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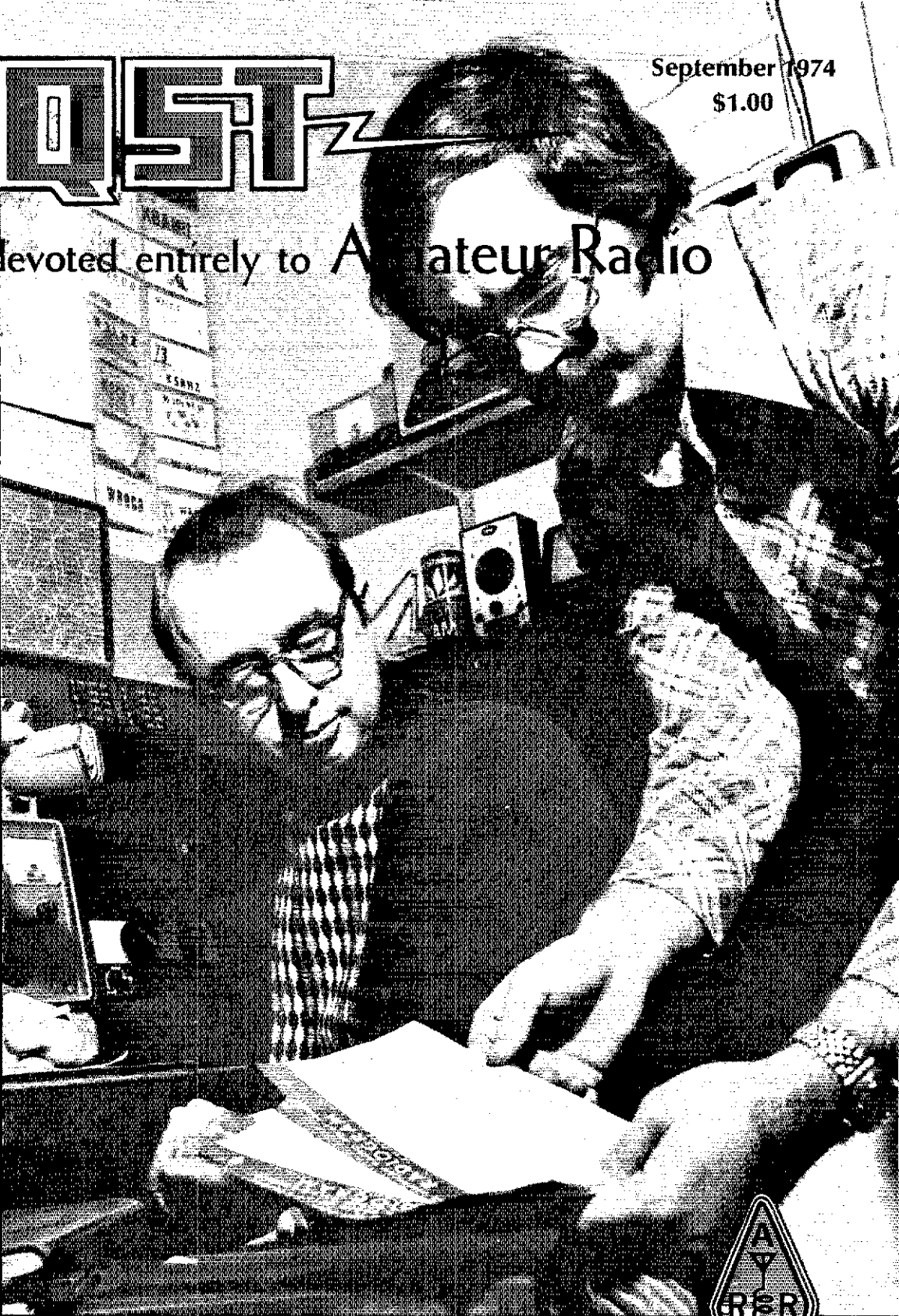

OFFICIAL JOURNAL OF THE ARRL

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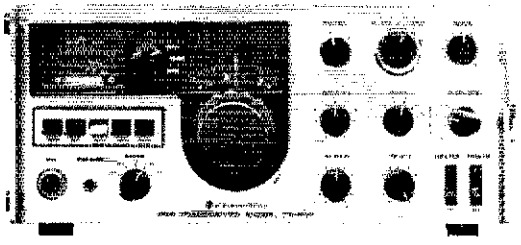

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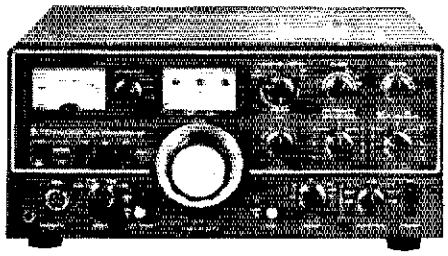

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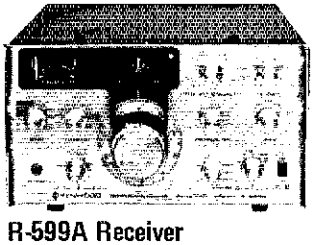

R-599A Receiver

The T-599A is mostly solid state . . . only 3 tubes, has built-in power supply, full metering (ALC, lp. RF output & high voltage), CW-LSB-USB-AM operation.
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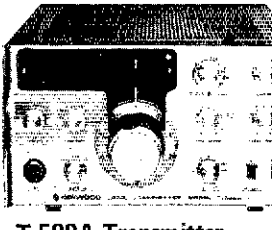

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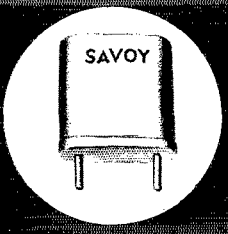

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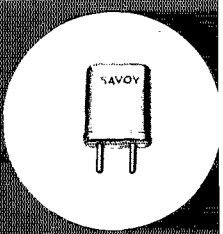

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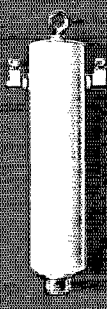

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QST

September 1974

Volume LVIII Number 9

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OUR COVER

Radiograms from backup communications check are inspected by WA3ODQ and K3ULJ. See page 51 for details on forthcoming emergency test with Oscar.

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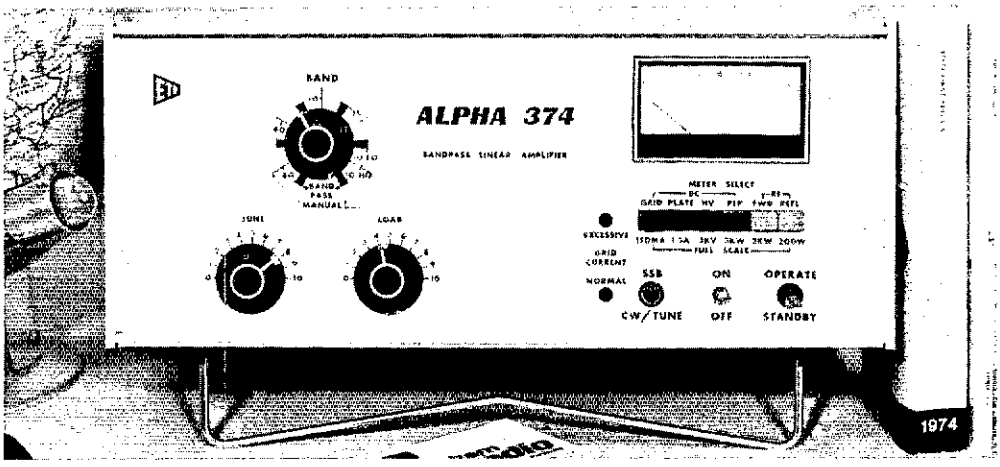

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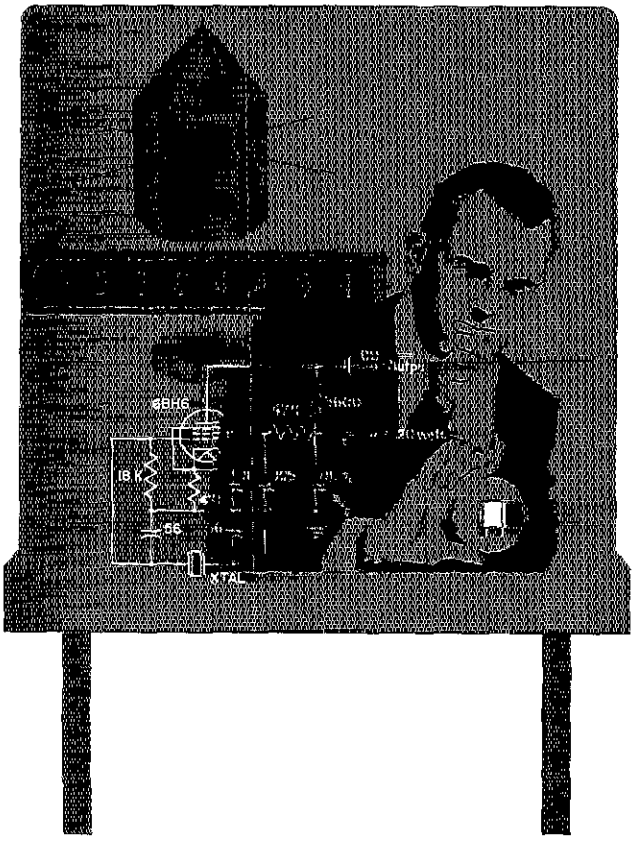

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors.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

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

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

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"It Seems to Us..."

MEMBERSHIP DUES

RAPID INFLATION the past couple of years has had a severe impact on ARRL's budget, the same problem faced in most other sectors of the U.S. economy. League financial statements of the 1970s have shown regular losses, substantial ones the last year or two. Facing economic reality, our Board of Directors at the July meeting took a step which won't be enthusiastically acclaimed but which was found inevitable – a rise in membership dues.

The number of hams in both the U.S. and Canada has shown little change in recent years. This has meant a generally static level of membership, of sales of publications, and of *QST* advertising. The effect has been to retard the growth of the League's income, while the major costs of operating our membership organization soared, particularly in publication of the official journal. Examples? *QST*'s printing bills for 1974's first six months totalled $256,000; two years ago the figure was $177,000 (though admittedly with slightly fewer pages). Mailing costs are now at an annual rate of $70,000; two years earlier the outgo was $42,000, and even that figure was up from $30,000 in 1970 – all with membership totals hovering around the 100,000 mark. And all this time, the "freeze" prevented compensating increases in *Handbook* and other publication prices, even though overdue.

In the short term, financial losses are cause for concern but not alarm. Statements of earlier years have shown gains, and as a non-profit association we aren't supposed to make money; service to the membership, not profit, is the League's reason for being.

With the freeze off, some of the prices of ARRL publications, always kept as low as possible particularly in the beginner field, are being adjusted upward, as costs rise. Others will follow as new editions and reprintings are released. Earlier this year advertising rates were raised so that industry would be contributing a fair share to the rising costs of *QST* production. But these measures only partially close the gap between income and outgo; it was obvious the current downtrend could not be allowed to continue, especially since preparation for and participation in the important World Administrative Radio Conference scheduled for 1979 will tax our resources to an extent that has yet to be determined.

In balancing a budget, the alternative to increased income is reduced expenses. Not one director felt that ordering a cutback in League services and activities was desirable. The membership in each division had indicated a near-unanimous sentiment that continuance of existing programs – even expansion, where feasible – was expected. To queries of members' reactions to a possible dues rise, many directors found a typical response: "Of course; what took you so long?"

The new rates – $9.00 in the U.S., $10.00 in Canada (to partially offset the $1.95 extra postage for a year's *QST* mailed across the border), and $10.50 elsewhere – are effective next January 1st. Thus there is ample warning – and plenty of time to renew at the old rates before the end of the year. Those who wish may sign up for any number of years in advance at the rates currently in force (see page 164). The best bargain of all, of course, is a Life Membership at twenty times the current annual rate, paid either in a lump sum or in quarterly instalments without interest over a two-year period. Some 5,000 far-sighted individuals already have been elected to LM status and are saving themselves a bundle as costs go up.

The League's programs are aimed at promoting the health and strength of amateur radio both domestically and internationally. Most members recognize that cutbacks can be made only at the risk of our not being able to do the required tasks in activities and services, and protecting amateur radio's future. The dues rise will help to permit the League to push forward its programs vigorously and on a sound financial footing. QST

League Lines . . .

At copy deadline FCC released three major actions proposing new rules affecting amateurs. With Board and EC minutes plus earlier dockets, our journal this month is already overstuffed with small print. Next month we'll have details; here are the regulatory highlights: (1) Special "commemorative" call signs henceforth to be available only to Extra or Advanced applicants, and only in connection with truly unique or distinct events: $9 fee required, plus $25 more if a specific call is desired. (2) Unattended repeater operation, permitting round-the-clock availability without the necessity of a control operator staying up all night; but recordings must be made (and shortly reviewed) when no control op is present. (3) Repeater crossbanding, generally per ARRL request (page 84, May QST). Comment deadline for all three is October 30.

Big doings in CB as well. FCC permits 60-foot towers for omni antennas (beams stay at 20), proposes enlarged space in the 27-MHz area totalling 70 channels, relaxation of tight restrictions on hobby use, prohibition of sale of CB-type linears. How much pressure this takes off the 220 area remains to be seen.

Anyone equipped, willing and able to participate in a checkout of the practicality of fax use on present SSTV bands, please register that interest promptly with Hq.

In June "Happenings" we reported the nomination of Richard C. Kirby, WØLCT, to be director of the International Radio Consultative Committee (CCIR). He was elected on the first ballot at the Plenary Assembly in Geneva July 16! CCIR is a technical-studies arm of the International Telecommunication Union, the world authority in communications matters. Kirby succeeds retiring Jack Herbstreit, WØDW/HB9AJI, in the post.

One phrase from a recent FCC pronouncement is worth repeating (no pun): "Stations conducting simplex communications on these [repeater input] frequencies in areas where their transmissions could be repeated should expect them to be repeated."

Ever try an ARRL FMT? (That's "frequency measuring test.") See rules for the September 8 event on page 87 of the August issue.

FCC quietly began using a new edition of the license document, Form 660, dated September 1973, a few months ago. "PRI" under station privileges at upper left means "Primary," the basic operator-and-station licenses which every amateur must have under section 97.40. Other station privileges which could be shown there include: secondary (as for instance, at your summer cottage), repeater, control station, and auxiliary link station.

It's time for clubs to commence the autumn sessions of code and theory courses for would-be hams. Spread the word through newspaper publicity, and bulletin-board notices in the local stores and schools. And register course schedules with your district FCC office; they often get queries on availability of training, and locating volunteer examiners.

The 1974-75 ARRL Net Directory is ready for distribution. It lists over 500 public-service-type nets that have registered for directory listing during the past year. To speed delivery send us a 6-1/2" x 9-1/2" or larger self-addressed envelope with 20¢ U.S. postage.

