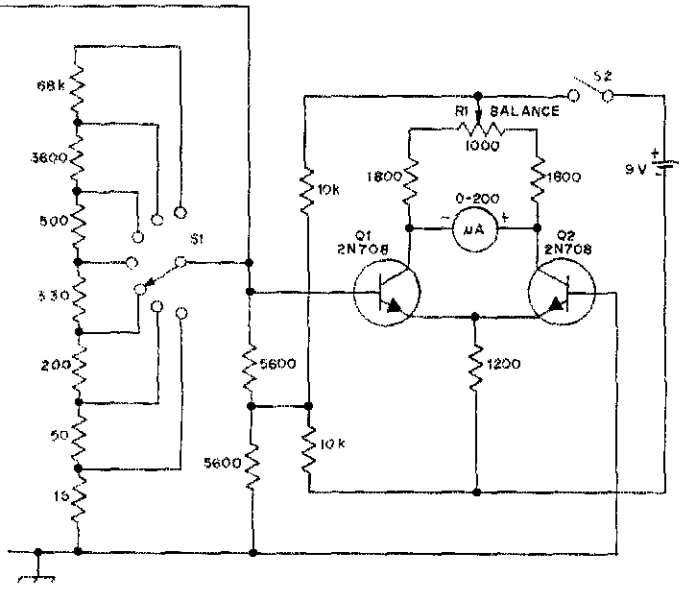
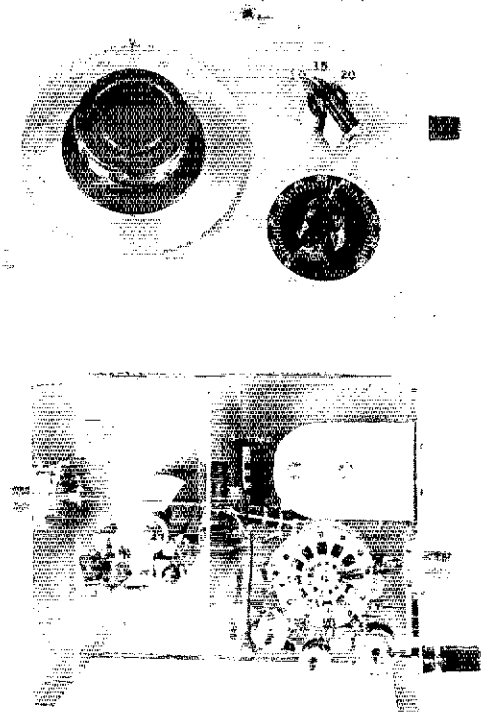


Fig. 3 — Circuit of the wide-range dc meter with built-in amplifier, for high sensitivity. All resistors are 1/4-watt composition.

Q1, Q2 — 2N708, HEP50, or equiv.
J1 — Phono jack.
R1 — 1000-ohm control, linear taper.
S1 — Single-pole, 7-position wafer switch.
S2 — Toggle switch.

This basic bridge has been found adequate for measuring radiation resistances plus loss resistances in the 10-, 15-, and 20-meter bands, where vertical antennas are manageable in size, and easily adjusted to resonance, which is necessary for accurate readings. The procedure is to set the resistance dial near the expected value (half-scale will suffice in most cases) and adjust the antenna for minimum meter reading. Then adjust the dial for minimum reading. A final adjustment of both



Bridge for 10, 15, and 20 meters, with built-in L/C switched networks.

the antenna and the dial for minimum will indicate a resonant condition, and a measurement of the antenna feed-point resistance.

More flexibility for these bands is obtainable through the use of a bridge having built-in switched L/C networks, as shown photographically. The circuit is similar to Fig. 2, with the following exceptions. J2 and J4 are eliminated as the result of direct connection of the two portions of the unit. C5 is used without the added capacitor, C6. L1 (10 meters) has 3-1/2 turns No. 18, spaced to occupy 1/4 inch of a Miller 4200 coil form. L2 (15 meters) is 6 turns No. 16 enamelled wire close-wound on a similar form. L3 (20 meters) is 11 turns No. 14 enamelled wire on a Miller 66A022-6 (purple) form. The resistor in parallel with J1 is 5600 ohms.

An external switched L/C network for 40, 80, and 160 meters is shown in the lower portion of Fig. 2. The variable capacitor, C5, can be calibrated in terms of the percentage of antenna length, above or below resonance. It should be pointed out that addition of such networks introduces a resistance in series with the loads, which should be accounted for in the calibration. At 160 meters this can amount to as much as 20 ohms additional resistance.

A broadband balun for measurement of balanced loads, such as center-fed dipoles and quads, will be used by the author in measurement of the effects of lossy earth on elevated antennas. It is shown attached to a bridge, built for 10-meter antenna work. It has trifilar windings of No. 18 enamelled wire, 8 turns, on a 1-inch toroid core, No. 2 mix.

The basic resistance bridge can be used to measure losses as small as one ohm in coils. The coil is connected in series with a variable capacitor, and a resistor of known value (20 to 30 ohms should suffice). The capacitor is tuned until resonance is found (minimum meter reading) and the resistance dial is then adjusted similarly. From the calibration curve the total resistance of the coil, connections, and series resistor is found. If thick short connecting wires are used, the loss in the coil is obtained by subtracting the series resistor value from the total. Usually the losses in the variable capacitor can be neglected.

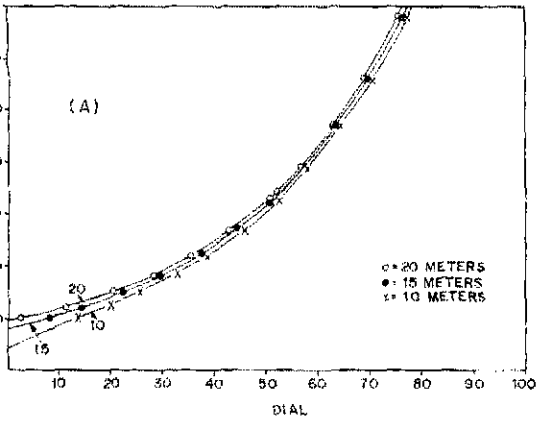
Parts placement and minimum lead inductance are crucial to satisfactory bridge operation in the hf bands. In some instances fixed-value capacitors are connected in parallel to reduce lead inductance. It should be remembered that an inch (2.54 cm) of wire can present a value of reactance on the order of the resistance being measured. High-accuracy measurement also requires good shielding between the bridge arms, and a clean sine-wave signal. Coupling between the arms, and harmonic content of the signal sources, should be down more than 40 dB, or one percent.

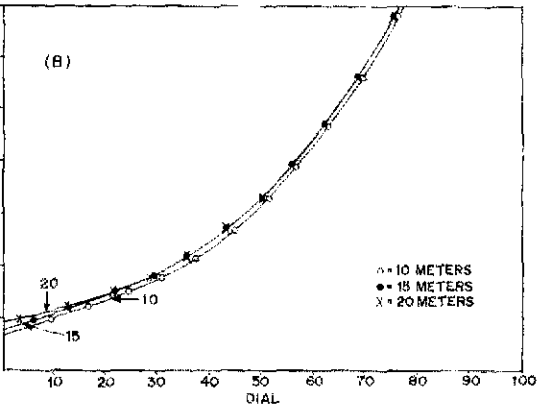
Calibration

The resistance dials of the bridges were calibrated using 5-percent resistors. Higher-precision resistors or an accurate dc resistance bridge can be used to obtain more precise calibration. Or, if a stock of resistors is available, the median value of several for each marked value can be used. Quarter-wave verticals for 10, 15, and 20 meters, and eighth-wave verticals for 40 and 80 meters were used in calibrating the length-indicating dials. No 160-meter antenna was available at this time.

The bridges can be used for measuring the reactive component of an unknown impedance. For this the resonance dials are calibrated with known values of reactance in series with a standard resistance of 30 to 60 ohms. Because of unwanted stray inductance and capacitance which are present when the switched L/C network is used, the real part of the impedance measurement usually suffers. Values tend to be high when the impedance is inductive, and low when it is capacitive. Reducing the network to a single L/C circuit improves this situation. At resonance, when the load is purely resistive, accuracies equal to those previously quoted are obtainable. If antennas are more than 20 percent off resonance, as can happen with short loaded verticals and trap verticals, a variable-frequency signal source could prove helpful in finding the resonant conditions of such antennas.

Resistance calibration curves for 10, 15, and 20 meters for the basic bridge, for the similar unit with built-in L/C network, and curves for 40, 80, and 160 meters for the basic bridge with and without the add-on L/C network for those bands,





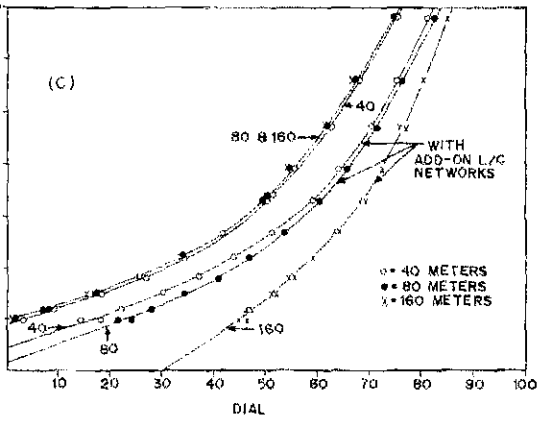


Fig. 4 — Resistance calibration curves for the bridges described. Curves in A are for the basic bridge of Fig. 2A, for 10, 15, and 20 meters. Curves in B are for the same bands, for the bridge with built-in L/C networks. Curves in C are for the basic bridge, with and without the add-on L/C Networks, for 40, 80, and 160 meters. Note that the curves taken with the switched networks of Fig. 2B are displaced considerably to the right, indicating higher resistance losses in these coils than for those in the networks for 10, 15, and 20 meters.

are shown in Fig. 4. Use of a straight-line-wavelength capacitor (rotor plates mounted off-center) for C4, as specified in the parts list, tends to reduce the resistance range, and thus provides more accuracy at high values of resistance than does a symmetrical capacitor (straight-line-capacitance type). A straight-line-frequency capacitor with 270-degree rotation provides a further spreading-out of the calibration, and improved accuracy. Such capacitors are not readily obtainable today, but may be common junkbox items in ham stations of long standing.

It is apparent from Curves A and B that performance at 10, 15, and 20 meters with and without the L/C network varies only slightly, indicating very low losses in the coils for those bands. Also, the curves are closely bunched, indicating superior performance at this end of the overall operating range of the bridge. The curves

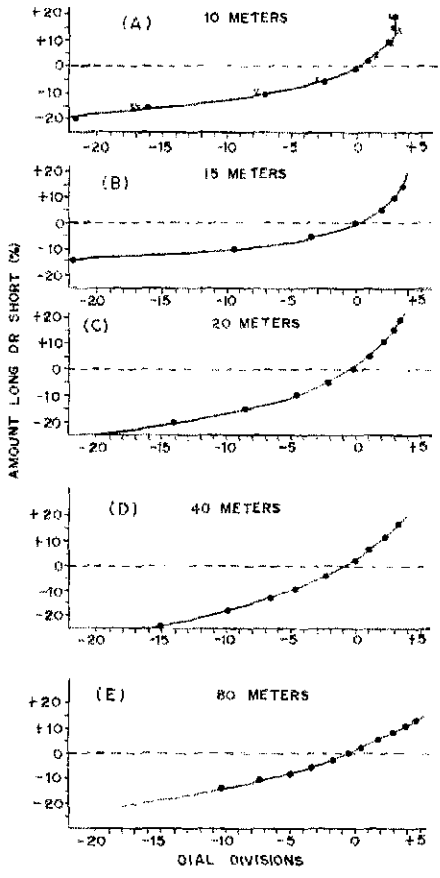
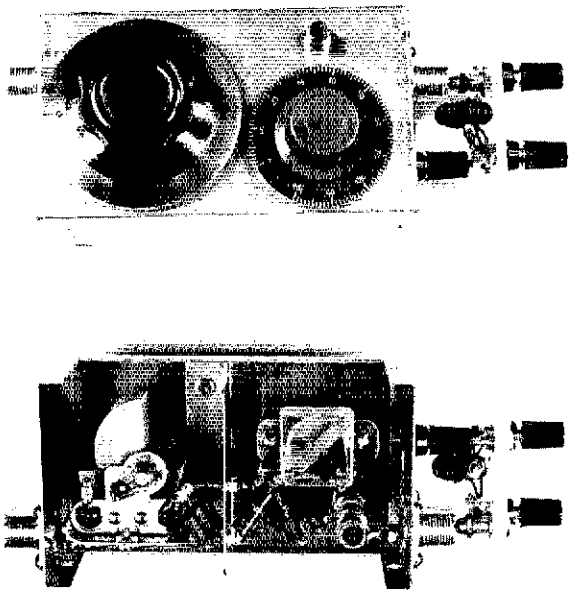


Fig. 5 — Resonance calibration curves, in terms of the percentage of the resonant length that the antenna is long or short. Curves A, B, and C were made with the bridge having built-in switched L/C networks. Curves D and E were made with the combination of Fig. 2. A 160-meter antenna was not available at the time of this work.



Compact bridge for 10-meters, with built-in L/C network. A broadband toroidal balun, shown plugged into the output, is used in work with balanced loads such as center-fed dipoles.

for 40, 80, and 160 meters, on the other hand, show clearly the effects of the higher resistance of the coils in the add-on L/C unit for those bands, the curves taken with the coils in the circuit being displaced considerably to the right. On 160 meters the loss from use of No. 24 wire on a small-diameter form can run as high as 20 ohms. Obviously one should not follow the familiar advice to calibrate on the lowest-frequency band. Separate calibrations should be made for each band, particularly if L/C networks are employed.

Resonance calibration curves for the amateur bands 10 through 80 meters (Fig. 5) give measures of the percentage of antenna length above or below resonance, as a function of dial reading. Note that the 10-meter curve indicates reduced inductive reactance as the length goes 15 percent beyond resonance. This is the result of the large diameter of the antenna tubing (1.25 inch, or 3.18 cm) causing the reactance to reach its peak at this length.

Finally, Fig. 6 shows a comparison of resistance calibration curves for bridges with various kinds of variable capacitors. The first curve at the left is for a bridge using a 150-pF differential capacitor having straight-line-capacitance characteristics. This bridge is similar to that in recent editions of the *Handbook*. Its range is large, and measurement of very low values of resistance is possible. Next is a curve made with a bridge having a fixed capacitor in one arm and a straight-line-wavelength variable in the other. The lower-value measurement range is somewhat restrictive, but the curve is not quite so steep as the one at the left, allowing more degrees of rotation for given changes in resistance, and increased accuracy of measurement. The third curve, for a straight-line-frequency capacitor having 270-degree rotation, shows the highest degree of accuracy in the useful range of 10 to 100 ohms.

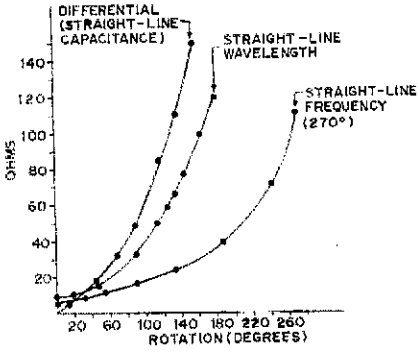


Fig. 6 — Resistance calibration curves for bridges with three different types of variable capacitors: differential, with straight-line capacitance plates; straight-line-wavelength, 180 degree rotation; and straight-line capacitance, 270-degree rotation. The middle curve is typical of the units described in detail here.

Applications

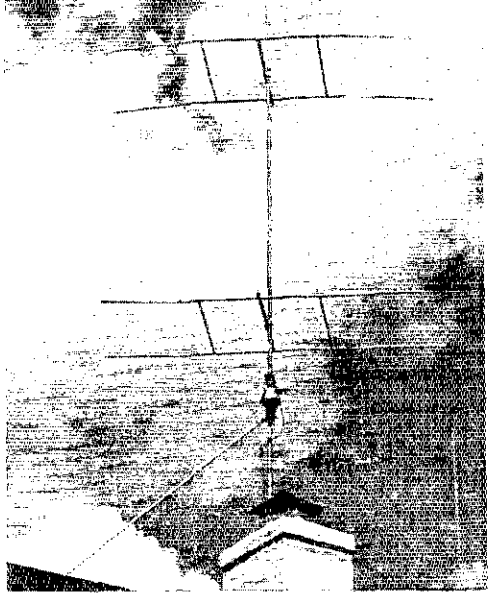
The author has pointed out in several recent articles[2] that ground-mounted verticals are very dependent on good ground systems for efficient operation. This is particularly true for antennas shorter than a quarter-wavelength, as their radiation resistance decreases very rapidly with reduced length. Shortening a quarter-wavelength vertical by 25 percent lowers its radiation resistance by a factor of about 3, from 35 to 12-1/2 ohms. It is also evident that a quarter-wave vertical will not present a perfect match to a 50-ohm line. Ground losses appear as a resistive term in series with the true radiation resistance. This kind of loss resistance *adds to the total noise at the antenna terminals*. This whole area of noise contribution due to lossy earth bears further investigation.

Effective use of the bridges and methods described should help the user of vertical antennas, particularly, to determine how well or how poorly his antennas really work, and to learn how to go about making them work better. Once the amateur takes this step he will see how much more valuable a tool the rf impedance bridge is than the more commonly used SWR indicators, particularly in work with antenna systems where ground is a major factor.

[2] Sevick, "The W2FMI Ground-Mounted Short Vertical," *QST*, March, 1973, and earlier articles in July, 1971, and June, 1972.

(Continued on page 41)

• *Beginner and Novice*



This is the completed Swiss Quad. As can be seen, there is very little sag in the antenna.

A Ten-Meter Swiss Quad ★ Missouri Style ★

WØERZ describes an antenna, which he says can be built for less than $12 (Spring 1974 prices) excluding the rotator and cables. Even though prices have climbed since then, this is still a real bargain for a beam antenna that has gain and directivity. John thinks that QST *readers would be interested in this design. To say we concur would be putting it mildly. It is with a good deal of enthusiasm that we say, "Well done, WØERZ.*

BY JOHN V. ELLISON,* WØERZ

THE SWISS QUAD was conceived about 15 years ago by HB9CV[1] and later reported in *QST*.[2] This antenna has proved to be a top performer among directional beams. Also, it is easy to construct. Yet, only a handful of hams have discovered the Swiss Quad benefits. Among ten-meter enthusiasts in eastern Missouri this antenna has been rediscovered, and a remarkable number of DX contacts are being made on a band that many hams consider "dead."

* 2 Douglas Lane, Kirkwood, MO 63122.

[1] Baumgartner, "The Swiss Quad Beam Aerial," *R.S.G.B. Bulletin*, June, 1964.

[2] Towers "The Swiss Quad at ZS6PP," *QST*, September, 1967.

Electrical Description

Basically, the Swiss Quad is a two-element array with both elements driven. One element is longer than the other, and to simplify our discussion of this antenna we will call the longer one the "reflector," and the shorter one the "director." Spacing between elements is usually 0.1 wavelength. As determined by the originator, the impedance of the antenna, using the 0.1-wavelength dimension, is approximately 50 ohms.

Fig. 1 is a drawing of the components of the beam. In its usual form, lengths of aluminum or copper tubing are bent to form the horizontal members. The element perimeters are completed

Table I — Materials

Four 10-ft (3.05 m) lengths 1/2-inch rigid PVC pipe.
Two 10-ft (3.05 m) lengths 3/4-inch rigid PVC pipe.
One 10-ft (3.05 m) length 1-inch rigid PVC pipe.
Twelve feet (3.67 m) 1-1/8-inch (29 mm) or larger steel or aluminum tubing.
Epoxy cement (equal parts of resin and hardener).
100 ft (30.5 m) annealed copper wire, 14 or 15 gauge.

with vertical wires. At the crossover points (X, Fig. 1), which are connected together, voltage nodes occur.

The formulas for the element sizes are based on the square (perimeter) and *not* the lengths of the wires. For the reflector the perimeter is equal to 1.148 × wavelength, and for the director 1.092 × wavelength or: Perimeter (in inches) =

$$\frac{984}{f\,\text{MHz}} \times 12 \times 1.148 \text{ (reflector)}.$$

As an example: Perimeter for 28.1 MHz =

$$\frac{984}{28.1} = 35;\ 35 \times 12 = 420.2;$$

$$420.2 \times 1.148 = 482 \text{ inches (reflector)}.$$

These formulas only apply to the use of horizontal members of aluminum or copper tubing. Using the PVC tubing and wire elements, the overall lengths of the perimeters are different and the correct lengths were determined experimentally as will be shown.

One of the advantages of this antenna over the more conventional quad type is that Plumber's Delight type construction can be used. This means that both elements, at the top and bottom of the beam, can be grounded to the supporting mast. In my antenna, the structure is lightweight but strong, and an inexpensive TV rotator carries it nicely. Another feature is the small turning radius, which is less than half that of a 3-element Yagi.

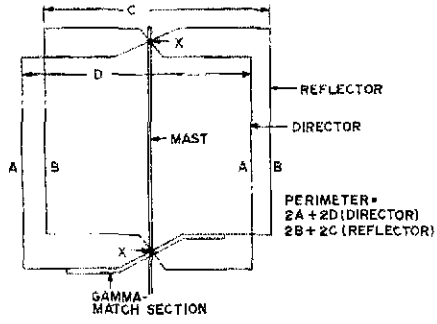


Fig. 1 — General arrangement for the Swiss Quad.

How to Build It

If your mechanical skills include the ability to form precise bends in aluminum or copper tubing the original design presents no great challenge. But *if your talents are limited to using the saw,* screwdriver, and pliers, build your Swiss Quad "Missouri style." The antenna in the photograph is made entirely of wire which is supported by two insulating frames constructed from rigid plastic water pipe. It can be built in a few evenings with minimal mechanical skills and a very modest cash outlay for materials. Rigid polyvinyl-chloride (PVC) water pipe is readily available from plumbing supply houses and from the large mail-order firms. The standard 10-foot (3.05 m) lengths are just right for building the ten-meter Swiss Quad. You can cut and drill PVC pipe with woodworking tools. PVC plastic sheds water, an advantage where winter icing is a problem. Heat from the intense *summer sun has not softened or deformed the* quad structure at the author's station.

To build the wire version of the Swiss Quad you will need the materials listed in Table I plus some wood screws and U bolts. Also required are a few scraps of wood dowel rod, and some old toothbrushes. A catalog order to Montgomery Ward resulted in the delivery of white PVC pipe marked "Cresline." Each size telescoped neatly into the next larger size. If you select another brand, be sure that the 1/2-inch size will slide into the 3/4-inch pipe.

Cut the PVC pipe to the lengths shown in Fig. 2. Also cut several short lengths of dowel rod for reinforcement at the points indicated. These are held in place by means of epoxy cement, mixed thoroughly and applied generously. The bond is improved if the PVC surface is roughened with sandpaper and wiped clean before the cement is applied. A tack inserted through a tiny hole in the pipe will hold each dowel in place while the epoxy cures (about 24 hours at room temperature).

Reasonable care is required in forming the boom end joints so that the two sections of 3/4-inch pipe are parallel. The joining method used at WØERZ is illustrated in Fig. 3. Parallel depressions were filled near each end of each boom with a half-round rasp. These cradles are about 0.4 inch (10 mm) deep and their centers are 41.3 inches (105 cm) apart. Holes are drilled for the U bolts and the joints are completed with the U bolts

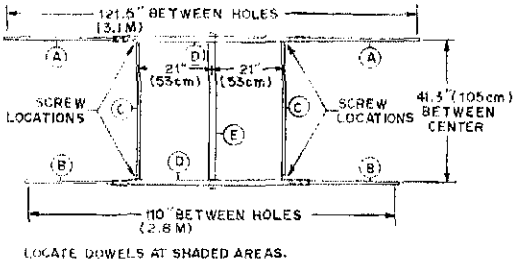


Fig. 2 — Dimensions and layout of the insulating frame.

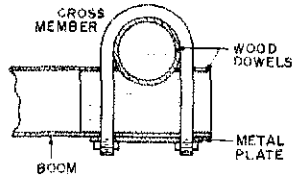


Fig. 3 — Boom end-joint detail.

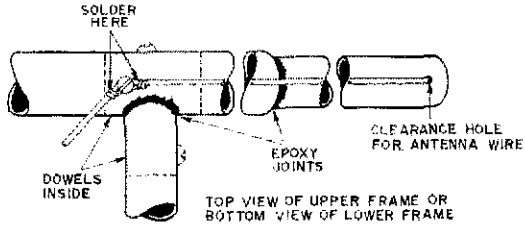


Fig. 4 — Details of the frame and wire assembly.

and epoxy cement. Draw the bolts snug, but not so tight as to damage the PVC pipe. Final assembly of the insulating frames should be done on a level surface. Chalk an outline of the frame on the work surface so that any misalignment will be easy to detect and correct. If the 1/2-inch pipe sections fit too loosely into the lateral members, shim them with two bands of masking tape before applying the epoxy cement.

Supports for the gamma-matching section can be made from old toothbrush handles or other scraps of plastic. Space the supports about 10 inches (25 cm) apart so that they support the gamma wire 2.5 inches (6.3 cm) on top of the lower PVC pipe. See Fig. 5 and photograph. Attach the spacers with epoxy cement. Strips of masking tape can be used to hold the spacers in place while the epoxy is curing.

There are several ways to attach the frames to the vertical mast. The mounting hardware designed for the larger TV antennas should be quite satisfactory. Metal plates about five inches (13 cm) square can be drilled to accept four U bolts. Two U bolts should be used around the boom and two around the mast. A piece of wooden dowel inside the center of the boom prevents crushing the PVC pipe when the U bolts are tightened. The plates should not interfere with the element wires that must cross at the exact center of the frame. A 12-foot (3.6 m) length of metal tubing serves as the vertical support. The galvanized steel tubing used as a top rail in chain link fences would be satisfactory.

When the epoxy resin has fully cured, you are ready to add the wire elements to produce the configuration shown in Fig. 1. Start on the top side of the upper frame. Cut two pieces of copper wire (No. 15 or larger) at least 30.5 feet (10 m) long and and mark their centers. Thread the ends downward through holes spaced as shown in Fig. 2 so that the wires cross at the top of the upper frame. Following the detail in Fig. 4, drill pilot holes through the PVC pipe and drive four screws into the dowels. The screws must be 41.3 inches (105 cm) apart and equidistant from the center of the frame. With the centers of the two wires together, bend the wires 45 degrees around each screw and anchor with a short wrap of wire. Now pull the wires through the holes at the ends of the pipes until taut. A soldered wire wrap just below each hole will prevent the element wires from sliding back through the holes.

Attach the wired upper frame about two feet (610 cm) below the top of the vertical mast. Make a bridle from stout nylon cord (or fiberglass-reinforced plastic clothesline), tying it from the top of the mast to each of four points on the upper frame to reduce sagging.

Now cut two 11.5-foot (3.5 m) lengths of wire and attach them to the bottom of the lower frame. Also, cut a 9-foot (2.74 m) length for the gamma-matching section. If insulated wire is used, bare six inches (150 mm) at each end of the gamma wire. Details of the double gamma match are shown in Fig. 5. Attach the wired lower frame to the mast about nine feet (2.74 m) below the upper frame and parallel to it. The ultimate spacing between the upper and lower frames, determined during the tuning process, will result in moderate tension in the vertical wires. Join the vertical wires to complete the elements of your Swiss Quad. All vertical wires must be of equal length. Do not solder the wire joints until you have tuned the elements.

HB9CV and ZS6PP stress the importance of connecting the Swiss Quad to a grounded metal mast exactly at the voltage nodes (crossover points) of the elements. Through an oversight, the upper crossover of the antenna at WØERZ was not grounded to the mast. No performance deficiencies have been noted with only the lower crossover grounded.

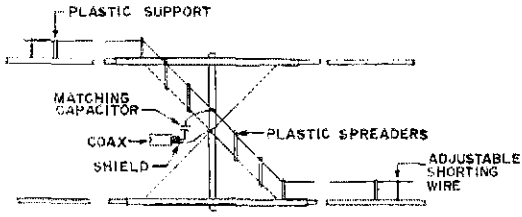


Fig. 5 — Details of the double gamma match.

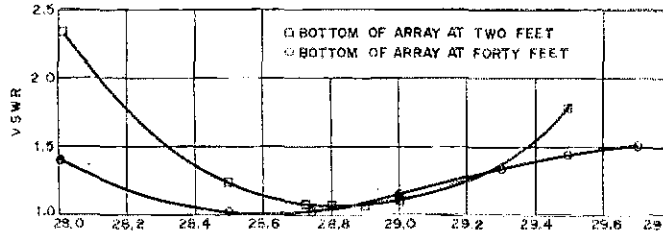


Fig. 6 — Effects of height on standing wave ratio.

Tuning and Adjustments

For tuning and impedance matching you will need a "dipper" (e.g., grid-dip oscillator), a VSWR indicator, and the station receiver and exciter. Stand the Swiss Quad vertically in a clear space with the lower frame at least two feet above ground. Using the dipper as a resonance indicator, prune a piece of 50-ohm coaxial cable to an *integral multiple of a half-wavelength at the desired* frequency. (RG-8/U and RG-58/U with polyethylene insulation have a velocity propagation factor of 0.66. At 28.6 MHz, a half-wavelength section (made from the above cables) is approximately 11.35 feet (3.46 m) long.[3] Connect one end to the midpoint of the gamma section and the other to a two-turn link. Couple the dipper to the *link. You may observe several dips. Look for two* pronounced dips near 26 MHz and 31.4 MHz. Measure the frequencies at which these dips occur using your receiver to double-check the grid-dip meter. Then multiply the frequencies and take the square root of this product; that is $\sqrt{f_1 \times f_2}$. If the result is less than 28.6, shorten the vertical wires equally and repeat the process until $\sqrt{f_1 \times f_2}$ lies between 28.6 MHz and 28.8 MHz. Your Swiss Quad is now tuned for the ten-meter band.

Remove the link and connect the VSWR bridge in its place. Connect your exciter to the input terminals of the bridge, tune to 28.6 MHz and apply just enough power to obtain a full-scale forward voltage indication. Measure the VSWR. Now slide the two shorting wires of the matching section to new positions, equidistant from the center of the wire elements, and measure the VSWR. Continue adjusting the shorting wires until *minimum VSWR is obtained. Insert a 100-pF* variable capacitor between the center conductor of the coaxial cable feeder and the midpoint of the gamma wire. Adjust the capacitor for minimum VSWR indication. It may be necessary to readjust both the shorting wires and the capacitor to obtain a satisfactory impedance match. With patience, a perfect match (VSWR = 1:1) can be achieved. Solder the shorting wires.

The matching results obtained with the Swiss Quad at WØFRZ are presented in Fig. 6. The adjustments were made with the antenna near ground level.

The variable capacitor may be replaced with a short length of RG-59/U coaxial cable. Each foot of this cable has a capacitance of approximately 20 pF. Measure or estimate the value to which the variable capacitor was finally set, add ten percent, and cut a corresponding length of RG-59/U. Solder the shield braid to the midpoint of the gamma wire and the center wire to the center conductor of the 50-ohm transmission line, leaving the other end of *the coaxial-cable capacitor open. You will* probably observe that the VSWR has increased. Snip short lengths from the open end of the capacitor until the original low VSWR is obtained. When the antenna was raised to 40 feet (12.2 m), the VSWR was less than 1.5:1 over the entire ten-meter band.

Tape the capacitor to the PVC pipe boom, then wrap a few bands of tape around the sections where the wires run along the sides of the pipes. Check the soldered joints and mechanical connections. Coat the soldered joints and the cable ends with a weatherproof sealing compound (e.g., silicone bathtub caulk) and hoist your new Swiss Quad up the tower.

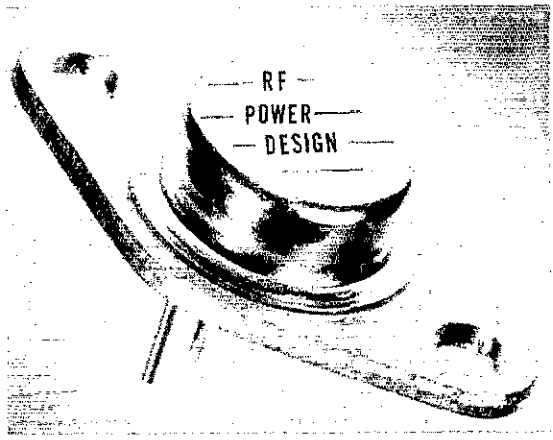
How Good is It?

On the air, the Swiss Quad is a tremendous performer. DX stations consistently report that WØERZ's signal is stronger than those of neighboring Missouri hams using other types of antennas and similar power. Signals that are unreadable with a dipole antenna become perfectly readable with the Swiss Quad. The beam pattern shows the main lobe to be 68 degrees wide. I calculate that my front-to-back ratio is better than 15 dB. Also, there

(Continued on page 26)

[3] Coaxial cable using polyfoam insulation has a velocity factor of 0.82.

LEARNING TO WORK WITH SEMICONDUCTORS



BY DOUG DE MAW,* W1CER AND
JAY RUSGROVE,** WA1LNQ

Part I – Transmitter Design

An earlier QST *series on transistor basics treated receiver design and included rules of thumb for use in building small-signal rf and audio circuits.*[1] *A simple cw/ssb 80-meter receiver was the workshop portion of the course. Numerous requests were sent to the ARRL for additional "courses" on solid-state equipment design. The present series was inspired by the positive indication that more of the same would be helpful to those wanting additional guidelines. This multipart treatise will offer some basic rules for designing cw transmitters with transistors. A 10-watt, 80-meter transmitter is offered as the workshop exercise. It will be described in step-by-step fashion, thereby enabling the constructor to test and use each module as it is completed. The final installment will show how to build a VFO for use in place of the crystal-controlled first transmitter stage.*

FOR THOSE without formal training in electronics, the changeover from vacuum-tube principles to the basics for designing and building with semiconductors can be an exercise in frustration. It is the fundamental purpose of this follow-up series to help dispel existing doubts and fears in the minds of prospective experimenters, thereby providing incentive to "learn by doing," while obtaining some simple rules on procedures for constructing transmitters with bipolar transistors. We will begin by outlining the long-range view necessary in designing a multistage solid-state transmitter. Emphasis will be placed in Part I on crystal-controlled oscillator design. It is recommended that the reader review the earlier series on transistor design, referenced in Footnote 1. Many

* *QST* Technical Editor.
** ARRL Technical Assistant.
[1] DeMaw and McCoy, "Learning to Work with Semiconductors," *QST* for April, 1974, p. 20.

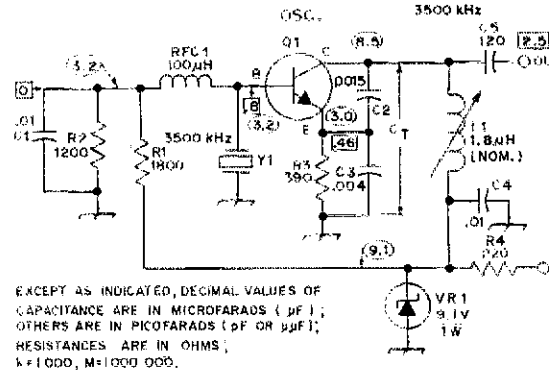


Fig. 1 - Circuit diagram of the oscillator. Most of the materials used can be obtained from Radio Shack stores. Numbered components not appearing in the parts list are identified for layout purposes only. Capacitors are disk ceramic. Resistors are 1/2-W composition.

L1 — Modified Radio Shack Ferri-Tenna Coil 270-1430 (see text).
Q1 — 2N3641 (Radio Shack 276-608, HEP50, HEP55 or equivalent).
RFC1 — 100-μH rf choke (Miller 70F104AI or equivalent).
Y1 — 80-meter crystal (International Crystal Co. type GP).
VR1 — 9.1-V, 1-W Zener diode.

$X_{C1,C4} = 5$
$X_{RFC1} = 2000$

1) $C1, C4 = \frac{1}{2\pi f X_C}$ 2) $P_{ic} \quad V_{cc} \times I_c$ 3) $P_{oc} = 0.7 \times P_{ic}$ 4) $I_C = I_c \times 1.7$

5) $E_o = \frac{2 \times P_{oc}}{I_C}$ 6) $Z_L \quad \frac{2 \times P_{oc}}{I_C^2}$ 7) $X_{L1} = \frac{E_o^2}{2 \times P_{oc}} \times 0.1$ 8) $L1\ (\mu H) = \frac{X_{L1}}{2\pi f}$

9) $V_{fb} = 0.25 \times E_o$ 10) $C_T = \frac{1}{4 \times \pi^2 f^2 L} = .0011\ \mu F$ 11) $C2 \cong \frac{C_T (V_{fb} + E_o)}{E_o} = .00137\ \mu F$

12) $C3 = C2 \times 3 = .004\ \mu F$ 13) $RFC1 \cong \frac{X_{RFC1}}{2\pi f} = 90\ \mu H$ (Min.)

of the design approaches discussed in that presentation are applicable in transmitter work, and the first course will serve as a useful adjunct to this one. To avoid needless repetition we will not explain the transistor terms and symbols which were covered earlier.

Choosing a Transistor

Whether or not a transistor is to be employed in small- or large-signal design, certain electrical traits will be the same for either job. That is, the f_T, V_{ceo}, P_T, gain, and I_C maximums are significant in choosing a device for a given application. For rf work it was stated in the receiver course that the f_T should be rated at least five to ten times greater than the desired operating frequency. Therefore, for 80-meter transmitter design we should select transistors with f_T specifications of 20 MHz or higher. Allowance must be made for voltage swing (collector to emitter) during sine-wave activity of an oscillator or amplifier. For cw work the amount can rise to twice the supply voltage, and for a stage that is amplitude-modulated the theoretical voltage swing will be four times the supply voltage. In a-m practice it seldom rises beyond three times the supply voltage, owing to a variety of conditions which are beyond the scope of this article.

It can be seen from the foregoing that in a design which calls for a 12-volt dc supply it is necessary to select a transistor whose V_{ceo} maximum is 24 volts or greater for cw work, and 48 volts or greater for amplitude-modulated stages. It is an unwise and strong-of-heart designer, however, who picks a transistor with a maximum safe-voltage rating near the peak-to-peak value caused by the sine-wave excursion. A good rule is to employ a transistor that has a rating somewhat *above* the predicted sine-wave value. For a 12-volt cw stage — a V_{ceo} of 30 volts or more. It should be remembered that excessive voltage and current can destroy a transistor almost immediately . . . not quite the case with its more rugged cousin, the vacuum tube.

There are a number of factors to consider when determining the safe power dissipation of a transistor. For small-signal work it can be assumed that the maximum power dissipated within the transistor will be 1 watt. Therefore, temperature is not a matter of primary concern. Heat sinks are not used with small-signal devices except in special applications which do not relate to this series. A safe rule of thumb is to dissipate *no more than 75 percent of the maximum power listed in the data sheet* for the transistor in question. If a rating of 0.5 watt is given, do not allow the product of the operating voltage and current to rise above 0.375 watt. Thus, if the supply voltage is 12, the maximum collector current should not exceed 30 mA. In commercial work it is a common practice to push beyond these limits, sometimes allowing a transistor to run as close to the maximum dissipation rating as 90 percent.

When working with transistors whose dissipation ratings are above one watt it becomes

important to consider the operating temperature and the effects of heat on the device. A condition known as *thermal runaway* can occur if attention is not paid to keeping the operating temperature below safe limits. Thermal runaway occurs when the transistor junction temperature rises beyond a safe value. As the temperature increases so does the gain, and with each degree of temperature rise the gain becomes greater. In short order, the transistor can destroy itself by consuming far more current than it is rated for. The effects of heat and gain go hand in hand, each adding fuel to the other's fire. Most transistors are rated for a given power-dissipation rating at 25°C, case temperature. Generally speaking, the *hfe* (current gain) of a silicon transistor doubles when the temperature increases to 175°C. Germanium transistors are more fragile in this respect, for their gain will double at an approximate temperature of 100°C.

It is reasonable to conclude from what has been said about temperature effects that the cooler the transistor can be operated the greater will be its chance for survival in a hostile environment of heat. Heat sinks are, therefore, necessary items when building a solid-state power stage. We will learn more about that subject later in the course. For the present it is ample to offer as a general rule the recommendation that the heat sink used should be as large as physically practical.

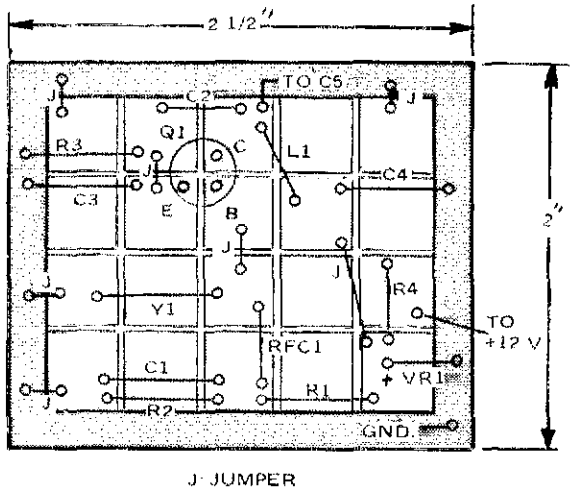
In only the most general of terms can we equate the safe power dissipation versus operating levels when working with rf power transistors. The effectiveness of the cooling technique, proper matching between stages (SWR), matching the last stage to its load, rf stability of the stage in question, and other considerations must be taken into account when choosing a transistor for a specified output power. PT is the rating given to a power transistor (in watts) for a case temperature of 25°C. A rough rule for amateurs to follow is to employ a transistor whose PT is twice the rf output amount the stage will be expected to provide. Thus, if 2.5 watts of rf output is needed, a device with a PT of 5 watts or more should be used. In commercial work, however, it is common to find a 5-watt PT transistor delivering, say, 3.5 watts. The extra safety margin is recommended for amateur work to prevent damage to the device during periods of experimentation and actual use in a completed project.

PNP or NPN

In recent years the trend has been toward widespread use of npn silicon transistors. Although germanium devices are suitable for many power applications, their ruggedness does not compare favorably with similar units made from silicon materials. Moreover, npn transistors lend themselves more readily to use in circuits which employ a negative ground bus. In the early days of transistor development and use, manufacturers found it less difficult to obtain good high-frequency performance from germanium components. Vastly improved manufacturing techniques over the years have made possible a reversal of that principle and silicon reigns supreme as the better material for most small- and large-signal applications. Therefore, this course will relate to npn silicon transistors for the most part.

Some Oscillator-Design Philosophy

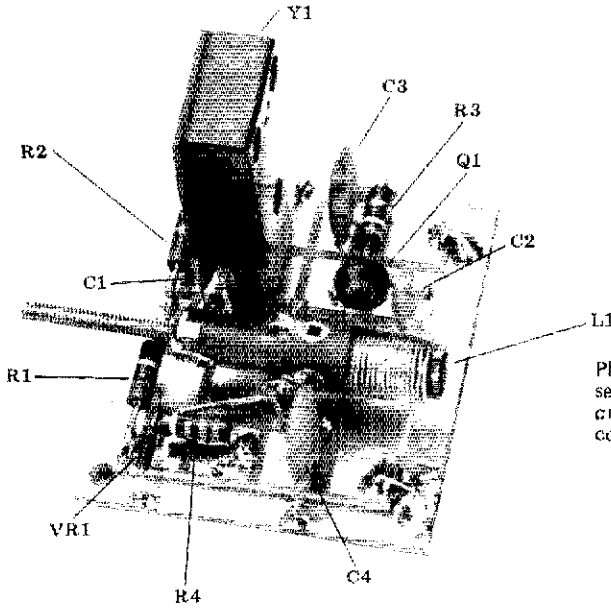
Whether an oscillator is used as a VFO or crystal-controlled frequency-determining element in a piece of equipment, the usual criterion is to obtain the best stability possible. A primary rule is, therefore, to avoid trying to deliver high power from the oscillator to a specified load. Power must be dissipated in terms of dc to obtain rf power output. The more dc power dissipated, the greater the heating of the transistor and the components near it. Heat causes changes in capacitance and resistance, thereby bringing about a gradual (and sometimes never-ending) change in operating frequency. Also, the greater the rf power developed by the oscillator stage, the more pronounced will



J - JUMPER

TOP VIEW FULL SCALE

Fig. 2 — Layout plan for the circuit board, showing how the squares (isolated pads) are cut, and where the parts are connected to them.



Photograph of the assembled oscillator circuit board showing component placement.

be the level of rf current circulating in the coil and capacitors, or the crystal and feedback capacitors. Circulating rf currents cause some heating in the components, contributing to frequency drift. It is prudent to minimize such possibilities by maintaining a design outlook that does not require more than 25 to 100 mW of rf power output from an oscillator. It should be remembered that heating in a transistor junction causes the capacitances between the transistor terminals (base-collector and base-emitter junctions) to change. The internal resistances of the device change with heat also. Such unwanted shifts in capacitance and resistance contribute to oscillator instability.

Whether an oscillator is coupled to an antenna or a succeeding stage in a transmitter circuit, the amount of electrical coupling should be kept as light as possible. That will minimize the effects of "pulling." Tight coupling to an antenna can lead to shifts in frequency if the properties of the antenna change during operation (movement in the wind, rain, etc.). Similarly, changes in load, caused by changes in operating level of the stage which follows an oscillator, can "pull" the frequency when the coupling is too tight between stages. That is why it is common practice to have one or more buffer stages following an oscillator: they help to isolate the oscillator from the load to which it must supply rf power or voltage.

For the most part it is wiser to design a low-power oscillator and build up the output level by means of Class A amplifier stages following the oscillator. The intermediate stage or stages will act also as buffers to minimize pulling. These rules apply also in the design of vacuum-tube oscillators. A one-transistor or one-tube transmitter will usually produce a chirpy signal. The reasons have been outlined in the foregoing discussion.

A Practical Oscillator

A property of major consideration in an oscillator is its power output. The circuit must be able to deliver the desired output amount in addition to that portion of the output needed to permit oscillation. That is, the rf energy in the collector circuit must be divided by means of a tapped coil, secondary winding, or capacitive divider to provide a V_{fb} (positive feedback voltage) which is fed in phase to the base or emitter terminal of the oscillator, depending on the type of circuit used. The quantity of V_{fb} needed to assure quick starting of the oscillator and sustained oscillation under loaded conditions depends on a number of electrical factors - transistor small-signal beta, biasing (class of operation), and phase relations. Transistors, when compared to tubes, are less easy to deal with when designing an oscillator. Although the *basic* design philosophy for oscillators applies to both devices, the internal structure of transistors differs markedly from that of tubes, and introduces R and C components which are not present in tubes. These R and C properties cause complex phase considerations which influence the overall design.

The amount of V_{fb} needed for a particular design may range from 10 to 50 percent of the available rf output energy at the collector. The smaller the amount, the greater the likelihood of unreliable oscillation. The greater the amount, the lower the oscillator efficiency, since a larger part of the available output is routed to the input terminal of the stage as V_{fb}. A ball-park value of 25-percent V_{fb} has proved workable for the writers. That amount will be used in the design of Fig. 1. Experimental adjustment of the feedback ratio is recommended for a working circuit, consistent with the desired efficiency, reliability of oscilla-

tion, and stability. Most final designs are based on that practice.

We will outline some basic steps for designing a workable oscillator. Simple algebra is all one needs to know to work the formulas given here. A Colpitts circuit is described in Fig. 1, primarily because it uses a high-C capacitive feedback divider. A high C-to-L ratio is desirable in the interest of stability. This is because the high shunt value of C tends to mask the changes in transistor junction capacitance during operation. The high ratio also provides an elevated Q_L, which is important to purity of the output waveform.

Our first requirement is to determine what the power-output level will be. Earlier we recommended a value between 25 and 100 mW for best results. Oscillator efficiency will depend on the class of operation . . . A, B, or C. Oscillator efficiency, respective to class of operation, can be equated to *amplifier* stages versus operating class, but the percentage of V_{fb} taken from the collector circuit will have a bearing on the absolute efficiency. Theoretically, we can expect 70-percent efficiency from a Class C oscillator of the type shown in Fig. 1. Therefore, that value will be used in our computations. Class C operation will provide more waveform distortion than is found in Class A or B oscillators, and that is one of the reasons a high C-to-L ratio is used in the collector tank – to assure good sine-wave output.

Assuming an approximate efficiency of 70 percent, and designing for 70 mW of output, we can compute the necessary de-input power by: Pie (small-signal input power) = Poe (small-signal output power) X 1.4. Therefore, our oscillator must operate at 100 mW Pie to produce approximately 70 mW of output (minus Vfb). Thus, the collector current needed for 100 mW Pie is: $Ic = W \div Vcc = 0.1 \div 9 = .011$ A (11 mA). This tells us that Q1 must be biased in a manner which causes 11 mA of collector current to flow. The foregoing values of current and voltage (11 mA and 9 V) establish what is known as the *Q point* (operating point) of the oscillator.

We must determine also what the ic (collector signal current) is in order to work the formulas. The ic can be found by multiplying the Ic (dc collector current) times 1.7. This will provide an approximate value – adequate for amateur work. In our design we have Ic X 1.7 = .011 A X 1.7 = .0187 A (18.7 mA).

Next, we must find the E_o (rf-output voltage) at the collector. It can be calculated from: 2 X Poe $\div$ ic. Thus, 2 X .07 W $\div$ .0187 A = 7.48 V. We need to know the collector impedance (Z_L) for the power level specified: $Z_L = 2 \times Poe \div ic^2 = 2 \times 0.07 \div .0187^2 = 400$ ohms.

The reactance of the tank coil, X_{LI}, can be obtained by: $X_{LI} = E_o^2 \div 2 \times Poe \times 0.1$. Thus, 55.9 $\div$ 2 X .07, multiplied by 0.1 = 40 ohms. Therefore, at our lowest operating frequecy (3.5 MHz) we need a nominal coil inductance of 1.8 μH. The latter is obtained from: $L = X_{LI} \div 2 \pi \times f = 40 \div 6.28 \times 3.5 = 1.8$ μH. A coil range (slug tuned) of 1 to 3 μH should be ample for the circuit of Fig. 1.

Since we chose a V_{fb} parameter of 25 percent of E_o, $V_{fb} = 0.25 \times 7.48 = 1.87$ V. It should be remembered that this value, like all others discussed in this presentation, are theoretical ones. Variations in the operating characteristics of the circuit will yield slightly different values in most cases.

Our next job is to select a suitable value for emitter resistor R3. The bias developed across R3 should be roughly twice the available feedback voltage, V_{fb}. Thus, 2 X 1.87 = 3.74 V. From this value we can find the resistance of R3 by using: $R = E \div I$. Therefore, $R = 3.74 \div .011 = 340$ ohms. The nearest higher 10-percent value is 390 ohms, so it will be used. The drop across 390 ohms will be 4.29 V ($E = I \times R$).

Base resistor R2 can be made three times the value of R3. Therefore, R2 will be 1170 ohms. The nearest standard value is 1200 ohms, which will be our selection for R2.

The base-emitter junction of Q1 should be reverse biased by an amount roughly equal to one half the available feedback voltage. Since we have 1.87 for V_{fb} the reverse bias will be 0.935 V. To obtain the voltage needed we must subtract 0.935 V from the amount developed across the emitter resistor. The value of base bias then becomes 3.355 V (4.29 minus 0.945 = 3.355). This means that base resistor R1 must be chosen to allow a voltage drop across it of V_{cc} minus 3.355 V, or 5.645 V.

R1 is determined by: $R = E \div I$. With 3.355 V residing at the base of Q1, we can find the current taken by R2: $I = E \div R$. Therefore: $I = 3.355 \div 1200 = .0028$ A, or 2.8 mA. To this amount we should add the internal current flowing in the base-emitter junction of the transistor. Normally, the amount will be between 0.3 and 0.7 mA, so we'll use a ball-park figure of 0.5 mA, or .0005 A. Hence, .0028 plus .0005 = .0033 A, or 3.3 mA. From this figure R1 is found to be 1710 ohms ($R = 5.645$ V $\div$ .0033 A). Since 1800 ohms is the nearest standard resistor value it will be used at R1.

Component Values and Types

It is seldom possible to find standard component values to match exactly those figures obtained from the formulas. For most applications, it is acceptable to use the nearest standard value. C2 of Fig. 1 computes to a value of .001375 μF, so a .0015-μF capacitor should be used. At C3 a value of .004 μF can be used in place of the .0045-μF amount obtained from the formula. However, those wanting to be precise can use series or parallel combinations of capacitors to secure values close to those obtained from the calculations. For best stability one should use silver-mica or polystyrene capacitors at C1 and C2. However, disk-ceramic capacitors often prove adequate in low-power crystal-controlled oscillators. The same is not true of VFO circuits, where stability is a more critical matter.

Resistance values for R1, R2 and R3 can be selected from 5-percent types if the builder wishes to use components which provide a close match to the computed values. Alternatively, series or paral-

tel resistors can be used to obtain the computed values.

C1 and C4 of Fig. 1 are used as bypass capacitors. They should be effective at the operating frequency. A reactance (X_C) of 5 ohms is ample for the purpose. At 3.5 MHz we calculated a value of .009 μF, so the next larger value, .01 μF, is the standard one chosen.

RFC1 is used to isolate Y1 from the low-impedance circuit formed by R1 and R2. Since a crystal is a high-Q device, the low value of resistance in the base-bias network would spoil the crystal Q and prevent oscillation. A reactance value (X_L) of 2000 ohms is adequate in the circuit. A 90-μH value was computed, but a 100-μH choke can be used to take advantage of standard values. Always use a *larger* value when substituting. In this example a 500-μH or 1-mH choke would work nicely, too.

Coupling capacitor C5 must be chosen to provide the amount of drive needed to the succeeding transmitter stage. The rule is to use the minimum amount of capacitance necessary to assure ample drive to the next stage, thereby affording good isolation between the oscillator and its load.

The slug-tuned coil used at L1 should have an unloaded Q of 50 or more at the operating frequency. An air-wound inductor could be used at L1, provided part of C2 was made variable by means of a trimmer capacitor.

Construction

The modular construction used in building the transmitter is similar to that of an earlier series of articles published in *QST*[1]. This method utilizes copper-clad circuit board divided into small squares, each being approximately 3/8 inch on a side, by drawing a hacksaw blade across the copper surface. Cut deep enough to ensure that none of the copper "islands" touch. This board is then mounted on a slightly larger piece of copper-clad board by means of GE Silastic cement or epoxy glue.

Most of the components used in the construction of the oscillator can be obtained from Radio Shack or a similarly stocked parts emporium. Emphasis has been placed on using easy to obtain components in this series of articles. L1 is a Radio Shack Ferri-Tenna Coil with both the fine wires and the coupling coil removed. The coils are replaced with 14 turns of No. 22 enamel-coated copper wire, close wound. Approximately half of the ferrite slug must be removed to provide the proper inductance range. This is accomplished by removing the slug from the coil-form body, then with the aid of a hacksaw gently cut through the ferrite material leaving 1/2 inch of ferrite connected to the threaded shaft. Save the unused slug material for an application later. When this has been completed, reinsert the slug in the coil-form body. Short pieces of wire are soldered to the lugs on the coil form to support it above the board. The wires are used also for making the electrical connections to the circuit board. The completed oscillator is shown in the photograph, and in the parts placement guide.

Adjustment

The FET voltmeter and probe constructed in Part 1 of "Learning to Work with Semiconductors, Receiver Design," can be used in this series of articles also.[2] Some amateurs who built the voltmeter had difficulty in getting the meter to "zero" properly. It was determined that because of different FET gain characteristics, such a problem could occur. The cure is to change R7, the "zero" control, from a 2500-ohm control to a 10,000-ohm unit. This will provide a greater "zeroing" range.

It should be noted that the circuit of Fig. 1 will oscillate without a crystal. However, when a crystal *is installed and L1 is adjusted properly*, the oscillator will "lock" on the crystal frequency. L1 is adjusted by placing the FET voltmeter probe across the output of the oscillator and adjusting L1 for maximim indication. This should be done while monitoring the crystal frequency by means of a communications receiver to ensure the coil is being "peaked" at the crystal frequency. When keying the 12-volt line the oscillator signal should be clean and chirp free. The voltages given in Fig. 1 may vary slightly depending on crystal activity, component tolerance, and transistor characteristics. QST

[1] *QST* for April through Sept., 1974.

[2] *QST* for April through Sept., 1974.

Swiss Quad

(Continued from page 20)

are deep nulls 85 degrees from the main-lobe axis, making it easy to attenuate an interfering signal from another direction.

There have been no really high winds since its erection to test the survivability of the plastic-pipe structure. The projected frontal area of the structure above the rotator is about five square feet (0.46 m^2). Gusts strong enough to tear branches from trees in the vicinity rotated the Swiss Quad against the drag of the rotator, but caused no damage to the structure.

The assistance and encouragement of WBØLFY, WBØCEI, WØMQL, WØLWQ, WØQHY, and WBØGGO were important factors in the development of the Swiss Quad – Missouri style. QST

FEEDBACK

It was recently called to our attention by Peter Stark, K2OAW, that the two-part article by Arlo Eggensperger, W2EIZ, which appeared in January and February, 1975, *QST*, was based on a design published by Mr. Stark in 73 Magazine during 1972. *QST* regrets that appropriate credit was not given to Mr. Stark for his earlier publication.

STOLEN EQUIPMENT

SBE Model SB-144 FM transceiver, No. 460198. *Contact W9NKE or the Davenport, Iowa* Police Department (319) 322-4465.

Drake 22C, No. 810646. Contact Doug Dowds, WB6ROH, 415 East 238th St., San Pedro CA 97725.

VARICAP TUNE YOUR VFO

BY WARREN MAC DOWELL,* W2AOO

MECHANICAL STABILITY generally evolves as a problem when constructing a homemade VFO. Creating a smooth tuning system without backlash and mechanical instability using a conventional capacitor can become difficult. The most minute mechanical strain on the capacitor shows up as frequency change. Expansion of the capacitor caused by heating effects is another problem that can result in frequency variation.

A relatively easy approach to smooth and compact tuning can be achieved through use of a Varicap diode. Varicap diodes are voltage-variable capacitance devices utilized for electronic tuning in receivers and transmitters. There are many other uses for such diodes. However, our main concern here is oscillator tuning.

* 11080 Transit Road, East Amherst, NY 14051.

Varicap diodes change capacitance in relation to the voltage applied to the diode. Therefore, by gradually varying the voltage applied to the Varicap, the capacitance is changed accordingly. The maximum voltage that can be applied depends on the breakdown rating of the particular diode. The current necessary for operation is negligible so a current-limiting resistor is used (R1 in Fig. 1). In my application, a Varicap with a 20-volt maximum voltage limit was employed, and a 12-volt regulated source supplied the necessary voltage for biasing.

A variable voltage divider was used to change the voltage applied to the Varicap. The maximum of course is the 12 volts from the regulated supply. A conventional potentiometer can be used for the voltage divider. However, for the smoothest possible tuning and bandspread, a ten-turn potentiometer was pressed into service. A matching counter dial was used in addition to the ten-turn control and calibrated accordingly. It might be added at this point that the Varicap is not an expensive device. The average price is about $3.50. A typical Varicap circuit is shown in Fig. 1. C2 is used to couple the varying capacitive effect of the diode to the tuned circuit of the oscillator. The value of C2 is generally in the neighborhood of 30 pF, but it may be increased or decreased in value to provide the necessary capacitance swing. C2 also provides some isolation from voltages that might be present in the oscillator tuned circuit. Any feedback voltage would affect the diode capacitance.

The dc source powering the Varicap must be completely free of ac ripple. If there is any ripple present, the diode will respond to the ac and the oscillator will be hum modulated. A battery source

(Continued on page 47)

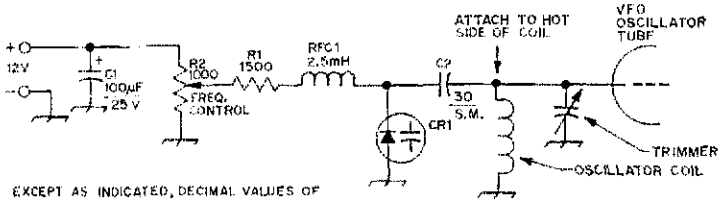


Fig. 1 — Schematic diagram of basic Varicap-tuned VFO. In the writer's unit CR1 had an approximate capacitance value of 100 pF with a voltage rating of 20.

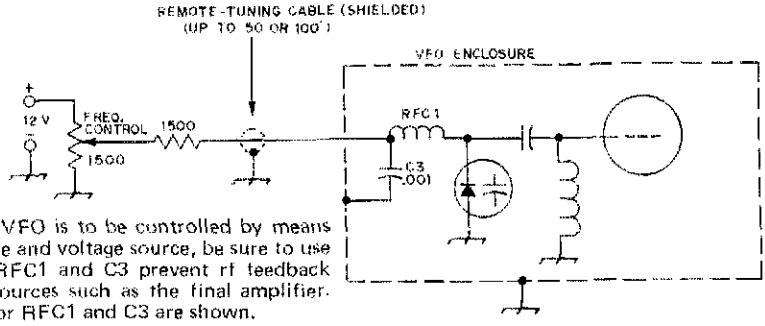
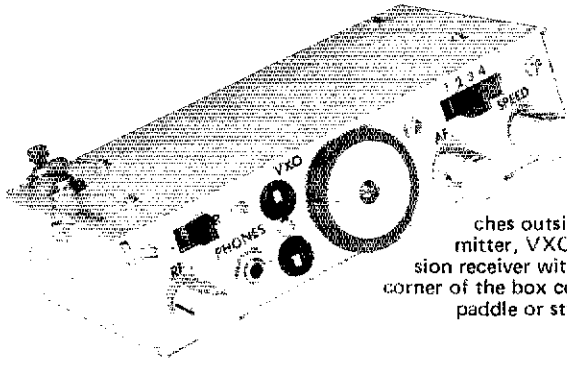


Fig. 2 — If the VFO is to be controlled by means of a remote cable and voltage source, be sure to use shielded wire. RFC1 and C3 prevent rf feedback from external sources such as the final amplifier. Typical values for RFC1 and C3 are shown.

The Ultramountaineer



The Ultramountaineer is less than a good-sized handful, 5-1/2 × 1-5/16 inches outside dimensions, yet it contains a 1-watt transmitter, VXO, keyer, sidetone monitor, and direct-conversion receiver with audio filter. Push buttons in the upper left corner of the box cover are dot-dash controls. An external keyer paddle or straight key can be plugged into the rear panel.

BY HOWARD F. BATTIE,* W7BBX

RECENTLY many descriptions of small rigs for emergency or portable operation have appeared in publications serving the amateur radio field. The evident criteria these transceivers have been designed to meet include low current drain, small size, and circuit simplicity. From the point of view of some potential users they have been over-simplified, to the point where operating them can be more of a challenge than a pleasure.

If more than a few contacts are to be made, essentials for the portable transceiver should include VXO or VFO, a minimum of 1 watt output, some form of audio selectivity, and if the user is a true cw addict, an efficient and comfortable keyer. These features are, of course, in addition to the usual and more obvious ones, above. Since the objective of this project was to maximize performance per cubic inch, miniaturization techniques were stressed. The circuit board is relatively dense. Maximum use was made of ICs, and smallest commonly available components. The result verifies the "Shrink Postulate" that the low limit of physical size of most equipment is reached when there is no longer adequate panel space for convenient operation of the controls, rather than by the number and size of required internal components.

* 12002 Cheviot Drive, Herndon, VA 22070.

I still don't know how Dick Tracy does it! The 40-meter cw transceiver described here approaches the ultimate in portability, with present techniques. It weighs in at 12 ounces, and uses less than 24 cubic inches of space, but it is no "wrist radio." Features include:

1) 1-watt output at 7 MHz (see Table I).
2) Adequate receiver sensitivity.
3) No tune-up after initial adjustment.
4) Independent rf and af gain controls.
5) VXO operation.
6) Active audio filter, with 180- or 110-Hz selectivity.
7) Electronic keyer, self-completing characters, 10 to 30 wpm.
8) Built-in key and sidetone oscillator.
9) Single 12-volt supply required; wrong-polarity protection built in.
10) 52-ohm antenna matching, with pi-network low-pass filter.

The block diagram, Fig. 1, shows the principal components of the Ultramountaineer, with switching circuits and direction of flow of rf and af energy. To minimize current drain the detector, audio preamplifier, and cw-filter power leads are disconnected while transmitting. The keyer B-plus could have been disconnected during receiving, saving 12 mA, but each time the voltage is

TABLE I -- Typical Operating Conditions for the Ultramountaineer

Supply Voltage	*Receiving Drain, @ mA*	*Transmitter Drain, Idle, mA*	*Transmitter Drain, operating, mA*	*Watts Output*
9.0	16-21	12	92	0.37
10.0	21-26	16	114	0.51
11.0	25-31	20	136	0.67
12.0	29-36	23	160	0.88
13.0	32-39	26	181	1.08
14.0	36-44	29	200	1.28
15.0	40-48	32	216	1.48

Receiver drain depends on rf gain setting.

reconnected to the keyer section a dot is transmitted. Keyer drain is not excessive, and leaving the unit operating allows speed adjustments on the keyer with the transmitter off. Faint clicks are heard, even though the sidetone oscillator is not activated. The diode CR1 prevents damage that might otherwise result from inadvertent connection of power with the wrong polarity. The pi-network low-pass filter reduces harmonic radiation and provides matching to a 52-ohm load.

Transmitter

A simple crystal-controlled Colpitts oscillator is used, with a variable capacitor, C2, in series with the crystal, to provide some frequency range, while preserving oscillator stability. The oscillator controls both transmitting and receiving frequencies, giving a range of 2 to 5 kHz from the crystal's marked frequency, depending on the activity of the crystal. In transmitting the VXO drives a 2N3866 Class C amplifier, Q2, carefully chosen for high beta and gain-bandwidth product.

A TO-5 heat sink is required for Q2. A ferrite bead is slipped over the base lead, to reduce the chance of vhf parasitics. Additionally, it elevates Q2 enough to permit vertical mounting of C1 and R4 under the heat sink.

Keyer

The keyer circuit, also in Fig. 2, is basically that of the W7ZOI one, with a few important empirical modifications. By changing the timing constant generated by R15 - 17 and C15 - 16 a more comfortable speed range was obtained. New values for C11 - 12 provide weight-range and dot-dash ratio which make the keyer indistinguishable from commercial TTL-type models. Some experimentation was necessary for exact values of C15 and C16. These are the basic dot-dash ratio-forming components, and electrolytics traditionally have value tolerances up to plus 100 percent of the indicated value.

An important addition to the W7ZOI design is C14, which stabilizes the U3B noninverting input voltage level, preventing voltage fluctuations caused by the sudden heavy current drawn during key-down conditions. Without this capacitor, relay chatter on each character break is pronounced. A value of 15 μF or greater, at 6 volts or more, is required.

Many solid-state current-keying arrangements were tried and rejected because of keying thumps, chirps, or insufficient current-switching ability in a TO-5 case. Additionally, the V_{ce} (sat) of a current switch connected to RFC2 lowers the input voltage available to Q2. The relay approach provides clean, reliable keying up to about 40 wpm. The relay has a 6-32 threaded hole in its frame (center relay contact) for mounting. An external key, bug, or keyer can be plugged into J2. The plus 12 volts appears across the key, but the maximum current that can be drawn is limited by the 1200-ohm resistance of K1A to 10 mA. A miniature phone jack with three terminals, insulated from the chassis, can be used in place of J2 to permit use of an external paddle. No connection would be made at J2; the internal keyer would be used with an external paddle. The built-in "key" is two momentary-contact switches mounted in the top surface of the case. These are S2 and S3 in Fig. 2.

Receiver

The "Synchrodyne" direct-conversion product detector is a favorite design for simple receivers. It has excellent sensitivity and recovered audio. Once peaked for maximum response, C17 does not require readjustment across the desired tuning range, 7 to 7.2 MHz. Though high selectivity is not typical with such simple circuitry, the detector is surprisingly immune to near-frequency overloading. Signal selectivity is provided in the audio section by the active filter, Fig. 3. Direct connection of the B-plus to pin 7 of U1 could eliminate the rf gain control, but significantly better performance can be obtained with the cw filter by proper adjustment of the rf and af gain controls.

A single IC, U2, is the principal component in the complete audio system and sidetone oscillator. Resistor and capacitor values for the U1-U2 combination were selected carefully during the initial

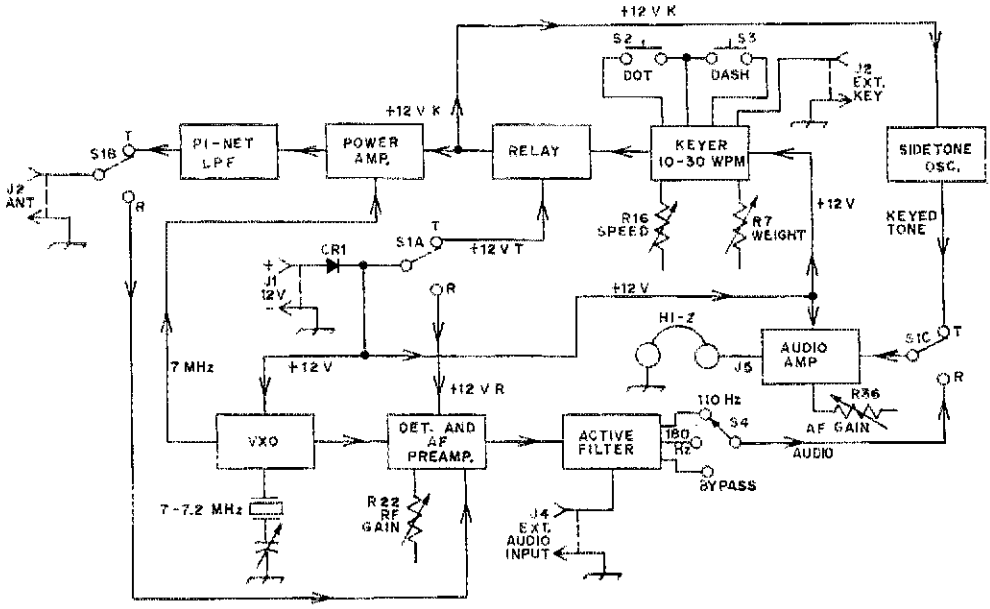


Fig. 1 — Block diagram of the Ultramountaineer 7-MHz cw transceiver, showing the principal components, controls and signal and power circuits.

breadboard and check-out phases. The bases of U2B and U2C are bypassed to ground, but more than sufficient audio is available at J5 to drive high-impedance phones. Be sure that electrolytic capacitors C26 and C38 are good; insufficient audio will result if either is defective.

CW Filter

The active audio filter, Fig. 3, is the basic design of the MFJ CWF-3 2-section cw filter, and is the heart of the Ultramountaineer's performance. This filter has superb characteristics for cw, and gives an increase in audio gain. In the 110-Hz selectivity position, adjustment of both af and rf gain controls is normally needed to prevent overdriving U2C. Signals barely heard in the bypass position become solidly readable with the filter in. Values shown give a center frequency of 800 Hz. Space could have been saved by laying out the board for an 8-pin 747V or 5558 IC, but quality-selected 14-pin μA747s, the 1-percent-matched components, and the sp4t slide switch are available from MFJ.[1]

Sidetone Oscillator

The twin-tee audio oscillator, Fig. 3, is the keying monitor. The frequency is controlled by R44, and is 800 Hz with the values shown. Audio volume is fixed by C42, which can be .001 or .05 μF, for lower or higher level, respectively. Pitch is essentially independent of supply voltage, and the output waveform is pleasingly sinusoidal.

[1] MFJ Enterprises, PO Box 494, State College, MS 39762.

Construction

As each subcircuit is assembled on the circuit board its performance should be verified before proceeding to the next. The following order is suggested to permit each unit to be used in testing the next: sidetone oscillator and audio amplifier, oscillator, detector, cw filter, rf amplifier, relay operation, and lastly the keyer. Approximate currents for each subcircuit, using a 12-volt lantern battery, are given in Table II.

The single-sided circuit board[2] is mounted at four points on 2-56 screws. Two No. 2 lockwashers and two No. 2 nuts raise the board a suitable height above the metal chassis and ensure adequate grounding. The protective diode, CR1, is run underneath the board from J1 to K1, with its leads protected by hookup-wire insulation. Short lengths of RG-174/U also run under the board for the antenna leads to the transmitter and receiver portions.

[2] Circuit board, approximately 2-1/4 × 4-7/8 inches, ready for use, available from MFJ Enterprises, $5.75 postpaid.

TABLE II — Typical current drains for the Ultramountaineer Subcircuits

STO	1 mA	CW Filter	4 mA
AF AMP	2 mA	RF AMP	170 mA
Oscillator	7 mA	Relay	10 mA
Detector	10 mA	Keyer	12 mA

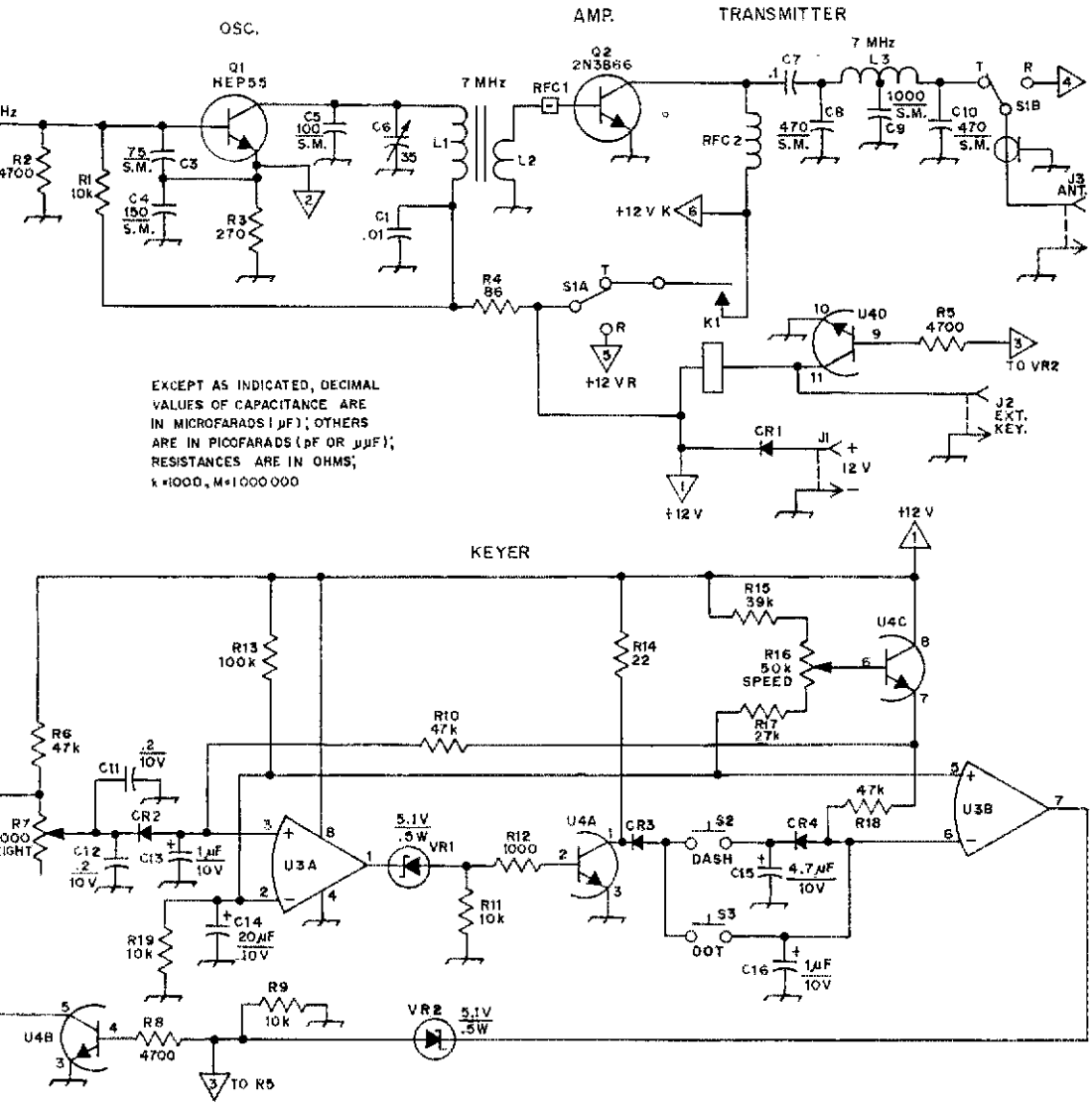


Fig. 2 — Schematic diagram and parts information for the W7BBX transceiver, transmitter and keyer portions. As seen in Fig. 1, the VXO, Q1, also serves the receiver. All parts carry numbers, some for text and layout reference only. Resistors are 1/4-watt, 10 percent, unless specified otherwise. Other parts are the smallest available type. Capacitors with polarity marked are electrolytic.

C2 — 63-pF variable, section of transistor broadcast radio tuning capacitor, with dial.
C6 — Mica trimmer, 3 to 35 pF (ARCO 403).
CR1 — CR4, incl. — Silicon diode, 50 PIV, 1 A.
VR1, VR2 — Zener diode, 5.1 V, 1/2 A (HEPZ0211).
J1, J2, J3 — Phono jack (Calectro F2-806, Archer 274-346).
K1 — Miniature dc relay, 12 V @ 10 mA (Archer 275-003).
L1 — 34 turns No. 28 enam. wire on 0.37-inch dia toroid core (Amidon T37-10).
L2 — 6 turns No. 22 enam. wire on low-Z end of L1.
L3 — 2 μH, center-tapped, 20 turns No. 20 enam. wire spaced to occupy entire toroid core, 1/2-inch dia (Amidon T50-2).
Q1 — Silicon npn, 310 mW, HEP55.
Q2 — 2N3866, RCA (substitution not recommended). Use TO-5 heat sink.
R7 — 5000-ohm linear-taper control, board-mount type.
R16 — 50,000-ohm control, linear taper, panel-mounting.
S1 — 4pdt miniature slide switch.
S2, S3 — Spst momentary-contact normally open push-button.
U3 — 5558 dual op-amp, 8-pin dual-inline plastic (Signetics 558, Archer 5558).
U4 — CA3045 14-pin dual-inline ceramic, or CA3046 dual-inline plastic (RCA).
Y1 — 7-MHz crystal, frequencies to suit.
RFC1 — Ferrite bead on Q1 base lead.
RFC2 — 51-μH inductor from surplus computer board.