Even tho ARRL is much more than just a magazine, we're not alone in suffering from rising publication costs. Just last month three national mags upped their prices: "U.S. News and World Report," from $12 to $14; "National Observer" from $9 to $12; and "Consumer Reports" from $8 to $11.

Phone DXCC holders, fear not -- the activity and the certificate remain, per Board order.

Quotes-of-the-month -- (From CB Magazine): " . . the vast majority of licensees in the Citizens Band operate legally . . ." But (from the Washington Star-News): FCC spot checks of truckers' use of Class D citizens radio units find that "50 to 60% of the radios . . lack the required federal license and those that do often violate power limits."

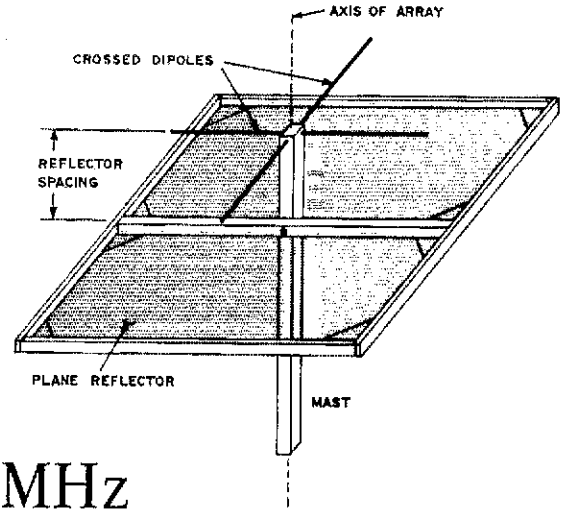


Fig. 1 The turnstile-reflector (TR) array consists of crossed dipoles above a screen reflector.

A Simple 146-MHz Antenna for Oscar Ground Stations

BY MARTIN DAVIDOFF,* K2UBC/WA3VCI

THIS ARTICLE describes a simple, effective 146-MHz antenna suitable for amateurs using, or planning to use, Oscars 6 and 7. The antenna, called a turnstile-reflector (TR) array, can be built very inexpensively and put into operation without the need for test equipment. The characteristics of the TR array should make it useful to amateurs who have never operated on the 2-meter band and to experienced vhfers who already possess high-gain rotatable 2-meter arrays. The basic TR array produces a broad, balloon-like pattern with modest gain. It can be mounted close to the ground and does not require rotators. When aimed vertically, it is effective only when the satellite is within a surface distance of 1,000 miles (1,600 km) from one's station. This distance can be extended by re-aiming the array for each pass.

Background

Early experience with Oscar 6 has shown that rapid fading can be a severe problem to satellite communicators. Fortunately, the ground station has control over two important parameters affecting fading – cross polarization between ground station antenna and Oscar antenna, and nulls in the ground station antenna pattern. (Note that these two parameters affect downlink, as well as uplink, antennas.) Fading because of cross polarization can be reduced by using a circularly polarized ground-station antenna.[1] Fading because of radiation-pattern nulls can be overcome either by (1) using a rotatable, tiltable array, and continuously tracking Oscar; or (2) using an antenna with a broad, null-free pattern. A number of amateurs have demonstrated that they are capable of using high-gain, narrow-beamwidth antennas to simultaneously track and communicate through Oscar. This method has serious drawbacks, such as the expense of one or two rotators and the need for either an extra set of hands or perhaps a cooperative and programmable spouse. The TR array uses the easier approach – it produces a broad balloon-like pattern.

How about transmitting gain? The TR array appears to trade operating convenience and low cost for a big gain penalty. After all, circular polarization at only one end of a communications link costs 3 dB with respect to matched linear polarization. Antennas with broad patterns don't have the gain of highly directive arrays. Calculations do, in fact, show this gain penalty when the TR array is compared to an optimally oriented, high-gain, linearly polarized array. But back to reality! The TR array should be compared to an antenna that is neither oriented optimally with respect to polarization, nor aimed perfectly. So, under most real conditions the theoretical gain penalty turns out to be largely imaginary. Unless

* Math Dept., Catonsville Community College, Catonsville, MD 21228.

[1] Nose, "Crossed Yagi Antennas for Circular Polarization," *QST* January 1973.

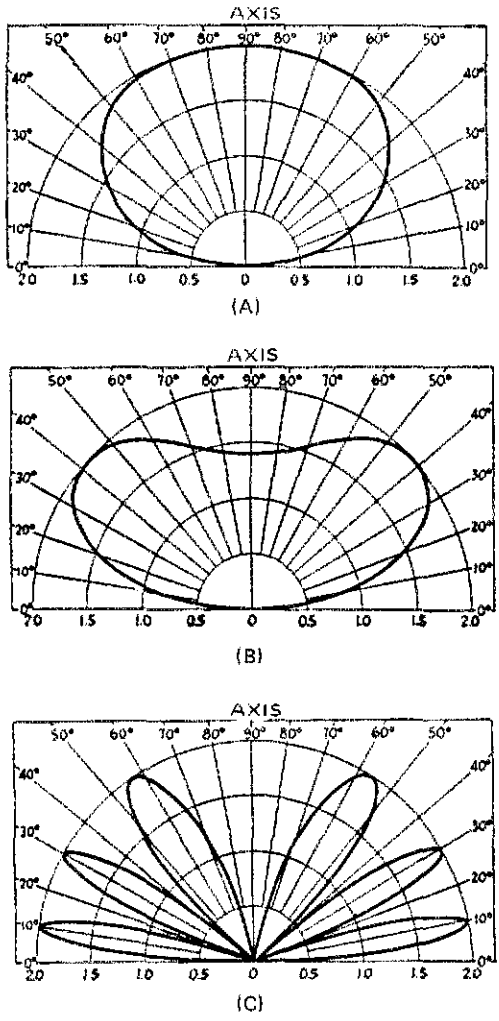


Fig. 2 — Elevation patterns for dipoles mounted over a ground plane. Pattern A is for spacing of 0.22 wavelength, B is for 0.37, and C is for 1.5 wavelength spacing.

one is interested in extreme DX, antenna gain is not very important in an uplink antenna. This is because the sensitive receiver aboard Oscar and the low free-space path loss at 146 MHz require the ground station to use *less* than 100 watts ERP. A greater ERP may overload the receiver.

Technical Description

The turnstile antenna consists of two dipoles mounted at right angles to each other and fed 90 degrees out of phase.[2] The TR array consists of a turnstile mounted above a reflecting screen. The plane of the dipoles and the plane of the reflecting screen are parallel. See Fig. 1. The axis of the TR array is an imaginary line perpendicular to the dipoles and passing through their common midpoint. Radiation from the TR array is nearly omnidirectional about the axis – the departure is negligible and can be ignored. Along the axis of the TR array the radiation is circularly polarized. Off axis the radiation is elliptically polarized.[3] Note that these comments on polarization and the omnidirectional character of the TR array are true for any spacing between the reflecting screen and the dipoles (reflector spacing). An omnidirectional antenna can be completely described by a single elevation pattern drawn for a plane containing the axis.

The reflector spacing has two important effects – it determines both the elevation pattern and the feed-point impedance of the antenna. Elevation patterns for certain reflector spacings can be obtained from the *ARRL Antenna Book*.[4] The feed-point impedance of a single dipole above a perfectly reflecting screen can also be obtained from that publication.[5] The delay line providing the 90-degree phase shift is most conveniently a section of coax cable which is *electrically* a quarter-wave in length. The characteristic impedance of the coax should be chosen to match a single dipole at the reflector spacing used. Because the two dipoles are mounted at right angles, their mutual induction is minimal. Consequently, connecting them for parallel feed yields a feed-point impedance of one half that of each dipole. Matching sections or baluns can be used as necessary.

The basic TR array uses a reflector spacing of 0.22 wavelengths. At this spacing the broad, null-free elevation pattern is similar to that shown in Fig. 2A. This array can be fed using the arrangement shown in Fig. 3.[6] Note that when a reflector is spaced 0.22 wavelengths in back of the turnstile, the array has an impedance approximately that of a dipole in free space. Other values of reflector spacing also produce useful patterns – we'll return to this later.

Construction

The wooden mast is 2 inches (50 mm) square and 8 feet (2.4 m) long. Dipoles are formed from No. 12 copper wire taped to 1/4-inch (6 mm) diameter oak dowels. The reflecting screen is 20-gauge hexagonal chicken wire, one-inch (25 mm) mesh, stapled to a four-foot (1.2 m) square frame made from furring strips. Hardware cloth can be used as well. Spar varnish on the wooden members will increase their lifetime. Corner bracing of the reflecting screen will provide mechanical stability. Silicone caulking compound can be used

[2] *The Radio Amateur's VHF Manual*, 1968, p. 211; or 1972, p 197.

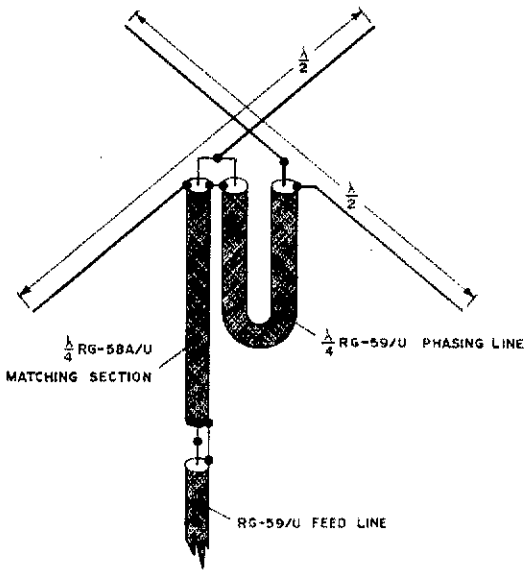
[3] The elliptical polarization degenerates into linear polarization as the angle between the axis and the line joining the antenna and observation point approaches 90 degrees.

[4] *The ARRL Antenna Book*, Chapter 2.

[5] *The ARRL Antenna Book* 1970, Chapter 10; or 1974 Chapter 11.

[6] See footnote 2.

Fig. 3 — Dimensions and connections for the turnstile antenna. The phasing line is 13.3 inches (33.8 cm) of RG-59/U coax. A similar length of RG-58/U cable is used as a matching section between the turnstile and the feed line.



to keep water out of the coax. Dimensions for 146 MHz are given in Fig. 3. See the *Radio Amateur's VHF Manual* for an alternative method of turnstile construction.[7]

Performance

My transmitter puts about 40 watts of 146-MHz rf into 30 feet (9.15m) of RG-59/U. The coax feeds a basic TR array which is usually mounted vertically with the reflector about 6 feet (1.8 m) above ground. Height is relatively unimportant, as long as the radio horizon is unobstructed at elevation angles above 30 degrees. Under these conditions downlink signal strength is adequate when the satellite is within 1,000 miles (1,600 km). Fading is much less of a problem than with any other antenna I have tried.

The method used to evaluate the performance of the uplink antenna might be useful to others. The basic problem is to isolate uplink system signal-strength variations from those on the downlink. To do this I compare the amplitude of my own downlink signal to the amplitude of the broadband noise from Oscar. The broadband noise is easily discernible when using a low-noise receiver in a quiet location. If the ratio of the amplitudes remains constant during a fading episode, I attribute the fading to the downlink. If my signal fades while the background noise from Oscar reamins constant, I attribute the fading to the uplink. The measurements are subjective. But after testing a number of antennas, I am convinced that this technique can be used to evaluate the performance of an uplink antenna.

Variations

Interesting variations of the TR array can be obtained by mounting the mast in other than a vertical direction and by using different reflector spacings. For example, I tried placing the axis of my basic TR array at an elevation angle of about 45 degrees with the azimuth aimed at the point of closest approach on a distant pass. Under these conditions, usable downlink signals were obtained from as far away as 1,700 miles (2400 km). The distance was probably limited by my radio horizon (I had the antenna propped against a chair at ground level). This experiment shows that one can increase the amount of time of access to the satellite by repositioning the antenna for each pass.

Another variation of the TR array which may prove useful to those with extra power available (100-300 watts) is the following: Setting the reflector spacing to 0.37 wavelength produces the pattern shown in Fig. 2B. When aimed vertically this antenna will both decrease one's signal strength when the satellite is nearby (preventing overload) and increase effectiveness when the satellite is distant (increasing access time and range). At this increased spacing the radiation resistance is slightly higher. To obtain a match for 50-ohm line, a 1/4-wave phasing line of 90-ohm cable should be used between dipoles. The 50-ohm feedline is connected directly, without a matching section.

Some operators using Oscar have tried turnstile antennas without the reflecting screen. Results were often poor. Apparently this is because of the elevation patterns that result from leaving the position of the image plane to chance. Consider, for example, what happens when the distance between the turnstile and the effective reflecting plane is 1.5 wavelengths. The numerous nulls in the resulting pattern, shown in Fig. 2C, make such an antenna unsuitable for Oscar operations.

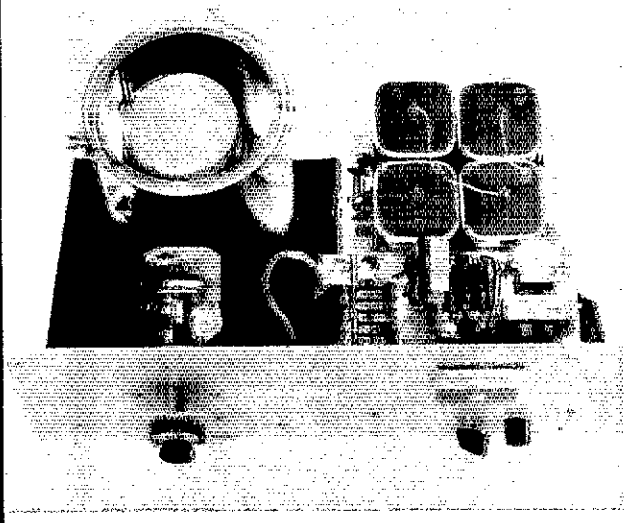
Closing Comments

At any given time, the repeater in Oscar is accessible to thousands of amateurs. It's extremely important that everyone be careful to avoid overloading it. Even with an antenna as simple as the basic TR array, it is possible to overload the satellite with as little as 50 watts of rf. QST

[7] See footnote 2.

Strays

A quantity of Western Union surplus teleprinter gear, including model 14, 15 and 19 page printers, perforators and reperforators, strip printers and a variety of miscellaneous test equipment is available from WB5CBC. An s.a.s.e. to William D. Johnston, 1808 Pomona Drive, Las Cruces, New Mexico 88001, will bring complete information.



An Experimental Frequency Standard Using ICs

Practical Ideas for Improving Short-Term and Long-Term Stability and Accuracy

BY RICHARD SILBERSTEIN,* WØYBF

A REVIEW OF basic crystal oscillator principles is necessary if we are to understand the special problems encountered in the design of frequency standards. The triangle A in Fig. 1A represents a device capable of amplifying the frequency in which we are interested. It may be a vacuum tube, a transistor, or a cascade of amplifying devices. The minus sign indicates that it is an *inverting amplifier*; that is, the phase of its output is inverted 180° from the input. The phase shift in a less-than-ideal amplifier may be something other than 0 or 180°.

The frequency-determining element, F, usually a resonant circuit or a quartz crystal, is necessary for sustained oscillations. Any small transient voltage in F is amplified in A. Part of A's output is fed back through a phase-shift network, P, so that it reaches the input in the same phase as (and stronger than) the original impulse. In other words, for the inverting amplifier, A, the loop phase shift must be 180° and the gain greater than 1. Oscillations will then be produced, and will build up quickly until the active elements limit the amplitude to where oscillations are just sustained. Any active circuit element *saturates* above a certain level; it has a *dynamic range* which limits its possible output.

One practical variable-frequency oscillator, in which the Q of the resonant circuit can be made large, and that circuit substantially isolated from the loading and variability of the amplifier, is a variation of the Colpitts circuit shown in Fig. 1B. C3 is much smaller in value than C1 and C2, so it is essentially in parallel with C4. Thus the frequency is determined mostly by L, with C3 and C4 in parallel across it.

When operated in its parallel-resonant mode, a quartz crystal acts like a very stable high-Q L-C circuit. It can replace the L-C4 circuit of 1B. Called the Guriot-Clapp Circuit, this is shown in Fig. 1C.

* 3915 Pleasant Ridge Road, Boulder, CO 80301.

Sources of Instability

Quartz crystals are useful small objects for precision frequency control, but it is important to show how imprecise they *can* be, and what must be done to control the sources of inaccuracy.

Frequency change is expressed in "parts in ten to the nth power". The number 1,000,000 is written as 10^6 since there are six zeroes. If a 1-MHz oscillator changes frequency by 1 Hz, it is said to have changed by 1 part in 10^6. Noting that $1/A^n$ is A^{-n} consider a 5-MHz standard which has changed by 1 Hz. The change is $1/(5 \times 10^6)$, 0.2×10^{-7}, or 2 parts in 10^7. A frequency standard's behavior is often expressed in rate of change per day, week or month, such as "3.5 parts in 10^8 per week". There is also *short term stability*, which describes more-or-less random changes during a typical day or shorter interval.

Effect of Temperatures

Quartz crystals change frequency slightly with temperature. A typical curve for the popular AT-cut crystal is given in Fig. 2.[1] The two temperatures T1 and T2, where the curve has zero slope, are called *turnover points*. Here the frequency change with temperature is close to zero, within a narrow temperature range. Various techniques may be used to obtain reasonable stability without resorting to a temperature-controlled oven. One is use of a capacitor having a negative temperature coefficient, to just compensate for the negative slope of the curve where it crosses T_{ref} at the zero axis. T_{ref} should be somewhere near the

[1] *Crystal Bulletin*, Vol. 1, No. 1, International Crystal Mfg. Co., Inc., 10 North Lee, Oklahoma City, OK 73102.

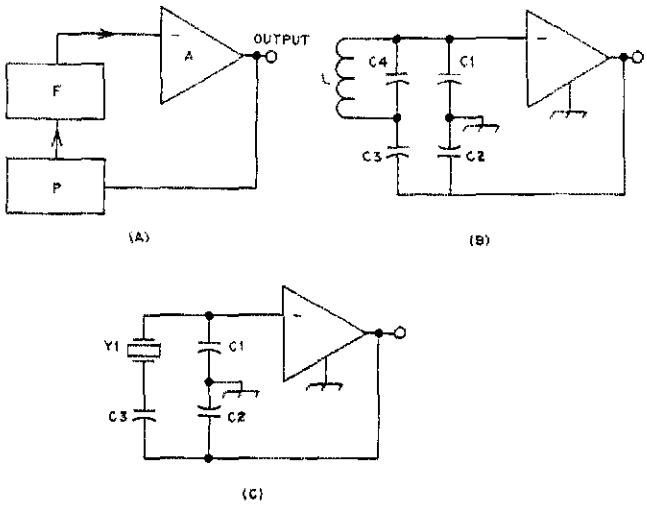


Fig. 1 — Basic circuit of an oscillator amplifier, A, using an integrated circuit, A, which includes an inverting amplifier. Also required are a phase-shift network, P, and a frequency-controlling element, F, which can be a high-Q tuned circuit or a quartz crystal.

Circuit B is the familiar Colpitts oscillator, using a high-Q resonant circuit, L-C4. Feedback is controlled by C1-C2. Isolation is provided by C3, a low-value capacitor effectively in parallel with C4. The crystal-controlled version, C, substitutes the crystal, Y1, for the tuned circuit in B. This is known as the Guriot-Clapp Circuit.

middle of the expected range of operating temperatures. A frequency standard using simple temperature compensation[2] holds frequency to a few parts in 10^7.

For greater precision, temperature *control* is required. A small oven is used, the temperature of which can be held constant, because it and the crystal are designed to operate above the highest ambient temperature likely to be encountered. The standard described here uses a crystal with a turnover point, T2, of 50°C, or 122°F. This temperature is held by placing the entire standard in a single oven.

Aging

Though a quartz crystal is ground to a critical thickness, to oscillate at a desired frequency, this frequency will increase with age in a somewhat logarithmic fashion, with a much greater change per unit of time occurring at first. Crystal activity also changes with time. One cause of crystal aging is crumbling of the quartz around scratches caused by grinding with abrasive paste. Fluoride etching beyond the depth of the scratches reduces aging.

In the past 30 years much has been done to reduce the effects of aging, and to increase the aging rate. Higher-frequency crystals age faster. Early crystal standards operated around 100 kHz. Now the top limit is about 5 MHz. Coupling to the crystal is important, and many electrical and mechanical improvements have been made in this area in recent years.

Crystal Drive

The larger the crystal drive power, the faster the aging, but excessive drive overheats the crystal, causing frequency drift. Too much drive may result in a cracked crystal, though this is not likely to happen at drive levels normally encountered in frequency-standard oscillators. The lower the drive the better the frequency stability, but going too far in this direction can yield a signal level not sufficiently above the amplifier noise. Some modern techniques use controlled aging. One ages the crystal with 10 mA of rf crystal current, the final current being only 10 μA. Application of rf current pulses to the crystal is also used in controlled aging.

External Circuit Effects

Limiting and dynamic range were discussed briefly earlier. All oscillators must obviously be limited in output. If some characteristic in the amplifier causes limiting, the crystal faces a load or drive-source impedance that is not stable with time, temperature, or dc supply voltage. The solution is to use controlled limiting. A modern drive-control technique is use of a high-gain rf amplifier, with an age range of perhaps 60 dB, to supply the drive.

Circuit isolation should be used to protect the crystal circuit from changes in load impedance. In Fig. 1C oscillation occurs at a frequency just below crystal parallel resonance, where the crystal offers a large inductive reactance. This is offset by the large capacitive reactance of the low-value C3, in series with the large C1 and C2. C1 has the amplifier input impedance across it, and C2 is shunted by the output impedance. The smaller C3 is, the less these impedances affect the crystal frequency. Additional isolation is obtained if the input and output impedances are large, compared to the feedback-capacitor reactances. A further method of decreasing the effects of external circuitry is use of negative-feedback stabilization, so that impedances with which the crystal does interface are as stable as possible.

Frequency Comparison Against a Primary Standard

The simplest way to calibrate a secondary frequency standard is to beat its output with the signal of one of the standard-frequency stations,

[2] Hoff, "Mainline FS-1 Secondary Frequency Standard," *QST* for Nov., 1968.

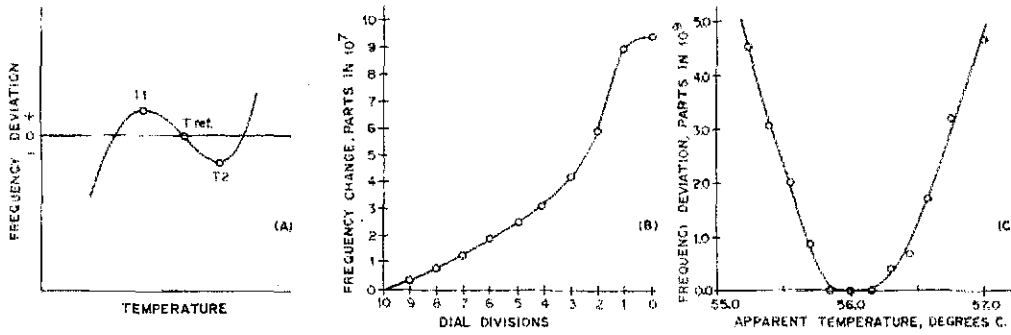


Fig. 2 – Various frequency characteristics of crystal-controlled standards. Curve A shows a typical temperature-frequency curve for an AT-cut crystal such as used in the standard described. Note that there are two "turnover points," T1 and T2. Point T_{ref} is important when using compensation with a negative-temperature-coefficient capacitor.

Curve B is a dial calibration such as would be made for off-setting the frequency by known small amounts. It is useful for estimates of how long to let the standard age before making internal adjustments.

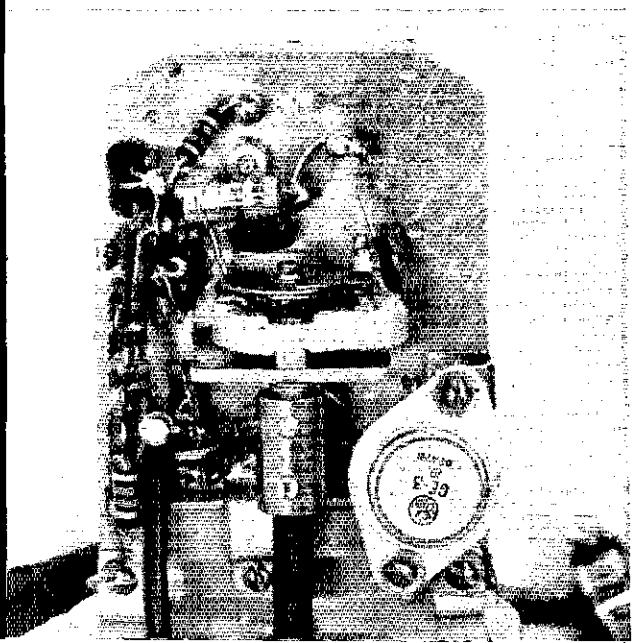
Curve C shows clearly the marked advantages of operating a crystal standard oven as close as possible to the turnover point, T2 of curve A. Within plus or minus 0.1°C of the *actual* turnover point is a very desirable tolerance for oven-temperature variation.

such as WWV. The strongest beats occur in a receiver when the signal inputs from the secondary and primary standards are of comparable strength. A harmonic can be used, as in comparing the output of a 5-MHz standard with WWV on 10 or 15 MHz.

Even this method has limitations. Sky-wave fading causes receiver-output fluctuations that contaminate beats observed audibly, or with the receiver S meter. Changes in the effective height of the ionosphere can contribute small *apparent* frequency shifts. An observer within reliable ground-wave range of the standard-frequency station (as with the writer's 40-mile path to WWV) escapes this problem. It can also be minimized on ionospheric paths by making observations at times close to noon at the midpoint between the observer and WWV, at Fort Collins, Colorado. Fading patterns differ from day to day, and with some patience times will be found when ionospheric effects are minimal. A strip-chart recorder is helpful in this.

The National Bureau of Standards also transmits standard-frequency signals on 60 kHz (WWVB) and on 20 kHz (WWVL) from Fort Collins. These stations are receivable at great distances, with narrow-band, low-noise receivers, and they enjoy relatively stable propagation conditions. Diurnal phase shifts on transatlantic paths can be predicted for these lf and vlf signals closely enough to permit precision frequency setting by stations at great distances. Internationally there are standard-frequency stations operating in the vlf, lf, hf, and vhf bands.[3]

Under laboratory conditions, it is possible to multiply the frequency up to the microwave region, and compare it with an atomic standard. A recent development at NBS uses the TV color-subcarrier frequency, 3579.545 kHz, as a primary standard. On the national networks this frequency is controlled by a cesium beam. The frequency stability on other networks is adequate for most purposes, though there may be phase jumps when a station shifts from network to local programming.

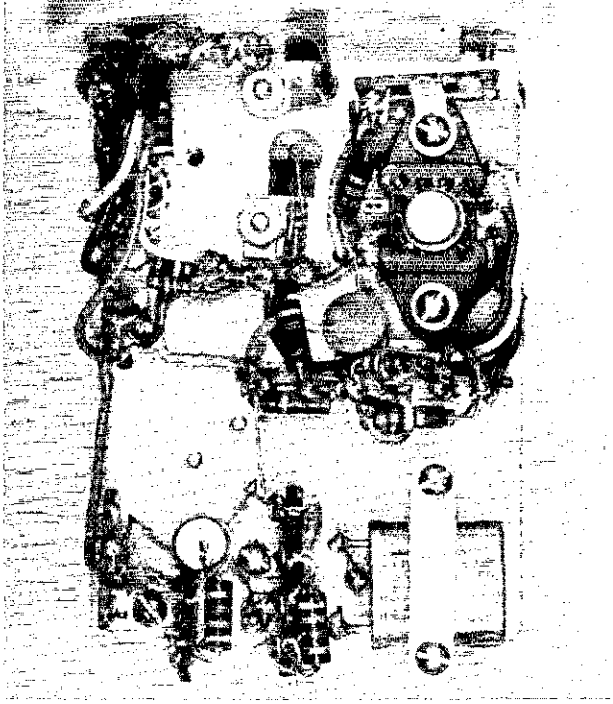


Top view of the oscillator-buffer and oven control circuit. The air variable capacitor is C5. Q2 of the oven control circuit is shown to the left of the shaft coupling, and the heater (R11) can be seen under Q2, the capacitor tuning shaft and the coaxial cable.

[3] Morgan, "Distribution of Standard-Frequency and Time Signals," *Proc. IRE*, June, 1957.

Silberstein, "Propagation-Study Potential of Standard HF Emissions not on the Shared Frequencies," *Frequency Technology*, Oct., 1969.

"Standard Frequencies and Time Signals," *Radio Amateur's Handbook*; Test Equipment Chapter, all recent editions.



Bottom view of the oscillator-buffer and oven control circuit. The thermistor, RT1, is shown in the upper central portion of the plate, just beneath the ground lug. This places it on the opposite side of the plate and directly under the heater.

These phase changes also occur on national networks when there is rerouting of microwave-relay systems.

Measuring Frequency Difference

The frequency difference between the primary and secondary standard's frequencies is measured by listening to the beat-note between them, if the difference is high enough to be in the audible range, or by counting the beats, when the secondary standard is close to being on-frequency. These can be seen on the receiver S meter, or heard audibly. Greatest accuracy is obtained by counting the number of beats in a specified time, or by measuring the time for 10 beats. If one uses a stopwatch and counts 10 beats in 80 seconds, the beat-frequency is 10/80, or 0.125 Hz. The proportionate error can be expressed as:

$$D = \Delta f/f$$
$$D = 0.125/5 \times 10^6 =$$
$$0.025 \times 10^{-6} = 2.5 \times 10^{-8}$$

or 2.5 parts in 10^8.