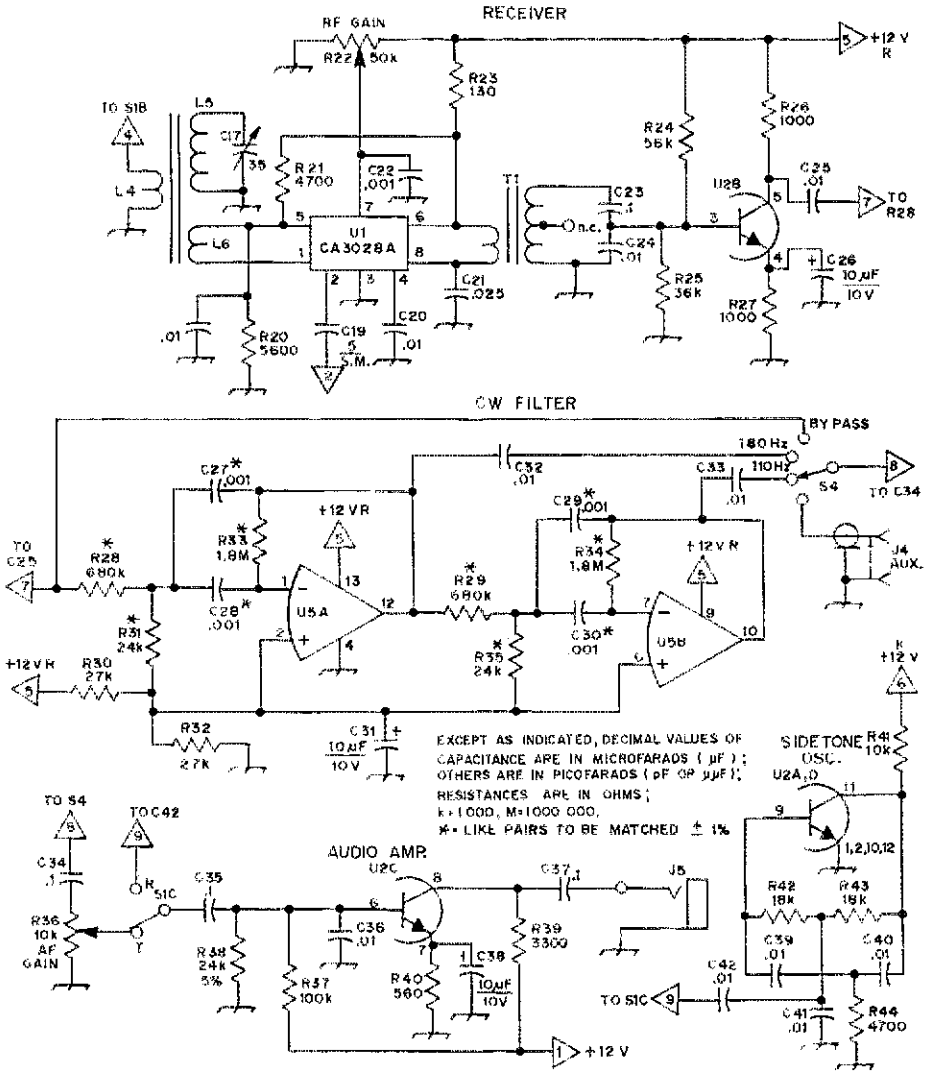


Fig. 3 — Schematic diagram of the receiver, cw filter, audio amplifier and sidetone oscillator portions of the miniature transceiver. Special parts information under Fig. 2 applies.

C17 — Mica trimmer, 3 to 35 pF (ARCO 403).

C27 — C30, incl. — .001-µF polystyrene; pairs matched plus or minus 1 percent.

J4 — Phono jack, like J1.

J5 — 3.5-mm phone jack (Calectro F-842).

L4 — 5 turns No. 22 enam. wire wound on L5.

L5 — 60 turns No. 28 enam. wire on 1/2-inch dia toroid core (Amidon T50-2).

L6 — 10 turns No. 22 wound on L5. Kit of coils and rf chokes, ready for use, can be obtained from Caddell Coil Corp., 35 Main Street, Poultney, VT 95764. Price $6, postpaid.

R22 — Like R16.

R36 — 10,000-ohm control, panel-mounting, linear taper.

S4 — Sp4t miniature slide switch.

T1 — 10,000-ohm primary, 2000-ohm secondary (Calrad CR-75).

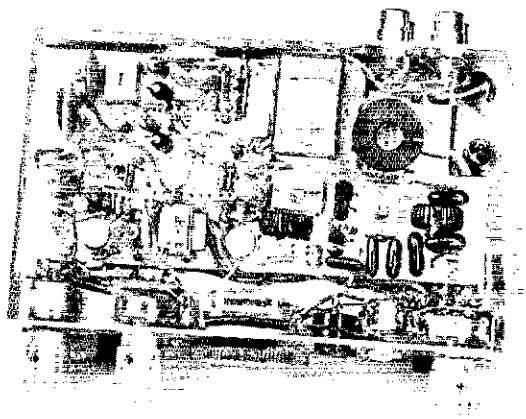
U1 — CA3028A or CA3028B 8-pin TO-5 (RCA).

U2 — CA3018A 12-pin TO-5 (RCA).

U5 — µA747 14-pin dual-inline plastic or 10-pin TO-5.

Use of toroidal rather than solenoid coils is a necessity in such confined spaces, if troublesome interaction is to be avoided. The toroids are supported vertically on their own leads and cemented in place by means of *Q*-dope. Miniature disk ceramic capacitors and 1/4-watt resistors are available from many surplus sources at bargain prices.[3] Where such thin foil paths are used in circuit-board patterns like these the strength and durability of the assembly can be improved by

[3] One source: Circuit Specialists, PO Box 3047, Scottsdale, AZ 85257.



Interior of the Ultramountaineer, with bottom cover removed. Component groups can be identified from Fig. 4, which shows the top-view layout, as seen here.

flow-soldering the entire foil pattern. Small hemostats are useful as needle-nose pliers, or as heat sinks on IC leads, during soldering. Scrape away all excess flux with an X-acto knife or dentist's scraper. A 1/4-inch hole is drilled in the bottom of the case to permit adjustment of R7.

Adjustment

With the antenna connected and S1 in the RECEIVE position, peak C17 on a weak signal. This is the only receiver adjustment. With a 51-ohm 2-watt resistor for a dummy load at J3, and a 250-mA meter in series with the 12-volt line, activate the transmitter by grounding the center conductor of J2 or pin 6 of U3B. Adjust C6 for maximum current. The peak is slight, but noticeable. Adjust R7 for proper weight and ratio at the speed you most often use. There is some interaction between R7 and speed range, so R7 may have to be readjusted for large speed changes.

Operation

Practice with the cw filter is helpful. The rf and af gain controls affect the filter performance to some extent, as the af preamplifier can overdrive the filter and audio amplifier, U2C. The extra af gain is helpful for weak-signal or dead-band conditions. The additional gain with the filter in the 110-Hz position also may call for reduced gain-control setting. In general the best filter performance is obtained with a low rf gain setting and the audio gain above midrange. Maximum recommended supply voltage is 14. The audio amplifier and keyer performance will tend to be poor at 9 volts or less. The frequency offset from TRANSMIT to RECEIVE varies from 82 to 93 Hz, depending on the crystal and the setting of C2, so a coil was not used in series with the crystal and variable capacitor, as had been done in a somewhat similar project.[4] Parts placement may determine whether such a coil is required. If it is, the value should be determined experimentally. The fourth pole of S1 can be used for this purpose.

There are obvious limitations in any built-in keying device for so small a rig. The momentary-contact pushbuttons used here, S2 and S3, feel strange initially, and are a bit tiring for long operating periods. Microswitches have a light touch, but require more space. Any external key, paddle, or bug will overwhelm the rest of the station in size and weight, but may be preferred when these factors are not of major importance.

Much has been written about maximizing your chances of success in operation with very low power. This writer has never been bashful about calling "CQ QRPP," answering anyone's CQ, or even running with the QRO boys in a contest. The Ultramountaineer is only three S-units down from the popular parallel 6146 rig, and you may make some of that up in extra care with your antenna. Antenna system efficiency is a must for success with low power. A final hint: don't leave a wattmeter in the antenna line with a QRP rig. Tune things up for optimum performance, then remove the wattmeter. Make every milliwatt work for you. There is no power to waste in a station like this!

EDITOR'S NOTE: "Cute — but does it work?" This typical reaction was answered positively by putting the Ultramountaineer on the multiband vertical test antenna used for ARRL Lab work. A hesitant "CQ de W1INF QRP hr" brought a reply and a 559 report from W1YWV, 90 miles east of us. Turned out he was a mountain back-packer, well sold on the merits of 7-MHz cw for company. He'd just recently returned from Colorado, where he had made regular use of a very similar rig (August, 1972, *QST*) that helped to inspire the author of this article to *smaller* and better things!

References

In addition to those footnoted, the following may be of interest to readers contemplating construction of lightweight portable gear:

Hayward, "The Mountaineer," *QST*, August, 1972.

Hayward, "The Micromountaineer," *QST*, August, 1973.

Batie, "Quality Recipe for a Portable Package," *QST*, August, 1973.

Batie, "Introducing the Argomate," *Ham Radio*, April, 1974.

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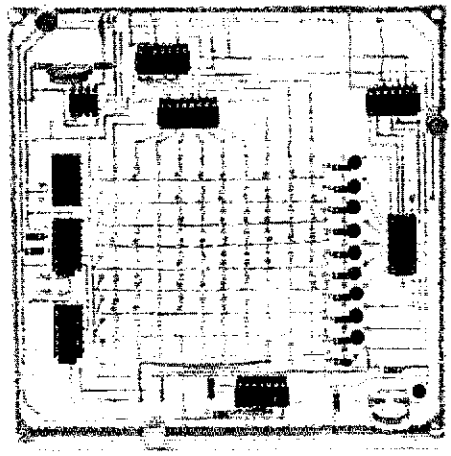
QST

[4] Batie, "Miniature 7-MHz Transceiver," *Ham Radio*, July, 1974.



This top view of the board reveals that there is plenty of space between components. No attempt was made at miniaturization in order to allow ease of construction. There is one unused IC socket, part of an experiment that was abandoned. The speed control (R1) is near the NE555, the smallest IC on the board.

A Low-Co$t CW Identifier

BY THOMAS McMULLEN,* W1SL

CW IDENTIFIERS have been used mainly in conjunction with repeaters as a means of automatically identifying the station in use. Many of the common identifiers use an extremely complicated encoding scheme to obtain the sequence that forms the code bits and spaces; others utilize a programmable ROM (read only memory) IC, which must have the code bits locked into it, unchangeable.

The identifier presented here is simple in format, and because of this simplicity it is a natural for uses other than repeater identification. It works on the simple row- and line-scanning technique and once the basic scanning circuitry is done, the diode matrix that enables the code-bit circuitry can be in almost any form that the builder desires. The matrix in the unit described here is hard-wired to the board, but plug-in cards, multiple cards and a selector switch, or a system of miniature clips or jacks are only a few possibilities for flexible programming. Contest calls, test signals, or any short message can be maintained in the memory, ready to go at the push of a button.

* Assistant Technical Editor, *QST*.

The Circuit

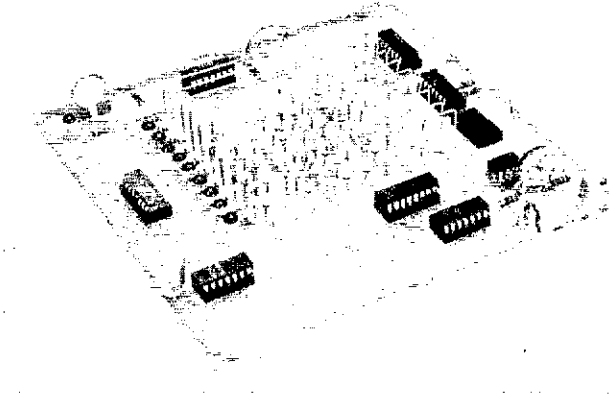
Simplicity is one of the keynotes in this circuit (Fig. 1). It uses the inexpensive and readily obtainable TTL family of ICs. A clock oscillator generates a train of pulses to set the speed of the code generated and to drive two frequency-divider circuits. Each divider reduces the number of pulses by a factor of ten and drives an associated BCD-to-decimal decoder IC. The decoders drive the diode matrix – one drives the lines in the matrix, the other drives the rows. The timing is such that the rows are driven at ten times the speed of the lines. In effect, this causes the lines to be scanned, and wherever there is a connection (diode) between the scanned rows and lines the circuit is completed to a switching transistor. The switching transistor keys an audio oscillator to form a code element. A proper combination of bits and spaces will form the cw message that has been programmed into the matrix.

Oscillator

A versatile and reliable IC, the Signetics NE555, is used to generate the clock pulses for the ID board. Speed can be controlled to some extent by the adjustment of R1, and the range can be modified by changing the value of C1. The output from the clock consists of a train of equal-width pulses having a good square shape factor, ideal for driving TTL circuitry.

Frequency Dividers

No unusual circuitry is used in the frequency divider part of the board. U2, a 7490, divides the output frequency generated by the clock oscillator, providing one output pulse for every ten input pulses. This output pulse is passed along to U4, which again divides by ten. Both U2 and U4



Horizontal "lines" connections for the matrix are formed by pieces of No. 22 tinned wire spaced approx. 1/2 inch above the board. This is a convenient spacing to support the diodes in place. The mounting of the board is left to the builder. Short metal spacers are adequate, or an edge-connector and socket may be applied with some modification of the layout. For a full-size template and parts-placement guide for the pc-board layout shown here, send 60c and s.a.s.e. to ARRL Headquarters.

provide output information in a BCD format, in which any number between 0 and 9 is presented as a combination of four digits (0, 1, 2, 4). The BCD output lines from U2 and U4 are connected to decoder-driver ICs. A reset voltage is applied to both dividers to stop the action and end the ID sequence. More on the derivation of the reset logic later.

Decoder-Drivers and Matrix

The purpose of the 7442 decoder-driver IC is to translate the BCD information from the dividers into a one-of-ten output format. Other decoders are available that have a greater range, one-of-twelve or one-of-sixteen. These decoders could be used to expand the matrix to contain more code bits for longer messages. However, it would require a new board layout, since this one was planned for a 10 × 10 matrix, or 100 bits. One 7442 is used to drive the rows (vertical portions) of the matrix – the other drives the lines (horizontal bars). The lines driver is not connected directly to that part of the circuit, however, because some translation of logic levels is needed at the output of the matrix. The line driver output connections are to the collectors of the ten line transistors (Q1 through Q10). The logic is such that when the collector circuit is completed (to a low or ground), and the base circuit is completed through the diode to a row decoder output, the transistor conducts. Since the transistor emitters are all connected in parallel, conduction of any one will actuate the remaining circuitry to generate a code bit. Q11 is a logic translator, generating a positive-going pulse across R3 in its collector circuit. This pulse triggers U6, a NAND gate that is connected as an audio oscillator. The output of U6 is a keyed audio tone. The function of R2 (in the base circuit of Q11) is best described as an oscillator "trigger" control – it changes the bias on Q11, affecting the amplitude of the pulse developed across R3. At one extreme the output is a steady tone, at the other there is no output.

Control Logic

The logic functions necessary to start or stop the ID sequence are provided by U7 and U8. In a normally off state of the identifier, a reset or logic-high condition is present on pin 2 of the 7490 dividers to inhibit the count. This voltage is generated by U8, a 7400 quad two-input NAND gate. Two sections of the 7400 are cross-connected, so that a logic high on one input (pin 10) maintains the high on the reset line. CR1 or CR2 provides a means of starting the ID sequence – a momentary closure to ground through either diode will force pin 10 to a low condition, causing the reset voltage to drop and allow the counters to function. Note that since both counters reset to 0, the intersection at row 0, line 0 must be left open. If there is a diode at this spot, the ID sequence will stop at a key-down position, holding the tone and transmitter on.

Two stop jumpers are provided for in the board wiring, one for a row stop and one for a line stop. They should be connected to the first empty position after the last program element. Note that the line stop jumper should be connected to one of the 7442 output lines, not the matrix proper. When both of these jumpers receive a logic low, the condition is applied to U7, which inverts the logic and applies it to U8, thereby generating the reset condition and stopping the counters. One of the sections of U8 is connected to provide a logic-high output that is maintained as long as the ID sequence continues. This voltage is nominally +5, but of low power capability, and therefore it must be applied to a relay-driver circuit that can keep the transmitter keyed during the ID period. It may be desirable to allow one or more blank row and line positions before the connection point of the stop jumpers, thus allowing a small interval between the end of the code and the time at which the carrier drops out.

Programming

Theoretically, the matrix has 100 positions available for programming. Actually it will only accept 99 bits, since row 0 and line 0 must remain open. Computer or switching diodes will suffice for the purpose of programming – 1N914s were used in one model constructed and "pull-offs" from a surplus computer board did as well in another instance. A diode must be wired between the horizontal-line bus wires and the row pattern on the pc board; the cathode of the diode must be toward the pc board. Each diode will form a dit, three in sequence with no spacing between will form a dah. A space between code bits (dits or dahs) is programmed by leaving one position empty. Three empty positions form a space between letters.

Acknowledgements

The writer would like to express thanks to Bob Corbett, W1CH, for the germ of an idea that started the development process. A well-done goes to Paul Crilly, WA1IND, for his patience in pc layout and testing of the circuit in the ARRL laboratory. QST

EDITOR'S NOTE: The programming of code bits should start at line 0, row 1, and proceed from left to right, just as you would read lines of print.

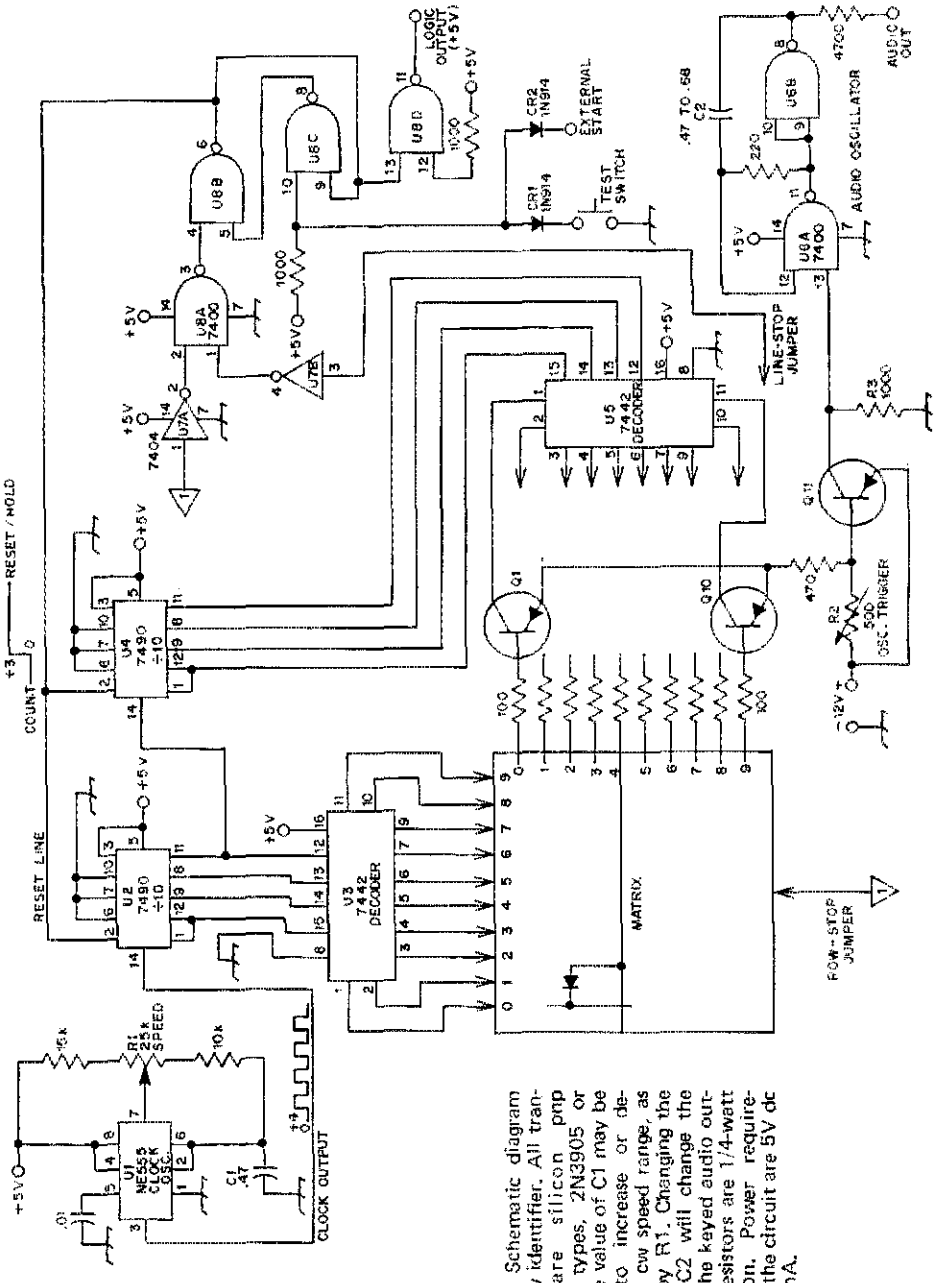


Fig. 1 — Schematic diagram for the cw identifier. All transistors are silicon pnp switching types, 2N3905 or equiv. The value of C1 may be changed to increase or decrease the cw speed range, as adjusted by R1. Changing the value of C2 will change the pitch of the keyed audio output. All resistors are 1/4-watt composition. Power requirements for the circuit are 5V dc at 170 mA.

The LOSSLESS Radiator

BY ALEK TRAHN, KLØOGE *

THIS ARTICLE describes a new and highly efficient radiation system readily adaptable to amateur radio. The conventional antenna is discarded, along with its losses, its tuning problems, and its bulk. Instead, the final tank coil of the transmitter becomes the radiating element. However, the final tank coil is no longer a coil; in the arrangement described here, the final inductor becomes a large, single-turn loop of 1/2-inch copper tubing atop the roof, with the directional characteristics of such a radiator. But most remarkable is the fact that radiated power is equivalent to final input power. A wattmeter in the antenna is no longer required, since transfer of energy from the final stage to the radiating element is lossless.

Figure 1 depicts the installation in use by the author. As will be seen, the final stage of the transmitter (in this case a pair of 6146s in parallel) has been moved to the roof of the house. A multiconductor cable is employed to bring filament, grid bias, plate, and final capacitor motor-drive voltages from the shack up to the roof unit. A five-wire cable serves admirably. The shield of the cable functions as a common ground for the circuits involved. A second cable, which in the author's case is a 35-foot length of RG-58/U, carries the rf excitation from the driver, located in the shack, up to the final stage located on the roof. (It will be found that the average transmitter affords ample excitation to compensate for the small loss introduced by the coaxial cable carrying the drive.)

The procedure for determining the dimensions of the single turn serving as the radiator involves only measuring the inductance of the present final-stage tank coil, then developing a single-turn loop of the same inductance.

Important to implementation of the new radiation system is proper matching of the coaxial-drive cable at both the excitation end and the final-stage termination. This is accomplished through employment of an impedance step-down matching network at the exciter output, with a step-up matching network at the input to the final.

The motor drive for the final tuning capacitor can be of the geared-down type often found in the surplus market. No harm is done by the fact that the capacitor is continuously rotatable. Tuning indication is furnished by the common household variety of SWR meter (in the "forward" setting) located at the shack end of the coaxial drive cable. When the resonant frequency of the final stage is equivalent to that of the driver, the indication will be obvious on the SWR meter, since the current flow up the coaxial cable will increase sharply.

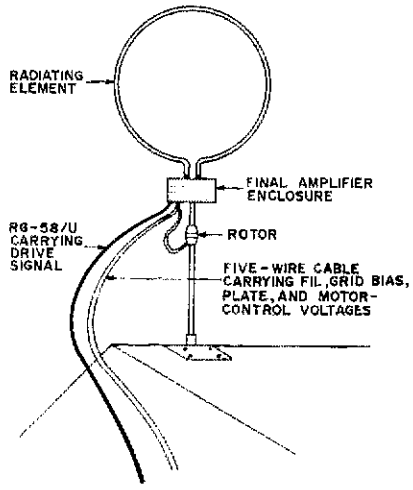


Fig. 1 — System diagram.

At the author's installation, which is subject to frequent tropical downpours, the final stage is enclosed in a waterproof cabinet, with the two loop terminals brought out through leakproof plug-in connectors.

Directivity is handled by rotating the entire roof-top system, i.e., the box containing the final, along with the loop. An ordinary TV rotor is used. A little extra length in the feed cables will allow for the necessary 90 degrees of rotation — all that is required to cover 360 degrees of radiation.

The chief disadvantage of this new and highly efficient radiation system is that the operator must climb to the roof of his house whenever the

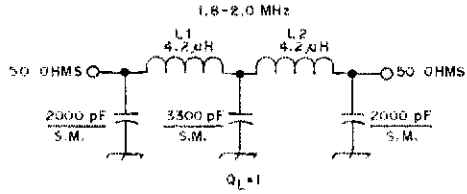
(Continued on page 72)

* Special event station, Cheechako Fair, Little Diomede, Alaska.

Hints and Kinks For the Experimenter

160 METERS WITH THE TEN TEC 405 AMPLIFIER

The writer needed an amplifier to go with his solid-state 160-meter exciter (*QST* for Nov., 1974), and it seemed likely that the Ten Tec 405 amplifier could be modified for use on 1.8 MHz. The band switch in the 405 is used to select half-wave filters for the band of use. The filters are the only tuned circuits in the assembly and are inserted after the broadband transformer in the collector circuit of the 100-watt amplifier.



L1, L2 – 20 TURNS NO. 22 ENAMEL WIRE, CLOSE WOUND ON ORIGINAL 80-METER TOROID CORE.

The first experiment called for external addition of a half-wave filter network, 50 ohms at each port, and with a loaded Q of 1. A filter was made from sections of Miniductor stock and surplus transmitting-style mica capacitors. The same constants as given in the accompanying schematic were used. Operation was tried with the band switch set for 80 meters. It seemed reasonable that 160-meter energy would pass through the 80-meter network since a half-wave filter is a low-pass filter. With the 160-meter outboard filter installed between the amplifier output and the coax feeder to the antenna, power from the exciter was fed to the 405. With approximately 5 watts of drive to the amplifier a power output of 50 watts was obtained. Apparently the input transformer and compensating network of the 405 are lossy at 1.8 MHz, thereby accounting for a higher required excitation level than for the hf bands. (The manufacturer rates the driving power at 1 watt for hf-band use.)

Some mismatch between the PA transistors and the outboard filter will result from having the 80-meter network connected to the outboard one for 160 meters. Therefore, it is recommended that persons interested in making the amplifier usable on 160 meters give up the 80-meter band and rewind the two toroids in the 80-meter filter section. It will be necessary to install new capacitors in the network. This modification was done by the writer, and performance has been excellent. – *WICER*

HF WIDE-BAND TRANSFORMER

A toroidal core is wound spirally with a single coaxial cable. The inner conductor of the coaxial cable functions as the primary winding and the outer shielding is segmented to form the secondary winding.

A center-tapped push-pull transformer configuration is shown (Fig. 1). It consists of a helical winding of coaxial cable on ring or ferrite core material. The ferrite inner conductor, with input terminals 1 and 2, corresponds to the primary winding. The outer shielding, with output terminals 3 and 4, corresponds to the secondary winding.

The cable is wound initially on the core at 1:1 ratio. The method used to obtain a 4:1-step-down ratio is illustrated. For each half of the transformer, A and B, there are effectively four primary windings magnetically coupled to one secondary winding. The effect of reducing the number of turns in the secondary is accomplished by sectionally discontinuing the outer shielding and rewiring the resulting sections into four parallel networks. Thus, the secondary is electrically equivalent to a single turn of a conductor about a magnetic core wound with four primary turns.

Specific performance data of this design indicate that the coupling coefficient between primary and secondary approaches unity. Stray inductance is lowered by this configuration. The amount of coupling and/or stray-inductance loss may be varied as a function of the diameters of the two conductors. Empirical study of the frequency characteristics of this transformer indicates a completely flat response from 100 kHz to 10 MHz. The networks in parallel need not be single turn as illustrated, but may be any number as required to meet specific requirements. *from AEC-NASA Tech Brief*

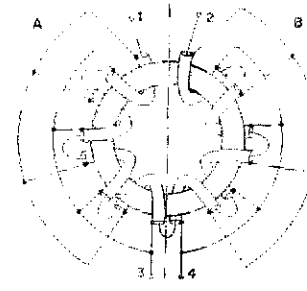


Fig. 1 – The high-frequency wide-band transformer uses coaxial cable to achieve high turns ratio, and flat response.

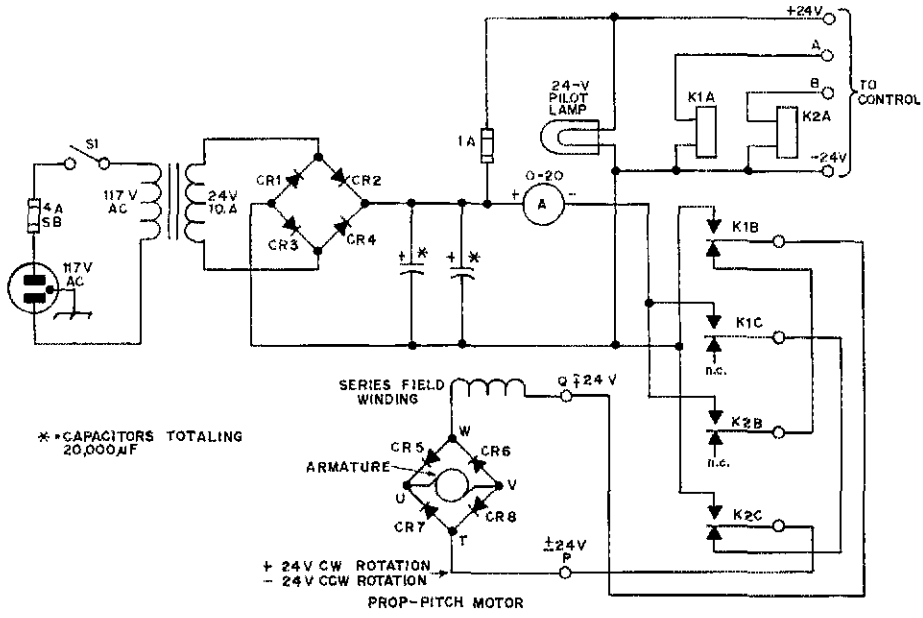


Fig. 2 — Power supply and diode arrangement at the motor for two-wire control of a prop-pitch motor. Relays K1 and K2 are 24-V dc types. The letters P, Q, T, U, V, and W refer to the terminals on the motor. Diodes CR1-CR8, incl. are 100 PRV, 15 A.

TWO-WIRE CONTROL FOR PROP-PITCH MOTORS

Prop-pitch motor control usually involves the use of several wires. The system described here uses only two wires, which greatly simplifies this rotator system. Basically, all of the components are located at the shack. Only three wires are required for the direction indicator, and two for powering the motor. By using diode logic, only two wires are necessary. The motor speed is the same in either direction. The direction indicator, power supply, and the arrangement of the diodes at the motor, are shown in the accompanying diagrams.

The control system offered here need not be used, but the motor will run more efficiently with dc as compared to an ac voltage. The 24-volt secondary can be wound on an old TV power-transformer core, retaining the primary winding. Since the duty is intermittent, No. 14 copper wire is adequate for the secondary. The motor operates over a voltage range from 24 to 30. The current consumption in normal use is 6 to 9 amperes, and in very cold weather, 10 to 15 A. The starting current is in excess of 20 A. – *William M. Fugate, W8IYD*

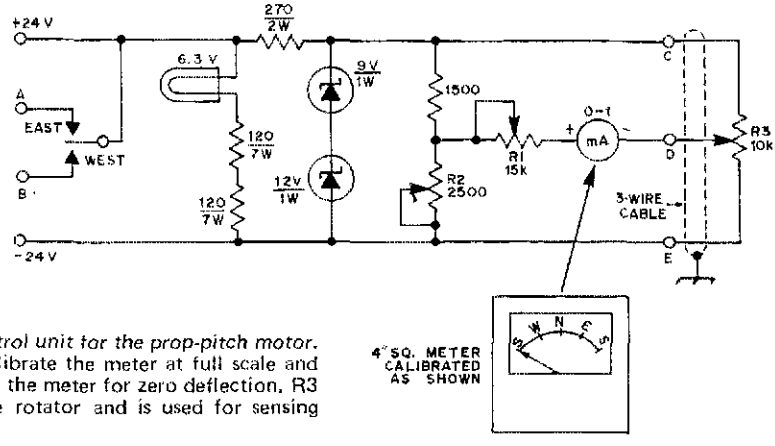
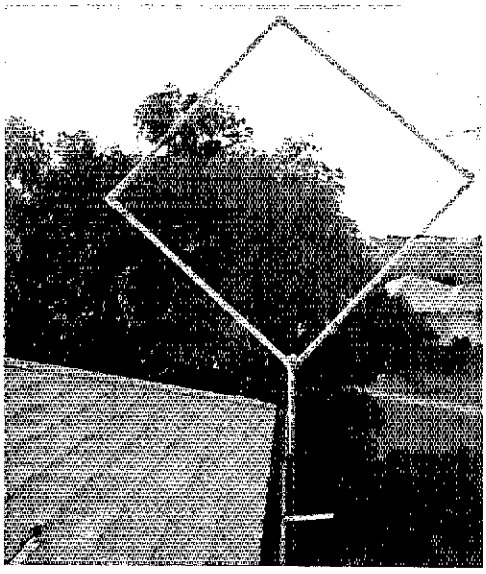


Fig. 3 — The control unit for the prop-pitch motor. R1 is used to calibrate the meter at full scale and R2 is used to set the meter for zero deflection. R3 is located at the rotator and is used for sensing direction.



A 160-Meter Receiving Loop

BY KATASHI NOSE,* KH6IJ

IN AREAS of high-density broadcast signals and Loran, the 160-meter band becomes a bewildering mess of heterodynes from cross modulation and harmonics. For this and other reasons, a loop antenna may result in a better signal-to-noise ratio.

The voltage induced into a loop antenna with dimensions small compared to the wavelength being received is given by:

$$V = k\ N\frac{A}{\lambda}\ Cos\ \theta$$

where:

V = induced voltage
k = proportionality constant
N = number of turns on loop
A = area of loop
λ = wavelength
$Cos\ \theta$ = normalizing factor and θ is the angle between the plane of the loop and signal direction.

To take advantage of the rejection characteristics, we resonate the loop to the desired wavelength (λ) which means that the area (A) and the number of turns (N) must be a compromise. After experimenting with an open loop you will probably want to construct a more permanent one with better appearance and more rejection.

* 4207 Huanui St., Honolulu, HI 96816.

The Electrostatic Shield and the Loop

To improve the rejection characteristics of a loop, the usual procedure is to shield the loop and to break the shield at the top. This prevents a short-circuited shield, but therein lies a problem because rain can leak into the system. However, by using PVC pipe fittings at this shield-break point, a rain-tight joint is possible.

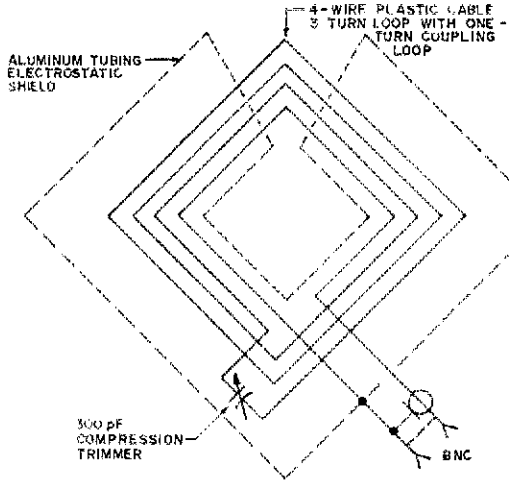


Fig. 1 — Electrical connections for the 160-meter receiving loop.

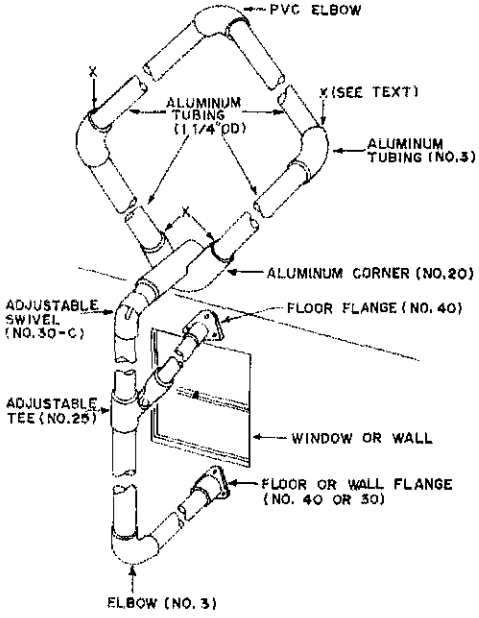


Fig. 2 — Construction of the loop, shield, and mounting bracket. The numbers in parenthesis refer to fittings from the Hollaender Mfg. Co.

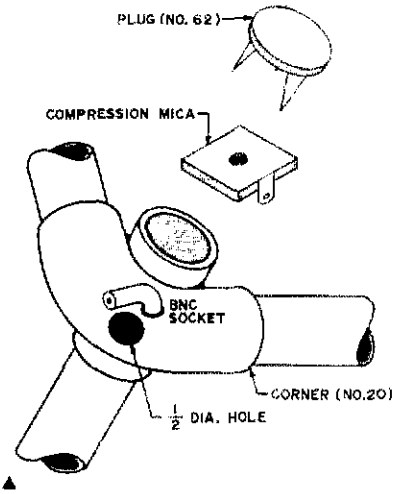


Fig. 3 — Detail of bottom corner.

The shield is made of standard aluminum 1-1/4-inch pipe or tubing with fittings called "Nu-Rail"[1] used for railings and shelving. The material comes in all manner of swivels, Ts, elbows, corners, and flanges. This results in a system which is mechanically strong, good looking and reminiscent of the ARRL diamond. Another advantage of this construction is that provisions for tilting the loop as well as rotating it are possible. Tilting the loop may be necessary since the polarization of the unwanted signal may contain both horizontal and vertical components. The finished loop is shown in Fig. 2.

The loop consists of three turns, 5 feet (1.52 m) on a side resonated with a 300-pF compression trimmer. (See Fig. 1). A one-turn coupling loop is terminated in a BNC right-angle female connector. The wire can be 4-conductor plastic telephone or intercom cable which is color coded. If 5 sides are chosen, you need only one plastic spacer support in the middle but two at each corner as shown in Fig. 4 to maintain even spacing when turning corners.

[1] Hollaender Mfg. Co., 3841 Spring Grove Av., Cincinnati, OH 45223.

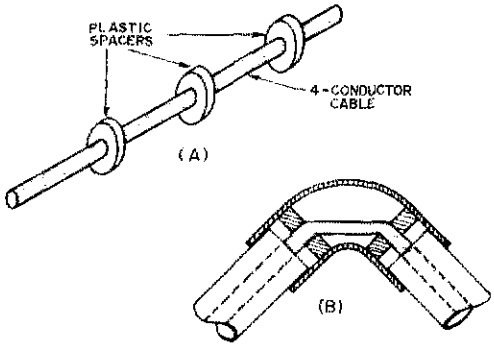


Fig. 4 — Shown at A is the method of mounting the 4-conductor cable so as to maintain constant spacing. Extra plugs should be used at the corners as shown in B.

Construction

Drill a hole on the side of the corner elbow shown in Fig. 3 to accept a right-angle BNC female connector. Then drill a 1/2-inch (12.7 mm) hole or larger on the bottom of the elbow. This acts as a drain hole and access hole to enable you to work on the BNC connector and to connect the two ends of the loop to the compression trimmer. The center holes of the plastic spacers, which could be poker chips, should tightly grip the wire. Otherwise gluing the wire to the spacers may be necessary.

The compression trimmer can now be wired and the loop tuned with a grid dip meter. Then the trimmer is wrapped in plastic and shoved into the corner piece. The corner piece is then capped with a plug as shown in Fig. 3. Places marked with an "X" should be caulked with bathtub cement to prevent water from seeping in. QST

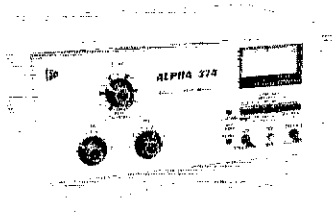
Simple RF Bridges

(Continued from page 16)

In the process of using and discussing the bridges described, it was brought to the author's attention that a variable resistance, such as the common potentiometer, can also be used in simple antenna bridges. Construction and use of simple bridges with resistive elements will be covered in a short follow-up article in a subsequent issue. QST

Recent Equipment

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



The *ETO* Alpha 374 Bandpass Linear Amplifier

AN ANALYSIS of the changes in amateur equipment design over the last decade reveals an interesting trend in the direction of increased performance and operating convenience coupled with smaller package size. The ETO Alpha 374 continues and advances this trend. A combination of modern compact components and a judicious use of the available cabinet interior space has resulted in an amplifier fully capable of continuous operation at the legal power limit. It is also one that occupies a volume hardly larger than the average ssb transceiver.

The Alpha 374 features the option of conventional manual tuning of the power-amplifier output network or operation in the BANDPASS mode, which requires no tuning adjustment other than setting of the band switch. Of the several areas where bandpass operation is attractive, two come to mind immediately. Rapid band switching is of prime importance in most contest work. Any time that is wasted in tuning up equipment after changing bands means contacts that are irretrievably lost. Over the course of a long contest period, this time is substantial. The Alpha 374 provides a competitive edge in this respect over a manually tuned amplifier, even one with the proper dial settings for each band segment marked clearly. The current generation of broadband solid-state transceivers of the 100-watt output variety are well suited to drive a no-tune-up power amplifier such as the Alpha 374 in the band-pass mode. One can envision bands free from endless dead carriers of perpetual tune-up enthusiasts when such equipment comes into widespread use.

The Alpha 374 is housed in a natural-finish aluminum instrument enclosure. The unit is shipped from ETO in two cartons, one containing the power transformer and the other containing the amplifier itself. Installation of the transformer involves removal of the '374 top cover and cover interlock switch. The 22-pound transformer is then lowered into place and secured to the cabinet by means of four 1/4-20 bolts which are inserted from the bottom. The entire operation takes less than 15 minutes. The band-switch, tuning, and loading controls are grouped at the left on the front panel, while control and metering functions occupy the opposite side.

A word about the unusual band switch is in order. Eleven switch positions are available. Each band, 80 through 15 meters has two stops; one for bandpass operation and one for manual operation. One manual and two bandpass positions (10 LO, intended for use from 28 to 29 MHz, 10 HI, for 29 to 29.7 MHz) are used on 10 meters. In each case, the band-pass position is indicated by a wide panel marker. The manual position is denoted by a somewhat thinner line.

Six push-button-selected metering functions are available; grid and plate current, high voltage, forward and reflected power, and an indication of the approximate PEP input. As an adjunct to the grid metering, two light-emitting diodes provide a visual indication of instantaneous grid current. The meter cannot respond quickly enough to display short peaks. A green LED (labeled NORMAL on the front panel) lights when a predetermined value of grid current is reached or exceeded. If the amplifier is overdriven, a red LED (labeled EXCESSIVE) illuminates to indicate that a somewhat higher preset grid current threshold has been exceeded.

The Amplifier Compartment

The Alpha 374 cabinet is divided into two equal-size rectangular enclosures in order to isolate the high-power rf stage from the power supply and control circuits. Three Eimac 8874 triodes are operated in parallel in a cathode-driven configuration, providing a 1200-watt total plate-dissipation capability. The 8874 anodes require

forced-air cooling. In the Alpha 374, this is accomplished by means of a pressurized anode compartment. An axial fan mounted in the power supply area, draws air through a perforated metal intake vent past the power transformer and into the amplifier compartment. The air passes through the 8874 cooling fins through short lengths of insulated air ducts and then into an aluminum channel which directs the exhaust air out of the cabinet. Additionally, a row of tiny holes at the bottom of the rear cabinet wall allows a small air flow past the 8874 socket pins and the tube bases. ETO recommends at least a six-inch clearance between the rear of the '374 and walls or other objects that could restrict the air flow. A built-in timing circuit is activated when the Alpha 374 is initially turned on to allow the indirectly heated 8874 cathodes to come up to operating temperature before drive can be applied to the tubes. The end of this period is signaled by the illumination of the meter lights. Eimac specifies a 60-second minimum warm-up, although the nominal time delay measured on the '374 tested was only 30 seconds.

An open-frame dpdt relay provides a "transceiver-compatible" transmit/receive function. The relay is actuated by shorting its control line to ground during transmit. The relay cannot be energized when the STANDBY/OPERATE switch is in STANDBY or when the amplifier is in the midst of the initial warm-up period. Also, when the overcurrent protection features (to be discussed later) have been tripped, the relay cannot be actuated.

The plate output network uses the pi-*L* configuration. A four-deck, eleven-position ceramic rotary switch handles all of the band-switching duties. While at first glance a four-deck band switch seems very complex, closer examination reveals that the switching arrangement is straightforward. One deck permits selection among the fixed-value transmitting capacitors used in the band-pass mode, or a single air-variable capacitor labeled TUNE in the manual mode. A second switch deck is used for the taps on the pi-section inductor. A third deck is for air-variable loading capacitors, factory preset for each band-pass position and for the front-panel adjustable air-variable capacitor marked LOAD used for manual operation. The fourth deck is for the taps on the L-section inductance, as well as for adding a fixed-value capacitor in parallel with the 80-meter band-pass variable loading capacitor. A key factor in the compactness of the rf section is the use of toroid cores for the 80- and 40-meter portions of both the pi-section and *L*-section inductances. Heavy gauge wire and silver-plated copper tubing make up the coils used on the higher frequency bands. The shafts of the variable capacitors used in band-pass operation are accessible only when the front panel is removed. Since these capacitors are aligned at the factory for optimum efficiency under typical ssb operating conditions, they should not be tampered with. Inside the amplifier compartment, cabinet seams and joints are covered with metallic foil tape to provide an rf-tight compartment.

The Power Supply Compartment

As can be seen in the photograph, the power transformer and the filter capacitor occupy most of the power supply compartment. The Hypersil-core transformer has a tapped double primary which is wired normally for operation from 235 volts ac. ETO will provide information for use from other common power sources. The test unit was used on both 117 and 235 V ac. Three secondary windings provide high voltage for the plate supply, low voltage for the control circuitry, and filament voltage for the three 8874s. The transformer high-voltage secondary is connected to four silicon diodes arranged in a bridge, located on a glass-epoxy circuit board. The circuit board is mounted on the terminals of the 30-μf oil-filled filter capacitor. A spring-loaded metal grounding strap attached to this circuit board ensures that the filter capacitor is discharged whenever the cabinet cover is removed. A string of bleeder resistors and the precision resistors that compose the HV meter multiplier are mounted on this circuit board as well.

The front-panel-mounted CW/SSB switch actuates a relay that selects transformer primary taps for providing approximately 1400 volts dc for cw and 2000 volts dc for ssb operation. This relay also selects a tap on the secondary filament winding to maintain the filament voltage at 6.3.

A self-latching-relay arrangement, actuated by a momentary-contact toggle switch, applies primary power to the transformer through two resistors that are intended to reduce the surge current produced by the initial charging of the filter

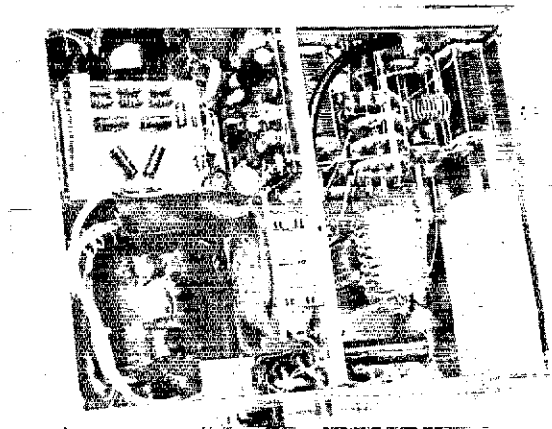


Fig. 1 — Top view of the ETO Alpha 374 amplifier. The power supply is located at the left, the rf power-amplifier components at the right. The circuit board visible at the top center contains the low-voltage regulator, the electronic bias-switching network, overload protection circuits, and the initial-warm-up time-delay components.

Table I – ETO Alpha 374 Characteristics

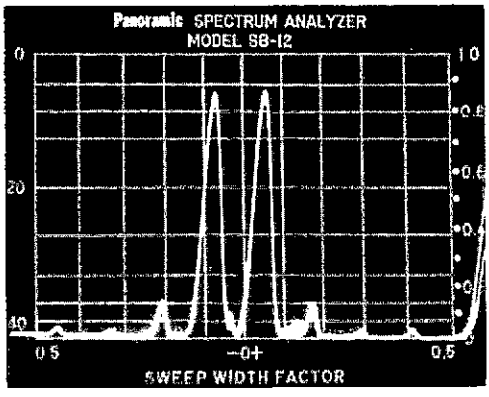
Band	Mode	Input Power*	Grid Current	Drive Power	Output Power		Efficiency	
					Manual	Bandpass	Manual	Bandpass
80	cw	1000	115	40	620	560	62	56
	ssb	2000	145	74	1350	1200	67	60
40	cw	1000	115	45	610	540	61	54
	ssb	2000	145	90	1280	1130	64	56
20	cw	1000	115	45	620	600	62	60
	ssb	2000	145	1000	1350	1350	67	67
15	cw	1000	125	53	620	630	62	63
	ssb	2000	150	100	1300	1350	65	67
10 (LO/HI)	cw	1000	115/120	36/40	500	490/540	50	49/54
	ssb	2000	145/150	70/80	1050	1100/1150	52	55/57

* Power input measurement on cw was made at approximately 1350 volts at 750 mA; on ssb at approximately 1900 volts at 1.05 A.

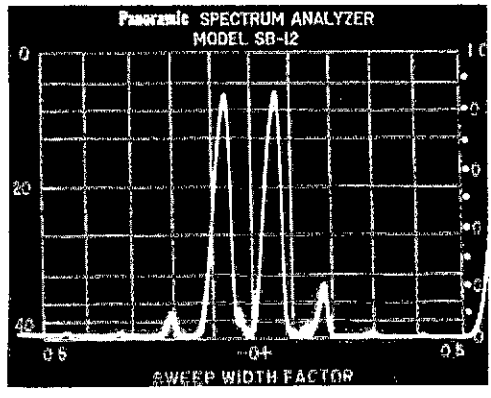
capacitor. These resistors are shorted out by a pair of relay contacts after the initial surge has subsided. In the Alpha 374 tested by the author, the filter capacitor developed an internal short circuit which blew the line fuse and cooked those two resistors, but caused no damage to the rectifiers or transformer – an ample tribute to the effectiveness of this arrangement. It is expected that this mishap was an isolated case and no such trouble was experienced with the replacement capacitor.

A cabinet top-cover interlock switch disconnects primary power from the amplifier by releasing the latching relay if the cover is opened by more than 1/8 inch. Additional protective circuitry is located on a pc board adjacent to the filter capacitor. In the event of greatly excessive grid current being drawn (much over 150 mA) the grid overcurrent protective relay trips, placing the T-R relay in the receive position and illuminating the red EXCESSIVE LED. If amplifier plate current exceeds 1.5 A, a plate overcurrent relay trips which unlatches the main power relay and shuts off all of the power. A relay protection circuit is also included to prevent the relay from being destroyed by a severe short circuit.

The electronic bias-switching arrangement in the Alpha 374 differs somewhat from the circuit used in the ETO Alpha 77 linear amplifier (see *QST* for March, 1973, pp. 50-53). When the 374 is in the OPERATE mode with the T-R relay not energized, the tubes are biased beyond cutoff by the application of 24 volts to the 8874 cathodes. This voltage is reduced by approximately one half when the relay control jack is shorted. This is enough bias to keep the tubes cut off with the lower voltage used on cw, but allows a small



(A)



(B)

Fig. 2 — Spectrum-analyzer display of the output of the ETO Alpha 374 amplifier with a two-tone 2000-W PEP input. The display at A was photographed in the MANUAL position; at B in the BANDPASS position. The horizontal axis of the display represents frequency, and the vertical axis amplitude. Each "pip" represents a single-frequency component of the rf output. The display is adjusted so the amplitude of each component may be read from the scale at the left, directly in decibels below the peak-envelope power (PEP) output, as rated by the manufacturer. Each reticle division represents 5 dB. Responses other than the two individual tones near the center are distortion products; third-order products at least 34 dB down may be seen at A. Third-order products at least 31 dB down may be seen at B. Individual tones of the two-tone signal are down by 6 dB from the PEP output. This is because the tones are displayed as two discrete frequencies. At the instant when voltages of the individual tones are in phase, they add to produce a peak in the envelope waveform pattern which is twice the voltage amplitude of a single tone alone. The power at the peaks of the envelope is therefore four times that of a single tone, a 4:1 power ratio being equivalent to 6 dB.

amount of plate current to flow in the ssb mode with its higher plate voltage. An rf sensing network at the amplifier input activates a transistor switch that lowers the cathode bias to the normal 5.1-volt operating value when a small amount of drive is applied. This eliminates the on/off bias switching which occurs at a syllabic rate and was a characteristic of the earlier circuit. When the '374 is in standby, the bias is held at 24 volts.

An rf wattmeter is built into the '374. An interesting feature is the calibration of the forward-power scale with 2000 watts maximum, and the reflected-power scale with 200 watts maximum. It is possible at a glance to tell if the indicated SWR exceeds 2:1 by comparing the location of the meter needle in the FWD position with the location of the needle in the REFL position. If the meter reading is lower in the REFL position than it is in FWD, the SWR is less than 2:1. The wattmeter appeared to give readings slightly more optimistic than a Bird Model 43 wattmeter. ETO recommends that the amplifier not be operated into an SWR exceeding 2:1 for manual operation, with 1.5:1 being the recommended limit for band-pass operation.

Additional Comments

The ETO Alpha 374 was used almost daily for a period of months, including two contest weekends when it was subject to constant use. At no time did the writer feel that the amplifier capabilities were even close to being taxed. In the MANUAL TUNE mode, there is no need to worry about whether the tubes or the power supply can handle a full kilowatt. In the BANDPASS mode, high-power operation requires no more adjustment than that involved in operating the exciter. An informative 27-page instruction manual which is included with the amplifier contains sections detailing installation, operation, theory of operation, and schematic diagrams, as well as a one-page chart of troubleshooting suggestions. – *WA1JZC*

The ETO Alpha 374 Amplifier

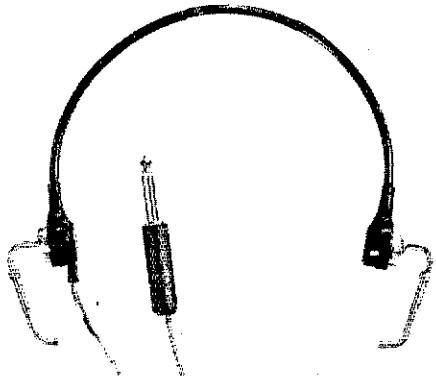
Power Input: 2000 watts PEP for ssb, 1000 watts for cw (for amateur service).*
Power Output: See Table I.*
Output tank-circuit configuration: Manually tuned Pi-L network or factory preset band-pass network.
Amplifier tube(s): Three 8874 triodes.
Plate dissipation: 1200 watts for the three tubes.
Cooling: Forced air, pressurized anode compartment.
Drive requirements: See Table I.*
IMD levels: See Fig. 2A and Fig. 2B.*
Frequency range: Amateur bands from 3 to 30 MHz.
Metering: Plate current, grid current, plate voltage, reflected power and forward power (watts), approximate PEP input (watts).
Power requirements: 117/235 volts, 20/10 amperes maximum.
Rear-panel terminations: Rf input, antenna relay, alc, aux, 24 V dc (all phono type), rf output (uhf type).
Color: Natural aluminum cabinet, gray cover.
Dimensions (HWD) and Weight: 7-1/2 × 17 × 13 inches, 50 pounds.*
Price class: $1300.
Manufacturer: Ehrhorn Technological Operations, Inc., Brooksville, FL 33512.

* Measurements made in the ARRL lab.

• *New Apparatus*

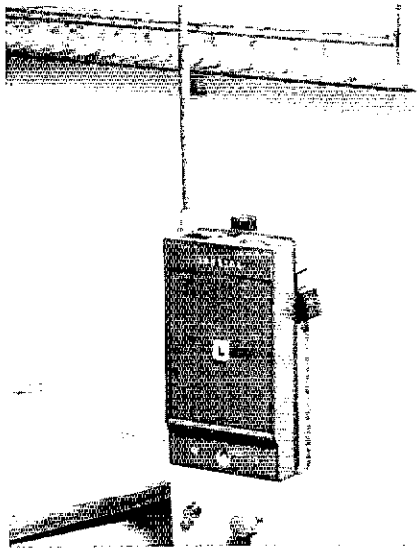
TELEX HTC-2 HEADPHONES

If the ham-shack noise level is relatively low while operating and one desires to have a lightweight pair of headphones, this Telex set may fill the bill. It uses a tubular sound technique that eliminates the need for a large dual-muff construction. For added convenience the sound tubes are adjustable and can be turned away while communicating with someone in the shack, *without* removing the headphones. They are designed for an impedance of 3.2 to 20 Ω. The phones weigh less than three ounces (including the five-foot cord and 1/4-inch plug), and if one is not paying attention, a sudden move away from the operating position can give quite a surprise! They're light enough to be forgotten easily. The



price class is $16, and the phones can be obtained through Telex, 9600 Aldrich Avenue, Minneapolis, MN 55420. – *WA1ABV*

(Continued on page 47)



HTACPS

Put Your FM HT to Work at Home

BY E. LAIRD CAMPBELL,* W1CUT

DON'T TRY to pronounce the title: it's an acronym for Handy Talky ac power supply. Does it bother you HT owners to let your rigs stand idle at home because you don't want to use up precious battery power? If the answer is "yes," the solution is an HT power supply that operates from the ac mains. Here are a couple of tricks that may encourage you to go ahead and build one.

* *QST* Advertising Manager.

Ideally, this ac supply should be lightweight and interchanged easily with its dc counterpart. The ac supply shown here weighs *less* than the NiCad pack and charger originally supplied. The supply is built into an empty battery case which makes it a breeze to change from dc to ac operation. Check with the manufacturer of your HT to see if he can supply you with an empty battery case.[1]

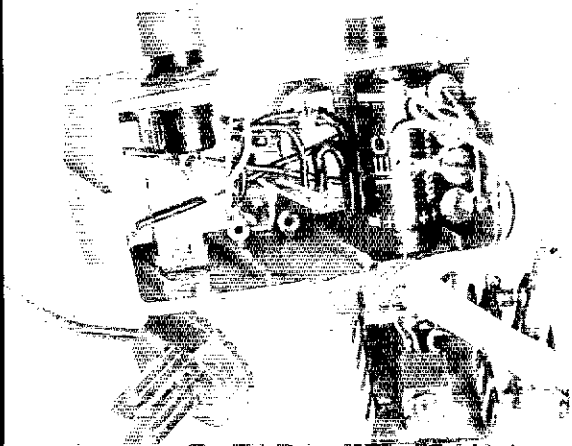
The only problem encountered during construction was finding a transformer with the necessary power capability and one small enough to be tucked into that cramped battery case. The E. F. Johnson 540[2] current requirement (during transmit) is approximately 600 mA. I couldn't find a single transformer that would do the job so I had to settle for two parallel-connected 300-mA units found at a local Radio Shack store. If you use two transformers, be sure to connect the secondaries so that they don't buck. In order to ensure that the transformers are connected properly the transformer primary leads are first connected in parallel. Take one lead from each transformer secondary and tie the two of them together. An ac voltmeter is connected across the remaining secondary leads. Apply 117-V ac to the primaries. If the meter reads zero the windings are phased properly and can be tied together. If the meter reads other than zero one of the secondaries will have to be reversed.

In order to get the transformers to fit in the battery box, it is necessary to clip off their mounting ears. After removing the ears, be sure the frame makes a tight grip on the transformer laminations. If the laminations are loose, the transformer will buzz . . . something most difficult to fix after the project is bottled up.

The power supply circuit is conventional with built-in HT over-voltage protection. Without it, if the 12-volt IC regulator goes bad, the voltage will suddenly zoom upward and damage the HT! With the 15-volt Zener diode floating in the circuit as shown, the voltage applied to the HT can never exceed 15 volts. If the IC regulator should fail, current would increase through the diode (no current-limiting resistor) causing the fuse to blow.

[1] If you own the E.F. Johnson FM 540 shown here, the Johnson part number for a battery case is 239-0130-002 and it's in the $5 price class.

[2] Recent Equipment, *QST*, June, 1971, p. 42.



Looking down into the power supply case. Two filament transformers are cemented to the bottom of the case. The diodes and filter capacitor are mounted on the wall at the right. A pop-in neon-lamp assembly is tucked in between the filter capacitor and the transformer core. An IC regulator (note its heat sink), Zener diode, and fuse are attached to the plastic case-cover plate in the foreground. For size comparison, that's a standard pig tail fuse (covered with shrink tubing) lying across the heat sink and Zener diode. A low-profile ac plug and lightweight ac wire keep the line cord from feeling like an anchor chain!

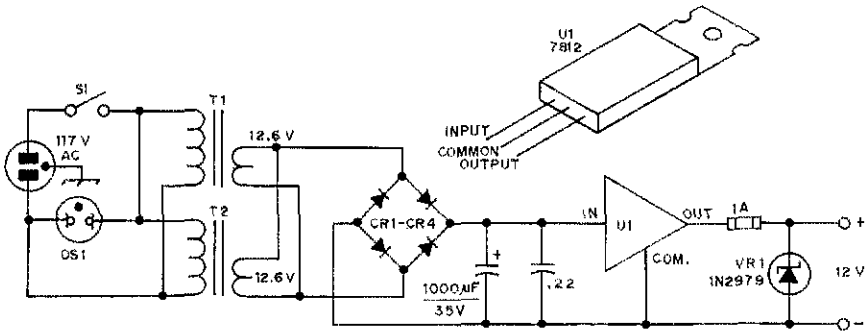


Fig. 1 – Schematic diagram for the HT ac power supply.
CR1-CR4 – Silicon diode, 200 PRV, 1 A.
DS1 – Pop-in neon-lamp assembly.
S1 – Spst push-button switch.
T1, T2 – Power transformer, 117-V primary, 12-V, 300-mA secondary (Archer Mini Filament or equiv.).
U1 – Fairchild 7812, 12 volt IC regulator.
VR1 – 15 volt, 10 watt Zener diode.

Consequently, no over-voltage damage to the HT will result.

With the added feature of an ac power supply, the HT *can* become a base station too. QST

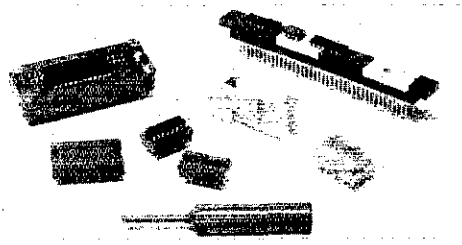
New Apparatus

(Continued from page 45)

Cambion XQ Components

It is almost a truism to state that the amateur who enjoys building his own equipment is finding it increasingly difficult to obtain the necessary parts. The recent introduction by Cambion of the XQ (experimental quantity) line of individually packaged components should be welcomed enthusiastically by constructors and experimenters alike.

Of particular interest is the large variety of integrated-circuit hardware offered. Included are sockets for not only the common 8, 14, and 16-pin dual in-line IC packages, but for 18, 24, 28, 36, and 40-pin versions as well, with either solder tails or wire-wrap posts available. A unique 40-pin zero-insertion-force socket designed to minimize the danger of bending delicate IC pins should attract the interest of builders of digital clocks and calculators. A useful item designed for high-density packaging of ICs without the necessity of using a printed circuit board is the "Integrated Socket" consisting of two parallel rows of 40 contact pins each, spaced 0.300-inch apart and molded in a body of diallyl phthalate. An Integrated Socket can accommodate up to five 16- or 14-pin DIP ICs. Interconnection of socket pins is provided for by means of wire-wrap terminals. The availability of ground/power buses and mounting hardware as accessories provides maximum flexibility and modular construction. Cambion offers a inexpensive hand-wire-wrapping tool and kits of precut lengths of No. 30 kynar insulated wire, which help bring the solderless wire wrapping technique into the realm of the home experimenter. Glass-epoxy component carriers that plug into standard IC sockets simplify the interfacing of discrete components with socket-mounted ICs. For troubleshooting convenience, Cambion manufactures an inexpensive IC insertion/extraction tool



and a handy push-on testing clip that allows easy access to the pins of a chip while it is in a circuit. To round out the IC hardware line, the manufacturer offers a variety of interconnectable breadboards and patch cables.

The rest of the XQ line includes items such as gold-plated plugs and jacks of many descriptions, interlocking battery holders, rf chokes and coils, and much more. A brochure detailing these and other not-to-be-found-elsewhere components may be obtained by writing to Cambion (Cambridge Thermionic Corporation), 4445 Concord Avenue, Cambridge, MA 02138. *WA1JZC*

VARICAP

(Continued from page 27)

or well regulated and filtered power supply is necessary.

The Varicap tuning system need not be applied only to VFO tuning. Receiver oscillators might be tuned as well. Other circuit considerations are shown in Fig. 2. The circuit described was used with the "High-Output Transistor VFO" described in *The Radio Amateur's Handbook* for 1971 on page 187, and worked exceptionally well. QST

50 Years Ago this month

April, 1925

. . . Editor Warner says a lot of us are still not using "clean" power supplies, and are coupling to the antenna directly instead of inductively, all of which help cause BCI – and also incurs the wrath of the public and the Department of Commerce. Fair warning!

. . . "The Reflection of Short Waves" is the famous propagation analysis by John L. Reinartz, 1XAM (later W1QP), which won for him the only ARRL Maxim Gold Medal ever awarded. A separate story on ham communication tests during the eclipse of the sun also bears out the principles. Ironically, Silent Keys reports the recent passing of Oliver Heaviside, known for his early theory on ionized layers.

. . . An early version of "Recent Equipment" is Ralph Batcher's review of the Grebe Synchrophase; the manufacturer doesn't publish a circuit, but it has been traced from the receiver itself and is published for the information of all members. The Browning-Drake "Regenaformer" is also described.

. . . The U. S. Navy wants to learn more about short-wave communication effectiveness and has put Lt. Fred Schnell on active duty (with seven months' leave from his ARRL Communications Manager post). He will join the fleet on its Australasian cruise this summer to work ham maritime mobile.

. . . One of the actions of the ARRL Board meeting, the second of a new body elected by us members under the new constitution, clarifies rules and sets new standards for League conventions. Another is authorization for a high-power station at League Hq.

. . . For the experimenters, Department Editor Hatry describes a model test table setup with battery hookups, rheostats, terminals, and of course a plethora of double-pole, double-throw knife switches.

. . . For the third quarter, the League shows a profit of $93.22.

25 years ago

April, 1950

. . . W1TS has turned out a neat 6AG6-6L6 rig to be featured in *How to Become a Radio Amateur*, and the editor is so impressed he carries the article in this issue as well.

. . . "Constant Modulation," in which the carrier is varied along with the audio to maintain a high and efficient percentage of modulation, is discussed by W8YHR along with circuit descriptions.

. . . It's not yet called a "balun," but W3OCZ presents circuits to match balanced and unbalanced lines.

. . . Clicks and contact bounce are two keying horrors W1DX shows us how to avoid by proper filters and bug adjustment.

. . . A third instalment ties ribbons on W1DF's treatise on low-pass filter design and construction. It will remain the standard for combatting our increasing problems with television interference.

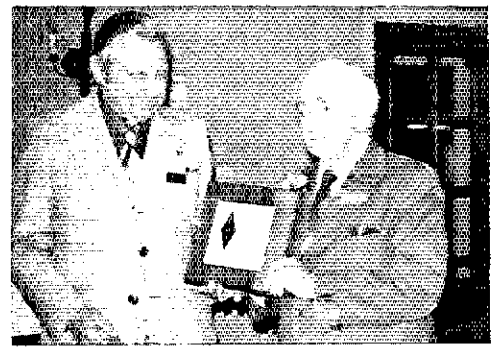
. . . The recent go-around with FCC on revising the amateur license setup, which prompted a couple of splinter "national" amateur organizations, has once again shown an inadequate understanding of the League's functional structure. Editor W1BUD covers the whole field, pointing out that basic control is in the hands of members.

. . . The incisive mind of Larson E. Rapp, W1OU, has tackled the 50-year history of amateur communication from the standpoint of RST reports, with startling disclosures such as the "QSL Effect" – the signal strength report is inversely proportional to the number of amateurs in a country and the resultant scarcity of such cards.

. . . The annual Sweepstakes is now so big the report is split between two issues of *QST*. This month carries the c.w. results, and who made the highest number of contacts in all New England? None other than: – *W1RW*

Strays

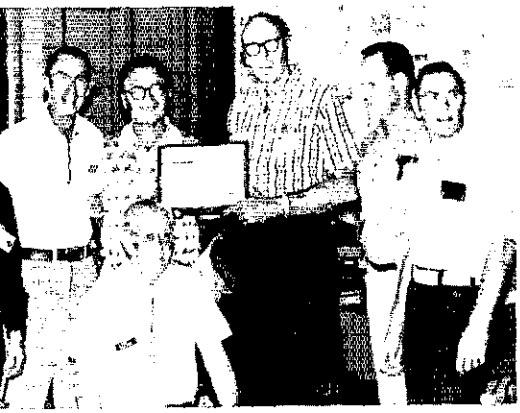
Alex Lariviere, VE2AB, at right, here is presented with a plaque for fifty years as a member of ARRL by Canadian Director George Spencer, VE2MS. *(Photo by Victor Livernois, VE2NK)*



More than a hundred years of service to ARRL here – Honorary "Veep" Ed Handy, W1BDI, gets his fifty year plaque from ARRL Treasurer Dave Houghton.

AMATEUR RADIO at the SISTER CITIES CONVENTION

BY VICTOR C. CLARK,* W4KFC AND
M. C. TOWNS,** K6LFH



Vic Clark holding citation presented to the ARRL by Sister Cities. Citation reads – "This commendation for exemplary achievement in furthering the cause of international understanding through dedicated participation in the Sister City program."(l. - r.) K6LFH, W7USA, W7CUP, W4KFC, W6ISQ, Claude Everson of NASA and K7MJC kneeling. *(Photo W6ISQ)*

AMATEUR RADIO attended the Sister Cities International Convention at Phoenix in September, 1974. Vic Clark, W4KFC, and "Chuck" Towns, K6LFH, discussed how amateur radio could be used by Sister Cities to communicate with each other.[1] In addition, a well-equipped station – borrowed from nearby Barry Goldwater – was put on the air using the special call WH7SCI. It was very ably manned by members of the Bash-Hal-Ne Ai (Navajo for "metal that talks"), Radio Club of Phoenix, Arizona Radio Club and the Scottsdale Amateur Radio Club.

The reason for this amateur radio effort was to introduce the 450-odd delegates from more than a dozen foreign countries to the fact that there is available *now* such an international resource as amateur radio – that, in fact, there is a service which will allow an individual here to talk to an individual there (where third-party agreements exist, of course).

Some Sister Cities pairs are already using amateur radio effectively on a scheduled basis to keep in touch. As the use of amateur radio by Sister Cities expands, the international awareness of the great potential of the amateur service will also expand. Hopefully, it would become apparent to the Sister Cities overseas that amateur radio can provide not only a friendly communication link, but, in times of emergency a direct connection with a MARCO (medical amateurs), Red Cross, and other international communication and relief organizations to save lives and property. It is important to the amateur's very existence that governments around the world be acquainted with these amateur capabilities. A country which understands and appreciates the services amateur radio can provide for its citizens will be much more likely to vote *for* amateur radio at the World Administrative Radio Conference in 1979.

If your town has a Sister City (check with City Hall) why not make it your project, or your local radio club's project, to work with that group to establish communications with an amateur in your Sister City? If your town has no Sister City, you may find out about the program by writing to: Sister Cities International, Suite 202, City Building, 1612 K Street, N.W., Washington, DC 20006.

Project Oscar prepared a booklet entitled "Sister Cities and Amateur Radio" for use at the convention. It was written primarily for Sister Cities people, here and overseas, as an introduction

(Continued on page 72)

* First Vice President, ARRL.

** President, Project Oscar.

[1] Troster & Towns, "The Oaxaca Experience," *QST*, Sept. 1974.

Chuck Towns, K6LFH discussing amateur radio with Mr. Simon Getonga; Deputy Town Clerk and representative from Nairobi, Kenya. Chuck met Mr. Getonga in Nairobi last year and invited him to attend the Sister Cities conference. *(Photo W6ISQ)*

AMATEUR RADIO PUBLIC SERVICE

NTS RACES AREC

In the Public Interest, Convenience, Necessity NRN

CONDUCTED BY BILL MANN,* WA1FCM

Break Emergency — Tornadoes Again

ON JANUARY 10, TORNADOES moved through Mississippi from about 0800 until 1600 CST bringing destruction to many areas of the state. Most severe damage was in McComb where a shopping center, school and an apartment complex were destroyed and other parts of the city heavily damaged. Local amateurs assisted with communications while telephone service and electrical power were disrupted. W5s JJW TAD TDC, K5s JMD SVC/5, WA5s UBQ VBS YJA and WB5NBO operated 2-meter fm extensively utilizing WR5AEK in McComb. WB5FXA left work and established the Mississippi Sideband Net at noon. The net supported a weather watch and the McComb operation until 2100 CST that night and from 0700 until 0910 the following morning providing an outside traffic outlet for WA5VBS who had the only remaining dipole antenna. From Natchez, K5SVC and WB5AHY carried generators and equipment to the disaster area and operated until 0900. Because of poor band conditions the night of January 10, stations in other states assisted with relays to keep the net going. About 75 amateurs participated and over 250 messages were handled. – *WB5FXA, SEC MS; WA5YJA EC* McComb.

"Break emergency!"

On the afternoon of January 10, that call of distress from K4TQR mobile through WR4ADD in Birmingham, Alabama, was the climax of a long and hectic day for members of the Birmingham Amateur Radio Emergency Service (BARES). The group works very closely with Civil Defense and Red Cross officials in Alabama and the BARES station, W4CUE, is located in the Red Cross Division Headquarters building.

At 0820, the tornado struck McComb and heavy thunderstorms began crossing the Alabama-Mississippi border. W4CUE and the station at Jefferson County Civil Defense Emergency Operation Center were activated and emergency nets on 2 and 75 meters were placed into standby session.

Soon, reports of bad weather were received by W4CUE and the information was plotted on maps at Red Cross Hq. Tornado touchdowns were reported in sparsely populated areas in western Alabama.

Suddenly, the call "Break emergency!" crackled over WR4ADD.

"This is K4TQR mobile four. I'm in the middle of a tornado touchdown right now!"

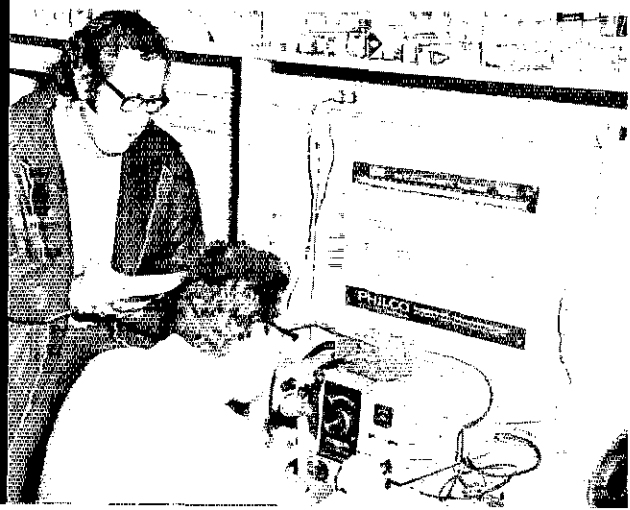
Then W4TWK reported: "A tornado just passed over my house."

In a matter of seconds, funnel clouds were being reported all over the Birmingham area, including twin funnels almost directly over the downtown section. As soon as the reports from K4TQR and W4TWK were received, they were relayed to officials. Warnings were issued at once. As reports came in by amateur radio, the operator at W4CUE was relaying the information to the National Weather Service on the county-wide c.d. net.

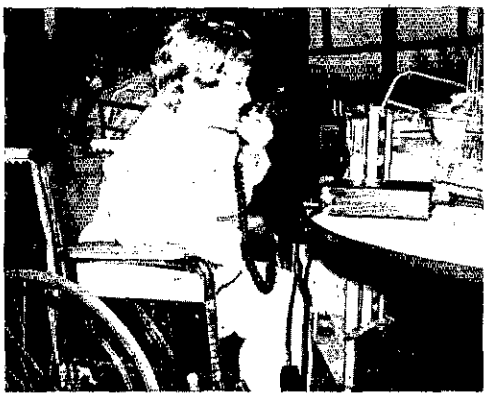
But the amateur radio efforts had just fully started. Emergency nets were set up on WR4ADD and WR4AEJ in Birmingham and WR4AGA near Pell City in addition to the Alabama Emergency Net on 3965 kHz. W4CUE jumped from one frequency to another funneling traffic to Red Cross, c.d., law enforcement and utility officials.

For more than 24 hours, amateur radio was the only means of communications out of the Pell City

* Assistant Communications Manager, ARRL.



Among the many Simulated Emergency Test reports that have been coming in steadily was this photo showing WA1DMC (standing) and K1YTY of the Wellesley (Mass.) ARS. (Photo via WA1RGA)



At Christmas, Howard County, Md. AREC members went to the Kernan Hospital for Crippled Children and let the children talk to Santa. Shown here helping things along is WA3SWS.

area, which was hardest hit by the twisters. Over 100 amateurs were involved in the activity from about 1000 January 10 until the afternoon of January 11.

In Pell City, Amateurs were stationed with Red Cross personnel at the National Guard Armory, the county hospital and the sheriff's office to relay damage and casualty estimates to officials. Health-and-welfare traffic was relayed quickly and efficiently on WR4ADD and WR4AGA. An on-the-scene net was started on 146.52 MHz and numerous messages were handled for local officials, since much of their communications equipment had been damaged in the storm.

On January 12, hams were active again with a tornado watch in southern Alabama and a sudden snowstorm in the northern part of the state. Then on January 14, services were again required in connection with a tremendous explosion at an explosives plant just southwest of Birmingham.

If there is any doubt about repeaters in particular or ham radio in general, there are thousands of persons in the Birmingham area, both hams and non-hams, who will be glad to voice their support. Amateur radio not only supplied the eyes and ears for the National Weather Service and vital information for relief officials, but was a source of information and comfort to thousands of loved ones. – WN4CXD and WA4BDW, EC Jefferson County, AL.

The Western Alabama Emergency Net activated at 1043 (January 10) when a tornado warning was issued for Tuscaloosa County. The local AREC plan was put into effect and W4WYN, W4WYO and WA4TAJ went to western parts of the county to monitor weather conditions. NCS was WB4SVH/4 at the Tuscaloosa County C.D. EOC. He gathered information from the mobiles and relayed to c.d. and weather service authorities. Later W4WYN confirmed a touchdown in Brookwood. A total of 7 mobiles and 10 fixed stations participated. All operations were through WR4AEH and secured at 1630. – WB4SVH, EC.

HXG is in. Traffic Talk in January '75 *QST* proposed that a new handling instruction be added for use on message traffic to indicate that if the message cannot be delivered without resorting to a toll call or mailing, it should be cancelled and the originating station advised. Response to the proposal was overwhelmingly favorable. Therefore, effective immediately a new handling instruction is added as follows:

> HXG – Delivery by mail or landline toll call not required. If toll or other expense involved, cancel message and service originating station.

Attention is called to a couple of notes of caution. First, *only* messages containing handling instruction "G" may be cancelled by the station attempting delivery if expense is involved; amateurs should continue to deliver non-HXG messages by whatever means available. Second, once it is determined that it is necessary to cancel an HXG message, the originator *must* be serviced, i.e. advised that no expense-free outlet is available and hence the message was cancelled per his instructions. If the originator does not receive a service message, he expects his message was delivered. Don't let him down.