By noting settings on the vernier dial, one can tell whether the secondary standard is higher or lower than the primary standard frequency. Because the crystal frequency increases with aging, it is desirable to set the vernier to a frequency slightly higher than the primary standard, when making an aging run, and observe the increase in difference frequency with time.

If the frequency difference (with 5-MHz standards) at Time A is 10 cycles in 80 seconds, or 0.125 Hz, and at Time B is 10 cycles in 100 seconds, or 0.100 Hz, the change has been −0.025 Hz. This corresponds to a proportional change, D, of 5 parts in 10^9.

If this change took place during a change of 5° in room temperature,the rate of change is 1 part in 10^9 per degree *F* (somewhat too large when an oven is used) and in the negative direction. If it took place after a 5-volt change in line voltage, the rate of change would be 1 part in 10^9 per volt. This might indicate trouble in the regulated power supply. If the change occurred after a 10-day lapse of time, it would indicate a drift rate of 5 parts in 10^{10} per day. As rates of change decrease with aging, it may be necessary to take readings at longer intervals, to insure precision. Any error caused by such things as room temperature differences at the times of the two readings is only one-tenth as great for a 10-day interval as for a one-day interval. Counting beats with a stopwatch yields data accurate to several parts in 10^9. For greater accuracy, use of a strip-chart recorder actuated by the receiver age is a better method. In measuring small on-the-spot changes, as from variations in room temperature, it is best to adjust beats to a slower rate, on the order of one cycle in several minutes, and use the chart recorder.

Constructing an Intermediate-Grade Standard

The author's objective was a secondary standard having an eventual aging rate of one part in 10^9 per day, or better. This was believed possible with an inexpensive crystal, a modest amount of stability control, and a good single oven. The first photograph shows the complete standard, built on a 19-inch (480 mm) relay rack panel 8-3/4 inches (220 mm) high. The standard proper, built on a thick slab of aluminum is visible at the left. Not visible in this view is the stopper of a wide-mouth pint vacuum bottle, to which the standard is assembled. The bottle, and a one-quart paint can used as an rf shield, are seen at the left rear. Regulated power supplies and auxiliary batteries are at the right. At the front of the panel are seen the vernier frequency-control dial, and a milliammeter and switch for monitoring the various circuits.

RF Circuitry

The oscillator uses the Guriot-Clapp circuit of Fig. 1C though it may not be readily identified in the actual schematic of the unit, Fig. 3A. The device, U1, is a broadband high-gain operational-amplifier type of integrated circuit. With its available high open-loop gain, it was reasoned that much negative feedback could be used to stabilize the circuit, and leave enough gain for oscillation. This IC fits the oscillator requirements, and another can be used for the oven-control circuit. This unit has been used for oscillator service at 5 MHz, and its open-loop gain is low enough so that a tendency to generate to parasitic oscillations could be curbed easily.

The inverting input of U1 is used for the oscillator. In an operational amplifier the actual gain is set by the ratio of resistors R1 and R2. With 470 and 4700 ohms, respectively, a voltage gain of 10, or 10 dB, is indicated. Theoretically, with an open-loop gain of 60 dB, the feedback resistors provide 40 dB of negative feedback, but because this IC is operated at a frequency above that where capacitive effects come into play, there is less than 20 dB overall gain. The low values of resistance provide the only simple way of suppressing parasitic oscillations in the IC.

R3 balances the input circuit, and brings the operating bias near a region of minimum distortion. R4 and R5 are for rf filtering. R6 is a biasing and feedback resistor in the buffer stage, and R7 (51 ohms) is for cable matching. The buffer stage, Q1, isolates the load, minimizing the loading's effect on frequency. An FET buffer (40673 or MPF 121) should provide better isolation than the bipolar stage described.

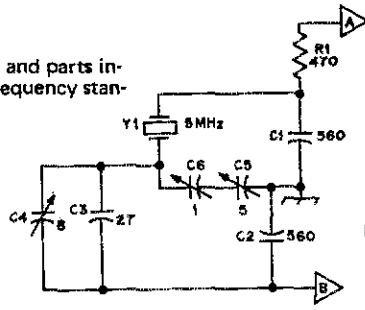
C1 and C2 are feedback capacitors. C3 is a fixed-value capacitor, which with the variables provides approximately 32 pF, for resonating the crystal at 5 MHz. C4 is an internally mounted glass trimmer, for rough setting of the frequency. C5 is an air trimmer that is mounted so that its Formica extension shaft goes through the stopper and panel to a vernier dial. C6 is a small capacitor which reduces the effective tuning range of C5. A high-quality glass trimmer, with its plunger all the way out, was used here. Capacitors C1, C2, and C3 are high-quality ceramic types (See parts list). Originally these were silver-mica, and are shown as such in the photographs. C7, C8, C9, and C11 are rf bypass capacitors.

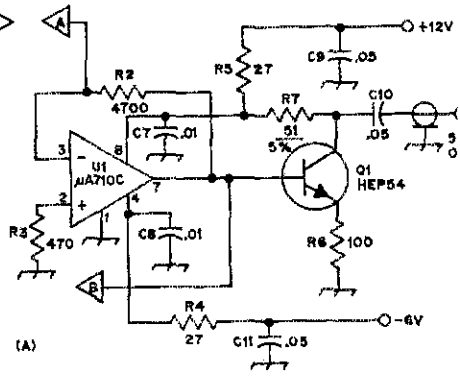
The early version of the oscillator, shown in the photographs and in the upper portion of Fig. 3, was modified for varactor control of the frequency, as shown in the lower part of Fig. 3. The Motorola MV1650 varactor, CR1, has an effective range of from just under 100 to about 200 pF. It is across the large C2, so its total effect on the frequency is small, and its relatively low Q has little effect on the overall circuit Q. The internal adjusting capacitor, C4, is now between crystal and ground.

R8 supplies dc to the varactor without shunting the rf. With C12, it keeps rf out of the bias circuit. C12 also isolates the varactor from the dc at the output of the amplifier, U1. R9 now becomes the frequency-adjusting element, replacing C5 of the original circuit. Though mounted inside the standard assembly, it could have been external just as well. Temperature changes will not affect the ratio of resistances on each side of the variable arm.

The Oven Circuit

The oven control circuit, Fig. 4, has temperature control by means of a thermistor bridge. The unbalance voltage produced by the temperature dropping below a specified value is sensed by a differential IC, which feeds a buffer and a power amplifier. The sign of the voltage change is correct for turning on the power amplifier. Power dissipated in the power transistor Q2 and its load heats the oven. A GE-3 germanium transistor is shown, but the HEP 230, a direct replacement, may be easier to locate.





EXCEPT AS INDICATED, DECIMAL VALUES OF CAPACITANCE ARE IN MICROFARADS (μF); OTHERS ARE IN PICOFARADS (pF OR μμF); RESISTANCES ARE IN OHMS; K=1000, M=1000 000.

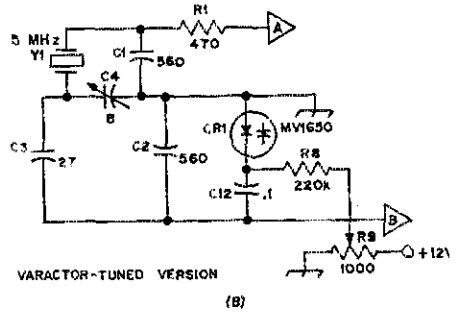


Fig. 3 — Rf circuits and parts information for the frequency standard described, showing tuning by means of a small variable capacitor, circuit A, or with a varactor, circuit B. Wherever possible the same parts identifications are used in both circuits. Parts not described are numbered for text references.

C1, C2 — 560-pF silver mica or high-grade ceramic; latter preferred. (Nytronics NYT-Cap).
C3 — 27-pF ceramic, like C1, C2.
C4 — 8-pF glass trimmer.
C5 — 3- to 5-pF shaft-type trimmer.
C6 — Glass trimmer adjusted to 1 pF approx.
C7, C8 — .01-μF 50-volt ceramic.
C9, C10, C11 — .05-μF 50-volt ceramic.
C12 — .1-μF 50-volt ceramic.
CR1 — Varactor, 100 to 200 pF (Motorola MV1650).
Q1 — HEP54 (Motorola).
U1 — Fairchild WA710C.
Y1 — 5-MHz low-drift crystal (International Crystal Mfg. Co. Type HA-1).

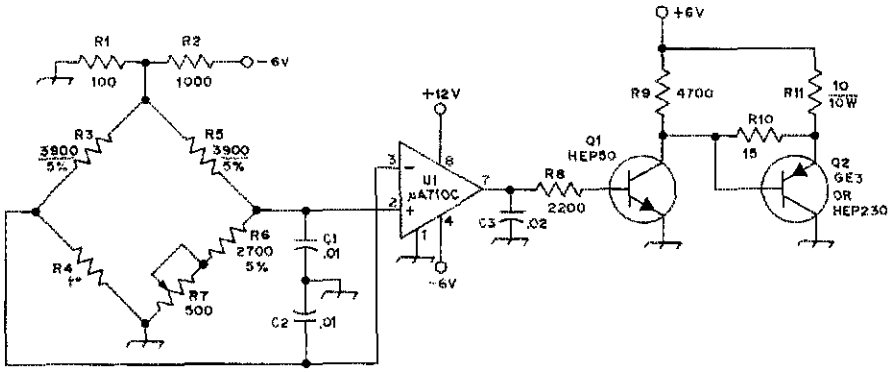


Fig. 4 — Oven control circuit details for the frequency standard. Capacitor values are in μF. Resistors 1/2 watt unless specified. Parts not described are numbered for text reference.
R4 — Thermistor; nominal resistance at 50° C 3600 ohms (GE 1D53, National Lead 1D053).
R7 — 500-ohm, 2-watt control. Mount externally.

The R1-R2 circuit is a voltage divider, to bring the operating points of the input terminals of U1 to safe values, and cause the thermistor to operate at low current, minimizing self-heating effects. The four arms of the thermistor bridge are internally mounted, except R7. The potentiometer is mounted at the rear externally, and is used for a vernier temperature adjustment.

R8 isolates the buffer, Q1. R11 is the output-load heater resistor. R9 in series with R10 ensures that Q2 is cut off when Q1 is not conducting. Capacitors C1, C2 and C3 are parasitic suppressors for U1.

The thermistor, R4, is a GE 1D53[4], which has a published resistance characteristic decreasing with temperature. At 50°C, its resistance is nominally 3600 ohms. It is fastened to the bottom of the slab chassis by means of epoxy cement, directly under the heater load resistor.

The heating system operates with 500 mA at 6 volts into the heating stage, until the thermistor is within about 1°C of the final temperature. At room temperature the current eventually stabilizes at approximately 90 mA, fluctuating only about plus-or-minus 5 mA. Contrast this with the behavior of an on-off thermostat system. Crystal oscillators in ovens with simple thermostatic control commonly show appreciable frequency jumps, as heater current goes on and off. Minor fluctuations in temperature at the heater are smoothed out in traversing the thick aluminum chassis, on the way to the crystal.

Power Supplies

In the power supply circuits, Fig. 5, the nominal plus 12-volt and minus 6-volt requirements are obtained from Motorola 1460R ICs, with regulation expressed as .002 or .003 percent change in output per volt of change in input voltage. There is also a current feature. A sawtooth voltage at low audio frequency appeared in the output of the negative supply. This was minimized by brute-force filtering. Current is measured by switching the milliammeter and a series resistor across the current-limiting resistors R3 and R10, which also serve as meter shunts.

It is important that the input dc voltage at terminal 3 of the MC1460R always be at least 3 volts greater than the output voltage, but the input must never exceed the rated 20-volt limit. The output voltage on the 12-volt supply is controlled by the value of R5, and in the 6-volt supply by R12. These may be computed from the formula:

$$R = \frac{E_o - 3.5}{.0005}$$

but final adjustments must be made. The R4-R5 and R11-R12 voltage-divider circuits were mounted inside the oven. They can be external if they have the same temperature coefficients.

In the original design, batteries were to switch in automatically, in case of power failure. The relay used was very troublesome, so eventually provision was made to connect the batteries in temporarily, if the unit was to be maintained in operating condition while being transported, or during power failures.

Layout

Close-up view of both sides of the slab chassis are shown. The aluminum plate is 3/16 × 2-1/2 × 3-1/2 inches (4.6 × 65 × 90 mm) trimmed at the corners to clear the vacuum bottle curvature. There is a small air gap between the chassis and the bottle stopper, mounting being by means of small aluminum angle brackets. In the first detailed picture the vernier tuning capacitor, center, and the power transistor, left, are the principal features visible. The heater circuit buffer, Q1 of Fig. 4, is seen at the right. The internal glass trimmer, C6 of Fig. 3,

[4] Changed to 1D053. If not available, try Fenwal RB41L1, obtainable from Burstein Applebee at moderate cost. This is larger in size, has a longer time constant, and needs mounting space. Needs about 3500 ohms for R6, for balance around 55 or 56°C. Fenwal GB3252 is small bead, with small thermal time constant. Values of R1 through R7 should be about 1/5th of the values given, except that R6 would be slightly more than 1/5th the value given.

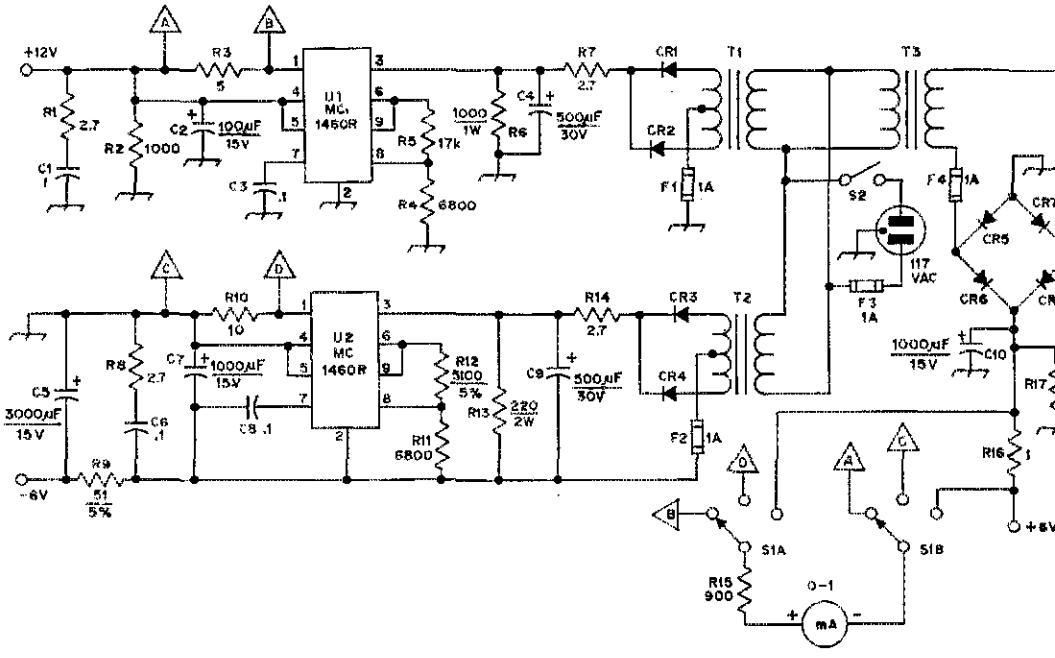


Fig. 5 — Circuit and parts information for the power supplies for the frequency standard. Parts not described are numbered for text reference. Capacitor values are in µF. Polarity marked on electrolytics. Resistors are 1/2 watt unless specified otherwise. Other than standard resistance values can be made by combining available types. See text re R5 and R12.

CR1-CR8, incl. — 200 PRV 0.5 A diode.
F1-F4, incl. — 1-A fuse.
S1A, S1B — 2-pole, 3-position switch.
S2 — Toggle switch.
T1, T2 — 117-volt pri., 25.2-volt sec., 0.3 A.
T3 — 117-volt pri., 6.3-volt sec., 1 A.
U1, U2 — Motorola MC-1460R.

is near the bottom of the picture.

In the other interior view, the thermistor is just visible in the upper center. The IC of Fig. 3 is in the upper right. The oscillator crystal is seen clamped to the chassis, lower right. The oscillator IC is at the lower left. Small Teflon feedthrough insulators carry several leads between opposite sides of the chassis. No photos were made of the varactor-tuning modification.

Assembly

The plastic stopper of the vacuum bottle was taken apart and the cork-grinding filler removed. A template was made for drilling three equally spaced mounting holes in the stopper lip and in the front panel. The holes in the lip were tapped for 6-32 thread. Holes were also drilled to pass the 1/4-inch (6 mm) Formica tuning shaft. The 6-32 mounting screws must be short enough to prevent any trouble with tightening the bottle firmly when it is screwed onto the stopper. Holes were also drilled to pass the rf cable, and the power-supply and control leads. These were enclosed in shield braid. The outer shield (paint can) is held to the panel with three angle brackets with tapped holes. A notch is cut in the top edge of the can to pass the various leads. The shields are grounded to tabs, adjacent to a mounting bracket. The hollow section of the stopper was then packed with fiberglass and Polyfoam. The small vernier dial is supported on metal pillars, away from the panel, permitting the setscrews that hold it to the shaft to be tightened externally.

The silver coating of the bottle couples to the rf components slightly, and also to outer shield. Small movements in position of the bottle with respect to the shield were found to cause small frequency changes. These problems were minimized by mounting the components close to the aluminum chassis, and by mounting the whole vacuum bottle in its plastic case as rigidly as possible. In soldering to the crystal pins it is advisable to heat-sink them with long-nose pliers, to avoid over-heating.

Adjustment and Aging

Before complete assembling of the oscillator, it is desirable to see that the oven temperature is going to fall near the crystal turnover point, in this case 50°C. A thermometer was clamped near the thermistor, and the unit was placed in the vacuum bottle, with wires and thermometer protruding. Minor adjustments were made on the bridge resistors until the temperature settled down close to the desired value. This is not a final setting, because in the permanent form the heat loss will be different, and it is desirable to operate very close to the actual crystal turnover point, which may vary from the manufacturer's stated value.

The internal vernier, C4 of Fig. 3A or 3B, must be set at the time the oscillator is assembled, so that the external vernier dial will be near its high-frequency setting (lowest capacitance) when the equipment first reaches a stable temperature and the oscillator is at zero beat with the primary standard. (The oscillator frequency will increase with aging, and will have to be brought down by adding capacitance.) This was accomplished by a series of rapid dismantling, internal readjustment, and reassembling procedures, with the frequency under continuous comparison with the reference standard. A heat lamp on the oscillator, when open, was some help in this.

A curve for the external vernier dial on the varactor, with frequency change given in parts in 10^7, is given in Fig. 2B. For any single-range vernier control, the total range of external adjustment should probably not be much more than one part in 10^6. More range may make the change per dial division too coarse for easy manual control, especially with varactors, whose capacitance increases logarithmically. It may be better to open the oven, perhaps once a year, and make an internal adjustment.

From a cold start, the frequency changed 5.6 parts in 10^6. In the next 24 hours the average rate was 1.3 parts in 10^7, and in the second 24 hours, 4.8 in 10^8. Shutdowns for circuit changes made it impossible to record continuous aging. After resetting the operating temperature, two months after the start, aging appeared to be decreasing logarithmically with number of days from start, reaching 3 parts in 10^9 per day in one more month. It is believed that this setup would arrive at 1 part in 10^9 in three or four months, though one builder has claimed only one month for a similar design.

An important step (unfortunately after two months) was to determine the true turnover point, and to set the thermistor bridge so that the oven would operate at this point at average room temperature. It is not necessary to measure actual oven temperature, but rather to hold the room temperature at its mean daily value, and measure the frequency difference between the oscillator and the primary standard for different settings of the external thermistor bridge control, R7 in Fig. 4. These settings were translated into *apparent* temperatures by use of the published curves for the thermistor used. "Apparent" is emphasized because the curve may not be accurate for every thermistor, and the final heater current is not reached at exact bridge balance, but at a higher thermistor resistance, corresponding to a lower temperature.

The curve of frequency deviation with apparent temperature, Fig. 2C, is essentially a plot of crystal characteristics near the turnover point, T2 of Fig. 2A. It is evident that the oven temperature should be set to within 0.1°C of the turnover point prevailing at average room temperature. This means that R7 should be within 10 to 20 ohms of the value for the nose of the curve. Actually the curve need not be plotted in temperature at all, for the resistance of R7, or the dial setting of its control, is the variable of practical interest. With great care in finding the optimum setting for R7, the frequency change with room temperature variation is reduced to something close to one part in 10^{10} per degree C. For more accurate performance, and especially for use in an environment where appreciable temperature changes are encountered, an outer oven would be almost essential, with a carefully engineered temperature-compensation circuit probably a poor second choice.

Conclusions

This experimental intermediate-grade standard, using a crystal of moderate cost, appears capable of achieving the modest objective of one part in 10^9 per day, after three or four months, yet there are ways by which further improvement might be made. Improvement in the aging rate might involve experimentation with crystal drive, and also investigation of the characteristics of critical components, such as the varactor, the IC, or the ceramic capacitors, any of which might have aging rates that predominate over the crystal characteristics. The stabilized differential-amplifier IC, with negative feedback, appears a good choice, but the effort may have fallen short of its goals here, in that the negative feedback may not be purely resistive. Fairchild suggests their μA715 as an improvement. This IC has a 65-MHz bandwidth, with an open-loop gain of 100 dB. It requires plus and minus 15-volt supplies.

The Signetics N5733K is of interest. It has its own selectable negative-feedback circuits, eliminating the need for R1 and R2 of Fig. 3. However, even at the 20-dB gain setting it has a small output phase shift at 5 MHz. It requires plus and minus 6 volts. The RCA CA3020 is another possibility. It uses only one power supply. It is also quite possible that a good stable FET might perform well in the oven arrangement shown.

Varactor vernier tuning offers flexibility of design not found in the variable-capacitor approach, but a well-regulated supply is essential with the varactor system, especially near zero voltage, where the greatest capacitance change with voltage occurs. With varactor tuning, the oven can be improved by placing the potentiometer outside the oven, eliminating the protruding insulating shaft.

Considerable improvement might be obtained with a double oven. A heater winding could be placed around the plastic container, and a sensing unit placed in not-too-close proximity to an individual turn. The space between the container and outer shield could be filled with fiberglass insulation. It might be desirable to operate the thermistor bridge at lower voltage, to minimize self-heating effects.

Only the highest quality resistors should be used. Metal-oxide resistors have been recommended for oscillator circuits. Industrial equivalents for some of the replacement-experimenter types of transistors might be desirable.

(Continued on page 167)

Phase-Locked Tuning In A Two-Meter Receiver

BY GRAHAM BENDER,* ZL1AHQ

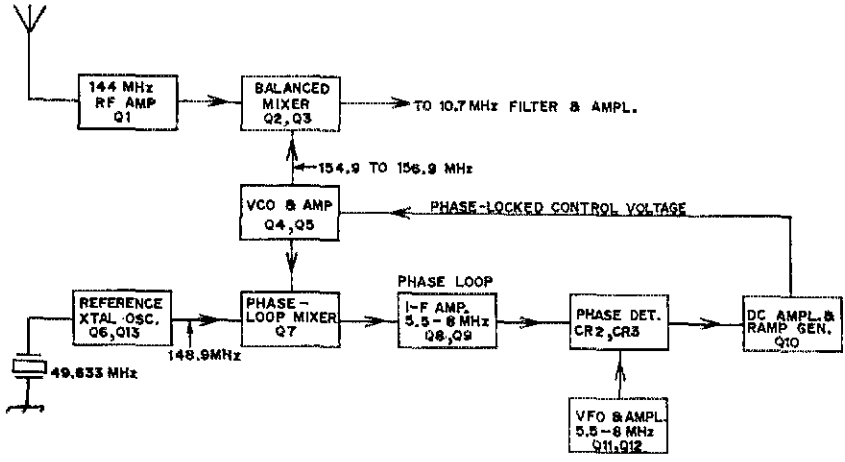


Fig. 1 — A functional block diagram of the receiver employing phase-locked tuning.

THIS ARTICLE describes a compact and versatile receiver capable of operating from mains power, or as a portable or mobile rig from a 12-V battery. The receiver covers the frequencies between 143.7 and 146.2 MHz, and it will also cover the range of 145.7 to 148.2 MHz if the reference crystal is changed. As the particular novelty of the receiver is in the use of the phase-lock system, this article will be concerned mainly with those portions of the circuit.

During the course of about a year, considerable time has been spent in the designing and building of a high-performance solid-state two-meter package. The receiver requirements were:

1) Wide dynamic range.
2) Single conversion.
3) Choice of i-f bandwidths of either 7 kHz or 30 kHz, using crystal filters.
4) Protected dual-gate rf amplifier, with delayed agc applied.
5) Double JFET mixer.
6) Phase-locked injection oscillator.
7) Good agc system.
8) Choice of ssb, fm or a-m reception.
9) Phase-lock indicator.

Using the interesting article in March 1970 *QST*, "An Engineer's Ham-Band receiver" as a base, Morris, ZL1TAQ, and I spent several evenings discussing the merits of simplified circuitry. Then using a drill press as a router, a set of three circuit boards were produced to make up the phase-locked front-end unit.

* 22 Glenside Ave., Pakuranga, Auckland, New Zealand.

Routed Boards

Some points in the production of routed boards may be of interest. The full-sized pattern is placed on the copper side of the board, and the position of all holes is marked with a sharp instrument. The islands of copper are then drawn in using a lead pencil. All wire holes are drilled with a No. 60 drill, and coil-form positions are marked and then drilled with a suitable drill.

Routing is performed by placing a 1/16-inch drill in the drill press, but allowing only 3/16-inch of the drill to protrude from the chuck. The depth gauge of the drill press is set to allow only the tip of the drill to enter the copper, and the chuck is revolved at high speed. This system leaves nothing to be desired and takes only a fraction of the time needed for an etching method.

When the drilling and routing are finished, the copper side of the board is rubbed with steel wool under running water, the board is dried, and is coated with flux. The board is then placed in an oven at about 200°F for about twenty minutes. It is then cooled and is ready for the mounting of the components. The flux may be made by taking a piece of rosin obtained from a musical instrument store and wrapping it in cardboard. A few taps from a hammer will produce a powder which may be dissolved in alcohol in quantity enough to produce a thick liquid.

Converter Board

This circuit makes use of a conventional 40673 MOSFET rf stage followed by a push-pull balanced mixer employing MPF107 FETs. It has been found

from experiment that this form of mixer has excellent signal-handling capabilities. A double-balanced mixer also was tried using MPF107s, but this circuit was discarded because of a lack of conversion gain and also because it had a tendency to break into regeneration. The VCO and the buffer-amplifier circuitry is straightforward and should pose no difficulty for the experienced constructor. Should the buffer amplifier show a tendency toward instability, the capacitance between base and ground could be increased by 10 pF.

Phase Loop Boards

Many problems were encountered in the construction of this board. These included:

1) Insufficient crystal oscillator injection to the phase-loop mixer.

2) Insufficient signal at the phase detector.

3) The difficulty of broadening the phase loop i-f from 5.5 to 8 MHz.

4) The working out of the correct parameters for the dc amplifiers. This included avoidance of loss of lock under small impact, such as when the

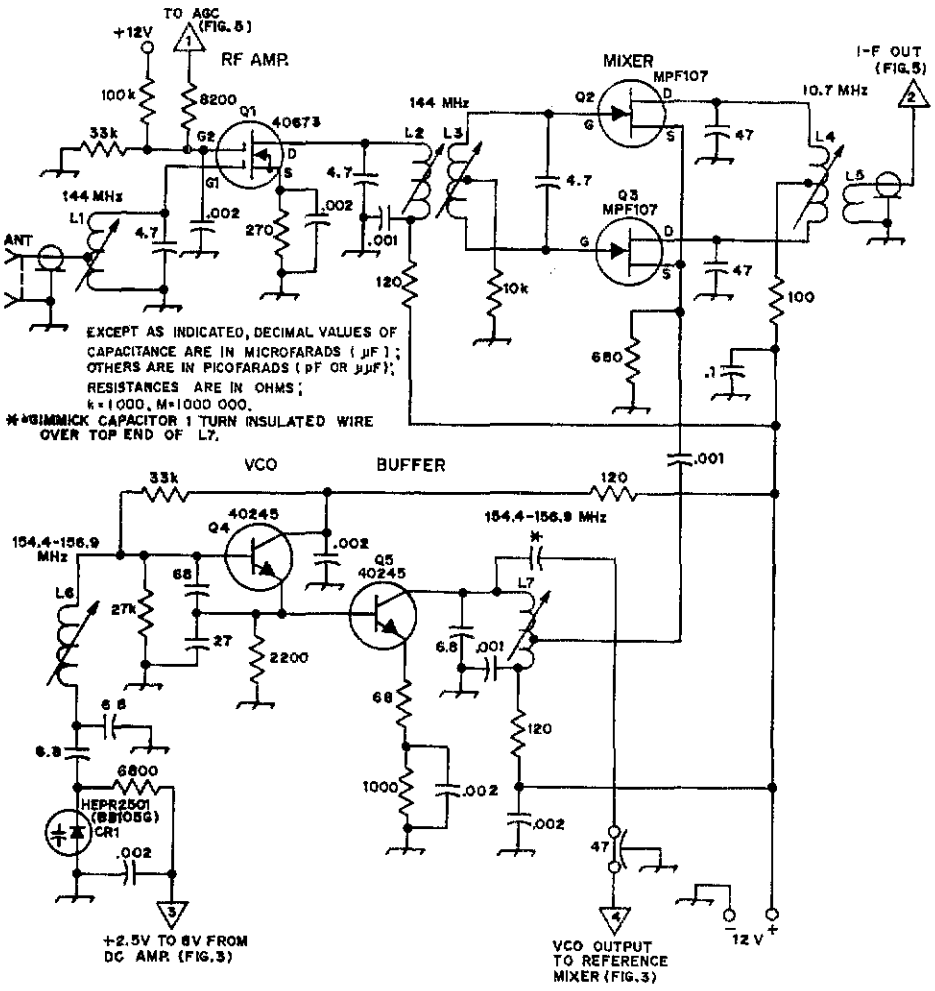


Fig. 2 — Schematic diagram of the rf amplifier, mixer, and VCO stages. In the coil-winding data given below, note that the first wire size is the nearest American equivalent to the size listed by the author. The number in parenthesis is British Wire Gauge used by the author and specified in the original text.