With our present supply, it will be some time before ARRL reference material can be revised to reflect this change. Pass the word, eh?

Wanted: More fiddle-footed hams. Despite generally poorer band conditions at this point in the sunspot cycle, network activity, both traffic handling and emergency communications, continues to be a popular amateur radio activity. Cw nets continue to handle a good percentage of the traffic. Phone nets have been a mainstay in the traffic game for a good many years. More and more emergency and traffic nets are noted on vhf repeaters. RTTY is acknowledged as a most practical method of handling bulk and point-to-point traffic. Traffic is even being handled by FAX, SSTV, and ATV. Oscar 6 and Oscar 7 have both

been used for traffic handling and emergency communications.

The use of the various modes for public service work is excellent. However, another problem crops up, that of intercommunications between the various modes. On occasion it is noted that a message will come in on a cw section net that has to be mailed, but for which there is a regular outlet on the section phone net. Lack of communications. Or, the section phone net has no outlet for traffic. Again it's mailed even though a local net on a repeater within the section has solid coverage of that area. Lack of communications. A "thru" message is listed on the repeater net, but "dies" because there is no one around to relay it to an hf net. Lack of communications. But aren't we communicators?

C'mon. Dust off the bug. Solder the proper plug on your microphone and locate the mike jack on the rig. Make an effort to report into an fm net, etc. *How are you going to feel in an emergency* when your help is needed, but you're limited in the service you can provide because you're not knowledgeable/familiar with other aspects of public service activities?

On message format. When standard message format is encouraged on the various nets and when "formal" traffic is handled before "informal" traffic, some amateurs say, "Hogwash." Well, *friends, if one of our main objectives is to train* ourselves to handle communications for public-interest agencies in times of emergencies, we'd better realize that word-of-mouth communications, communications without standardization, just doesn't make it. If we're handling a message for Red Cross, for example, the person who receives a message requesting supplies (or whatever) is going to want to know what amateur originated the message and where and when it was originated. The message will require a complete address in order for the correct party to receive it. The request should be specifically spelled out, i.e. an exact text. The recipient must know who sent the message, including the sender's title.

By handling all messages in standard format and making this the primary function of traffic nets, we're keeping ourselves in shape so that we don't have to *learn* during an emergency. Standard message format isn't important? Hogwash!

Registration Days. It's not too early to start thinking about registering nets for the next ARRL *Net Directory*. Only nets registered during the 12-month period ending June 1, 1975, will be carried in the new listings. If you're a net manager or other participant who knows the pertinent details, send for a "handy-dandy" net registration card (CD-85); include an s.a.s.e. please. The Directory lists all timely-registered nets which operate on frequencies inside the amateur bands, and whose primary function is public service. Remember, deadline is June 1, 1975. — *WA1FCM*

On Emergency Communications

If the novice license becomes a five-year ticket and if the communicator class comes into existence, both under the proposed Docket 20282, maybe they can be used to revitalize ARECs, writes EC of Inyo County, Calif., WA6YWS. These are usually enthusiastic hams not full of com*placency as many older hams, he says, who aren't* interested in "games" as they call them. "Sure they come around when everything blows up. At which time they usually blow things up worse by their poor knowledge of operating techniques." Mundane week-to-week or day-to-day drill using exercise messages is thought of as a "kid game," not worth their time. A novice net which was organized there recently has been very active, and participants enjoyed the SET. Some of the regular group did not want to get involved in SET activities.

Have you ever been guilty of saying this: "Sure, *I'd get in on the action and help out if an* emergency of some kind occurred in my area. But I just don't have time to get in all those drills and tests that are held several times a year. I never know when they're gonna be held anyway." Or instead have you received something that sounds like this: "This certifies that John Q. Doe, operator of Amateur Radio Station, WF2XYZ, is a full member of the Amateur Radio Emergency Corps, division of the Amateur Radio Public Service Corps for one year from date below or endorsement on reverse side. In the event of need brought about by disaster or other extraordinary circumstances, this operator offers his personal time, skill and amateur radio station facilities to his country and community. He will also participate in normal Emergency Corps activities to the extent indicated by his class of membership above." (AREC membership card.) Who would you rather be? Contact your local EC or drop us a note.

■ Got any gripes? That is, comments or suggestions along the lines of: Field Day changes (as relate to emergency communications), improving *emergency communications preparation, new ideas* for the SET, the AREC and the like? Ship out your comments to your nearest Emergency Communications Advisory Committee member or if it would be of interest to all committee members, route it to headquarters for forwarding. The members are as follows: Chairman, M.F. "Bud" Cone, WA4PBG; James P. Collinsworth, WB2EDT; Ellwood W. Haldeman, W3PST; Andrew C. Clark, W4IYT; William E. Mixon, K5SVD; Arthur R. Smith, W6INI; Robert L. Klepper, W7IEU; Robert S. Dixon, W8ERD; Robert J. Hajek, W9QBH; Harry F. Legler, WØPB; Holland H. Shepherd, VE3DV; *Director Liaison, Max Arnold, W4WHN; Head*quarters Liaison, William Mann, WA1FCM. — *WA1STO*

■ SECs reporting in January show a downward trend, just as last year. Forty-one reports were sent compared to last year's 33 (compared to 45 in December of 1974!) These reports represent 13,633 AREC members. Last year they covered 11,491. Maybe the SET kept the SECs too busy. Those sections reporting were: Alask, Alta, Ariz, Colo, Conn, Del, Hawaii, Ill, Ind, Kans, Ky, Mar, Mich, Miss, Mo, Mont, NC, NFla, NLI, NNJ, NTex, Ohio, Okla, Ont, Org, Oreg, Que, SV, SDgo, SJV, SCV, Sask, SFla, SNJ, STex, Utah, Va, Wash, WVa, WMass, WPa.

Traffic Talk

It seems like every time we mention book messages, more confusion results. Here's a closer, more detailed examination which should answer all questions about book traffic (but we aren't placing any bets!).

Emergency power and a lonely dipole left by an unknown airline were what HP1ND used in Brus Laguna to report damage to HRØCOPEN in Tegucigalpa during the Honduran hurricane disaster caused by Hurricane Fifi.

Any two or more messages which contain identical parts may be sent in book form. Accordingly, any two messages could be "booked" if they have the same station of origin, same date, etc., but this would not be particularly advantageous. Typical book messages have identical preambles, addresses, texts or signatures or any combination of these.

Proper handling of book traffic calls for sending the identical parts first, followed by the variable parts. Here's an example of a properly sent book message with identical preamble (except numbers), text and signature: "Here is a book of two. ROUTINE WA1FCM ARL 3 BRISTOL CT MAR 27 break ARL SIXTY SEVEN break BILL NR 5 MRS HAROLD WISKLEY 54 WIZARD AVE CLEVELAND TEX TEL 555 3977 break NR 6 MR HERMAN JONES 733 BARREL BLVD WAYLAND WASH TEL 522 0793 end of book."

Other examples of messages which may be advantageously sent as book messages include: military-arrival messages which usually have identical preambles (except number) and texts; "congratulations on your anniversary" messages on behalf of service organizations such as Kiwanis, Lions, etc., which usually have identical preambles (except number) and texts (except the anniversary number – e.g. 50th anniversary); holiday greeting traffic; some fair or exhibit-station traffic; etc.

Whether or not traffic is considered as (hence counted as) book traffic depends upon how it was sent or received. If it is sent or received in book form – i.e. identical parts are not repeated in each message – it IS book traffic and should be counted as such. A relaying station may choose to individualize book traffic received or book individual messages received (if they contain identical parts). Here, the *way* it is sent is changed, but not *what* is sent.

Sometimes one hears during message transmission: "Text same as previous message." Or, "Do you have the W5XXX text? If so I won't send it." This is *not* proper form for either individual messages or book traffic. *Such traffic should not be counted!* If a station chooses not to send messages in proper form, that station is not entitled to take credit (re reports to SCM, BPL, etc.) for such traffic.

With a little thought, counting book traffic is simple. For every message originated, received, relayed or delivered in book form, count one point for every *three* messages in the book, plus one point for any over a multiple of three. Examples: a book of three counts as one; a book of 7 counts three; a book of 17 counts as 6.

Let's take some specific examples. Station A originates a book of five, each having a different message number (of course). All are sent to the same station, so he counts this as two originated. (Note that after June 30, whether or not traffic is counted as originated or sent depends upon whether it is originated on behalf of a third party or not. See Feb. '75 *QST* page 64.) Station B receives a book of 5. He sends three of those to Station C (as a book), later sends one to Station D and still later one to Station E. Actually he has sent a book of three (counting as one) and two individual messages. His total count is two received, three relayed (sent). Station F has received a book of three of which the identical parts of the book message are sent to three different stations at the same time, followed by the variable parts to each station. Since identical parts were sent only once, he counts one relayed (and one received). Each station counts as one received.

When listing traffic on a net, the actual count should be given rather than the number of messages in the book. Thus, a book of 8 "thru" messages is listed as "thru 3." Individual listing of book messages should only be made if messages will be going to different stations, e.g. various delivering stations.

At this point you may be wondering if it wouldn't be simpler to count book traffic individually. Yes, it would. In fact it used to be. Unfortunately, this method was abused by stations originating books of 25, 50, etc., and suddenly accumulating high traffic totals compared to others doing greater amounts of work handling fewer numbers of individual messages. It encouraged more "junk" traffic. So, a change in counting was made: no matter how many messages in a book, it would only count as one message. But this discouraged "booking" of traffic, and book traffic can aid in the efficiency of net operations. A compromise was reached; the one for three method outlined above was instituted. A rough estimate is that it takes about the same time to pass, say, an "average" book of 6 as it does two "average" individual messages.

In summary, only messages in which the entire preamble, address, text and signature are sent count as individual messages. Messages with identical parts which are sent in proper book form count one for every three plus another point for any over a multiple of three. Improperly sent messages don't count.

Counting book traffic is not difficult. Let's all count book traffic the same and not consider book traffic as a traffic-counting loop hole to pad traffic totals.

■ *Keep it short.* (What a title to follow a dissertation on book traffic!) Occasionally, we find

ourselves handling messages with checks of 35, 40, etc. There is no rule that says a message cannot be handled by amateur radio if it has more than 25 words in the text. However, 25 – or even better, 20 – is a good guideline for the originator to consider max. Sometimes, it is necessary to exceed that guideline to get the necessary information through. But many times a long text contains unnecessary verbiage. Keep the text to essentials. Guide "third parties" in their selection of words. Be concise!

Should a station or net refuse to handle any messages that have a check of more than 25? No way. That certainly doesn't enhance the public service aspect of traffic handling!

■ During January, the Forty Meter Eye Emergency Net – Morning Section, held 27 sessions. Sixty eyes were shipped as a result of net activities reports net manager W5JA.

■ *National Traffic System.* In the monthly tabulation of region, area and national NTS nets, one column is devoted to rate. This figure is simply the number of messages handled per minute for each net during the month. Stated another way, it's the total traffic handled divided by the total number of minutes in directed session. Rate is useful as a means by which one aspect of a net's efficiency can be compared to its efficiency in previous months. Because of circumstances (number of sections or regions, population, etc.), comparison of rates between nets becomes rather meaningless.

In an effort to standardize the rate statistic, the following should be considered by net control stations when reporting amount of traffic and minutes in session to the net manager. Only traffic handled at the direction of the NCS should be counted. The time reported should be number of minutes from the time the net is opened (i.e. stations start reporting in) until the sending of the last message has been completed. If the NCS sends two stations off frequency to pass traffic then closes the net, he uses the time that the last message was completed to determine total net time.

It's easy to manipulate the circumstances to achieve a high rate, but a far more important consideration is the accurate and efficient handling of the traffic. Rate is the end result, not the means by which the end result is reached. If all NCSs follow the guidelines outlined, rate will become a more meaningful and more significant indicator of the net's comparative performance. – *WA1FCM*

■ *January Reports.* Mgr., K7NHL, is increasingly concerned with the low number of stations being used or available for regional reps on PAN. How about some help? Certificates issued for activity on 3RN went to: W2KAT/3, WB2FWW/3, W3s EEB EML FA FZV IPX LOS NNL QU WRE, K3s CB DI DZB KAJ MVO OIO, WA3s AFQ PXA QOZ QYY SWF. WB2FWW/3, D3RN Mgr., says January was another fantastic month for the net and hopes February isn't a letdown. Without rotten conditions to gripe about, W4HFU can't think of other comments. DRN6's early session shows very healthy signs of life. Starting Feb. 1, DRN7 will hold a morning session on a trial basis through the month at 1830Z on 7265. A trial net session during the last day of the SET was held on 160 meters by 8RN, and was successful. WA9LED, 9RN Mgr., says "Let's do our sunspot dance!" D7RN needs participation from all sections and wants more traffic originated.

Net	*Sessions*	*Traffic*	*Avg.*	*Rate*	*%Rep.*
PAN	32	2039	63.7	1.248	95.3
DPAN	29	290	10.0	.353	79.0
CAN	31	1322	42.6	1.018	100.0
PAN	31	1408	45.4	.998	95.7
1RN	62	650	10.5	.470	94.7
2RN	63	605	9.6	.632	98.1
3RN	62	430	6.9	.351	89.8
D3RN	35	398	11.4	.442	97.1
4RN	48	659	13.7	.548	74.2
RN5	62	1008	16.3	.462	87.8
DRN5	35	295	8.4	.280	71.4
RN6	62	938	15.1	.545	98.4
DRN6	62	706	11.3	.234	76.8
RN7	55	331	6.0	.381	65.2
DRN7	20	52	2.6	.121	28.5
8RN	53	351	6.6	.317	76.3
D8RN	35	252	7.2	.529	91.4
9RN	59	502	8.5	.358	84.7
D9RN	14	58	4.1	.204	57.1
TEN	60	590	9.8	.403	81.1
DTRN	60	91	1.5	.100	40.1
ECN	70	528	7.5	.423	95.7
DIWN	27	51	1.9	.099	62.6
CTN	33	613	18.6	.344	91.7
TCC Eastern	120[1]	938			
TCC Central	87[1]	619			
TCC Pacific	117[1]	1035			
Sections[2]	4520	25347			
Summary	*5620*	*42106*	*7.5*		
Record	*4855*	*40100*	*19.1*		

[1] TCC functions not counted as net sessions.

[2] Section and local nets reporting (130): APSN (AB), MTN (Man.), APN (Mar.), CMN GBN ODN WOEN (ON), WQ-V/QHF (PQ), AENB AEND AENM (AL), ASN (AK), ATEN HARC (AZ), OZK (AR), NCN NEN SCN (CA), CN CPN CSN NVHFTN (CT), DEPN DTN (DE), EAST EMTN FPTN GN NFPN QFN TPTN VEN (FL), GSBN GSN GTN (GA), IMN (ID, MT), ILN (IL), ITN QIN TIN (IN), 175MN TLCN (IA), KPN KSBN KWN QKS QKS-SS (KS), KNTN KSN KTN KYN MKPN (KY), LAN LRN LSN LTN (LA), PTN (ME), MDCTN MDD MEPN (MD), EMRI EMRIPN EM2MN WMN WMPN (MA), MACS MNN QMN WSBN (MI), MSN MSPN PAW (MN), MTN (MS), ACE JC2AN MoAREC MON MoSSB MSN PHD SCEN WEN (MO), MTN (MT), NMN TCAREC (NE), NHVTN (NH, VT), NJN NJPN NJSN (NJ), NLI NLIPN NYS (NY), CN NCSSBN THEN (NC), BN OSN OSSBN O6MtrN (OH), OEON OPEN OTWN S1N (OK), BSN OSN PAAREC (OR), EPAEP&TN PFN PTTN WPA (PA), SDN (SD), TN (EN), HAEN LEX-SS TTN (TX), BUN UCN (UT), VNTN VSBN VSN (VA), NSN WSN (WA), WEN WVN (WV), BFN BWN WIN WNN WSBN WSSN (WI).

Transcontinental Corps

W2LR, Eastern Dir, writes that he's going to cease commenting about the rotten conditions and maybe they'll go away. W7GHF is reported to be doing a good job running TCC Pacific while K5MAT is in school for three months.

Area	*Funct.*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern	133	90.2	2489	938
Central	93	93.5	1296	619
Pacific	124	94.4	2111	1035
Summary	*350*	*92.7*	*5896*	*2592*

The FCC roster (January): Eastern Area (W2FR, Dir.) – W1s NIM QYY, WA1MSK, W2s ER GKZ KAT/3, WA2s DSA ICB KCW PII UWA, WB2s FLI PYM RKK, W3s ML K3s CB DZB MVO OIO, W4UQ, K4KNP, WB4SGV, W8PMJ, K8KMQ, WA8HGH, WB8ITL, VE3SB. Central Area (KØAEM, Dir.) – W4OGG, WB4DXN, W5s GHP MI OU UGF UU, WA5IOH, W9s CXY DND NXG, WA9LED, WB9KPX, WØs HI INH ICX QMY ZHN, WAØINM. Pacific Area (K5MAT, Dir.) – W5RE, K5MAT, W6s BGF BVB FOT MLF RSY UF VNO VZT, K6HW, WA6DEI, WB6OYN, W7s BQ GHF KZ, K7s IWD NHL NHV OEG, WØLQ, KØDRL, WBØHCK.

Independent Net Reports (January)

Net	Sessions	Traffic	Check-ins
Early Eighty Free	31	183	273
North American Traffic	27	325	425
20 Meter ISSB	22	1212	272
7290 Traffic	50	749	2006
Hit & Bounce	31	896	360
Hit & Bounce Slow	20	209	284
Ohio Valley Teenage	31	64	383
75 Meter ISSB	31	527	1397
Northeast Traffic	23	43	219
IMRA	27	521	1293
Mission Trail	31	260	1426
Central Gulf Coast Hurricane	31	161	1674

Public Service Diary

■ Forrest County, MS – Apr. 14-17. The Leaf and Boule Rivers' levels hit an all-time high necessitating Hattiesburg ARC members to begin communications for the e.d. They set up in the National Guard Armory, Red Cross headquarters, the sheriff's office, the evacuation medical shelter and the V.F.W. Center. Rigs were operated on two meters when no phone service was available. Amateurs were transported to the shelters and offices by National Guard helicopters as roads were flooded. Some 470 messages were handled for agencies and individuals. Seventeen amateurs were involved. – (WB5DCY, SCM MS)

■ Amory, MS – Oct. 30. After seeing a wreck on the highway in front of his home, WB5LJM tried to phone the police. He couldn't get through so asked for help via two meters. WB5MOZ called police. – (WB5DCY, SCM MS)

■ Southeastern, MI – Dec. 1. Nineteen inches of snow fell, closing Interstate 94, and diverting traffic into towns. The Cascades ARS set up operation at Jackson Office of Emergency Measures headquarters and Red Cross headquarters as motorists were directed to shelters. Third-party traffic from stranded motorists to their homes was handled on 75 meters and through repeaters. – (W8OQH)

■ Valley Mines, MO – Dec. 17. WAØUTH/mobile Ø relayed via WRØABC to WØFWY/mobile Ø that a car was damaged and in the ditch off Highway 67. Sheriff's office was notified immediately. – (WØFOE, EC Washington and St. Francois Cos.)

■ Banks, OR – Dec. 21. A search for a missing man was assisted by AREC members. Communications between sheriff's units on horseback and the fixed station at their headquarters was maintained, but the man was not found. – (WA7EUQ, EC Washington Co.)

■ Leadington, MO – Dec. 29. KØZNJ/mobile Ø relayed via WRØABC to WAØUTH that a car was burning. The Highway Patrol was called. (WØFOE, EC Washington and St. Francois Cos.)

■ Long Island, NY – Dec. 4 - Jan. 6. Long Island Mobile ARC members called in 18 accidents, 28 disabled vehicles, three inoperable traffic lights, two brush fires and one inoperable railroad crossing signal, to proper authorities via two meters. – (K2QPF, EC Oyster Bay)

■ San Diego, CA – Jan. 5. WA7OFV announced on WestCARS that he had an emergency message for a doctor in Baja California, Mexico. K6DBJ took the message and went to the Mexican Emergency Net frequency and passed the message to XF2EZL who called police. – (W6GBF, SCM SDgo)

■ Imperial Valley, CA – Jan. 5. While providing communications for a motorcycle race, WA6ODQ, W6INI and W6GBF reported minor mishaps and one bad injury to sheriff's office and the hospital. Operations lasted 5 hours. – (W6GBF, SCM SDgo)

■ Meadowlands, PA – Jan. 6. K3PSP/mobile 3 spotted a brush fire and called for help via WR3ADG. He was answered by WA3TOB who called police. – (WA3OKK, EC Washington Co.)

■ The Midwest – Jan. 11. KØYXO/mobile Ø was snowbound at Estherline, SD, and was able to notify his family via WAØCAQ. WAØWLP, WAØDLB and WØCAQ were told of a family missing on their way to Minnesota, and went out looking for the car. Via the Weather Net, they relayed that the family was found safe, near Bismarck, ND. WAØRWM got information of two servicemen, one enroute to California and one to South Carolina. He located them at Yankton, SD, and relayed the news to the parents. A total of 125 stations participated from ND, MN, SD, NE and WI, relaying information and monitoring the frequency. Members of the PICONET assisted in the operation. – (WAØRWM)

■ Kingston, ON – Jan. 11. VE3CJJ was contacted via repeater VE3KBR that a bus had broken down. He put a call on repeater VE3KER; VE3CPK answered and called police. (VE3EW)

■ Birmingham, AL – Jan. 14. A nitroglycerine plant exploded and three amateurs provided liaison between Red Cross and firemen and medical technicians. K4OIV, W4DFE and WN4CXD worked for approximately an hour while numerous other stations were on standby. – (WN4CXD)

■ Kingston, ON – Jan. 15. A truck went out of control in front of VE3DXY/mobile 3. He called via two meters and W2EAP answered, who in turn

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for January Traffic

Call	Orig.	Recd.	Rel.	Del.	Total
W3UOL	317	960	806	49	2132
WØWYX	52	962	123	844	1986
W6RSV	74	686	609	6	1374
KØONK	50	639	616	26	1331
KØZSO		575	1	569	1145
W3VR	247	372	318	19	956
W6YBV	232	332	293	48	905
K9CPM	48	438	103	305	894
WA4AVN/4	27	387	373	14	801
WB2PYM	42	369	340	5	756
WA1OMB	104	260	203	136	703
K4SJH	143	325	199	9	676
WB2RKK	26	353	248	45	672
WØZWL	2	315	-	314	631
K6HW	14	293	289	4	600
WA2PIE	9	298	226	16	549
WB6ERG	103	213	213	15	544
WA5ZZA	75	270	192	4	541
W2KA1/3	31	268	194	39	532
WA1ECM	39	267	107	115	528
W5UGE	30	248	206	37	521
WA1OJO	42	270	164	39	515
K6GMI	24	261	217	12	514
WA4UBI	32	246	225	8	511
WA3PZO	54	265	131	56	506
W8PMI	11	258	228	3	500
WB6LJG(Dec.)	7	387	380		*67
WA2PIE(Dec.)	35	274	208	10	527

BPL for 100 or more originations-plus-deliveries

W6RTI	202	WA8WZF	131	WA8MCR	114
W3UBE	185	WAØYVT	126	WN1UAX	108
KH6IAC	178	K6UYK	125	W1DMH	107
WAØAUX	168	K4WC	124	WN2UUD/2	106
WØAIR	160	WØØRHC	122	WA5IQU	106
WA2FPI	159	W5GHP	120	WB8PAV	104
WA3AIO	156	VE3GOL	117	WB2RKJ	101
WB6PVH	146	K3CR	115	WB2EWW/3	100
WØNO	139	KØGNE	115	WN2UUD/2(Nov.)	162
W5TI	132			WA1QJQ(Dec.)	152

BPL Medallions (see December, 1973 *QST*, p. 59) have been awarded to the following amateurs since last month's listings: WB2RKJ, WA3IYA, WB4GFU, KH6IAC.

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.

Public Service Honor Roll January 1975

This listing is available to amateurs whose public service performance during the month indicated qualifies for 40 or more total points in the following nine categories (as reported to their SCM). Please note maximum points for each category: (1) Checking into cw nets, 1 point each, max. 10; (2) Checking into phone/RTTY nets, 1 point each, max. 10; (3) NCS cw nets, 3 points each, max. 12; (4) NCS phone/RTTY nets, 3 points each, max. 12; (5) Performing assigned liaison, 3 points each, max. 12; (6) Phone patches, 1 point each, max. 20; (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, 5 points.

W5UGE	76	WB8PAV	52	W1BVR	44
W4OGG	70	KØBIX	52	W1EIH	44
WB2PYM	66	W5GSN	51	WA1MJE	44
WA1MSK	64	K3KAJ	50	K1PAD	44
WA1QME	64	WA4FBI	50	WA1POI	44
WA1QJE	64	WB4GHU	50	WA2BSU	44
WB2FWW/3	64	WB5GZG	50	W2MLC	44
WB5AMN	64	WB5IZQ	50	WA2PCF	44
W5GHP	64	WA1PAZ	49	K3OIO	44
WA5IQU	64	WA3DUW	49	WA3SWE	44
WA5ZZA	64	WB4DJU	49	WB4FKJ	44
WB4ECB	63	WB5JBW	49	WB4SKI	44
WA1MHJ	62	K5MAT	49	WB4SVH	44
WA1SHO	61	W5MY7	49	W4TYF	44
WA2DSA	61	WA6DMB	49	K4VND	44
W7OCX	61	WB6OYN	49	K4YRL	44
WBØHBM	61	W2GHT	49	WB6AKR	44
WA1FCM	59	W8HZA	49	W6INH	44
WB2RKK	59	WB8KKJ	49	WB6IVA	44
WA3DUM	59	WB9ICH	49	WB8NII	44
WB2UFG	58	W9NXG	49	K9ZJV	44
W4ROS	58	WA9QVT	49	WBØUV	44
W4WXZ	58	KØMKI	49	WBØKWI	44
WB5BMA	57	WØOTE	49	WØOP	44
VE2DRC	52	WØOYH	49	VE3UOZ	44
WB2FLF	56	WAØTNM	49	VE3GJG	44
WB2JID	56	VE3ERG	49	VE3SB	44
WA3VDQ	56	VE3GFN	49	WA3UKZ	43
WB5IUS	56	KL7DDO	48	K9UTQ	43
WA8HGH	56	WB4GIR	47	W1UX	42
WB8JCW	56	WB6PVH	47	W2KAT/3	42
WBØCZR	56	WB9KRR	47	WA3PZO	42
WB5IGF	55	WBØMHF	47	WA5VBM	42
W6RFI	55	K1MZB	46	WA6IBO	42
W9MFG	55	WB4DXN	46	WB8DQX	42
W2MTA	53	WA4ZDW	46	WBØHER	42
WA5PHQ	53	WA6DFI	46	WB4CRT	41
VE1AMR	53	W8IBX	46	K4IAI	41
WA1QKD	52	WAØFMD	46	W7LG	41
WA2PDI	52	W2FC	45	VE1ARB	41
WB2RKJ	52	WA3ATQ	45	W2FR	40
WA4GBC	52	W3ECS	45	WA3LOP	40
WB5EKU	52	K6GMI	45	WR9NMF	40
WA6TVA	52			WØCHJ	40

contacted VE3VG and VE3GMC. Police were alerted. – (VE3EW)

■ Englewood, OH – Jan. 16. Members of the Dayton ARA, Miami Valley FM Association, the Miamisburg Wireless Association and other amateurs took part in providing communications after a power and phone outage. Mobile units using two meters were dispatched and fixed stations were established. – (W8ILC, EC Montgomery and Greene Cos.)

■ Ridgewood, NJ – Jan. 18. WA3SGO/mobile 2 observed an accident directly in front of him. He called for help via WR2ABN, getting assistance from police. – (WB2FLF, EC Ridgewood)

■ Logan, OH – Jan. 19. Following the death of a Pennsylvania woman, friends wanted a quick way to notify the deceased's son in Central America. They contacted W8DCX of Logan remembering a recent newspaper article about him. He in turn sent a radio message to WØWSX who relayed the story to TG4FT in Guatemala City, Guatemala, who delivered the message to the son. (W8DCX)

■ Green Co., PA – Jan. 25. A tree blocking the road was spotted by K3PSP/mobile 3. He called via WR3ADG and was answered by WA3OKK/mobile 3 who relayed the information to WA3FOI who called police. – (WA3OKK, EC Washington Co.)

■ Snohomish Co., WA – Jan. 27. W7ZFX/mobile 7 was in contact with W7CSK via WR7ADB when he came upon an overturned oil-tanker truck. Police were notified by W7CSK. – (W7IEU, SEC WA)

■ San Diego, CA – Jan. 31. A phone call was received by W6GBF from a person requesting assistance in locating a lady on vacation in San Felipe, Baja California, Mexico. Her exact location was not known and there were no phones or telegraph communications with the area. The lady's mother had passed away. W6GBF checked into WestCARS with a response from W6YES who called the sheriff to get the DeAnza Rescue unit into action. WA6EQX relayed the message to the San Felipe Fire Chief, and W6YSP contacted XE2MRE and XE2TN with the same information to make sure it was delivered. The lady was located and she returned to the U.S. – (W6GBF, SCM SDgo)

■ Springfield, MA – January. The Red Cross responded to three major fires and called on the Provin Mountain Amateur Repeater Assn. to assist them. W1MTV was the control operator and constant communications were maintained to provide food and shelter for homeless families. – (WA1OTC)

■ Queens Co., NS – Feb. 2. VE1KX/mobile 1 was in contact with VE1FV when an accident occurred. Police were summoned by VE1FV. – (VE1FV, EC Liverpool)

■ Lockeport, NS – Feb. 3. Seven area amateurs provided communications to and from the town when a fire ravaged out of control for several hours, rendering phone service useless. – (VE1FV, EC Liverpool)

■ St. Petersburg, FL – Feb. 5. WB4VWO/mobile 4 came upon the scene of an accident. He contacted K4FCW through WR4ALM who then called police. – (K4SCL, SCM SFla)

■ Pascagoula, MS – Feb. 9. An automobile on fire was spotted by WA5UCR/mobile 5. He reported this to WB5FXA via WR5ADC and police and fire units were alerted. – (WB5FXA, SEC MS)

■ Pasadena, CA – Feb. 9. WB6HKM/mobile 6 came upon a traffic accident and asked for assistance through the AREC repeater, WR6ACD. He was answered by WA6VFV who called police. – (WB6VYX, EC Los Angeles)

■ Pinellas Co., FL – Feb. 11. A hit-and-run collision was observed by WA4FNY/mobile 4. He called for help via WR4ALM contacting WB4VWO/4 and WA4FQT/mobile 4. One called police and one, the civil defense. – (K4SCL, SCM SFla)

■ Oakford, PA – Feb. 11. A car fire was spotted by K3TKZ/mobile 3. Using WR3ABK, he sent out a call for help and was answered by K3ZFD, K3ZXO and W3MJH. Fire officials were called. (K3TKA)

■ St. Petersburg Beach, FL – Feb. 16. WA4FYR observed a vehicle whose occupants were throwing lighted firecrackers into other vehicles. He contacted WB4VWO/4 through WR4ALM who called police who then stopped the vehicle. – (K4SCL, SCM SFla)

■ South Central Alaska – Jan. 23. Three Anchorage repeaters were switched to emergency power and Anchorage AREC nets were activated when a major power outage covering areas from Kenai to Anchorage occurred. Five amateurs acted as NCS for a total of 5 hours but frequencies were monitored until the next morning. – (KL7HMN, EC Anchorage)

■ *Special Activities, October.* The Richmond (VA) Amateur Telecommunications Society provided communications on Oct. 27 for safety and checkpoint logging to the American Cancer Society

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Hamfest Calendar

APRIL

Alabama – The Birminghamfest Convention is Saturday and Sunday, May 3, 4 at the Alabama Fairgrounds. Gates open at 1 PM. Hospitality suite at the Sheraton Motor Inn. Make reservations early. Write: W4CUE, PO Box 603, Birmingham AL 35201.

Arkansas – The "OZK Picnic" is April 6 at Burns Park, North Little Rock, 10 AM - 4 PM.

California – The Antique Wireless Association's second Western Regional meeting is Saturday, April 26 from 9 AM - 5 PM at the Foothill College Electronics Museum, 12345 South El Monte Road, Los Altos Hills. Swap sale in parking lot from 9:30 - 11:45. Inspect early gear brought in by local collectors, 10:30 - 11. Judging of equipment in contest at 11 AM. Lunch noon to 1 PM in cafeteria or bring your own. Technical sessions in the afternoon. For info contact: Thorn Mayes, W6AX.

Florida – The St. Petersburg Amateur Radio Club's annual hamfest is at Lake Maggiore Park, Sunday, May 4. Tables available for sales or trading equipment as well as home-made arts and crafts items.

Georgia – The Columbus Georgia hamfest sponsored by the Columbus Amateur Radio Club is April 19-20. Flea market at 1 PM, Saturday, ending 2 PM Sunday. Contact: Gary L. Kindred, 293 Nightingale Drive, Columbus GA 31906. Phone (404) 689-4494.

Illinois – The 9th annual hamfest of the Rock River Radio Club is Sunday, April 27, at the Lee County 4-H Club Center, Amboy, IL. (1 mile East of Jct. of Rt. 52 and Rt. 30, south of Dixon, Il). Advanced tickets $1.50; gate $2; special until April 1 – 4 tickets for $5. Rain or shine, indoor facilities, camping area. Limit 1 table free per party; additional tables $5 each or bring your own. Talk-in frequency will be 146.94 MHz.

Illinois – The DeKalb County hamfest is May 4th, 8 AM - 3 PM at Notre Dame School, (off Rt. 23, 3 miles south of DeKalb, signs posted). Registration $2 at door; $1.50 in advance. Write: Howard Newquist, WA9FXW, 508 W. State, Sycamore IL 60178, before April 25th. Talk-in 146.13 and .94 direct.

Louisiana – The Baton Rouge hamfest is May 3, 4. Hospitality room from 12 to 4 PM Saturday, May 3 and banquet at 7:30 PM. On Sunday May 4th, swap tables, commercial displays, contest, auctions and entertainment for the children begins at 9 AM. For info write: BRARC Hamfest '75, PO Box 15043, Baton Rouge LA 70815. Meeting of the Louisiana Council of Amateur Radio Clubs on May 3rd at 3 PM. The site is the Catholic High grounds, located at 855 Hearthstone Drive.

Maryland – The Greater Baltimore Hamboree is at Calvert Hall College, Putty Hill and Goucher Boulevard, Towson (one mile south of Exit 28 of Beltway-Interstate 695), on Sunday, April 6 at 9 AM. Food service, flea market, contests. Registration $2; complete table set-ups indoors. Info: Joe Lochte, 5400 Roland Ave., Baltimore MD 21210 or Brother Gerald Malseed, 8102 La Salle Rd., Towson MD 21204. (301) 825-4266.

Maryland – The Potomac Area VHF Society's annual hamfest is Sunday, May 4 from 9 AM to 5 PM at the Agriculture Center in Westminster, MD. Registration of $3 includes flea market or tail gate sales. Food and beverage catering and unlimited parking. Talk-in on 146.94 and 146.52. For info contact: K3DUA or WA3NZL.

Mexico – The 43rd Convention of the Mexican League of Radio Amateurs, (Liga Mexicana De Radio Experimentadores, A. C.) is May 29, 30, 31 located at the Holiday Inn Hotel. Beginning Thursday registration at noon. Welcoming cocktails at 9 PM. Registration Friday 8 - 10 AM. Convention opening 10 - 11 AM. Technical sessions til 1 PM. From 2 - 5 PM outdoor seafood dinner. At 8 PM social event, Mexican Night. Saturday registration 8 - 10 AM with technical meetings until noon when the Convention closes followed by "Charreada" Mexican Rodeo with Mexican food from 2 PM - 5 PM. "Tombola" – goodbye supper and ball at 8 PM. Sunday courtesy cards will be extended to visit social or sport centers. Write: Radio Club Petrolero, A.C., Apdo. Postal 1363, Tampico, Tam. Mexico.

Michigan – The Wexsaukee Radio Club's 15th annual swap n' shop and eye-ball QSO is May 3rd in the National Guard Armory in Cadillac starting at 9 AM. The swap shop is open to all. Lunches available at noon. Free parking. Tickets available at the door.

Michigan – The Grand Rapids annual communication show and swap n' shop is on the Mall with exhibits April 24-26. Ham and electronic swap n' shop is April 26. (At Eastbrook Mall on East 28th St., N.E. corner of M11 and M44). Contact: Bob, WN8PTM, PO Box 2402, Grand Rapids MI.

Missouri – The Sixth annual Northwest Missouri hamfest is Sunday May 4th. The location is Kansas City North Community Center, 3930 North Antioch Rd., Kansas City MO (1/4 mile east of 135 & 129 jct). Swaptables, food, programs of interest, talk-in 3.925 and 146.94 MHz. Midwest Director W0FIR discusses license restructuring. For info write: P.H.D. Amateur Radio Assoc., PO Box 11, Liberty MO 64068.

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COMING ARRL CONVENTIONS

May 2-4 – Pacific Division, Fresno, California.
May 24-25 – Tennessee State, Knoxville.
July 4-6 – Georgia State, Atlanta.
July 5-6 – West Virginia State, Jackson's Mill.
August 1-3 – Canadian Division, Calgary, Alberta.
August 29-September 1 – Atlantic Provinces, Moncton, New Brunswick, Canada.
September 12-14 – NATIONAL, Reston, Virginia
October 10-11 – Great Lakes Division, Columbus, Ohio.
October 17-19 – Midwest Division, Lincoln, Nebraska.
October 24-26 – Southwestern Division, Ventura, California.
November 1-2 – New England Division, Hartford, Connecticut.

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

CITIZENSHIP RULES DROPPED

In the February issue, we reported on the passage of Public Law 93-505 which revised the Communications Act allowing non-citizens to obtain licenses in the Safety and Special Radio Services on the same basis as citizens and nationals. The amateur regulations have now been amended (along with similar rules for other services, including the Citizens) to conform to the Act. A new rule has been added specifying that an address in the U.S. must be furnished to the Commission by each licensee. The text follows:

PART 97 – AMATEUR RADIO SERVICE

Section 97.9 is amended to read as follows:

97.9 Eligibility for new operator license

Persons are eligible to apply for the various classes of amateur operator licenses as follows:

(a) Amateur extra class. Anyone except a representative of a foreign government, who either (1) any time prior to receipt of his application by the Commission has held for at least 1 year an amateur operator license of other than the novice or technician class, issued by any agency of the U.S. Government, or submits proof that he held *for a period of 1 year an amateur operator license* at least equivalent to a general class license issued by a foreign government, or (2) submits evidence of having held a valid amateur radio station or operator license issued by any agency of the U.S. Government during or prior to April 1917.

(b) *Advanced class.* Anyone except a representative of a foreign government.

(c) *General class.* Anyone except a representative of a foreign government.

(d) *Conditional class.* Except for the representative of a foreign government, anyone:

(1) Whose actual residence and amateur station location are more than 175 miles airline distance from the nearest location at which examinations are held at intervals of not more than 6 months for General Class amateur operator licenses.

(2) Who is shown by physician's certificate to be unable to appear for examination because of protracted disability.

(3) Who is shown by certificate of the commanding officer to be in the armed forces of the United States at any Army, Navy, Air Force, or Coast Guard station and, for that reason, to be unable to appear for examination at the time and *place designated by the Commission.*

(4) Who furnishes sufficient evidence, at the time of the filing, of temporary residence for a continuous period of at least 12 months outside the continental limits of the United States, its territories or possessions, irrespective of other provisions of this paragraph.

(e) *Technician class.* Anyone except a representative of a foreign government.

(f) *Novice class.* Anyone except a representative of a foreign government or a person who holds or who has held within the 12-month period prior to the date of receipt of his application, a Commission-issued amateur radio license. The Novice Class license may not be concurrently held with any other class of amateur radio license.

Section 97.37 is amended to read as follows:

97.37 General eligibility for station license.

An amateur radio station license will be issued only to a licensed amateur radio operator, except that a military recreation station license may also be issued to an individual not licensed as an amateur radio operator (other than a representative of a foreign government), who is in charge of a proposed military recreation station not operated by the U.S. Government but which is to be located in approved public quarters.

Section 97.42 is added to read as follows:

97.42 Mailing address furnished by licensee.

Each application shall set forth and each licensee shall furnish the Commission with an address in the United States to be used by the Commission in serving documents or directing correspondence to that licensee. Unless any licensee advises the Commission to the contrary, the address contained in the licensee's most recent application will be used by the Commission for this purpose.

Subpart G – Operation of Amateur Radio Stations in the United States by Aliens Pursuant to Reciprocal Agreements

27. In Subpart G of Part 97 the title is revised to read as set forth above and 97.301(a) is revised to read as follows:

97.301 Basis, purpose, and scope.

(a) The rules in this subpart are based on, and are applicable solely to, alien amateur operations pursuant to section 303(l)(3) and 310(c) of the Communications Act of 1934, as amended. (See Pub. L 95-305, 88 Stat. 1576.)

Subpart H – [Removed]

28. Subpart H of Part 97 is deleted.

1979 CONFERENCE PREPARATION

The Federal Communications Commission has begun its formal perparations for the 1979 World Administrative Radio Conference with publication of a Notice of Inquiry, Docket 20271. The League has filed these comments in response:

RESPONSE TO NOTICE OF INQUIRY

The American Radio Relay League, Incorporated, the national non-profit association of amateur radio operators, submits the following comments in response to the Notice of Inquiry, Docket 20271, released by the Commission on January 10, 1975.

1. In all preparations for the 1979 General World Administrative Radio Conference, ARRL believes it essential to recognize that the actions of the Conference must be designed to meet the

demands of telecommunications through the year 2000. It is in that light that these comments of ARRL are submitted.

2. Because of the projected growth of the amateur service both in the United States and world-wide, ARRL will advocate

(a) the expansion of certain high-frequency bands currently allocated to the amateur service,

(b) the reduction of the sharing with other services now required in certain other high-frequency bands, and

(c) the establishment of new allocations to the amateur service in portions of the HF radio frequency spectrum now allocated to other services.

3. The rationale for the expansion of the amateur allocations in the HF portion of the spectrum is contained in a report recently (1973) prepared by a sub-working group of the Spectrum Planning Subcommittee of the Interdepartmental Radio Advisory Committee. As preparation for the 1979 General WARC progresses, ARRL will draw on the aforementioned report as appropriate to substantiate the specific proposals.

4. If the IRAC report is not available to the Commission, ARRL is prepared to submit the substance of the rationale as a part of the proceedings in this docket.

(Continued on page 66)

SIDEBANDS, ETC., MUST BE IN BAND

The Federal Communications Commission has clarified its rules for amateur emissions, making it plain that both wanted and unwanted products must be confined to the amateur bands within the limits of good practice. Some suggestions of these limits are quoted from other portions of FCC rules as an aid to understanding the Commission's intention.

Pertinent parts of a recent letter follow:

Section 97.63 of the Commission's Rules requires all emissions from an amateur station to be confined within the authorized amateur bands. The carrier and unwanted sidebands are considered part of the emissions from a single sideband transmitter. There are no specifications in the amateur rules which delineate the permissible radiated power level of unwanted sidebands, carrier or intermodulation products. So long as your desired emissions are entirely within the authorized amateur bands, and your unwanted emissions (carrier, unwanted sideband and intermodulation products) are consistent with what is considered current good amateur practice, you may operate on any carrier frequency within the authorized bands.

An example of what may be considered "good amateur practice" concerning carrier and unwanted sideband suppression for an amateur station using type A3J emission (single sideband with suppressed carrier) can be taken from Part 81 of the Commission's Rules. Section 81.132(d) reads, in part:

81.132(d) Authorization to use . . . . A3J emission is limited to emitting a carrier . . . . at a power level at least 40 decibels below peak envelope power.

In addition, concerning unwanted sidebands and intermodulation products, Section 81.140 reads, in part:

81.140(a) The mean power of emissions shall be attenuated below the mean power of the transmitter in accordance with the following schedule: (a)(2) When using emission A3A, A3B, A3H, or A3J: (i) On any frequency removed from the assigned frequency by more than 50 percent up to and including 150 percent of the authorized bandwidth: At least 25 decibels; (ii) On any frequency removed from the assigned frequency by more than 150 percent up to and including 250 percent of the authorized bandwidth; At least 35 decibels. (a)(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 plus 10 log 10 (mean power watts) decibels.

Section 15.7 of the Rules specifies permissible levels of incidental electromagnetic field radiation. Section 15.7 (b) provides for protection from interference to *all* established radio services, not merely to the broadcasting services. Section 15.7(e) states "That in the event harmful interference is caused, the operator of the apparatus shall promptly take steps to eliminate the harmful interference." . . . — *Vernon A. Spring, Acting Chief, Safety and Special Radio Services Bureau*

BALDWIN NEW GENERAL MANAGER

Last month we reported on the retirement of John Huntoon, W1RW, as General Manager of ARRL and Editor of *QST*. Now it's time to introduce his successor: Richard L. Baldwin, W1RU. Dick came to League Headquarters in 1948

as assistant secretary and shortly thereafter was on the road explaining the League's views on the FCC restructuring proposals of that time, docket 9295! In 1956 he moved into the Managing Editor job, responsible for production of *QST* and all the League's books. In 1963 Dick became assistant general manager, and almost immediately got involved with international matters. The Intruder Watch was organized in 1964 with Dick as organizer and staff liaison between the monitoring amateurs and the Commission. The same year, he began attending the seminars which the International Telecommunications Union conducts in Geneva for middle management people from developing countries; this participation has continued every two years since, and has resulted in

acquiring some good friends for amateur radio in countries which may become pivotal. A couple of years later Dick made a tour of the amateur radio societies in middle eastern countries, encouraging them to begin long-term preparations for frequency conferences. In 1967, a similar tour was made of Africa. W1RU was an observer at the 1971 World Administrative Radio Conference on Space. On February 26 just past Dick started on a three-week tour of the Far East, including participation at the Region Three IARU conference in Hong Kong March 4-10; again, a major purpose is to stimulate amateur society preparation for the 1979 ITU conference at which frequencies will be discussed.

On the personal side, Dick was first licensed in 1934 as W1IKE and holds the Extra Class license. He's earned DXCC, WAS, WAC and membership in the A-1 Operator Club, with both phone and cw activity from his station. He was graduated from Bates College and holds a Masters in physics from Boston University. Five years service on destroyers in the Pacific during World War II led to his present rank of Commander, U.S. Naval Reserve. He's been active in the Hartford Power Squadron and has recently been elected as its commander. Dick and his wife Phyllis are the parents of a son and a daughter. They live in Simsbury, Connecticut; have a vacation place at Owl's Head in Maine, and sail their 35-foot ketch, *Endurance*, out of Mystic, Connecticut.

REQUESTS FOR RULEMAKING

Henry Perozzo, W7UD/WR7ACU has filed a petition for rulemaking asking that only Advanced or Extra Class amateurs be licensees or trustees of repeater stations: RM-2407.

RM-2481, by Louis R. Huber, W7UU, requests amendment of section 97.103 to delete the log requirement for a description of amateur traffic handled.

Ronald K. Long, W8GUS, has filed RM-2490, which asks that the rule on availability of operator license be amended to recognize photocopies for this purpose.

Though the time for formal comment on these petitions is technically past, in practice FCC welcomes the views of amateurs on such petitions at any time; address the Amateur & Citizens Division, FCC, Washington DC 20554 and indicate the RM number to which you are replying.

JAMES P. BORN, Jr., W4ZD

We regret to report the death, in January, of James P. "Bubber" Born, Jr., W4ZD, ARRL director from the Southeastern Division from 1954 through 1963. Bubber was a communicator for the Atlanta (Georgia) Police Department for years, and lived in suburban Livonia. He had been at various times president of the Georgia Cracker Radio Club, manager of the Georgia Cracker Net, SCM of Georgia, holder of ORS, OPS, and OVS appointments – and a distinguished "High Potential" in "Royal Order of the Wouff Hong" initiations during Georgia State Conventions.

MINUTES, EXECUTIVE COMMITTEE MEETING
No. 352 January 15, 1975

Pursuant to due notice, the Executive Committee of The American Radio Relay League, Inc., met at the Headquarters office of the League at 2:30 P.M., January 15, 1975. Present: President Harry J. Dannals, W2TUK, in the Chair; First Vice President Victor C. Clark, W4KFC; Directors Roy L. Albright, W5EYB, Max Arnold, W4WHN, John R. Griggs, W6KW, and Robert B. Thurston, W7PGY; and General Manager John Huntoon, W1RW. Assistant General Manager Richard L. Baldwin, W1RU, and a number of other directors and vice directors of the League were also present.

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

Amateur Radio Club of Shreveport, Shreveport, La. Avon (High School) High-Frequency Society, Avon, Conn.; Calhoun County Repeater Association, Battle Creek, Mich.; Central Washington Amateur Radio Club, Ephrata, Wash.; Colorado School of Mines Wireless Society, Golden, Colo.; Critical Bias Radio Club, Inc., Toledo, Ohio; Delmarva Amateur Radio Club, Seaford, Del.; Division Ave. High School Amateur Radio Club, Levittown, N.Y.; The Dorchester Amateur Radio Club, Dorchester, Mass.; Duluth International Airport Amateur Radio Club, Duluth, Minn.; Florida Atlantic University Amateur Radio Club, Boca Raton, Fla.; Herschel F. Rawls Memorial ARC of Texas A & I Univ., Kingsville, Tex.; Hinsdale Central High School Amateur Radio Club, Hinsdale, Ill.; The Indian Mountain School Amateur Radio Society, Lakeville, Conn.; Keene High School Amateur Radio Club, Keene, N.H.; Kings Amateur Radio League, Brooklyn, N.Y.; Michigan DX Association, Okemos, Mich.; Mitchell County Radio Amateur Club, Osage, Iowa; Oconee Amateur Radio Club, Milledgeville, Ga.; Pine Barrens Radio Club, Vincentown, N.J.; Provin Mountain Amateur Repeater Association, Westfield, Mass.; Public Service Communication Association (SERCOM), Lancaster, Pa.; Raritan River Amateur Radio Club, New Brunswick, N.J.; Ridgefield H.S. Radio & Electronics Club, Ridgefield, Conn.; USC Amateur Radio Club, Los Angeles, Calif.; VE1RPT Association, Dieppe, N.B., Canada; Wallace Wood, Jr. H.S. Amateur Radio Club, Davenport, Ia.; Webb School of Knoxville Amateur Radio Club, Knoxville, Tenn.; West Coast Amateur Radio Service, Inc., So. Lake Tahoe, Calif.; West Island Radio Club, Dorval, P.Q., Canada.

On motion of Mr. Griggs, unanimously VOTED to grant approval for the holding of a New England Division Convention in Hartford, Conn., on November 1-2, 1975; a Midwest Division Convention in Omaha, Nebraska, on October 8-10, 1976; and tentative approval for a Delta Division Convention in Chattanooga, Tenn., during August, 1975.

On motion of Mr. Griggs, Life Membership was *unanimously GRANTED to the following applicants:* (See adjacent pages)

On motion of Mr. Arnold, unanimously VOTED to authorize Assistant Secretary David Sumner to sign checks on League depositories on behalf of the General Manager.

Mr. Zak presented a financial report for the 1974 ARRL National Convention in New York City, whereupon, on motion of Mr. Albright, unanimously VOTED to express deep appreciation to the Hudson Amateur Radio Council for their contribution of $1,500 to the ARRL Foundation.

There being no further business, the Committee adjourned, at 3:02 P.M. W1RW, *Secretary*

NEW LIFE MEMBERS OF THE LEAGUE

C. Greg Abercrombie, WB4NXY; Forrest D. Akers, W3PTS; Richard C. Albury, W5SOQ; J. C. Alexander, Jr., WB5KQN; Martin M. Alexander, KØRQF; Charles T. Allen, K5YUR; James R. Alpine, K8SJP; Allen L. Ames, WA6FDB; Alfred Apodruk, KL7BJV; Belarmino Alvarez, KP4DJE; R. B. Ammons; Donald L. Anderson, W9AAA; James R. Anderson, KØUCH/WB9KWI; Terry M. Anderson, WØASZ; A. Robert Andrews, K3QXH; David O. Armstrong, WB4IXW; John T. Armstrong, WA2VHK; Kenneth A. Ascher, WB8LIT; Ralph B. Atkinson, WB4ZNB; Donald J. Backys, K9UQN; Myung S. Bae; Joseph F. Bagdal, W8AVD; Richard A. Baker, WB4UPB; John R. Barber, W1PRT; Stanley Barczak, K8MJZ; Charles E. Bardsley, III, WB5FXA; Roger C. Barr, WA4MWP; Alex Barvicks, WB4RVH; Norman R. Bash, WA8COB; Calvin R. Basham, W8NR; Clifton D. Baucom, W6WBK; William C. Beach, WA8SSI; Kenneth A. Becker, WA1MEE; Robert C. Becker, WA3AHP; Wayne R. Beeson, WBØBTB; Claude E. Belcher, K4DBM; Charles R. Bell, WØCZP; Jack A. Benz, KP4DDL; Stephen F. Berbick, K3PBL; Don Berger, W4CQC; Leland S. Berger, K2HPR; Eugene A. Bergman, WB6IBU; Howard Berlin, K3NEZ; J. Douglass Berry, W3SAU; Raymond Biederman, Jr., WB6HDG; Thomas L. Bishop, KØTLM; Bruce B. Blackburn, Jr., W4TA; William M. Bird, WB2BWE; John F. Blackburn, K6WA; Robert Blase, III, W2CIN; Frank C. Bliesener, Jr., W8CMJ; Homer P. Blincoe, W4SDG; Otto Bluntzer, Jr., WB2RJB; David A. Bond; James R. Boyer, WØNAE; Donald B. Brah, K4ITH; Thomas W. Braidwood, W5BW; Daniel A. Brant; Daniel J. Breinin, WA2WOE; Robert T. Brietske, KØRLJ; Robert Brinker, W9OKD; William E. Brister, W5SZW; E. Frazer Britten, WA2WBY; Wayne Britton, WA8CRW; John R. Brochon, K3ZFD; Richard T. Brockmeier, W8QPP; Philip E. Broeg, W1HBB; Douglas N. Brooke, K5YHX; Johnny F. Brown, K4OTR; Kenneth D. Brown, WA2FUI; E. E. Bryant, W6EYR; Mark L. Budinger, WB2EPR; Gary N. Bullinger, WB9BVZ; Michael A. Burker; Allen R. Burson, K5WXZ; Leo A. Bush, WA7NHP; Eugene P. Bye, W7WMO; Rosalie W. Cain, WB9FJT; Antonio F. Calaf, KP4RD; William L. Calderwood, WB6FES; Alwyn E. Campbell, WAØOKD; Joseph C. Canizaro, W5WQI; Gary Capson, VE1AHM; F. P. Carlson, W7SKK; William E. Cernich, Jr., W5EKF; Alan Chandler, K6RFK; Jack Chandler, W6OUR; Arthur V. Chapman, Jr., WN4KOR; Duane C. Cheney, WB2RLI; Harrison L. Church, WØKXP/9; Albert W. Ciampaglia, W3VSD; Charles F. Clark, Jr., WA9UQO; R. E. Clark, WØQIN; Lorimer Clayton, W4LDB; Philip Clegg, W1HID; R. D. Clifton, VE3BOC; Ted K. Clifton, W9SWH; Richard W. Cline, WB6SUD; William F. Coldewey, Jr., WA8DJS; Eugene G. Cole; Thomas J. Coleman, K6VW; Robert L. Collara, WA1LBO; Ray Colins, WA2GBC; Robert C. Colyar, WB6ZBF; Terry A. Conboy, WA7DOX/WB6GRZ; Carl D. Cook, WA6JUD; Orlan Q. Cook, WØOYH; Paul Cooling, VE3GVY; William R. Cooper, WB9HVJ; Robert D. Corbett, W1CH; Dennis H. Corder, KØMRI; Robert J. Cordier, Sr.; Richard J. Cotton, W8DX; Paul Keath Cowell, WØNIZ; Larry Cos, WA6AIL; Perry F. Crabill, Jr., W3HQX; Lester A. Cushman, W1AWZ/W1BX; Robert Dablow, WBØBIN; John L. Dack, W7KH; Robert E. Dalton, Sr., WA3TLP; Edward V. Daly, WA2CZG; Wesley H. Daniels, WBØMUI; Lynn H. Davenport, W7FGM; Harry Davis, Jr., K3WAC; Kent Davis, K4ESX; Merlin E. Dealy, K6GDZ; Kenneth Warren Deans, K3WNT; Fred Dellinger, Jr., WB4MPJ; Clarke L. Diekmann, K3WGF; Edgardo De Jesus, DU1EJ; Richard J. DeVoe, WA4HJU; Richard J. Disana, WBØJQA; Paul O. Doering, WA5ZMD; Robert W. Doersam, W8QEM; Paul J. Domanski, WA3QPX; Nelson E. Donahue, WA4ABY; R. L. Douglas, VK2ON; Emile L. Dumais, WA1AGQ; Charles M. Dunlap, Jr., W2WOE; Neil Francis Dunn, W1WFV; James M. DuPont, W2DEO; Victor De Santo, Jr., WB2IXA; Arlen J. Dykema, K8EFK; Darrel E. Easter, WA1AAV; Ronald Ebert, WA6SRX; David A. Eckhardt, W6LEV; Roger H. Edelson, W6QKD; G. A. Edmisten, W6TPJ; David F. Edwards, Jr., WB9FML; George W. Egger, K9ERP; William P. Eibel, WA3VCP/WB5MUZ; Alfred L. Elkins, WØIBX; John E. Elkins, K4PLD; Frank H. Emens, W4HFU; Takeo Endo, JA1VZM; Michael F. Enquist, WA7YHX; Willard S. Erhardt, WB6SLZ; Robert J. Ertman, K3BV; George J. Faatz, K4KH; Joseph F. Falabella, K3DB; Paul H. Fassbender, WB2RBV; J. A. Fegan, VE3BUL/GW3TTF; William H. Ferguson, W4DSR; Robert W. Fischer, WB2EUH; George W. Fish, Jr., WAØCPY; Allen Fisher, K8CFB; William H. Fitzpatrick, WBØFHH; Jerry O. Flatt, WA7BAV; H. Dean Foels, WAØOAO; Charles E. Fogelstrom, WB2QNF; Stephen P. Fortin, WA3EYD; Harold W. Foss, WB8LSP; Earl D. Fox, W4DWR; Arthur J. Freed, K6HQY; Jeffrey A. Freedman, WA7MHP; Earl A. Freeman, WBØINH; Raymond W. Freese, WBØFAK; Robert J. Freund, WA9LYV; Ivan J. Frey, W8NYS; H. G. Freymann, DK4OO; A. L. Fuiks, Jr., K5RHP; Charles A. Furtak, Jr.; John C. Gallucci, WB8AKU; Antone Garibaldi, W6NWO; Owen S. Garner, W1SBM; John J. Geary, K5IIG; Tom Gentry, K5VOU; John M. Geruhr, WBØCMC; Thomas R. Gettelman, W9IZO; Frank C. Gibson, Jr., WN1SJJ; Malcolm Gillespie, WA8YZQ; William Edward Gilpin, VE3EKK; Hans Glista, WA1LWS; William J. Gochee, K9GCX; David Goldberg, K9SLH; Jerry L. Golden, WA9OZN; Jeffrey B. Goldman, K3DUA; Joseph D. Goldstein, W2BDU; Eunice B. Gordon, W1UKR; Robert Gordon, K2IPV; W. Glenn Gorham, VE5GG; J. Michael Gower, WB4CMQ; Thomas W. Grafton, Jr., WA5OAZ; Gordon A. Grant, VE3DY; Willard L. Graves, Jr., W3DOT/WBØLGG Austin H. Green, K6TLP; Joseph E. Green, K2VUI; Martin Grey, WA2DAB/WA3YNR; Anthony D. Grieco, K3KEM; Robert W. Griffitts, WN6UKI; M. A. Griswold, W8JXM; Gerald E. Grodecki, K8KOP; Stanley V. Grupinski, WB2RFA; M. G. Gudzin, W5JZY; Edward D. Gurdak, K2GBC; Thomas Gutshall, W3BZN; Paul W. Haczela, K2BQO; Walter J. Hagen, WA2ALV; Douglas G. Hall, VE3TB; Harold F. Hall, K2SGX; Bernard S. Hamada, KH6COB; Albert W. Hamilton, W2FFW; Benjamin S. Hargrave, Jr., K7NWN; Ross Harrell, WA6LTQ; Tom Harrell, K4TSJ; Dale S. Harris, W4DM; Nelson Hauke, WA7CXD; Theo Hauser, DL8TH; John S. Hawkins, W4TYV; Thomas W. Hawkins, Jr., WA3QLY; Julius Hayden, WN5GXH; LeRoy F. Heckman, Jr., W3ASC; John K. Heinbuch, K8YDR; James M. Heller, Jr.; Frank F. Helton, WAØCWV; William Henderson, III, WN1RZH; Robert J. Hendricks, WN6ZMS; Joseph W. Hendrix, WØFCE; David A. Herman, WN4HTM; Jesus A. Hernandez-Alvarez, YV5ALH; Fried Heyn, WA6WZO; Harold C. Hill, Jr., WA8IGN; Jack R. Hill, Sr., WA4DQD; Bryan Hines, WB2OUZ; Robert M. Hisamoto, KL7AM; Glenn E. Hobbs, K9ROE; Richard P. Hoffman, WAØGWC; Donald W. Hoge, K9VWX; Jim Hoisington, WB5LOK; Tom Holtenga, K8NGV; Bud L. Holman, WA4ASJ; Don Holmes, WØORK; Duane K. Holsten, W2GLT; Arthur A. Holz, WB6THM; Robert W. Hooper, W1OFR; Jeffrey J. Hopkins, WA1NRH; James N. Horne, K4JKE; Roger W. Hoskin, W5QEP; Preston E. Hotz, K6WD; Donald B. Houtz, WN3WHX; Duane O. Howe, W7IBL; Edward H. Howe, K5KPS; William E. Hubbard, W5HXR; Jiri Hudec, OK1VW; Willard R. Hughes, W3TYQ; Charles W. Hummel, K3BFA; Eric D. Hyatt, WB4QNP Robert M. Inks, WA5MUM; Robert W. Irish, Jr., K5ZOL; Curtis B. James, W7HGU; Eugene A. Jank, W5EJT; William V. Jarvis, W1USJ; Adolph A. Jelen, W9IT; Neal F. Jenkins,

WB4YRE; Andrew M. Jensen, K5FPO;Michael P. Jogoleff, WA6MBZ; H. Cash Johns, WBØLBL; Ellen M. Johnson, WAØUXO; Merle W. Johnson, WAØUXN; R. W. Johnson, W6MUR; Dale D. Jones, W7CFJ; Gary Jones, WBØJAY; John Paul Jones, WA7IXE; Paul E. Jones, WA7JRY/W2MCO; Mark Joshu, KL7HGP; Robert Kafarski, WA2RBE; Donald W. Kane, WB2BEZ; Allan H. Kaplan, W1AEL; David H. Kaplan, WA1OUI; Carl A. Karhuse, WN6GBD; Gregory Karpowicz, WA5UAM; Karl J. Kasel, WBØBMY; William S. Keller, III, WB2RKK; Donald J. Kelly, VE5TX; William M. Kelsey, WB2FGA/8; S. C. Kennedy, WB5COO; James F. Kenney, W7WKH; Thomas M. Kent, K7OCW; Myron A. Kern, WØZHB; Kenneth H. Kerwin, II, K6UXO; William B. Kincaid, Jr., WA4YND; Gary R. Kleinerman, K2SXA/WB2EUC; Robert L. Klepper, W7IEU; Stanley W. Klock, K1EHO; Glenn M. Knappenberger, W7KLB; Harvey M. Knickerbocker, K6SK; Sheldon G. Knoch, K6NO; Akira Kobayashi, JA1JIX; Masamitsu Kobayashi, JA1EMX; Milton C. Koeppen, W9GAG; Tetsuhisa Kojima, JA1KPG; David F. Kosh, K3YVN; Edward L. Koskie, WA2SVH Eugene M. Kowalewski, W1TEE; Paul Kranz, W1CFT; Frank G. Krupansky, WB2VEE; James D. Kulp, K3AWZ; Harvey S. Laidman, W6MFK; D. Gregory Lambert, WB2URA; Larry Lambert, WAØTRO; Lloyd D. Larson, WB9DUY; Walter Laud, W9CU; Donald M Lauderdale, W5JUZ; Gayle A. Lawson, KØFLY; Jerre Lawson, WA7OJM; Philip W. Lejman, K9FHP; H. Lester Leland, WB2NPR; Andrew leonard, K4IMA; Lawrence Leveson, W2KKT; Berndt lindberg, WNØMIP; Robert L. Lippman, K2GHY; Ronald Lipsit; Clifford N. Lomax, WNØKXC; Roger W. Lory, WA3FPM; David J. Lowenstein, K7WQO; Paul J. Luhn, W8MXR; Allen W. Luniewski, WA3MHY; Thomas G. Lusch, WA8ZTV; Thomas J. Lussen, WA4ILH; Richard L. Lyle, WB4LLV; David C. Lynch, WB2IQL; John Lynch, Sr., WA7PFA; Joseph P. Lynch, WB5KFW; Linton A. Lyon, WN7YYG; Raymond W. MacKenzie, W3ZPZ; Craig B. Malkowski, WB8FVA; Ronald G. Martin, W6ZF; Roy A. Maskell, VE3ADM; Alvin F. May, WN7AJP; Eugene W. May, Jr.; Jack W. McCallon, W5QMY; Dennis J. McCarthy, KØYTI; Lloyd D. McCombs, WBØIDUY; Joseph H. McConaghy, K3JGJ; Martin McCormick, WB5AGZ; Duncan F. McDonell, K6LHA; George R. McFarland, W1YSP; Robert E. McGee, VE2DNH; Mary Jane McGleish, WA8PII; William R. McKechnie; James C. McLarnan, WB8DZM/ZF1JM; John B. McMaster, K2JN; Donald F. Meadows, W6ZGM; Anthony J. Medeiros, Jr., WA1NQV; William Q. Meeker, Jr., WB2KTO; Eugene B. Melchor, K4OPK; Larry Merer, WA4SQI; Robert W. Merrian; Charles H. Merritt; David K. Mery, WN5JMT; Armin H. Meyer, W3ACE; Howard E. Michel, Jr, KØBPY; James P. Mickelson, W3BOI; Thomas A. Milan, VE4LX; Harry W. Mill, WBØAGM; Donald A. Miller, W9WNV/W6ERO; Jerome Stapleton Miller, W8IDP; Jesse L. Miller, W5SF; Walter E. Miller, WB2REE/W6; Barry L. Mitchell, K3WKV; Henry P. Mitchell, K6RPA; Robert Mitchell, W9DD; Richard G. Moench, WA9VDJ; William P. Molnar, WA3JGQ; Peter Monsch, HB9ABN; James L. Moore, WA9ZFM; Stephen F. Moore, WA8LUR; Chester W. Moorehead, WAØWHL; Myrle H. Morgan, Jr., K1HJC; Robert W. Morgan, W6PIU; William B. Morris, K4CBI; James I. Moss, WB9AJZ; Jeremy Muller, WA1FZV; Arthur J. Mumaw, W2FQX; Jeffrey S. Mumma, WA3OZX; Philip Muncaster, VE7AWJ; Thomas J. Muncey, W7DIK; Richard S. Munger, W7IGS/DA1MR; William C. Moyers, Jr., WB4YPO; Myron L. Murray, WA2TYP; James B. Nail, WA2MBP; Don E. Naumann, WB9FCW; Stanley R. Nazimek, Jr., WB2GKF; Robert F. Neal, WB2VPK; Charles H. Neeland, WBØKIG; Robert H. Neff, WA3YOJ; William H. Nelson, WAØTFT; Anders C. Nielsen, OZ1ZJ; Don L. Nobles, WB5IPF; Dean E. Nold, W9KX; James C. Nordgren, WB9BNF; Terrence B. Norman, WA4HPF; Kenneth C. Norton, WB4HKZ; Lynn Oatman, K3FKE; John A. O'Bannon; Joseph F. O'Brien, WA4DOX; John E. Obst, WB9IXZ; August L. Oechsli, K2PQY; Noboru Ogawa, JF1RWP; John D. O'Larey, K7KNU/KL7HBK; Arnold Osen, K2LQL; Juan M. Ortiz, KP4GN; Hugh W. O'Toole, K9CPQ; Donald R. Otto, WB6VPQ; Wayne E. Overbeck, K6YNB; Courtenay S. Overin, Jr., W6LVQ; William H. Owens, W6EDT; Jerome D Page, WA7YQQ; Thomas Palko, WB5ASD; Arthur N. Paradis, W8KAY; John Paradis; Robert U. Parent, WA1FSR; James C. Parker, Jr., W8VKM/2; Robert W. P. Patterson, K5DZE; Henry J. Pavlis, WA6SQX; Elmer W. Pearson, WØEU; Spencer J. Pearson; Travis W. Pederson, W5ZSX; James M. Peirson, K6YU; Jim Penkala, WA6UKY; Harry J. Perrin, W6JOE; Cornelius Perry, II, W9TGX; Gary A. Peterson, KØCXK; Bobby N. Petrosky, WB5FMA; Robert W. Phare, WB8HKQ; John J. Podpechan, WA5HTS; Tony J. Podrasky, WA2EAA; Philip Poling, W4DNZ; William L. Pope, K4VDQ; Granville D. Porter, WB4TOG; W. A. Porter, VE3IZ; Ken Powell, VE6CCT; Willis D. Propst, K7RSB; Keith D. Pugh, W5IYH; Samuel P. Puner, WN2SYP; Steven O. Putman, WB4ZRR; Marshall Quiat, WBØHWQ; Lyle B. Quinn, WØTQD; Kermit W. Raaen, W7BG; J. Woodson Railey, W6RPK; Glen Rantala, WN1UJU; Howard D. Rawls, WN4FZR; George F. Reher, W6TWP; D. R. Reid, VE7AZN; Thomas H. Reid, W7GHG; Steven E. Reyer, WA9VNJ; Jonathan R. Richardson, WB5LAL; Phyllis A. Richmond, WB8FPD; George E. Riggins, Jr., WA6DZR; William M. Riley, WA4BKB; Raymond F. Rinaudo, W6ZO/W6KEV; Jim Robb, W6OUL; Fred J. Robinson, VE3GCP; Wayne L. Robinson, Jr., WA3HJC; Richard H. Rockenberger, WA8HEG; Robert Rodriguez; Floyd Roland, W5JKU; Joel M. Rose, W8GOE; Jack H. Ross, K4NTD; William A. Roussel, Jr., K5RVF; Henry H. Rugg, VE2HN; John W. Ruggiero, K2EGS; John W. Ruppert, WB9JOV; Peter A. Russett, W1BWK; Charles E. Ruth, WNØFVP; Theodore D. Sadilek, WA8MFQ; S. Robert Salow, WA1IDA; John T. Salyer, K3DPQ; Greg Sanderson; Joseph Saugier, K6CD; James H. Sayer, VP9BY; Harvey Schack, WA2WWJ; Helen E. Schadler, WB5GIN; Edwin M. Schaefer, III, K9JMA; Milton J. Schnebelen, WØLRO; George E. Schoenfeld, WA2TJM; Robert W. Schoenfeld, WB2VEF; Walter C. A. Schrader, WA9WJE; Peter M. Schumacher, WØJYJ; Richard H. Schwanke, W9HXM; Chester Schwer, WB8PHU; Walter H. Schwiebert, K7HGZ; Leo W. Scott, W3QDJ; Ken Seals, WBØBIY; Paul M. Sexauer, W9ITO; Jerry Wm. Sharp, WB4AOT; Rodman A. Sharp; Jack A. Shay, W7GXC; Ronald L. Sheetz, W3ELT; Jack Sherman, VE4AT; John C. Shew, WB4HQE; Wayne L. Shirk, WØCLK; Robert G. Shoup, WA5DJD; William L. Showers, WA7YDT; Thomas R. Siafakas, WA2IJK; Arthur R. Siegel, WA6WND; Michael M. Siegel, WB2FCP; Ralph A Sieloff, W2WKR; Preston W. Simms, W5RM; Richard A. Simpson, W6JTH; Ronald W. Sizer, K1VYU; C. B. Skeels, W8TBP; Muriel W. Skinner, K6BPT; Tom Slater, WB8PDG; Richard G. Slavens, WA6IMF; Richard L. Small, WA7VUU; Arthur R. Smith, W6INI; Bradford A. Smith, K1SED; Gordon L. Smith, WA9SLU; Gordon R. Smith, K7HFV; John H. Smith, W5HMM; William C. Smith; J. Russell Snedeker, W2EEQ; M. Duane Snyder, KL7IEG; Kenneth Harvey Soll, WA3RMS; Heinrich F.

Sonnenberg, WA8BAL; Helmuth G. Spieler, DJØKF; E. D. Spencer, W7TMF/BSF; Frank A. Spurr, Jr., WB4YRB; Jeff Stahl, WB8HYC; George R. Steber, WB9LVI; James D. Steffey, WA2SUS; R. Paul Stein, Jr., K5AWK; William M. Stem, K4NSO; Paul J. Steves, WB2QJV; Frank B. Stilwell, WB8OFR; Lee Stoller, WB2EXQ; Wayne A. Strahl, K9OKD; Robert I. Stuckert, WA9SYD; N. Paul Stucky, WØHOM; Fred C. Stueve, KØTCS; R. A. Sutter, WBØMPF; Frank L. Swaim, W8USP; Merrien L. Swanson, K6KDB; Stanley Sybiak, WA1HJN; Joseph E. Szabo, WB6FBL; Charles L. Taylor, WBØFBY; Basil E. Thompson, K9KRN; William W. Thompson, K1NNB; Willard D. Tiffany, W6GNX; Charles W. Tinsley, W9BPW; Edward N. Toth, K9QMO; Stephen L. Towle, KØSVW; David B. Toy, WA4MKY/WA3VPU; Ramon P. Traver, WA2LJM; Michael S. Trombetta, WA6EAR; Russell W. Trook, WNØOFU; Daniel J. Truland, W1YCZ; Theodore A. Turk, WB8ADA; Ralph H. Turner, W8HXC; Harold A. Twining, K2DBB; Clifford A. Upton, WØLME; Robert H. Van Outer, WB4YQY; Luis M. de la Vega, KP4DMZ; John W. Wagner, W8AHB; Marvin L. Wahl, W6FUV; Jeffrey L. Walden, WA9NIZ; Lawrence P. Waldron, WA4RZY; W. P. Walkling, WNØMPA; Robert W. Walstrom, KØZTV; Donald B. Walter, W7JEG; Fred J. Walz, KØTPF; Henry H. Ward, Jr., WA4JGA; Harry O. Watkins, K7KEH; K. N. Watkins, VE3CAL; Robert Wallace Watts, WA6RMQ; Ted R. Wayne, WB4CBP; Tim Wayne, WA4GVX; Phillip A. Weaver, WØOJL; William J. Webster, Jr., WB2TNC; David A. Weinstein, WA2RXH; Douglas G. Welcker, WA7CLY/WB4KGY; David W. West, WBØATD; John F. West, Jr., WA9ESO; Michael C. Wheeler, WB4YDX; Victor E. White, W6ODD; David B. Williams, WB8LXA; Frederick J. Williams, W1WFJ; Raymond S. Wiltshire, WAØUDI; John Park Winkler, Jr., WØNMU; Robert J. Wittla, K8AXD; Paul Wnek, WA3KRD; J. Preston Wolfe, WB4LNI; Charles B. Wolfmeyer, WØKH; Paul A. Wolfmeyer, WAØWYG/WA2WYA; William L. Womack, K4IAV; Charles S. Wood, Jr., WA8KKN; M. I. Chas. E. Woodson, W6NEY; Owen H. Wormser, K6LEW; Jim J. Wortham, W7GNP; K. Yeatheard, VE6KY; Floyd Young; Allan C. Zeis, W6LVI; Leon D. Zetekoff, WA2RRG/WA4ZLW. QST

Hamfest Calendar

(Continued from page 57)

New Jersey — The Tri-County Radio Assoc.'s annual auction and flea market is April 27 at the Forest Lodge in Warren. For info write or call: WA2SGL (201) 381-7293 or W2IHA (201) 635-8703. Rain date is May 4.

New Mexico — The 11th Annual Whitey's Bean Feed is at La Mesa (Near Las Cruces) from noon Saturday April 26 thru Sunday 27th. Sponsored by Mesilla Valley Radio Club with "Whitey," K5ECQ, as chef. Swapfesting, chili bean feed, beverages, and eye-ball QSO. Free camper parking Sat. night on grounds. Adults $3.50, kids $1.50. Talk-in .16-.76 and 146.52 and 3.940 MHz. For info contact: K5HZH, 1020 Circle Dr., Las Cruces NM 88001.

New York — The Overlook Mountain Amateur Radio Club's annual banquet is on Saturday, April 5.

New York — The 11th Annual Amateur Radio Luncheon Meeting in connection with IEEE International Convention is Tuesday, April 8, at the Engineers' Club, 32 W. 40th St., New York at 11:30 AM, sponsored by QCWA and the Radio Club of America. Guest speaker is Charles Dorian, W3JPF, on subject of satellite communications. Advance reservations required at $8.50 each. Send checks to: Nathaniel Pfeffer, W2AIM, 1085 Park Avenue, New York, NY 10028.

New York — The 42nd Annual Western New York hamfest and VHF conference is on Saturday, May 31st. Funfest Friday night at the Rochester Marriott Inn. Hamfest at the Monroe County Fairgrounds, Rt. 15A near Thruway exit 46. Programs include MARS, AREC, QCWA, ARRL Forum, FCC Forum, speakers, general interest meetings and a YL fashion show in downtown Rochester. Special this year, FCC exams. Advance registration $3.50, with banquet $11, at gate $4. For tickets and info write: WNY Hamfest, Box 1388, Rochester NY 14603. Advance tickets end May 23.

New York — The Sixteenth annual hamfest, sponsored by the Southern Tier Amateur Radio Club is scheduled for 10 AM, April 19, at St. John's Ukranian Hall, Johnson City, NY. Admission to lectures and flea market only, $1 for adults, total admission for dinner and awards, $6.50. For tickets or info write to: STARC, PO Box 11, Endicott NY 13760. Advance sales by April 26.

North Carolina — The Third Annual Raleigh Amateur Radio Society hamfest is all day Sunday, April 20 at the Crabtree Valley Mall, Hwy 70W, just west of the city. A Covered flea market, many good group meetings. Registration $2.50. Food at reasonable cost. For flea market reservations and other info write: Mr. George Richards, WA4EKJ, Chairman, RARS Hamfest, PO Box 17124, Raleigh NC 27609.

Ohio — "FM BASH", an annual affair in Dayton is Friday night of Hamvention, April 25, at the Imperial House North. Sponsored by the Miami Valley FM Assoc. from 9 til ? Admission free, snacks and COD bar, entertainment, ladies tables and more. Contact K8SNJ, 725 Parkview, Dayton OH 45403.

Pennsylvania — The Northwestern Pennsylvania swapfest is May 3 at Crawford County Fairgrounds, Meadville. Flea market at 10 AM. Free admission. Refreshments available. If rain, indoors. Talk-in 146.94, 04/64, 29 MHz. Map and details: RAE, Box 844, Erie PA 16512.