CR1 — Voltage-variable capacitance diode, 10 pF nominal, HEP R2501 (BB105G).

L1 — 5-1/2 turns No. 20 (20) tinned, spaced 1 wire dia on 1/4-inch slug-tuned form. Tap 2 turns from cold end.

L2 — 6 turns like L1, not tapped.

L3 — 6 turns like L1, center tapped. L2 and L3 are mounted side by side, spaced 7/16-inch center-to-center.

L4 — 45 turns No. 34 (38) enam. center tapped, close wound on 1/4-inch slug-tuned form.

L5 — 7 turns No. 24 (26) enam. close-wound over center of L4.

L6 — 4-1/2 turns No. 20 (20) tinned, spaced 1 wire dia on 1/4-inch slug-tuned form.

L7 — Same as L6, tapped 2 turns from cold end.

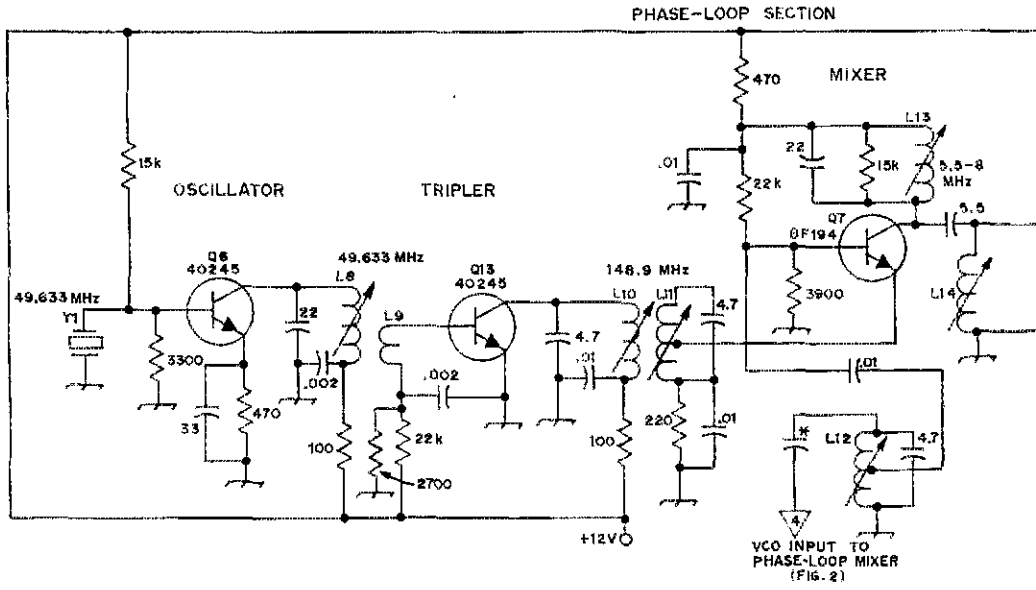


Fig. 3 — The phase-loop section of the receiver contains the reference oscillator, mixer, band-pass amplifier, and phase detector circuits. A dc amplifier develops control voltage to apply to the VCO. C9, C10 — 1000 pF. polyester.

CR2, CR3 — 1N34A (OA159).

L8 — 10 turns No. 24 (26) enam. close-wound.

L9 — 1-1/2 turns No. 24 (26) wound over cold end of L8.

L10, L11, L12 — 5-1/2 turns No. 20 (20) tinned, 7/16-inch long.

L13, L14 — 55 turns No. 38 (42) enam., close-wound.

L8, L14 incl., Wound on 3/16-inch dia slug-tuned forms.

L15 — 40 turns No. 34 (38) enam. on 1/2-inch dia toroid core. Amidon T-50-6, (Ducon F4038/1 Q1).

L16 — 20 turns No. 34 (38) enam., (two strands) bifilar wound on same core as L15.

unit was tapped with the handle of a small screwdriver; the correct conditions of lead/lag circuitry across the output of the dc amplifier; and the avoidance of unnecessary loading across this output.

In the final circuit all these problems have been overcome and the unit can now be dropped 6-inches to a solid bench and still remain phase locked.

VFO Board

The transistor oscillator circuitry is rather unusual (though very stable in operation) and is followed by a buffer amplifier. A small portion of the output signal is rectified and the resultant dc is fed back to the base of the transistor oscillator to maintain constant output over the tuning range of 5.5 to 8 MHz. This also reduces the harmonic content of the oscillator output.

I-F and Filters

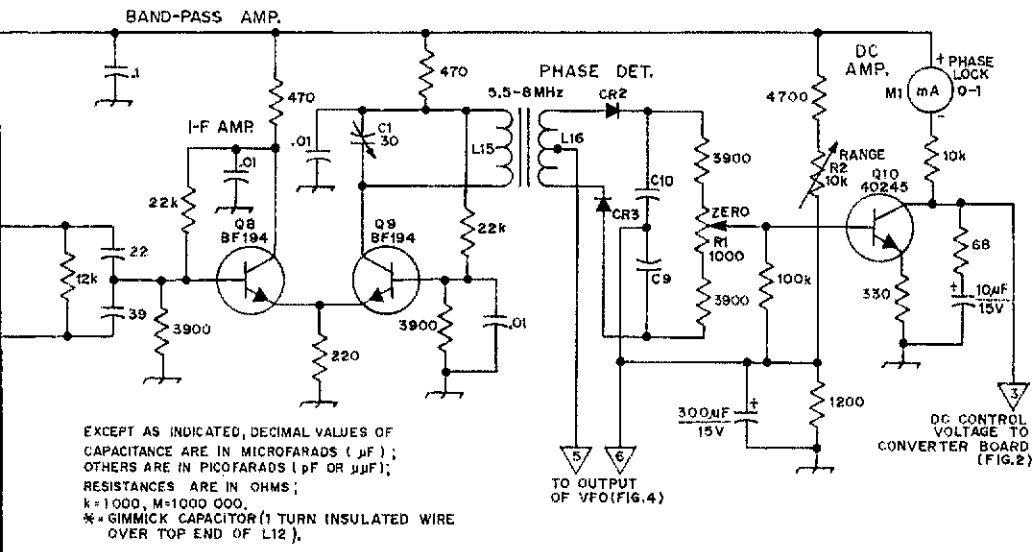
In my experience, problems encountered in the termination of crystal filters in the endeavor to obtain a flat band-pass response are more easily solved by generating more signal than is required and then using resistive terminations on both input and output. This avoids other solutions which can involve the shuffling around of approximately four unknown variables.

The filter input is switched by means of silicon signal diodes. The output of each filter feeds its own dual-gate FET amplifier. The amplifier activated by S1B or S1C has age fed to gate two, while the other has −4.5 volts applied to gate two, causing the stage to be inoperative. An auxiliary output is taken from the last i-f stage, which will allow the builder to use other detection schemes. These could include a limiter and discriminator for fm use, or a product detector if desired.

Construction

Nothing in the construction is unusual, other than the method of preparing the pc boards as described earlier. Good vhf practices should be followed. In the original version the size of the converter board is 5-1/8 × 2 inches, the VFO board is 3 × 2, the phase loop board is 5-7/8 × 2, and the i-f board is 11 × 2 inches including space for the filters.

The size and configuration of the audio amplifier and power supply sections are determined by the builder's requirements. There are many small audio amplifier assemblies available that will perform adequately in boosting the level of audio from the detector output.



Any of the common power supply schemes may be used to obtain the regulated 12 volts for the unit. That used by the author employed a series-regulation circuit, providing a stability of better than 0.1 V from no load to 2 amperes.

Alignment Procedure

Adjustment of the i-f stages should present no difficulties. A 10.7-MHz signal can be applied to the input, then each stage can be adjusted for maximum indication on the signal-strength meter. The variable source resistor for Q15 should be adjusted until equal indication is obtained through both filters, if the selectable-bandwidth feature is incorporated.

After the i-f system is aligned satisfactorily, connect the converter board to the i-f input. A 1000-ohm potentiometer should temporarily be connected between the 12-volt supply and ground. The wiper arm of the control should be connected to the 6800-ohm resistor that applies bias to CR1. Set the voltage between the wiper arm and ground to 2.5. Connect a 144-MHz signal generator to the input. Adjust the slug in the VCO coil until a signal is heard, then peak all rf coils and the i-f. Now set the signal generator to 145 MHz and adjust the Varicap voltage until the signal is heard again. Finally peak the VCO buffer output (L7) with the aid of a sensitive rf indicator (rf probe). Remove the temporary 1000-ohm control.

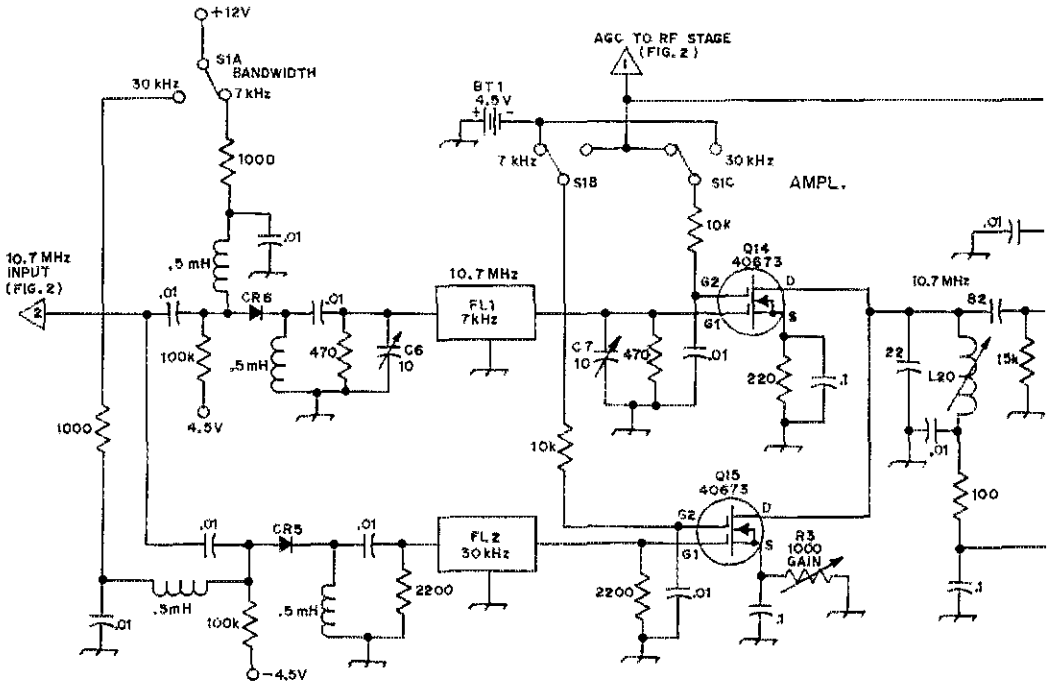
Adjustment of the phase detector board: Connect the 12-volt supply to the board, and with the aid of a sensitive rf indicator, adjust the crystal-oscillator stage for maximum output. Turn the power supply off and on to check that the oscillator will start easily. Now connect the signal generator to the input of the phase-loop mixer, Q7. Set the signal generator output to 154.7 MHz and peak the tuned circuit (L13) in the collector of the phase-loop mixer. Reset the signal generator to 156.5 MHz and peak the other band-pass filter tuned circuit, L14. Reset the signal generator to 155.7 MHz and, by means of C1, peak the tuned circuit feeding the phase detector. Sweep the signal-generator frequency across the range 154.4 – 156.9 MHz, taking note of the approximate voltage variation across the phase detector. Then make adjustments to L14 and C1 in an attempt to obtain a flat response. Typical readings would be 0.6 V at either end and 1.1 at the center frequency.

Ramp Generator

A ramp voltage is generated because of the time taken to charge C8, a 300-µF capacitor, which is connected to the dc amplifier, Q10. When the 12-volt supply is first turned on, Q10 has no forward bias on its base; therefore no collector current is drawn. In this condition, the control-line voltage is 12. As C8 becomes charged, the base of Q10 becomes more positive, causing an increasing amount of collector current. The current will increase until the control-line voltage drops to a value of 1.5. This change in voltage on the control line, applied to CR1, has caused the VCO frequency to sweep from approximately 160 MHz to below 154 MHz.

Adjustment of the dc amplifier is started by removing the reference crystal, Y1, from the socket. Then dc level control, R2, should be adjusted until the control line voltage is 1.5. The crystal then should be returned to the socket.

Adjustment of the VFO board: Connect the 12-volt supply and set the VFO range to tune 5.5 to 8 MHz, by adjusting the 1-10 pF trimmer. Connect a dc voltmeter across the junction of diode CR3 and the 18-KΩ resistor, and ground. Tune the VFO to 8 MHz and peak the 3- to 30-pF



trimmer across the toroid for minimum voltage reading. This reading should be near 0.2 volt. Connect the VFO output link to the phase detector after disconnecting the power to the phase detector board. Now connect the voltmeter across the diode loads in the phase detector. Tune the VFO from 5.5 to 8 MHz and note the voltage reading. This should be 2.3 to 2.5 V. In the prototype, the VFO drift after three hours was less than 100 Hz and less than 400 Hz after 16 hours.

Connection of all boards as a unit: Connect the voltmeter from the dc control line to ground. When the supply is turned on, the voltmeter should flick up to 12 V and then drop steadily until a phase-lock condition is obtained. The lock conditions can be checked by tuning the VFO. When

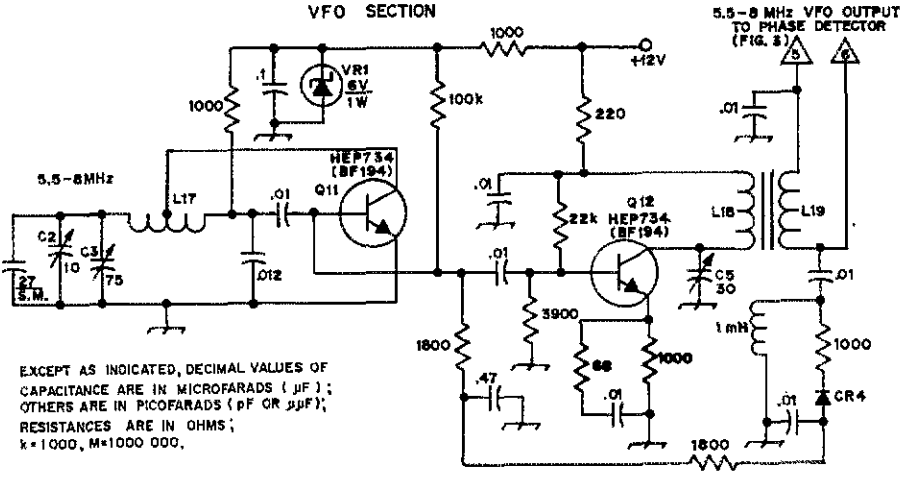


Fig. 4 — The VFO section also includes a buffer stage for greater stability.