Pennsylvania — the Spring dinner meeting of Eastern Pennsylvania Section is at the Buck Hotel, Feasterville, on April 19. Dinner at 6 PM followed by section activities meeting. Ladies and guests invited. Advance reservations for dinner required, prior to April 12th, with EPA — K3NYX, 127 Market St., Tamaqua PA 18252. Reservations $7. For additional info contact: EPA — SCM, W3ZRQ.

South Carolina — The Blue Ridge Radio Society's annual hamfest is May 4 at the Recreation Bldg. in Cleveland Park, Greenville. Flea market, fun from 9 AM - 3 PM. For info write: Don Rose, 11 Ivanhoe Circle, Greenville SC 29607.

Washington — The Skagit Amateur Radio Club of Washington State's 22nd hamfest and banquet is at Bryant Grange Hall on April 19. An all day program is planned with Northwestern Division Director Thurston and other ARRL officials. For more info contact W7LFA.

Wisconsin — The Northeastern Wisconsin swapfest is Saturday, May 3 at the Labor Temple, Neenah, Jct of Hwy 141 and Hwy 114. Talk-in on 146.94 and 3.985. Large indoor swap area and food and beverages available. Advance tickets or at the door $1; $1 for tables. For advance tickets or info contact: Mark Michel, W9PJT, 700 Kinzie Ct., Menasha WI 54952.

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

A MESSAGE FROM THE PRESIDENT OF THE IARU

This month, the International Amateur Radio Union celebrates a most significant anniversary. It was in April, 1925, that a congress of delegates from 23 national radio societies convened in Paris in accordance with a proposal made a year earlier by the *ARRL*. The congress was organized by a committee of French amateurs and was charged with the responsibility of forming an international organization to protect the interests of the radio amateur in the "short waves." By this time, international amateur communication was an accomplished fact and pressure from commercial and government interests to ban amateurs from this spectrum was already anticipated. The congress approved the first constitution of the Union on April 17, 1925, which we therefore can consider our "date of birth."

Membership at first was open to individuals, and it was anticipated that National Sections would be formed in countries with 25 or more members, these Sections eventually to become national societies in their own right. The subsequent evolution of the Union as a federation of national amateur radio societies was foreseen from the start. The progress of the IARU perhaps is illustrated best by the fact that the countries represented by its 88 member-societies contain some 700,000 amateur stations – very nearly all of the world's amateur population.

The world has changed a great deal in the 50 years since the founding of the International Amateur Radio Union, but the need for an international organization to coordinate and foster international amateur two-way communication is as great as ever. The amateurs of the world will be made increasingly aware in the next several years of the role of the Union, as we approach the ITU general World Administrative Radio Conference. It is therefore worth reminding ourselves that the organization itself is as old as the concept of international communication between private, non-commercial radio stations in people's homes. It is to the protection of this concept that we must rededicate ourselves. The challenges facing us in the immediate future impart a sense of urgency to this rededication. – *Noel B. Eaton, VE3CJ, President, International Amateur Radio Union*

IARU ADOPTS NEW CONSTITUTION

A revised Constitution of the International Amateur Radio Union, proposed by the *Radio Society of Great Britain*, has been adopted by the Union. The proposal required the affirmative votes of two-thirds of the entire Union membership in order to succeed.

The new Constitution recognizes the existence of the regional IARU organizations which have developed in all three International Telecommunication Union Regions in recent years. The regional organizations are making increasingly important contributions to the work of the Union.

DIVISIONS SCHEDULE CONFERENCES

About every three years, the IARU regional organizations schedule conferences for the purpose of discussing and resolving problems of mutual interest to the member-societies in each of the three ITU Regions. An IARU society which is a member of a regional organization has the opportunity to send a delegate to the conference, or, in some cases, to provide a proxy so that another delegate can vote in its behalf.

The Region III Division Conference was scheduled for Hong Kong on March 4-10. Region III, the newest of the regional organizations, held its last conference in Tokyo in 1971.

The Region I Division Conference is planned for Warsaw on April 14-18. M. Mili, Secretary-General of the ITU, has accepted an invitation to open the conference.

The *Union Interamericana de Radioaficionados IARU Region II* will hold its next conference in Miami early in 1976, possibly at about the same time as the Miami Hamboree/*ARRL* Southeastern Division Convention. This would permit the delegates to attend both events in the same trip.

Of course, a major topic on the agenda of each conference is the preparations being made on behalf of amateur radio for the 1979 ITU general World Administrative Radio Conference. QST

The 1975 officers of the *Philippine Amateur Radio Association* were inducted recently in a ceremony in Manila. (l-r) Inducting Officer General Estrada, DU1JJT, president DU1JMG, DU1JO, DU1BOS, DU1NRS, DU1RS, and DU1MQ.

Correspondence From Members-

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

A SUGGESTION

● While squinting through footnotes hidden below and throughout construction articles and parts lists in the *Handbook*, it struck me how convenient it'd be to be able to thumb to the "Construction Practices" chapter and to find a complete list of manufacturers of all these parts I have to mail-order . . . all in one place and alphabetically arranged, and with addresses. . . . – *Joe Hoener, KØFYL, Hutchinson, KS*

SUMMING UP

● OM WA2HMH and others who want 2-letter calls for all Extra Class licensees (February *QST*) are forgetting to do their sums.

The possible number of two-letter calls per prefix is 650. For W and K calls the total for ten districts is 13,000. Since there are already about this number of Extra licenses issued, future Extra Classers won't have much chance of having a two-letter call. Where, then, is the incentive?

The situation could be helped if calls of the form WAØXX were used. This would allow nearly three million "two-letter" calls.

This, or some equivalent, is my recommendation. Simple arithmetic says, leave the present 25-year requirement for 1x2 calls alone. – *R.P. Haviland, W4MB, Daytona Beach, FL*

● In regard to the 2x3 callsign making pileups tough, bull, pure bull, and it's time someone told WA2HMH so! Cracking a pileup takes good equipment, skill and technique. Bear in mind that here in the Middle South, us poor boys have to work through both the legendary East and West Coast Aluminum Curtain powered by the extraordinary East and West Coast kWs. *Ha.* My 2x3 callsign has not stopped me from DXCC, 5BWAS, plus 35 other national and international operating awards, and I don't even consider myself a contester. I have worked over 450 stations through Oscar 6 and 7, both cw and ssb, with no known losses due to WBS, etc. I made 30- to 40-second windows into Hawaii, Alaska and England through Oscar 6 with no ill effects. WA2HMH's statement that very few of the League Officials hold WA or WB calls again is pure bull! Check page 6 of any *QST* or page 58 of the December issue. My callsign did not stop me from attaining SCM, Assistant Director, PAM, etc. In conclusion sir, you only deprive yourself if you allow your OVS appointment to become inactive. And more important, if you allow your ARRL membership to expire, do you realize that you have lost the opportunity to cast even a negative vote in the affairs of the League?

Enjoy your vacuum . . . – *William L. Appleby, WB5DCY, Long Beach, MS*

PRO AND CON

● My compliments to Messrs. DeMaw and Dorbuck on the article "Transmitting Variables" in February *QST*. They did a fine job and the style should be a standard of comparison in all future technical articles published in *QST*. My interest was not so much in building the final amplifier, but in the technical presentation. I mentally went back over about 50 years of reading *QST*, thinking how little the authors of various articles had actually contributed to the state of the art. Many how-to-do articles, but not so many as to why it was done.

We are doing a fair job of developing appliance operators, but little or nothing toward the development of good technicians! Articles such as the one I mentioned above would go a long way toward helping out even the appliance operators! Many of us, in the early days, needed to know how the thing was designed and how it worked, besides how to build it. Much of the time we spent countless hours looking through various magazines and books trying to find out those things. There is still some surplus gear on the market that would provide parts and, with articles like I've mentioned, improvising would be made much easier. – *J.H. White, K4UC, Burlington, NC*

● Your technical editors, Doug DeMaw, W1CER, and Anthony Dorbuck, W1YNC, should be immediately fired for their article "Transmitting Variables – Who Needs 'Em," *QST*, February 1975, pages 37-43. In these times of modern technology, *QST* has stepped backwards over 20 years by using type 807 tubes. Wide frequency coverage could be easily obtained from transistors. Transmitting tubes such as 807s or 4-1000As are not recommended for ssb amplifier service. An amplifier is not linear unless its IMD content is within good engineering practice. The word linear is misused everyday in amateur circles.

Many hams will unknowingly accept poor articles such as the above on the basis of "published in *QST*." Each technical article should be in accordance with current state of the art. Unless this is done, *QST* will slowly lag behind industry. *QST* is now about 15-20 years behind. Good articles should be solicited; but first of all, you need a technical editor who can differentiate between a good article and a poor one. After that, the standard of quality can be maintained. – *Sam Goda, WA6JRA, Orange, CA*

RECOLLECTION

● On re-reading the article on the artificial ionosphere investigations in November *QST*, I recollected an interesting – to me, at least – experience of an ex-ham friend in the early days of WWII. During the mid-30s he was working with a German tech rep.

Shortly after the U.S. became involved in WWII, my friend was visited by military intelligence representatives who were following up on a chance remark the German tech rep had made about some research the Germans were doing on "controlling the ionosphere."

What if the Germans *did* have some sort of ionospheric modification project going on back then which got shelved for lack of interest or funds? Can anyone shed some further light on this? – *C.F.W. Anderson, K2KF, Oakhurst, NJ*

Strays

The Foundation for Amateur Radio, Inc., a non-profit organization with its headquarters in Washington, D.C., announces its intent to award three scholarships for the academic year 1975-76. All amateurs, wherever resident in the U.S. and holding an FCC license of at least General Class, can compete for one or more of the awards if they plan a full-time course of studies beyond high school.

The John W. Gore Scholarship pays $750. Applicants must intend to pursue a career in electronics or a related science and have completed at least one year in an accredited college or university toward a baccalaureate or higher degree. Preference will be given to residents of the District of Columbia, Maryland, and Northern Virginia.

The Richard G. Chichester Scholarship also pays $750. Applicants must be members of the ARRL and be sponsored by an ARRL-affiliated club. There is no restriction on the course of study, but applicants must be enrolled in or have been accepted by an accredited university or college and intend to seek a baccalaureate degree. Preference will be given to residents of Ohio, Kentucky, Indiana, Illinois, the District of Columbia, Maryland, and Northern Virginia.

The Edwin S. Van Deusen Scholarship pays $250. Applicants must have been accepted or enrolled in an accredited 2-year technical school and intend to seek an Associate degree in a science related area. Area preference is the same as the Gore Scholarship.

Application forms can be requested from the Chairman, Scholarship Committee, 8101 Hampden Lane, Bethesda, MD 20014. Requests must be postmarked prior to June 1, 1975.

The Foundation is devoted exclusively to promoting the interest of amateur radio and to scientific, literary and educational pursuits that advance the purposes of amateur radio.

Top photo: ARRL president W2TUK (right) presents a special Oscar pin to Dr. Frederick B. Tuttle, NASA Director of Educational Programs, in recognition of his assistance to the Oscar education program. A similar award was made to NASA's Dr. William Rich, not shown in the photo. The occasion was a briefing at NASA Headquarters, attended by representatives of over ten government agencies, on the contributions of amateur satellites to education. Below, Amsat's K3JTE responds to audience questions about Oscar 7.

Happenings

(Continued from page 59)

5. On May 14, 1974, The Director of the Office of Telecommunications Policy advised the Chairman, Federal Communications Commission, that Loran-A was to be phased out by about July 1, 1980. The Director, OTP, recommended that the band 1800-2000 kHz be fully restored to the amateur service, and stated that he had asked IRAC to plan for suitable modification of the allocation table and for such other action as would restore the amateur radio service to primary status in the so-called 160 meter band. ARRL supports this action, and is prepared to document the need and desirability for such affirmative action by providing statistics on the growing use of that band by nets and individuals rendering public service and emergency communications.

6. ARRL recognizes the heavy pressures that exist in the VHF area, and has recently experienced such domestic pressures on the amateur radio service at 220 and 420 MHz. Although the growth of amateur use of VHF/UHF/SHF may not have precisely paralleled that of government and commercial users of those portions of the spectrum, amateur occupancy of VHF/UHF/SHF is expanding, and rapidly in some areas. Therefore, in these 1979 General WARC preparations, ARRL will advocate retention of the present amateur allocations at 50 MHz and above, and will be prepared to document the need for such retention for both terrestrial and space operation.

7. ARRL will furnish the Commission with arguments for eliminating the separate definition of "amateur-satellite service," believing that the full and free development of amateur radio operational and technical advances will best be served by an amateur radio service that has but a single definition — i.e., the amateur service is a single entity, and a part of it should no more be sub-categorized as "amateur-satellite service" than other parts should be as an "amateur aeronautical service" or an "amateur mobile service."

8. Finally, ARRL will review the language of Article 41 of the Radio Regulations, in an effort to offer such improvements as might obviate past misunderstandings as to the role that the amateur radio service can play in international communication and understanding.

THE AMERICAN RADIO RELAY LEAGUE

By Robert M. Booth
Its General Counsel

February 13, 1975

The World Above 50 Mc.

CONDUCTED BY BILL TYNAN,* W3KMV

WHEN I WAS ASKED to undertake the task of conducting this column, my first inclination was to say no. Ed Tilton, Sam Harris, and Bill Smith, who have preceded me on this masthead, represent very difficult acts to follow. I must admit, however, that I was sufficiently flattered and challenged by the idea that I was unable to resist the temptation to "give it a go," as they say in G-land.

Any success I may have as conductor of "The World Above 50 Mc." will depend in part on what insight I may be able to bring to the job after following and participating in vhf activities over the past 30 years or so. More important will be the inputs of news and ideas from you, the readers of these pages.

Of particular importance and help, as the changeover is taking place, would be your suggestions as to what you would like to see in future columns. Should changes be made in the material presented, or in the ways it is presented? Should more space be provided to fm, FME, and satellite operation, or should more traditional weak signal modes be stressed? What can this column do to stimulate more regular activity on the frequencies above 50 MHz? What simple circuits, gadgets, matching schemes, and the like have worked well for you? They might be exactly what another vhfer, or would-be vhfer, has been looking for, and just might make the difference that could get him on or keep him on vhf. This column will provide the forum for airing your good ideas with the rest of the fraternity, if you like that kind of thing.

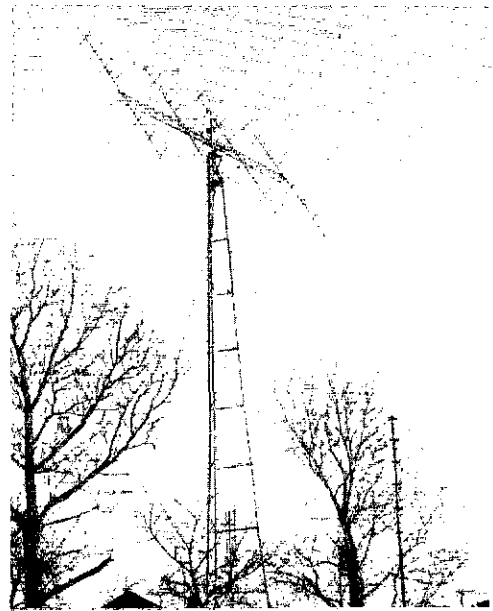
Our Bands at the Crossroads

It is somewhat ironical that the changeover in conductors is taking place at this particular time, since, as I view things, Amateur Radio, and especially vhf/uhf, is at a very critical point in its history. The direction taken will probably be greatly influenced by events and decisions taking place within the next few months.

On the matter of 220 MHz, FCC has recently been given the go-ahead by Office of Telecommunications Policy, a very influential organization attached directly to the White House, to proceed with the reallocation of several Megahertz of our band to the Class E Citizens Service. It appears that, unless some sort of miracle occurs, this change will be ordered very soon. We will be left with a band only a fraction of the size of our present allocation. What we do with this remaining fragment will, to a great extent, determine whether amateurs retain any frequencies in this useful and interesting part of the radio spectrum, or if we lose the rest of the 220-MHz band and possibly some or all of other vhf and uhf bands as well.

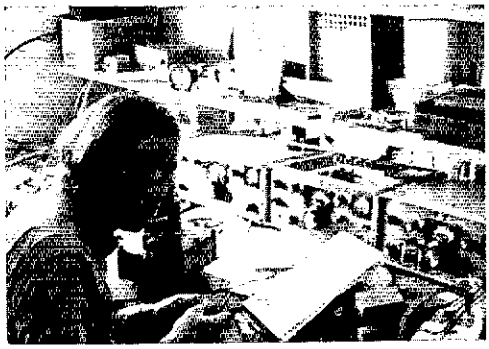
The other specter on the horizon is Docket 20282, recently released by FCC. Its proposed rule changes, if they go through in their present form, will have a major impact on vhf operation as many of us know and love it. For example, the docket calls for allowing operation by Communicator Class licensees on 144 to 148 MHz, using fm voice modulation *only*, with power inputs of up to 250 watts. The Communicator Class is the proposed new license requiring no code exam and containing a simplified written test. Note that the Communicator CANNOT use code. Presumably, the only portion of the 2-meter band which would be off limits for the Communicator Class licensees would be the 144.0 to 144.1-MHz cw segment. How long it would be before this bastion falls is anyone's guess.

What benefits might the Communicator Class license bring to Amateur Radio? Numbers, for one. At present the number of licensed amateurs is



The 160 element collinear up 88 feet at WA2BIT.

*Send reports and correspondence to Bill Tynan, W3KMV, Box 97, Burtonsville, MD 20730.



Successful 144 MHz EME'r Barry Forrest, WA2BIT, of Far Rockaway LI N.Y.

declining slightly each year. This is in contrast with what is occurring in other communications groups, including the Citizen's Radio Service. It is a simple hard fact of life that politicians and lawyers think more in terms of numbers, not really understanding what constitutes quality in technical areas. Unfortunately for the inhabitants of the world above 50 MHz, it is in our portion of the spectrum that the greatest crunch in frequency allocations exists. Thus, it is up to us to come up with constructive means to increase occupancy of our bands while, at the same time, preserving sufficient space for carrying on the weak-signal communications experimentation which has characterized and distinguished the vhf amateur.

If you haven't already read Docket 20282 carefully, we suggest that you do so soon. The full text is in the February *QST*. Decide for yourself which of the Commission's proposals will be good for Amateur Radio, and in what ways, if any, the proposals should be modified to obtain the desired result of making Amateur Radio attractive to more people, without serious impact on the good things being done on the vhf bands today. Write up your comments and send the original and 14 copies to the FCC. Send a copy to your ARRL Division Director (name and address on page 8). I'd like to see a copy too, so that I can get an idea of the thinking of the readers of this column. Please do it soon, as the date for submitting comments is June 16. If your ideas are to be considered in framing the ARRL Presentation, your Director must receive them soon.

If you are an ARRL member, you probably have the ARRL questionnaire on Docket 20282. If you do not have it, you soon will. This is not just a yes-or-no thing. Rather, it was designed to elicit shades of opinion, not just on the proposals themselves, but on their impact on amateur radio. Study the questions carefully before marking the answers. Get the form back to ARRL promptly – there's much work to be done between now and June 16.

Apologies are hereby offered for beginning my term as conductor of this column with a subject such as this, but I feel that its impact and urgency warrant space in these pages right away.

Now to more interesting subjects.

Want to phone in your hot news for the "World Above 50 Mc."? W3KMV has set up a telephone message recording system for this purpose. It's on 24-hour service to record your input to the column. (Call when your rates are low!) The number is (301) 384-6736.

EME

The big news this month is, naturally, the EME tests on 144 and 432 MHz by the gang at the SRI Radio Club, WA6LET. The tests came too late in the month to get detailed reports from all stations taking part, but W1HDQ has compiled a summary obtained from Vic Frank, WB6KAP, and Bruce Clark, K6JYO.

The February 22-23 operation of WA6LET, using the SRI 150-foot dish came close to disaster, as the result of feed and feed-line problems. Power back from the moon on 144 MHz was estimated at 10 dB below the previous experiment. Despite this, 54 contacts were made with 38 stations, 24 of them not worked on the previous test. All call areas were worked on 144, plus VE2, VE3, F, DL, SM, PAØ, and a first, ZE1DX, believed to be the first African EME QSO on 144 MHz. Seven of the QSOs were good enough for solid ssb communication.

A saturated feedline and a relay that didn't switch caused an amplifier blowup on 432, the first night, after only 25 minutes of operation. At this time their signal was being widely heard, but receiving was down. Between then and the second night's schedule, feverish effort got the 432 setup back into working condition, for 1 1/2 hours of service and 11 QSOs. Stations worked on 432 were W1SL, W1JAA, K9AQP/1, K2UYH (2 contacts, one on ssb), W3CCX/3, W4ZXI, K8UQA, W9WCD, ZE5JJ, and PAØSSB. W2SZ/2 and KØTLM were heard, as were other signals not yet identified, but audible on the taped record.

Part of the trouble this time resulted from the operation on two bands, which made feed compromises necessary. At least one more test will be coming up soon, this time on 432 only, with optimum feed arrangements for that band only. Date is not yet set, but we'll get the word around when it is.

We are also considering starting an EME box to be published every few months. It could list activity by bands with number of different stations, number of states, and countries worked. Please pass along your ideas.

VHF Station of the Month

Even before he decided to build a 2-meter EME station Barry Forrest, WA2BIT, Far Rockaway, LI, had a good signal up and down the East Coast. But you should hear it now that he has his 8877 feeding a 160-element collinear at 88 feet. Since then, from this vantage point near Washington, DC, Barry has one of the "really big" signals out of the New York City area. If his tropo is impressive, Barry's signal off the moon must also have something going for it. So far since completing his EME setup, Barry has worked W8KPY, K2RTH, (the hard way to span a few miles), W6PO (everybody works him), K8III, K1WHS, W4WNH/8, SM7BAE, and VK5MC. By way of demonstrating that he still has some things to accomplish, Barry reports hearing but so far not working K6QEH, WA7BJU, K1KOP, VE2DFO (on SSB) and K5BXG. Barry is

particularly looking for Europeans, but will schedule anyone.

West Coast VHF Conference

Word comes from Louis Anciaux, WB6NMT, that the 1975 West Coast Vhf Conference will be held May 2, 3, and 4, at the Sheraton Inn on Harbor Island. This is right across the road from the San Diego airport, and convenient for those flying in by commercial airlines or private plane. Antenna gain measuring contests for 144 through 1296 MHz will be among the interesting and informative events. A noise figure contest will be held, with equipment available so you can tweek up your converters and preamps before subjecting them to the fray. Of course there will be worthwhile technical presentations and lots of good fellowship. More information – if you intend to be there – from Lou at 4519 Narragansett Avenue, San Diego, CA 92107. Advance registration is $2.50. At the door it's to be four bucks.

VHF Beacons

Mention has been made in these columns in the past of the use of TV carriers as propagation condition indicators. Now Ed Sleight, K4DJC, comes up with another suggestion. He points out that numerous stations operate with continuous carriers between 120 and 136 MHz, generally with powers of about 200 watts, into omnidirectional antennas. Most operate 24 hours per day, providing weather and other information to pilots. The service is called Airport Terminal Information Service (ATIS). Since the stations are below the 2-meter band and above the fm broadcast band, they should make good indicators of the possibility of E_s tropo, and aurora. A request, with stamped envelope, to Ed Tilton, of ARRL Headquarters, will bring a list of ATIS stations.

Speaking of beacons, be reminded that Larry Kayser, VE3QB, Ottawa, Ontario, operates VE3TEN on 28.175 MHz. For those who may be interested, he has offered to also operate a similar beacon on approximately 50.1 MHz. Those having opinions of this are asked to pass them along and we'll forward them to Larry.

K7ZCB, Boring, OR, makes the point that hearing DX beacons, without knowing how to get the attention of the beacon operator, can be very frustrating. Reception of beacons, even though it doesn't result in QSO's, is still worthwhile, provided the reception is reported. It's better to have the beacons than no signals at all, at least in this editor's opinion. If there is provision for breaking a beacon (in the manner used with TI2NA, for example) we would like to know, so that we can publicize it in these pages.

OVS and Operating News

50 MHz From reports received, our lowest vhf band did not favor us with too much in the way of DX in January. WA1OLK of Spencer, MA, mentioned openings on Jan. 1 (QSO with W4GJO) and on the 3rd to 4, 5, 8, 9, and 0.

WA5IYX, San Antonio, found January to be above normal in number and duration of E_s openings on 50 MHz. Pat observed 16 different periods of sporadic-E on 6, on 12 different days. His report for February, through the 18th, shows the band open on 8 days, with Feb. 7, 8, 11 and 17 the best of the month. The morning of Feb. 8 was exceptional for E_s muf in the winter months, with Minnesota and Wisconsin fm stations receivable for

2-METER STANDING

K1HTV	36	8	1310	K5VWW	26	7	1930
K1ABR	35	8	1478	W5SXD	25	6	1265
W1AZK	34	8	1412	W6PO	26	10	8000
WA1FFO	34	9	2624	W6GDO	18	5	1326
K1WHS	30	10	2500	W6WSQ	16	4	1390
K1UGQ	30	8	1370	K6QEH	13	4	2580
W1VTU	29	8	1296	K6HAA	13	4	2580
K1BKK	29	8	1275	K6JYO	13	4	1240
W1JSM	29	8	1100	K6HMS	11	4	1258
K1PXE	28	7	1250	WA6JRA	6	3	2591
K1MTJ	26	7	1250	W7JRG	28	6	1320
W1FZA	25	9	2750	K7NII	25	5	1290
W1HDQ	24	7	1040	K7ICW	18	4	1278
K1RJH	22	7	1450	WA7BBM	14	4	1250
K2RTH	39	10	2590	W8KPY	42	10	2050
W2AZL	38	9	2500	K8AXU	38	8	1275
W2NLY	37	8	1300	W8IDU	36	8	1150
W2CXY	37	8	1360	W8YIO	36	8	1100
W2ORI	37	8	1320	W8IDT	36	8	1150
W2BLV	36	8	1150	K8DEO	35	8	1200
WA2FGK	33	8	1340	K8HWW	34	8	1164
W2CUX	33	8	1334	WA8PIE	32	8	1000
WB2WIK	32	8	1080	W8NOH	31	8	1165
WA2CJK	31	8	1160	WA8LLY	28	8	820
W2CRS	30	8	1270	W8TIU	24	8	1000
K2CEH	29	8	1200	W8KBC	24	7	900
W2CNS	27	8	1150	K8ZES	22	8	675
K2DNR	27	7	1200	W9YYF	43	9	4500
WA2BIT	25	9	10,000	K9UIF	43	9	1575
WB2SIH	25	6	1000	K9UGD	42	9	1300
WA2UDT	24	7	1020	W9AAG	41	9	1200
WA2EMB	23	6	1335	K9AAJ	41	9	1200
K2BWR	23	7	1350	W9OII	37	8	1075
WA2PMW	23	6	1000	W9BRN	36	9	1260
W2DWJ	23	6	860	W9PBP	34	8	820
K3CFY	37	8	1237	K9HMB	33	10	1820
W3RUE	36	8	1250	K9UNM	33	8	930
W3BHG	35	8	1260	WB9NLF	30	9	1819
W3BDP	29	8	1225	W9JDJ	29	8	1000
W3LNA	27	8	970	KØMQS	46	10	10605
W3OMY	26	8	800	WAØCHK	44	10	1650
K3CFA	25	8	1200	WØLER	44	9	1440
W3TMZ	24	8	1000	WØDQY	41	9	1300
W3HB	23	8	1310	WØLFE	40	9	1100
W3ZD	22	8	950	WØRLI	36	9	1293
W3TFA	21	8	1342	WØPW	35	9	1380
K3QCQ	21	7	975	WØENC	35	9	1360
K3OBU	21	7	930	WØEMS	34	10	1320
K4GL	40	10	2340	WØLCN	33	9	1100
W4HJQ	39	9	1150	WØPMN	30	9	1244
W4WNH	38	9	1350	WØDRL	27	9	1295
W4HHK	38	9	1280	WØMJS	26	8	1118
K4IXC	37	9	2480	VE1ZN	7	2	500
K4EJQ	37	8	1125	VE2DFO	39	10	10605
W4VHH	36	8	1125	VE2YU	32	8	1200
K4VW	35	8	1440	VE2BZD	23	7	1309
K4QIF	35	8	1225	VE2HW	18	6	800
W4FJ	34	8	1150	VE3ASO	38	9	2140
W4AWS	29	8	1350	VE3BQN	37	8	1250
W4ISS	29	8	1000	VE3EZC	33	8	1283
K5BXG	44	10	1553	VE3AIB	29	8	1340
W5UGO	43	10	1398	VE3EVW	29	8	1100
WA5UNL	42	10	1700	VE3DSS	27	8	1200
W5ORH	42	10	1507	VE3CWT	27	7	1072
W5RCI	42	9	1289	VE3EMS	27	8	1100
W5WAX	39	10	1370	VE7BQH	12	3	7920
K5WXZ	38	10	1450	KH6NS	3	2	6000
W5HFV	38	10	1285	SM7BAE	1	1	11055
W5AJG	33	9	1360	VK3ATN	4	4	10417
W5UKQ	33	9	1290	VK5MC	3	3	10000
W5LO	39	7	1325	ZL1AZR	2	2	11055
K5PTK	29	9	1330				

Figures are states, call areas, and best DX in miles.

(Continued on page 142)

YL news and views

CONDUCTED BY LOUISE RAMSEY MOREAU,* W3WRE

The YL Story — Asia

ASIA WAS FIRST represented by YLs in amateur radio in 1934 when China issued licenses to two women, AC8HNB and AC8DS; and by Japan's Chyono Suzuki, J2IX, who is still very active with the call JH1WKS. Since "Suzi" received her call, the YL population in Japan has become the largest in Asia, with over 100 members of the JLRL, the very active YL club of that country.

India's growing list of women amateur radio operators includes some 25 calls, VU2AIC, VU2CP, VU2DNZ, VU2EV, VU2JD, VU2KY, VU2IS, VU2LA, VU2LD, VU2NC, VU2NKZ, VU2MI, VU2OV, VU2QC, VU2QF, VU2QI, VU2SC, VU2UAZ, VU2WW, and VU2YL. Of that list, seven are also YL-OM couples.

The Philippines have a special station, DU1GSP, issued to the Girl Scouts of the Philippines, the only DX country to grant this type of license, as well as having 3 YL operators, DU1AJ, DU1JC, and DU1NE. On the mainland, Korea's 4 YLs are HM1AM, HM1DG, HM1DR, and HM5BG.

There are three YLs in Ceylon, 4S7YL, 4S7SI, and 4S7SU, and also three in Iran, EP2EA, EP2WA, and EP2YL. Thailand has granted licenses to 2 women, HS1ABF, and HS1AEY. MP4 also has two YL calls with MP4BFC in Bharain, and MP4QBO in Quatar.

Turkey and Hong Kong have just one YL operator each, TA1RT and VS6FH. There is also Maldive Island's 8Q6AC to add to the YL picture there.

Israel's 4X4NW, 4X4YL, and 4X4CX are three who represent the growing interest of women in amateur radio in that country.

In Jordan, JY2 is the only known YL call in that country, but some 30 others are being trained as operators, and may eventually add to Jordan's YL picture.

While there is no licensed YL in Vietnam in 1975, there was in 1935 when that country was known as French Indochina.

More recently, Mongolia's first YL was licensed with the call JT2RA.

The YL story in Asia, as in Africa, is a story of growth since 1934 when the entire continent was represented by just three women. In several countries the feminine touch has been briefly evident, as in Nepal when a licensed amateur radio operator was on a visit. In others, as in Vietnam and China, it was there and, we are sure, will appear again. The YL picture world wide is growing as women all over the world are reaching out, via amateur radio, to meet and know each other.

1974 Trillium Weekend Results

First Place	VE3FSA, Reg Pearson
Second Place	*VE3PQ, Paul Edgley*
Third Place	VE3CMQ, Ralph Miles

The Ontario Trillium with the highest score for the contest was Barbara Newman, VE3BFN. TOT *winners in the* "Lucky Draw" were VE3ASZ, VE3ARG, VE3CLT.

TOT members are not eligible for the contest award, but are there only to give points to participants. The winners will receive the Trillium Plaque. Second and Third place winners will each receive a certificate.

Canadian YL Special Calls

Looking for a different YL call? Nova Scotia's 26 YLs may be using CH1 as a prefix to mark Truro, Nova Scotia's 200th anniversary.

The gals in Calgary will also be using a different prefix in 1975. The special previx CY6 was granted for the Calgary Anniversary Year. The CLARA publication *Canadian YL Directory* lists 14 women amateur radio operators living in Calgary, which is

Cindy Bishop, WN4FCH, YLRL Novice Correspondent.

* YL Editor, *QST*. Please send all news notes to W3WRE's home address: 305 N. Llanwellyn Ave., Glenolden, PA 19036.

more than enough to qualify for the Calgary Century Award by working YLs only.

What is "33?"

We keep being asked "Why 33, and what does it really mean?" The answer is best given by the YL who originated it, Clara Roger, W2RUF.

Clara says, "Back in the days when YLs were few and far between on the amateur frequencies, long before YLRL was organized, warm friendships began because we were working the same gals constantly. I thought we should have something other than 73 as a signature, and 88 was just a bit too mushy, so I started using 33. It caught on as a signature between YLs.

This friendship frequently calls for something a little warmer than 73, so, when YLRL adopted it in 1939, the meaning was defined as "Love sealed with friendship between one YL and another."

That is the answer from the gal who originated the idea. But 33 is not limited to YLRL members alone, it has become the "touch of the YL" between any two women amateur radio operators.

Clara Roger, W2RUF, the YL who originated "33".

YLRL Membership

In answer to newly licensed YLs who do not know YLRL members, and who have requested information about YLRL, all requests for membership should be sent to the membership chairman of her geographical area. They are: Eastern United States, Marge Campbell, K4RNS, 65 N. Arbor Drive, Ormond Beach, Florida, 32074. In Western United States, Beth Taylor, W7NJS, 14637 S.E. Fair Oaks Ave., Milwaukie, Oregon, 97222. The International Correspondent, in charge of DX membership and the YLRL Adoptee Program is Ione O'Donnel, WA2DMK, Newcomb, N.Y. 12852.

YLRL Contests, Novice Award

Novice participation in all YLRL contests is welcome. The club offers a special certificate to the Novice who submits the highest scoring contest log, and the membership will be looking for these operators in the Novice section of the bands during the cw portions of the contests.

All amateur radio operators with a Novice license are eligible to take part. The YLRL sponsored contests are Howdy Days in September, YLAP in October, and the January DX YL to North American YL. These are restricted to YL operators only. The YL-OM is open to anyone who wishes to participate.

Annual CLARA Day Contest Results

First Place	Cathy Hrischenko, VE3GJH, CLARA member
Honorable Mention	Diana Van Der Zande, VE8NN, CLARA member
Non-member YL winner	Bill Flynn, VE5WF
Second Place	Malcolm Timlick, VE4MG
Third Place	Gordon Samson, VE2DKK

CLARA member first place received a club pin and certificate. Second prize was a CLARA jacket crest.

Non-member prizes were trophy and certificate first prize. Second and third place winners received certificates.

PJ-YL Club 1976 BARC Hostesses

The Penn Jersey YL amateur radio club has been asked to serve as the hostesses of the women's activities at the Bicentennial Amateur Radio convention of the Atlantic Division, ARRL, in July 1976. Carolyn Current, W3GTC has been appointed Chairman of the YL program, with the PJ-YL membership assisting as official hostesses.

QST

Left photo: 1975 PJ-YL officers seated l-r, W3TNP, Bert, Secretary; W3AAU, Edith, President; standing, l-r, K3FYS, Mollie, Vice President; K3YPH, Dottie, Treasurer. *(W3AAU photo)* Right photo: NYC YLRL members with a guest from Australia. Seated l-r, Maris, VK3KS, Christine, WB2YBA, 1975 YLRL President, Madeline W3EEO, Ruth, WA2RIX. Standing, Sue, WB2ZZJ, Edith, WB2NTT. *(WB2YBA photo)*

Silent Keys

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

K1ABE, Edgar J. Bowser, Rumford, RI
K1CNK, Norman B. Friedman, West Haven, CT
W1MHJ, Edward J. Mullett, Melrose, MA
WA1MQV, Gary E. Young, Groton, CT
W1OBQ, Albert M. Jackson, Feeding Hills, MA
W2ABL, Edward V. Edwards, Wall, NJ
W2BMQ, *Anthony P. Garzillo, Oceanside, NY*
W2DMJ, Frank A. DeBartola, Wood-Ridge, NJ
K2EC, Samuel W. Knapp, Southhampton, NY
K2IES, Joseph P. McCrea, Rye, NY
WB2JZM, Howard Parker, Scotch Plains, NJ
W2KXR, Samuel H. Fried, Clifton, NJ
W2NMB, Lewis Hirsch, Maplewood, NJ
W2QH, Donald G. Goetcheus, Green, NY
K3LPC, Charles M. Lukens, Selinsgrove, PA
K3MK, Harland D. Hotham, Sarver, PA
W3PQB, Roscoe K. Christman, Trumbauersville, PA
WA3SNJ, Clyde M. Reed, Pittsburgh, PA
W3VXZ, Randolph Lightner, Hollidaysburg, PA
K3YKC, Francis McDaniel, Washington, DC
K4BZR/W9FCO, Earsel D. Frick, Sr., Jacksonville, FL
K4CR, Harold Cagle, Jonesboro, TN
WB4EMA, Sidney C. Liedman, Maitland, FL
WN4EOB, *Sarah F. Blossey, Venice, FL*
WB4GCI, Herbert A. Snow, St. Petersburg, FL
WA4IAD, Clarence Hudson, Albany, GA
W4JIA, A. Curtis Bryant, Newport News, VA
K4JRQ, *Kenneth M. Zinn, Hollywood, FL*
W4LKT, Herbert Evans, Daytona Beach, FL
WA4PTQ, Craig D. Moseley, Winston-Salem, NC
K4VWL, Roy Bridwell, Startex, SC
W4WIZ, Alvin W. Purser, Macon, GA
W4ZUK, Frank M. Rule, Fort Lauderdale, FL
W5AVA, Edgar G. Chatterton, Wichita Falls, TX
K5GDV, Francis L. Schuler, Los Lunas, NM
WN5LWW, Clarence R. "Joe" Bieber, Oklahoma City, OK
W5NKV, Harold L. Morris, Anson, TX
W5RBN, William L. Haynie, El Paso, TX
W5VN, Ernest R. Arms, Senatobia, MS
W5ZLP, Jack Hemby, Columbus, MS
W5ZN, Ed Nettleton, Port Aransas, TX
W6CC, Edwin C. Garrette, Colusa, CA
K6EAQ, Edward R. Shedd, Santa Barbara, CA
KH6GIX, *Meredith M. Millner, Honolulu, HI*
WA6GQJ, John W. Wallace, Sr., Olancha, CA
K6MFS, John C. Petersen, Long Beach, CA
W6NWY, Joseph F. deGregorio, Lompoc, CA
W6NZY, Walter G. Smith, Alameda, CA
WB6TVL, Charles S. Smith, San Francisco, CA
WA6VJV, Harvey F. Helling, Irvine, CA
W7AWG, Raymond S. Allen, Mesa, AZ
W7BXT, Edward D. Brown, Buhl, ID
W7BZJ, Emmett E. Connor, Jerome, ID
W7FNG, George M. Minato, Seattle, WA
W7FRT, Orval M. Nunn, Salem, OR
W7FSG, Chester A. Bruner, Phoenix, AZ
K7LKR, Donald A. Hansen, Westminster, CA
W7NH, Nellie H. Hart, Jerome, ID
WA8CXY, Paul R. Hubbard, Zanesville, OH
W8DFC, Owens A. Hutcheson, Princeton, WV
W8HCG, James W. Beattie, Kettering, OH
WB8HYN, Richard C. Ramsey, Detroit, MI
W8KHY, John Quincy Adams, Battle Creek, MI
K8KNU, Robert W. Pease, Columbus, OH
WA8NWD, Warren A. Spencer, Sault, Ste Marie, MI
W8RO, George Huberty, Jr., Cleveland, OH
K8USF, Andrew E. Szucs, Fairview Park, OH
W8ZBT, Ivory J. Olinghouse, Niles, MI
K9DBF, Edgar E. Miller, Eau Claire, WI
W9FIF/K4TGJ, William Ash, Windermere, FL
W9FXO, Ernest K. Laskowski, Wood Dale, IL
W9IUT, Arthur E. Swan, Waynesville, IL
W9KNV, Martin Carlson, Brookfield, IL
WB9KYO, Denny D. Rotramel, Indianapolis, IN
W9LOQ, George P. Chievrue, Harwood Heights, IL
W9ME, Vern Slagle, Ft. Wayne, IN
K9PPJ, Donald E. Glisson, Chicago, IL
WA9PSA, Donald E. Morris, Thomson, IL
K9QAN, Charles G. Sperling, Richmond, IN
W9QMX, Edward J. Gronowski, West Allis, WI
W9VYR, Malvin R. Schneider, Ashkosh, WI
WA9WEN, Norman H. Nilsson, Libertyville, IL
WA9ZJF, Walter H. Ziebarth, Chippewa Falls, WI
WAØANW, Donald W. Schoeppner, Templeton, IA
WBØBHD, Fredrick J. Moulton, Attica, KS
WØHMX, Henry O. Schulze, Robbinsdale, MN
WØLMS, Fred A. Young, Concordia, KS
WØPR, Stanley J. Mahurin, Brookfield, MO
WØQVY, Philo H. Schultz, Pierre, SD
KØVPM, Milton R. McCoy, Hopkins, MN
KØYBD, Oswald D. Graves, Clayton, MO
VO1AS, A.F. Wood, St. Johns A1C 3E6, Newfoundland
VO1CV, Harold H. Keeping, Port Aux Basques, NF Canada
VE1LG, Fred E. Bath, Middleton, N.S. Canada
HC1XA, *Xuaco Alvarez, Quito, Ecuador SA*
HC2MJ, Victor M. Janer, Guayaquil, Ecuador, SA
HC2SW, Stanley L. Parker, Guayaquil, Ecuador, SA
VK2WU, Lew Macdonald, Charlestown, N.S.W., Australia
ZL3CC, J. B. Elliott, Spreydon, Christchurch, New Zealand
EI5BZ, Benjamin C. Rosset, Loch Gowna, Ireland

Lossless Radiator

(Continued from page 37)

occasion arises to change bands, which is handled by plugging in the loop for the desired band. Perhaps the use of a multiband tuner for the final can be of assistance here. Such circuits have been used with considerable success in the past.

So there you have it. The very latest development in rf radiation. No more antenna and lead-in losses; the hottest rf element[1] in your transmitter is now radiating for you. Output power is equal to *input power. Lossless radiation has been achieved.* QST

[1] **For safety, it is essential that the builder of a lossless radiator system takes steps to avoid high voltage (such as from the plate supply) from *appearing at the radiating element. This should be* accomplished by inserting an adequate blocking capacitor in the high-voltage cable which goes from the shack to the rooftop.**

Sister Cities

(Continued from page 49)

to amateur radio. Anyone wishing to have one of these write to Sister Cities Headquarters at the address above, or, send a 9 × 12 self-addressed stamped manila envelope with 70 cents postage to Project Oscar, Foothill College, Los Altos Hills, CA 94022.

The opportunity exists for amateurs everywhere to expand their services to their own communities, and, hopefully, at the same time, help amateur radio itself. You are invited to join this effort via Sister Cities International. QST

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

W h e n :

A six-inch scorpion, disturbed by Jack's keying, scuttled out of the transmitter. He slashed at it with a handy screwdriver and half a dozen young scorpions leaped off their mother's back to scurry in all directions . . .

Yechhh! "Marooned in Paradise," a tale told by veteran sparks E. Jay Quinby in Society of Wireless Pioneers' *Sparks*, Volume III, borrowed from the nostalgia file of ex-W9HPJ, revisits the hurricane season of 1912 to further round out the radio history of strategically situated Swan Island. HR6SWA, following a sequence of popular KS4s, is the current big ham signal out of that spot. There some sixty years ago a succession of rugged radiomen manned the one-kW spark and Perikon receiver of Tropical Wireless under the absurdly simple call US. Using a jazzy combination of landwire code and International they maintained liaison through fierce low-frequency atmospherics with Key West's two-kilowatter and Audion, Havana's ten-inch-coil Marconi installation, the Trinidad (Cuba) half-kW Telefunken setup and a variety of wandering steamers and tugs whereon crystal detectors were the rule.

Fending off friendly malarial mosquitoes, assorted vipers, armies of roaches, madly itching fungi, skin-sloughing humidity and other Caribbean delights under mounting static, operator Jack Fogarty managed to detect the frantic CQDs (SOSs) of OA, banana boat *Olinda*. To power US's spark Jack had to crank up a balky gas engine and deftly flip on the heavy alternator drive belt without mashing fingers. Turned out that *Olinda* had lost its propeller in a budding hurricane and was dragging anchor toward the rocks of Cuba's Cape Antonio about eighty miles from Swan. Fogarty lost precious time restringing a guy snapped at the 150-foot level by rising wind and rain but he succeeded in alerting the tug *Rescue* via complex priority relays through Trinidad, Havana and Key West.

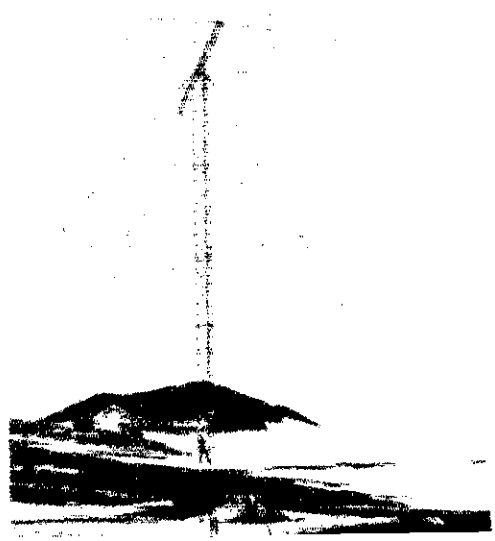
Rescue showed up just in time to pull little *Olinda* to safety from white water. Chatting back and forth as was the informal fashion in those early days, Fogarty discovered that OA's familiar fist belonged to Ray Greene, an old seagoing crony. Ray was plenty scared by his narrow escape, and since both worked for parent company United Fruit, Jack had little trouble effecting an exchange of berths. Ray eagerly grabbed the debilitating shore assignment and Jack gladly fled the island for more sanitary duty elsewhere. Fogarty failed to tell Greene that the previous Swan operator succumbed to paranoic alcoholism and was forcibly removed.

That was the awful year of *Titanic's* loss, a landmark in marine wireless. By rapid regulation wire-type Morse was thoroughly supplanted by the slower but more easily managed International version, excessive free-language chatter was severely discouraged and numerous other ship safety rules were inaugurated. Many more years were to pass, however, before the vital communications outpost on Swan Island assimilated sufficient qualities of home.

† † †

W h a t :

Time again to let the new blood do their DX thing in "How's." Generals may have deserted 21 MHz in droves because of the higher-frequency shortwave depression but a stubborn Novice contingent still ekes out a DX living there. Nowhere else to go, really, because the 40- and 80-meter WN subbands are allocated quite apart from frequencies normally used for radiotelegraphy in most overseas regions. Novice DX results may be shrink-



KC4USS has your QTH of the Month at 77.8S-166.7E where a KWM2 and 30S1 feed this 6-32-MHz log periodic. That's famed Mt. Erebus in the background. The outbreak of spring up our way means that winter soon will clamp its icy grip on desolate McMurdo Station. *(Photo via opr. M. Fussell).*

* c/o ARRL, 225 Main St., Newington, CT 06111.

ing but not their enthusiasm. A few observations from them now, keeping in mind that many will be ex-WNs by the time this *QST* gets around. . . . Started out with fifteen watts, a dipole and one crystal. Next came a Globe Chief with VFO, then a 2NT. First 15-meter QSO was WN7YFE, then WNØIAY for a new state. DJØ PJ9 and JH1 contacts made me a real DX hunter. A folded-dipole two-element beam is a great improvement over the old 7-MHz dipole. (WN8RKF) . . . I have a few DX contacts among my first 400 QSOs but current conditions surely are rough on us Novices, limited as we are in power and frequencies. (WNØNFV) . . . My 40-meter dipole hooked Puerto Rico, Brazil, Fiji and the Canal Zone in my first month on 21 MHz. (WN2WYL) . . . Got about a dozen countries with my first rig, a Challenger, an NC183D receiver and 75-foot end-fed wire. Then came an SB102, some good 15-meter openings, about 25 new countries including CR6OR for WAC. Alaska frustrated WAS, though. Crossmode QSOs, cw to ssb, are still lots of fun on 15. Some of mine were with HP1MN, FI2WX, WA8TFJ/YV6, WB4HIT/VP7, ZF1AG and 8P6BG. Being a Novice can be great fun at times but when 15 is dead there's plenty of incentive for that General ticket and a move to clearer (DXier) frequencies. (WN1RFD) . . . An MJF cw filter helps my AX190 perform well on 15 cw where my 7-MHz dipole seems hot endwise toward South America, better than a broadside dipole. No DX on 80 meters yet, and only an XE1 on 40. (WN1TGG) . . . I think it's important that we little guys without beams and expensive gear get our two cents on record. After I replaced my 40-meter dipole with W1CER's *QST* Novi-Loop I quickly hooked KP4 KZ5 LU PJ PY ZL and other goodies. Now *that's* an antenna! Fifteen is very tricky these days and I'll be glad to hit 20 meters with my new General ticket, an SB102 and 3-element rotary. (WN8PNJ) . . . A four-element monobander helped by HW101 to some interesting 21-MHz DX despite erratic propagation. Qualified for the Advanced license and soon will be trying my DX luck on SSTV. (WN6UCC) . . . Several Costa Ricans on 15 seem to enjoy ssb-to-cw contacts with WNs. My inverted-V dipole does well toward South America and New Zealand. (WN4FZQ) . . . Sure hope this spring produces some of the 21-MHz DX that poured in a year ago when I caugh CE CX F DJ G HA KH6 LU OE ON PY SP TI UA YU ZF and ZL. (WN4DRZ) . . . Closed my Novice career at 52/38 countries worked/confirmed plus WAS and WAC. Yes, fifteen seems to be dying but now and then some tremendous DX signals break through such as 20-over 9X5PT. I'll be putting a new two-element three-band quad to work as a General. (WN6UFW) . . . Who says 15 is drying up? Recently worked CR G HI JH KG4 KZ5 LU OA PY TI VP1-2-9 YV ZL and 9X5 on the band. Now let's have some WN action on 28 MHz. (WN2ISJ) . . . ZL2ACP often calls CQ WN around 21,150 kHz. TI2AJF and ZS6BKS also enjoy working 15-meter Novices. (WN4GHU) . . . While stalking DX on 40 meters I've been browsing through 165 old *QST*s thanks to neighbor W9RYA. CE6DT and WH6ONT are my best 7-MHz catches so far. (WN9LXK) . . . WN6ARP joins the aforementioned correspondents to report this sampling of DX still answering Novice callers on 21 MHz: CEs 1DM 3EQ 3HN 6DT, Cos 2BM 6AH 6VM, CP7GM, CR6s CK OR, CXs 1NE 2AAQ 7AE, DJs 7AK ØVO, DKs 2UB 8NM, DMs 4X1 2AQI, EI9CF, EL2s DS NS, F6BRP, FG7AO, Gs 3AMR 4BNU 4CUN 5AQZ 6YJ, GD4AM, HC1PZ, HI8s CRO LPN, HKs 3CTJ 7BDA, HPIs AC MN, HV3SJ, JAs 2MEF 6GND, JF1UJF, JH1s GTV VOE WIX, KA6WS, KGs 4FU 4FX 6AAY, KH6s IFY IGT IJS, KL7HHX, KP4DHW, KX6s GS MV, KZ5s AC ASN VV WB, LUs 1DOW 1HDC 2FEQ 2EN 5DAK 5DVO 8EIO 6DJX 6EF 8HAP 9FAZ, OAs 2CD 4AOB 4SS 4XK 6CV, OH2BAD, OK1AUG, OZ6PI, PJs 2JW 9JR, PYs 1BDU 1DUB 1HQ 1MCC 1NBA 1NFW 2BCQ 2CJW 2FIK 4UAN 5C1G 8RW 8ZAI 9OK/1, PZ1BC, SP5PWK, SV1DO TI2s AJF BEV HRC WD WX WTC, IP2BX, VE8s CF Ps, VK2 2ADE 4RF, VPs 1MPW 2LAW 7BA 9HL, WB4BUQ/8R1, WH6s 1DS 1FN 1MI, WP4s DRT DSZ, XEs 1YL 2PRS, YNs 1FWN 4IM, YO8FZ, YUs 1NPZ 1OBY 2BQR, YS1ESH, YV4s AGP AJZ AKI, ZF1s AG SF, ZLs 2BCP 2GH 3JC 4NH, ZSs 1ANT 6AFC 6BKS, 3D2GA, 6Y5DE, 8P6BG, 9H1CH, 9X5PT and 9Y4MH. Over half a DXCC in that batch, darned good mileage on the few sunspots now decorate Old Sol.

† † †

How:

Yeah, how's DX? WB5HVY, who had a fun DX tour as WN5HVY, contributes a thoughtful answer to the question frequently put by brand new WNs: *What's* DX? Our usual space pinch necessitates considerable abridgment but here goes. . . .

DX, the radio abbreviation for "distance," means different things to different individuals. I can remember the thrill of my first three-mile contact. Almost every QSO after that provided a new DX record for me for a while. My best DX as a Novice was VQ9R in the Seychelles, a distance of 9600 miles. How does a Novice with low power and only a fair antenna work that many miles? Well, as a WN I used an HW16, external HG10B VFO and a monoband beam for most of my DX hunting. The rotary was mounted on a 80-foot heavy duty TV push-up pole and was very effective for both transmitting and receiving in the selected direction. But a beam is not a must. Neighbor WB5JBW, also using an HW16, had a simple coax-fed dipole that worked almost anything I did -- and some I didn't. My transmitter had a modest 30-watt output on 21 MHz. Stories abound about hams working the world on much lower power. For the serious DXer, regardless of power, I urge the use of a VFO although I did work five continents with crystal control.

The main secret in getting consistent DX results is to listen, *listen*, LISTEN. You'll never work 'em if you don't hear 'em. I was always confident of being able to work anything I heard as a Novice. With more careful listening you'll be amazed at what you can work. When you tune in a DX station make sure he is ready for your call before you start pounding the key. Interrupting his QSO before he finishes is a good way to get him to ignore you no matter how well he hears you. Call him close to his frequency. Sending his call once and yours twice, a 1X2, usually does the trick. There may be many others calling him and callers with good timing frequently slip in ahead of louder stations whose calls are too long or ill-timed. Patience is a *must*. My first African took me two hours to catch.

Where's DX? Almost all my foreigners were worked between 21,110 and 21,135 kHz but a goodly number were scattered all over the 15-meter Novice band. On 40 meters I found 7135 kHz a good spot for such western hemisphere DX as Cuba, Mexico, the Carihbean, etc. Eighty meters can surprise you, too. WN5IJE caught a Cuban on his local net frequency one night. Fifteen, despite present propagation problems, remains *the* Novice DX band. When 21 MHz is right you'll find Europeans popping through in the late mornings, Africa and South America in the early afternoons, the Pacific and Asia in late afternoons and evenings. Apparently a few more years must pass before 15 again becomes reliable for the day-after-day solid DX openings prevalent in the late '60s. And then 28 MHz will become hot WN DX territory as well.

In my experience most DX stations will exchange only signal reports, QTHs and names with you. Many of them depend on your RSTs to help them check their equipment so do give honest reports. Sometimes you'll run across DX operators who really like to chew the rag. Here you get the thrill of exchanging ideas with someone thousands

YV5EED (right) confirmed WN4FVU's first DX QSO in person while Martha and OM WB4ZNH visited Ramon's Caracas hamshack last September.

of miles away. But let the DX station set the pace. If he's one of those rare ones who visit the Novice bands to give as many WNs as possible a chance to work him, then the quick RST exchange is the type of QSO to have. One more thing: Almost all publications discourage the calling of CQ DX by U.S. stations. I've found, however, that when a band is open and lots of DX can be heard CQ-DXing can be quite successful. You won't get many exotics this way but you can get DX answers. One of my biggest thrills came one morning last November when DX stations kept calling and working me one after the other for almost two hours. Sure made me feel like rare DX myself!

Now 73 and CU on 15!

† † †

Where:

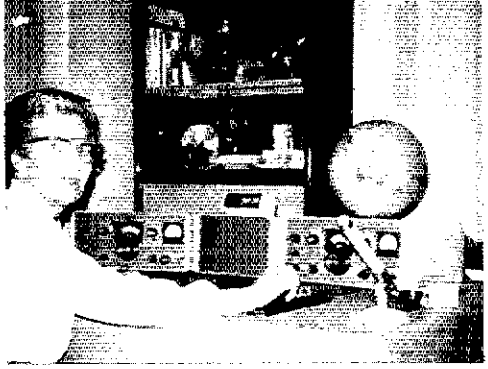
NORTH AMERICA – A35FX, GC3YIZ, HH2WF, HKs 3DMH ØBKX, I4SHN, KA6WS, KL7FA, KZ5AA, OA2CD, PJ9CQ, SM7ACB, UR2DE, VE8NN, VK6MK, VPs 1FF 2GLE 2MJK 2MOT 2MQ 2MSU 2VBH 5SF 5WS, VRs 1AA 6TC, VS5MC, W6GBY/6Y5, YBØ ABD, YJ8BL, YS1GWE, ZD8MF, ZM7AH, 7P8s AQ and AY, along with QSL aides Ws 4SME 5MYA 5ZF, K3s RLY TUP, WA6AHF, WBs 4SHB 5IZN, DK5JA and ZL2AFZ are this month's "QSLers of the Month" applauded for quick card comebacks in mail from "How's" correspondents W4FL, Ks 2HYM 6TLG, WA4BTC, WBs 2ISJ 6UEW 8FLE ØCGJ and WN6ARP. Any worthies out your way? . . . We're available as QSL managers for overburdened operators at the DX end, the rarer the better. (WA2SOU, WBs 2ISJ and 4ZSO) . . . WØGX's QSL managership for 3E1KC (HP1KC) dates from January 6, 1975. (K9KEV) . . . My QSL stock for YN4IM was delayed due to the printer's illness but they'll be getting around eventually. Promise! (W5QPX) . . . My tour as TI2WX's QSL manager dates from the first of this year. (W4MYA) . . . Sure would be nice to know whether or not a QSL would be forthcoming before one spends hour after hour in some massive pile-up! (WB5KPN) . . . Commonwealth of the Bahamas becomes the 148th member country of International Telecommunications Union and trades its old VP7 label for the C6 prefix. C6AAA is ex-VP7AA, C6AAB is former VP7AB, etc. (DXNS) . . . CY is a fresh Canadian identifier, CY6NW really being VE6NW. (WCDXB) . . . 'Alp! Assistance! Aid! These parenthesized brethren seek secrets toward prying pasteboards from holdouts specified: (W1JUB) FP8DG, OX3YY, VP7CQ, YV5CET, ZB2CI, 4X4TI, 9L1GC, all worked the QRP hard way; (K2HYM) CN8TC, YS3EL, 9L1GC; (K6DT, then W6VOE) C3AB of '51, EA9DC '52, TA3AF '51; (WA3ERG) TU2s AF BK '72, WB5APF/KC4, 5Z4OA, 9H4C all '73; (WA4DLY, then WN4DLY) OZ7AN, SK2DR both '73; (WB5KPN) FGØAE, LU1ZC, VP8JT, VS6EG, YA3AG, ZP5TT, 3AØFY, 5Z4MO; (WB8FLE) PYØCZR, VQ8CC, VR4CR, VS9ASP, XW8CB, ZC4GB, 9V1NV all '67; (VK2BC) FB8ZZ and FM7WF both '71. Any 'alp?

AFRICA – So far VQ9BP reports only 624 QSLs received for his group's recent Desroches DXpedition, or a response of 30.8 percent. Sixty-one of 104 countries worked produced cards. QSLs arriving without self-addressed stamped envelopes or International Reply Coupons will be answered via bureaus with probable delay of six months or more. (WCDXB) . . . Those C5s are former ZD3s at the same Cambia addresses. C5s AG AM and AR are ex-ZD3s G M and R, etc. (DXNS) . . . Operator Steve of Antarctica's ZS1ANT indicates that his QSOs from that station may be confirmed through ZS5FA. (DXNS) . . . For three years I've bombarded FR7AM with every entreaty known to man but still no Europa QSL. Only stony silence, so I doubt that his latest Glorioso QSOs will be confirmed. (K2AGZ) . . . P. O. Box 4308, Patrick AFB, Florida, 32925, replaces the old Box 4187 address for relay of Ascension Island QSOs. (WB6UFW) . . . I apologize to W7VRO and any other DXers inconvenienced by my QRT and inattention to inquiries. Dick was my QSL manager, the best one could wish for, and I'm sorry he was beset with unanswerable cards. (ZS1XR) . . . W2GHK's DXpedition of the Month QSLing facilities have received no logs for the 1973-'74 CT3 activity of DJ6QT. Senders of about a hundred QSLs thus will have to stand by until Walter's records arrive. (K4KH) . . . Scratch another -- the Cyprus bureau is bouncing QSLs bound for "5B4ZW." (W1HV)

EUROPE – Russia's Box 88 may be slow but it's very sure. I have nearly 100-percent returns from that bureau so far. Wish France and Cuba would produce QSLs as reliably. (WB8FLE) . . . OK-OL stations will sign commemorative OK3Ø-OL3Ø prefixes, suffixes unchanged, until May 9, 1975. (OK1DDK/CRCC) . . . IVØs are Rome 11s operating commemoratively with suffixes the same; IVØAMU equals IØAMU. (DXNS) . . . Brother Ed of HV3SJ estimates that more than 90,000 QSLs have gone forth to confirm that station's QSOs. (W4WFL) . . . Amsterdam amateurs can sign PA7 in lieu of PAØ this year, suffixes as usual, during the city's 700th anniversary of founding. Special commemorative QSLs will be issued. (PAØJR/VRZA)

OCEANIA – As new trustee of the Midway QSL Bureau at KM6BI my job is frustrated by the fact that the previous proprietor departed two years ago leaving no records. I'm unable to relay QSLs and QSL requests to former KM6s who have left Midway because no forwarding addresses are available. Ex-KM6s reading this are urged to claim their mail at the KM6BI address. I'll do my best to keep the hook clear. (K4DNU/KM6) . . . My QSL duties in behalf of DU6BG began as of January 27, 1975. (WA7RFH) . . . Cards for my KX6ZZ, VE3EZM/C21 and VR4AZ contacts entered the mails in mid-January thanks to QSL Manager VE3GUS. Chris then tackled my 3D2DD and VK2BZM/4/9 logs. (VE3EZM)

SOUTH AMERICA – Very sorry that DXCC Rule No. 8 precludes DXCC credit for my W5VOM/CE2/CEØZ contacts and I apologize to all QSL applicants who though they had a "new one."



VK3YL became the third young lady to hold an Australian amateur license back in 1930 and continues very active on cw. Austine assisted a 50th anniversary QSO between VK3BQ and W5NW last November.

Likewise WB4NCT/CEØZ, both of us operating aboard USS *Tang* which was anchored in Bahia Cumberland within half a mile of Robinson Crusoe Island in the Juan Fernandez group. Perhaps consideration should be given to some modification of that rule. (W5VOM/6) . . . Argentine stations with Z-lettered suffixes appear to have become more active of late. Call numerals may vary but the pattern goes like thing: Antarctica, LU-Zs B D E F H J K L N P Q R U V W X; South Orkneys, LU-Zs A G M; South Sandwich, LU-ZY; South Shetlands, LU-Zs C I O S and T. (DXNS) . . . W2AB-W2FBA, QSL manager for VP8KD died last December. Since then several requests for cards have arrived bu I cannot find the VP8KD logs and am thus unable to confirm the QSOs. (WB2ISJ) . . . Now to data more specific but remember that all recommendations are not necessarily either accurate, complete or official.

A35AF, K. Inoue, Box 19, Vav'u, Tonga Islands (or via JA1SWL)
A4XFP, K. Cutler, P. O. Box 248, Muscat, Sultanate of Oman
C6ABK, J. Wederburn, Box 8688, Nassau, Bahamas
DA1ET, G. Crawford, 327th Sig. Co., APO, New York, New York, 09052; or 666 Zweibruecken, Kreuzberg, 4219E, W. Germany
EL2JC, J. King, Box 98, Monrovia, Liberia
F2QQ,R. Gemehl, 18 rue Jean Jaures, Bois-Colombes, 92270, France
FB8s XH XI XK (via F2MO)
FB8s YC YD (via F9MD)
FB8s ZE ZF (via F8US)
FO8s DH DO (via F6BXL)
HI8XRG, R. Gonzales, P. O. Box 2180, Santo Domingo, D.R.
HP1XMH, P. O. Box 7265, Panama, R.P.
HR6CS, C. Schmidgall, French Harbor, Roaton, Bay Islands, Honduras
K4DNU/KM6, S. Kibler, USNS, Midway Island, Box 14, FPO, San Francisco, California, 96614
KS6FF, via B. Giunta, W6KLI, P. O. Box 182, La Puente, California, 91747
LU4ZS, Base Area Commandant, Maraubiu, Antarctica, Argentina
OE2WSL/5B4, W. Schiendl, AUSCON, P. O. Box 375, Larnaca, Cyprus
ON4AXA/mm (Via ON4QP)
P29DP, D. McLaren, New Tribes Mission, Goroka, Papua
PA7ØØASD, c/o VRZA, P. O. Box 400, Rotterdam, Netherlands
PAØIWH/S2, W. Bolkensteyn, P. O. Box 681, Dacca, Bangladesh
TR8BA, P. O. Box 3853, Libreville, Gabon
TU2FL, Box 20894, Abidjan, I.C.R.
VE3EZM/C21 (via VE3GUS)
ex-VK9ZB, B. Bailey, VK3MK, 116 Lyons st., S. Ballarat, Victoria, 3350, Australia
VP2ABA, P. O. Box 132, St. Johns, Antigua, W. I.
VP2KC, Box 70, Dominica, W.I.
VP2LBO, P. O. Box 494, Castries, St. Lucia, W.I.
VP2LBU, P. O. Box 61690, Caracas, 106, Venezuela
VP2s LBX VZ (via WA5QYR)
VP5TF, c/o P. O., South Caicos, Turks & Caicos
VQ9P, Box 223, APO, New York, New York, 09030
VR1AR/a, W. Rapley, c/o P. O., Funafuti, Ellice Islands
W5VOM/CE2/CEØZ, W. Ramsey, W5VOM/6, 8615 Dent dr., San Diego, California, 92119
W6BYB/VE1, J. Mayes, RR 1, Hwy. 25, York, P.E.I., Canada
W6GBY/6Y5 (to W6GBY)
WA1OGA/VQ9, R. Wheeler, MCBIO, Alpha Co., FPO, San Francisco, California, 96601
WA6HNQ/VQ9, C. Smith, c/o MARS Stn., FPO, San Francisco, California, 96685
WA6TJV/KS6 (see KS6FF)
XE1JM, Box 5A, Morelia, Mich., Mexico
XE3FSA, P.O. Box 329, Merida, Yucatan, Mexico
XP1AA, Box 543, RCA BMEWS, APO, New York, New York, 09023
XV5s AA AB DA (Via W7PHO)
YBØABP, c/o U.S. Embassy, Djakarta, Indonesia
YN6VOM (see W5VOM/CE2/CEØZ)
3D6AX, via Dr. L. Levy, WA5IEV, 119 E. Oakridge Pkwy., Metairie, Louisiana, 70005
5T5ZR/p, P. O. Box 202, Nouakchott, Mauritania
5U7AH, J. Leroux, P. O. Box 326, Niamey, Niger
7Q7DW, G. Perrett, M.o.W. & Supplies 316, Private Bag 3, Lilongwe, Malawi
9K2DR, P. O. Box 2, Kuwait
9Y4GS/VP7 (to W4BRB)

C5AM (via K3GJD)
C5AR (via G3LQP)
C6ABN (via WA1PZQ)
C6ADF (via K4VMA)
DK6PN/A6 (via DK3NK)
DU6BG (via WA7RFH)
EL1H (via SM2DMJ)
EL8A (via OZ6HS)
GC4DAA (via G3ZQW)
HA1Ø4UA (via HA5KKN)
IVØMRX (see text)
JY9CS (via K5OEA)
JY9US (via W3HLR)
OD5JT (via OH2MT)
OH3XZ/Ø (to OH3XZ)
PA7JR (see text)
PJ8KI (to W8KI)
PJ8YCQ (to W4YCQ)
TJ1AD (via K4QKW)
TR8BJ (via DK6ST)
TI2WX (via W4MYA)
VP2A (via W5NOP)
VP2EEB (to K6SE)
VP2GAM (via G3OKA)
VP2LA1 (via W2AAF)
VP5BT (to WA5QYR)
VP7BC (to WB4YHN)
VR4AZ (via VE3GUS)
YB1ABR (via W7VRO)
YBØABS (via W5DL)
ZF1AU (via WA4BTC)
ZS1ANT (see text)
3C1XJB (to W4BRB)
3Y3CC (via NRRL)
5B4BH (to OE3BHB)
5N2AAE (via SV1DX)
5V7AR (via F6ACB)
6Y5MD (via WB2HNP)
7X4MD (via WA4KJR)
7X5AB (via F6BFH)
8P6ES (via K4GLJ)
8Q6AI (via DJ5IO)
9L1JT (via G3SGK)

This catalog comes courtesy Ws 1CW 1JUB 4WFL 5VOM 9DY, Ks 2HYM 4KH 6SF 9KEV, WA2JZX, WBs 2ISJ 6UFW 8FLE 9GGD ØCGJ, VE3EZM, VK2BC, Columbus Amateur Radio Association *CARAscope* (W8ZCQ), *DX News-Sheet* (G. Watts, 62 Belmore rd., Norwich, NR7 OPU, England), International Short Wave League *Monitor* (E. Chilvers, 1 Grove rd., Lydney, Glos., GL15 5JE, England), Japan DX Radio Club *Bulletin* (JA3KWJ), Long Island DX Association *DX Bulletin* (K2KGB), Newark News Radio Club *Bulletin* (M. Witkowski, Rt. 5, Box 167, Stevens Point, Wisconsin, 54481), Northern California DX Club *DXer* (Box 608, Menlo Park, California, 94025), Southern California DX Club *Bulletin* (W6EJJ), VERON's DXpress (PAØTO), West Coast *DX Bulletin* (WA6AUD) and Western Washington DX Club *Totem Tabloid* (WA7JCB). Your turn at this churn?

W h e n c e :

OCEANIA – KM6s BI EA and a WN8 portable are the only active Midway stations at present, the former frequently available on the Confusion Net, 14,305 kHz around 2230 GMT, with a TR4 and Yagi. I started a ham class here in January so we may have a few more KM6s later this year. (K4DNU/KM6 . . . Despite power outages and other problems my three-day KC6SX operation produced 3070 contacts with 113 countries. Saipan business obligations subtracted from available hamming time. (K4KQB) . . . W2LH, K2s BM IQR, WA2LAW and other local clubbers welcomed a recent visit by well known VK3XB. (WB2YBA) . . . K6RIR, WB6LTJ and I found two resident hams on Wallis, both inactive. We made over 9000 FW0 QSOs and more than a thousand from FK-land. (K6YFZ) . . . Windy weather gave antenna problems on the Chathams. We hope to hit the Kermadec Islands soon but transport and landing will be difficult. (ZL1BKL, K6DT) . . . WB4KSE/KW6 enjoyed multiband contesting on 10 through 80 meters, RTTY included. Loran harmonic splatter fractures 75 meters on Wake. (K2BT) . . . My wife and I will be visiting the States from mid-April to late June and would like advance contact with clubs whose members might be interested in hearing about amateur radio in the wilds of Papua. (P29GA) . . . ZL2AFZ, a world favorite New Zealand DXer, recuperates from serious auto collision injuries at the home of granddaughter ZL2AQO. (W6SO) . . . ZKs 1AA 1MA and 2BD confer regularly on 3860 kHz at 0800 GMT or so. (WA3SWF) . . . A35AF, currently Tonga's only resident ham, endures a mediocre radio location and modest equipment. ZK1CD buzzes off to Australia for possible reassignment to Cocos-Keeling or Papua. (WCDXB) . . . KS6FF, formerly WA6TJV/KS6, worked eighty 14-MHz countries in his first five Samoan months. (W6KLI) . . . After four days as VE3EZM/C21 I enjoyed 1020 QSOs from Honiara in October as VR4AZ. Then came contest sessions as 3D2DD followed by 1005 contacts as VK2BZM/9 on Norfolk Island, the prettiest spot of all. (VE3EZM)

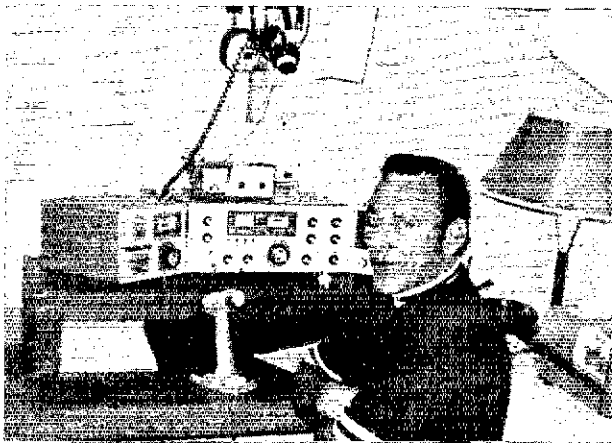
ASIA – XW8HP is my old friend JA3JYX doing two years near Vientiane with Japan's version of the Peace Corps. Takao likes 14- and 21-MHz cw with a kW and simple antennas. Ten interests him, too, and he'll be watching for those occasional openings to the U.S.A. (W6DTY) . . . XW8HR, for whom I handle QSLs, is gaining his first hamming experience on 15 sideband. Hiro will then try 20 and 40 before closing down in July. (JA1XMS) . . . UD6DHU has by far the best 3.5-MHz cw signal from western Asia at my location. (VO1KE) . . . Most consistent Asian here on 80 cw is UL7GW on either path. (W1SWX) . . . Tim Chen & Co., now signing BV2A on cw and BV2B on voice, are restricted to 14,025, 14,040, 14,218 or 14,250 kHz. (WB2UKP) . . . Need just a few more cards for DXCC after seven months as HS4AKF. (WA7CIP) . . . CR9AK still puts in rare appearances on the 14,225-kHz Asian net often emceed by W7PHO. (WA4BTC) . . . The first 160-meter JAs of the season broke through here December 7th-8th. They transmit on 1908-1912 kHz, and JA2GQO says their clearest spot for receiving W/Ks at present is usually 1807-1808 kHz. (W5NW)

AFRICA – After three years QRT I've started up again on 14-MHz ssb using a modified HW32A and 14AVQ with eight radials. I'll be DXing on other bands when an FT401B arrives. Hope the sunspot minimum is soon behind us. The only consistent openings in Mauritius these days are to Europe. (3B8BJ) . . . SU1IM is having receiver problems and I's welcome help in assisting Ibraham toward better ssb results. (W3HNK) . . . Returned home to Washington after three DXciting months in Lourenco Marques as CR7WD. (W3YY) . . . 9X5KE had to restring his quad after a direct lightning hit. (WB2EOO) . . . Handy 5BDXCC item 6W8DY works the States 7070 to 7204 kHz around 0800 GMT. (WA2JZX) . . . 7Q7DW, formerly 5Z4DW, still likes 21-MHz cw sport with his FT101 and triband 2-element quad. (K9KEV) . . . College student ZS6BHW, too young for a Swaziland license at 17, offers 40-cw contacts as ZS6BHW/3D6. Karl finds the long path on 7 MHz reliable enough for ragchews with our west coast gang. (K6SF)

SOUTH AMERICA – LU6DTM/z, an aeromobile on the runway at Marambio Bay, Argentina, broke into a long 14,325-kHz ragchew between KC4s AAD of Siple Station and USS at McMurdo asking for transantarctic weather and flight information. We assisted in bringing the C130 down to our 8997-kHz control frequency for his flight to McMurdo, W6MAB assisting on 20 meters. (KC4USS) . . . The ham hospitality of the YV gang is unbeatable, especially that of new ARRL member YV5EED. (WB4ZNH) . . . If all goes well I should soon be radiating a stronger signal from Easter Island than the one I made 5BWAS with almost four years ago. I'll be using an NCX1000 and TA33. (CE0AE-K2BUI) . . . My reciprocal authorization as PZ5FB is good through June. Openings are producing all continents but Asia for my FT101B, triband 2-element beam and 40/80 dipoles. (W2FCR) . . . XQ3ED signs the Chilean extra-Class prefix regularly on 15-meter cw. (WB2ISJ) . . . My W5VOM/CE2 and YN6VOM activity occured from USS *Tang* while moored to piers at Valparaiso and Corinto. (W5VOM/6) . . . 4M6AG's ceremonial action at Caracas in December featured a Conference of Central American Presidents. (DXNS) . . . VFE beams aimed at Washington and San Francisco from KC4AAA, devised at the Navy's south pole diggings twenty years ago, now work as well as ever at an ice depth of 35 feet. (LIDXA)

* * *

Note: K5FVA, W9NN and other ARRL DX Advisory Committeemen await viewpoints of League members in their areas regarding DX questions of moment. If you would offer a constructive gripe or two, hop that DXAC stick and give 'em a shot. QST



YB9ABT digs regularly for the States on the lower kHz of 20 meters around 2100 GMT. When home from Indonesia Gene relaxes in Minnesota as a WBØ. *(Photo via WB9EBO)*

Operating Events ..... de W1YL

APRIL

1-May 1 *Calgary Centennial Alberta QSO Party*, p. 93 Mar.

2 *W6OWP Qualifying Run* (W6ZRJ, alternate), 10-35 wpm at 0400 UTC (Universal Coordinated Time, calculated same as GMT), on 3590/7090 kHz. This is 2100 PDST the night of April 1. Please note that dates are always shown at least 2 months in advance and times are always the same local "clock time," i.e. 9 PM local Pacific time. Underline one minute of the highest speed copied, certify copy made without aid (typewriters OK), and send to ARRL for grading. (Note: ARRL Form CD-9 shows qualifying run schedules for both W1AW and W6OWP, as well as the complete W1AW code practice schedule.)

4-6 *Fourth Annual Novice QSO Party*, sponsored by the International Novice Amateur Radio Assn., from 1800Z April 4 to 0600Z April 6. Any class amateur works novices, exchange RST and name. Work each station only once. Novices multiply total QSOs by total prefixes worked. Non-Novices multiply total QSOs by no. of Novice prefixes worked (i.e., WN4 WN8 OA3N OA2N are different Novice prefixes). The following are considered novices, with an X indicating a letter assigned in sequence and the dash indicating a numeral: EL-NX, HC-NXX, HI-NXX, KG4NXX, KZ5XXN, LB-XX, OA-NXX, OL-XXX, VU2XXZ, WH6XXX, WL7XXX, WN-XXX, WP4XXX. Please use CQ NP for contest call. To qualify for awards, mail logs by May 1 to Andi Anderson, WB5MYV, Boles Route, Waldron, Arkansas 72958.

5-6 *Florida QSO Party*, p. 93 Mar. *SP DX Contest*, sponsored by the Polish Society, the PZK, from 1500Z Sat. through 2400Z Sun. The object is to work as many SPs as possible in as many different SP powiats as possible, 80-10 cw only. Single operator single band and multiband, multioperator multiband only. Send RST plus QSO no. starting with 001. SPs will send RST plus an abbreviation of their powiat. Each SP (or 3Z) QSO worth 3 points, the same station may be contacted once per band. A multiplier of one for each different powiat which counts only once in the contest. Score equals QSO points times no. of different powiats on all bands. Multiops. may not use more than one transmitter with the same call. Certificates. Usual logs, separate for each band, full summary info, plus signed declaration. Entries must be postmarked no later than May 1 and sent to: Contest Mgr., PZK, Box 320, Warsaw 1, Poland.

6 *Worked All Britain (WAB)* hf cw, from 0900-2100Z, single op., multiop, single or multiband. (Only one transmitter to be used at any given time.) Exchange RST, QSO no. (starting with 001), WAB Book no. (if any) and in addition, UK contestants transmit their WAB area and county. Each complete QSO counts 5 points. For overseas entries, the multiplier is the no. of WAB entries, only. For UK entries, the multiplier is the no. of WAB areas plus DX countries (all G prefixes count as 1). The hf bands for this contest include 10-15-20 meters. Logs must show full info. Certificates. Logs must be received by the WAB Contest Mgr., R. L. Senter, G4BFY, 10, Toll Bar Ave., Rottesford, Nottingham NG13 0BB, England, by May 26. Contest committee decisions final.

12-13 *CD Party cw*, open to all ARRL appointees and officials, notified separately by bulletin. (Note, it starts at 2300Z April 12 and ends 0500Z April 14.) The July parties are open to all ARRL members. *The First Common Market DX Contest, Virginia QSO Party, Fourth Annual County Hunters SSB Contest, Swiss Contest*, pages 93-94 Mar.

15 *WIAW Qualifying Run* (10-35 wpm at 0130 *UTC/GMT), transmitted simultaneously on 1.805 3.58 7.08* 14.08 21.08 28.08 50.08 and 145.588 MHz. This is 2130 EDST (9:30 PM local Eastern time) the night of April 14. Underline one minute of top speed copied, certify copy made without aid, and send to ARRL for grading. Please include your full name, call (if any) and complete mailing address. A legal size addressed stamped envelope would be appreciated.

19-20 *CD Party phone* (see 12-13 listing). *Bermuda Contest phone*, p. 94 Mar. (Late word indicates that the method of counting the multiplier has been changed to a system using the sum of each different VP9 station worked on each band.) *7th RTTY WAEDC, Zero District QSO Party*, p. 94 Mar.

26-27 *PACC Contest*, p. 94 Mar.

28 *Special W1AW Evening Qualifying Run*, Sunday night local, times/details same as under the April 15 listing.

MAY

1 *W6OWP Qualifying Run.* (Remember, this is April 30, local!)

1-5 *KVØISU Special Operation* by the Cyclone Amateur Radio Club of Iowa State University, to help with the University's annual VEISHEA celebration. Freqs.: ssb, 3975 7275 14275; cw, 3575 7075 14075; RTTY (170 hertz shift), 3625 7095 14095. Send an s.a.s.e. for a QSL to the club, c/o WAØKHF, Box 11, Friley Hall, I.S.U., Ames, Iowa 50010.

3-4 *Bermuda Contest cw*, see April 19-20 listing plus p. 94 Mar.

3-5 *Connecticut QSO Party*, sponsored by the Candlewood Amateur Radio Assn., from 2100Z May 3 to 0200Z May 5, all amateurs invited to participate. Exchange QSO no., *RST*), *ARRL* section (for out-of-state stations), Connecticut county for Conn. stations. Stations may be worked once on each band and also on each mode. To score: outside stations multiply total QSOs by the no. of Conn. counties worked (maximum of 8). Conn. stations multiply total no. of QSOs by no. of ARRL sections or provinces. (DX contacts count as only one additional section.) Note, W1QI/1 will be operating cw on odd hours and phone on even hours and counts for 5 QSOs (each band, each mode). Novices count 2 points per QSO. Suggested frequencies: cw, 3540 7040 14040 21040 28040; phone, 3925 7250 14300 21375 28540; novice, 3725 7125 21125 28125. Awards. Logs must show category, date/time(Z), stations, numbers, exchanges, bands, QSO points and claimed score. Enclose a large s.a.s.e. if results are desired. Postmark logs by June 2 and send to the Candlewood Amateur Radio Assn., c/o Donald Crosby W1EJM, 10 Royal Road, Danbury, CT 06810.

10-11 *Russian Contest*, cw only, sponsored by the Radio Sports Federation of the USSR; with a theme of "Peace to the World" (CQ-M). All amateurs are invited to participate, cw only, 2100Z May 10 through 2100Z May 11; 80-10 meters. Send reports plus serial number (starting with 001). Types of competition: single op. single band, single op. all band; multiop all band single transmitter. (Club stations are classified as multiop. all bands single transmitter regardless of the no. of operators.) The multipliers are those on the R-150-S countries list (similar to the ARRL Countries List). The same country is counted only once during the contest. Contacts between stations in the same country are not counted. The same station may be counted only once per band. Only those countries/territories are counted as multipliers which will be confirmed by the participants' logs. Contacts between stations on different continents count 3 points, between stations on the same continent 1 point. All contacts must be complete to count. Final score, total QSO points times sum of country multipliers on all bands. Certificates. You may apply for the several Russian awards without supplying QSLs by clearly indicating the qualifications in your entry. All entries must be postmarked no later than July 1 and mailed to the Krenkel Central Radio Club of the USSR, Box 88, Moscow, USSR.

10 *Frequency Measuring Test*, open to all, begins with a callup at 0130 and 0430 UTC May 10. (Remember, this is the evening before, local time!) The periods for measurement start at 0137 (80 meters), 0145 (40 meters) and 0153 (20 meters); for the late run, 0437, 0445, 0453, respectively. Each measuring period lasts five minutes. Submit your averages for each 5-minute period which will be compared with the umpire's averages during the same period. (The umpire is a professional measuring laboratory.) Tell how many readings you took to form your averages. Approximate frequencies for the early run are 3532, 7074 and 14,112 kHz. Late-run frequencies are 3549, 7070 and 14,107 kHz. Your entry must be received by May 21 to qualify for the *QST* report of the competition. *W1AW will* start transmitting the official results in a special bulletin May 22. *World Telecommunications Day Contest*, phone (cw May 17), sponsored by the Brazilian Ministry of Communications, the full 24-hour GMT period, 160-10 meters. Each participant will attempt to make the highest possible number of contacts

with the different ITU zones of the world, in order to enable his country to win the ITU Trophy. Send report plus ITU Zone (see p. 87, April 1972 *QST*). Contacts with stations in the same country = zero points; in another country in the same ITU Zone 80/160 meters = 2 points, 10-40 meters = 1 point; on the same continent and in another zone, 10/15/20 = 30 points, 40 = 5 points, 80/160 = 6 points. Final score the sum of QSO points times the number of different ITU Zones worked. Medals to the 3 highest world scorers per mode. Logs for each mode must be postmarked by June 30 and sent to: Minister of Communications, DFNTTF-, 70,000, Brasilia, DF, Brazil.

10-12 Georgia QSO Party, sponsored by the Columbus Amateur Radio Club, starts 2000Z May 10 and ends 0200Z May 12, no time or power restrictions. Contacts may be made once on phone and once on cw on each band with the same station. Ga.-to-Ga. contacts permitted. Exchange QSO no., report and QTH (county for GA stations, state/province/country for others). Score 2 points per contact. GA stations multiply QSO points by the total no. of different states/VE provinces worked. DX stations may be worked but do not count as multipliers. Out-of-state stations use the no. of GA counties worked for multiplier (possible total of 159). Appropriate certificates/plaques. Suggested freqs.: cw, 1810 3590 7060 14060 21060 28060; ssb, 3900 3975 7245 14290 21360 28600; novice, 3718 7125 21110 28110. Try 160 at 0300Z, 10 on the hour and 15 on the half hour during daylight periods. Logs must show date/time in GMT, stations, exchanges, bands, emissions, multipliers. Check lists would be appreciated. Include the usual declaration and mail by June 9 to the Columbus ARC, attention John T. Laney, K4BAI, Box 421, Columbus, GA 31902. Enclose a large s.a.s.e. for a copy of the results.

11 Worked All Britain, low-frequency phone (160-80-40). For additional info., see April 6 listing.

14 WLAW Qualifying Run.

17 World Telecommunications Day, cw, see May 10 listing.

17-18 YL-ISSB QSO Party, the full period GMT. The contest element has been eliminated this year so there are no rules. Everyone is requested to participate on that weekend so that one big QSO Party will be the result. This info. submitted by Lyle Coleman, W7EOI, 412 - 19th St. SW, Great Falls, Montana 59404.

17-19 Michigan QSO Party, from 1800 May 17 through 0200Z May 19, sponsored by the Oak Park Amateur Radio Club. Phone and cw are separate contest, but one may enter logs for both modes. Michigan stations may work each other. A station may be contacted once on each band/mode. Portables and mobiles may be counted as new contacts each time the county changes. Exchange RS(T), QSO no., QTH (MI stations send county, others use state or country). Scoring: multipliers are counted once only. MI stations score 1 point per QSO and use the sum of states/countries for the multiplier (KH6, KL7 count as states). VE counts as a country. Max. mult. is 75. Non-MI stations: QSO points times MI counties. (1 point for each W/K/WA/WB8 Michigan QSO; 5 points for each WN8 and special events station QSO; max. mult 83.) VHF only entries: same as above except that multipliers per VHF band are added together for the total multiplier. Suggested freqs.: cw, 1810 3540 3725 7035 7125 14035 21035 21125 28035 28125; phone, 1815 3905 7280 14280 21380 28580; vhf, 50,125 145,025. Between 1600-1900 UTC try 15 meters on the hour and 10 meters on the half hour. Awards. A summary must include all pertinent info, plus usual signed declaration. MI stations include club name for combined club score. Contest committee decisions final. Mailing deadline June 20. Send entries to Dennis Motschenbacher, WB8EUO, 24101 Meadowlark, Oak Park, Michigan 48237.

24-25 New York State QSO Party sponsored by the Rensselaer Polytechnic Institute Radio Club, W2SZ, from 1700Z May 24 to 0500Z May 25 and 1200-2359Z May 25, 1975. Stations may be contacted once on phone and once on cw on each band. NY stations may work other NY stations. Exchange consists of signal report, serial no. starting with 001 and QTH (counties for NY, state/country for others). Suggested freqs.: cw, 1810 3560 7060 14060 21060 28060; phone, 3975 7275 14285 21375 28575; novice, 3725 7125 21125 28125. Score 1 point per QSO times the no. of multipliers: states plus countries for NY stations, maximum of 62 counties for others. Number the first contact for each new multiplier. A check sheet is requested from stations making over 100 contacts. Appropriate certificates. Entries should be sent no later than June 30 to John C. Yodis, WA2EAH, 43 Beacon Ave., Albany, NY 12203. Results will be sent only to those enclosing a no. 10 s.a.s.e.

25 Memorial Day Zip Code Contest, sponsored by the South Eastern Virginia Wireless Assn., the full 24-hour period GMT. Note there are 3 of these annually, Labor Day, Christmas and Memorial Day. Mailing deadline for all entries June 30, enclose return s.a.s.e. for copy of the results. The same station may be worked once per band and mode. Phone and cw are separate and should be scored separately. Exchange RS(T) and Zip Code as it appears on the station license plus state/province/country. DX stations use 00050 for their Zip. Scoring is based on the last 2 digits of the Zip Code worked, (i.e., 23518 is work 18 points). Multiplier of one for each state worked, plus one for the first DX contact (max. of 51). KH6 and KL7 are states but may be counted for the first DX contact. Final score is the sum of all zip points times the state plus DX multiplier. Suggested freqs.: cw, 40 to 60 kHz up from each band edge; phone, 3900 7225 14275 21350 28550 plus or minus 15 kHz; novice, 3710 7110 21110 28110 plus or minus 5 kHz. Awards. Mail all entries att. WB4MTZ, SEVWA, P. O. Box 14411, Norfolk, VA 23513.

JUNE

1 Worked All Britain, low-frequency cw.

4 W6OWP Qualifying Run.

12 WIAW Qualifying Run (plus 40 wpm!).

14-15 VHF QSO Party.

21-23 West Virginia QSO Party.

28-29 FIELD DAY!

July 4, SKN

July 5-6, DL Activity Group QRP Contest, 7X2 Contest

July 12-13, CD cw, 10-10 Summer QSO Party

July 19-20, CD phone, Space Net Contest

26-Aug. 7, Calgary Centennial, Calgary-to-Mobile Contest

July 26-27, CW County Hunters Contest

Sep. 6-7, VHF QSO Party

Sep. 7, EMT

Oct. 11-12, CD phone

Oct. 18-19, CD cw

Nov. 8-9, SS cw

Nov. 8, EMT

Nov. 22-23, SS phone

Dec. 6-7, 160-Meter Contest

Dec. 13-14, 10-Meter Contest

ARPSC

(Continued from page 56)

Bike-a-thon. Hand-held 144 MHz units were employed with WR4ACW and its autopatch available as back-up if needed. Five amateurs were involved. – (W4THV EC) *November and December* During the holiday season Salina (KS) amateurs sent messages for Thanksgiving and Christmas. A two-meter unit was set up at stores where shoppers could make up their greetings. Eight amateurs participated. – (WBØDNI) Howard Co., MD AREC members went to the Kernan Hospital for Crippled Children on Dec. 25 and let children talk to Santa via two-meter fm. In the lobby a display of the amateur units was set up. – (WA3SWS, EC) *January*. The Owen Sound (ON) Kiwanis Club Snowmobile Marathon was held Jan. 25. Eight members of the Georgian Bay ARC set up mobile units along the 100-mile course and a fixed station was utilized with excellent coverage by repeater VE3OSR. – (VE3EFX) Communications for the Baldwin Park (CA) parade on Jan. 25 were handled by 31 area amateurs. Along the parade route, units communicated with police officers and other units were set up at the parade control points, judges, announcers and at the police department. – (WB6MKA), EC) QST

Operating News

GEORGE HART, W1NJM
Communications Manager
ELLEN WHITE, W1YL
Deputy Communications Mgr.

ASST. COMMS. MGRS.: *DXCC*, R. L. WHITE, W1CW; *Hq. Station*, C. R. BENDER, W1WPR; *Contests*, F. D. NISWANDER, WA1PID; *Public Service*, W. C. MANN, WA1FCM. *Affiliated Clubs*, JIM CAIN, WA1STN

Changing the Subject. A lot goes on in the Communications Department at ARRL Headquarters. For administrative convenience, the department is divided into six "branches," with nominally an Assistant Communications Manager in charge of each when or if a qualified person can be found. We now have ACMs in all branches except one. The subject matter of this column is changed from one branch to another, to give a fair "shake" to all forms of activity. "Newsy" items are of course inserted as they occur, and occasionally the Communications Manager goes off on a tangent of his own, but if you'll look back, you'll see that last month we discussed W1AW, in January it was Affiliated Clubs, in December it was DX, in November Contests, and so on, pretty much in rotation. So we "change the subject" from month to month. Let us know what aspects of your favorite operating subject you would like discussed. Next time it's that branch's "turn," we'll throw it at the supervisor thereof.

New SCM Election Procedures. This month it's Administration's turn, and we happen to have a nice newsy item for you – a change in our long-standing SCM election procedures. Few people in the field know precisely what procedure we do use, and often jump at erroneous conclusions based on comparisons between SCM and Director election procedures. Actually, the two types of elections are not handled in the same way at all.

Why not? Well, because there are only 16 directors but 74 SCMs, making it feasible to conduct 8 simultaneous elections a year for directors but somewhat unwieldy to do so for 37 SCMs. So SCM elections are spread out over the entire 12 months and, unlike director elections, take place immediately whenever a vacancy occurs – because there are no "vice SCMs" to take over to finish an unfinished term.

What complicates the machinery is the chronology that has to be observed, complicated still more in recent years by postal delays. It used to be that we could depend on members getting their copies of *QST* prior to the tenth of the month of issue, and so closing dates could be set for that same month, if this is the way they fell. Not any more. Some members get their copies by the first of the month, some not before mid-month, some even later. Then, if a balloted election is required, we have to allow much more time than previously for ballots to be received by the members and returned to headquarters before the closing date.

There is also the business of *QST* space. Nominating petition solicitations and election result info are run bi-monthly instead of every month for this reason, and sometimes this adds an extra month to the procedure. The old procedure, which we'll make no attempt to explain in detail, was constantly adapted to take postal and other delays into account, until it became so complicated that we hardly understood it ourselves. The new procedure will not significantly reduce the time element, but hopefully *will* standardize things so that everything can be better understood. It has the additional advantage of making possible a minimum of two solicitations for each election instead of only one, as now.

The biggest problem is to start the election wheels in motion so that a new SCM will be elected in time to take over smoothly on expiration of the incumbent SCM's term. So let's hypothesize that SCM A's term expires on Jan. 10. In order to allow sufficient time for all procedures to be completed, the first solicitation will have to take place in *June QST* of the previous year, with an announced closing date of August 20. This gives the membership about two months to notice the solicitation and get up a petition. If no one notices it, or they forget about it or put it off, the solicitation is repeated in August *QST* with the same closing date (Aug. 20). This may not be much notice for some of those who haven't seen it before, but it *is* the second notice. If, however, no valid petition is received by Aug. 20, we keep on soliciting every other month, with closing date the 20th of that month, until we receive a petition.

5-BAND AWARDS

(Updating the March 1975 listing.)

5BDXCC: (Starting with number 390), DJØUP PJ2VD WB2AMO HC2TV HKØBKX.

5BWAS: (Starting with number 202), WA7IJN WB5HGS K4K2P YV4AGP W7GBL.

W1AW SCHEDULE (effective February 23, 1975)

The ARRL Maxim Memorial Station welcomes visitors. Operating-visiting hours are Monday through Friday 1 P.M. - 1 A.M., Saturday 7 P.M. - 1 A.M. and Sunday 3 P.M. - 11 P.M., (all times local Eastern). 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 Mar. 28, May 26, July 4 and Sept. 1, 1975.

Times/Days CDT	UTC	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*	*Sunday*
0740	1240	← Oscar[9] →					.....	.....
0800	1300	CODE PRACTICE[1] (5-25 wpm MWF, 35-15 wpm TTh) Details Below →					.....	.....
1200-1300	1700-1800	21/28 cw[7*]	7.290*	21/28 cw[7*]	7.290*	21/28 cw[7*]	.....	.....
1300	1800	← Oscar[9] →					.....	.....
1320-1400[4]	1820-1900[4]	14.290*	14.080*	14.290*	14.080*	14.290*	.....	.....
1400-1500	1900-2000	7.080*	21/28 ssb[8*]	7.080*	21/28 ssb[8*]	7.080*	.....	.....
1500	2000	← CODE PRACTICE[1] (10-13-15 wpm) Details Below →					.....	Oscar[10]
1530	2030	← CW Bulletin[1] →					.....	.....
1600-1630[4]	2100-2130[4]	7.1 Nov.[5*]	21.1 Nov.[5*]	28.1 Nov.[5*]	21.1 Nov.[5*]	7.1 Nov.[5*]	.....	Oscar[11]
1630	2130	← RTTY Bulletin[3] →					.....	.....
1700-1800[4]	2200-2300[4]	CPN[6]	14.095 RTTY*	3.625 RTTY*	7.095 RTTY*	CPN[6]	.....	.....
1800-1830	2300-2330	.....	CN[6]	.....	CN[6]	.....	.....	.....
1830	2330	← CODE PRACTICE[1] (10-13-15 wpm) Details Below →						
1900	0000†	← CW Bulletin[1] →						
1930-2000[4]	0030-0100[4†]	3.7 Nov.[5*]	14.080*	14.080*	7.1 Nov.[5*]	14.080*	.....	.....
2000	0100†	← Phone Bulletin[2] →						
2010-2030[4]	0110-0130[4†]	3.990*	50.190*	145.588*	1.820*	3.990*	.....	.....
2030	0130†	← CODE PRACTICE[1] (5-25 wpm TThSatSun, 35-15 wpm MWF) Details Below →						
2130-2200[4]	0230-0300[4†]	3.580*	.....	1.805*	.....	3.580*	.....	.....
2200	0300†	← RTTY Bulletin[3] →						.....
2230	0330†	← Phone Bulletin[2] →						.....
2240-2300[4]	0340-0400[4†]	7.290*	3.990*	7.290*	3.990*	7.290*	.....	.....
2300	0400†	← CW Bulletin[1] →						.....
2330-0000[4]	0430-0500[4†]	3.7 Nov.[5*]	7.080*	3.580*	7.1 Nov.[5*]	3.580*	.....	.....

[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 on 3.625, 7.095, 14.095, 21.095 and 28.095 MHz.** Bulletins at 170 Hz shift, repeated at 850 Hz shift when time permits.

[4]Starting time approximate, following conclusion of bulletin or code practice.

[5]W1AW will tune the indicated band for Novice calls, answering on the caller's frequency.

[6]Participation in traffic nets.

[7]Operation will be on one of the following frequencies: 21.02, 21.08, 21.11, 28.02, 28.08, 28.11 MHz.

[8]Operation will be on one of the following frequencies: 21.26, 21.39, 28.59 MHz.

[9]When an Oscar satellite is in orbit, daily updated orbital data is sent at 18 wpm on cw frequencies.

[10]Oscar orbital data for the coming week, on cw frequencies.

[11]Oscar orbital data for the coming week, on RTTY frequencies.

* General contact period.

** No 10- or 15-meter activity from 2030-0000 GST.

† Indicates following day when UTC is being used.

All frequencies are approximate.

W1AW CODE PRACTICE

W1AW 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*	*UTC/Days*
10-13-15	7:30 PM EDST dy 4:30 PM PDST	2330 dy
10-13-15	4:00 PM EDST MTWThF 1:00 PM PDST	2000 MTWThF
5-7½-10-13-20-25	9:30 PM EDST SnTThS 6:30 PM PDST	0130 MWFSn
7½-10-13-20-25	9:00AM EDST MWF 6:00 AM PDST	1300 MWF
35-30-25-20-15	9:30 PM EDST MWF 6:30 PM PDST	0130 TThS
35-30-25-20-15	9:00 AM EDST TTh 6:00 AM PDST	1300 TTh

Apr. 4: It Seems to Us
Apr. 8: Correspondence
Apr. 16: League Lines
Apr. 24: ARPS
Apr. 30: World Above
May 2: YL News

The thing to remember is that if you don't get a petition in by the first closing date, and there is a balloted election, the election will probably not have been completed by the Jan. 10 expiration date and you'll be left with an "expired" SCM, who nevertheless carries on if he's willing.

But let's suppose we do receive a valid petition by or before Aug. 20, what happens then? First, we must get info on the candidate's amateur history and background to use in case there's an election, and his written acceptance of nomination. This can be a time-consuming process if he does not respond promptly. However, it's possible that if he is the only candidate the election can be completed by the closing date, Aug. 20, almost five months before he takes office.

Too long? Possibly, but if a balloted election is required, there are so many delays involved that there is none too much time. First, we have to be sure both candidates *are* candidates, then we have

DX CENTURY CLUB AWARDS

New Members

Radiotelephone listings follow the general-type "New Member" and "Endorsement" listings -- January 1-31, 1975

DK3LP	259	W1GMF	142	FP2MW	111	K9SJJ	103	JA6JNF	101	K2GAT	100
WB6AGP	197	W7MCU	138	GW3SB	109	WA2BIQ	103	W2VAV	101	WB2FVX	100
K4IRQ	184	W4BUW	125	K3QIA	109	DJ6RX/W6	103	WB2FLF	101	WB4ASV	100
WA8VHV	177	K6UNE	120	VE3CDM	109	WB8JDA	103	WB4BAU	101	WB4WFT	100
K6SSJ	162	KH6IGC	118	W2DOE	108	OK1DKR	102	WB4VKW	101	WB4ZNH	100
I3MQ	160	K8LUU	117	JA6XE	105	VE1BU/W3	102	JA1SXH	100	WB5DCY	100
JA6RIL	145	WA2MBM	112	EA3JJ	104	WA1AKS	102	K5AOL	100	WA7CUW	100
		DK6NP	111			DA1OR	101			WAØQZN	100

DL7NC	192	W8JJK	150	WB4BWN	121	FP2DB	110	WA9YDO	103	F6ASF	100
WØWO	188	WA8VHV	149	DU1JMG	118	W4BUW	106	WB8HLI	101	K4DEK	100
EA4LK	180	OK1AHZ	145	VE3GDO	114	K8LUU	105	WB8NVQ	101	W3DVY	100
WB6AGP	180	WA1ARN	145	DL8JO	111	VE7KL	104	DU1MR	100	W3HCW	100
K2DPA	159	JA6RIL	141	VP9H	111	WA1HMC	104	FP2MW	100	WA7OYL	100

Endorsements

In the endorsement listings shown, totals from 120 through the 240 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..

WØMLY	345	W7EKM	290	I8JN	250	W7GYF	220	W4JUI	180	K2GXP	140
W2FZY	340	W6YQI	290	K4LR	250	WB9CBY	220	WA4BTC	180	K4UEE	140
W4BQY	340	K4EWG	280	SM6DBB	250	YU2AKL	220	WA7PEZ	180	K6AG	140
VE3BWY	335	KP4DJE	280	SM6EQS	250	DJ4BE	200	W9MYG	180	VE7KL	140
VE5RU	335	OH8SR	280	W3GL	250	G3JFF	200	DK4YG	160	YO1FX	140
K8DYZ	325	W1ESN	280	W4ORT	250	K1DMG	200	JA4XH	160	WA1OYK	140
JA7AD	320	W3AXW	280	W5TMN	250	K3JYZ	200	K3LWM	160	W2TKZ	140
W3CS	320	W3LB	280	W7BE	250	VE3FLE	200	K3NYI	160	W4JIK	140
W9DH	320	W5PAQ	280	W7DH	250	W4WFL/1	200	K3PUI	160	W8GE	140
W9IK	320	W8LBM	280	W8SYR	250	W2GRR	200	K5KLA	160	WBØEZQ	140
K9WEH	315	W2GA	270	W9MCR	250	W3HCW	200	K5FTA	160	K2QLY	120
W2MZV	315	K4ISJ	270	W9OEO	250	WB4OGW	200	K7NHV	160	KH6GHZ	120
WA2HSU	310	WA8TDY	270	K4ZYU	240	WA4DHO	200	SMØBTS	160	KH6HML	120
W4NO	310	W9ALI	270	W4LBP	240	W6DOT	200	VE3BVD	160	VE1RO	120
W6EJJ	310	WB9GIT	270	W4WHK	240	WB8AAX	200	W1GNC	160	W2DUN	120
W8CNL	310	HB9AMO	260	W5HIC	240	WA9EED	200	WA2WBE	160	WA2AOG	120
W3AC	305	K2GBC	260	W5SBX	240	WBØBQG	200	WA4ULL	160	W4IMB	120
WØTDR	305	K3SEW	260	HI8LC	220	YU3TFA	200	W6MJP	160	WA6WEI	120
DJ6RX	300	KP4DKZ	260	K3AMI	220	DJ8EQ	180	WB8LVA	160	W7GBL	120
G3KDB	300	K5FVA	260	K4ACP	220	K6JAN	180	W9KOB	160	W7ISG	120
K9PPY	300	WA6VJD	260	WB4MHK	220	WB2GYD	180	WØBWJ	160	WA8WIK	120
K6SOK	290									XE1FR	120

YV5AJK	330	K6SOK	290	W3CDL	250	W7JWE	240	DJ3EJ	180	K3JYZ	140
W9HPS	325	W3AC	290	W5HCJ	250	K2CJD	220	I2AKI	180	IU2DR	140
PY4KL	325	W8COG	280	W5TWN	250	LA4DM	220	DK4YG	160	W7BCT	140
VE3WT	320	WB9BGS	280	W6GTL	250	OZ3PZ	220	EP8DH	160	W7WT	140
YV5AXQ	320	W4BQY	270	W7YQI	250	W3GL	220	K3PUI	160	WØEVE	140
W9TKD	315	KP4DJE	270	W9JJV	250	WA3ATX	220	K6JAN	160	ZS6BLK	140
K9WEH	310	DL3VX	260	YJ8BL	250	W9OEQ	220	W5SBX	160	K2GXP	120
KØBUR	310	F5RV	260	ZL1AMN	250	K5YMY	200	WØBWJ	160	K3DH	120
WA2HSU	305	WB5DJA	260	VP9GF	240	W1KSN	200	WØWAM	160	KH6HML	120
EA7IR	300	W8LBM	260	W1ESN	240	W2GWT	200	5U7BA	160	WB6ECI	120
W4UMF	300	K5FVA	250	W5SZV	240	WB4FCE	200	JA4XH	140		

to order ballots printed. When the printed ballots are on hand, then they have to mailed out, with another possible delay. Members have to be given at least six weeks to return the ballots. Even if all goes well, it isn't likely that the election will be completed prior to late October, and if things go about as usual, not until mid-November. This still leaves the better part of two months before he takes office, so why not move the whole procedure up about two months?

Okay, let's try it. First solicitation is in August *QST*, deadline Oct. 20, second solicitation in October *QST*, deadline Oct. 20. Two weeks to get ballots printed, two weeks more to get them in the mail, six weeks more to get them back and counted, here it is right on the outgoing SCM's

expiration date and the new guy is only just elected and doesn't know the ropes. He has to be thrown to the wolves (members) cold turkey. We usually try to give him a month to get established before he takes over.

Well, it's still pretty complicated and time-consuming, but the only way to do it. The important thing for you the member to remember is to keep an eye on that "Election Notice" heading in this section of *QST* on the even-numbered months. When you see your section listed, don't just sit there, *do* something. If you don't, you might find yourself without an SCM, or someone you don't want elected by default, or the old SCM reelected without ballotting against your wishes. This office is constantly in the middle of hassles in which disgruntled members are complaining about their SCM and want him removed from office. This is possible, but it "ain't easy." SCMs are elected officials, and once the members elect him, or allow him to be elected by default, that's usually *it* for the two-year term. It is little wonder that SCM candidates are hard to find considering the widening scope of their functions and responsibilities and the amount of pressure they often have to face while in office. If the man you want is defeated in a contested election, or the man you don't want elected – well, that's the way the democratic cookie crumbles. But if the man you don't want is elected with no opposition, you have nobody to blame but yourself. The opportunity was there to run someone against him, or do so yourself, and you blew it. The new solicitation procedures will insure that you will be notified twice that an election is pending. Please check this section of *QST* every so often to make sure. It's part of your responsibility in any democratically oriented organization.

Honest Reporting. Have you looked in your log recently (we hope you still keep one!) to see how many reports you have received recently below 599? How about the reports you have given out? Quite a bit of correspondence has been received on this subject, but the perfunctory reporting still goes on and many are asking "What's the use of a quantitative report at all? Why not just say your signal is readable, strong and of good quality (or whatever) and let it go at that?"

A good question! The obvious rejoinder is, "Why not, indeed?" You can even go into further detail, like "Your signal is perfectly readable and moderately strong with pure tone, but I note a slight frequency drift and a click on break extending about three kilohertz on the high side." This would certainly qualify as a description of your signal as heard at the other end of the circuit, but leaves something to be desired in brevity – especially on cw. The readability and strength readings are common to all kinds of emission, but the tone (i.e., quality) report seems to be peculiar to cw, or nearly so, and here is where the greatest trouble lies in reporting, because with readability you may be referring to problems with atmospherics, fading, and/or interference, and with strength you could be having a poor propagation path. But with "tone" or quality, you are almost surely referring to something the operator could correct if he wanted to or knew how. Therefore, there is a natural reticence to criticize.

What's to do? Many suggestions have been made to change the RST system so that it makes more sense, is more useful, is easier to understand, covers more detail, etc. Most of them are good ones, some are a bit outlandish. But the primary ingredient to any reporting system is to *use* it, and if we don't use it, *no* system is going to work any better than the present RST system does. So, before we start hacking away at the existing setup, let's have a go at campaigning to use it properly and honestly. Until or unless we are willing to do this, no new system is going to work any better.

QRM to W1AW. Honestly, we don't know what the world is coming to. Almost every day we get complaints of QRM to W1AW's code practice and bulletins, especially the former. The way the story usually goes, the frequency is relatively clear when the transmission starts, then a rash of "tuners" appears and other stations start CQing and conducting QSOs right on top of W1AW, making reception impossible. There is no doubt in the minds of the complainers that all this QRM is

DXCC Notes

Announcement is hereby made of the availability of a new DXCC award and a new fee schedule for all DXCC awards.

The new DXCC award is for CW only. Applications for it will be accepted starting June 1, 1975. Credits for the CW DXCC must be for contacts made January 1, 1975 and after.

A new fee schedule for all DXCC Awards and endorsements will go into effect starting June 1, 1975. All new applications for the DXCC award must contain $10.00 U.S., (or 56 IRCs). This $10.00 will be used to return the applicant's confirmations by registered first class mail, the certificate, the DXCC lapel pin and handling. While applications may be made for any, or all, of the DXCC awards at the same time, the $10.00 application charge applies to each of the applications.

Each subsequent submission for endorsement (or completion of a new application) must contain a handling fee of $2.00, *plus postage* for the return of the applicant's confirmations.

The above charges apply to everyone. In addition, however, non-ARRL member applicants in Canada, the U.S. and possessions (including Puerto Rico) must include an *additional* service charge of $5.00 for each new application and a $2.00 *additional* service charge for each endorsement application.

As of June 1, 1975 the application charge for the 5BDXCC will be $20.00.

The following are high-claimed scores. They read, from left to right: Call, score, QSOs, sections, hours of operation. Final scores will appear in the April CD Bulletin. – *WA1PID*

CW

W6PAA	297,150	842-70	20
W6RJT	295,750	840-70	20
WA2QOO	270,200	765-70	20
W2YD (WA2SRQ, opr.)			
	261,165	751-69	19
K4PUZ	255,645	734-69	18
K2NUV	251,550	766-65	17
W7IMU	241,200	680-68	20
K0UXR	225,746	661-68	17
K0ZXE	218,046	628-69	18
W8UHF	203,010	606-67	12
K2UOC	195,640	580-67	19
WB4HAQ	192,120	601-64	20
W6BIP	186,786	559-66	19
W9PIJ	177,210	532-66	13
K4DAS	173,600	554-62	18
WJ1V-VS	169,000	515-65	12
VE2BYR	164,775	507-65	20
WA3SWI	151,800	518-66	10
WI4ICV	149,120	462-64	17
K5LUR	148,800	480-62	15
W8SH (WB8BPY, opr.)			
	148,050	470-63	13
W4UQ	139,930	417-66	12
K3DZB	138,915	436-63	12
WA1NRI	137,970	438-63	19
KH6RS (K2SIL, opr.)			
	132,800	408-64-	9
WB2GAV	131,670	411-63	16
WA2DSA	131,400	453-60	10
WB5HOD	130,880	405-64	20
W0ETT	126,480	404-62	17
K4LAN	121,815	409-59	16
WA0ESJ/0	121,440	384-66	10
WA1MYK	115,900	375-61	16
K3BEA	114,975	365-63	16
W4AUL	114,880	351-64	12
W1DAL	111,300	364-60-	6
WB2RKJ	111,290	356-62	16
WA2PBL	110,676	350-62-	9
W3DI	109,740	365-59	16
W4MYA	109,360	384-58	13
VO1KE	108,000	354-60	16
W6DQS	104,100	341-60-	6
WB2RKK	104,000	312-64-	8
WB0GFX	103,840	347-59	10
K2KIR	102,175	327-61-	6
WB9KMQ (+WB9KRR)			
	120,300	397-60	18

PHONE

WB9HAD	174,850	534-65	19
WA3SWI	137,800	419-65-	
WB2RKK	122,566	378-64	13
K0ZXE	113,288	350-64	15
K6BI	107,250	330-65	13
K0UXR	105,710	341-62	10
K5LUR	92,400	308-60	16
W9NTW	74,670	262-57	11
W5MUG	67,280	232-58	12
K3HXS	63,190	242-53	12
WB9KMQ	64,220	243-52	11
K0UVI	62,400	240-52	10
W6RJT	55,008	198-56-	4
K4PUZ	54,550	203-51-	5
K1ROL	51,975	189-55-	9
W5UGZ	51,700	181-55-	5
W0ETT	49,225	174-58-	8
K2ICW	48,440	173-56-	4
W7TMT	47,775	195-49-	5
W8NOH	47,250	170-54-	5
W4OZD	46,956	180-94-	3
K4BAI	44,415	185-47-	7
WA2MBP	44,370	169-51-	7
KH6RS (K2SIL, opr.)			
	43,350	168-50-	5
WA7TZO	43,605	166-51-	5
WA7LKD/5	42,900	165-52	13
WA3SWC	41,580	149-54-	6
K3ORW	41,565	166-51	14
K4KZP	40,250	156-50-	4
VE2BYR	39,800	135-56-	6
W4MYA	36,570	159-46-	6
WA1SUN	34,080	136-48-	3
K5LZO	33,810	138-49-	3
W3JHT	33,320	131-49-	9
WS1I	33,075	129-49-	5
WB0JGT	32,585	130-49-	5
K6OPH	32,095	126-49-	4
K0SGJ	30,870	123-49-	4
W5RE	28,520	117-46-	5
WA0TKI/0	26,555	109-47-	2
W2GHT	26,230	115-43-	2
K2NHV	26,220	106-46-	1
WB8PLO	25,615	109-47-	7
W6PRP	25,520	112-44-	3
WA3SVT (+WN3WOI)			
	50,490	185-54	11

deliberate and malicious and headquarters should do something about it.

We have to point out two facts: First, that QRM itself is not illegal, even if it annoys you. Second, that any amateur station has as much right on 3580, 7080, 14080 or whatever as W1AW has. And a third thing we would like to point out, while perhaps not a fact, is that about 90% of the interference on W1AW is entirely unintentional or caused by stations operating on the basis of one or the other of the two facts above.

And still a fourth point that is important is that whether a case of QRM is thought to be malicious or not, it is not *legally* malicious unless it is proved, and this is mighty hard to do. Not impossible, but very difficult, unless the perpetrator openly admits before witnesses that this is his intention.

Which leaves us where? No where? Not exactly. If we can eliminate the unintentional interference, we'll have taken a giant step in the right direction while contemplating how to minimize that which is deliberate. Perhaps a campaign to call to the attention of interfering stations that they are making W1AW reception difficult would help, on the assumption that they do not already know it – asking them, nicely, to cooperate. Such pleas should go directly from you to the interfering station, and we'll even propose a text: "Dear OM: I was trying to copy W1AW's code practice on (date, time and frequency) but was having a difficult time because of your strong signal on or near the same frequency. I realize you have as much right to the frequency as W1AW has, but the latter is rendering code practice and bulletin service to thousands of amateurs and would-be amateurs who are trying to meet licensing requirements or keep informed. This is to ask you *please* to yield to W1AW during such periods. The schedule is printed monthly in the *Operating News* section of *QST*. Thanks, 73." And sign it with your name and call; *don't* send it anonymously.

We would be willing to bet that such a campaign, if subscribed to widely, would eliminate better than 50% of the problem.

New DXCC Charges. Elsewhere in this section is an operating note detailing the new charges being levied for DXCC awards commencing June 1, 1975. Based on the assumption that the increase in the charges may be shocking to many, we herewith offer background and explanation.

DXCC was originally offered as a membership service, pure and simple. You worked the countries, collected the cards, sent them in, Headquarters checked them over and you got your certificate. In the course of time, DXCC became a most coveted award, and partially as a result, partially as cause, its standards of integrity and conscientiousness in checking applications became high – especially when it was discovered that some cards had been altered, cards belonging to a very few then-well-known DXers and amateurs of otherwise-prominent stature. Much detective work became involved, some of it professional. It cost the League a lot of money.

Money wasn't so much a problem in those lush post-war days, and nobody gave a thought to trying to get it back by charging for the service. Several timid suggestions that DXCC processing be made less exacting were emphatically booed down by the DX fraternity and the members in general. And so the rules became tighter, the processing more meticulous, investigations of alleged cheating more expensive, often bordering on litigation and occasionally actually involving same – but still a free service of the League to all amateurs, foreign and domestic.

As time and economic conditions changed, the charging of fees of various kinds to recover some costs became desirable, then necessary, and now becomes imperative. In fact, as the demand for this service increases and the costs rise, and as your League continues to operate in the red (hopefully not for long), either economy of operation or recovery of costs (or both) to bring an equal balance between revenues and expenditures loomed as a basic necessity to our economic survival. This means, as far as DXCC is concerned, either reducing processing to perfunctory funda-

New A-1 Operators

W1NT K2UME K4IAF WB4YCV
WA5LES DM2DQD P29MM

mentals, or maintaining the present standards and recovering operating costs through increased fees. Experience indicates a strong aversion to the former.

So, with the advent of CW-DXCC, which figures to add considerably to operating costs, the whole situation was reassessed on the basis of what it actually costs to administer DXCC and all its cupola awards and fees that would have to be charged to recover those costs were computed. The new schedule of fees, announced elsewhere in these pages, is the result. These fees apply to all DXCC submissions received at headquarters subsequent to May 31, 1975 – *WINJM*

SCM ELECTION NOTICE

To all ARRL members in the Sections listed below.

You are hereby notified that an election for Section Communications Manager is about to be held in your respective sections. This notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned are required on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been both the holder of amateur Conditional Class license or higher (Canadian Advanced Amateur Certificate) and an ARRL full member for at least two years immediately prior to receipt of petition at headquarters. Petitions must be received on or before 4:30 PM Eastern local time on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, Zip code of the candidate and signers should be included with the petition. It is advisable that a few extra full-member signatures be obtained, to insure that it will be valid.

Elections will take place as soon after the closing dates specified as full information on the candidates can be obtained. Candidates' names will be listed on the ballot in alphabetical order.

The following nominating form is suggested. (Signers should be sure to give city, street address and Zip code.)

Communications Manager, ARRL (Place and date)
225 Main St., Newington, Conn. 06111

We, the undersigned full members of the . . . . . ARRL Section of the . . . . . Division, hereby nominate . . . . as candidate for Section Communications Manager for this Section for the next two-year term of office.

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

George Hart, W1NJM, Communications Manager

Section	*Closing Date*	*Current SCM*	*Present Term Ends*
Wash.*	4/20/75	M.E. Lewis, W7QGP	7/2/75
N. Mex.*	4/20/75	E. Hart, W5RE	7/2/75
Ala.*	4/20/75	J.A. Brashear, Jr., WB4EKJ	7/11/75
Ga.*	4/20/75	R. LaRue, W4BYG[1]	4/13/75
Sask.*	4/20/75	P.A. Crosthwaite, VE5RP	4/10/75
W. Mass.	6/20/75	P.C. Noble, W1BVR	8/11/75
Alaska	6/20/75	R. Davie, KL7CUK	8/17/75
Kansas	6/20/75	R.M. Summers, KØBXF	8/18/75
W. Va.	6/20/75	D.B. Morris, W8IM[2]	9/18/75
Canal Zone	6/20/75	Chris Q. Smith, KZ5CQ[3]	7/11/76
Mich.	6/20/75	L.J. Olinghouse, W8ZBY[4]	12/10/76
E. Pa.	6/20/75	A.R. Breiner, W3ZRO[5]	2/4/76
S. Barb.	6/20/75	D.P. Gagnon, WA6DEJ	9/2/75
Tenn.	6/20/75	O.D. Keaton, WA4GLS	9/11/75
S. Diego	6/20/75	C.L. Huvar, Jr., W6GBI	9/24/75
Del.	6/20/75	R.E. Cole, W3DKX	10/10/75
E. Bay	6/20/75	C.R. Breeding, K6UWR	10/10/75
Va.	6/20/75	R. Slagle, K4GR	10/11/75
R.I.	6/20/75	J.E. Johnson, K1AAV	10/12/75
S. Dak.	6/20/75	E.C. Gray, WAØCPX	11/1/75
La.	6/20/75	R.P. Schmidt, W5GHP	11/4/75
Maritime	6/20/75	W.D. Jones, VE1AMR	11/10/75
N.C.	6/20/75	C.H. Brydges, W4WXZ	11/10/75
Hawaii	6/20/75	J.P. Corrigan, KH6GQW	11/12/75
Wisc.	6/20/75	R.Pedersen, K9EHI	12/11/75
Ill.	6/20/75	E.A. Metzger, W9PRN	12/15/75
N. Fla.	6/20/75	F.M. Butler, Jr., W4RKH	12/15/75
Maine	6/20/75	P.F. Sterling, K1TFV	12/28/75

[1] Resigned 10/7/74
[2] Resigned 1/1/75
[3] Resigned 1/25/75
[4] Silent Key
[5] Resigned 2/15/75

SCM ELECTION RESULTS

Alberta	D.Sutherland, VE6FK	1/11/75
B.C.	E.Savage, VE7FB	5/1/75

Balloting Results: In the San Francisco Section, Mr. Charles K. Epps, W6OAT and Mr. Thomas H. Monroe, Jr., W6GGR were nominated. Mr. Epps received 185 votes and Mr. Monroe received 122 votes. Mr. Epps' term of office began March 1, 1975.

FEBRUARY 9 FMT RESULTS

Reported by W1YL

Amid reports of horrible conditions we had a super turnout for this most recent FMT! A total of 260 participants reported results based on 2424 readings with 42 *aficionados* making the Honor Roll! Both 20-meter runs were uncopiable by the umpire (and most everyone else!). Here are the official measurements used in calculating the averages: early run, 3538.971 and 7028.850 kHz; late run, 3535.261 and 7046.205 kHz.

Those new to the program and interested in an appointment as an ARRL Official Observer should check with their SCM (page 6) to see if they can qualify. The next FMT is scheduled for May 10 with rules in full in Operating Events, this issue.

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 accredit as of equal merit all those reports computing 4/10ths parts per million (or better) accuracy. A participant must submit a minimum of 2 measurements to qualify for this listing.

W1RGW W1PLJ K1VHO WS1JW W2AIQ K2LGJ W3BFF K3WIK K4BE W4KA W4NTO WA4RSF K4SAV WB5ASD W5FAIO K5LAZ W5OS K5WVX WB6AAL K6BE W6CBX WA6CKD W6CLM WB6MZP W6OQI W6RQ K7CC W7DY W8CUJ W9MNY K9WGN WØBJ WØBKV WBØDRV WBØHVQ WØHH KØJTA WØMDL WØPHY WØRUR Ireland Mendenhall.

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 35 parts per million. Class II OOs must show at least 179 ppm.

Better than 35 parts per million

(.5) K2EK K5RHR, (.6) W1DDO K4IAA W4IKB W9KO, (.7) WA3KLR K6GZ W9ABI, (.8) W4JUR W9KI WA9VDJ, (1.0) W9ENN K9WMP WAØDKA KØZQD, (1.1) K1BWN WA2CCF W7CX W9EKJ, (1.3) K1KQJ K4BSD K6MZN WA9CXN, (1.4) K4JK, (1.7) WA5WGJ W8PTT, (2.0) WA8LWB WA9BPG WA9RVY, (2.1) W8OEM, (3.0) K2IEJ, (3.5) KØAZJ, (3.6) WA1SSH, (4.0) WA5CBT W9WWT/7, (4.2) W4QN, (4.4) WA6MWG, (4.5) W1AYG, (4.7) WA5IHM, (5.1) W4AWS WB5HBO, (5.3) VE2HN, (5.4) VE6MJ, (5.9) K1EPL, (6.2) W2JDC, (6.5) W1VH, (6.6) W7ENA, (6.7) W3YO, (6.8) W1CSS K1CUX W8OMY, (7.0) W9REC, (7.2) W7WM, (7.3) W1AM, (7.6) W4YOK K9UQN, (8.0) KØTCG, (8.2) WA1MKP W3ADE WA8BJF K9OSC, (8.4) WA1HSN, (8.5) WA9YDO WAØRYL, (8.7) W6EJK W7EDZ, (9.0) WA1SCV W3MDO K6ASK/6, (9.4) WA1RFT, (9.7) W7JMS, (9.9) K4CXX/4, (10.0) WB8AYN, (10.3) W6AEE, (10.7) K5UZL WØDJV, (11.0) WB2EDW WA7HGB W9AG, (11.3) K3YHR, (11.6) WB4CCU, (12.3) W3KEK, (12.4) W9HPG, (13.0) W1GFC, (13.6) W3EBK, (14.0) WB2VLG, (14.2) K6GG, (15.6) W4OGH, (16.1) W1VZ, (16.4) WA3GBU WA3JSZ W6MQF/4, (17.2) W8CXM, (17.3) W8BU, (18.0) K6BI, (18.1) WA6WXH, (18.6) WA5ZBN, (19.5) W6PZU, (20.0) WA1MSK WB4KCL, (20.3) K1IAX WA6MBP, (21.5) K4QG, (22.3) WA2UUA, (23.1) K5PCW, (23.2)

(Continued on page 165)

Station Activities

All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

DELAWARE – SCM, Roger E. Cole, W3DKX – SEC: K3KAJ. RM: W3EFB. PAM: WA3DUM. PSHR: WA3DUM 59, K3KAJ 50. K3KAJ states the Delmarva Hamfest will be Aug. 17, 1975 with a meeting of those interested to be scheduled in Apr. There is also a possibility of establishing an Amateur Radio Station at the Delaware State Fair, if we find 20 or 25 operators and equipment. Those interested in participating, notify K3KAJ. W3TBG has a new digital readout for his FT-101. WA3VDJ has an amplifier on 80-20 meters. W3DOG has a new TR-72. Del. 2-meter net QNI 6; Del. 6-meter net QNI 14; DEPN QNI 65, QTC 17; DTN QNI 294,' QTC 70. Traffic: K3KAJ 137, WA3DUM 128, W3EFB 66, W3DKX 58, WA3GSM 51, K3YHR 33, WA3QLS 16, WA3TVS 9, WA5KUD/3 3.

EASTERN PENNSYLVANIA – SCM, Allen K. Breiner, W3ZRQ – SEC: W3FBF. RMs: K3DZB, W3EML, K3MVO. PAM: WA3PZO. The EPA CW net meets nightly on 3610 kHz at 0000Z. The EPA-EP&FN fone net meets nightly on 3917 kHz at 2300Z had QNI 507 and QTC 308. The PTTN training net meets nightly on 3610 kHz at 2330Z had QNI 202 and QTC 140. WA3NHO was appointed as OVS. K3BHU was appointed as OBS. Thanks for the comment from the following on the SET: WA3ATQ, WB2FWW, WA3VDQ, W3ADE, W3FBF, K3HXS, W3CMA, WA3VUF, K3NYX. Some said "best ever", others "oh well", "wait 'till next year." WA3UDS and WA3TMP are now Advanced Class. W3OY just returned from surgery and a session in hospital, along with W3EML *who is recovering from eye surgery. A late Christmas present arrived* to K3BFA in the form of a Classic tri-bander beam. The Hazleton 2-meter repeater is switching to .07-.67 WR3ADF. The Wilks College repeater received its ticket and is on .28-.88 as WR3AEV. The trees that interfered with the antenna system of W3EU are now being used as part of the fuel shortage. W3BUR is honeymooning in VP9-Land. K3DTD received CW-WAS. WA3UDV was down with the flu during SET and so was your editor. W3ID is converting to ssb. Welcome to the crowd Frank. By the time this item is published you will probably have a new SCM. I wish to thank all who helped make this job as easy it should be. However I believe I was justified in a resignation as well as the decisions that were made by this office. I cannot condone nor agree with the actions taken by a certain few who have been instrumental for this final decision. The section was beginning to shape up and in another year should have been back in the top three as it was back in the 1960's. May I wish my successor luck. As always, if passing through Tamaqua, the shack door is always open to the many friends that I have made in the past. Traffic: W3CUL 2132, W3VR 956, WA3PZO 506, WA3ATQ 388, WB2FWW 345, W3FBF 275, K3BHU 252, WA3VDQ 218, WA3PHQ 209, K3OIO 179, W3WRE 176, W3ZRQ 153, WA3REY 118, WA3UKZ 83, K3MVO 67, W3ADE 66, W3EML 61, WA3RCA 57, *W3BNR 55, W3VA 51, WA3UNI 47, W3ID 42, WA3SVJ 41,* WA3SVK 41, WB2RBA 31, W3LC 29, WA3CFU 26, K3KNL 19, WA3AVJ 18, WA3LWR 18, WA3UDV 14, W3AXA 13, K3HXS 11, WN3WOE 11, W3CMA 9, WA3VQE 9, W3CBH 7, WA3YEX 7, W3BUR 6, K3DTD 6, WA3HWZ 5, WA3TMP 5, WA3LYC 3, WA3VUE 3, K3KTH 2, K3BFA 1, WA3BSV 1, WA3CKA 1, W3EU 1, W3GMK 1, W3GOA 1, K3KCM 1, W3KEK 1, WA3NDQ 1, W3OY 1.

MARYLAND-DISTRICT OF COLUMBIA – SCM, Karl R. Medrow, W3FA – SEC: K3LFD. RM: W3FZV. PAM: WA3EOP. NCM: WA3LPL. The Univ. of Md. W3EAX produced 8 new *Novices. The General class is underway* with WA3MJF instructing. WA3UFW moves to Kitt Peak Observatory. Congrats to the Univ. of Md., and to K3ORW, WA3VSG brand new Generals. WN3YKK starts MDNN on 3715 daily at 0000 GMT. Try it! W3MSN makes WAC on SSTV on 20 meters. WA3TDZ now WA4LWL in Fla. W3OYL returns to the air to find QRM still here. WB8SKY reports the GW ARC and Red Cross got together for fun and service. W3IK is the new alias of K3STU. WA3JSZ can measure frequencies with *the best. The AREC gang was out in force during the SET.* Lots of activity by the MDC ARPSC and a well done to all. WA3EOP had MEPTN all primed. MDD fought stinko conditions. A good time had by all. The Montgomery AREC was entirely emergency powered on two meters. K3IQG is suffering a 2nd semester slowdown. W3JZY just beats the snowstorm home to become snowbound. W3OKN retired, working on his western Penna. *OTH. New ECs K3ORW,* KØECG/3, WA3RWS and W3YWK stirred up lots of activity in the SET. W3CDQ and W3FZV did some CD partying. WA3RVU has a bent vertical. W3FCS with efficient effort produces maximum results. W5TWT/3 says his keyboard CW is something else, and of the 730 feet of tower in his front yard 150 feet of it is all his. W3TN grandpa, W3URV son, and WN3YSF grandson make it a family affair and all with the same name yet! WA3SJY exclusive on 20 and 15 meters. W3BHF says the five blind Novices at the West Va. School For The Blind need more novice crystals. W3MHH portable LU4 during vacation. W3RMQ spoke on antennas at the PARCS meeting. WA3TSP operates W3USS, and W3DOS is NCS for the Foreign Service Net on 21415 1500 GMT. W3STG and W3HVM can be found on 2 meters. WA3RSG had county-wide 2-meter drill during SET and W3EOV participated. K3LFD steps down as State MARS Dir. K3DI now knows what a SET is. WA3WRN was broken by a CBer on 3860 no less! WA3UPH keeps Clinton alive. W3CDC and WA3PZT among those helping in Carroll Co. WA3SEE reports the unscheduled 2-meter net is periodically initiated by "telephone tree" alerts. WA3UYF won his antenna problem battle. With the nets: Washington Region PON 13/92/24.1. MEPN 23/126/24.1 MDCTN 15/71/20.8. MDD 62/238/5.3 (Sessions/Tfc/QNI Avg. MEPN toppers WA3ADQ, W3LDD and others W3DKX, W3JQN WA3LPL, WA3PRW and WA3RCI. MDD top brass W3FA, W3FZV and K3KAJ. MDCTN Honor Roll W3FA, WA3EOP, W3ADQ WA3LPL, K3ORW, WA3IHW, W3LDD, WA3UUM, WA3PRW and W3FCS. Traffic: (Jan.) W3CWC 352, W3FA 271, W3OKN 160 *W3FZV 158, K3DI 99, WA3SJY 94, WA3UDM 63,* WA3RVU 60 W3FCS 58, K3ORW 51, WA3WRN 41, WA3UYF 37, WA3SJS 28 W3EOV 26, WA3UPH 24, W5TWT/3 24, KØECG/3 23, W3EAX 18 W3TN 18, WA3PZT 11, W3ZNW 11, WN3YKK 7, W3BHE 6 W3CDG 5. (Dec.) K3IQG 61.

SOUTHERN NEW JERSEY – SCM, Charles E. Travers, W2YPZ – SEC: W2JI. PAMs: WA2DSA, WA2DVE, WA2DIW.

Net	*Freq.*	*Time(PM)*	*Sess.*	*QNI*	*Tfc.*	*Mgr.*
NJN	3695	7	31	467	177	WA2DSA
NJN	3695	10	31	207	88	WA2DSA
NJSN	3730	8:15 Dy	37	258	126	WA2DIW

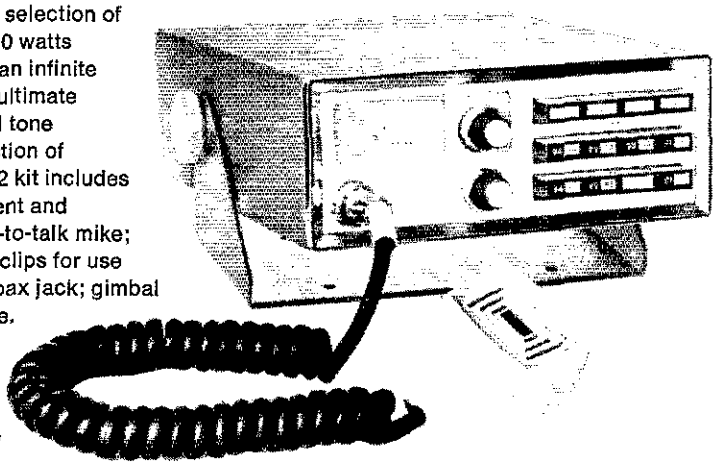
Considerable interest was shown in recent SET activity by the W Jersey RA with the cooperation of the Co. RO K2VKS. The clu repeater was used in the exercise. W2HOB and WA2OTS manne the Emerg. Operating Center. Participating in the successful dri were K2VKS, W2CSV, WB2DJH, K2GIJ, K2OWQ, WB2AN. WB2LCC, WA2IVO, WA2HJF, WB2UBU. WJRA holds regul "hunts" every 3rd Wed. in conjunction with BURLCO RACES K2ARY transmitted five bulletins during the month on 146.27 an 28450. Rancocas Valley ARA elected WB2UMQ, pres.; WA2NEC vice-pres.; WB2JJN, treas.; K2BG, secy.. Burlington County Radi Club – W2QXG, pres.; KWA2QZQ, vice-pres.; W2CVS, treas WB2YXP, secy. W. Jersey Radio Amateurs – K2OIJ, pres WA2OTJ, vice-pres.; K2SQS, secy.-treas. The WJRA operates a clu repeater on a 24 hour basis with autopatch on a pay-as-you-go basi Access to patch is multi-digit. WA2SEA is the 1975 GCARC F chmn. Recent OPS appointments include WA2LZB and WB2EW. Chuck is also a member of the Army MARS program and recent installed an 80-meter dipole. Send OPS and ORS appointme certificates for endorsement. Traffic: W2HIP 43, WA2TRK 3 W2YPZ 26, W2ORS 25, WB2SFX 11, K2BG 10, W2JI 10, W2RF 10, WA2LZB 3.

WESTERN NEW YORK – SCM, G.W. Hippisley, K2KIR – Ass SCM: Richard M. Pitzeruse, K2KTK. SEC: W2CFP. For n

Put together the top-value Heathkit 2-meter package!

Start with the Heathkit HW-202 2-Meter FM Transceiver.

It's an all solid-state design that you can build and completely align without special instruments. And this compact little beauty gives you independent pushbutton selection of 6 transmit and 6 receive crystals. 10 watts minimum output. Will operate into an infinite VSWR without failure. And for the ultimate in convenience there's the optional tone burst encoder for front panel selection of four presettable tones. The HW-202 kit includes two crystals for set-up and alignment and simplex operation on 146.94; push-to-talk mike; 12-volt hook-up cable; heavy duty clips for use with temporary battery; antenna coax jack; gimbal bracket, and mobile mounting plate. See specifications below. Crystal certificates available at 5.95 each.



Kit HW-202, 11 lbs., mailable . . . **179.95***

Kit HWA-202-2, Tone Burst Encoder, 1 lb. . . **24.95***

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Add 40 watts of output

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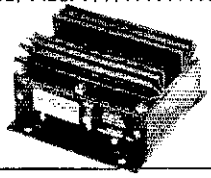

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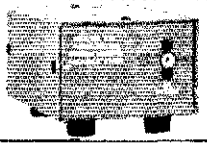

HW-202 SPECIFICATIONS — RECEIVER — Sensitivity: 12 dB SINAD* (or 15 dB of quieting) at .5 μV or less. **Squelch threshold:** 3 μV or less. **Audio output:** 2 W at less than 10% total harmonic distortion (THD). **Operating frequency stability:** Better than ±.0015%. **Image rejection:** Greater than 55 dB. **Spurious rejection:** Greater than 60 dB. **IF rejection:** Greater than 75 dB. **First IF frequency:** 10.7 MHz ±2 kHz. **Second IF frequency:** 455 kHz (adjustable). **Receiver bandwidth:** 22 kHz nominal. **De-emphasis:** −6 dB per octave from 300 to 3000 Hz nominal. **Modulation acceptance:** 7.5 kHz minimum. **TRANSMITTER — Power output:** 10 watts minimum. **Spurious output:** Below −45 dB from carrier. **Stability:** Better than ±.0015%. **Oscillator frequency:** 6 MHz, approximately. **Multiplier factor:** X 24. **Modulation:** Phase, adjustable 0-7.5 kHz, with instantaneous limiting. **Duty cycle:** 100% with ∞ VSWR. **High VSWR shutdown:** None. **GENERAL — Speaker impedance:** 4 ohms. **Operating frequency range:** 143.9 to 148.3 MHz. **Current consumption:** Receiver (squelched): Less than 200 mA. Transmitter: Less than 2.2 amperes. **Operating temperature range:** −10° to 122°F (−30° to +50°C). **Operating voltage range:** 12.6 to 16.0 VDC (13.8 VDC nominal). **Dimensions:** 2¾" H x 8¼" W x 9⅞" D.

*SINAD = $\frac{\text{Signal + noise + distortion}}{\text{Noise + distortion}}$

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The world's most advanced amateur radio system

SB-104 SSB transceiver— a new standard for the industry

A revolutionary "new generation" transceiver. It's completely solid-state and totally broadbanded to eliminate preselector tuning. And the output can be instantly switched from 100 watts to 1 watt. The true digital readout offers resolution down to 100 Hz and outstanding tuning accuracy. Receiver intermodulation distortion has been minimized and there are very few active devices ahead of the highly selective crystal filter. Adjacent channel overload is negligible, yet sensitivity is better than 1 μV (.6 μV typical) and front-end overload is dramatically reduced. The "104" is 12 VDC-powered for mobility and the optional HP-1144 fixed station supply fits inside the SB-604 speaker cabinet. An optional noise blanker can be installed in the "104" and an optional 400 Hz crystal filter improves CW selectivity.

Kit SB-104, 31 lbs., mailable **669.95***
Kit SBA-104-3, 400 Hz CW crystal filter, 1 lb., mailable **34.95***
Kit SBA-104-1, Noise blanker, 1 lb., mailable **24.95***
Kit SBA-104-2, Mobile mount, 6 lbs., mailable **34.95***
Kit HP-1144, Fixed station power supply, 28 lbs., mailable **89.95***

SB-230 — the lowest-cost conduction-cooled linear around

The SB-104's "silent partner." 1200 watts PEP or 1000 watts CW from less than 100 watts drive. It's rated at 400 watts input for slow-scan TV and RTTY. The high-efficiency Eimac 8873 triode is double-shielded to reduce stray RF and a massive heat sink replaces noisy fans and blowers. The "230" assembles in just 15 to 20 hours with no alignment.

Kit SB-230, 40 lbs., mailable **319.95***

SB-634 station console combines 5 convenient accessories

The "634" performs 5 important functions — a 10 minute digital ID timer with visual or visual and audible indicators an RF wattmeter that reads 0-200 or 0-2000 watts with ±10% accuracy, an SWR bridge, a hybrid phone patch that can be used manually or with VOX control, and a 24-hour digital clock that runs independently of all other functions. It's a must for every well equipped station.

Kit SB-634, 14 lbs., mailable **179.95**

SB-614 station monitor shows you how clean your signal is

Highly visible 1½ x 2" CRT detects problems that can reduce the effectiveness of your signal — non-linearity, insufficient or excessive drive, poor carrier or sideband suppression, regeneration, parasitics and CW key clicks. It monitors SSB, CW and AM signals from 80 to 6 meters. Push-pull drive for keystone free trace; automatic sync sweep generator with 3 ranges from 10 Hz to 1 kHz. Can be used as an ordinary oscilloscope from 10 Hz to 50 kHz.

Kit SB-614, 17 lbs., mailable **139.95**

SB-644 remote VFO

Designed exclusively for the SB-104. It provides split transmit and receive control and you aren't frequency-limited in any way — transmit at one end of the band, receive at the other. The "644" even has two crystal positions for fixed-frequency control. The "644" has a linear dial, but the exact frequency is displayed on the "104's" digital readout. The display automatically changes when switching from transmit to receive.

Kit SB-644, 10 lbs., mailable **119.95**

SB-604 station speaker — response-tailored to SSB

Designed to match the SB-104 in styling and performance. The "604" uses a 5x7", 3.2-ohm speaker. And there's room inside for the HP-114 power supply. With connector cable and plug.

Kit SB-604, 8 lbs., mailable **29.95**

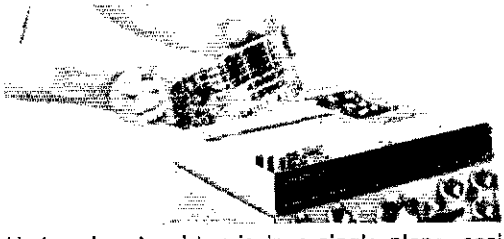
DESIGN NOTES

Larry Houghton
Chief Engineer —
Communications

A New Approach to Kitability

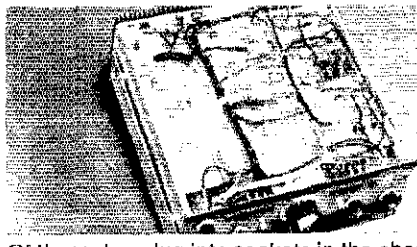
One of the major design-goals of the SB-104 project was to make the transceiver as easy to build and service as possible. Words like "kitability," "buildability" and "serviceability" take on new importance when you're designing a transceiver as complex as the SB-104. No matter how good the electronic design may be, its usefulness is diminished if it can't be built and serviced by a typical ham.

Our ham group's mechanical designer, Jim Smiley, coordinated the layout and packaging of the SB-104 and most of the other new SB products. If you have an opportunity to examine a 104, I think you'll agree that Jim's efforts have turned a complex piece of equipment into a relatively easy and enjoyable kit-building experience.



Under chassis wiring is in a single plane, easily accessible for soldering and trouble-shooting measurements. Top and bottom cabinet shells are mounted after the kit is complete. Each shell can be independently removed for access to either upper or lower chassis. This approach to kitability takes full advantage of the SB-104's circuitry for a confidence-building alignment and check out procedure, and for money-saving, do-it-yourself service.

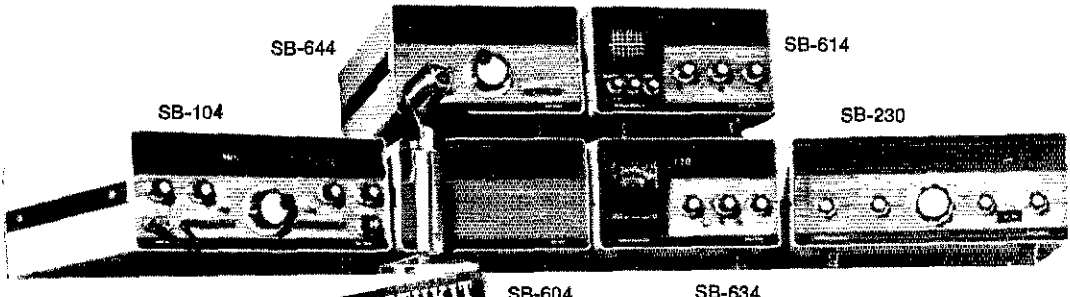
About two-thirds of the construction time is spent building fifteen, G-10 epoxy printed circuit boards.



Of these, ten plug into sockets in the chassis, snugly held in place with vertical card guides. The seven large boards can be extended out of the unit for alignment and fault isolation. All boards except the high-level transmitter circuits are diode switched. This allows their physical placement to be independent of switch shafts, eliminating shaft alignment problems. Inter-board connections are handled by two precut wiring harnesses.

The SB-104 features a single, full-sized aluminum chassis. Four panels containing pre-mounted circuit board guides and seven intercard shields are easily mounted to the chassis. When front and rear panels are attached, the resulting structure is strong yet light in weight. This construction technique minimizes tolerance buildup both laterally and front-to-back for improved sheet metal fit.

Larry R. Houghton
K8ZVF



information, see Nov. '74 QST, but some times may be in err
to DST now in effect. Net mgrs. please advise. Net reports:
(Jan.): QTC 797, QNI 1014, 68 sessions; FSS (Dec.): QTC 165
391, 33 sessions. Sorry to report Fahter Malloy, W2OKL, a
Key, a ham for 30 years, and members of IMRA, New Adv
Class licensees: WB2FJC and WA2UBT. WN2UUL moved In
polis; WB2RWU presently in San Francisco and WA2ARA in
Ariz. WB2WUB new officer of ARATS. DXCC to WA2LUF, W
WA2LEZ. Novice and General class code/theory classes going
in Syracuse area. W2CFP received six EC reports for Dec., su
holding regional EC meetings at various WNY hamfests, st
with the Southern Tier Hamfest in Johnson City Apr. 19,
activity: W2RUF reports NYSTN/EANTN operated hourly
Novice NCSs under tutelage of WA2PUU. Auburn ARA h
AREC participants with half on emergency power. Other
stations reporting emergency-powered operation include
(WB2JRX), W2MTA, W2FR, WA2ICB, and K2s KIR and
Comments on new FCC proposals received from WA2EYJ an
Ithaca, ARATS, Syracuse, Auburn, and Norwich clubs. WB2s
JRX, WPA, WA2TPR, K2YCO active in the VHF SS. WB2IPX
five-element beams for 6 and 2; WA2HUP building 2M pr
WB2WPA started an FM traffic net in Rochester on 146,
looking for stations with NTS liaison capability. K2KIR finall
KH6RS on 160 in the CQ 160 test; WA2ICB and W2EOS spent
and Jan. designing/building 160M converters for the big
WA2EYJ reports activity on 80-10 and 2; WB2JJ on from
CVARA (Norwich) celebrating their tenth anniversary, WA2
busy building IC breadboards. FSS bulletin reports on 2M
hiking in the Catskills by W2WSS. WA2FTK working in Nor
WA2YQQ on the mend. K2GEF MCed the Utica annual install
banquet. Add GFI to TVI, BCI, and HFI. WA2BPE's FM
activates his household Ground Fault Interrupter! PSHR to
and W2MTA. Traffic: W2FR 351, W2MTA 290, W2RUF
WA2JCB 212, WB2JRX 179, W2OE 170, WA2HSB 159, WA2
135, WB2AEK 107, WB2THS 93, WA2TPC 91, WB2VND 91,
82, WA2PUU 82, WN2UBW 74, W2HYM 63, WB2QIX 63, W2
54, WA2LUF 48, WA2AIV 38, WN2VEJ 37, K2KIR 35, WA2
31, W2EAF 28, K2OFV 27, W2ROF 25, WB2KUN 22, WA2
21, W2EOS 20, WB2QDN 18, K2DNN 14, WA2ELD 13, WA
10, WA2SMM 10, K2KTK 9, WA2SMQ 9, K2IMI 3, WA2GLA

WESTERN PENNSYLVANIA – SCM, Donald J. Mysle
K3CHD – SEC: W3ZUH. Asst. SEC: K3SMB. PAM: K3ZNP.
W2KAT/3, W3LOS, W3KUN. WPA CW Net meets daily on
kHz at 7:00 PM local time. Pa. Phone Net meets Mon.-Sat. on
kHz at 5:30 PM local time. I would like to thank the WPA
Traffic Net, Pa. Phone Net, numerous local HF nets and
repeaters for the fine job done during the SET in Jan. Contact
W3ZUH for info on AREC in your county. The follo
appointments are current for 1975. SEC W3ZUH; RMs W2K
W3LOS, W3KUN; PAM K3ZNP; ORSs W3ATQ, K3CR, K
K3EXE, W3ELZ, K3HCT, W3IYI, W3IDO, W3KUN, W2K
W3KQD, W3LOS, W3LOD, WA3MDY, W3NEM, WA3
W3RUL, WA3RWO, WA3SWF, W3SN, K3SJN, WA3SWC, K
WA3JTS, W3UT, WA3VBM, K3VOV, W3YA/K3HKK;
K3HWL, WA3HSR, WA3IYA, K3JSV, W3KUNQHR, W3
WA3SSU, K3SMB, K3VYY, WA3WGV; OVSs K3ASI, K3
W3KQD, W3OCN, WA3SSU, WA3TGR; OBSs K3ASI, WA
WA3QQR, W3SAY, K3SMB; OOs W3ELZ, W3GOJ, K3
WA3RCN, WA3TGR, WA3WKS, W3ZUH; OPSs K3CR, W3
WA3EJO, K3HZL, WA3JIH, K3OTY, WA3QQR, WA3
W3TTN, K3ZOB. W3INN had perfect QNI for 1974 in the W
Area CD Net – 51 consecutive Sun. The South Hills Brass Pou
& Modulators elected W3MML, pres.; WA3LVB, vice-pres.; K3
treas.; WA3UIE, secy.; W3BWU, W3LDB, W3QNI, dir.; W3
K3WNZ, K3VXV, trustees. Penn State ARC elected WA3
pres.; WA3UBJ, vice-pres.; WA3GYT, secy.; WN3WUD,
WA3VZN and WA3OVZ, dir. Good luck to W3KUN who re
retired and has held the ORS appointment since 1936 an
appointment since 1937! WA3RCN active with the Maritime &
and Intercontinental Nets. Reps from Erie, Corry, Warren, J
town, Youngstown, Indiana and Pittsburgh groups along wit
Freq. Allocator from the Ohio Conference met in Meadville
Western Penna. Repeater Council. The Nittany ARC will displ
exhibit on amateur radio and Oscar at the Blair Earth
Resources Program held at Hollidaysburg, Pa. Nittany AR
Assn. installing repeater WR3AEN on Little Flat Mountai
Spring on 146.25/.85. The Crawford ARS meets the 3rd T
each month at the Meadville Jr. HS, Diamond Square, Meadvil
at 7:30 PM. The Pa. Phone Net had 27 sessions, 709 stations
in and handled 534 messages. The WPA CW Traffic Net h
sessions, 435 stations check in and handled 280 messages. WA
and W2KAT/3 were awarded the BPL medallion. PSHR

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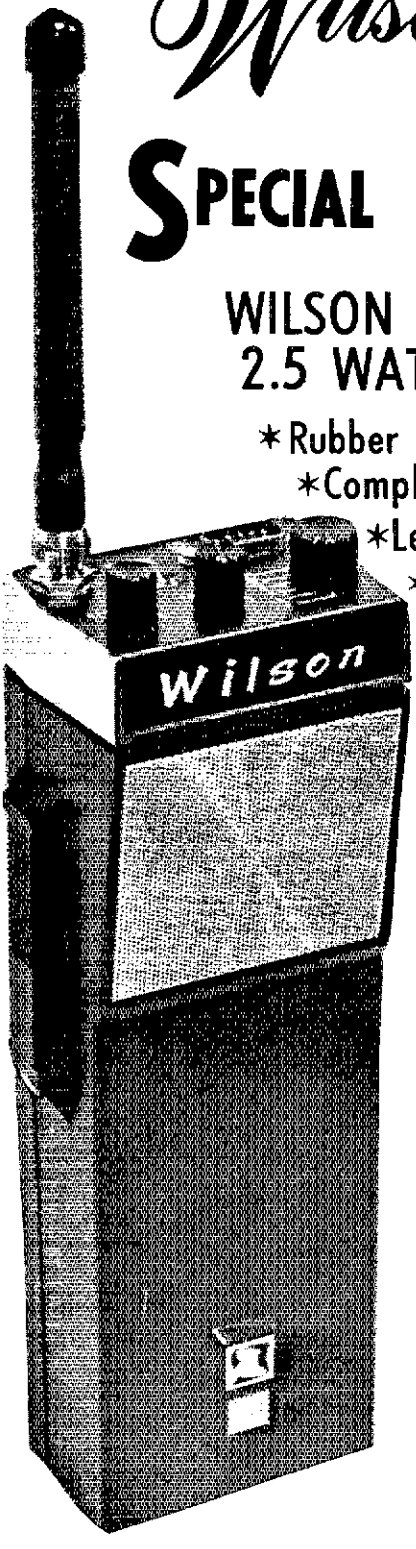

*Rubber Flex Antenna
*Complete Set NiCad Batteries
*Leather Case
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Of Common Frequencies,
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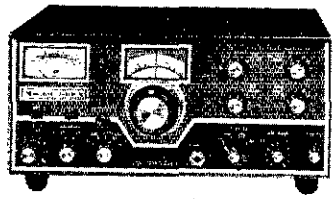

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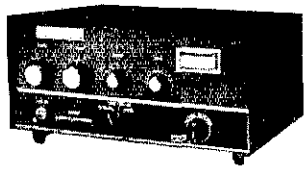

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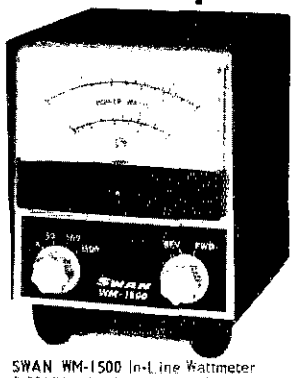

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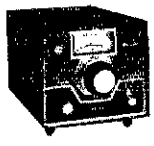

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WA3SWF 44 and W2KAT/3 42. W2KAT/3 and K3CR made BPL. Traffic: W2KAT/3 532, K3CR 242, WA3VBM 232, WA3SWF 143, W3ZUH 135, K3CB 105, K3SMB 72, K3CHD 59, W3EGJ 54, K3HCT 28, W3TTN 27, W3UT 26, WA3WKS 26, K3SJN 23, WA3UJT 21, WA3VJL 19, WA3OKK 16, K3ASI 14, WA3IYA 14, WA3QLG/3 13, W3SN 13, K3ZNP 12, W3KUN 11, K3VOV 11, W3ATQ 8, K3LVO 8, WA3QER 8, W3RUL 6, K3HWL 4, W3IDO 4, W3LOD 4, K3PLX 4, WA3SWC 2, WA3PMT 1.

CENTRAL DIVISION

ILLINOIS – SCM, Edmond A. Metzger, W9PRN – Asst. SCM: Harry J. Studer, W9RYU. SEC: W9AFS. PAM: WA9LDC. RM: W9NXG. Cook County EC: W9HPG.