CR4 — 1N34A (OA159).

L17 — 19 turns No. 24 (26) enam., close-wound on 5/8-inch dia form. Tap 4 turns.

L18 — 35 turns No. 34 (38) enam. on 1/2-inch dia toroid core. Amidon T-50-6, (Ducon F4038/1).

L19 — 20 turns No. 34 (38) enam. on same core as L18.

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

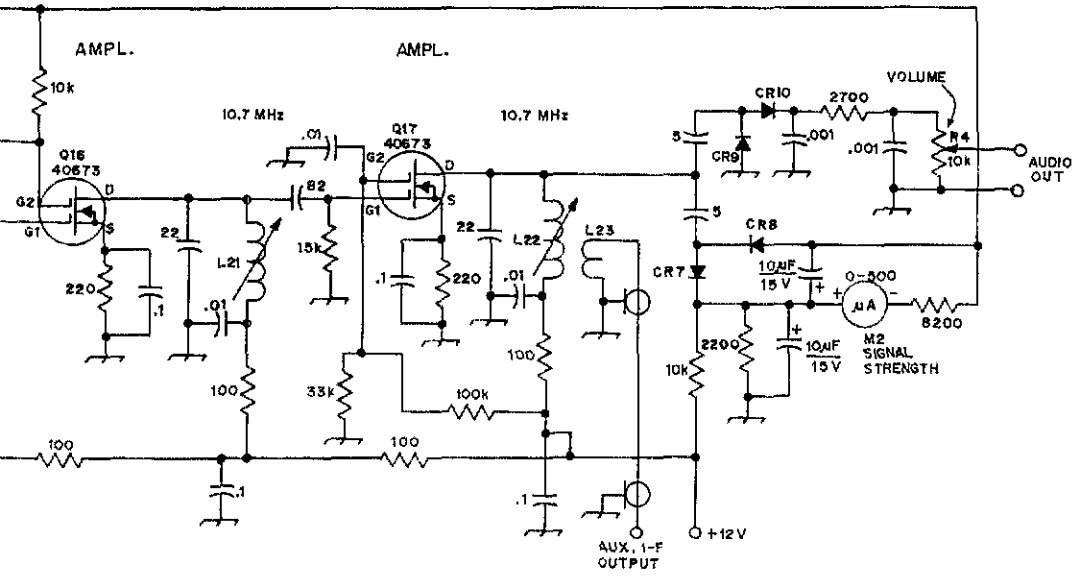


Fig. 5 — The i-f amplifier board features diode switching of the filters to select the desired bandwidth. The dual-gate MOSFET following the filter that is not in use is biased off by application of negative potential on gate 2. The bias battery can be small, since there is negligible current flow.
CR5, CR6 — IN4148.
CR7, CR10 incl. — 1N34A (OA159).
FL1, FL2 — 10.7-MHz crystal filters of bandwidth desired. 8-pole CF Networks filters used here. Resistors across input and output of filters must match the impedance of the filter used, as specified by the manufacturer.
L20, L21, L22 — 55 turns No. 34 (38) enam. close-wound on 3/16-inch dia slug-tuned form.
L23 — 3 turns No. 26 (28) enam. over cold end of L22.

the frequency is tuned higher, the voltage should rise and when tuned lower it should drop. If a reverse condition is noted the Varicap diode has been soldered in back to front. If the voltmeter reading drops to 1.5, locking has not occurred and the slug in the VCO coil may need to be adjusted slightly to obtain lock.

Performance

The dynamic range in the prototype was from 0.1 μV to 100 mV. A 50-mV signal could be fed into the front end and swept over the range 144 to 148 MHz without any spots (spurious responses) appearing. At 100-mV signal level, three weak spots appeared, but no sign of front-end desensitisation or cross modulation was noted.

This receiver leaves nothing to be desired as to performance, and should present no problems in being duplicated by advanced amateurs. It has been used in two Field Day contests, transmitter hunts, a mobile rally, and as a home station with a 20-dB gain antenna ahead of it, without suffering from cross modulation or overload.

Acknowledgment

The author would like to express appreciation to Morris Lister, ZL1TAQ, for his design assistance. QST

Strays

Mountaineers W6JTH and WA6VBA are conducting mini-Field Days this summer and fall; they are open for suggestions of rare needed counties in the western regions. Contact either Dick Simpson or John Grebenkemper c/o Radioscience Laboratory, Stanford, CA 94305.

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The League Headquarters building is open to visitors Monday through Friday, 7:30 A.M. – 5 P.M. on a "drop-in" basis, (except April 12, May 27, July 4, Sept. 2, Nov. 28 and Dec. 25) and at other times by appointment. The headquarters is on Main Street (Conn. Route 176 and 176-A) about a mile north of the center of town, and about 3 miles west of Conn. 15-U.S. 5, the Wilbur Cross Highway. (For W1AW visiting hours, see the schedule in "Operating News.")

Off-Center-Loaded Dipole Antennas

BY JERRY HALL,* K1PLP

IN THESE TIMES when much of our amateur population lives in urban areas, the subject of shortened antennas for the lower frequency amateur bands is a very popular one. Physically short ground-mounted vertical antennas with lumped-constant loading to make them resonant can be quite efficient radiators, if a good radial system has been installed. This has certainly been evidenced in Sevick's series of recent *QST* articles.† To many amateurs, however, the "hitch" in constructing such a system is the installation of a *good* radial system. It must be admitted that for the "top" amateur bands, 160 and 80/75 meters, an efficient system of buried radials requires a sizable amount of real estate, even for a physically short radiator. On the average city-size lot, 50 or 75 by 120 to 150 feet, it's almost impossible to install a highly efficient radial system for 80/75 meters, much less for 160 meters, when structures like a house and perhaps a separate garage exist. Or to some amateurs, just the thought of burying hundreds or maybe thousands of feet of wire is enough to turn off any enthusiasm for the project. What's the alternative? A dipole type of antenna with lumped-constant loading. At modest heights, 30 or 40 feet, such an antenna will prove to be quite satisfactory if it is physically longer than about 0.2 wavelength. *Shorter lengths may also be used, at reduced* efficiency. Such an antenna can be fed directly with 50-Ω coaxial line, and it can be operated with no earth ground. (Of course the chassis of the transmitter and/or receiver should be grounded adequately for protection against shock hazard.)

Nearly all of us are familiar with the concept behind the use of inductive loading. A vertical antenna which is shorter than a quarter wave (or a dipole antenna which is shorter than a half wave) will exhibit capacitive reactance at its base (or center) feed point. To cancel such capacitive reactance, a coil having the proper inductive reactance may be connected in series with the base feed point of the vertical. The *same result* will be obtained through the use of two such coils for a dipole, one coil connected in series with each half. It is not necessary for the inductor to be installed at the feed point, however. In fact, greater radiating efficiency results through improved current distribution if the inductor is located along the radiator some distance away from the low-impedance feed point, *viz*, in the manner of a center-loaded mobile whip antenna. Fig. 1 shows this concept extended to a dipole element, with off-center loading. The inductors resonate the antenna to the operating frequency, but do little actual radiating themselves. (This is in contrast to helically wound or continuously loaded elements, where a long thin inductor is the radiator as well as the loading element.)

In the antenna represented by Fig. 1, there are many variable factors to be considered when a practical antenna for a given frequency is being constructed. Of primary consideration from an efficiency standpoint is the overall length, shown as dimension A. Another consideration for efficiency is the distance of the coils from center, dimension B. The longer the overall length (A), up to a half wave, and the farther the loading coils are placed from the center (B), the greater is the efficiency of the antenna. However, the greater is distance B (for a fixed overall antenna size), the larger the inductors must be to maintain resonance. Theoretically, if the coils were placed at the outer ends of the dipole, they should be infinite in value to maintain resonance. Capacitive loading of the ends, either through proximity of the antenna to other objects or through the addition of capacitance hats, will reduce this requirement to a more practical value.

What Inductance Values?

As a matter of personal interest, this writer has been doing experimental work for a number of years with off-center-loaded antennas. One big drawback to such experimentation was the ever-present need for a large amount of cut-and-try work to arrive at resonance whenever a new set of dimensions was to be used. Probably the number of pruned-off turns from coil stock from such experiments, if straightened out and soldered end to end, would make up several full-sized half-wave antennas for the 160-meter band. Therefore, most of the writer's work of late in this area has been in going through paper-work exercises, looking for a way whereby at least "ball-park" values of inductance needed for a particular system could be calculated.

The equation contained in the Mobile chapter of *The ARRL Antenna Book* for determining the capacitance of a vertical antenna shorter than a quarter wavelength looked promising in early computations, and, indeed, it became the basis for the calculation procedure which finally resulted.

*Associate Technical Editor, *QST*.
†These and all other references are listed at the end of this article.

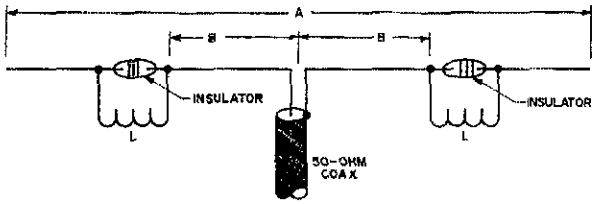


Fig. 1 — A dipole antenna lengthened electrically with off-center loading coils. For a fixed dimension A, greater efficiency will be realized with greater distance B, but as B is increased, L must be larger in value to maintain resonance.

This procedure has been found to produce results much closer than mere "ball-park" values for the necessary inductance — for wire antennas "in the clear" at moderate heights, the final inductance values found by cut-and-try pruning for lowest SWR at the desired frequency have been so close to the value from calculations that a laboratory bridge was necessary to measure the difference. The results are equally good for elements using tubing. Once the needed inductance value is determined by calculations, it is generally found sufficient to obtain coil dimensions from an ARRL L/C/F Calculator (see LaPlaca†) or by equation. Any significant pruning which has been found necessary could always be attributed to objects in proximity to the ends of the antenna.

The complete set of calculations is expressed in the mathematical relationship below as Eq. 1, presented here primarily for mathematics buffs or those having access to electronic computers.

This equation yields the inductance required, in microhenrys, for single-band resonance of a shortened antenna of a particular physical size at a given frequency, for a specific position of the loading coils from the center of the antenna. To spare the reader the task of performing some rather tedious calculations, Fig. 2 has been prepared from Eq. 1. The curves of the chart have been normalized, and may be used for any frequency of resonance. The chart is based on a half-wavelength/diameter ratio of the radiator of approximately 24,000. (This corresponds to No. 14 wire on 80 meters or No. 8 wire on 160 meters.) For "thinner" conductors, the required inductance will be somewhat greater than that determined from Fig. 2, and less inductance will be required for "thicker" conductors.

The use of the chart is as follows: At the intersection of the appropriate curve from the body for dimension A and the proper value for the coil position from the horizontal scale at the bottom of the chart, read the required inductive reactance for resonance from the scale at the left. Dimensions A and B are shown in Fig. 1, and for use with the chart are expressed as percentages. Dimension A is taken as percent length of the shortened antenna with respect to the length of a resonant half-wave dipole of the same conductor material. Dimension B is taken as the percent of coil distance from the feed point to the end of the shortened antenna. For example, resonating an antenna which is 50% or half the size of a half-wave dipole (one-quarter wavelength overall), with loading coils positioned midway between the feed point and each end (50% out), would require loading coils having an inductive reactance of approximately 950 ohms at the operating frequency. If the antenna is hung "in the clear," and if the length/diameter ratio of the conductor is near 24,000, inductance values as determined from the chart will be very close to actual values required. (Eq. 1 above takes the diameter of the radiator into account, and thus may be used for any length/diameter ratio.) For practical purposes, dimension B may be taken as that distance from the center of the feed-point insulator to the inside eye of the loading-coil insulator, and dimension A

(Eq. 1):

$$L_{\mu H} = \frac{10^6}{68\pi^2 f^2} \left\{ \frac{\left[ln \frac{24\left(\frac{234}{f} - B\right)}{D} - 1 \right] \left[\left(1 - \frac{fB}{234}\right)^2 - 1 \right]}{\frac{234}{f} - B} - \frac{\left[ln \frac{24\left(\frac{A}{2} - B\right)}{D} - 1 \right] \left[\left(\frac{fA}{2} - fB\right)^2 - 1 \right]}{\frac{A}{2} - B} \right\}$$

where

$L_{\mu H}$ = inductance required for resonance
ln = natural log
f = frequency, megahertz
A = overall antenna length, feet
B = distance from center to each loading coil, feet
D = diameter of radiator, inches

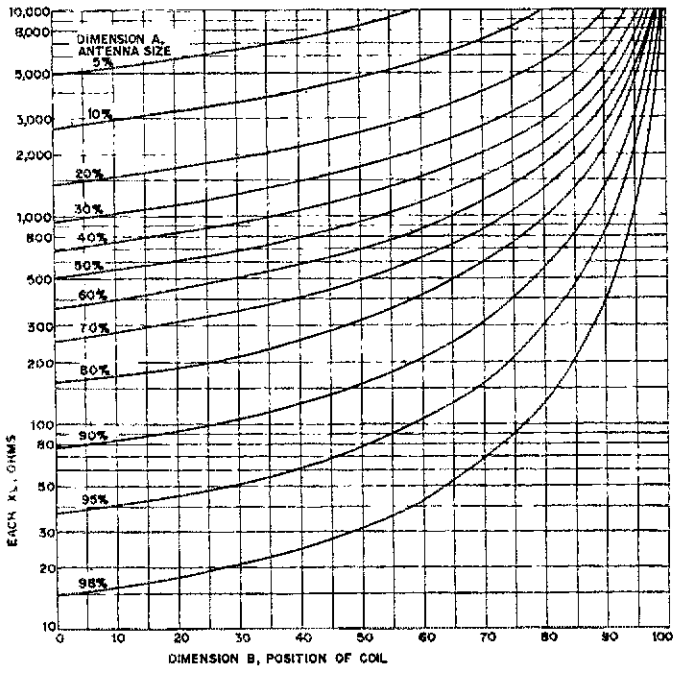


Fig. 2 — Chart for determining approximate inductance values for off-center-loaded dipoles. At the intersection of the appropriate curve from the body of the chart for dimension A and the proper value for the coil position from the horizontal scale at the bottom of the chart, read the required inductive reactance for resonance from the scale at left. See Fig. 1 regarding dimensions A and B.

as the eye-to-eye distance inside the end insulators (which are not drawn in Fig. 1).