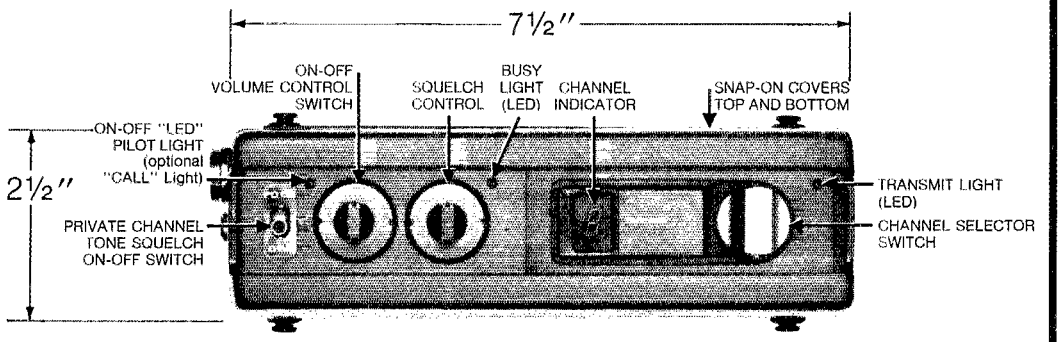
Net	*Freq.*	*GMT/Days*	*Tfc.*
ILN	3690	0030 Dy	185
ILN	3690	0400 Dy	79
Ill Phone	3915	2245 Dy	413
NCPN	3915	1800 MS	117
NCPN	3915	1300 MS	162
IEN	3940	1400 Su	no report

The Hinsdale Central High School ARC is a new ARRL affiliate. W9NXG resigned as RM effective Feb. 1. K9ZTV has been named his successor. W9NXG is on his way to Fla. for a well deserved vacation, and I want to thank him for an FB job. The Hersey HS ARC WB9KET, Arlington Heights planning a repeater. W9CP, W9CSN/W9PBL/4 and K9QPX have joined the ranks of Silent Keys. Our sympathy to their family and many friends. W4DOC invites all to the Atlanta (Ga. that is) Hamfest on July 5 and 6. WB9NLO and WB9LSC are new Advanced licensees working 2-meter fm. WB9NSF a new General. WB9PHM is ex-WN9PHM. WN9OLF has worked his WAS. PAM WA9LDC wishes everyone the best of regards and expects to be back on the bands shortly. From reports received the SET exercise for 1975 had good participation. W9HPG spoke at the Chicago Chapter OCWA about the restructuring docket. WB9IPX has a GTX-200 2-meter fm and HyGain twenty-two-element beam operating on two meters. WB9PZN the call of the Centennial HS Amateur Radio Club in Champaign. The best of all editorials received in regards to Docket 20282 is summed up in publication from the Starved Rock Radio Club – "You owe it to yourself to read in detail and be able to talk intelligently on the air regarding the docket. There has been much misinformation, conjecture and wishful thinking circulated in Ham channels on this subject. Much of the gossip on the air has taken the form of witch hunting and you can thank ARRL for supplying the correct data put into the hands of the League membership by QST for study." The Argonne Amateur Radio Club after 12 years as WA9BRE, is now memorial station W9QVE, which was a long time call of Glenn Mack of Elmhurst. WB9PIO new QTH is PSC Box 4268, APO N.Y. 09009. New Novices in the Mt. Carmel area are WN9PGD, WN9PGC and WN9PLW. K9YST now W8LNH. W9QKF's talk at the York Radio Club's Jan. meeting was "How to cook a circuit board." WA9AFC has a new Drake R4-C. K9PGN, W9QUO, W9IWI and W9FO are the officers of the recently formed Metro Amateur Radio Club (Chicago). New officers of the Radio Amateur Technical Society of Lansing, Ill. are WB9FWO, WB9IWO, WA9NFO and WB9ISR. Their club station is K9TZZ (issued in memory of the late Don Curet. W9ZSN moved to Gulfport and is waiting for his 4 call. Don't forget June 1, The Starved Rock Radio Club Hamfest and June 8, The Six Meter Club of Chicago will hold their annual picnic. Traffic: K9MWA 492, W9NXG 423, W9AES 249, WB9NOZ 175, K9ZTV 131, WA9ULP 129, W9JXV 105, WA9OYL 79, WA9VGW 79, WA9IJE 71, W9LNQ 64, W9VHD 57, W9KR 52, WB9DED 37, W9HPG 35, K9BGL 34, W9HOT 31, K9KHI 29, WN9OLF 10, W9PRN 10, W9RYU 10, WB9ELP 7, W9MTT 6, K9DDA 5, W9LDU 5, W9VEY 4, WB9AWY 2, WB9IPX 1, WA9MZS 1.

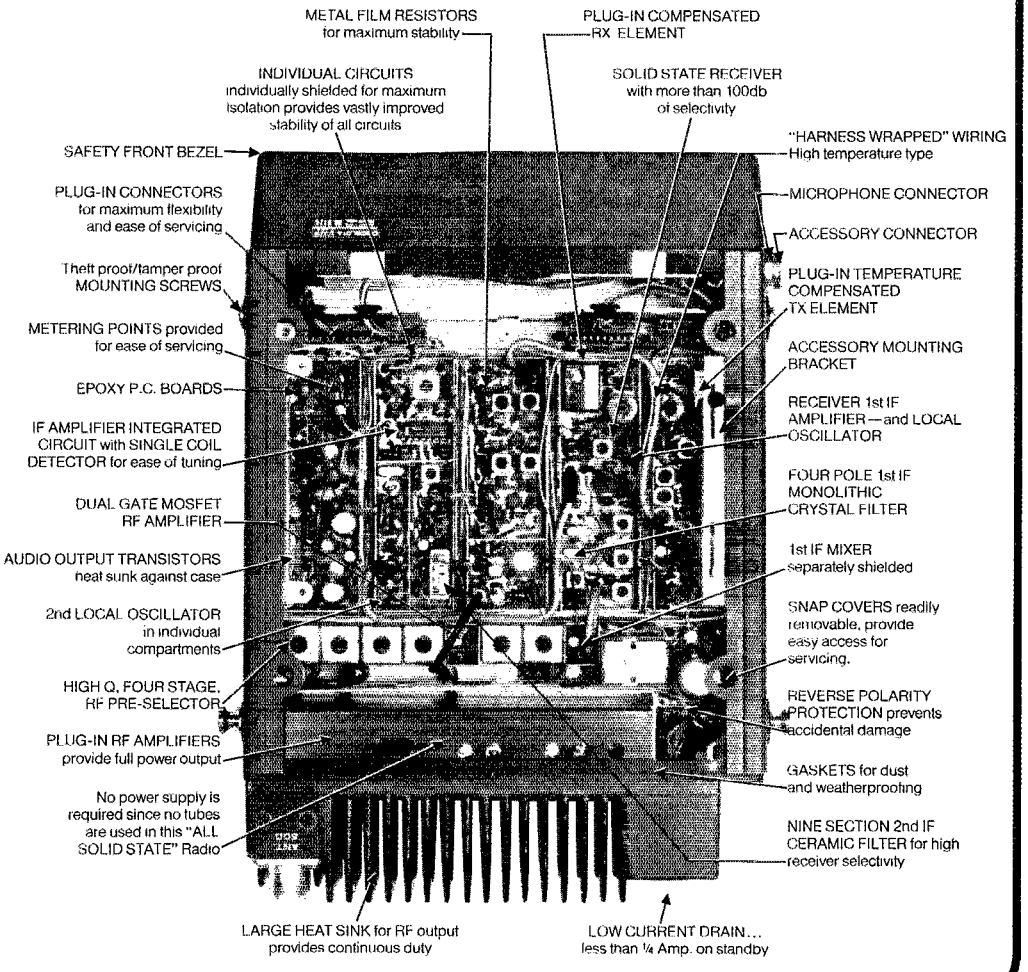
INDIANA – SCM, Michael P. Hunter, WA9EED – SEC: WA9OMH. PAMs: WA9OAD, W9PMT.

Nets	*Freq.*	*GMT/Day*	*QNI*	*QTC*	*Mgr.*
ITN	3910	1330,2300 Dy 2130 M-S	4296	994	WA9OAD
QIN	3656	0100,0400 Dy	271	211	WB9OMX
IPON	3970	1300,2130 Su	129	7	WB9AHJ
EC	3910	2230 1st T			WA9OMH
Hoos. VHF	50.58		645	20	W9PMT

Activity appears to be holding about normal for this time of the year. SET participation was very good and the discussions are also interesting (especially by the first timers). Congrats to WA9OMH, WN9PWO and WB9GIR on making BPL this month. The contest boys are in the middle of their spring flings with some very good scores emerging. Hearty congrats to W9ZTD on his 5BDXCC. It



The 809/859 Base Mobile Transceiver



would appear that daytime NTS is finally getting some needed assistance from the ninth region. WB9AIU has organized the daytime 9RN on 3940 at 2100Z daily. Our section has had good participation but we could use more. With the advent of the valuable NTS net, we have no excuse for not using NTS as our so means of traffic handling. From the noise on the bands, it is obvious almost everyone has heard of the FCC proposals for possibl restructuring. Before you get too excited, however, you would d well to study the full text carefully, Feb. QST. Then write to FC with your comments. Only YOU can help! Traffic: WA9IMH 50 W9FWH 335, W9QLW 227, WN9PWO 224, WB9FOT 21 WA9OAD 214, WB9OMX 185, WB9GIR 175, WB9MDS 15 WA9TJS 116, K9EQT 105, WA9OKK 89, W9ENU 75, WB9MD 61, K9CBY 41, K9DLY 35, W9BUQ 31, WB9HCH 31, WA9CYG 2 K9RPZ 28, K9RWQ 28, W9MCJ 27, WB9BAP 23, WA9OHX 2 W9IRT 20, W9UFM 20, W9PMI 19, WA9SBR 19, W9LWI 1 W9CMT 17, W9KWB 17, WN9MAM 17, WA9LGQ 14, WN9PFZ WA9AJY 10, W9HUF 8, WB9IHH 8, WB9DNT 6, K9YBM W9RTH 5, K9TKF 5, WA9UUH 5, K9PSL 2.

WISCONSIN – SCM, Roy A. Pedersen, K9FHI – SEC: K9PK PAMs: W9AYK, WA9LRW, K9UTQ. RMs: K9KSA, WB9IC K9LGU, W9MFG, K9GSC.

Nets	Freq.	Time(Z)/Days	QNI	QTC	Mg
BWN	3985	1245 M-S	458	349	W9AY
BEN	3985	1800 Dy	873	242	WA9LR
WSBN	3985	2330 Dy	1408	315	K9UT
WNN	3725	2330 Dy	199	87	WB9I
WSSN	3662	0030 M-W-F	76	23	K9K
WIN-E	3662	0100 Dy	392	289	W9M
WIN-L	3662	0400 Dy	235	113	K9E
WRN	3660				K9G
WIPON	3925	1801 M-F	667	52	WA9N

WSBN certificate to K9HDF, WB9NKC, WB9KRR, W9BZU Manitowoc Co, WB9EJE on Board of Dir. of WVRA also tre WVRA should have over 600,000 points as a club score in the N SS. WB9KPX new FCC operator to EAN. WA9OVT Extra Cl license. WB9NME worked ON5IU, FT8TC, ZS2AG, CX1EK/K YS1FAE, LA2MA/MM2. New Novices from WARC: WN9s P PTR, PTX, PTY, PUB. ORS renewed W9RTP. EC for Shawano WA9BZW. WB9LKC using Argonaut 75 QSOs in six weeks. Mountain Repeater has new GE transmitter. Regret to report Silo Keys WA9ZJF, K9OBF, W9EWO, XYL of W9LIY, W9QM W9VYR, K9DAF worked W2IHG through Oscar 7. OPS WB9KMO. Don't forget YTARC Hamfest May 17, 1975. K9G owner of L4B working DX 3B6, ER7, 9J2. WSBN, BEN, BWN, O cert endorsed K9FHL ORS, OBS renewed W9IND. New Novices Portage WN9QDT, WN9QDU. WSBN, BEN, BWN certs renew W9ZGQ. RM, ORS, OPS, WIN, WIN-L certs endorsed K9LC W9NEN has reciprocal license for the Bahamas W9NEN/C6A: C is new Bahama prefix. QCWA has 110 members in Wisc. BE WSBN certs renewed K9UTQ, WB9ICH RM for WNN. W9II delegate for BWN. WNA picnic at Oshkosh July 13. K9CPM m BPL. W9AYK on 2 meters. WA9OVT received 2nd class fone tic for elements 1,2,3. WB9NME has WAS. WA9AJW Advanced Cl New Novices WN9PYE, WN9QBF, WN9PZJ. Oconomowoc RC Swan 350-C. WARAC Swaptest had 40% more attendance than year. Traffic: (Jan.) K9CPM 894, W9CXV 318, W9DND 2 WB9KRR 191, K9FHI 182, WA9OVT 176, WB9KPX 152, W9M 123, K9LGU 117, WA9KRF 116, WB9ICH 101, K9UTQ WB9ABF 65, K9KSA 59, W9IHW 55, W9AYK 54, W9PD WB9KMO 48, WB9NME 47, WA9LRW 45, WB9LSS 36, WA9P 36, K9HDF 33, W9VBQ 31, WB9HLS 27, WA9GJU 25, K9IPS WN9PTX 24, W9MDU 21, WB9NKC 18, WB9JSW 17, WN9OPI WB9LKC 16, WN9NRK 13, W9WJH 11, WA9AJW 2. (D WA9GJU 45, WN9NKK 6. (Nov.) WA9GJU 82.

DAKOTA DIVISION

MINNESOTA – SCM, Tod Olson, WØIYP – SEC: WAØ PAM: (MSPN-E) WBØFTL. Chief RM: KØZXE. Chief OO: WAØ Chief OBS: WBØLOR.

The Minn. Calling Frequency is 3925 kHz

Net	kHz	Time(P)/Day	Sess.	QNI	QTC	
MSN-1	3685	8:30 Dy	31	262	87	K
MSN-2	3685	10:15 Dy	27	104	21	WAØ
MSPN-N	3945	12:05 Dy	28	896	143	K
MSPN-E	3925	5:45 Dy	30	881	102	WB
PAW	3925	9A-5 Ex-Su	192	4981	447	WAØ
MWX	3925	6:15 Dy	31	309	303	K

New appointments in Jan.: SEC WAØOFZ; PAM WBØFTL; WBØLDW; OPSs WAØMMV, WAØYWA, WBØFTL. New ARRL

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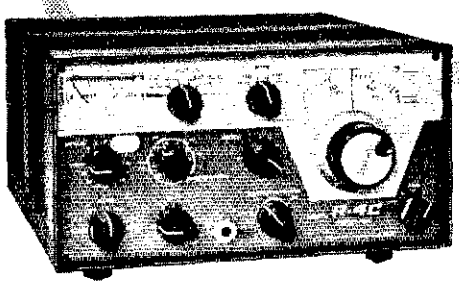

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- Transistorized audio
- Optional high-performance noise blanker
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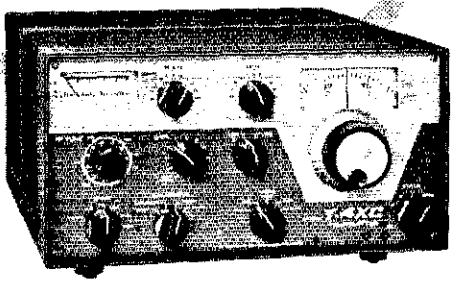

T-4XC Transmitter

T-4XC FEATURES:

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222.34	223.90	146.10	146.52	52.525	52.525
222.38	223.94	146.12	146.61	52.70	52.60
223.14	223.98	146.16	146.70	52.76	52.64
223.26	224.74	146.19	146.72	52.82	52.68
223.30	224.86	146.22	146.76	52.88	52.72
223.34	224.90	146.25	146.79	52.92	52.79
223.50	224.94	146.28	146.82	52.96	52.80
		146.34	146.85	53.15	53.05
		146.52	146.88	53.25	53.08
		146.94	146.94	53.68	53.16

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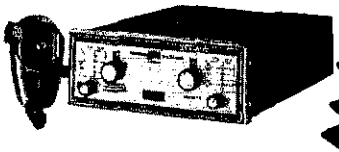

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$219.95
(Incl. 52.525 MHz)

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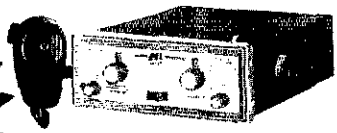

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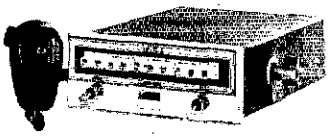

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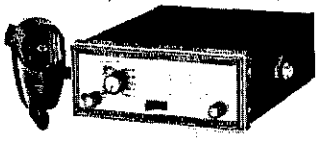

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and the following **standard** crystals @ $4.25 each:_____ $_____

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Sub-Total $_____ Ind. residents add 4% sales tax: Cal. residents add 6% sales tax:_____ **TOTAL:** $_____

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Prices and specifications subject to change without notice.

Members: WØASZ, WAØGWC, WØORK, WØQIN, WAØTFT, KØTPF, WAØUXN, WAØUXO. KØBUD new Public Relations Asst. to the Dak. Division Dir. KØLAV reminds us that the WINDS net will again be active during a Tornado watch or warning. Check 3912 kHz (146.94 MHz) for info gathering. KØCSE passed his Advanced Class exam. Rptr. info: Waseca 34/94 WRØAGF; Duluth 34/94 WRØAIM; 22/82 WRØAII, WAØKMR and WØNO are building repeater at Iron Mtn. WØNO, WAØYVT, WBØHOX, KØGNI made RPL in Jan. WØZHN, WØIYP presented a program at Duluth Jan. 17. WAØIAW, WØIYP discussed 20282 at a VARS meeting in Waseca Jan. 31 while WØPAN was at the 3M Radio Club banquet the same night. Don't forget to return your League survey and also the Division survey on the FCC proposals. This month we thank the MSN NCS group: KØCVD, WØYC, WAØURW, WBØLDW, WAØYAH, WBØKTH, WAØJPR, KØZXE, WØPFT, WØNFU for a job well done. Traffic: WBØHOX 368, WAØYVT 261, WØZHN 228, WØNO 194, WØQMY 194, KØGNI 188, KØZXE 139, KØCVD 118, KØPIZ 97, WBØFTL 94, WAØVUP 93, KØRMX 87, KØCSE 82, WAØTFC 64, WAØGLI 62, WØIYP 59, WBØMHL 55, WAØONE 54, WBØLDW 48, WBØCPC 47, WBØEMI 44, WBØLOR 40, WAØURW 35, KØZBI 34, WBØKTH 32, KØFLT 29, WAØYAH 29, WAØRKV 26, WØWAS 17, WAØWOV 17, WAØIIB 16, WBØCYM 15, WBØDBD 13, WØHZU 13, KØJTV 10, WBØENK 9, WBØMOI 9, WØAA 7, WBØJYT 7, WBØGMK 5, WBØGMJ 4, WAØMMV 4, WØPAN 4, WAØDUA 3, WAØJPR 3, WØRIQ 2, KØSXQ 2, WØOPX 1.

NORTH DAKOTA – SCM, Harold L. Sheets, WØDM – SEC: KØRSA. OBS: KØPVG. RM: WBØHHC. OO: WØBF, KØRTY home from the hospital. The Minot RC held its annual winter dinner. Certificates of service from the Disaster Emergency Services Assn. were presented to WØHVA and the Minot Radio Assn. by the local CD dir. WRØAGR the Forx Repeater station on the air and working well. WAØCSK, WAØCSL, WØYIZ, WA2VOI and KØOSI got it up on top of the State Mill. WAØIVI and WAØIUJ helped with the tune up and necessary repairs. WØRRW was contacted in Fargo with excellent copy. Congrats fellows. WAØIUJ of the Red River Valley Vocational Center put up a 432 Helical antenna and a circular polarized 2-meter beam to track Oscar 7. WBØEVT made the local newspaper when KØAAJ, WØOPL, WØCDO and WAØCHR visited him and held an antenna party for him. When the Jan. 11 blizzard struck, WAØRWM activated the YL WX Net and with the assistance of WØCAQ and WBØGJY kept the net in operation 'till the band went out. WAØWLP, WAØDLB and WØCAQ along I-94 helped in passing along info of missing parties. 125 stations checked in, NI 79; Minn. 31 and 10 from SD. WBØHHC again made RPL. SF found many amateurs ready for it, WAØSUF., WAØWLP, WØMXF and WØBF were the main spark plugs.

Net	*kHz*	*CST/Days*	*Sess.*	*QNI*	*QTC*	*Mgr*
RACES	3996,5	S-S 1730 1830	54	726	149	WBØA WAØSL
YL WX	3995,0	0730 M-F 0830 S	27	447	438	WAØRW
Goose River	1990,0	0900 S	4	56	2	WØCD

Traffic: WAØRWM 468, WAØSUF 230, WBØHHC 215, WØCDO 58, WØDM 50, WØWWL 40, WØMXF 17, WBØFUO 14, WBØBMG 7, WAØJPT 7.

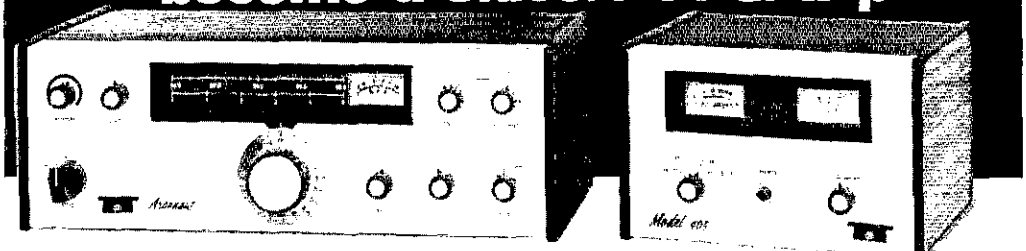
SOUTH DAKOTA – SCM, Edward C. Gray, WAØCPX – The SD summer ham picnic will be June 14 and 15 at the 4-H Grounds west of Mitchell. An Antenna Program, Amateur Satellite, Two Meter Transmitter Hunt, Amateur forum, and a presentation by ARRL Division officials are some of the activities planned. Activities will also be available for the XYL and the children. WNØOMD, WNØOME and WNØOMF are new Novice licensees. RM WAØTNH reports that the SD CW Net handled 2280 formals during 1974. The SD Weather Net handled by WØZWL and WØMZI operated throughout the day, Sat. Jan. 11, 1975 with many net controls handling traffic caused by a severe blizzard. All nets reported good activity this month. Traffic: WØZWL 631, WAØTNM 276, WAØKKJ 149, WØHOJ 125, WAØVRL 116, WAØUEN 96, WBØIJV 7, WBØEVQ 27, KØDUR 24, WØDVB 15.

DELTA DIVISION

ARKANSAS – SCM, S.M. Pokorny, W5UAU – SEC: W5RX. PAMs: WB5FDP, W5POH. RM: W5MYZ.

Net	*kHz*	*Time/Day*	*QNI*	*QTC*	*Mgr*
ARN	3995	0030 Dy	297	36	WB5FDI
OZK	3765	0100 Dy	242	47	W5MY
ANN	3715	0000 Dy	86	22	WB5IQ
APN	3937	1200 M-S	849	22	W5PC
M-Bird	3925	2130 M-F	294	6	WA5ZV
AFN	3995	2330 Dy	341	55	WH5IC

The Argonaut has become a *Classic* in QRPp



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Linear, 100 Watt, Model 405	**159.00**
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Power Supply for 505 and 405, Model 251	**99.00**

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New FCs: W5TXA for Washington Co.; WB5GAX Monroe Co. New Ark. hams, WN5LQG, WN5NIJ and WN5NNA. OZK picnic at Little Rock on Apr. 6, hope to see you there. W4WHN, Delta Dir. also plans on being there. SET '75 had good turnout with many test problems presented, thanks to all who were active for this test. Mountain Home repeater WR5AGS on 28/88, with new antenna should have better coverage. Club secretaries advise me of new officers and other activity. Request station activity reports for this column. Traffic: WB5IGF 121, W5MYZ 57, W5UAU 33, K5OKQ 18, WB5GAX 17, W5TXA 15, W5EIJ 14, WB5GWU 11, W5SHV 7, W5KL 6, W5BED 2.

LOUISIANA – SCM, Robert P. Schmidt, W5GHP – Asst. SCM: John Souvestre, WA5NYY. SEC: W5TRI. RM: WA5ZZA. PAM: WB5EKU. VHF PAM: WA5KND. My apologies to WA5LPW, treas. of the Southwest LA ARC. In the Feb. column I had his call listed in error. New officers of the Ozone ARC in St. Tammany Parish are WA5QCX, pres.; W5RBT, vice-pres.; WA5FDD, secy.-treas.; WA5CKI, WA5WUJ, WA5YJW, board. The club is busy getting their 31/91 repeater on the air under the call WR5AHT. The Alligator Net on 3925 issued over 800 certificates since its inception, advises WA5YJW, NCS. Congratulations to all members who participated in the SET. All LA nets broke records, and in particular LTN. Many thanks to all members, especially the ECs, also WB5EPE, SW La for his work as acting EC for that area. The Lafayette ARC Dinner on Feb. 15 was a great success. New officers Lafayette ARC are W5SMC, pres.; WA5BIM, vice-pres.; K5MGA, secy.; K5ARH, treas.; W5EXI, K5DPG, W5WPO, board. WA3AGM/5 was transferred to Norfolk, Va. LAN welcomes new member K5TTC, Baton Rouge, and also the return of OT WA5NUK of New Iberia. Congrats to WB5IYH, former area EC now State RO. W4OGG, Tenn. visited W5CFZ Lake Charles for fishing. I must report the new time for the RTTY Net is apparently not too good, QNI has fallen off. I would like to hear from all active RTTYers as to the best time for this traffic net.

Net	kHz	Time/Days	QNI	QTC	Mgr.
LAN	3615	7:00/10:00 PM Dy	415	316	WA5ZZA
LTN	3910	6:45 PM Dy	398	286	WB5EKU
LSN	3703	8:30 PM M-F	120	76	WA5IQU
LRN	3587.5	8:30 PM W	5	7	W5GHP

Traffic: WA5ZZA 541, WA5IQU 323, W5GHP 317, WB5EKU 203, W5MI 125, WB5LBR 98, WA5TQA 96, WB5JZQ 86, WB5KFA 74, W5CEZ 51, WB5FZJ 36, WA3AGM/5 21, K5FTC 18, WB5IKT 10.

MISSISSIPPI – SCM, W.L. Appleby, WB5DCY – Asst. SCM: C.E. Gibbs, W5ELL. SEC: WB5FXA. It is with regret that I report WB5LPM a Silent Key. Basic Electronic Courses underway at Gulfport by W5PDG & WA5SUE, Code classes at KAFB & in North Biloxi by WB5MCC. Upgrading: WB5KUJ, Extra; WN4HRR/5, Cond.; WN5KFN, WB5HVY, WB5JBW, WN5MTQ, WA5EZQ, WB4NKP/5, Advanced. K5GVG on coast; WN4HRR/5, WN5MTE new rigs; WB5FXA new HF amp, K5UEP, WB5IUS, ORSs; K5OAF, RM; WB5KUJ ORS & OBS; WA5MPQ EC; WA5RKR OVS; K5KTL, WB5AHZ OPSs, K4INY now W5UQJ. WA5WXF/5, WN1FOT/5, WB4NKP/5 at KAFB. MTN Certs issued to K5OAF, WB5KUJ, WA5YZW, WB5IUS, W5WZ, WB5JBW & W5EDT. WB5EHI, WA5FDP designing keyers. MCARA plans Hamfest in Apr. 1976. Cert of Appreciation to WA5YZW for 3 years as Net Mgr. MTN. K5TYP lost HF antennas in windstorm. K5TQM heard on HF. W5RRG, W5PIX, WA5LDG/5 heard on vhf-fm. Amateurs involved in the McComb Tornado communication operation were WA5VBS, WA5UBQ, WA5YJA, W5JJW, W5TAD, K5JMD, WB5NBO, W5TDC, K5EEB, K5SVD, W5KYC, WA5OHQ, K8YUW/5, WB5FXA, WA5JTB, W5YZL, K5SVC/5, WB5AHY/5, W5IBO, W9IXV, WA5SNX & W5IBU. WM5BIL, MCARA special call received Cert of merit, 1st Pl 5th Dist in WW WPX SSB Contest. WB5FCO reed FO 2nd Cl Phone. Heard in Jan. CD Pty W5MUG, W5RUB, WB5EIN, WB5FXA, W5LL, WB5DCY. Welcome new amateurs WN5NJZ, WB5NLU, WN5NLN, WN5NLP, WN5MLQ, WN5NLL. Enjoyed visit with Hattiesburg ARC, Miss. Coast ARA, Jackson Co. ARC, Keesler AFB ARC. Note page 65 Feb. QST for new Traffic Categories. PSHR: WB5JBW & WB5IUS. SET best in several years. Net Mgrs., SEC & ECs did FB job.

Net	Freq.	Time(Z)/Day	QNI	QTC	Mgr.
MSBN	3987.5	0015 Dy	–	–	WB5BU
MSN	3733	0000 TThs	–		WB5JB
MTN	3665	0045 Dy	149	69	K5OA
CGCHN	3935	0100 Dy	1674	161	W5OE

Traffic: WB5IBW 136, K5OAF 128, WB5IUS 120, W5EDT 8[illegible], WB5BKM 70, WB5FXA 70, K8YUW/5 67, WB5DCY 64, WB5LPI 61, WB5EIN 46, WB5BUE 45, W5SBM 39, WA5YZW 39, W5NC 21, WB5FHA 20, W5QDC 8, W5LL 7, W5UCY 3, WA4EQP/5 [illegible]

CW FILTER

The IMPROVED CWF-2BX offers RAZOR SHARP SELECTIVITY with its 80 Hz bandwidth and extremely steep sided skirts. Even the weakest signal stands out.

Plugs into any receiver or transceiver. Drives phones or connect between receiver audio stage for full speaker operation.

● Drastically reduces all background noise ● No audible ringing ● No impedance matching ● No insertion loss ● 8 pole active filter design uses IC's ● Bandwidth: 80 Hz, 110 Hz, 180 Hz (selectable) ● Skirt rejection: at least 60 db down one octave from center frequency for 80 Hz bandwidth ● Center frequency: 750 Hz ● 9 volt transistor radio battery not included.

● 400 Hz or 1000 Hz center frequency available add $3.00.

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CWF-2, PC board, includes 4 position selectivity switch $16.95
CWF-2, kit $14.95

SSB FILTER

The SBF-2BX is a **new and different** kind of single sideband filter.

Unintelligible signals become readable as you slide the selectivity switch to optimize the audio bandwidth.

IC active filter includes high-pass filter plus selectable cutoff active lowpass filter. Select 2.5, 2.0, 1.5 KHz cutoff.

SBF-2BX, assembled and tested $24.95
SBF-2, PC board, includes 4 position switch; wired and tested $17.95

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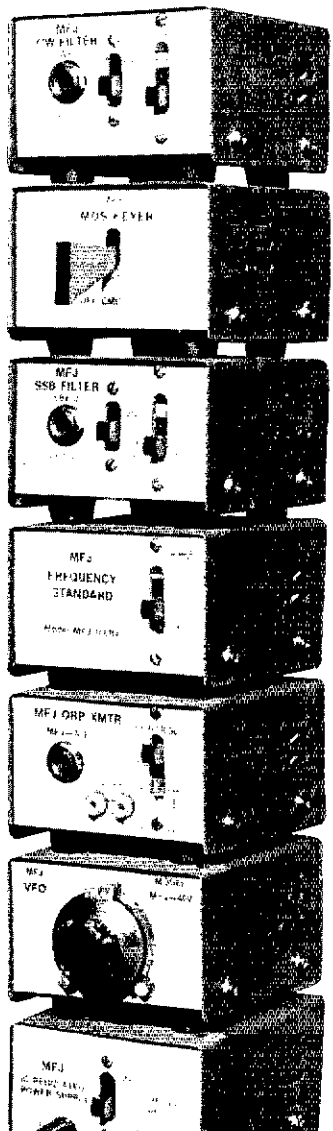

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(perfect for operation where sidetone is built into rig)

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Add a battery and crystal and you're on!

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W5UEP 2, WN4HRR/5 1.

TENNESSEE – SCM, O.D. Keaton, WA4GLS – SEC: WB4DYJ. PAMs: WB4PRF, K4LSP. RM: WB4DJU.

Net	Freq.	Time(Z)/Days	Sess.	QNI	QTC	Mgr.
TPN	3980	1140 M-F	89	3824	261	WA4EWW
		1245 M-F				W4PFF
		0030 T-Su				WB4YPO
		1400 SSuH				
TCN	3890	0030 M	4	77	14	WA4ZBC
TFCN	3980	1300 Su				
		2200 Su				
TN	3635	0100 Dy	27	210	144	K4YFC
TNN	3707.5	0100 Dy				WA4GAM
ETVHFN	50.4	0100 TThS	12	163	0	WA4YKN
ETVHFN	145.2	0100 WF				WB4BZG
TTMN	28.7	0100 WF	8	75	0	WB4NFI
MTTMN	28.8	0200 TF	9	60	0	W4EAY
ACARECN	145.28 145.88	0100 T	5	125	1	WB4ZSZ
KCARECN	145.52	2230 F	4	30	4	WA4ZBC
WTVHFN			11	143	0	WA4VVX

The Bays Mountain RC elected WB4ZOY, pres.; WB4NIR, vice-pres.; WB4FKM, secy.-treas.; WA4ZAL, act. mgr.; WB4MPJ, editor. Foothills ARC elected WB4BAD, pres.; W4PFP, vice-pres., WB4ZIZ, secy.; WB4JMV, treas.; WA4JUB, pro. dir. WB4GJE announces the opening of the Blount County AREC net at 0130Z Jan. 16 on 28.710 MHz and will meet each Wed. the stated time and freq. WB4ZSZ has received OPS, ORS and OVS appointment. K4EJO appointed OVS, WB4CRT ORS. Congratulations to all those who had a part in making the 1975 SET the best in Tenn. history. Traffic: W4OGG 293, K4CNY 245, K4YFC 203, WB4DYJ 176, WB4YPO 150, K4KCK 139, WB4DJU 130, W4CYL 96, WB4ZSZ 82, K4MOA 80, WB4CRT 56, WB4CMQ 48, WA4GLS 38, W4RUV 36, WA4ZBC 35, W4SGI 34, WB4DGI 19, WB4MPJ 18, WB4ANX 16, WB4DDV 10, WB4GBI 6, K4AMC 4, WA4GTW 3, WA4KFS 2.

GREAT LAKES DIVISION

KENTUCKY – SCM, Ted Huddle, W4CID – SEC: WA4GHQ.

Net	Freq.	Time(Z)	QNI	QTC
KRN	3960	1130	349	30
MKPN	3960	1330	1017	74
KTN	3960	2345	1494	18
KYN	3600	0100	329	28
KSN	3600	0300	140	8
KNTN	3725	0200	42	5

Jan. was SET month and Ky was at it again! A successful Jan. Section meeting was held in Louisville with 37 attendees. We found some problems with our traffic system and will be sending out new plans soon. Special mention should go to WB4IGX who helped out nets when the band went out and he had to NCS from Ga. Pat is an ex-KTN members and also provided this same service during the Apr. tornadoes. K4ISI has organized a Louisville AREC Net. Meets Wed. at 2100 local time on 146.46 fm. New officers for the Wilderness Road ARC are WA4DWJ, pres.; WN4BUE, vice-pres., WA4BZS, secy.; W4CDA, treas. The No. Ky ARC conducted an "envelope drill" during the SET. Traffic: WA4GHQ 420, W4CID 256, WB4ZML 210, WA4IGS 185, W4BAZ 156, W4RHZ 135, WB4FCB 100, WB4FXQ 89, WA4AGH 83, WB4AUN 77, WB4FOF 66, WB4WND 61, K4UNW 60, WB4FAT 44, K4UMN 44, WA4FAI 40, K4HFD 33, W4CDA 32, K4HOF 30, WB4ZMK/4 28, K4AVX 25, WA4RCD 19, WB4SKT/4 19, WB4IBO 14, WR4FOT 9.

MICHIGAN – Acting SCM, A.L. Baker, W8TZZ – SEC: W8MPD. RMs: W8IYA, W8WVL, W8RTN, W8GLC, K8KMQ, WB8IMI, WB8NIL. PAMs: K8GBC, K8LNE, WB8BYB. VHF PAMs: K8AEM, WA8WVV.

Net	Freq.	Time/Days	QNI	Tfc.	Sess.	Mgr.
QMN	3663	0000 Dy	1075	295	87	W8IYA
WSBN	3935	0000 Dy	751	118	32	K8GBC
MACS	3953	1600 Dy	933	481	34	K8LNE
UPEN	3922	2230 Dy	671	56	34	WB8IEF
GLETN	3932	0230 Dy	563	49	28	WB8OBI
Mi.6M	50.7	0000 MS	206	38	21	WA8VXI
MNN	3720	2230 Dy	445	166	33	WB8JAI

It is with deep regret that I record here the passing of your SCM LJ Olinghouse W8ZBT. Olie was a grand old man, who gave of himself. He was your friend, and he was mine. We shall all miss him. A election will be held as soon as possible, meanwhile I will try t carry on. SW Mich. 2M nets 129 QNI with 1 traffic in 8 sessions a reported by W8CVQ and WA8WVV. WB8RXS is now General Active on 8RN and QMN. WB8MJI now active on 2M fixed and mobile. WA8FXR, of Sparta has been selected as Amateur of Th

KLM ELECTRONICS INTRODUCES . . .

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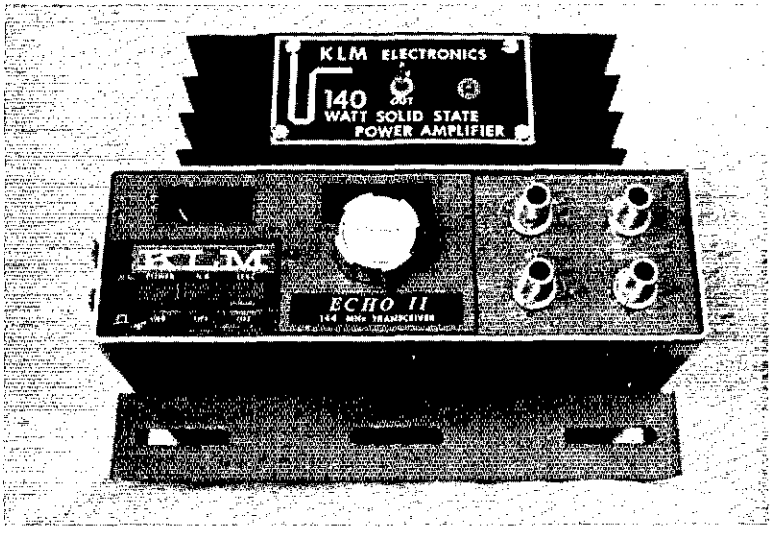
A new 2 meter SSB/CW Tranceiver for fixed or mobile operation



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- Noise Blanker
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- Lightweight 8 lbs
- Compatable with PA 10-70BL and PA 10-140BL KLM Linear Amplifiers

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Save over $58.00 with our introductory offers.

Pkg #1

1 KLM ECHO II 2 meter Tranceiver	$389.00	
1 PA 10-70BL Linear 70 watt Amp.	$139.95	
* 1 KLM 144-148-9 element Antenna	$ 33.95	
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Year by the new MAC'S net. Kalamazoo ARC elected to its Board of Dir. W8ICY (1st term) and WA8WVV was reelected. I am advised that W8KHY and WA8NWD are now Silent Keys. Don't forget the Mich. QSO Party May 17-19. Some truly fine trophies for high scores were on display at the Southfield Hamfest. Contact WB8FDO for details. Traffic: K8DYI 339, K8KMQ 318, WB8ITT 315, WB8JAD 276, K8LNE 241, WB8NCD 156, WB8DKQ 143, WA8WZF 143, WB8EBG 142, W8OW 134, WB8NII 100, K8ZJU 88, WB8RXS 85, WB8MJI 80, W8MO 79, W8GLC 78, K8WRJ 74, W8TZZ 72, W8RTN 57, WA8TBL 57, W8NOH 55, WB8IMI 45, WA8YPY 45, W8EU 41, WB8EEU 40, WB8JIX 38, WA8RXI 36, *WB8HYR 35, WB8OBR 35, W8VIZ 34, K8GBC 33, K8IED 26,* WB8EKA 24, K8HGA 24, WA8ENW 22, WB8PFB 22, W8EOI 21, W8IUC 21, WA8UON 19, WB8SWL 18, WB8APN 17, K8AMU 16, W8EZL 15, WB8IFS 12, WA8WVV 12, WB8DJS 10, W8SDB 10, W8WVL 10, K8GXV 9, WA8MDK 9, K9PYN 9, W8SCW 9, W8OBF 7, WB8BPY 6, WA8CUP 6, K8LJS 6, WB8MKU 6, WB8GKB 5, W8HKL 4, W8YIQ 4, W8JUP 3, K3SJL/8 3, K8WLE 3, W8LOU 2.

OHIO – SCM, Hank Greeb, W8CHT – Asst. SCM: William K. Shaetter, WA8MCR. SEC: WA8COA. RMs: WB8KKI, WA8WAK. PAMs: W8MOK, WA8VWH.

Net	*Freq.*	*Time*	*QNI*	*QTC*	*Sess.*	*Mgr.*
O6MtrN	50160	0200	395	134	36	WA8VWH
OSN	3577	2310	251	89	30	WB8KKI
8N	3577	2345/0300	564	358	66	WA8WAK
OSSBN	3972.5	1530/2100/2345	3215	1653	139	W8MOK

W8IBX and WB8IKY propose a Novice Net, to be held 2 to 7 days per week within the Novice Band, probably at 5:30 PM on 3707 kHz. Newcomers interested in joining such a net are encouraged to listen to this frequency at the specified time, such a net may be in operation by the time you read this. If nothing heard, contact either of the above for info on the status of the endeavor. W8ZET is back from a sojourn in Norway; he reports activity is high on 2 fm. Code & theory classes began at West Tech. High School & Lorraine Community College in the Cleveland area. New officers: Tri County Radio Assn., *WA8AIL*, pres.; *W8GOH*, vice-pres.; *K8DEN*, treas.; WA8WHP, secy. Parma Radio Club, WB8ISC, pres.; WB8ZAU, vice-pres.; WA8ROK, treas.; WA8AOY, secy. Indian Hills RC, WB8HNX, pres.; K8ZGW, vice-pres.; W8KF, secy.-treas. Westpark Radio Ops, K8GZQ, pres.; WB8EVY, vice-pres.; W8LMS, secy.; WB8FOZ, treas. Lake Erie ARA, WB8IYR, pres.; K8SGX, vice-pres., W8GRG, secy.; WB8CQA, treas. Queen City Emergency Net, WA8COA, pres.; WA8SIX, vice-pres.; K8UOK, secy.; WA8NCU, treas.; WA8DFD, comm. mgr. W8DCX received a good writeup on his efforts at "getting the message through" to relatives of a deceased person who were located in Guatemala. Most of you will have paid $5.00 extra for a small license plate sticker, allowing you to keep your existing amateur radio call letter license plate. I am soliciting petitions, public service publicity releases, and any other items which will be useful in a campaign to get the Ohio State Legislature to reduce or eliminate the extra fee for these Call Letter plates. Please contact your State Representative and Senator on this subject, and forward information to me. Laws CAN be changed. Traffic: W8PMJ 500, WA8HGH 408, W8PTT 368, WA8MCR 367, W8CUT 294, W8LF 245, W8EGD 200, WB8KKI 199, W8IBX 197, W8MOK 188, W8ENI 171, WB8QXN 147, W8IJD 111, W8DIL 93, WA8VWH 91, WB8KWD 89, WB8RKA 87, WA8EFX 80, W8MGA 79, WA8YUB 76, W8CHT 75, WB8SMD 73, WA8SSI 70, WA8TSX 58, W8QZK 57, W8GOE 54, WB8OMO 54, K8BYR 49, WB8JGW 47, WB8GGR 45, W8OF 45, W8SUS 42, WN8PIY 40, WA8SED 38, W8GVX 37, K8VMI 34, WA8ROQ 30, WB8MGW 29, W8OUD 29, W8UMH 29, K8MLO 25, WA8ETW 22, K8LXA 22, WA8MHO 21, K8JPI 20, W8WEG 19, W8DCX 17, WA8DWL 17, WB8CJU 15, K8CKY 15, WA9MWF/8 14, WA8MIH 13, WB8CLF 11, WB8FMW 11, K8QYR 11, WB8LIG 10, W8NAL 10, W8TH 10, W8ARW 9, W8CXU 9, WB8AYC 8, W8DPW 8, WA8FSX 5, W8IBC 5, W8UQY 5, K8GRO 4, WB8PGW 4, W8BHL 2, K8PBE 1.

HUDSON DIVISION

EASTERN NEW YORK – SCM, Graham G. Berry, K2SJN – Asst. SCM/PAM: Kenneth Kroth, WB2VJB. SEC: W2KGC. Asst. SEC: K2AYO. RMs: WA2PJL, WB2IXW, WA2FBI, K2DN for RTTY. Nets: See past columns for days, times, frequencies. Many new appointments made – look for announcements in next column. New Rochelle Communications Club heard K2SJO on Docket No. 20282, had Mayor Frank Garito as installation officer for new officers and directors listed last month. Schenectady ARA heard WB2EOU on why's and how's of contesting. Albany ARA also had K2SJO on new license structuring. Harmonic Hills ARA heard WA1FRH on "radio and the Airlines." Club secretaries note: if

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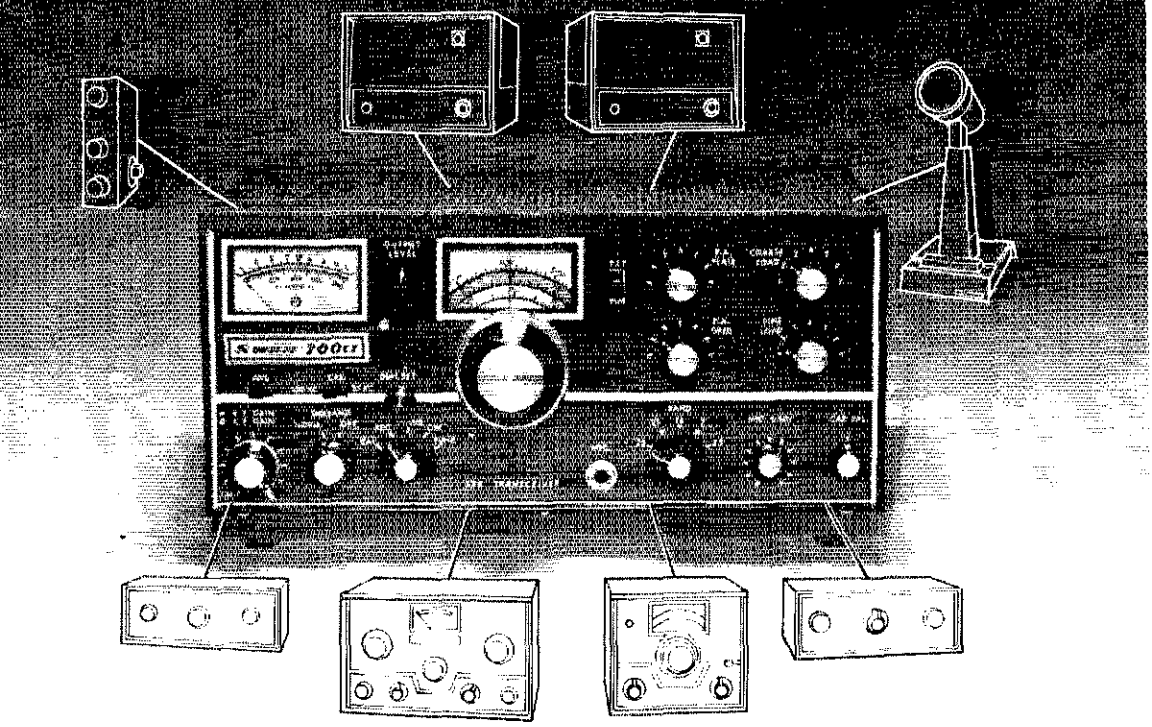

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you're not listed here, your newspaper or notice did not reach SCM in time. Check your mailing list! All traffic handlers note Feb. QST on new point method due to start soon. New York Phone Net 1974 totals: QNI 14,785, QTC 2,122: 372 hours of operation. Good year and congrats to all concerned. New York CW Net (NYS) reports 8,448 check-ins, 4,357 traffic handled in '74. Another good job! ARPSC terrific job in SET, helped along by two new county ECs – WB2SON Orange Co., WB2ZCM Albany Co. All counties now covered except for Greene, but K2AYO, Tri-county coordinator, might be ready to name ECs for Warren and Washington soon – ask him spot if you can handle. Trial operation during SET of NYS net on ssb in addition to regular cw times very effective; thanks to WA2PJL for idea and organization. BPL No 3 to WA2PJL; additional BPL to WB2RKF, WA2ATQ and WB2YRL installing RTTY in Saratoga Emergency Opeations Center on 80M. HELP! Mount Vernon HS Radio Club suffered a rip-off of ALL equipment in station and looking for donations to get back in business. WA2UAC finished HW202 for Pearl River HS station. K2JQB, K2QDF, K2RRZ, WA2QEG – charter members of Communications Club of New Rochelle now Life Members by club vote. During SET WB2KDC, W2GTI, W2PKY, W2EIV all went on emergency power along with WA2PJL. W2GTI went to garage, tapped gas tank for gas for generator, and switched entire house over to emergency power! That's dedication and welcome! Traffic: (Jan.) WA2PJL 549, WB2RKF 362, W2BIW 152, K2DN 139, WB2TGL 105, K2OUA 89, W2EIV 79, WB2BWE 51, K2SJN 47, WB2THS 36, WB2VJB 29, K2TTG 24, WN2YGN 21, WB2RUZ 18, WB2ELA 14, WB2SON 14, W2SZ 14, K2HNW 13, WB2VVS 13, WA2PAU 8, WA2FBI 4. (Dec.) WA2PJL 527, WB2RKF 259, WB2VVS 25, WB2BXL 14, WA2PAU 8.

NEW YORK CITY-LONG ISLAND – SCM, John H. Smale, WB2CHY – Asst. SCM: Art Malatzky, WB2WFJ. SEC: K2HTX. RM: WB2LZN. PAM: WB2EDW. VHF PAM: WB2KQF.

NLI*	3630 kHz	1900/2200 Dy	WB2LZN Mgr
NLI Phone*	3928 kHz	1730 Dy	WB2PYM Mgr
NLS*	3730 kHz	1830 Dy	WB2EDW Mgr
Clear House	3925 kHz	1100 Dy	WA2DDD Mgr
All SVC	3925 kHz	1300 Su	W2OF Mgr
MICHARAD	3925 kHz	1300 MTWThFS	W2QE Mgr
ESS	3590 kHz	1800 Dy	K2UIR Mgr
NYSTPEN	3925 kHz	1800 Dy	WA2RSP Mgr
MRA	40/00 MHz fm	2100 TTh	

*Denotes section net, all times are local. K2OPT now the VHF freq coordinator for NNJ, NYC-LI and Westchester. Welcome to newly affiliated clubs, Division Ave. H.S. ARC and Kings Amateur Radio League. The new Great South Bay ARC will meet the 2nd Mon. of the month at Lindenhurst Jr. H.S., contact WA2JZX for further info. W2EW now on 2 FM with a GTX200, W2YNM will soon have a kw linear. WB2VTN now has his Advanced. Congratulations to WB2LYB on getting one year subscription to the Callbook for being one of the "top" OOs for 1974. The Hall Of Science ARC started their winter classes with 250 plus sign ups, they are also acquiring an FT101-B. The Lake Success Radio Club has moved into a new shack at the Sperry Plant. WB2FJX reports the Beach Channel H.S. RC will soon be equipped to work 2 and 6 meters. W2PF, W2AIM and W2BZ attended the SE ARRL Div. Convention in Miami, Fla., Jan 18-19, and the QCWA dinner; they met many ex-W2s who are now W4s. The Electchester ARS and VHF Soc. enjoyed a fine talk by WB2AQC on his trip to the Balkan Countries. The Hall Of Science ARC has call WB2ZZO for their club location in a trailer adjacent to the Hall Of Science in Flushing. WB2FVX has upgraded to Advanced. W2LYH has received his 40 wpm sticker. He is also building a 160-meter transverter. K2VGD has installed a two element 313 Hy-Gain and quad and now doing some phone patchin with the KC4 group. It is with deep regret that we list WB2ZHM as a Silent Key. WB2OYV still trying to get his rig back on the air, h and WA2KOC came in next to last in a LIMARC Bunny Hunt. I hope that all members and clubs will take time to read and study and discuss the "restructuring" docket No 20282; remember this is now just a proposal. K2KJX home from the hospital and doing nicely. Traffic: (Jan.) WB2PYM 756, WB2FLF 309, W2KC 304, WB2LZN 202, W2MLC 104, W2GKZ 96, WB2QBP 88, WB2HTM 86, WA2WKH 80, WB2IID 78, W2LYH 72, WB2UFG 64, WB2NEI 61, W2GLF 51, WB2CHY 36, W2EW 34, K2JHF 31, WN2PQE 29, WB2QCF 29, WA2JZX 25, WA2KVH 23, W2HXT 22, WB2VTN 22, WA2TQT 14, W2PF 6. (Dec.) W2MLC 150, WN2PQE 86, K2FV 28, W2HXT 24.

NORTHERN NEW JERSEY – SCM, William S. Keller, II, WB2RKK

Net	*Freq. Time(PM)/Days*	*Sess.*	*QNI*	*QTC*	*Mg*
NJN	3695 7:00 Dy	31	467	177	WA2DSA

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NJPN*	3950	9:00 AM Su	-	-	-	WA2DVE
NJPON VHF	146.52	10:00 Su Th	10	115	87	WA2EPI
PVPEN*	145.71	8:00 Dy	37	155	28	WA2OPY

*Includes special SFT sessions. SEC: WB2PBO, PAM: WA2DVE, RMs: WA2DIW, WA2DSA. New appointments: WA2DVE as PAM, W2SWE EC for Kearny & vicinity; WA2DVE and WA2SLF OBSs, W2YD OO; WA2SLF OPS; WN2UID/2 ORS (D) and K2QBW OVS. OO reports received from WB2CST, WA2DNY, K2EK, WB2IEC, *WB2TPH.* Appointees are reminded to report monthly to the SCM. Club activity was high in Jan. Nutley ARC running a novice theory course. WB2PBO reports the formation of the Cranford ARS, which will have license courses. New officers for the New Providence ARC are W2L1J, pres.; WA2RRI, vice-pres.; WB2UEQ, treas.; W2SGO, secy.; W2YM act. chmn. W2LTJ recently spoke to that club on a highly-accurate crystal-controlled clock. Livingston ARC holds its meetings the 1st and 3rd Fri. Sept. thru May at 8 PM in the Livingston Memorial Rec. Bldg. W2HXJ was presented the Ham of the Year award by the Garden State ARA on Jan. 25. W2DYS teaches a license class with WN2VXL on Mon. Much AREC activity this month, especially with the SET. W2ODV, W2OPE, W2JBF among those with emergency power who participated. W2JBF is the CD-DC Dir. in Barnegat, assisted by K2KBF in this and EC duties. *Cranford AREC jumped from 14 to 22 members. NNJ congratulates* WA2DIW on receiving Amateur Extra; WA2UOO on recent marriage; and WN2SLA on receiving WAC, with 60 countries confirmed. Welcome to new hams WN2YJQ, WA2YGR, WN2YJA and WN2YWA. WA2DIW has an 80-meter matchbox and WA2YMC with a 120 watt 2-meter fm rig. WA2GEZ worked NH on 2 meters. WA2EZW and WA2DZL working on equipment for just below 6 GHz. W2CVW reports activity in the Jan. VHF SS. WB2NOM worked 4X4 and OD5 on 75 ssb to complete his 75M WAC. K2ABE *works XYL. WB2OAA on 2-meter fm from a tugboat. K2QBW* worked YV5, OA8, VP2M via Oscar. W2CVW working thru Oscar 7 and reports getting his old HF17 back. WN2TUS invites all to join the NNJ roundtable on 21.15 at 8 PM on Tue. WN2TRS wants to form a UFO net. Again, my special thanks to those who helped *make SET '75 a success! Traffic: (Jan.) WB2RKK 672, WA2DSA* 454, WA2EPI 414, K2BHL 206, WA2BSU 202, WN2UID/2 202, WB2ELF 187, K2OQJ 148, WA2SLF 110, WA2DIW 102, WA2KFF 100, WA2PCF 96, WB2PBO 89, W2SWE 76, W2CU 58, WB2AEF 55, WA2DVE 54, WB2GAV 51, W2BLM 44, WB2RMK 43, WA2OPY 35, WB2YGT 35, WB2HSG 32, W2CVW 30, WB2VUF 27, WA2CWS 25, WB2FIT 24, W2ZFP 22, WB2RJJ 20, W2YD 19, K2ZFI 18, WA2CCF 17, WB2KNS 17, WB2NOM 17, WB2OVA 16, W2GSA 13, WA2SRQ 13, WB2HSD 12, WA2ELW 11, WB2VFT 11, WA2CAK 10, K2USA 9, WA2SHF 8, K2KF 7, WA2QJU 6, W2HSM 5, WA2UOO 5, WA2EUO 4, W2WOJ 3, K2MFF 2, WA2RGV 2. (Dec.) K2KF 12. (Nov.) WN2UID/2 389.

MIDWEST DIVISION

IOWA - SCM, Max R. Otto, WØLFF. WBØEGI hosted 3[0] members of Siouxland Repeater Assn. KØBGG is new treas. and KØARR new control station. WRØAGZ a product of the Assn. was demonstrated by WAØBMP along with a showing of a home brew scanner for HR-2 by WØMMO. KØTFT will house the repeater on his farm with the receive antenna up 146-ft., whew! May 1-4 is Veishea time at Iowa State and KVØISU will be in action. OBS WAØKHL now hear on Afternoon Net 3980 2215Z Fri., also 16/76 2330 Thur. & Sun., again Sun. 34/94 at 0000Z. Congrats to WNØOJD for being first grad from Ames Novice Class. Yours truly got involved in Jan. CD party. Most fun I've had since I played hookey from HS for an SS contest. KØPSC, WBØFGO, WAØVUY and WAØYRX mixed talent and gear and many children in hospital were able to QSO *Santa via 2M. "The Rag Chewers" a new club in Cedar Rapids with* plans for a repeater on 40/00. WBØDXM, ptes.; WØPER, veep; WBØJGS, secy.-treas. Clinton ARC new officers KØAEF, pres.; WAØDUB, veep; WNØNLZ, secy.-treas. OO WAØFFN says many 75M QSOs need a timekeeper and then ID properly. WAØVDX will in 160-Meter Contest and CD Party. Yours truly had a nice eyeball with the Mt. Pleasant Club. Iowa City ARC is starting 2M net 28/88 0100Z Mon. WAØHFW has new eleven-element 2M beam plus VHF SWR bridge and wattmeter courtesy of Santa and his XYL. If you live near Cerro-Gordo, Clay, Decatur or Webster counties how about an EC appointment. Iowa was represented in the DTRN by KØAZ, WAØLKM, WØMOQ, KØDDA, WAØTAQ, WØLCX, KØASR, KØFL.

Net	*kHz*	*GMT(Z)/Days*	*QNI*	*QTC*	*Sess.*	*Mgr*
Iowa 75 Meter	3970	1830 M-S	1729	160	27	WAØVZ

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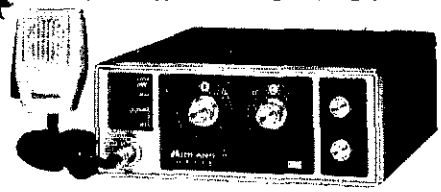

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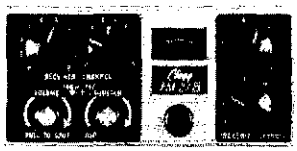

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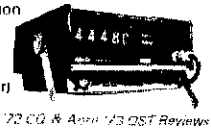

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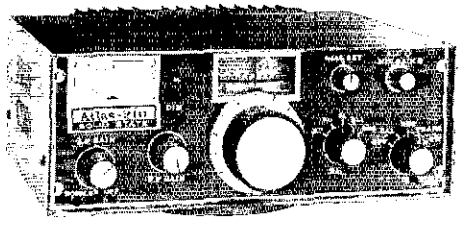

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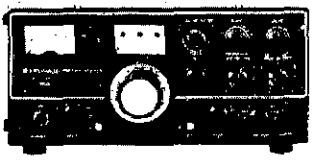

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Iowa 75 Meter	3970	0000 M-S	1168	43	27	WAØA
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Traffic: (Jan.) WAØAUX 474, KØAZJ 232, WØMOQ 50, WAØV 33, WAØKHF 19, WØLFF 15, WAØAVW 7, WBØIZS 1. (De WAØTAO 58.

KANSAS – SCM, Robert M. Summers, KØBXF – SEC: KØJM RM: KØMRI, PAMs: WAØSEV, WBØBCL. VHF PAM: WAØED Transmitter problems have kept me off the air. Sorry to hear t our mgr. of the weather net WAØLBB has been ill and in hospital. The Hambutchers net reports will appear in the Ks sect activities column for a few weeks; mgr. KØDSO reports QNI 3 QTC 24 in 23 sessions. The Kans. Weather Net QNI 580, QTC 2 KSBN reports QNI 863, QTC 128; KPN QNI 119, QTC of QKS-SS QNI 121, QTC 141; mgr. WØOYH. Attention all Novice of Kans. and those of you who can relay the message – QKS- meets daily on 3735 at 8 PM local time. Check-ins encouraged. Q reports QNI 519, QTC 302 in 63 sessions. It appears that most ev ARRL AREC Zone had some type of activity in the 1975 S KØJMF reports 679 AREC members now on file and still reach for that 1000 figure. Many thanks to WØGCJ for an FB job as P the past months. I know you all will get with WAØSEV in attempt to keep the ball rolling with the Phone nets. Congrats in order for WØHI on his becoming mgr. of the Central Area N Understand Zone 7 in SE Ks planning a picnic this year. Let y SCM and SEC know of all these events. Hiawatha ARC planning a two meter repeater. NW Ks now on .16/76. Traffic: WØINH 3 WBØHBM 217, KØJMF 166, WØHI 146, WBØCZR 130, WØFIR 1 WØOYH 127, WBØHTR 126, WØOF 104, KØMRI 98, WØCHJ WØPB 66, WBØKWJ 64, WAØSEV 61, WØKL 58, WBØKWI KØBXF 38, WØWOB 31, KØJMF 30, WBØGVR 26, WØGCJ WAØGSG 18, WØMCH 15, WAØKVP 13, WØRBO 11, WØFDJ WØOGH 7, WAØOWH 6.

MISSOURI – SCM, B.H. Moschenross, WAØIFMD – Asst. SC Clifford E. Chamney, KØBIX. New appointments: WØLSR, EC WBØJWM as ORS. Endorsements: WBØIENV, WAØJOG WBØATD as ECs; WAØITU OO; WØHBH OPS and WAØY WBØCKI ORSs. Although conditions were poor SET activity reflected in the following Net reports. Thanks to all who pa cipated.

Net	*Freq.*	*GMT/Days*	*QNI*	*QTC*	*M*
MOSSB	3963	0000 Dy	1326	194	WBØF
MEN	3963	2330 MWF	601	69	WØN
MON/ MON2	3585	0100/ 0345 Dy	332	166	WØ
WEN	28.6	0230 M	140	12	WBØ
JC2AN	.28/.88	0330 T	94	28	WAØR
MSN	3715	2200 Dy	77	118	KØO
SCEN	.07/.67	0230 M	76	9	WAØF
PHD	50.45	0230 T	51	7	WAØK
MOAREC	3963	2345 M	46	1	KØI
ACE	7120	1930 Su	11	7	WØC

Don't forget MO-Kan. Council of ARC's meeting in KC on Apr Lots of new licenses issued, congrats to: Novices: WNØC WNØOIP, WNØOIQ; Generals: WBØMIX, WBØIVU; Advanc WBØIXS; Extra: WAØPZI. Belated congrats to WNØLPU on Novice ticket. WØKYS and WAØYTU are conducting amateur r classes. KØKWJ has a new XYL. WØQWS/Ø led MO in the annual MO QSO party sponsored by KØLIR. WBØGNL was Amateur of The Month. I regret to report WØBVV as a Silent K PHD has their largest Novice class in history (63). Traffic: KØC (331, WØOTF 168, KØBIX 141, WBØHSP 123, WØBV WBØLRX 114, WAØEMD 103, WØNUB 88, WØEPI 83, WØOUD WØJKF 32, KØPCK 30, WBØLMW 28, WØRTW 23, WAØFKD WØGBJ 14, WNØNNL 12, KØRWL 11, WAØPZI 10, WNØNPY WØBVL 8, KØAHL 7, WAØKUH 5, WAØSXV 4, WBØENV 1.

NEBRASKA – SCM, Dick Dyas, WØJCP – WØMKP rece received the QCWA 50 year certificate. WØTHX and WBØC Silent Keys. WRØAIK call of new repeater in Lincoln on 146, 146.97 MHz. WRØAIE call of North Platte repeater Amateur Eastern Nebr. had a good test of their emergency procedures wh severe snow storm hit the area in Jan. All emergency nets activated and put to good use. I am in receipt of a letter from CD in which he expressed his appreciation for our valuable devoted service during the Blizzard of '75. SET also provid means of making improvements in emergency procedures. Lincoln Experimental Communications Soc. is a new soc. in Lin consisting of amateurs with common technical interests. WØN and WBØIUT have details. NEB I & II QNI 62, QTC 2; NMN 1103, QTC 12; WNN QNI 556, QTC 26; AREC QNI 216, QT

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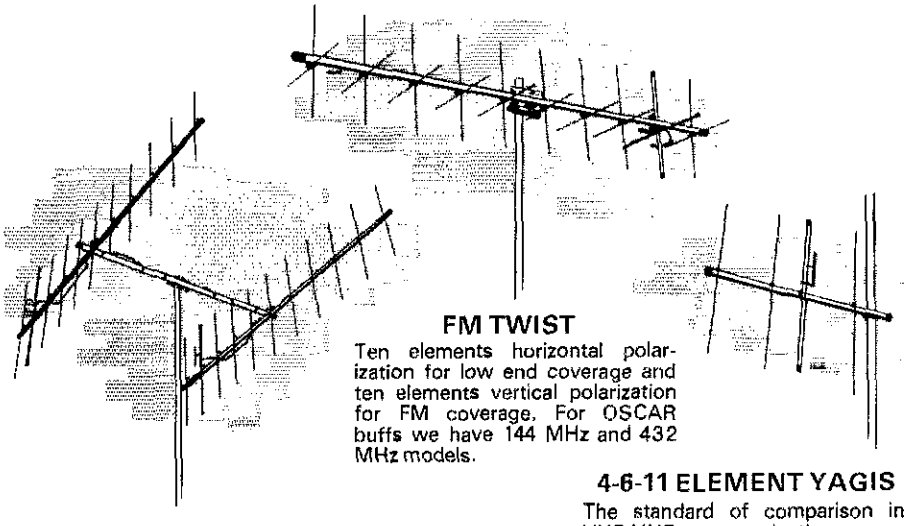

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NEW ENGLAND DIVISION

CONNECTICUT – SCM, John McNassor, W1GVT – SEC: W1DGL. RM: K1FIR. PAM: K1YGS. VHF PAM: WA1OYE.

Net	*Freq.*	*Time/Days*	*Sess.*	*QNI*	*QTC*
CN	3640	1900 Dy	63	547	559
CPN	3965	1800 M-S	36	649	544
		1000 Su			
VHF 2	28/88	2130 Dy	55	409	136
CSN	3725	1730 Dy		285	237

High QNI: CN – WA1OME, W1CTI, K1FIR, WA1FCM, WA1GFB and W1KV. CPN – W1NQO, K1PAD, WA1OME and WA1RUR. SEC W1DGL extends sincere thanks to all who were active during the SFT. Please join the Conn. EC Net on Sun. AM following CPN on 3965 – good start so far and can be a big assist to the EC group. All Nets were busy and held extra sessions – Net Bulletins paid off and members were quite busy. Dir. W1HHR reminds all clubs that your Year-end Annual Club report to ARRL is now due – be sure to send! K1FIR has temporarily terminated the late session of CN because of poor band conditions. Pioneer Valley ARC will hold NE Convention in Hartford Nov. 1, 2, 1975! ICRC (28/88) has A-OK Autopatch – also needs activity on 450 Repeater. W1WEE and W1YA7 assisting Retarded Group with Amateur Radio in Meriden. Congratulations to: W1RU named ARRL Gen. Mgr.; W1RW on his retirement as ARRL Gen. Mgr.; WA1UME for General Class; WA1OME and WA1FCM for Jan. BPL the hard way; Indian Mountain School ARS, Ridgefield High School Radio & Electronics Club, and Avon High School Hi-Freq. Society for ARRL affiliation! The '75 SET was another much enjoyed Winter Field Day. When you make your plans for '75 Field Day, be sure to consider the merits of CW – it will pay off! Traffic: WA1OME 703, WA1FCM 528, WA1GFB 280, WA1SHO 267, WA1RYL 238, WA1RUR 229, W1EFW 203, W1AW 198, WN1UAX 173, WA1LMV/1 135, WA1IGF 120, WA1STN 115, W1CTI 97, W1GVT 93, WA1JCN 86, WA1UNE 84, WA1RXA 68, WN1INR 65, K1YGS 63, WA1IKN 58, W1KV 57, WA1JZC 55, W1DGL 50, W1DHC 32, WA1SWJ 11, WA1NLD 10, W1QV 10, WA1RSG 10, WA1PJP 9, W1BDI 7, WA1JGA 6, W1WEE 5, W1CUH 3, W1DM 2.

EASTERN MASSACHUSETTS – SCM, Frank L. Baker, W1ALP SEC: W1AOG writes from Fla. WA1KZF new EC for Provincetown. New appointments: WA1MEH as ORS, OPS, OVS. Endorsements now for TWO YEARS (1977) but reports are still required each month: W1AOG as SEC, ORS, OBS; W1MX OVS, OPS, ORS; WA1IFE OPS, OVS, OBS; W1BHD EC, OVS, OBS; W1PL OO, ORS; K1PNB RM, EC; W1BB EC, OO; W1KBN ORS, OBS; WA1KZF OPS, ORS; W1AX OPS, ORS; W1AQV, W1KGU, K1YBS, K1UMP OBSs; W1MNK, WA1DXL, WA1OWO, K1NIO, W1RVV, W1BAB, K1WVW, W1MOL, K1NFW ECs; W1BGW OO; W1QYY, W1SMO, W1PEX, W1UF, K1BUF ORSs; WA1NRV, WA1PGY, K1CLM OPSs; W1AAL, W1UF, K1OJQ OVSs. W1MHJ, WN1FBM are Silent Keys. W1OAL now retired and living in Dennis. Middlesex ARC having an Auction Apr. 11, W1GSL ex-K1BOW first trustee of K1MQ would like to hear from any of the original members. WB2CPV has the call WA1UIK. WA1PLN is Dir. for ECARS on 7255, also starting a Novice Net for DARC on 15. WN1UMP is XYL of K1RCD. W1NF and W1DWY are experimenting on 95 kHz. K1BUF got her MD in Education, her OM W1ZQM doing a lot of traveling. WA1OEY now in Westboro, K1HIQ had an operation, W1RSF has an SB-220. New officers of Massasoit ARA: W1AAL, pres.; W1LM, vice-pres.; K1RIW, secy.; WA1GAJ, treas. Dorchester ARC now affiliated with ARRL, I received many SET messages. W1IDR feeling better after an operation. W1RX on 10-75. WA1OJU made BPL, also W1DMH, W1CR on 2 FM. WA1IFE worked W8s and W9s. W1IAA worked VE7BBC via the moon, his son WN1UHA has 25 states. WA1FNY has his General. W1MWM home from hospital. WN1UIK has a 32V2. If you're a member of U.S. Power Squadron contact W3JOO and tell him what equipment you have for maritime mobile operation. WA9IXN in Framingham and working for Sylvania. K1DVX reports a new net, The Knights of the Round Table on Mon. + Fri. at 1100 on 50,320. W1SNN gave a talk at the

Quannapowitt RA. W1PL in Germany on business, W1ASB move*to Fla. W1UX is asst. secy. NYSPT&EN for '75, W1EIH has RFT* gear. WA1MYK back to Amherst will be on from W1PU(WA1RGA on 6 and attending Worcester P.I. W1AYI on 2 fr W1BB's going to visit son Hawaii, also VK & ZL-Land. WB2TN spoke on repeaters at South Shore Club. K1ZZY in Yarmout WA1NNT moved to NH. WA1KZT has WA1KYU, WA1LGV K1TCO, K1UQI in his AREC group in P-Town. WN1TWL on c WA1LBG/1 on 2 fm. W1FJI is asst. CD Dir. in Westport. W1CGR WA1CRI building a counter. WA1KFA has FM27B on 2 fr WA1FOV on also. WA1QJU new OVS.

Net	*Freq.*	*Time/Days*	*QNI*	*QTC*	*Mgr*
EM2MN	145.8	2000 M-F	102	99	WA1IF
EMRIPN	3898	1730 Dy	192	217	WA1QJ
HHTN	04-64	0330Z Dy	382	108	WA1MF
EMRI	3660	(900/2200 Dy	493	365	WA1MS
Mfg. House	3925	1100 M-S	497	341	W1U
(Dec.)			494	466	W1U
NEEPN	3945	0830 Su	72	9	W1KK

Traffic: (Jan.) WA1QJU 515, WA1MHJ 308, WA1OKD 22 W1DMH 138, W1DMS 133, WA1GIK 130, W1CE 116, W1UX 10 WA1OWQ 83, K1PAD 83, W1EIH 79, W1TKZ 74, WA1MYK 5 WA1POY 52, W1FMG 47, WA1PAZ 44, W1MX 43, WA1IFE 3 W1PEX 36, WA1RGA 27, W1EQH 26, W1PL 7, W1GNM W1MNK 2. (Dec.) WA1QJU 311, WB2CPV/1 236, K1PNB 5 (Oct.) W1EMG 75.

MAINE – SCM, Peter E. Sterling, K1TEV – SEC: K1CL PAM: K1GUP. RM: K1MZB. We want to congratulate WA1NXR receiving WAS No. 10 on SSTV. K1MTJ left for Guam and expec to be there for about a year. He may be signing his old c KG6ALV. WA1PEL wishes to thank members of the Seagull Net f their assistance in handling messages into Maine. Hope many of yo will send your comments in regarding Docket No. 20282. I wish thank at this time all those who participated in the 1975 SET. good job well done. the Pine Tree Net reports 30 sessions, 51 traff 66 check-ins for Jan. The Northeast Area Barnyard Net reports sesions, 850 check-ins for Dec. W1LIC is on 2-meter fm. New har in Maine are WN1UFV, WN1UGH, WN1UGX, WN1UHD. Congra fellows. The Seagull Net reports 974 check-ins, 125 traffic for De The Northeast Area Barnyard Net reports 27 sessions, 903 check- for Jan. What is the latest dope on the Rockland repeater? Is operating and if so what kind of coverage are they getting? A *would like to have some info on the repeater* K1PMR, WA1UM and company have been working on. Traffic: (Jan.) K1MZB 14 WA1IOG 63, WA1JHT 44, K1TEV 21, W1GWS/1 13. (Dec K1MZB 154, WA1IOG 101, K1GUP 67, WA1JHT 27, K1TEV 1 W1CTR 2, WA1MUX 1.

NEW HAMPSHIRE – SCM, Robert C. Mitchell, W1SWX – SE K1RSC. RM: WA1GCE. PAM: K1YSD. Endorsements: K1RSC SEC; K1YSD PAM; W1JB/W1APK OO, OPS, OBS. It is my sad du to report the passing of K1TVB. WN1TZS reports the Merrima Valley High School has started a Radio Club, with direction fro My Dyer, Science teacher. They plan to have new novices by Ma W1JB is active in the Medicare Net at 9 AM on 3825 Mon. - S K1YSD on the mend and plans much activity when ham shack relocated. The NHVT Net report shows 166 check-ins, 145 traf with K1LMS as top check in. WA1ETC using the Drake Twins an vertical. K1ACL working at Pease AFB. K1PQV corresponding w KL7HRK (WA1JTM). Congrats to the Keene High School RC their ARRL affiliation. WA1PEL at Pease AFB handling lots traffic thru the Seagull Net. WA1JSD says the Novice Roundup h good participation by the NH gang. Welcome to WN1UJ WA1UJL, WN1UKA, WN1UKW, WN1UKV, WN1ULF, WN1UJ WN1UJC, WN1UJA, WN1UJB and WA1UIP. Traffic: (Jan.) K1LM 73, WA1GCE 62, K1PQV 61, W1JB 30, K1ACL 19, W1BYS WA1JSD 3, W1SWX 3. *(Dec.)* WA1GCE 70.

RHODE ISLAND – SCM, John E. Johnson, K1AAV – SE W1YNE. RM: WA1POJ. PAM: WA1RFT. New Novices in RI WN1s UKR, UKS, ULG, UKC, UFM and UFN. New Techs. *WA1s ULJ and UHO.* New Conditional is *WA1UGD* and n General is WA1UHT. The Newport County Radio Club elected following officers for the coming year. K5FPW, pres.; W1JE vice-pres.; WN1UEJ, rec. secy.; W1PDL, secy.; WA1OSL, treas. Ce and theory classes taught by K1PTV are starting and are open anyone interested in amateur radio. WA1POH has volunteered to chmn. of the Field Day Committee. The Club has selected a site the best reception for a repeater on Aquidneck Island. Taking p were W1GO, K5FPW/1, W1RUS, WA5EXE/1, W1GHH, K1CI WA1QKB, W1AGB and WA1PZC. The best site proved to be a wa tank located at Slate Hill with an elevation of 355 feet above

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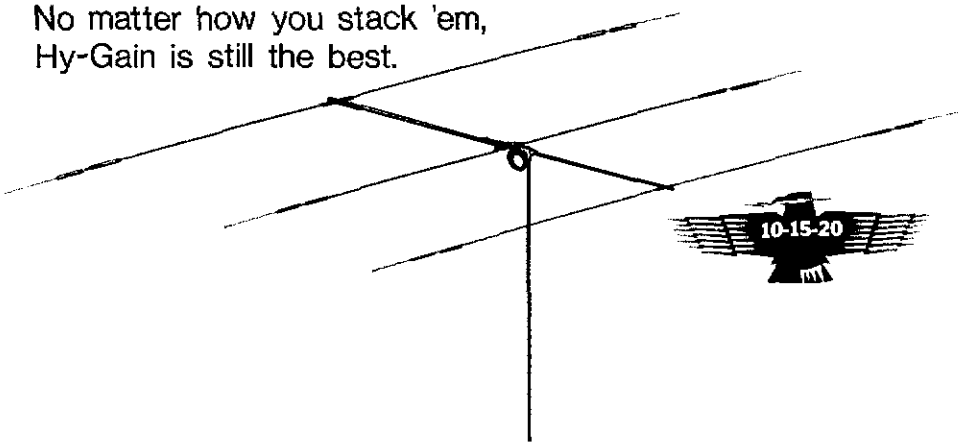

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level. The club is well on its way to raise the necessary money to construct their repeater station. Traffic: WA1POJ 202, WA1RFT 7.

VERMONT – SCM, James H. Viele, W1BRG – SEC: W1VSA.

Net	*Freq.*	*Time(Z)/Days*	*QNI*	*QTC*	*Mgr.*
VTSB	3909	2200 M-S 1130 Su	631	95	WA1PSK
Carrier	3935	1300 M-S	417	11	W2DSK
Green Mt.	3932	2130 M-S	474	36	W1JLZ
Vt. Phone	3932	1230 Su	105	9	W1KKM

We all mourn the recent passing of K1PPW. He will be greatly missed on the air waves. BARC has picked Aug. 10 for the annual International Field Day. WR2ADL has blossomed out with a brand new identifier. K1OAJ completed a shack renovation project. New officers of Northeast FM Repeater Assn. (W1ABI) are K1BKK, pres.; K1OAJ, vice-pres.; K1YGI, secy.-treas. Up-to-date list of repeater frequencies in Vt., Northern NY and Que. is available by writing this office. Traffic: W1LMO 16.

WESTERN MASSACHUSETTS – SCM, Percy C. Noble, W1BVR

This year's SET was by far the best our section has ever had. WMEN, WMN, WMPN and the various 2-meter repeaters with complete liaison between our section nets and daytime 1RN and evening 1RN. Since each repeater group does not normally cover the entire section, we have added to the present section UHF/VHF PAM a new appointment – WA1PLS as UHF/VHF PAM for Hampden, Hampshire, Franklin counties. By the time you read this we hope to have UHF/VHF PAM for Worcester Co. We thank CMARA and MARC for their excellent bulletins received each month, but we are always very short on individual reports from Worcester Co. operators. WMEN held 4 regular Sun. sessions with 2 extra with emergency power only. QNI 81, traffic 18 (not including SET). Mt. Lincoln repeater held 22 AREC sessions, QNI of 25 different stations, traffic 12 (not including SET). WMN held 31 sessions, QNI 154 and traffic 138. WMPN held 23 sessions, QNI 282, traffic 39. Believe both WMN and WMPN had 100% liaison representation on daytime 1RN and evening 1RN. Thanks to those in charge of each: WMEN WA1DNB, WMN W1DVW, WMPN WA1MJE, UHF/VHF W1KZS, Mt. Lincoln WA1PLS & AREC nets with the following ECs: SEC WA1DNB, W1CSE, W1KZS, WA1ORT, K1RGO, K1SSH. The Provin Mountain Repeater Club now an ARRL affiliate (congrats). With regret we report W1OBO a Silent Key. He was one of the founders of HCRA. W1IBZ has new TA-33, K1RQF a new R4C. SET information found elsewhere in this issue. Traffic: (Jan.) W1TM 207, WA1MJE 161, W1DVW 158, W1BVR 120, WA1DNB 71, W1ZPB 48, W1KK 47, WA1OUZ 28, K1RGO 26. (Dec.) WN1RSY 61.

NORTHWESTERN DIVISION

ALASKA – SCM, Roy Davie, KL7CUK – PAM KL7HOV reports 31 sessions, 563 check-ins, 4 OB, 244 messages, 19 PP for the Alaska Snipers Net, KL7HMN busy with SET and power outages during Jan. SEC KL7IDO reports the SET a howling success. There were responses from Anchorage, Delta Junction, Kenai, Kodiak, Ketchikan, Juneau and Point Barrow. This covered the state in good shape. KL7HDX says he will soon be finished with his satellite antenna and then will be on Oscar. KL7HRK was a good tie in between AK and the lower 49 using TCC, RN7 etc. during SET. KL7HNQ complains of poor condx. due to aurora. Please provide me with frequencies and calls of stations in your area who operate on two meters. KL7HEQ is compiling shadow data for AK which he will publish for all interested parties to enable anyone traveling in AK what to expect for communications in the areas which have two meter capability. Traffic: KL7IDO 51, KL7CUK 22, KL7HMN 21, KL7HDX 19, KL7GCH 13, KL7HNQ 4.

IDAHO – SCM, Dale A. Brock, WA7EWV SEC: W7JMH. PAM: WA7HOS, VHF PAM: WA7FSI.

Net	*Freq.*	*Time*	*Sess.*	*QNI*	*QTC*	*Mgr.*
FARM	3.935	0200 Dy	29	1030	19	WA7HOS
IMN	3.582	0130 M-F	29	212	92	W7GHT
RACES	3.990	1515 M-F				K7UBC
Id. Silver	3.930	0110 MWF				W7IY

New officers at the Idaho Society of Radio Amateurs at Boise are W7FOF, pres.; WA7VPW, secy.; K7DOJ, treas.; W7SC, W7JE, WA7ESU, W7OHM, dir. W7GHT is running a new BD-10 keyer. Lewiston-Clarkston Amateur Radio Club elected WA7LRP, pres. WN7TNT, vice-pres.; WA7CTS, secy.-treas. WA7CTS is new OBS. Traffic: (Jan.) W7GHT 373, K7NHV 140, WA7CTS 118, W7FIS 19, WA7FWV 17. (Dec.) W7FIS 6, W7IY 2.

NEWS BULLETIN

NO APRIL FOOLIN'—

DEAR OM:

YES!!! YOU READ IT RIGHT — PAGES 106-107, JAN. '75 QST!!!

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WRITE TODAY FOR OUR LATEST BULLETIN/USED EQUIPMENT LIST!!!!

OREGON – SCM, L. Ray Perkins, WA7KTU – Asst. SCM: Daniel T. O'Connell, WA7TDZ. SEC: W7HLF. RM: K7OUF. PAM: K7RQZ.

Net	Freq.	Time(Z)	QNI	QTC	Mgr.
BSN	3908	0130	709	104	WA7SSO
OSN	3585	0245	150	119	K7GUP
AREC	3993	0300	313	1	WA7RWM
Nuclear	50.250	0130	22		W7EFE
PDXAREC	146.04/64		301	4	K7WWR

Mid-Valley ARC, (Corvallis-Albany area) will provide communications for a Walk-a-Thon in Apr. K7VKZ is the chmn. and the group will be using the 01/61 repeater. Beaver State Net is holding an open forum on the proposed "Restructuring Docket 20282" at 2:00 PM each Sun. afternoon. In the Bend area the repeater frequency is 34/94. It is getting near time to send in your repeater information to Headquarters for the new Repeater Directory. Eugene-Springfield area amateurs put together a very good display at the Valley River Center during Jan. At the same time we had a one hour program on "Periscope", KVAL-TV. About one hundred area hams signed up and there will be a local Directory printed and available to all who signed up. Thanks for this one go mostly to K7OLN. Next project for this group will be to put together a local AREC. What is your group doing? VHF, UHF, HF, QSO party, anything but noghting. Traffic: (Jan.) K7IWD 244, W7ZR 186, K7OUF 96, W7HLF 93, K7IFG 75, K7WWR 66, WA7YEU 64, WA7TXV 52, WA7KIU 20, WA7QDC 19, W7DAN 16, WA7UIO 13, W7LT 5. (Dec.) K7IFG 59.

WASHINGTON – SCM, Mary E. Lewis, W7QGP – SEC: W7IEU. PAM: K7YRQ. RM: K7OZA.

Nets	Freq.	Time	QNI	QTC	Sess.	Mgr.
NTN	3970	11:30	1919	117	31	W7PWF
NWSSB	3945	18:30	233	106	31	W7FTM
NSN	3700	0300Z	392	24	31	WA7NIF
WSN	3590	0130Z	328	112	31	W7LG
WARTS	3970	17:30	2287	149	31	W7QGP

NSN has 9 Novices as reg QNI and 7 Novice visiting stations. W7LG new mgr. for WSN. Comments on SET: W7IEU says thanks to those who participated in SET. Someday we'll get it all together. W7BQ SET on PAN was like old regular traffic days-loaded. WA7OCV condx bad, bad all month. WA7WMB SET was a gas. People still talking about all the activity, pleased with turnout 32 of 59 people in AREC actually got on and passed traffic. Pierce AREC Net now on 146.58 at 18:30 Mon. We created so much activity during SET on 3970, 3930 and 2-meter simplex and the repeaters it was refreshing to have ARRL members and non members ask what is SET and how can I be active in '76. Well done fellows and gals. K7FTU elected chmn. of Mt. Rainier Council B.S.A. Explorer & Search Rescue Unit, Tacoma. W7BUN has been on swing shift. K7BBO selling all his vhf gear and antennas and moving to Sunny CA for his health. Excellent meetings in Yakima, Aberdeen Longview-Kelso and Vancouver on Docket 20282, members non-members turn out very good and the question and discussion periods that followed proved you are interested in the outcome. Thanks for asking me. Traffic: W7IEU 149, K7VNI 149, K7OZA 116, WA7BDD 110, W7PWP 102, WB7ZNW 102, W7QGP 75, WA7OCV 67, K7OXI 64, K7CTP 63, W7BUN 60, WA7WMB 59, W7LG 50, W7HHU 48, W7BQ 38, WA7RCR 25, W7SYS 20, W7AIF 7, W7AXT 5, WA7GVB 4, K7ETU 3, K7GGD 3.

PACIFIC DIVISION

EAST BAY – SCM, Charles R. Breeding, K6UWR – Asst. SCM: Ronald G. Martin, W6ZF. Asst. WB6RPK. Asst. SEC: WB6DSE Appointments: W6REX, OO; K6PMG, ORS; WB6WBG, OPS. K5AM now K6BE in Berkeley, K6HW made BPL. Looks like that new electronic keyer makes a difference, W6IXK also made PSHR again. Congratulations to both for their fine work. It would take more than this entire column to list all those who took part in the SET. All counties were active and did a fine job. May I thank all of you for your hard work and interest in Public Service. The Mt. Diablo ARC broke its own record in radio classes. They now have 10 enrolled in Novice, General and Advanced classes. W6REX los his four-element quad in recent wind storms. WA6YST keeping Napa active on 2 meters, WA6WAI busy updating his equipment. W6SN having a grand time since his retirement. WB6BNR found a whole new world with QRP. WA6DWM and W6LGW both had bouts in the hospital. Reports both are doing well. CCRC reports new calls in the Section: WN6HMK, WN6HNS, WB6HKR, WN6HMD, WB6HOK, WA6HQB, WB6HQL, WB6GIO, WN6GLT, WA6GIO, WN6HZE, WN6HXG, WN6JDE, WN6IGF, WN6IFR, WN6JDC, WB6IGS, WN6IGD, WB6IGW, WN6IFK, WN6IPM, WN6IPC, WN6IOV

WN6IVS, WN6IVL, WN6ITL. Congratulations to VE2AQV/W6 on his appointment as PR Asst. WN6FOA had a ball working DX on 15 meters. JA8MWO was a visitor at the Jan. meeting of the Mt. Diablo ARC. Make plans for the Pacific Division Convention, May 2, 3 and 4, in Fresno. Traffic: (Jan.) K6HW 600, W6TYM 165, WA6IPI 123, W6JXK 102, K6PMG 41, WB6VEW 26, K6UWR 16, WA6VEW 2, W6ZF 2, (Dec.) W6TYM 26.

HAWAII – SCM, Pat Corrigan, KH6GQW – SEC: KH6IKB. The annual SET was a great success due to EB efforts of KH6s IKB, HRG, HOU, HPQ, IAC, HSS, IJW, KG6JAQ and others who *volunteered their time. It was the best ever here and next year* promises to be better. W6RSY was traffic gateway and within one hour some traffic was already on E. Coast! SAROC-Hawaii is now going to be in July. KH6HRG added FL-2100B to his signal. KH6BZF's parents visited during Christmas. Lee says he was first KH6 on Mode B (70 cm/2M) Oscar 7. He is building four twelve-element yagis for 2-meter tropo. KH6AD and Lee trying helix antennas. KH6IAC stuck at 96 confirmed for DXCC. Woody did great job in SET. With electric rates skyrocketing, it would pay to more closely follow FCC rules regarding using minimum power necessary to estab./maintain contacts. KH6s need more exposure in a Public Service role. Contact KH6IKB if you are interested in Emerg. Comm. preparedness. And, if you perform some activity connected with Pub. Ser., let him know so we can publicize and improve our image. 10 meters bleak during DX Test but lots of KH6s were on. Low bands were good except for QRN. Guam boys working up a cw tfc net. Traffic: (Jan.) KH6IAC 449. KH6HRG 33. (Dec.) KH6BZF 33.

NEVADA – SCM, Harold P. Leary, K7ZOK – WA7VIJ & WA7YWH received General tickets, WA7ZJL received Advanced Class license, WA7UEK active in Eyebank Net. W7OK one of the first to receive the new IARU 5BWAC certificate. WA7NEH/7 convalescing in hospital in Vegas. WA7OWW handles KC4 phone patches. WA7MKI/K6FEB has new home, tower and beam with central station service. Hi! K7ICW finally received cards for 5BWAS. WA7DUF is DC3 pilot for Nev. Airlines. W7VIU joined Silent Keys in Dec. WA7KNK worked MS in 10 Meter contest. Sierra Hamfest set for Aug. 9, 1975! W7SRM recovering from illness. W7DID in St. Mary's hospital for surgery. Las Vegas Radio Amateur Club officers are W7ZTA, pres.; W7IZU, vice-pres.; K7OHX, secy.; W7ILX, treas. Remember to send Mar. reports to W7AAF who will be SCM on Mar. 10. LVRAC has plans for participation for all hams in various events. Traffic: W7ILX 165, WA7UEK 63.

SACRAMENTO VALLEY – SCM, Norman Wilson, WA6JVD – SEC: W6SMU. Congratulations to the RAMS on their 20th anniversary. RAMS officers for 1975 are WA6UNL, pres.; WA6ITE, vice-pres., WB6TXC, treas.; K6GUQ, secy.; W6OHP, WA6RWR, WB6KZN, board. WA6ITE has also been elected prospective trustee of the North Hills RC repeater. Welcome to the West Coast Amateur Radio Services, Inc., a new ARRL affiliate. K6QIF, Sacto. EC reports a very successful SET with 108 operators participating. K6QIF is also a new OBS and K6RPN is a new OPS. W6TEE gave a presentation on proposed restructuring to the Jan. meeting of the NHRC. K6SG, who has a new 51-ft. crankup tower, demonstrated his home built programable electronic keyer to the meetings of the N. Calif. Contest Club and the NHRC. WN6HBI has completed DX60B and WA6JVD has built a new 40-meter kw amp. Very high winds in Yolo Co. caused serious damage to the beams at WA6HAU and WB6MDP/6. WA6JVD escaped with a horizontal vertical. Traffic: K6RPN 193, WB6POQ 4, WB6MDP/6 3, WA6JVD 2.

SAN JOAQUIN VALLEY – SCM, Ralph Saroyan, W6JPU – The Delta Amateur Radio Club held their annual installation and dinner on Jan. 18, 1975. New officers are WA6WRM, pres.; WA6SSF, vice-pres.; WA6TBU, secy.; WA6FBL, treas. K6GZN acted as MC. K6OZL has 100 countries on 75 meters. K6URK heard on 75 regularly. The new repeater call of the Repeater Associates is WR6AJD. WA7BCS/6 is the pres. of NAS Lemoore ARC. The SET exercise was handled by W6YEP, EC of Fresno Co., and was assisted by many hams; 2 and 75 meters were used to handle traffic. WA6CPP has worked all Ore. Counties. The new officers of the Stockton ARC are K6JKO, pres.; WA6CPP, vice-pres.; W6YKS, secy. W6HLC is on 75 ssb. K6JKQ has an SB50 6-meter ssb rig. K6QHC on 6 meters RTTY. WA6KZV and gang were active in SET in Kern Co. K6OZL working DX on 75 with 2 vertical quarter-wave antennas. W6NRO has a 32S3. K6UFC has a KwM-2 and a 30L1 amplifier. WB6OSH has a Clegg. A reminder; the DX Convention is to be held in Fresno, Apr. 19-20 at the Hilton. The Pacific Division Convention will be held here in Fresno May 2-3-4, 1975. You still have time to send in your reservations. Traffic: WA6RXI 107, K2SSX/6 1.

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SANTA CLARA VALLEY – SCM, Jim Maxwell, K6AQ/W6CUF – SEC: WA6RXB, W6RSY, W6YBV, W6REF made BPL. W6RFE and WB6TYA on PSHR list. WA6UAM continues to work into the Los Angeles area on 2M with only 75 W PEP out. UAM is tooling up for some EME work. SCV clubs interested in learning of activities of their neighboring clubs should contact WA6JGZ of the Central Calif. Radio Council. WA6NDN basked in the sun in KH6 during Jan. and reports WN6HVI and WN6JDI are now active from Belmont. K6QYT was on emergency power only during the SET, reports W6DFB. Part of their activities included handling tfc with K6OL, who patrolled the San Andreas fault with his mobile rig. Also QRV mobile was WB6JFH – on a wheel chair/6! WA6SCY passed his Advanced Class exam and is now a control stn. on WR6ABD. SCV's neighbor WB6VBG QRL with school. The SET coincided with a meeting of the Portola Valley Disaster Planning Committee. The coincidence of dates was exploited by W6ONB who made friends with an on-the-spot demo of ham capabilities, loading up a temporary wire string out from city Hq. W6ONB also has a packet of info on the Northern Calif. Net (NCN), available for an SASE. OO W6AUC continues to pass out friendly advice on the Novice bands. Clubs interested in an in-depth discussion of Docket 20282 (restructuring) should pulse Pacific Division Dir. W6ZRJ for a presentation. WA6LIJ is FARS raffle chmn. for the next year. All contributions of gear are welcome for the cause. Traffic: (Jan.) W6RSY 1374, W6YBV 705, W6REF 387, WB6TYA 119, W6BVE 111, WB6VBG 91, W6ZRJ 55, W6AUC 49, W6DFB 32, W6OII 26, WA6SCY 22, WA6HAD 18, W6ONB 13, K6AQ 10, W6KZJ 10. (Dec.) W6ZRJ 60, WA6HAD 22. (Nov.) W6ZRJ 19.

ROANOKE DIVISION

NORTH CAROLINA – SCM, Chuck Brydges, W4WXZ – SEC: K4FBG, PAM: WB4JMG, VHF PAM: K4GHR, RM: WB4ETF, PIC of the Month is WB4CES serving Mecklenburg Co. and looking forward to hearing from all emergency minded folks in the Charlotte area. Initial reports indicate a very successful SET. Approximately 250 messages were handled on 3923 and a big thank you for your participation. SET details will appear in QST. New directors for the Fatheel Net are WA4BFT, W4EJF. Reelected by popular demand for net secy. was W4OFO, "old faithful." Congrats. CNCTN (Salisbury 16/76) had 31 sessions, 738 QNI, 468 minutes, 29 QTC. WA4VNV Buncombe EC reports tornado watch on Jan. 1 with 32 stations involved. Several 2-meter repeaters including Raleigh, Greensboro and Asheville have code practice for users. Alamance ARC had its installation of officers banquet and W4WXZ spoke on Docket 20282. New Alamance officers are WB4SGA, pres.; WB4SGB, vice-pres.; WB4SGC, secy.-treas.; WA4EFW, cng. The NC Six Meter Assn. boasts 35 plus members and is offering an award for working 5 members, send info to WB4MXC. The 6-meter net meets 9 AM Sun. on 50.12. New club is the Rockingham County ARC; officers are K4YEC, pres.; W4YOY, vice-pres.; K4BYX, secy.-treas.; W4NAP, act. chmn. This club plans code & theory classes and reports WA4CON to Advanced, WN4LQS, WN4LTY new Novices and WA4DWL to General. Congrats. W4IP now has worked over 600 different stations on 2 meters. New EC and their co. are: WB4UOU, Lenoir; K4BGD, Pamlico; WB4LDC, Haywood; WA4YVF, Surry; WA4IAG, Yadkin & K4AIH, Cherokee. NC now has 31 ECs covering 39 counties. Traffic: (Jan.) K4MC 201, W4OFO 156, WA4YDJ/4 150, K4PZH 139, K4FTB 126, W4WX 112, WB4EFX 75, W4FMN 70, WB4JMG 62, WB4KHZ 61, W4TY 37, WA4KSO 35, WB4MXG 30, W4EHF 22, K4BE 12, W4IZI 1, WB4MKI 8, WB4CES 7, K4AIH 6, WN4HRR/5 3, WA4KWC 2, W4REZ 2, K4TFN 2, WB4TNB 1. (Dec.) WB4WII/4 11.

SOUTH CAROLINA – SCM, R.H. Miller, WA4CEJ – Asst. SCM: Charles N. Wright, W4PFD. RM: K4LND. PAM: K4GOG. A contest-type SET is unheard of. One that also provides training has further value. Jan.'s hurricane hunt exercise was notable in this and other respects. Participation was enthusiastic. Coordination was excellent. Timing was perfect, and control superb. Observance of instructions was universal, even to the smallest detail. The ARES net moved with the precision of well-trained troops. Seldom is such a wealth of vital information exchanged so rapidly. Discipline was the watchword. About the only thing missing was the anticipated "monkey-wrench in the works." Accuracy of calculations also exceeded all expections. Scores as follows: Two bulls-eyes: W4UKU, WA4GFL, WB4OFU, W4MTK, WA4BDG. One bulls-eye and one on target: W4SPI, W4NTO. A bulls-eye and a neat miss: W4YSF, K4FKJ, WB4KNB, K4MXU, WB4OBZ, W4PST. On target and a near miss: WA4UZA, K4GOG, WB4UUH, K4MHU, W4ELW. One on target: K4ZU, K4DNV. Well done, gang. Traffic: (Jan.) W4NTO 142, WB4OBZ 84, K4FRX 6. (Dec.) WB4OBZ 202.

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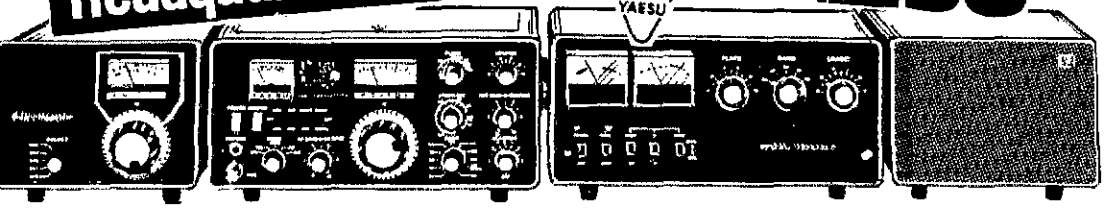

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MMB-1	Mount	19	SP-401	Spkr.	19	XF-31C	CW Filter	45
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VIRGINIA – SCM, Robert J. Slagle, K4GR – Asst. SCM: A.E Martin, Jr., W4THV. SEC: WA4YIU. Asst. SEC: WA4PBG. RMs W4SHI, K4IAF, WB2VYK/4, WA4AVN, WA4DHY. PAM WA9NEW/4. BPL: WA4AVN/4. WB2LAI/4 now WA4MMP WA4FPT has new (female) second harmonic. WA4YIU hopes to ge 10-15-20 quad up soon. SET went well locally on phone but cw wa disappointing; K4AWV and WB4ODZ of SPARK made pre-SE personal appearances on local TV talk show. Note WA4AVN/4' traffic score this month! WB4DRB/4 QRPing. W4WRM call o W6OEO in Va. Dishwasher of W6MQF/4 dripped into new R4C an he had to bake it out! W4TE too busy journalizing. W4ZM finall (?) got 50 Year ARRL Pin! W4HU retired Jan. 31. WA4PBG an W4UMF commended by ARRL Board for their work in behalf o Amateur Radio! Dir. W4ACY and Vice Dir. W8JM visited wit northern Va. club officials. ARRL First VP, W4KFC active in VN KØPIV/4 back to sea in June. W4TMN sweating a new SB220 WB4DRC operated W4PAY during SET. Counties WA4WQG 3075 W4JUJ 3002. K4MSG has new noise blanker, really takes out lin noise! WA4GPM and WA4MMP drawing up charter for Tidewate VHF Society and invite inputs. Also heard from LARC, SPAARC HRRA. VNTN QNI 198, QTC 45; VSBN 1026/217 (less SET); VS 434/162; CVN 481/44.

VSMN	3947 kHz	0715/1630 EST M-F
VSBN	3947 kHz	1800/2200 EST Dy
VSN	3680 kHz	1830 EST Dy
VNTN	3712 kHz	1830 EST Dy
VN	3680 kHz	1900/2200 EST Dy
CVN	50.25 MHz	1900 EST Dy
VEN	3947 kHz	1930 EST Dy
CV2FMSN	01/61 WR4ABO	2000 EST Dy
VNEN	7145 kHz	1800 EST Dy

Traffic: (Jan.) WA4AVN/4 801, W4UQ 352, K4IAF 284, K4KN 276, K4GR 215, W4QDY 184, WA9NEW/4 154, W4YZC 141 K4KDJ 140, WB4KIT 138, WB4DZL 106, WA4YIU 90, WA4HU 81, K4JM 81, W4SUS 78, WB2VYK/4 73, KØPIV/4 69, K4EZL 55 K4VIG 53, W4TZC 52, W6MQF/4 48, WB4FDT 43, WA4SMR 36 K4PRQ 28, W2TPV/4 23, W4KFC 20, WA4DRB 18, WA4QEL 1 K4FEL 11, W4SIG 10, K4VWK 8, WA4WQG 8, WB4WUZ 8, W4M 7, W4WRM 7, W4FMN 6, W4JUJ 2, W4KX 2. (Dec.) WB4SGV 11 WB4DRB 7. (Nov.) WA4GPT 41.s.

WEST VIRGINIA – Acting SCM, K.C. Anderson, W8DUV – SEC: WA8NDY. RMs: W8HZA, W8JWX. PAMs: W8DUW, W8IYD Phone Net Mgr.: WB8DQX. CW Net Mgr.: W8HZA. This info wi appear quarterly unless changed. WB8PAV made BPL and ORS Also appointed in Jan. WB8IJW. WB8OMC ORSs; OVS: WA8KC. OBS: WB8DQX; OO: WB8MKL. W8DFC became Silent Key Jan. Active for more than 50 years, Hutch will be missed. WV Phon Net: 31 sessions, 1249 stations, 263 messages. WVN: 31 session 284 stations, 133 messages. WV Novice Net: 154 stations, 8 messages. MARA 2-meter net: 22 sessions, 83 stations, 37 message Traffic: WB8PAV 274, WB8IJW 205, W8HZA 104, WB8MKL 6 WB8DQX 58, W8SQO 58, K8QEW 57, W8DUV 35, WA8WCK 1 W8IM 12, WA8NDY 12, WB8NFZ 11, W8EUE 7, WB8AKR WB8EKG 6, K8ZDY 6, K8BCF 5, W8CZT 5, W8LGT 5, WB8CPU K8IXO 4, K8LSN 4, WA8YCD 4, W8ZQ 4, WB8CJG 3, WA8LFW WB8PKF 3, WB8SCG 3, K8ZPR 3, K8CFT 2, W8ETF 2, WB8LAI WA8LZE 2, K8NNK 2, WB8SCD 2, WB8SQX 2, WB8BBG W8CKX 1, K8GLN 1, W8GWR 1, K8GWS 1, W8KBM 1, WA8KC 1, WB8MAV 1, WB8MQI 1, K8NPV 1, K8NYG 1, WA8OKG W8QEC 1, K8QYG 1, WA8THX 1, WB8TOC 1, WA8TOM K8VQG 1.

ROCKY MOUNTAIN DIVISION

COLORADO – SCM, Clyde O. Penney, WAØHLQ – SE KØFLQ. RM: WBØHCK. PAMs: KØCNV, WAØYGQ. KØSPR repor that traffic has been increasing on the Continental Tfc. N (Daytime), but would like to have more traffic originations fro Colo. stations. Newly elected officers for the Boulder ARC for 19 are WBØCDI, pres.; WBØBEM, vice-pres.; WBØFFH, treas.; WAØNA secy. The newly elected officers for the Colo. YLs for 1975 a WAØPYZ, pres.; WBØDUV, vice-pres.; WAØWAD, secy.; WØHE treas.; WAØMNM, historian. KØPGX recently handled emergen communications from a North Dak. station, operating on batte power, that was completely cut off by a raging blizzard, with 4 fe of snow on the ground, no heat, lights, phone or electric power. long distance phone call by KØPGX to a police station near t stranded ham, initiated relief for the ham and his family. Net T for Jan.: Hi-Noon Net QNI 1113, QTC 81, informals 144. sessions, 1013 minutes. Late Net Tfc. for Dec.: Columbine Q 1236, QTC 113, informals 258, 26 sessions, 1045 minutes. Traffi

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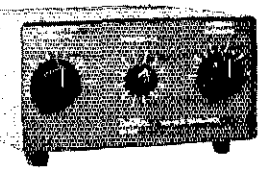

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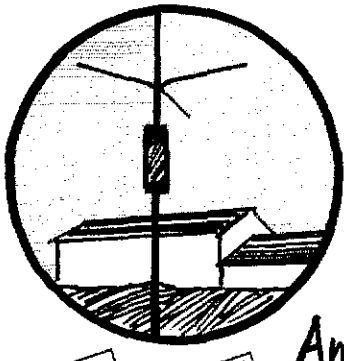

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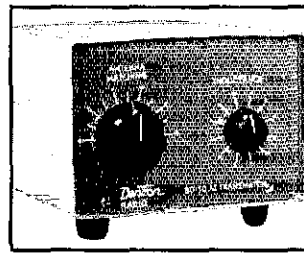

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(Jan.) WØWYX 1986, KØZSQ 1145, KØSPR 131, WØIW 12
WØHXB 99, WAØYGQ 71, WAØTMA 44, KØTLV 43, WSHRS/Ø 4
WBØCVR 30, WØENA 19, WØPT 18, WAØYED 10, WBØIZO
WAØYNQ 4, WAØHLQ 2. (Dec.) WBØHCK 320, WØPT 12, KØCN
2, WØJGT 1.

NEW MEXICO – SCM, Edward Hart, Jr., W5RE – Asst. SCM Joe T. Knight, W5PDY. SEC: W5ALR. PAMs: W5PNY, W5DMC RMs: W5UH, K5KPS. NMRRN meets daily 3940 kHz at 6 PM loc time. Handled 49 messages with 814 stations checking in. Soutl western Net meets daily on 3585 kHz at 7:15 PM. Handled 17 *messages with 253 check-ins. WB5KSS received 25 wpm certificat* WB5AOX has new Wilson 2M HT. One of the thieves who stol some two meter equipment in Albuquerque was foolish enough t put it on the air. Thanks to the efforts of the local members wit DF equipment he landed in the pokey and the equipment wa recovered. *The local amateur clubs in Albuquerque are arranging t* supply equipment to the Weather Bureau to put the weathe broadcasts on the Weather Bureau frequency. Seems as though th Bureau can't do it because of lack of funds. Traffic: K5KPS 22 W5UH 215, W5ENI 199, K5MAT 176, WB5KSS 124, W5RE 8 W5PDY 43, W5YO 35, WA5OHI 13, W5QNO 11, WA5MIY 6.

UTAH – SCM, Ervin N. Greene, W7EU – SEC: W7GPN. RM W7OCX. New EC for Cache Valley, WA7MXZ. BUN meets daily 1930 CUT, UCN daily at 0130 CUT. In 1974 the BUN was session 371 times for 5,876 minutes accounting for 10,43 check-ins, successfully completing 453 messages. Six net certificat were issued. The average number of different stations checking each month was 134. VHF Society officers for 1975: WA7SY pres.; WA7TID, vice-pres.; WA7DEH, secy.-treas.; W7VEO, fre coord.; WA7ARK, repeater engr. Thanks to all who participated the SET especially to SEC W7GPN and EC WA7TEH. Utah ARE nets meet: Salt Lake County, 0145Z on 147.06; Utah Count 0145Z on 146.46; Davis County, 0100Z on 146.58; Weber Count 0130Z on 146.22-82 Ogden Repeater. WA7VNQ has relocated Midvale, has new SB202 linear. WA7MEL studying for first phon while assisting UARC school. W7UTM monitors 34-94 repeater f emergency assistance as does W7DBR in Ogden area. W7HOI experimenting with Solid State Noise Blanker circuits. WA7TS getting Utah Tech. College station on RTTY while attending ther W7FYR trying to teach his VHF rig not to smoke. Traffi WA7MEL 72, K7ZVT 65, WA7OAU 41, W7OCX 33, W7DKB 3 W7RO 28, W7FYR 26, WA7TSB 23, W7EU 16, WA7TEH 1 WA7JRC 10, WA7FKT 2, W7QDY 2, WA7VNQ 2, W7UTM 1.

WYOMING – SCM, Joe Ernst, W7VB – The Fremont Co. AR now shares a building at the Lander Airport with the CAP and oth communication groups. The club plans affiliation with ARRL. *beginners class is underway in preparation for the Novice exar* W7SQT lost his tower during Jan. windstorms. W7RJR joined th ranks of newlyweds, is moving to Mont. The Snowbird Repeat near Alta up the Little Cottonwood Canyon at 11,000 feet, will in operation early Spring serving SW Wyo. and UT, on 147.7 input, 147.180 output, an open repeater. WØSIN Rocky Mt. D scheduled to speak at the Casper RC in late Mar. or Apr. WA7WF also joined the ranks of newlyweds. WA7YWA reports a new rad club being formed, a class is underway at the HS. WA7VEX active Rawlins. Traffic: W7TZK 79, K7VWA 47, K7SLM 37, W7SQT 3 K7WRS 25, K7ITH 20, W7HNI 17, W7IOI 11, WA7TCO WA7NHP 8, W7SDA 4, WA7SGG 4.

SOUTHEASTERN DIVISION

ALABAMA – SCM, James Brashear, WB4EKJ – SEC: W4DG RM: W4HFU, PAM: W4LNN. Sorry to hear K4HNY is leaving c Section. WA4JBC on the air with new Tempo 1 and having a be He is also on *2 meters. The Jan. 10 tornado blew down the antenn* (3 of them) of K4JYO, EC Marengo Co. Officers of the Limesto ARC are W4FXZ, pres.; W4MTO, vice-pres.; WA4WLD, secy.-tre Congrats to WA4MLK, XYL of W4ROS and to WN4MDG, XYL WB4UHC who recently received their new tickets. W4YFN a *XYL K4VJL recently celebrated their Silver Wedding Anniversa* K4JK misses his linear since he sold it. The Huntsville ARC repo W4YFN gave a talk on the history of Huntsville ARC. K4BPY g an interesting talk to the Huntsville ARC on Oscar 6 and 7, K4II and his XYL, WA4GOD, conducted a tour of the Huntsville Tin printing plant. WA4BDW presented a program on Ham Radio classes at Mountain Brook Jr. High School, he also produced a minute radio show about Ham Radio on WVOK-AM. WA4BDW FC, Jefferson Co. Seems like we had a pretty good SET (confirm by K4UMD). He says lower bands were lousy and 75 meters

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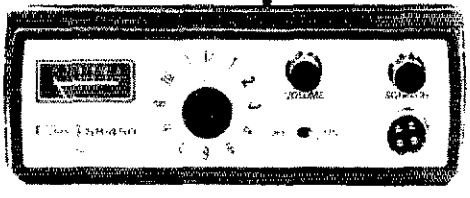

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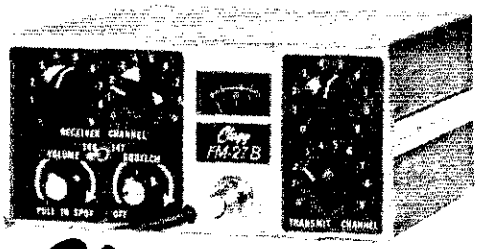

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testing ones patience. Don't forget the Birminghamifest (May) an Mobile (June). Appointed WB4IYW as ORS; W6LJU/4 as EC Traffic: WB4EKJ 213, W4RQS 210, W4LNN 163, W4DGH 16 WB4FZO 158, K4AOZ 139, WB4KSL 103, WA4AJA 83, WB4IY 56, WB4BDW 48, K4CUU 39, WB4SVH 39, WB4RCF 28, WB4TV 21, K4VF 17, K4UMD 12, WA4ZDW 8, WB4FJP 4, WB4NLW 3.

GEORGIA – Acting SCM, John Englund, K4JJQ – PAM K4JNL. RM: K4JJQ.

Nets	*Freq.*	*Time(Z)*	*QNI*	*QTC*	*Mgr*
GSN	3,595	2300/0200	244 (304)	87 (193)	K4JJ
GSBN	3,975	2300	1347 (1374)	101 (121)	K4JN
GFN	3,718	2200	93 (78)	47 (9)	WA4F
CVEN 2	146,94	0130	XX (451)	XX (61)	K4Y

QNI/QTC listed above is for Jan. (Dec.) Congrats to WA4FSL new mgr. of GTN. New appointees: K4CBO OO & OPS; W4BT OO. New Novices: WN4s LIQ, LPK, LSA & LZS; welcome to ha radio gang. Sawnee Mt. Repeater (.75/.15) now on the ai W3GUK/4 in College Park working DX on 2 fm. WN4GVG ne WA6FIS. EAN certificates received by WB4RUA and K4JJQ. RU made clean sweep in Nov. SS, both modes! Silent Key: WB4LH New officers of ARC of Savannah: K4CBO, W4KGP, WB4NTV K4GCU, WB4NSX and WB4IGS. New officers of Atlanta RC W4BTW, W4BCD, WA4AKU, W4GKF, WA4VWV, WA4HNL an W4IXN. Traffic with * indicating PSHR: (Jan.) WA4FSL 29 K4WC 149, K4YRL* 99, W4NET 97, K4FJY 92, W4AAY 6 WA4AKU 54, K4NM 31, K4BAI 26, W4AMB 20, K4JJQ 1 W4CZN 14, W4HON 11, K4PIK 10, W4JM 4. (Dec.) WA4FSL 43 K4JJQ 162, W4AAY 82, K4NM 42, K4JFY 41, W4CZN 22, W4J 4, K4WC 1, WB4ZBS 1.

NORTHERN FLORIDA – SCM, Frank M. Butler, Jr., W4RK – SEC: W4IKB. RMs: WB4DXN, WA4WIW. PAMs: WA4IZM/7 W4SDR/40, WB4RSZ/VHF. The SET boosted traffic totals th month; WA4FBI made BPL. NFPN had two emergency pow sessions, with good attendance on both. FPTN Net Certificates we issued to W4s DTS, GUI & WNY; K4s EIW, LPS & YPN; WA4 BGW, EYU & IWW; and WB4s DAD & GHU. Pensacola had stations on QFN in Dec. K4VND upgraded to Advanced Class. T Five Flags ARA bought a new TH6DXX to go with the 40-met beam and is all ready for FD. Fort Walton hams provid communications for a 25-mile "Mod March"; about 10 hams headc by W4BVE took part. The PARC had an oyster shucking contest W4MMW's; W4ROM was the fastest eater! WSTGX/4 is a veteran c traffic handler – and a YL. K4VFY again active in traffic nets c 75/80m from Panama City. Old timer W4PHV back on 75/40m wi a TR-4. WB4UPJ now mgr. of TPTN and asst. mgr. of FAST Ne K4BHW and WB4EWQ have 25 members in a Novice Clas WA4BAX now Advanced Class. W4GUI keeping skeds with KØON to handle welfare traffic. WB4OMG named "Gator of the Month *by GN. W4BYG working on new repeater for Orange Park – 31/9* WB4HKP QRT for TVI problem in cable system. Good to ha W2JI/WA4HCS active again from Winter Park. WA4FYW appoint EC Sumter Co. W4LDM reminds all traffic handlers to count confirm check on messages. W4MB, W4LDY new calls in DAyto Beach. Sorry to report the passing of W4LKT; he was regul contributor to "Groundwave." Have you got your Fla. Traf Routing Guide yet? Traffic: (Jan.) WA4FBI 511, WB4GHU 26 K4VFY 253, W4LDM 243, W7EM/4 193, WB4DXN 180, W4SE 127, WA4HOL 114, WB4SKI 104, K4CVO 96, K4VND W4WNY 89, W4IKB 72, W4RKH 67, W4KIX 57, WB4JHQ 5 WB4HKP 49, W4LSR 46, W4BYG 45, WA4HCS 41, WB4DAD WA4FJA 32, W4IA 24, WA4WBM 24, WA4EYU 23, WB4NJI WA4CRI 16, WA4IWW 15, WB4VMP 8, K4FLV 6, WB4VAP K4RNS 5, WB4NHH 1. (Dec.) W4SDR 127.

SOUTHERN FLORIDA – SCM, Woodrow Huddleston, K4S SEC: W4IYT. ASst. SEC: W4SMK. RMs: K4FBE, W4E WA4GBC. PAMs: WA4NBE, W4OGX. New appointments t *month:* W4ESH, EC Hendry Co. WN4GNI, ORS-II. Endorsemen K4GFW OPS and OO-III; WB4FEC ORS. Net certificates issu WB4KSG/4 FAST Net. OOs reporting: W4AWS, K4DAS, K4JI W4MML, K4NE., WA4UVG, WA4ZLW. WN4GNI, ORS-II, at age youngest ham in Osceola County, reports he passed his Gene *Class exam. Looks like we will lose an ORS-II but gain an OR* soon. WB4ZSO reports his new quad and linear working gre K4DAS enjoyed Jan. CD party – his first in 11 years – turning good score of 173,600 points. W4EHW operated 38 hours dur SET at Miami Civil Defense by WB4ONR, WB4ZSO, WB4SJQ an others. K4JVA/4 operated at National Hurricane Center, Miami,

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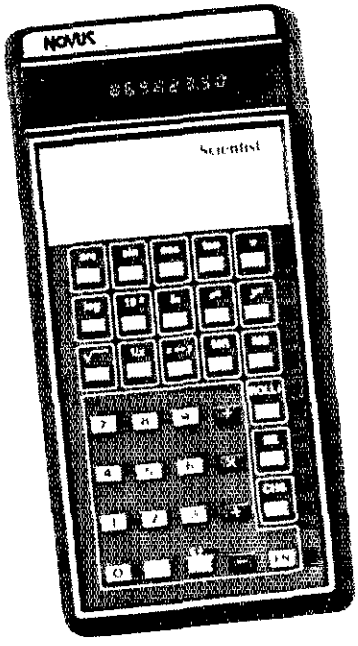

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W4KGJ, WB4CTD, WB2VEE and WA4LZN. W4IYT reports Miami Red Cross K4IWT simultaneously operated 2 repeaters, 1 simplex, HF SSB and 4 airplanes during SET with 8 operators: St. Petersburg ARC repeater WR4ALM conducted 3 formal net sessions during SET, with liaison to NTS and Fla. SET key stations, handling 32 messages. Traffic: (Jan.) K4SJH 676, WA4GBC 418, K4SCL 366, WA4SCK 321, K4IWT 217, W4WYR 206, WB4KSG/4 192, W4EH 190, WB4ZSO 154, WB4HJW 105, K3PIE/4 91, W4BM 76, WN4GNI 74, W4IRA 71, W4DQS 69, WA4EIC 68, W4EHW 66, WN4JWN 60, WA4IJH 58, WAWB4AID 57, WB4ALH 55, W4DVO 50, W4IYT 49, K4TH 44, W4TJM 44, W4BCZ 41, K4JVA/4 36, K4BLM 32, W4SMK 27, W4OGX 26, K4AIZ 25, WA4UOQ 25, W4GDK 22, K4CFV 16, W4MML 13, WB4UNV 11, K4DAS 9, WB4BMR 8, K4EBF 8, K4QG 7, WB4ABK 6, WA4KKE 5, WB4VYU 3, K4GFW 2, W4KGJ 2. (Dec.) K4AIZ 227, W4DVO 97, K4NE 31, W4IYT 19, WA4BPE 16, K4SGR 10, W4MML 8, K4GFW 2.

SOUTHWESTERN DIVISION

ARIZONA – SCM, Marshall Lincoln, W7DQS – PAM: WA7JCK. RM: K7NHL. A successful SET operation in central and southern Ariz. included fixed and mobile stations on 75 ssb and 2 fm in and around Phoenix, Tucson, Apache Junction, Buckeye, Glendale, Cave Creek, Wickenburg and other areas. Currently active ECs are K7JWB, Maricopa Co.; K7NTG, Pima Co. and K7ZMA, Mohave Co. ECs are needed in other counties. Anyone interested contact W7DQS, Box 1490, Wickenburg, 85358. WA7JKS is chmn. of the Southwest Division Convention being planned for Apr. 9-11, 1976, in the Tucson Convention Center. W7EAH is vice-chmn. Officers of the Tucson Repeater Assn. are W7HFR, pres.; K7MNN, vice-pres.; K7UHW, secy.; WB2WPY/7, treas. Officers of the Superstition ARC are K7WJF, pres.; WA7RDC, vice-pres.; Naomi Hensley, secy.; W7WPN, treas. Communications for the Gold Rush Days parade and rodeo at Wickenburg were provided on 2 FM by WA7CYP, WA7GEP, W7JCH, WA7NMO, WA7UJH, K7UOP, WN7WEO, WA7YLM, WA7YUA and W7DQS. W7WGW has a 147.6/147.0 repeater on the air in Phoenix with the call WR7AFC. The new name for the former New Mexico CW net, which also serves Ariz., is the Southwest CW Traffic Net (SWN). It operates daily at 0215 GMT on 3585 kHz, K5KPS mgr. K7ZMA is a new OBS. Nets: (Jan.) Cactus Net QNI 1011, QTC 343; ATEN QNI 582, QTC 16, certificates to K7GLA, WA7NBQ, K7NMQ, K7NTG and W7RQ; SWN QNI 253, QTC 172. (Dec.) ATEN QNI 546, QTC 31, certificates to K7GLA, WA7KQE, K7NMQ, K7NTG. PSHR: K7CC 34. Traffic: (Jan.) K7NHL 279, K7NTG 60, WB2WPY/7 30, K7CC 30, W7DQS 21, WA7YKM 18, K7NMQ 7, WA7VWG 3, K7MTZ 2. (Dec.) WA7KQE 20, W7CAF 7, K7GLA 3, K7NMQ 2.

LOS ANGELES – SCM, Eugene H. Violino, W6INH – SEC: WA6DUC. RMs: WB6OYN, K6UYK. Lets not forget the Society of Wireless Pioneers are having their annual section Luncheon at Brothertons in Pasadena on May 31. Please send your requests to W6PZY or W7GAQ/6. WB6ZLP reports that the Metro net during Dec. had 27 sessions with 372 check-ins and handled 379 messages. We can use a liaison between MTN and or SCN as go betweens with Metro. W6CL was elected The Amateur of The Year by the Monterey Park RC. Teleo RC reports that there are radio classes at the Fullerton College Wed. and Thur. PARC RC having regular scheduled clinic for those who want their units put on the right frequency and adjusted. The VHF reporter reports a steady growth of members during the past year and expects 1975 to be even better. The LERC RC planning on a larger hamfest this year so those who missed last year be sure to get your tickets early. This has been one of the Los Angeles Section's high spots of events for many years, so clubs and amateur please help make this a big one. The San Gabriel RC reports the winners of a recent T-Hunt were WA6CYY followed by WB6YMF. AREC activities: 30 operators assisted the Covina Chamber of Commerce Christmas Parade, net control handled by WA6VFV. The Baldwin Park group handled the Anniversary parade under the direction of WB6MKA. W6CF just missed winning an eight hundred dollar prize at SAROC. W6AM held another of his famous open houses recently and many local amateurs had the rare opportunity to see this world famous station. W6POW recovering after short stay in local hospital. W6SZH working on a new ultra inexpensive receiver design. The prototype is up and working and can be seen at the Carson High School ham class on Wed. nights. WB6FDR heard mobiling around town in a new car. Mel seems to have one of the more outstanding mobile signals in these parts. The SCM elections will probably be over by the time you read this, so thanks to those who have been so loyal in the past four years. It's been a pleasure serving such a fine group. I

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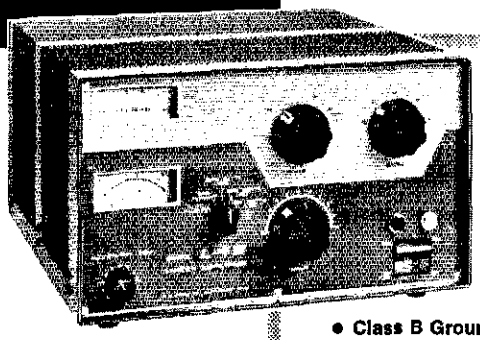

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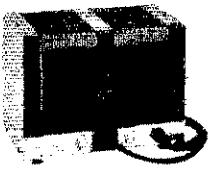

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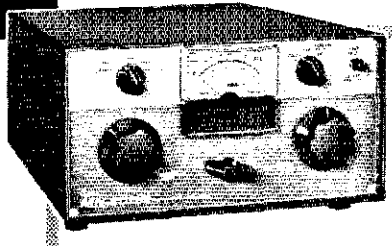

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have tried to represent all members regardless of their type of operation or interests. WA6PEA spotted 3 out of 4 unlicensed hams frequenting our bands lately. I wonder how many are getting by? WB6EJG and WA6EJP have been active in the Valley Simulated Emergency drills. Some members wonder why I don't attend more than two or three club meetings per month; "this column and all the other work that goes with this job." WA6BCO has received license for 220 MHz repeater, hopes to have it on the air soon. Club program chmn. don't forget to get in touch with K6RIR, WB6LTJ, K6YEZ for a good program on the Wallis Is. DXpedition with pix and all. Traffic: WB6OYN 365, W6INH 201, K6UYK 196, WB6MKV 80, WA6IDN 73, WA6TLV 54, W6OEO 47, W6IVC 31, WB6FTB 29, WA6TCH 24, WA6ZKI 18, WN6AIT 14, WB6YID 14, WA6BCO 12, K6EA 12, WB6OYD 10, K6CL 6, WA6PUA 6, W6NKE 4, WB6VZI 4, W6KAT 1.

ORANGE – SCM, William L. Weise, W6CPB – Asst. SCM: Dick Burbeck, K6CID. SEC: WA6TVA. PAM: K6YCI. RM: WB6AKR. Code and theory classes are in process in the Anza Valley. Meetings are held at the Anza Electric Cooperative each week. K6VI, K6VDS, W6AYI, W6RID, WB6NSK and WB6MMA are the instructors. Thanks for info, Garland. WB6VTK back from his overseas tour in the Far East. Welcome back. New OO is WA9UCE/6. Welcome to the Orange Section. W6BAM lost his A-frame mast during recent Santa Ana winds and is temporarily off 80 meters. DO NOT forget when renewing your license to include the following statement: "This is not a major application as defined in Section 1.1305 of the Commission's rules." I am still looking for input on "how you feel" about the new docket 20282. The 1975 SET was a great success; many newcomers participated this year. An exercise of this type provides excellent training in message handling. Long and short skips are in. This causes some interference to local and state-wide traffic nets. WB6FIG very active on traffic nets. John checks in on nine different nets covering Calif., Ariz. and Tex. Congrats on your excellent record. By the time you read this you should have received the questionaire regarding Docket 20282, from W6KW Dir. Southwestern Division. Hope everyone replied constructively to John's questionaire. He needs your comments. These proposed rule changes effect you and me and every amateur. Please respond. Traffic: (Jan.) WB6FIG 544, K6GMI 514, WB6AKR 223, WA6TVA 177, W6WR 128, WB6VTK 46, W6CPB 17, W6QBD 16, WA6BJO 14. (Dec.) WB6FIG 767.

SAN DIEGO – SCM/SEC, Cy F. Huvar, Jr., W6GBF – Asst. SCM: Art Smith, W6INI. Escondido ARS elected W6ODG, pres.; W6FVB, vice-pres.; WB6NUE, secy.; W6MNH, treas. South Bay ARS elected WA6JCG, pres.; K6STH, vice-pres.; WN6CUO, secy.; WA6ENU, treas. Congrats to SDAR Council on receiving news for the ARRL National Convention to be held Sept. 22/24, 1978. Kudos to Palomar ARC and Repeater group for furnishing 2-meter equipment to amateurs who are patients in North County Hospitals. This is a moral booster which words cannot describe. Keep up the fine work. SD Repeater Assn. has new repeater on Mt. Laguna 146.16/76 with coverage to Yuma, Az. My thanks to ECs, Asst. ECs, NCS, NTS, and all who took part in SET '75. This year ARES exposure to Fire, Police and Red Cross had excellent results. Remember last Sun. each month is Emergency Test so use emerg. power, portable antennas and report changes to your EC. El Cajon ARC has 13 students in Amateur Class. K6CD reports Poway Adult Classes results are 9 passed code, 8 took exams, fine show Joe. QCWA has 142 members. K6CM received a plaque from members at least year's pres. WB6NVW is TI2WX soon to be XE2WTX. WB6EFF now WB9OWV. Upgrading: WA6HXU, WB6NUE, WB6CAO, WB6CTC. New licensees: WN6IQY, WN6IBE, WN6ILI, WN6HPE, WN6IQT, WN6ILE. Only 2 months 'till Field Day, plan to make it best ever. How about appointees participating more in CD QSO Party? Lets represent the Section on the air. This month 12/13 and 19/20. PSHR: WA6DMB, WB6PVH. Traffic: WB6PVH 405, WA6DMB 236, W6RGF 184, W6VNQ 87, W6DEY 40, W6PZL 38, WA6IIK 22, W6GBF 11, K6PM 3. (Dec.) W6VNQ 76, WA6BDV 61, WA6UFY 1.

SANTA BARBARA – SCM, D. Paul Gagnon, WA6DEI – SEC: WB6HJW. RM: K6QPH. PAM: K6YX. K6TOE received his CW WAS Award from Morro Bay. New hams in Morro Bay area include WN6HIK and KC6BF. W6IDU sends bulletins on 146.58 RTTY at 1945 Tue. W6PDU a new OPS and active on cw and phone net. WA6WYD totaled 188 messages on MARS RTTY. WN6HOZ a new ham in Santa Barbara. WB6DPV/4 was a house guest of K6YX in Jan. WA6BLS has been heard on the section net of late. SBSN meets on Wed. at 2000 on 3935. W6OUR, WN6ZMS, WA6MBZ and K6LHA are recent new Life Members of the League. WB6PGK and XYL took a cruise to the V.I. The Mission Trail Net Annu

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PA220/15 Kit	similar to PA144/15 for 220 MHz		**$39.95**
PA432/10	**NEW**—similar to PA144/15 except 10w and 432 MHz		**coming soon**
PA4010H Kit	10w in—40w out—relay switching		**$59.95**
PA110/10	10w in—110w out 2 meter amp	factory wired	**$179.95**
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SEE YOU AT DAYTON

Roundup will be held in Bakersfield June 14 and 15. W6MHK presented a movie of his indoor loop antenna at the So Cal DX Club. W6MIG has been elected pres. of the Sherlock Holmes Society of LA. WN6EJO doing a great job as new editor of the Poinsettia ARC newsletter "Overmodulation." Make plans now to attend the Division Convention to be held in Ventura in Oct. New pres. of the Sulphur Mt. Repeater Assn. is WB6RWY. VP is WB6FLI and K6YLQ, secy.-treas. The SET in Jan. went off quite well. Did you participate? Contact your EC. PSHR: WA6LBO 42, K6YX 29, W6POU 9, WA6DEI 46. K6CFJ teaching communications for the Civil Air Patrol in Camarillo. WA6MLI operating MM up and down the coast. WA6SSN completing work on a Video RTTY display. Traffic: WA6DEI 184, W6JTA 182, WA6MBZ 174, WA6LBO 81, W6CDN 73, K6YX 40, W6POU 34, WA6VBU 8, K6QPH 5, W6IDU 1.

WEST GULF DIVISION

NORTHERN TEXAS – SCM, L.E. Harrison, W5LR – Asst. SCM: Frank E. Sewell, W5IZU. SEC: W5SHN. RM: W5QU. Your SCM received over 25 messages during SET; thanks to W5SHN and WB5BFW for full cooperation & activities. Your attention invited to OBS No. 519 establishing new fee schedule for Amateur Services. New officers Richardson WK are WA5FTP, pres.; WA5JMK, W5MTA, W8TIF/5, 1st, 2nd & 3rd vice-pres.; W5MJA, secy.-treas. Meetings held 2nd Mon. monthly 8 PM, TPL Auditorium downtown Richardson at Beltline. Dallas ARC "tower" Committee proceeding according to plan plus a low "profile" and no waves. New officers elected DARC Feb. meeting. Installation in Mar. meeting. Temple ARC transmitter hunt won by W5EAX & W5UPO. Temple ARC understands FCC has amended Part 2 & 95 of its rules prohibiting the sale of single-band RF Power Amplifiers for use in the "CB" band. Enforcement procedures have proven ineffective. Nice turnout at Dallas QCWA meeting. SEC W5SHN now reviewing all EC appointments. These include W5CBT, WA5KHE, W5TVS and K5ZCO so if anyone feels he's behind in certification here's your chance to update and get aboard. BPL certificates are behind in preparation so if you don't have yours just "hold the tone" and I'll get with you. Tex. CW Tfc. Net Bulletin is well written, prepared and I assume receives good distribution to all hands. If not let SCM know. Congrats to WB5BFW and his staff. Irving ARC Jan. report says WA5PCF demonstrated his newly constructed DF gear. W5OGZ arranged for Harmond Hunter, Champion Spark Plugs to show film on "Ignition Systems." IARC has new club roster. Reports reaching SCM indicate several meetings in Division planned by Dir. Albright to update amateurs on Docket 20282 including Oak City, Euliss, Houston, San Antonio, Corpus and Valley. We hope everyone can attend. Hq. will conduct an "all opinion" poll in Mar. or Apr. of this year. Dir. Albright's Annual report arrived and should be read by all members. ARRL Pres. Dannals W2TUK conducted a meeting before the Amarillo ARC Jan. 28. Hams in Tyler are interested in establishing Emergency Communication. W5QPX sent in another FB report with 25 observations. WB5CKM makes request for OO appointment. Traffic: W5TI 289, W5QU 198, W5GSN 85, W5YK 14, W5LR 12, WB5KMN 3.

OKLAHOMA – SCM, Cecil C. Cash, W5PML – Asst. SCM/SEC: Leonard R. Hollar, WA5FSN. PAM STN: WB5AZS. PAM OTWN: WA5OUV. PAM OFON: WA5ZOO. Four clubs in Okahoma City joined forces and put out only one publication per month now instead of the previous four bulletins, which were in many cases duplicated on the mailing, this should cut down on the postage and also amount of paper. The name of the new bulletin is Central Oklahoma Radio Amateurs – Collector and Emitter (CORA-C&E). The first issue came out this month and is really a dany. It is published by (1) Aeronautical Center ARC, Inc., (2) Oklahoma City VHF ARC, Inc., (3) Mid-Oka, Repeater, Inc., and (4) Oklahoma City Autopatch Assn., Inc. New repeaters in the area are Grandfield WR5AHR 16/76; Muskogee WR5AFY 16/76 and 25/85; Miami WR5AHX 22/82. Lawton still waiting for their license will be on 28/88. W5JJ and YF are spending winter vacation in Fla. Please get your comments in on Docket 20282. New officers of Mskogee ARC are K5ZEP, pres.; WB5HLR, vice-pres.; W5WAX, secy.-treas. New pres. of Altus ARC is WN5LAF, public relations and historian is K5YNV. Congrats to new General Class WB5NMB; Tech. WB5NNH; Novice WN5NMZ. The 1975 SET seemed to be a great success as I received radiograms or written messages from many locations around the section. I still need appointees as OOs and also need very, very much someone to step forth as RM. Traffic: W5RB 134, W5PML 81, WA5FSN 55, W5FKL 54, WA5ZOO 51, WB5GWB 49, W5WAX 48, WB5ELG 47, WB5EQR 25, WB5LHR 22, W5SUG 16, WA5WRC 7, W5JJ 5, WA5OUV 5, K5LUJ 1.

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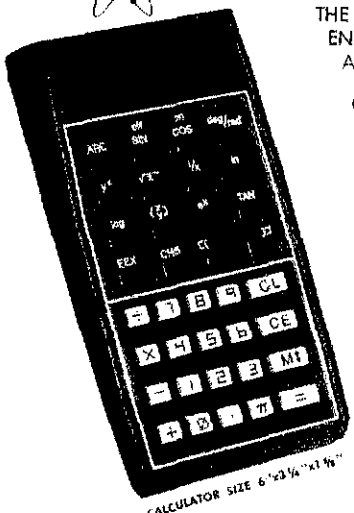

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ALGEBRAIC NOTATION (SUM OF PRODUCTS)	YES	YES	NO
DEGREE/RADIAN KEY	YES	YES	NO
MEMORY (OTHER THAN STACK)	1	1	1
KEYS	36	40	35
LOGIC	ALGEBRAIC	ALGEBRAIC	POLISH
LOG, 10^x	YES	YES	YES
TRIG (ARC, SIN, COS, TAN)	YES	YES	YES
DEGREE ⟷ RADIAN CONVERSION	YES	YES	NO
DEG/RAD MODE SELECTION	YES	YES	NO
Y^x, e^x	YES	YES	YES
X^2	NO	YES	NO
$\sqrt{X}$	YES	YES	YES
$1/X$ X⟷Y	YES	YES	NO
π	YES	YES	YES
EXCHANGE X WITH Y	YES	YES	YES
BIGGEST DISPLAY	YES	NO APPROX 20% SMALLER	NO APPROX 20% SMALLER
2 PARENTHESIS LEVELS (BRACKETING)	YES	NO	NO
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SOUTHERN TEXAS – SCM, Arthur Ross, W5KR – SEC: WB5CUR, PAM: W5HWY, RM: W5UGE. OOs reporting this month: WA5LFQ, WA5MIN, W5NGW for Jan. and Dec. WA5ZBN with two nice return comments, and *W5RBB*. OVSs reporting this month: WB5CIT, WB5HRI, WA5QCP. OBS WA5IQV reports increased activity on 6 meters. ORS WB5GZG having fun on 2 meters. OPS WA5VBM reports Lufkin repeater back on the air. EC WB5FMA reports eight active ops in Georgetown; WB5HDS has homebrew beam. RM W5UGE spoke to Austin ARC at annual banquet, subject US-USSR joint space mission. OVS WB5CIT ready for Mar. Freq. *Test and has WR5AGT in full operation on 449/440 MHz. OO/ORS* W5RBB reports new established Houston Area Emergency Net getting busier; meets every Wed. nite 8 PM local, 3898 kHz. EC WB5GFU reports McAllen has new repeater license, WR5AIA, and is operating on 146.16/.76 MHz; W5PLV lecturing to Magic Valley ARC on solid state devices. MVARC and PanAM Univ. ARC jointly sponsoring code and theory classes for Novice class licenses and will *start on higher class licenses soon. The PAN-AM Univ. (PAU) ARC* has 50-ft. tower and will soon have RTTY. Corpus Christi ARC radio operator classes off to flying start with WB5HHT instructing Novice class and WA5VRO conducting the General class. Corpus Christi ARC sponsors Explorer Scout Post 7388; the Post made big splash with its radio station at Scouteraft Fair. WB5JJO has a seven-element beam mounted on a pickup truck! Traffic: (Jan.) W5UGE 521, W5TQP 491, WB5CUR 299, W5UJJ 283, W5KLV 237, WR5FMA 162, WB5AMN 155, WA5VBM 150, WA5GZG 139, W5BGE 103, W5HWY 78, WA5ZBN 65, W5KR 64, K5HZR 53, K5ROZ 51, WB5UR 35, W5RBB 35, WA5FOE 31, WB5GFU 22, W5TFW 17, W8UX/5 7, WB5MUW 4, WB5CIT 2, K5RVF 2. (Dec.) W5UJJ 324, W5TTS 63, WB5GZG 53.

CANADIAN DIVISION

ALBERTA – SCM, Don Sutherland, VE6FK – SEC: VE6XC, PAM: VE6ALQ. It is with deep regret I report the passing OTs *VE6HM and VE6UQ. Both OTs will be sadly missed but fondly* remembered. The Calgary Centennial Convention Aug. 1,2,3 is shaping up real well. The pres. of CARF and ARRL will be in attendance, with many other officials of both organizations. One of the highlights will be the NASA exhibit with astronaut Dr. Owen Garriott W5LFL in attendance. For full information write CARA Box 592 Calgary, Alberta T2P 2J2, attn: Convention Comm. The CY6 prefix and Centennial award are very popular – this should make the Centennial Alberta QSO Party during month of Apr. highly popular. Traffic: VE6FK 146, VE6FS 70, VE6AMM 25, VE6JL 10, VE6WN 10, VE6YW 6, VE6CE 4, VE6AGV 2, VE6BL 2, VE6FV 2, VE6AVV 1.

BRITISH COLUMBIA – SCM, H.E. Savage, VE7FB – ORS VE7ZK traveled 2,735 miles, from July to Dec. 27, by car to meet 39 sessions on PAM, RN7 and BCEN nets. VE7CCJ not satisfied with the sun of KH6-Land ended holidays in Ariz. reports that he enjoyed 2 meters with his portable. VE7KC and XYL VE7DKC are heading for VK-Land. B.C. FM meetings are drawing large attendance and place to meet the dyed-in-the-wool VHF/UHF amateurs. All reports coming in lately concern two meter activities. Santa Claus brought many a new two meter rig. Traffic: *VE7ZK 138*, VE7CDF 137, VE7BLO 44, VE7TT 17, VE7QQ 8.

MANITOBA – SCM, Steve Fink, VE4FQ – MTN was active during the Jan. SET. We regret to record the passing of VE4KN long-time editor of BARC Sparks. The new Winnipeg Repeater Soc exec. has VE4NI, pres.; VE4HR vice-pres.; VE4IA, secy.; VE4FP treas.; VE4YD, tech. dir. BARC exec. consists of VE4OD, pres. VE4UN, vice-pres.; VE4XN, secy.-treas.; VE4FT, PR. The Northern boys are trying 147.33 FM with VE4TM, NC, NW, and QN for starters. VE4DQ now signing VE7DEP, VE4SC now VE7DLX, and VE4EQ is awaiting a VE7 call, while the trend is reversed with VE7BOZ now active in Flin Flon. We welcome VE4JZ and MZ, new calls in Brandon. MTN: 33 sessions, 137 QNI, 130 QTC. MEPN: 31 sessions, 1198 QNI, 21 QTC. Traffic: VE4RO 198, VE4PG 117, VE4TY 52, VE4TR 20, VE4QI 18, VE4VV 17, VE4JA 15, VE4FC 10, VE4CR 8, VE4LU 7, VE4UN 7, VE4HA 6, VE4FK 4, VE4LN 4, VE4NE 4, VE4NM 4, VE4JP 2, VE4XN 2, VE4UC 1, VE4YO 1.

MARITIME – SCM, W.D. Jones, VE1AMR – SEC: VE1SH, RM: VE1ARB. It is with regret I report that VO1CV and VE1ANV are now Silent Keys. This year's VE1 Contest was a resounding success, both cw and phone portions showed increased participation. VE1MX is still hammering away at 160 meters with 4

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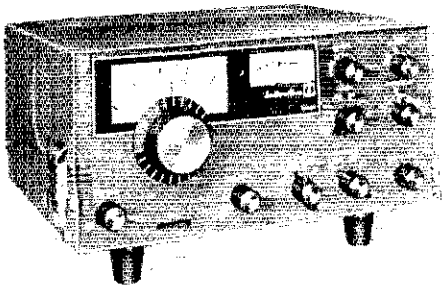

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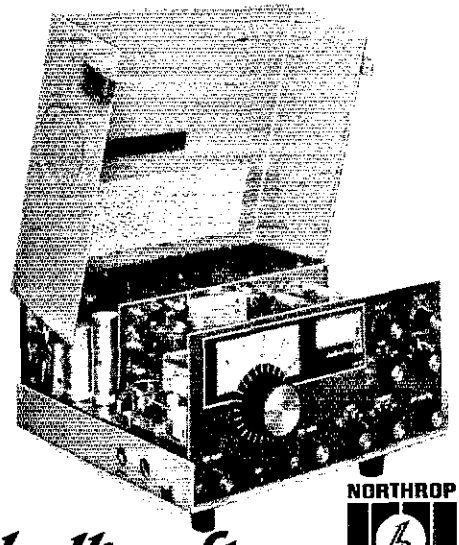

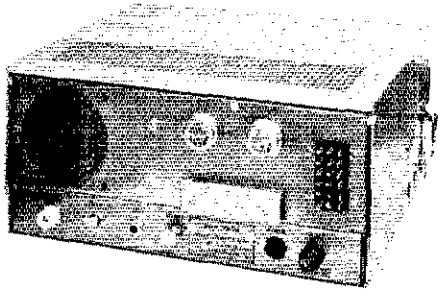

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countries worked at last count. SET '75 showed increased activity with Sydney, Halifax - Dartmouth, P.E.I. and Moncton holding AREC exercises on 2 meters. APN reports sessions 37, QNI 205, QTC 194. Traffic: VE1AMR 215, VE1ZH 139. VE1ARB 132, VE1AKB 44, VE1AAO 41, VO1GW 41, VE1SH 30, VE1ABU 28, VE1AWS 19, VE1HJ 11, VE1AWP 9, VE1AYJ 9, VE1AFM 6, VE1KR 4, VE1AMB 2.

ONTARIO – SCM, Holland H. Shepherd, VE3DV – The big news for Jan. was of course SET '75 and the many local exercises conducted by the nine Ont. ECs. Ont. NTS members did a fine support job under very adverse condition. Congratulations gang and a special thank you to those non-AREC members who helped out in distributing the traffic. This year saw Oakville with its own AREC group under VE3GFP while Windsor had a new EC in VE3FFQ. Consensus was that it was enjoyable with lots of enthusiasm. Please welcome a new Ont. OO Class IV VE3DDD. Remember John is there to help you with those clicks, chirps and frequency problems so give him your support. VE3FRG, mgr. ODN enjoying a few weeks in the sun at the Bahamas. VE3JA is pres. of the Airstream ARC and is now down in Tex. Brodie will be back in Brandon for the big rally in June and is looking for some help from Manitoba hams to make it a gung ho event. VE3YQ, VE3OZ, VE3AAS are all Fla. bound. Under the guidance of VE3GFG and VE3EGA the Wawa-White River district Lake Superior should see a spurt in amateurs in the near future as five students are enrolled in a ham radio course at Sault Ste Marie College. VE3HRA is the first graduate. Unfortunately I must report that Ollie Olinghouse, W8ZBT, SCM Mich. has just become a Silent Key. The sympathy of all Ont. radio amateurs, but in particular the GRN, go to Ollie's family. Traffic: VE3SB 494, VE3GOL 474, VE3EHF 286, VE3FQZ 259, VE3GJG 178, VE3DV 171, VE3DVE 127, VE3DPO 124, VE3AWE 118, VE3FRG 88, VE3GNW 85, VE3GT 69, VE3FGV 67, VE3GRR 59, VE3EQE 52, VE3EWD 50, VE3CYR 35, VE3FHQ 32, VE3FGT 25, VE3EBC 24, VE3BZB 23, VE3FZG 21, VE3AGN 20, VE3DH 18, VE3CPG 15, VE3ASZ 14, VE3VD 9.

QUEBEC – SCM, Larry Dolev, VE2YU – On behalf of the SEC I would like to thank all those who participated in the SET '75. Que. traffic men have once again shown they can originate and handle large volumes of traffic over short periods of time. The gang at VE2GRP and VE2UMS made a particularly good effort in encouraging new members to listen, learn and put into practice ARRL traffic procedures. My thanks to VE2ALH and VE2DRC for their missionary work in recruiting new traffic men from many parts of Que. Members of the West Island Radio Club continue their many activities including SSTV, speech processor (W1FBY), and frequency synthesis. Any amateur living on the West Island is invited to join. Contact VE2SB. A new radio club has been formed in Montreal called Union Metropolitan des San-filistes. Meetings are held in College Marie Victorin in Montreal North. Traffic: VE2ALH 457, VE2DRC 344, VE2OJ 133, VE2DR 106, VE2CTA 94, VE2YU 92, VE2DEA 79, VE2BP 36, VE2APT 24, VE2EC 22, VE2UY 12.

SASKATCHEWAN – SCM, P.A. Crosthwaite, VE5RP – The Swift Current area has formed a club with VE5HN, pres.; VE5EO, vice-pres.; VE5PZ, secy. They're a fine group of amateurs and will do a lot for amateur radio in their area. The Summer games will be held in Swift Current in the summer of 1976 and the Swift Current amateurs are now getting prepared for the required communications. VE5HV working on a two meter repeater and has it all built except the duplexer. Our SET exercise was a complete success. The amateurs in Sask. did a fine job and should be commended for their efforts. There was some confusion on the procedure in traffic count so an article in the Mar. QSO will explain Month-end traffic count. Traffic: VE5TT 106, VE5BR 97, VE5DE 72, VE5XC 61, VE5RE 54, VE5DN 37, VE5HP 34, VE5NJ 17, VE5WM 16, VE5VK 15, VE5YK 13, VE5ET 8, VE5IG 7, VE5RE 7, VE5XY 7, VE5UX 5, VE5IZ 5, VE5KF 4, VE5KS 4, VE5RB 4, VE5LK 3, VE5LN 3, VE5LH 2, VE5PD 2, VE5UT 2, VE5BW 1, VE5TP 1, VE5WF 1.

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TR-3 Xcvr 399
TR-4 Xcvr 489
TR-4 NB Xcvr 459
RV-4 remote VFO 69
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HT-41 275
HT-44 Transmitter 169
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SR-160 Xcvr 149
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SB-301 Receiver 229
HS-24 speaker 9
XO-2 2m converter 25
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SBA-300-4 2m conv. 19
DX-60 Transmitter 59
DX-60B Transmitter 69
DX-100B Xmtr 99
TX-1 Transmitter 39
HX-10 Transmitter 188
HX-20 Transmitter 125
VHF-1 6-2m Xmtr 79
SB-400 Transmitter 225
SB-401 Transmitter 249
HW-7 QRP Xcvr 59
HWA-7-1 AC supply 9
HW-12 75m Xcvr 75
HW-12A 75m Xcvr 85
HW-22A 40m Xcvr 65
HW-100 Xcvr 249
SB-100 Xcvr 325
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World Above

(Continued from page 69

nearly three hours, beginning soon after 9 am, loc time. Skip signals were heard up to about 90 MI most of the time, and briefly up to 94.5, arou 9:40.

As is often the case in months of low 6-met activity, Pat found 12 instances of E_s skip on t TV channels, when no 6-meter signals were hear

The great tropo opening of January 26-7 appeared to be the best in a long time, if not for time in Pat's records. Uhf TV signals from t northeast began coming in around 9 am, S Antonio time, the 26th, with Louisiana stations 400 to 500 miles first recognized. The first Flori reception, Channel 20, Ft Myers, showed up 9:30, followed by Channel 40, Sarasota, a channels as high as 44 in several Florida cities. *was interesting that the overland paths dropp* out first, by about 10:45. Channel 40, Sarasot was in until just before 11:30 am. Pat attribut *this to the faster warming at low levels over la* masses, compared with the over-water path Florida.

Channel 33, Baton Rouge, was in just aft midnight, local time, Jan. 27. High-band vhf T signals were seen from Florida soon after, un after 1 am. Miami and Tampa, 7 and 13, were se *between 4 and 5 am, and at 5:01, Channel 3* Columbus, GA was in. Many Louisiana, Mississip and Alabama uhf TV signals were in during t morning, but only Channel 40, Sarasota, at 5:4 and 20, Gainsville, at 5:55, were identified as fro Florida. Just to confuse the issue, sporadic-*E* sk showed up around 1500, with Cuban test patter seen on Channels 2 and 3. High-band vhf and u tropo came in again on overland paths, to as far Georgia about 7 pm, the 27th, lasting to about am, the 28th.

K7ZCB agrees that six meter conditions ha been down this year. Dave heard no E_s in Januar *The only thing to break the monotony w* reception of scatter signals from W7UBI in Idal on the 19th. Despite the fact that W7UBI w *calling for stations to the south, his transmissio* were about S3 at Boring, Oregon. W7UBI's scat schedules are also mentioned by AL, K7ICW, "Lost Wages." Al says that there are 15 to scatter regulars, including K7TUO in Washingt Some of the Northwest boys have also been tryi scatter on 10 meters as well.

WAØQPA, Minneapolis, and WAØMRH, Omal caught what appears to have been the sa opening, beginning in the first (UT) hour of Feb. It started with Georgia, at 0015, for WAØQP followed by Florida, Louisiana, Texas, N Mexico, and finally California. John had ne worked California stations on 50 MHz in t *winter months before this. WAØMRH first heard* at 0050, calling 7s and 9s, with generally we signals. At 0104 he worked WA3UHY, Marylar *briefly, and from 0130 to 0420, stations in Oh* Illinois, Virginia, the Carolinas, Georgia, Tex New Mexico, Arizona, and California were in. T same day (UT) 1320 to 1800, the Southeast was again, with Puerto Rico, Texas, and Mexic stations added. The band was open briefly Florida, beginning at 0045 Feb. 12.

144 MHz The tropo contact between K7IC Las Vegas, and W7RUC, Sierra Vista, AZ, *reported in last month's column. We have m* details from both. They had been running dur

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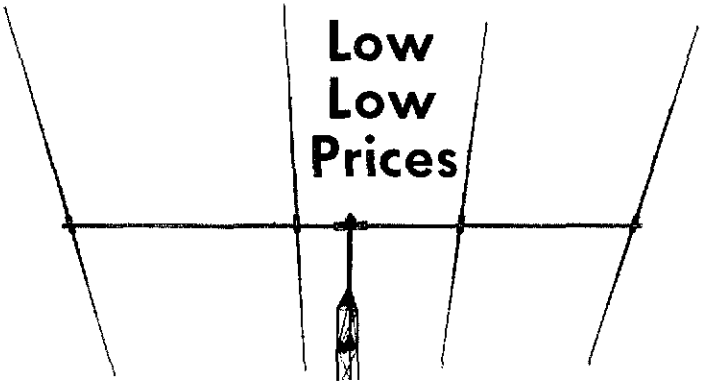

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the Geminids without much luck. On a 75-meter sked, W7RUC told K7ICW that he wanted to try tropo for a new state. Al says he didn't give very good odds on a successful contact (where he lives, he should know all about odds!) but, to his surprise, he heard a weak signal from W7RUC at once. Actual exchange of enough information for a QSO took about 20 minutes. Steve's signals peaked up to about S5 for periods of 7 to 10 seconds at a time, as high as S7 on a few short meteor bursts. Most of the time it was R3, in the noise. From the other end, Steve, W7RUC, notes that he had replaced his feed line just prior to the Geminids. That apparently paid off, as it has for so many others. He says that tropospheric propagation in his desert area seems to follow an annual cycle which depends mainly on the amount of moisture in the atmosphere. Winter and summer seem to be better than spring and fall. Time of day also makes a great difference. Steve stresses that extended-range tropo propagation in the desert areas is possible under the proper conditions, and these conditions exist more often than most vhf residents of these areas realize. Important factors, Steve notes, are a relatively unobstructed horizon for at least a few miles, and the topography of the path. He feels that well-equipped desert stations can work regularly over 250- to 300-mile paths, by cw or ssb on 144 MHz. Stations at each end having EME-type installations with antennas which can be trained on the horizon should be able to work over desert tropo paths as long as 600 to 800 miles. The array at W7RUC is 4 8-element Yagis at 50 feet. The receiver noise figure is 1.3 dB and he has a noise blanker and a 200-Hz filter installed in a 75A4. The transmitter runs 1 kW into a pair of 4CX350s. In addition to K7ICW, Steve has had long haul tropo contacts with K9DKW/7 Kingman, AZ, over 300 miles, along the same path as Las Vegas, and W5LO at Edgewood NM, just a few miles farther, but northeast.

Two meter mobile, using ssb, seems to be coming to the fore, thanks to the little transceivers coming out of Japan. Jim, WB6JNN, has been copying W6KBE while Mel is mobile in the San Jose and Santa Clara Valleys, 20 to 45 miles over mountains which range up to 2,000 feet. Mel uses a Belcom Liner 2 and a modified KLM 140-watt amplifier. Signals run S3 to 9 with an 8-element array on Jim's end. (Horizontal polarization – in California, of all places!) Let's hear from other areas of the country concerning mobile ssb. It could bring renewed life to parts of the 2-meter band that have suffered from the mass exodus to fm, above 146 MHz.

WB6JNN also lists some local 2-meter nets, meeting in the Bay area. The SPECS net meets Monday at 7:45 pm local time on 146 MHz. The SCV Section Net uses the same frequency each Tuesday at 8 pm. There's a c.d. net on 145.54 Wednesday at 7:45 pm. All of the above are on a-m.

W1WEE, Meriden, CT, reminds us that DX isn't all there is to vhf. He and W1YAZ put on a demonstration of ham radio for a group of retarded people in the Meriden area, using a Two'er set up at a recreation center. This work brought a fine response, and repeat visits are planned.

Back in the DX vein, K4EJQ mentions a real good tropo opening at the end of December, in which he worked stations in 8, 9, and 0 areas. Bunky says that the tremendous Gulf opening at the end of January, reported in last month's column, did not extend as far inland as his Blountville, TN, QTH.

WA4VQD writes from Montgomery, AL, that

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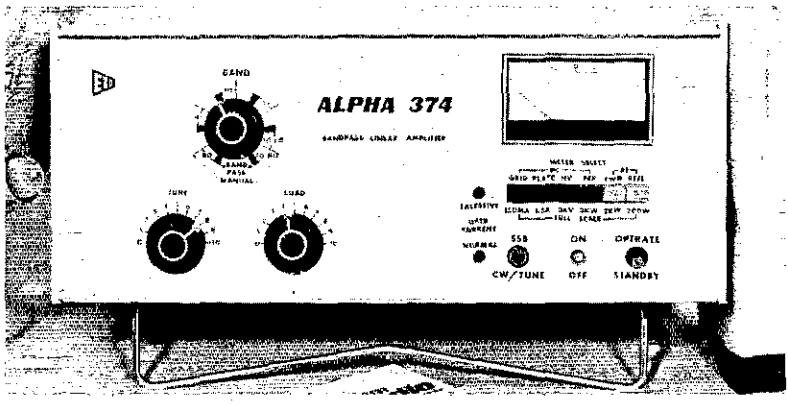

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he got in on the great tropo opening the end of January giving K5VWW and WA5HNK, both of Houston, their first Alabama contacts on Two. For others needing his state, Jan puts out regular nightly calls on 145.11 at 2130, and on 145.01 at 2145 local time. He will swing the beam through the full 360 degrees during these periods.

From Richardson, TX, near Big D, WB5LUA writes the big end-of-January opening netted contacts with W4VCI and WB4WXZ in Florida, W4WDH in Georgia, and W5RCI in Mississippi, as well as WA4VQD.

432 MHz and Up Other than EME, reported elsewhere, the big news on 432 was the big opening in January across the Gulf. Just a few of the Texas stations getting in on the fun were W5FCB, Port Arthur; W5UPR, W5LDV, and K5LLL, Houston; W5GVE/5, Corpus Christi; and WB5LUA near Dallas. W4UWH, Auburndale, and K4NTD, near Orlando, held up the Florida end.

As reported in last month's column, the late January Gulf tropo session resulted in 1296 QSO's for K5LLL and W5LDV (both of Houston) with K4NTD. As Chic, W5LDV, says, this bears out predictions made by W1HDQ years ago. How much higher will it go? Only time and the right kind of activity will tell.

On the Oscar Front

OA8V, who has been shaking up the satellite boys on Oscar 6 and Oscar 7 (Mode A), will soon be adding some spice to 7B. It is understood that Ted Mathewson W4FJ has shipped a varactor tripler to Paul's Peruvian jungle QTH, and Bob Crumrine, WB2DNN, informs this writer the Rochester VHF Group has provided one of that organization's fine 2-meter converters. I am sure the Oscar 7 Mode B gang are grateful to both Ted and the Rochester VHF Group.

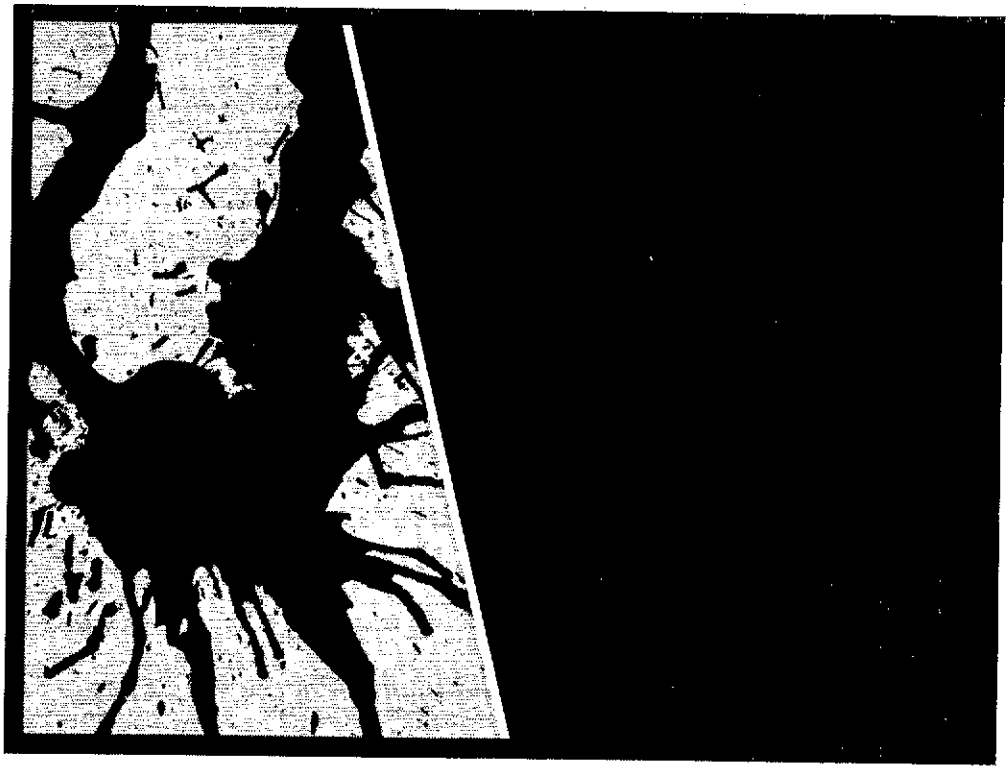
WB6NMT wants to explore over-the-horizon tropo paths via 7B. Lou points out that extended tropospheric ducts are quite commonplace from the California Coast out toward KH6. They may extend even farther. He asks that Pacific area stations who can listen to the Oscar 7 2-meter downlink write him at the address given earlier, for details on his schedule of transmissions.

Have you heard the Oscar 7 435.1-MHz beacon yet? I tried it with a Janel converter, using only a 6-inch piece of wire stuck into the input connector, and got a solid signal about 6 dB above the noise.

The best time to look for the beacon is on the reference orbit (first orbit of the Greenwich day). It is operated only when the satellite is in Mode A, since it would desensitize the 432-MHz receiver portion of the 432-146 transponder used for Mode B. There is a problem with the beacon losing strength after it has been on for a few minutes, so it is easiest to hear on the reference orbit, when the spacecraft switches modes.

WB6JNN reports getting good ssb signals from a number of Mode B stations while he is operating mobile in the Bay area. Who will make the first in-motion Oscar contact?

Looking for a handy way to keep track of orbits? W6PAJ is offering a book of Oscar 6 and 7 orbits for 1975. Also included are the telemetry equations for both satellites. For a copy, send $3.00 to cover the cost of printing and mailing to Skip Reymann, PO Box 374, San Dimas, CA. 91773. QST



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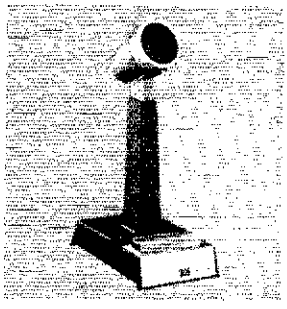

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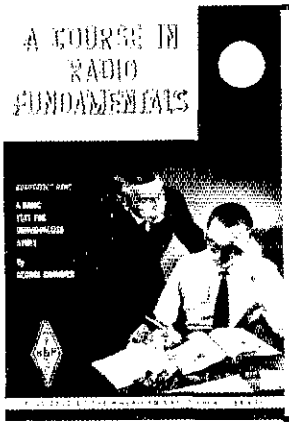

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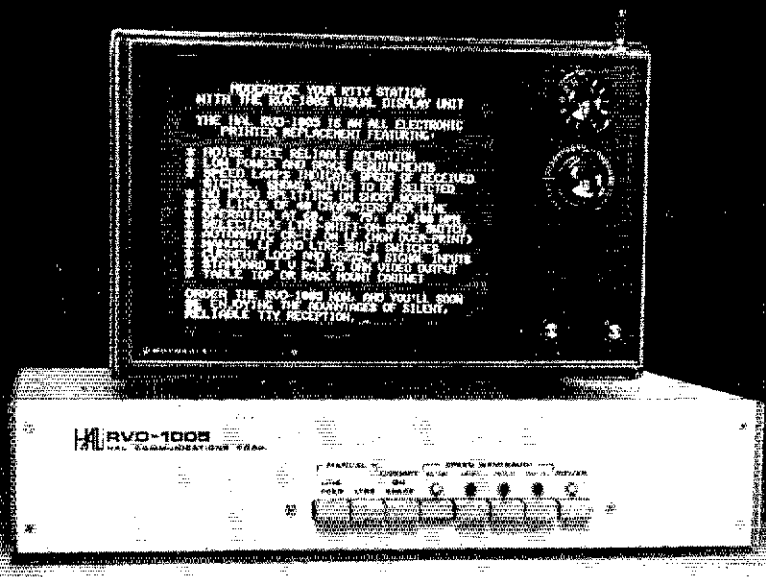

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☐ Please send me the HAL catalog

Name _____ Address _____ Call Sign _____

City/State/Zip _____

RVD-1005 Video Unit: $575. RVD-2110 Monitor TV: $150. DKB-2010 TTY/CW Keyboard: $425. All prices include USA shipping. Add $10 each for air shipment. Illinois residents add 5% sales tax.

HAM-ADS

(1) Advertising shall pertain to products and services which are related to amateur radio.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters, be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters. Ham-ads signed only with a post office box or telephone number without identifying signature cannot be accepted.

(3) *The Ham-Ad rate is 60 cents per word, except as* noted in paragraph (6) below.

(4) Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 20 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 60-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 25 or more years is eligible for membership. Members receive a membership call book and quarterly news. Write for information, Q.C.W.A. Inc., 2012 Rockingham St., McLean VA 22101, Mamaroneck NY 10543.

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.

FREE sample copy Long Island DX Assn. bulletin, Latest DX news. Business size s.a.s.e. to the L.I. DX Assn., P.O. Box 73, Westbury NY 11590.

EDITING a club paper? Need public relations help? You should belong to the Amateur Radio News Service. For information write: Rosemary Willis, 9276 Borden Ave., Sun Valley CA 91352.

HAMFEST! Indiana's friendliest and largest Spring hamfest. Wabash County Amateur Radio Club's 7th annual hamfest will be held Sunday, May 18, 1975, rain or shine, at the 4-H fairgrounds in Wabash, Indiana. Large flea market (no table or set-up charge), technical sessions, bingo for XYLs, free overnight camping, plenty of parking. Lots of good food at reasonable prices. Admission is still only $1 for advance tickets, $1.50 at the gate. For more information or advanced tickets, write Bob Mitting, 663 Spring St., Wabash, IN 46992.

NEW York City: Second Annual Hall of Science Radio Club Auction Flea Market, Saturday, June 7 at Worlds Fair Grounds, Flushing L.I. No sellers commission, but 10% fee on auctioned items. Admission — $2 Zoo, boating, children's farm, art and science museums adjacent. Field day goodies galore. Box 1032, Flushing, NY 11352.

VACATION Land Hamfest — Sunday, May 18, 1975. Erie County Fairgrounds near Cedar Point. Huge Flea Market area. First prize — Regency HR-2B. Tickets — $1 advance, $1.50 at gate. Information: Hamfest, P.O. Box 2037, Sandusky OH 44870.

RADIO Expo '75: *September 6&7, Fair Grounds, Grays Lake* ILL. Seminars, Fleemarket, Manufactures Exhibits, Camping. Information: Write EXPO Box 1014, Arlington Hts. IL 60006.

AUCTION: The New York Radio Club will hold it's annual auction, Friday, April 11, at the George Washington Hotel, 23rd Street and Lexington Ave., N.Y.C. Doors open at 6PM. Auction starts at 7PM Donation $1.

COLLINS KWM-2 (Ser. 98) w/waters Q-Mult and PM-2 supply — $350; Pickering KB-1 keyer, mint — $200; Hall, HA-1 keyer, seldom used, orig carton — $50; 275 W Matchbox — $60; All w/ manuals. Dave Bushnell, W2DKP, 55 Laurel Ave., Irvington NJ 07111. (201) 373-8308.

QSLs??? "America's Finest!" Samples 50c, DeLuxe 75 Religious 50c. (Deductable). Sakkers, W8DED, Box 21 Holland MI 49423.

PICTURE QSL cards of your shack, etc. from your photograp or art work. 500 — $13.50, 1000 — $18.25. Also unusu non-picture designs. Generous sample pack 35c. Half pound samples 65c. Raum's, 4154 Fifth Street, Philadelphia PA 1914

3-D QSLs — Far more spectacular, little more cost. Samples 25 (refundable). 3-D QSL Co., Monson 2, Mass. 01057.

TRAVEL-PAK QSL Kit — Send call and 25c; receive your ca sample kit in return. Sameo, Box 203, Wynantskill NY 12198.

FREE Samples—Stamp appreciated. Samcards, 48 Monte Carl Dr., Pittsburgh PA 15239.

QSLs, samples 10c. Fred Leyden, W1NZJ, 454 Proctor Av Revere MA 02151.

QSLs 300 for $4.65, samples 20c, W9SKR, Ingleside IL 6004

QSLs "Brownie" W3CJI, 3035A Lehigh, Allentown PA 1810 Samples with catalog 35c.

DELUXE QSLs, Samples 20c. Petty, W2HAZ, P.O. Box 523 Trenton NJ 08638.

DON'T buy QSL cards until you see my free samples. Fa service, economical prices. Little Print Shop, Box 9848, Austi TX 78757.

FRAME Display, and protect your QSLs with 20 pocket plast holders. 2 for $1, 7 for $3, prepaid and guaranteed. Tepabe Box 198T, Gallatin TN 37066.

QSLs. Second to none. Same day service. Samples airmailed 25 Include your call for free decal. Ray, K7HLR, Box 33 Clearfield UT 84015.

QSLs — Variety, value, quality, custom. Samples and catalo 20c. Alkanprint, Box 3494, Scottsdale AZ 85257.

RUBBER stamps $2.50 includes postage. NJ residents add ta Clints Radio, W2UDO, 32 Cumberland Ave., Verona NJ 0704

QSLs from "Bullett," creative designs, fast service, economica *Send 20c for samples to Bullet Printing Co., Box 3033, Waco T* 76707.

QSLs catalog. Samples 35c. Ritz Print Shop, 5810 Detroit Ave Cleveland OH 44102.

COMPLETE 36 page QSL catalog! 300 cuts, stock and in *samples. Ten sample QSLs, 25c. Cornelison's, 321 Warren St.,* Babylon, NY 11704.

QSLs, samples $2.00. John Hull Printing, Rte 6, Box 41, Dulut MN 55804.

CANADIAN Surplus Catalog and flyers $1. Etcox Electronic *Box 741, Montreal Canada H3C 2V2.*

QSTs wanted 1917/1929; 300 copies available 1937/197 inquire with sase, Marconi 12V DT-65 2m/Fm Xceiver offered $95. VE2OU, 2785 Valcourt, STE Foy, Quebec, Canada, G1 1Ws.

VP2M land DXpedition! Modern house overlooking ocea constant sea breeze. Hygain quad at 70 ft. SB200, 18 AV vertical. $90 weekly. Doc Beverstein, 60 Amsterdam, Toront M4B 2C2, Tel. 416-755-2117.

CANADIANS — Wanted: Collins KWM- 2/2A or 32S-3/3A complete with power supplies. State price, S/N, condx, Stewart, VE4GS, 26 Dominion Bay, Thompson, Manitob Canada. R8N 1L3.

TRI County Radio Assn. will hold its annual auction and fl market April 27 at the Forest Lodge in Warren, NJ. For in write or call WA2SGL. (201) 381-7293 or W2IHA (20 635-8703. Rain date is May 4.

NORTHWESTERN Pennsylvania Swapfest, May 3. Crawfo County Fairgrounds, Meadville. Flea Market begins 10AM. Fr admission, refreshments available. Indoors if rain. Talk- 146.94, 146.04-64, 29.0 MHz. Map and details: RAE, Box 84 Erie PA 16512.

EVANSVILLE Tri-State ARS will hold their annual hamfest May 18, 1975 at the 4-H fairgrounds, US 41, 3 miles north town. Overnight camping, auction, flea market, and ladies bing For information contact Jay, WB9ICL, R1, Box 56M, Wadesvi IN 47638.

ROCHESTER NY — Western New York Hamfest date Saturday, May 31st, at the Monroe County Fairgrounds. Ho headquarters is the Rochester Marriott. FCC exams at Hamfest. Information? Write: WNY Hamfest, Box 138 Rochester NY 14603.

JUNE 1, SRRC Hamfest, same place as last year. Long SASE i must for information and advance registration. See display this issue QST. Starved Rock RAdio Club, W9MKS, RFD 1, B 171, Oglesby IL 61348, Phone (815) 667-4614.

INDIANAPOLIS Hamfest, Sunday, July 13, 1975. Mari County Fairgrounds. Admission $2 per person, children unc 12 years, free, Forums all day, Ladies' and children's activiti Good food, free coffee and donuts until 10AM. Inside F Market, $2 with vehicle, free without vehicle, Free outside f market. Commercial booth available — $25. For information tickets write: Indianapolis Hamfest Association, Inc., PO B 1002, Indianapolis IN 46206.

SAROC Hawaiian Convention Holiday new dates, July 17-1 1975. *Deluxe rooms all seven nights Sheraton-Waikiki, Honolu* Exhibits, Technical sessions, cocktail party and banquet. Limit number reservations on Western Airlines from Los Angeles a Oakland. Reservations available from mid-west and east co principal cities. Travel arrangements by Del Webb World Tra Company, SAROC Las Vegas Hotel Sahara, January 8-10, 19 Direct all inquiries to SAROC, POB 945, Boulder City *89005.*

DRAKE DSR 1 Digital Receiver wanted cash. Write by Air Mail. SWL Dematteis Giuseppe Via Nizza 50, Torino 10126, Italy.

WANTED: Miniature audio chokes. Two 1 henry, type TRW/UTC I-DI-T327 and two 1.3 henry type TRW/UTC I-DO-T127. Price inclucing postage to R.A. Sutherland, Box 405, Pt. Moresby, Papua New Guinea.

CASH paid for your unused tubes and good ham and commercial equipment. Send list to Barry, W2LNI, Barry Electronics, 512 Broadway, NY NY 10012.

CALL Toll-free: (800) 327-7799. Ask for Bob Hoffman (Jaro Electronics Corp.) We buy all types of tubes. Top prices paid for Varian, Eimac, Amperex. Address: 412, 27th Street, Orlando FL 32806. In Florida call collect (305) 843-9551.

SPIDERS for boomless quads. Heliarc welded aluminum. Al's Antennas, 1339 So. Washington St., Kennewick WA 99336.

VERY in-ter-est-ing! Next 5 big issues $1. "The Ham Trader," Sycamore IL 60178.

TRANSFORMERS rewound, Jess Price, W4CLJ, 507 Raehn, Orlando FL 32806.

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.

WE BUY electron tubes, diodes, transistors, integrated circuits, semiconductors. Astral Electronics, 150 Miller St., Elizabeth NJ 07207. (201) 354-2420.

MOBILE Ignition Shielding gives more range, no noise. Kits and custom systems. Literature, Estes Engineering, 543-A West 184th, Gardena CA 90248.

TELETYPEWRITER parts, manuals, supplies, equipment. Toroids, s.a.s.e. for list. Typetronics, Box 8873, Ft. Lauderdale FL 33310, W4NYF. Buy parts, late machines.

MANUALS for ham gear before 1967. Large s.a.s.e. for quote on specific manuals. W0JJK, Hobby Industry, Box Q864, Council Bluffs IA 51501.

WANTED: An opportunity to quote your ham needs. 35 years a ham gear dealer. Collins, Drake, Ten-Tec, Swan, Kenwood, Tempo, Clegg, Regency, Icom, Hy-Gain, and all others. Also $25,000 inventory used gear. Request list. Chuck, W8UCG, Electronic Distributors, Inc., 1960 Peck St., Muskegon MI 49441, (616) 726-3198, Telex 22-8411.

SWAP-N-Sell ads free in Tradio. Box 4391, Wichita Falls TX 76308.

THUMPING Kegers Net meets every night 3927 kc.

AMSAT/OSCAR 6-7 slides, set of 5 -- $1.25 Lift-Off and Equipment, Proceeds AMSAT, K6PGX, P.O. Box 463, Pasadena CA 91102.

WANTED, Make, Model and Serial Numbers of stolen ham gear, for big list. W7UD, 3637 West Grandview, Tacoma WA 98466.

WANTED: Heath SB-640 in good shape and condition, with manual and cables. S.R. Armijos, 1 Amy Court, Verona NJ 07044.

CLEGG FM-27Bs at prices I dare not publish. W0NGS, Bob Smith Electronics, 1226 9th Ave. North, Fort Dodge IA 50501. (515) 576-3886.

160 METER top loading section for vertical antenna. Have a big signal on top band. Adjustable anywhere in 160 meter band. Mounts on extendable mast or any 1/4" section. Highest quality materials. 50 ohm feed. Rated 1 kW. Satisfaction guaranteed. Send $34.50 ppd or write for free information to Bill Turney, WA0RFF, 1414 East 9th, Hutchinson KS 67501.

FM receiver, preamp, scanner, UHF converter kits. Hamtronics, 182 Belmont, Rochester NY 14612.

FOR SALE: Collins 75A-2 — $150. Heath HW-12 AC-DC p/s — $125. Central Electronics 100V — $295. Cash and Carry. A. Hutchins, WA2LHC, c/o 18 Central Street, Foxboro MA 02035.

WANTED: Yaesu FTV 650 six meter transverter. Give price and condition. Killoran, 8451 13th So., Minneapolis MN 55420.

GONSET G-28 10M transceiver, excellent condition — $90. Polycomm 6M transceiver, Excellent condition — $130. J. R. Gotthardt, K1UAF, Apt. D-20, 1189 Washington St, Middletown, CT 06457. (203) 347-2464.

SWAN: 500CX with SS-16B Swan 1200W linear. Both used 5 hrs. Best offer. WA1FNS, Ira Deutsch, P.O. Box 324, Charles St, Sta., Boston MA 02114.

HEATHKIT SB-303 solid state receiver, works perfect, never on air — $320. E.J. Jones, Box 40, Pomfret Hall, Univ. of Arkansas, Fayetville AR 72701. (501) 575-2835.

WANTED: TRI-EX tower model HZR471N (71' rotating tower) and must be galvanized and complete with rotating rings. Paul Neveu, WICKA, 60 Northwestern Dr., Bristol CT 06010. (203) 582-4885.

COMING to Florida? Use our club station or your own rig and our all-band antennas to work DX or your home town. All hams welcome. Details — H.E. Saxton, W4QED, c/o Spanish River Inn, Delray Beach FL 33444.

TRISTAO self-supporting crank up heavy duty tower, Model TWS-754 with hinged base and TRM-100 tower raising fixture. Handles 24 square feet of antennas in 80 mile winds. Factory reconditioned like new with new winches, cable, etc. List price $2750, sacrifice for $1,250. FOB Hanford CA. Doug Hahle, K6OE, Box 218, Carmel Valley, CA 93924.

WANTED: Ameco VFO No. 621, contact W2BXD.

TELETYPE equipment for sale, for beginners and experienced operators. RTTY machines, parts, and supplies. Special Lorenz model 15 KSR checked out — $95 and Lorenz 15 ASR — $145 plus shipping. Atlantic Surplus Sales Co., 3730 Nautilus Ave., Brooklyn NY 11224.

FOR SALE: Heavy duty BTI linear- console model spare. New 3-1000Z — $560. W1CPI.

PROP Pitch motors wanted — medium sized, in good condition, need repair and maintainence manuals if available with motors or separate. Need several for friends overseas. J.P. Ashcraft, 5641 Dyer St., Dallas, Texas, 72506, WB5BFZ.

YAESU FT-101 owners, VOX hang-up problems? Get special April 1975 issue of monthly FT Newsletter, Send dollar bill, creditable towards dues if you join the International Fox-Tango Club. Or business-size SASE for complete information. Milt Luwens, WA2AOQ, 3977-F Sedgwick Ave., Bronx NY 10463.

SELL: Need money for summer school, Clegg Interceptor VHF receiver — $195; Motorola T53GKT — $100; Model 28KSR — $250. E. Wagner, 1018 Birch Haven Cir., Monona WI 53716.

SELLING: Heath SB-303 receiver and SB-400 transmitter, beautiful condition, recently factory aligned. All crystals and cw filter, pair only — $550; SB-650 digital display, mint — $125. Take all three for — $630. All cables and manuals included. You pay UPS charges. Martin Yoskowitz, 67-67 Burns Street, Forest Hills NY 11375.

WANTED to buy, police radio equipment made prior to 1945. Also, any literature, ads, or books on radio equipment of this period. Ronald Phillips, 1925 Baltimore, Kansas City MO 64108. (816) 842-9009.

FOR SALE: Heath SB-101; HP-23B p.s; SB-610 monitor; all in perfect condition, with manuals; — $400. Gary Boatright, WB5KNR, Box 306, Vinita OK 74301.

MECHANICAL television: Want correspondence with old-timers once involved in this. Want experiences, literature, Jenkins Baird equipment. Also seek 1920's record changers. Wallace Wood, Box 8153, La Crescenta CA 91214.

WANTED: National SW-5, SW-4, SW-3, SW-58 SW-3 Bandspread coils, pilot Super Wasp, Grebe CR-18, C. Byrnes, P.O. Box 25, Pismo Beach CA 93449.

WANT: New A D — 1530; Sell: G R — 78, ideal for tourists. Radio WA0GYX, 1107 N. Scott No. 3, Belton MO 64012.

WANTED: SX101, Johnson Viking Matchbox 250 or 750 watt with SWR meter. HRO6O coils AB, AC and AD. 80 or 40 meter Little Giant antenna. State condition and price, including shipping. K9UKX 51625 Chestnut Road, Granger IN 46530.

COLLINS Owners: Why pay $200 for 200 Hz xtal filters? I have 300 Hz cw/xtal filters for 75S1-75S3B-75A2-75A4, or any 455 kHz I.F. receivers. Collins number X-455KF300. These are mil-spec Collins xtal filters, metal case, in sealed Collins boxes. Spec sheet included. No receiver mods in early 75S3B (before 1968). Few minutes work in other cases. Instructions included for 75A4-tested and guaranteed. Shipped UPS to your door — $49.95. W1EBC, Gary Firtick, 40 Pilgrim Trail, Woodbury CT 06798, (203) 263-3138.

MOBILE OPS: Please send SASE for info on shielded ignition systems. Summit Enterprises, 20 Eider Street, Yarmouthport MA 02675.

BEAM headings — computerized to your QTH. 100's of cities worldwide, put your sig where they are! SASE for info, K2KVS, 5615 Truscott Terrace, Lakeview NY 14085.

HEATH: SB-401 and SB-301 with cw filter, excellent condition — $475. WA2NCO, 835 Bradt Street, Schenectady NY 12306.

GALAXY: GT-550A, RV-550A, RF-550A, SC-550A, AC-400, calabrator 250, and Vox-35C. All recently purchased, unused, mint — $800. WA2NVB, 11 Berkley Road, Scotia NY 12302.

YAESU FT101B, like new, with cw filter, fan, mobile bracket and Hustler antenna, all coils except 75M. — $675. Eugene Odell, PO Box 5195, Lancaster PA 17601. Bus (717) 569-7059.

SIGNAL One owners: Nixie unit with plug-in IC's. Perfect condition. Save $50 and buy this for — $100. W3VDA, Box 1333, Harrisburg PA 17105.

SALE: HRO-500 receiver model 88-4433 — $800; Frederick Electronics, Model 1200 FSK demodulator — $300; 60 ft. Universal tower, less base, with HY-Quad No. 244 antenna — $250. All excellent condition. 299-4355. Albuquerque NM 87112.

SELL: Swan 300B, scratchless, used less than 6 months, with manual and Shure 450 mike — $400 postpaid. R. Thoms, 3321 Federal, Denver CO 80211. (303) 477-3390.

WANTED: Two (2) each Westinghouse model WC183T integrated circuit, T style only, unused, brand new. State price, R.S. Crowell, 640 Stonehenge Dr., Mary Esther FL 32569.

HEATH DX-20 and Ten Tec No. 200 VFO for sale as a unit — $65. Joseph Schwarz, WA2TNH, S.A.O. 60 Garden St., Cambridge MA 02138. (617) 495-7226 days; (617) 259-8508 evenings.

NOVICE station: Heath RX-1 Mohawk Receiver w/s speaker and 6 meter converter — $125; Ten Tec TX-100 Transmitter — $45. Both rigs in mint condition, package deal, both for — $150. Contact Richard Harris, WN2UMI, 70-06 169th St., Flushing NY 11365. Phone (212) 591-7356.

COLLINS 32S1 — excellent condition, no scratches $375 less power. W1BGW, 28 Newhaven Street, Boston MA 02132.

HALLICRAFTER HT40 XMTR with Matchmate HA5 VFO heat hd 20 calibrator, all mint, with manuals — $100. H. Alman, WN1TKD, 2 Meryl St., Medway MA 02053. (617) 533-8904.

MAGNUM six for Heath gear — $75, includes cables, shipped postpaid. Joseph Arcure, Jr., W3HNK, P.O. Box 14, Norwood PA 19074.

FOR SALE: 2 new 7650 tubes, also one R390A/URR receiver, like new, will recrate and ship. K5JEB, 1724 Foster Rd., Las Cruces NM 88001.

ARGONAUT 505 - $250; Comcraft CTR-144 — $350. Don Barnes, WB6ZTN, 8092 Slater Ave., Huntington Beach CA 92647. (714) 847-3875.

SPECTRONICS Digital Display DD-1 compatible FT-101, FT-101B. New, mint, original carton — $150 shipped. WA5WQF, 835 Merridel, Houston TX 77024. (713) 468-4208.

NATIONAL 200 5-band transceiver, NCX-A power supply/speaker, 10-15-20 trap dipole, Turner mobile mike, spare finals, manual, 200W ssb, 50-200W cw, — $275 WB8CTY, 3378 Euclid Hts. Blvd., Cleveland Heights OH 44118.

COLLINS: 75A4, KWS-1, complete. Make offer to University of California Radio Club, W6BB, 344 Cory Hall, Berkeley CA 94720.

BC-779, VHF-152, Viking I (4D32), all — $75. Philadelphia area. Jankowski, W3EVU, 225 Forrest Hills, Devon PA 19333.

YAESU FR-DX-400 rcvr. and SP-400 spkr — $290; Mosley 3 band Quad — $75; AR-22 rotor — $25; Ameco SWR bridge — $25; 10 foot tower, top section, with roof mount and rotor shelf — $90. WB2KBK, 1803 Lincoln Ave., Pompton Lakes NJ 07442. (201) 835-4711.

HW-16 with manual, dozen xtals and Drake LP filter — $70. Pickup, K2DRA, 211 Rexland Drive, Boonton NJ 07005. (201) 335-2616.

TV Cameras with 700m lens and solid state electronics, new, bankruptcy sale — $115. Power supply with BNC video output jack — $30. Price includes shipping within USA (California residents add 6 cents tax). W6WQD, Bob Allen, 124 Lundy Lane, Palo Alto CA 94306.

FOR SALE: Collins 32-S1 $300. Call after 6 PM. Eugene Rhodes, WB4JCV, 227 Edison Dr., Pensacola FL 32505. (904) 453-3844.

SELL: Complete station, DX60B, HR10, HG10B, and HW16 all for — $275, or trade for HWIO1 and HP23B. John, WA1TCP, 64 School Street, Seekonk MA 02771.

KNIGHT SR-2, General-coverage receiver, mint, — $55. WN2VZQ, Jeff Stern, 809 Flanders Dr., Valley Stream NY 11581. (516) 791-7471.

WANTED: R24/ARC5 in good or better operating condition and appearance. Advise of any modifications. Also, two 1625 tubes. Ellsworth R. Wells, W1HNK, 6 Byron Street, Randolph MA 02368.

WANTED: Hallicrafters T-54 7" television receiver, any condition, including parts only. Also, manufacturer's service manual (not Photofact). C. H. Sarver, 6011 N. River Rd., Waterville OH 43566.

SALE: Collins 62S-1 excellent — $650; Millen 92200 2 kW transmatch — $100; Millen 90651 grid-dip meter, 11 coils — $50; KWM-2 mobile power supply — $80. K3SLJ RD No. 1, Box 24, Pottsville PA 17901. (717) 622-2398.

FOR SALE: National NCX-5 Mk II, NCXA power supply, and VX-501 VFO, Package deal — $400. Heath TV post-marker sweep generator, Model IG-57 A — $125. Cash and Carry. W5MTL, Guy Kelly, 1710 Swansee, Dallas TX 75232. (214) 331-4871.

KENWOOD TS-900, four months old, hit by lightning, no visible damage inside or out, power supply perfect. Make offer. HAM-M rotator — $75; Murch transmatch 2000A slight cabinet damage — $110; Heath SB-630 (patch, timer, swr and digital clock) — $75; HM-102, needs small repair — $10; Plate transformer 3500-0-3500 volts, one ampere — $25; Auto transformer 110-220 input, 7.5 KVA — $250; Good used 4-1000A — $35; 2K-3 with custom power supply by Henry Radio, use as desk or console, new 3-500Z's, 2.5 kW — $825. Offers considered on all above. W0WAM, 7928 Hedges, Raytown MO 64138 (816) 358-1148.

Morse Telegraph Club Inc. international organization invites wireless operators to join in preserving history of telegraphy. Quarterly magazine Dots and Dashes tells story of telegraph, Morse and International CW nets. Write C. D. Combs, International President, 721 South 49 St., Lincoln NB 68510.

FOR SALE: Mini-beam HQ-1 as pictured on page 160 of January QST — $50 FOB. Need an old SB-200 for parts. Earl Crews, W5UCF, 3002 Palo Alto, Carlsbad NM 88220. Phone (505) 887-5294.

TWO-METER 6M antennas, 1/4; 5/8 W "cartop"; and fixed station. Unique designs. Send for literature. Marsh Devices, P. O. Box 154, Old Greenwich CT 06870.

EICO 753 transceiver, AC power — $90 or your offer. Prefer pickup, but will ship. Jim, WB7AAU, 626 Ave. C, Snohomish WA 98290.

WANTED: HW-16 and HB-10B VFO. Brian Goetsch, WN7YMW, 1124 Wilbur, Walla Walla WA 99362.

FOR SALE: NC-300 Rec'r — $100; TX-62 Transm't — $85.00; Matching VFO — $35; Valiant I Transm'r — $95; Communicator II, needs work — $40; P-2 bridge — $20; Vanguard 2m converter, needs work — $25; Vanguard 6m converter — $30; Long John 2m ant. — $25; Tri-band 10-15-20 ant. — $50; 8-element 2m ant. — $20; CDR rotor with 50 ft. cable — $30; old DeVRY scope — $10; crystal calibrator — $10; gold Vibroplex — $25; 10 lb. box misc. (Cable, relays, etc.) — $10. Send certified check or money order, for shipping add 5% (Valiant and antennas will be sent REA or truck freight collect.) WB9ENO, William A. Nicewander, R 2 Box 358, Waupaca WI 54981. (715) 258-3424.

2 MTR fm transceiver, SB144 — 12 channels, 10 watts output, 7 channels with crystals — $175. Walt, WA2HDG (201) 835-5490 after 5 PM.

SELL: Swan SS-200 — $575; P&H 2-150 2m transverter — $150 D.M. Johnson, 10515 Penn Ave., Bloomington MN 55431.

NOVICE station, sell complete only, no shipping: Halli. SX-9 with QF-1 Heath DX-40, CW-AM with VF-1, T/R, lightning bug all with instruction manuals — $120. J. Rowland, 64 Ridge Ave Park Ridge NJ 07656. (201) 573-9776.

SELL: Tecktronics "L" scope Plugin, — $35. WB8NJE, 363 Florian Drive, Columbus OH 43219.

FOR SALE: 2 meter fm RTTY, W.U. 101 printer, transistor TU, AFSK, floor cabinet, manuals, paper. Motorola 30D, 16V — $95 complete. WA9MRG, N87W15898 Belleview Blvd Menomonee Falls WI 53051. (414) 251-6446.

DRAKE 2C and 2CQ. Good condition, original owner — $200 W8PBP, Gene Elmore, Jr., 209 Vallis, Spencer WV 25276.

STATION sale: Hallicrafters SR-400A, SSTV, TTY, two meter servicing books, test equipment, antenna. Send for list WA7TMR, Box 216, Logan UT 84321.

FOR SALE: Eico 723 trans — $40; Eico 722 VFO — $40; al with manuals. You ship. Harry Hall, 2607 Avena St., Wheato MD 20902. WN3YIC. (301) 942-2463.

WANTED: Power transformer for Heath Marauder HX10, par No. 54-114. W2SEF, D. Keller, RD2, Tully NY 13159. (315 696-8256. Collect calls accepted.

Drake T4XR, R4A, MS4, excel condx. — $600. De Vendis, 142 W. Ashcroft, Fresno CA 93705.

SELL: Swan 250 with 117XC and calibrator. Excellen condition — $240, WB2NJH, 409Y Laurel Trail, Martinsville N 08836. (201) 469-7185.

WANTED: QST 1915 Dec; 1916 all except Aug. and Oct.; 191 Jan, Feb, Sept; 1919 June-Dec; 1920 Jan., Feb., March, June July; 1921 Dec. C. J. Mozzochi, W1JYQ, Box 1315, Hartford C 06101. (203) 527-8635.

HAMMARLUND HQ-170A receiver, 160 through 6 meters, wit clock, manual, and matching speaker; all in good condition. $170, pick-up preferred. Bill Klinger, 1424 Lakewood Ave, Lakewood OH 44107. (216) 228-6216.

COMPLETE 1926 QSTs mailed for first — $20 received. K2IK Box 648, Ogdensburg NY 13669.

HELP needed: Newly organized college club needs a rig and/o any type gear we can get. We have little money. If you can help contact Robert Henningsgard, WA0ZGT/4, Box 332, Florid Southern College, Lakeland FL 33802.

JOHNSON Viking 2 kW linear. New spare 4-400A's. Pick-up only — $200. Norm Into, W1RN, Ph. (203) 658-7941.

FOR SALE: Drake R4B, T4XB, AC4, MS4, MN4 — $800. D.F Carl, 215 Church Street, Catawissa PA 17820.

Yaesu FL2100 linear. Like new, original carton — $299; Mosley 10/20 beam — $50; Complete prop-pitch system including indicator, selsyns, motor, bracket. Pickup — $75. Simpson 260 — $25; Simpson 269- $35; transmit receiver switch — $25 W1WHS, (203) 869-7307.

COLLEGE forces sale, entire station. DX-60B, HG-10B with matching speaker w/manuals, key, microphone. Hy-Gain w/cable — $215. Midland VHF mon. conv. w/12V p.s. — $20; Surplus xtal cal. $5. M. Messenger, 140 Ocean Parkway Brooklyn NY 11218.

COLLECTORS items. Cleaning house. Several complete and incomplete years QST, Popular Electronics, Popular mechanics Popular science, Mechanix illustrated, Hints & Kinks, others Send stamp for list. K4ABL, Box 22214, Louisville KY 40222

NEED: 757 loctal base tube. W9JU, 3009 Mayfair Drive Kokomo IN 46901.

HEATH SB-104 SSB transceiver, brand new, professionally wired, aligned, tested, including matching AC supply/speaker $1000. Prepaid UPS. Jim Perry, 12 Rick Drive, Florence MA 01060. No calls.

SB200, 3 months old, prof. wired — $225; SB100, Cw filter, p.s. speaker — $325; SB610 monitor scope. - $50. R. G. Waigo 139 Kings Drive, Riverhead NY 11901.

FOR SALE: Hammarlund HQ-170 receiver-clock speaker never used $240. Hewlett, Phone area (516) 744-4019.

COMPACT KW station: SBE-33 factory reconditioned — $180. Matching SB-1-LA kW linear, with new fianls — $130. Mic included, all in top notch condition. Rick, K1BQT/1, 21 Lakeshore Drive, Barrington NH 03825. (603) 664-2088.

SELL: Apache with SB10 or trade for Ranger II or comparable VFO-CW 80 through 10 transmitter. Want QST from 1970-71-72. Prefer pickup on Apache. Tom Snipes, 206-49th St., West, Bradenton FL 33505. (817) 747-2618.

ANTIQUE Collectors: rare classic United Lansing Model 150 chassis with front panel. Six Kellogg AC tube TRF. Unique four-gang horizontal movelemt rack and pinion tuning capacitor. Foltz, Box 1310, Sedona AZ 86336.

WANTED: AF-67 and PMR-6A manuals or copies. Also want 2215 kHz crystal filters. Kurt Wehle, Jr., WA4SMI, 4709 Twinbrook Rd., Fairfax VA 22030.

SALE: Video tape recorder B/W Ampex VR 660, studio quality — $400, including 22" monitor-receiver. You take care of the transport from Milwaukee WI. Albert S., (414) 352-2896 eve's.

WANTED: cabinet for Hammarlund SP600 receiver. Sell transistorized Grid-Dip meter. Midland 23-120 — $20. Tyler 1515 Bayshore Blvd, apt. 7, Dunedin FL 34528.

HEATH SB101 transceiver with cw filter and HP23 power supply, constructed by Heath. SB600 speaker, Heath mike, Drake W-4 wattmeter, autronic keyer and key, Drake low pass filter, Superex phones, etc. Excellent condition — $425. Gedaly, WB2ZKY 41-15 50th Avenue, Long Island City NY 11104.

TV Antenna VHF/UHF/FM/Ham 2-meters Rcv/Xmit, 300-ohm line furnished, size is 18 X 48 in., can be unrolled and hung on wall vertically. Choose either landscape, galaxy, hanging-branch, or plain plastic acrylic artistic design. Order postpaid airmail for $15 cash or COD from Antenna Design Co., 11621 Hughes NE, Albuquerque NM 87712.

SELL: Drake 2B, 2AQ, 2BC — $185; you ship. J. Miller, WB8CVF, 11904 Canton Rd., No. 330, Cleveland OH 44106.

CRYSTAL packages with the purchase of any 2 meter FM radio. Write for our deal on the rig of your choice. Factory-authorized dealers for Collins, Regency, Drake, Icom, Atlas, Alpha, Kenwood, Tempo, Ten-Tec, Swan, Clegg, Genave, Standard, SBE, Midland, Hy-Gain, CushCraft, Mosley, Hustler, plus accessories. For the best deal around on HF or VHF gear, see us first or see us last, but see us before you buy. Write or call us today for our low quote and become one of the many happy and satisfied customers of Hoosier Electronics, R.R. No. 25, Box 403, Terre Haute, Indiana 47802. (812) 894-2397.

7JP4 wanted, in good condition. Also shield and bracket for mounting 7JP4 on Hallicrafter T-54 TV chassis. K4HEF, 1212 S.W. 18 Street, Fort Lauderdale FL 33315.

WANTED: Johnson 275W Matchbox, W0DKX/4, 2941 Kedron, Winston-Salem NC 27106.

HQ215 receiver, hardly used, original box — $285; 100KC E/Put counter — $38; Fluke differential VTVM — $35; 202CR audio oscillator — $40; 500' RG/62-U coax, $10; WV-97A Voltohmyst — $25. Want synthesized 2MFM, K4IJT, Rt. 3 B53A, Brevard NC 28712.

FOR SALE: SB-102, HP-23A, SB-600 — $395; very good condition. W2HWV, John Cavallari, 430 East 67 Street, NY NY 10021. (212) 861-2388.

SB-34, excellent condition, w/mike, calibrator and spare tubes — $265; Bumper mount Hustler antenna W620 and 15 meter resonators — $25, Both for $275. Ben Moses, W2GGV, 1 Lincoln Plaza, New York, NY 10023. (212) 873-1010.

FOR SALE: Drake T-4XB transmitter and R-4-B receiver. Like new. Power supply and speaker. Mike, key, patch cords and stacking kit — $650; Collins 51J3 slant bar, 388 General coverage receiver. Good condition, needs dial cord — $250. Joe Engressia, WA4JZT, 2770 Madison No. 7, Memphis TN 38111.

HW-22A, mod for phone and novice cw, HP-23B with package — $125; Also, DX-100 in mint condition — $60. John T. Davidson, WN9NPR, 90 Belterive, Springfield IL 62704.

SALE: Heath HP 23-A, HW-101, cw filter and remote VFO — $225; SBE 34 mic and calibrator — $225. J. Garry, 36-05 218 St., Bayside NY 11361, (212) 224-8278. Pickup only.

DRAKE TR4, manual — $395; AC supply homebrew — $25; Drake mobile supply, custom transmission hump rack, speaker — $75; Shipping $5 each. Jim, K6AIP, (714) 496-3333, 34022 Blue Lantern, Dana Point CA 92629.

HX-30 six meter ssb transmitter, perfect condition — $135 plus shipping. Jim, WA8NLC, 1500 West North, Apt. D 42, Jackson MI 49202.

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50 FOOT Rohn, 25G tower, complete with rotor plate and house bracket; never assembled — $175; large prop pitch motor — $50; Swan TR4HA beam — $125; Gonset 201MK TV — $250; Hofstrom LK-2000 HD, linear, with new 3-1000Z — $475. W3FVC/5, 414 E. Gaywood Ave, Columbus MS 39701. (601) 327-2700.

HEATHKIT SB-401 with crystal pack and Heathkit HDP-21A desk mic — $265 or most reasonable offer. Will ship. Bob Melius, WA0NIE, 1385 Portland Ave., Saint Paul MN 55104.

SELL: Drake TR4, AC4, MS4, mint. — $450. Richard Jansma, WA8QJK, 421 Stewart, Big Rapids MI 49307.

TOROIDS: 88 and 44 mH $6.60/dozen. Telecommunications, Box 4117, Alexandria VA 22303.

DRAKE: 2-C W/2AC, excellent — $205; Heathkit DX-60A and HG-10 VFO — $85. WA4VEE/0, Quarters 4414C, U.S.A.F.A., CO 80840.

SELL: All or separate, cartrivision Video Tape Recorder and two TV cameras with manuals. Approx, 100 tapes; movies and blanks up to 100 minutes. Also, have bulk tape, splicer, spare parts. Write Dennis Trimble, 5154 Roeder Road, San Jose CA 95111.

MANUALS for Govt. surplus gear, only $6.50 each; URM-25D, R-220/URR, SP-600JX, TT-63A/FGC, TS-497B/URR, R-274/FRR, TS-382D/U, ALR-5. Thousands more available. Send 50 cents (coin) for 20-page catalog. W3IHD, 7218 Roanne Drive, Washington DC 20021.

WANTED: Old Baldwin Headphones, 1P501 longwave, Ship receiver, 1920's XTMR. George Guy, WB2TJT, 1928 Hiway 35, Wall NJ 07719

SWAN 250 transceiver — $175; Swan TV2 — $175; Swan 117XC supply — $75; Philip Schwebler, W9GCG, 4536 N50 St., Milwaukee WI 53218.

COLLINS 7583 Drake 2NT Johnson VFO w/ Homebrew pwr. sup. Autronic Elec. keyer w/Browncomb. Key — A11VG — $550, Local TA-9-0898, K2LWM, 2246 Story Ave., Bronx, N.Y.C. NY 10473.

YAESU FT-2 auto: Excellent condition, original accessories plus xtals — $290. Greg Jump, K8GKH, 2195 Mattis Dr., Dayton OH 45439.

DISCOUNT Prices plus full warranty, all items guaranteed. Write quote Midland 13505 30W2MFM; CDE Ham-2 117.00; Belden 8448 rotor cable 8 wire 12c/ft; 20% discount Hygain TH6DXX, 204BA; Mosley Classic 33, 36; 15% discount Triex W, MW, supermast — FOB Calif; Belden 8214 RG8 foam coax 22c/ft; Sprague 500pF/20kV doorknob cap 1.95; Rotron Nugget blower-NTH2 7.95; Raytheon 811A 7.95 ea, 15.00/pr; Vibroplex; Sorensen ACR2000VA AC regulator 150.00-Write specs; Quote TS520, KLM Echo 2MSSB; Longwire antenna-22GA/7STD Phos-Bronze 2.50/1000 Ft; new panel meters, old tubes (IV, 7V, etc.); Prices FOB Houston, Madison Electronics, 1508 McKinney, Houston, Texas 77002. (713) 224-2668; Nite (713) 497-5683.

SELL: Complete station — $600; HW-100, HP-23, HP-13-A Elmac AF-68 w/M-1070 p/s. TR-22-C like new. 3 mikes, Eico 710 dipper. Heath Super Twoer. CD rotator TR-44 new, Hustler mobile antenna & RM-75, 2, 6 & 10 beams. Other extras. Prefer local buyer or pick up. Steve Spevock, Route 2, Rivesville WV 26588.

WANT: KWM-2A, round emblem, mint condition, Have 75S-3A, 75A-4, and KWS-1 to trade or sell. K1OJQ (617) 773-4421.

TTL/2 Demod, Professionally built by J&J Electronics. 170/850 shift, autostart, tuning eye, 19" rack panel, Little use. Excellent condition, $100 FOB. W1FUF/6 D. Stamps, 293 Reindollar Ave., Marina CA 93933.

WANTED: Manual or schematic and tube checker chart for Weston Model 774-4 analyzer. Harold Nycum, W3ILO, RD2, Templeton PA 16259.

MAGNUM Six RF speech processor, hardly used, with instructions and cables. Heath colors — $100. WA1HMW, Pinewood Road, Bolton MA 01740.

WANTED: HRO-60, Factory wired Johnson 500. Please state modifications, options, serial numbers, condition, and your terms in first letter. All replies answered. J.F. Schultz, WA1QOP, Plainfield VT 05667. (802) 454-8561.

SELL: SB 101, spkr. & pwr supply, al condx. 350 dollars. Mosley TA-36 6 el. tri. band beam, al condx. 130 dollars. R. Haynes, 12118 Glen Valley Rd., Brecksville OH 44141. Phone (216) 526-4452.

WANTED: Surplus R-44/ARR-5 radio, signal corps, by Hallicrafters. If clean — $75. LaVern Hansen, Eden Valley MN 55329.

FOR SALE: 50' high galvanized steel fold-over crank-up tower with base. W. Franzwa, K6SIK 3538 Arcadian Dr., Castro Valley CA 94546.

SELL: HW 101 with HP 23b supply — $260. Or, will swap for a Robot camera. WB2LTS, 133 N. 19 St., Wyandanch NY 11798. (516) 643-2412.

SB303 — $190 firm. Archer rotator with cable — $35. 24 hour Tymeter clock — $10. Heath IG-102 RF generator — $20, manuals. You ship, WB5HZZ.

CALCULATOR: Texas Instruments SR-10, square roots, reciprocals, etc. Eico 720 cw transmitter — $50 each. WB9FDR, (414) 258-4577.

ANTIQUE 1924 radio a III-A. Excellent condition. Photo available. Best offer. Glenn Steiner, 345 Felshaw, Gaylord MI 49735.

FOR SALE: Hallicrafters FPM-300 — $325; Drake 2-B with 2-BQ speaker/Q-multiplier — $160. Godwin, 225 Main Street, Newington CT 06111.

GROUNDED grid filament chokes 30 amps — $5; plate chokes 800 mA — $4; 2 amp — $6; 3-30 Mcs; 1/2" X 5" ferrite rods — $3. PPUSA, 48 William Deane, 8831 Sovereign Rd., San Diego CA 92123.

QUAD kits — $14.50 to $25. Boomless spider mount - $12. Send s.a.s.e. for information. WAC, 404 Sanders Rd., SW, Huntsville AL 35802.

GR 916AL RF bridge — $230; Eico 240W solid-state multimeter, unused — $65; Dumont 404 pulse generator — $30. Robert Stein, 1849 Middleton Ave., Los Altos CA 94022.

UPGRADE your ham license Now! Beat the change and preserve your privileges. Let Posi-Check help you. Original, expertly devised, multiple choice questions and diagrams covering all areas tested over in FCC exams. IBM sheets for self testing. Keyed answers with explanations. Extra Class — $4.90; Advanced Class — $4.65; General Class (including latest rules and regulations) — $5.10; Novice — $3.35. First class postage prepaid U.S.A. Air mail 25c extra per copy. Send check or money order to Posi-Check, P.O. Box 3554, Urbandale Station, Des Moines IA 50322.

BUY-Sell-Trade. Write for monthly mailer. Give name, address and call letters. Complete stock of major brands, new and reconditioned equipment. Call us for the best deal. We buy Collins, Drake, Swan, etc. SSB & FM. Associated Radio, 8012 Conser, Overland Park KS 66204. (913) 381-5901.

C-LINE year old and perfect, T4XC, AC4, R4C w/4NB, 250 & 500 cy, MS4 — $1030 pkg. SB220 — $365, K8IKB, 407 Normandie, Bowling Green OH 43402. (419) 352-8734.

HEATHKIT: HR-10B receiver with calibrator and DX-60B transmitter with VFO. Excellent condition. Upgrading shack. Price — $200 complete. Strothmann, (812) 522-6111.

EICO 720 XMTR, HA-230 rcvr, Emi Mark 6 video camera. Mint condition. W.B. Taylor, WA2RGP, 208 Union Street, Brooklyn NY 11231.

QUALITY stainless steel threaded, washer, hardware fasteners! List, no prices, 10c. Walt, W8BLR, 29716 Briarbank, Southfield, Mich. 48076.

GE CAVITY filter with coupling loop 132-174 MHz, never used — $195; Motorola T1375AB remote desk sets, standard squelch, never used, two — $230 each; B&W model 426 low pass filter, 75 ohm — $11.50; Dentsu-Seiki semi-automatic key — $7.50; Superior 670-A VOM 117 VAC — $5.50; RCA low band CMFA-100J Carfone, rf only — $9.50; Swan 10-80 trap vertical, damaged but complete — $27.50. K4JLD/3, 7 Long Lane, RD 2, Hummelstown PA 17036. (717) 566-6098.

SWAN 270B — $385; excellent condition, with mobile supply. K6JAD, 3136 Ronald St., Riverside CA 92506. (714) 682-8935.

SB-10 sideband adapter — $45; RME-4301 sideband slicer — $25. Want tribander beam. WA1GTS, 12 Charles St., Plantsville CT 06479. (203) 621-5954.

DRAKE 2C For Sale. Reasonable. Make offer. WN6EMT. (415) 647-5722.

CRYSTALS airmailed: Nets, Mars etc. — Novice, active FT-243, all frequencies, minimum five, 40M, 15M, 10M — 99c each, 80M $1.75. Cover bands inexpensively, rock solid — less than five 80M $1.90, other $1.50. Novice, eight crystals — four band, edge calibrator and QSO package (also good with VFO) — $9.95. General purpose: FT-243 .01% — 32 pF., — 3500-8600 Kilocycles $1.90, (five $1.75 ea.) 8601-13000 fundamentals, 10000-30000 overtones $2.95. 160M, four/$9.80, single $2.95. Add 45c for AST-6 (thin FT243, fitting HC-6/u socket above 3000). For .005% add 50c each. Airmail 20c crystal, 1st-cl, 15c. Free listings. Bob Woods, W0LPS. "Crystals since '33". C-W Crystals, Marshfield MO 65706.

WANTED: Used Instructograph machines. Dick Aspinwall, 6213 13th Ave. South, Seattle WA 98108.

MINT 6 meter Swan 250 with 117XC — $275. New 2 meter Regency HR212 7 sets crystals colinear mobile antenna — $260. All with factory cartons. East, K5MDI, 2801 Dominique, Galveston TX 77550. (713) 744-4981.

HAMMARLUND HQ 110C, perfect — $95, plus UPS. D. Sowers, K4SUE, 522 McGeorge Dr., Vinton VA 24179.

DRAKE R4C, AC4, MS4, 4NB, FL500. Factory fresh, only four months old, immaculate — $1095. Heath SB610, SB630. Both excellent — $69 each. Teletype 28KSR MKII floor console, excellent — $250. TTL-2 RTTY, TU Excellent — $125. Mark, K7HPH, 801-561-4430, 438 Roosevelt Street, Midvale UT 84047.

SELL: 1920's vintage radios, 2-tube Crosley-Westinghouse. Best offer. W8ETX, 1205 Logan St., McMechen WV 26040.

WANTED: Antique wireless (radio) sets, tubes, components, books, magazines, catalogues. Bill Nangle, 761 No 29th St., Milwaukee WI 53208.

POLYGRAPH (lie detector) Keeler 6308, case, all accessories, new, in carton, cost — $1325, trade for linear 2 kW or other gear-equal value. W0CEC, 7825 E. 117 St., Kansas City MO 64134.

ANTIQUE radios for sale. Large SASE for list. NY area buyers welcome to come see. Radios, 45 Allen Dr., Woodstock, NY 12498.

FOR SALE: IEEE Transactions on Electronic Computers, Dec. 1951 (first issue) through March 1972, complete. — $60 plus shipping. W6ALF, 1236 E. Union, Fullerton CA 92631.

FOR SALE to highest offer, 1 NCX 3 in top condition, with 12 V power supply, microphone, built-in speaker. You pay shipping. Sid Fritsch, RD No. 1, Box 64, Lockwood NY 148859.

FOR SALE: Collins 75S-1, like new — $300. Collins KWM-2, like new — $650. 516 F2 p/s — $120. K9IYT (317) 476-7965.

COOL it with a new Mark 4 Muffin 100 cfm fan. 120 VAC, 50/60 Hz. Postpaid. Guaranteed. Check or moneyorder $10 each. P.R. Electronic Supply, Box 203, Webster NY 14580.

QST, CQ, 73, Poptronics, others — wanted by collector. Pay $1.50 per year for anything, or swap with mine from 50's. Also, collect Callbooks, ARRL Handbooks and publications. Don Erickson, 6059 Essex, Riverside CA 92504. (714) 687-5910.

WANTED: Collins "S-Line", KWM-2 or 2A, with station control, 30L1 amp.; 60' free standing crank-up tower. W. Ridings, 5301 Rockledge, Buena Park CA 90621.

WANTED: SSB gear in working or repairable condition. State price and condition in first letter. Elvin Miller, 505 Roxbury Ct., Ft. Wayne, IN 46807.

HOW to pass examinations — $2. Swank, 657H Willabar, Washington Court House OH 43160.

RECEIVERS — $13.76, Scopes — $10.71. Directions on how you can buy Government Surplus electronics directly from the Department of Defense. Send $2. H.L. Collins, Jr., Box 198, Tiburon CA 94920.

DYCOMM: 2M amplifier, 10W in, 100 W out, not a kit — $110. Dycomm, Brick Booster 2W in, 25W out. Brand new (Hamfest won) — $50. Lee Allen, Rt. 2, Hendersonville TN 37075.

WANTED: Heath HPD-21A; transmatch to handle 1 kW. Greg Gohlen, R No. 2, Moweaqua IL 62550. Phone (217) 768-4477.

FOR SALE: Gonset GSB-100 transmitter. In fine condition — $150. Richard C. Young, 2726 Telequana Dr., Anchorage AK 99503.

WANTED: Hallicrafters SX-100. Spencer Cromwell. (714) 356-4803, 1313 East Seventh Street, Space 118, Holtville CA 92250.

SELL 71' Trex tower, HS471, H.D. top section, torque arms, thrust bearing, gave, guying kit and raising fixture. 1600 cost, sell — $999. WA6EKL, 18634 Tulsa St., Northridge CA 91324. (213) 360-7227.

ROHN No. 25 tower, 70 ft., really rugged, seven sections, rotor and base plates, guys — $185. Ham-M rotor (complete) — $75. 400 ft. low loss 50 ohm (alum. jacket) coax cable — $30, Pick up. M.M. Kovar, W2ZN, 3 Puddingstone Ct., Morristown NJ 07960. (201) 267-0657.

COLLINS 75S-1, 32S-1, 312B-4, 516F-2 cables and manuals. Good condition. K9FZS (317) 966-5020.

WANTED: Army operation and maintenance manuals for SC-348-K radio receiver. Art Hudson, WN8TLJ, 1019 Wilmington Ave., Apt. 41, Dayton OH 45420.

SWAN 350 (late) with opposite sideband, calibrator, mint 117X ac with cord, manuals — $325 or best. Martin, Box 288, Umatilla FL 32784.

CUSHCRAFT A-144-20T Satellite Crossed Yagi 10 + 10 el — $40 Alliance U100 rotator and 100 ft. cable — $25. W6RGZ, 1330 Curtis, Berkeley CA 94702. (415) 526-7345.

WANTED: Galaxy RF550A wattmeter, Hallicrafters LF tuner HA-10. K2EGI, 5 Stratford Pl., N. Babylon NY 11703.

FOR SALE: Excellent 75S-3, one owner — $425 or trade towards excellent L-4-B linear. George, K4IQC, 105.883-1503-1009, Nottingham, Huntsville AL 35803.

SELL: Drake DC-3 — $50; Heath HP-13 — $40; Xmfr 3600-0-3600 at 1 amp, 110/220 Pri — $40 fob. W0AIH, 304 W. 17th, Grand Island NB 68801.

SB 401, SB301, speaker — $450 plus shipping. Mint condition. Built by engineer. Jim Bennett, 305 "C" Ave., Hiawatha IA 52233. (319) 393-2356.

TR4C won in contest, unopened box. Best offer. New 4-250A — $18; Heathkit Shawnee — $45; Robnt 70A, 80A Swan 120 — $75; Heathkit HP23 — $35. K8YVA, 2901 Cricket, Wickliffe OH 44092.

WANTED: Autronic key only. Jim Manship, K4ET, Rt. 8, Greensboro NC 27410.

WANTED: Swan TV-2C meter transverter, also need Swan NS-1 noise blanker. Steward Cook, K2IUD, 53 Orlando Ave., Albany NY 12203. (518) 489-1820.

COLLINS 75A4 serial 5824 with speaker, cw and phone filters, unused since overhaul — $350. TR4 serial 29286 w/blanker factory checked 1974 — $400. W9UZC (618) 252-7084.

2M FM — Heathkit HW-202 with tone encoder, 94 Simplex, HW-202-1 AC supply, just factory aligned and tested. First certified check $180 and 1 ship. Charlie Bruggemann, 358 Oxford Rd., Ladson SC 29456.

SB301, SB401, CW filter, matching speaker — $500. WB8NWE/8, Joe Subich, 55 W. Home, Westerville OH 43081.

WANTED: New Mor-Gain 75-10 Multi-Band Doublet, W1NSR, 267 East Riding Drive, Carlisle MA 01741.

DESK model 32RO — $150; small USLS-465 vacuum variables — $35. W6ME, 4178 Chasin Street, Oceanside CA 92054.

HEATH SB-301 — $200. Excellent condition. Dan Trainor, WA1QZX, Sycamore Dr., Westwood MA 02090.

POLE-VAULTING poles, 24, 14 foot poles for sale. Mint condition, excellent for quad — $300 or best offer. You ship. WB4URW, 8802 Bellefonte Rd., Richmond VA 23229. (804) 282-6735.

WANT: Marauder HX-10, sell PM2B XCVR. WN3VJS, 437 Crescent Rd., Wyncote PA 19095. 887-7896.

DRAKE 2C/calibrator — $190. Like new and clean. WB9MYC, Box 137, Liberty IL 62347.

NEW CCTV cameras by Eumig, f1.9, Zoom, full interlace, solid state, with service manual. Guaranteed — $119 plus $5 shipping (U.S.A.). Other VTR gear. W6DOM, HAAS Enterprises, 6017 Majorca Court, San Jose CA 95120. (408) 997-0132.

YAESU Twins, sell FRDX-400 FLDX 400, will ship — $425. K3JFY, 116 Magnolia Dr., Levittown PA 19054.

WANT: Collins 180S-1, 136B-2, 516F-2, DL-1, SM-3. Sell: MP-1, PM-2. WA5RGX, Box 254, Southaven MS 38671. (601) 393-0858.

BARGAIN for expert. Modified HW 100, transistorized, 600 W input, autom. tuning, spare parts, changes documented, plus AC-power supply $190. Ted Koch, 53E Sherwood Forest, Wappingers Falls NY 12590. (314) 831-2893.

TS-520 — $565, Shure 444 — $20. WA6YMX, 9392 El Blanco, Fountain Valley CA 92708.

SELL: Icom IC-21 and accessories — $300; NCL-2000 with spare finals — $375; Also: EV674 mic; new TB2 thrust bearing; 6 element 6 meter and 15 element 2 meter Hy-Gain; CQ mag 1960-1972; RDR (225-390 MHz) receiver, cheap. WB9GGD, Box 551, Monroe WI 53566.

SELLING Out. Hornet tri-bander, Apache, Bud Low Pass filter and SX-111 (bent cabinet). Also 57-65 QST in binders. Best offer for any or all. You pay shipping. W4DML, R.E. Faucett, 703 Hutcheson, Blacksburg VA 24060.

TEMPO FMH, 6 crystal channels, charger, Ni-Cad batteries — $230. Glenn Ungarten, WA3VQW, 777 Walnut Court, Cornwells Heights PA 19020.

SELL: Knight space spanner receiver — perfect condition — $20; Hallicrafters S40B, good condition — $40. W1GAJ, 1183 Southeast, Amherst MA 01002.

SELL: Drake R4C absolutely mint — $395; New 3000 watt generator 8 HP electric start with gas saver — $450; K1YGS, Box 161, Torrington CT 06790.

LOGIC Probe Kit!!! — Now a digital Logic Probe Kit at a realistic price. Red, green and yellow light emitting diodes signal the presence of logic levels encountered in TTL digital circuitry. Utilization of transistor and integrated circuit switching techniques permit the Digapeake-A to indicate logic 1, logic 0, and pulsing circuit conditions. Complete kit including easy instructions is available now from Chesapeake Digital Devices Inc,, Dept A, P.O. Box 341 Havre de Grace MD 21078. Satisfaction guaranteed. Order yours today — $14.95 plus shipping. Maryland residents add tax please.

FOR SALE: Drake SW-4A shortwave receiver and MS-4 speaker. Less than 20 hrs. use. Manual included — $295. Bob, Box 235, Keppel PA 16136.

HALLICRAFTERS FPM-300 with 10 meter xtals and fan — $340. Great condition. Joe Roth, WN3VJK, 99 Thompson Dr., Pittsburgh PA 15229.

SELL: HP524C Counter nixie readout to one cycle, excellent — $250, pick up only; Swan 260 transceiver, excellent — $295; Heath scope IO-102, factory wired,like new — $120; T43GGT with crystals, control head, mike, cable — $170, good condition. Vic, WB2PYE, 325 Wilson Ave, Westwood NJ 07675.

NEED: Station Monitor type Heath SB610 or similar, also good communications dynamic desk mike w/ptt and headphones. Have for trade or purchase Heathkit Seneca VHF-1 am/cw xmtr; Finco A-62 6-2mtr beam; Knight R55A general coverage receiver. Call Paul St. Andre after 6PM (516) 676-4535 or write 103 Altamont Ave., Sea Cliff NJ 11579.

SELL: Heath SB-300 receiver w/cw, SB-400 transmitter, both modified per QST Dec. '66 — $410. C. Brelsford, K2WW, 255 Danbury Circle, Rochester NY 14618. (716) 244-9519.

SELL: Heath HW22A with HP23A and HP13A supplies, 2 mikes hustler mobile antenna and extras — all excellent, $175. WA2RUL, 64 Lake Ave., Center Moriches, NY 11934. (516) 878-4836.

MOTOROLA HT200, 34/94, 94/94 case, nicad, charger, merc. batt., parts for 3 more freqs. — $175. Also 5/8 wave trunk mt. ant. — $25. WB9BVV/@ Mark Reising, 506 Main, Rolla MO 65401.

COLLINS equipment. All have round emblems. KWM-2, plug in relays, 2 years old — $850; 75S-3B, late run — $725; 312B-4 — $150; 516F-2 — $150; 30S-1, old but unbeatable and in top shape, — $850 with spare tube; Novice adapter, good for nets — $20; Noise blanker 136B-2 — $50, working when removed from old M-2. Tubes: 4CX1000A — $50; 4CX1500 — $50, not good for commercial use, but OK for amateur. Will discount on entire package or groups. No trades. No collect calls. Grant Bright, WB4CJC, Box 256, Loganville GA 30249. Phone (404) 466-8111.

SELL: Swan 260 Cygnet for $250. Drake TR-4 w/blanker, AC-4, MS-4, for $500. All perfect condition. WWant: Heath SB-303-401-600. Mark Kiehl, WB8EOU, 1687 Broadway, Apt. No. 102, Ann Arbor MI 48105. (313)769-1329 nite.

QSTs, sell all or part. Excellent private collection, 1924 to 1972, a few later issues missing. Prefer vicinity San Francisco for transportation ease. F. Tesche, 3728 Mosswood Drive, Lafayette CA 94549. (415) 284-5608.

TUNER — Drake MN-4, 300-watt, like new. B&W JCX100E, Butterfly capacitor, 0-100 uH variable inductor. Best offers, WA6KPN (415) 846-4842.

SELL: Lampkin 105B frequency meter with frequency chart for 30-50; 150-175 mc. — $125. Larry D. Kuykendall, WA8FJA, 210 S. Elm St., Moorefield WV 26836. (304) 538-6832.

WANTED: B&W 5100B modulation transformer or modulator deck. Harold Fisley, WA3SPD, Box 56, Saint Marys City MD 20686.

HQ170A — $125; BC348Q w/ac supply — $50; Navy RCH rec. 80 Ke. to 24 Mc — $75. W2DQC (914) 769-9331.

HEATH HR-10B, DX-60B with solid state VFO — $135. Excellent. Ed Danford, WA4BEQ, 109 Colby Road, Oak Ridge TN 37830. (615) 483-1412.

FOR SALE: Eimac 4CX5000's, guaranteed — $75; total of six, will consider trade. Collins 512J, TMC CU591 — $225; BW-5100B xmttr — $75, Wanted: VGC-41 Mite Teletype General Dynamics: SC910A, SC907, SC908, SC910 R. George H. Rancourt, K1ANX, 78 Williston Ave,, Easthampton MA 01027. (413) 527-4304.

TR22C 2m XCVR, mobile, portable. Nicads, 12 channels, .52-.34/.94-.25/.85. Like new — $180. John Ayers, 3209 Cleveland Ave,, Aliquippa PA 15001.

CLEGG Venus with matching ac supply — $150. Needs minor repair. WA3UDN, 507 Longridge Drive, Pittsburgh PA 15243.

COUNSELOR — Over 19, Gen. Class operator. Summer camp in Maine (July-August). Exc. sal & benefits. Allowance for own trg. Write: Director, P.O. Box 178, Carle Place NY 11514.

COUNSELOR — Operator with General license to teach ham radio at Pennsylvania co-ed camp. Have completely equipped ham station. Write Trail's End Camp, 215 Adams Street, Brooklyn NY 11201.

RADIO Instructor: General class license required for outstanding brother-sister camp in the Pocono Mts. of N.E. PA, 2 hrs from NYC. Must have own equipment. Please reply stating nature of equipment and qualifications to: Pocono Highland Camps, 6528 Castor Avenue, Phila. PA 19149. Tel (215) JE3-1557.

HAM Counselor for top sleepaway camp in NY state. 21+. Call (516) 643-2805. Write Camp Lokanda, 4 Cropley CT., Melville NY 11746.

HAM with General Class license, high school graduate minimum. To teach radio to campers at outstanding Co-ed camp. Write for application to New Jersey YMHA-YWHA Camps, 589 Central Avenue, East Orange NJ 07018. Phone (201) 678-7070.

Operating News

(Continued from page 85)

VE3DDD, (23.3) WA7TZO, (24.2) WB2MDR, (25.0) KØMKD, (25.9) W5PW, (26.2) WB4RUA, (26.7) WBØHBM, (28.4) WA5QBO, (28.9) W7FIS, (30.7) W2SBI, (32.3) K4CFV, (33.3) WB5ETT, (34.1) VE7DES.

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(35.3) WB2APO, (35.9) K5BSZ, (36.0) W5ARV, (36.1) Andi Bingham, age 12, (38.4) K4CFI, (39.7) WN2SLA, (40.6) W6RNU, (41.2) WB4IYG, (41.9) W4HU, (43.0) K2JN, (45.0) WØOYT, (47.7) K4MC, (48.4) Bill Bingham, (55.8) WB9JUL, (58.1) WB8NGA, (58.4) Dick Bingham, (70.2) WB2TFH, (81.5) K7ISL, (94.8) WA8VTD, (95.0) K4RTA, (99.8) W9TGN, (106.7) WA1JZU, (115.6) K4IKP, (122.8) K2QMF, (126.7) WIDAL, (126.9) VE6XO, (136.3) WA2QMI, (169.1) WA1NAE, (170.6) W9MJM, (179.0) WA6FCO.

The following entries did not meet the minimum criteria for Class II, in what seems to be unusual errors involving math, etc.: WA2YPW W2SGI W4UCL W5KYD W6AUC WA6INF/5 WB8QYM WA8UUY WAØHIK.

Feedback

Re the November FMT report in the January issue: That 5.6 ppm score belongs to W4HU (not W4AU) - sorry, John! W6RQ claims that for most of his life he has been known for his appearances in the errata (feedback!) columns; now because we omitted one of his readings in the Nov. FMT - one which puts him right at .5 ppm - oh well!

Frequency Drift

Equipment used: homemade counter and shielded VFO, 5 MHz standard for counter set against Loran-C on 100 kHz as WWV reception was poor. - K1VHO. Using a much modified Drake 2B with a built-in Macleish type rec/counter and proportionally controlled oven for the time base to help keep me on the Honor Roll. - W5IJW. The 10 kHz marker is continually calibrated against WWV using a Heath monitor scope to zero the signal. The GRI interpolation osc., 5000 Hz, is calibrated against WWV tones at 400 and 600 Hz. I also use the calibration chart provided with the osc. The 100 kHz crystal in the R388 receiver is calibrated against WWV at the start of the tests. This is important to get an accurate readout from the R388 (which is a check against my final reading on the interpolation osc.). First, W1AW is tuned in on the R388 and a dial reading is observed. The closest 10 kHz marker is recorded. The difference between the 10 kHz spot and the receiver is read out and computed. This tells me where to look for the beat on the interpolation osc. The R388 BFO is turned off and the audio beat note between W1AW and the 10 kHz marker is read off the interpolation osc. If the beat is close to 5 kHz it means watching the meter very carefully. The reading is either added to or subtracted from the 10 kHz mark frequency. Several readings are taken and averaged. This usually gives me a reading only 2 or 3 hertz off the true ump's reading. It is important to keep the incoming signal level and the level of the 10 kHz marker as near as possible. - W6CBX. Just want to mentioned that during the Sept. FMT my transmitter was terminated in a dummy load. Didn't want to be accused of being one of those signals on the FMT, hi! - W6CLM. My 90th consecutive FMT. All it took was a bit of luck with band conditions, equipment, AND remembering the right day! - W6RQ. Since I'm an average ham with personal equipment I've used for 25 years with some updating I would like to propose that the FMTs be made with equipment owned and used for OO work. What kind of a demonstartion of ability is it to use government or company owned equipment for the FMTs and then use the receiver dial for OO work. Usual dead carriers on, but I don't mind, it is a challenge. - K7CC. Just for kicks, I went back and measured both the 80/40 signals at the end of the half hour. The early run signal had drifted down about 2 cycles but the late signal remained about the same. Pretty good stability! - W8CUI. Signals on early 80 the best and most interference-free that I have ever heard. Previous tests have been made by feeding the output of a CE100V transmitter into a counter and adjusting the output in the calibrate position to feed the counter and the receiver for zero beating purposes. This has worked well in the past. This time, I offset my Atlas receiver which has an up-down counter hooked into it to get about 1 kHz beat tone.

— WØMDL.

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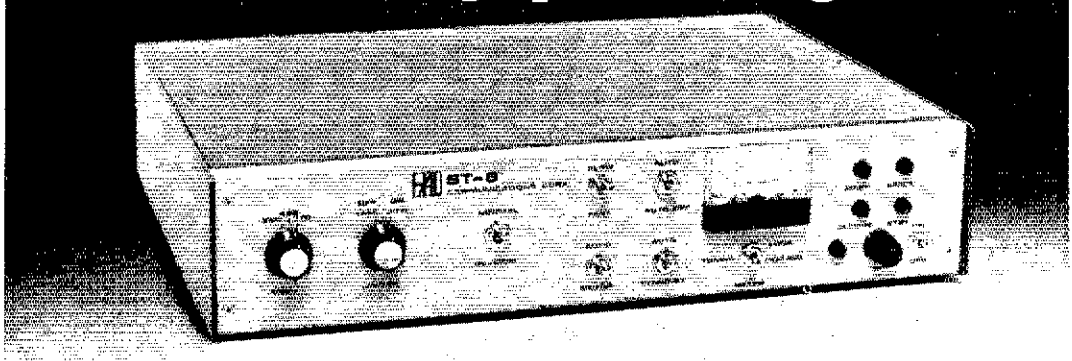

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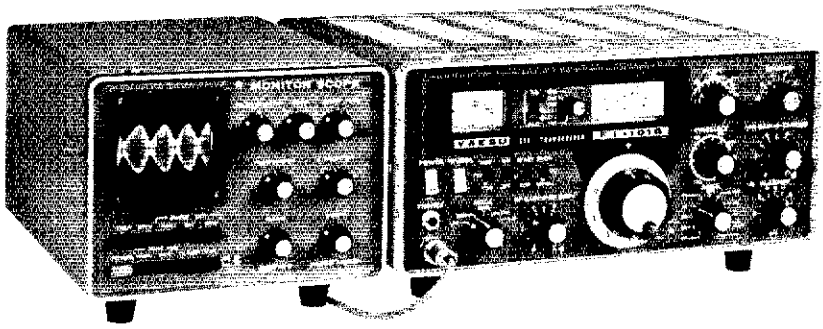

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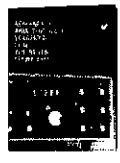

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