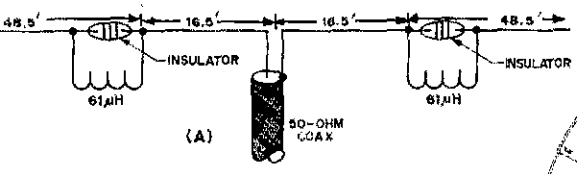
Proximity of surrounding objects in individual installations may require some pruning of the coils, and the exact amount of final inductance required should be determined experimentally. If the antenna is hung in inverted-V style, with the ends brought near the earth, the required inductance will almost always be somewhat less than that determined from the chart or equation. A grid-dip meter, Macromatcher (see Hall and Kaufmann†), or SWR indicator may be used during the final adjustment procedure.

Practical Antennas

Although one might erect an inductively loaded antenna that is cut for a single amateur band, it is possible to use the antenna itself for two, three, or more bands of operation, if provision is made to lower the antenna for band changes. A simple rope halyard and pulley arrangement at one of the supports will do the trick. Fig. 3A shows a 3-band antenna of this nature, for 160, 80, and 20 meters. If the insulators shown are left open, with nothing bridging them, the antenna is a simple half-wave dipole cut for 14.18 MHz. (The 48.5-foot lengths act merely as support wires, and have negligible effect on operation of the antenna.) If the insulators are bridged with short lengths of antenna wire, the antenna becomes a center-fed 80-meter dipole, resonant at about 3.6 MHz. For 160-m operation the 20-meter insulators may be bridged with loading coils to resonate the antenna at 1.8 MHz, as shown in Fig. 3A. Burndy or other manufacturers' "Servit" type of electrical connectors may be used for ease in making band changes quickly, as shown in Fig. 4.

The calculation procedure for determining loading-coil values for the antenna of Fig. 3A, using the chart of Fig. 2, goes like this. If operation is desired on 1.8 MHz, the length of a full-sized half-wave dipole is found from the relationship $468/f$ to be 260 feet. The 130-foot length of Fig. 3A represents 50% of this size, meaning that the dimension-A curve marked "50%" in Fig. 2 is to be used. The position of the coils is $16.5/(16.5 + 48.5) \times 100$ or 25% of the distance out from center, dimension B. From the intersection of 25 (horizontal scale at bottom) and the 50% curve, the required inductive reactance is read from the scale at the left of Fig. 2 to be 650 ohms. The inductance, L, is $650/2\pi f$ or 57.5 microhenrys, if No. 8 wire is to be used. For smaller diameter wire, the inductance should be somewhat larger. (Calculations from Eq. 1 for No. 12 wire indicate the required inductance is 60.99 μH.)

The radiation resistance of a shortened antenna loaded to resonance is less than that of a full-sized antenna. Further, the shortened antenna is "sharper," meaning that the change in reactance versus frequency is greater. In other words, the shortened antenna acts as a tuned circuit having a higher Q than a full-sized antenna. To check these characteristics, the line input impedances for the antenna of Fig. 3A were measured with a laboratory bridge, and the electrical line length at the measurement frequency was then taken into account to determine the impedance at the antenna feed point. The antenna was constructed of No. 12 wire and hung at a height of 50 feet as a "flat-top" radiator.



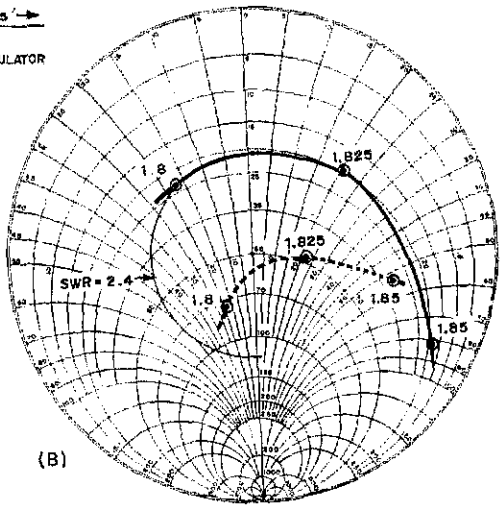


Fig. 3 — At A, an 80-meter dipole loaded for 160-meter operation. The inductors are 37 turns of coil stock having a 3-inch dia and 10 turns per inch (B&W 3035). At B, the impedance plot of this antenna installed at a height of 50 feet (solid curve), and the plot of a 160-m half-wave dipole (broken curve).

The solid curve of Fig. 3B is a plot of the feed-point impedance versus frequency for this antenna. The plot on Smith Chart coordinates is more meaningful than a simple SWR-vs.-frequency curve because the magnitudes of the resistive and reactive components are shown, as well as the sign of the reactance. (Capacitive reactance is negative, plotted to the left of the vertical center line, and inductive reactance is positive, plotted to the right.) In this presentation, a 50-ohm nonreactive impedance will appear at the exact center of the chart. The SWR in 50-ohm line for a given frequency may be determined by first noting the distance from the center of the chart to the particular impedance plot on the curve, and next measuring this same distance down the vertical center line from chart center (a drawing compass is helpful for this task), and finally dividing 50 into the value read at that point on the center line. For example, the SWR at 1.8 MHz equals 120/50 or 2.4, as indicated by the segment of the 2.4 SWR circle in Fig. 3B. It may be seen that resonance (zero reactance) occurs at approximately 1810 kHz, where the resistance is about 22 ohms. The SWR at resonance is 2.33:1, and climbs to 3:1 at 1825 kHz. At 1850 kHz, the SWR is 10:1. Without any matching provisions the antenna is relatively sharp, as mentioned earlier. If one sets the usable bandwidth as the frequency range where the SWR is 3:1 or less, it is approximately 35 kHz, or 1.9% of the resonant frequency. As far as efficiency is concerned, ohmic losses are low, and the antenna is a good performer on 160 meters. Because of its horizontal polarization, it has proved to be most effective at night, and stations several hundred miles away have been worked with S-9 reports received for the 50-watt signal.

For a comparison of impedances, the broken curve of Fig. 3B is a plot of measured impedances of a full-size half-wave dipole, 260 feet long overall, hung in place of the shortened antenna. From this curve it may be seen that resonance occurs at 1810 kHz, where the resistance is 59 ohms. The 3:1-SWR bandwidth for the half-wave antenna is in the order of 60 kHz, or 3.3% of the resonant frequency. It is interesting to note on this curve that the SWR at resonance is 1.18:1, and that it is a somewhat lower value, 1.15:1, at a frequency a few kilohertz above resonance. (Measurements were made every 5 kHz across this band, but plot points are shown only for 25-kHz increments to avoid crowding of the data.) This evidence refutes the oft-heard statement that the SWR-vs.-frequency curve is *always* lowest at antenna resonance. Points to remember are that the SWR in a transmission line is completely dependent upon the characteristic-impedance value of the line in use. Using a line of different impedance may shift the position of the SWR curve along the frequency axis in a simple

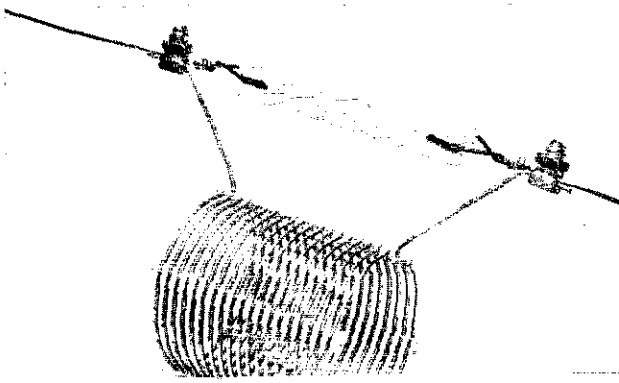
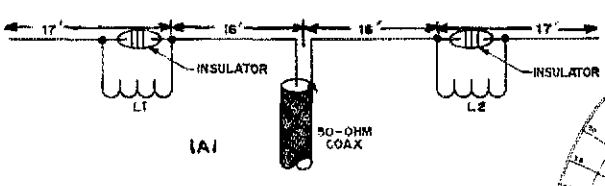


Fig. 4 — Copper electrical service connectors, sold under one trade name of Servit, provide a simple means of installing the loading coils. The antenna wire and the ends of the coil wires should be tinned to prevent corrosion. In addition, a protective coating of acrylic spray may be used at each connection.



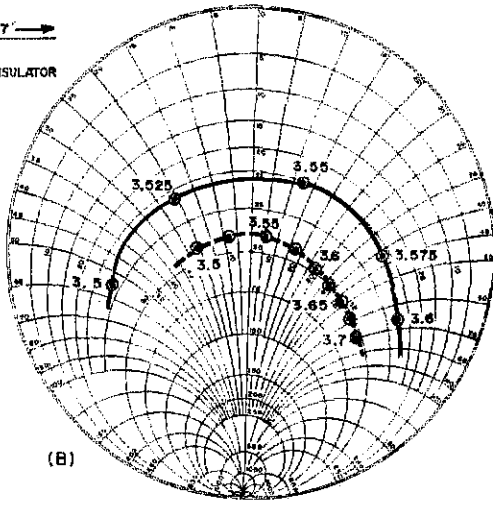


Fig. 5 — At A, a 40-meter dipole loaded for 80-meter operation. For resonance at 3.55 MHz *the coils should be approximately 40 μH (27 turns* of stock); 3.75 MHz, 35 μH (24 turns); 3.9 MHz, 31 μH (22 turns); and 4.0 MHz, 29 μH (21 turns). These are calculated inductance values for No. 12 antenna wire. Coil stock referenced above is 3-inch diameter, 10 turns per inch (B&W 3035). At B, the impedance plot of the 3.55-MHz version (solid curve) and of an 80-m half-wave dipole (broken curve).

SWR-vs.-frequency plot. This is definitely true in this case – if the 160-meter half-wave dipole were to be fed with 75-ohm line, the lowest SWR would occur at a frequency about 5 kHz *below* antenna resonance, whereas with 50-ohm line the lowest SWR is at a frequency slightly *above* resonance. The reason this happens is that the resistive component of the impedance, which consists of the radiation resistance plus any loss resistance, is not constant with frequency, even over a rather narrow frequency range. It must be acknowledged that the differences here are very slight, however, and for practical purposes the frequency of lowest SWR is (within a few kilohertz) the resonant frequency of the antenna.

Another point concerning the SWR values bears noting. The values as determined from the plots in the manner described above are quite accurate, having been determined by measurements with laboratory equipment. In contrast, measurements with simple SWR indicators usually cannot be relied upon for anywhere near the equivalent accuracy.

For example, the author owns a commercially manufactured SWR indicator of the Monimatch type (see McCoy†) which, under a particular set of conditions, indicates a 2.5:1 SWR in a line where laboratory measuring equipment shows the *true SWR to be 4:1.* A significant difference! Herein lies another reason why impedance plots on Smith Chart coordinates are more meaningful than a simple SWR-vs.-frequency curve – greater accuracy may generally be expected.

A Half-Size 80-Meter Antenna

Fig. 5A shows the 3-band concept described earlier as it can be applied to 80, 40, and 20 meters. Its overall length is 66 feet, not a difficult length to use on a small lot. This antenna was constructed for 80-m operation with a design-center frequency of 3.55 MHz, using No. 12 antenna wire and 40-μH loading coils – 27 turns of stock having a diameter of 3 inches and a pitch of 10 turns per inch (tpi). Feed-point impedances versus 80-m frequency for the antenna, hung at a height of 50 feet, are shown by the solid curve at B of Fig. 5. Actual resonance occurred at 3.54 MHz, where the resistance was about 26 ohms. The bandwidth within which the SWR is 3:1 is 60 kHz, or 1.69% of the resonant frequency.

Also shown in Fig. 5B, by the broken curve, are the feed-point impedances of a half-wave dipole, 132 feet overall length, hung in place of the shortened antenna. Resonance occurs at 3.54 MHz, where the resistance is 43.5 ohms and the SWR is 1.15:1. The broader nature of the half-wave antenna is exhibited by the "tighter" curve which swings closer to the 50-ohm center point of the chart than the shorter, loaded antenna. The SWR at 3.5 MHz is 1.6:1, and remains below 3:1 to 3.67 MHz.

Capacitive and Inductive Loading

One would assume that a combination of capacitive and inductive loading might provide a different feed-point impedance than would inductive loading alone, because of different current distributions in the radiators. To check out this assumption, the antenna of Fig. 5A was used as a "test bed" for comparative measurements. Capacitance hats were attached at different points along the 17-foot lengths of wire outside the coils, and the coils were pruned to reresonate the antenna at about the same frequency as before. The impedance measurements were then repeated.

Dangling End Sections:

First, "hats" consisting of 18 inches of No. 12 wire were affixed to the antenna ends and permitted to dangle. This lowered the resonant frequency to 3435 kHz. By calculations, this was approximately the same effect as that of extending the 17-foot portions of the antenna by the same amount as the dangling lengths, so it would seem

Table I — Characteristics of various loading techniques, 66-foot 80-m dipole.

Loading	*Approx. feed-point resistance, resonance*	*SWR at resonance*	*3:1-SWR bandwidth, % of resonant freq.*
40-μH coils only	26 ohms	1.92:1	1.69
36.5-μH coils, 18" dangling ends	26	1.90:1	1.79
36" hats outside 32.5-μH coils	23	2.15:1	1.68
30-μH coils, 36" hats at ends	25	1.98:1	2.05
None (λ/2 dipole)	43.5	1.15	Greater than 3.6

Coil positions for each loaded antenna were 16 feet from antenna center. All antennas were constructed of No. 12 wire and installed at a height of 50 feet.

to make little difference whether short sections of extra length are added inside the supporting insulators or are at the ends, suspended at right angles to the main antenna wire.

The inductors were reduced from 40 to 36.5 μH (25-turn coils replaced the original 27-turn coils), and resonance occurred at about 3575 kHz. At this frequency the resistance was 26 ohms and the SWR 1.90:1. The 3:1-SWR bandwidth, 64 kHz, is 1.79% of the frequency of resonance. The impedance plot for this arrangement is shown as Curve A in Fig. 6. The resistance at resonance for this antenna is identical to that with the coils alone, and the bandwidth is only 4 kHz greater, 64 kHz vs. 60. From these results, one would conclude that the main advantage offered by the "danglers" is a small saving of space over a flat-top antenna.

Capacitance Hats Near Loading Coils:

Next the dangling end sections were removed and a pair of capacitance hats was formed, each from two 36-inch lengths of No. 12 solid wire. The two wires for a single hat were attached at their centers to the antenna wire at a point just outside one of the loading coils. The hat wires were then bent radially to form an X at right angles to the antenna wire, like four spokes of a wheel with the main antenna wire at the hub. The diameter of the X-shaped hat was thus 36 inches. The second hat was placed in a like manner just outside the second coil. Burndy connectors were used to affix the hat wires. The resonant frequency of this configuration with the original 40-μH loading coils was found to be 3290 kHz. The effect of adding the hats was about the same as that of extending the 17-foot lengths to 19 feet.

When the inductors were replaced with 23-turn coils (32.5 μH), the antenna resonated at about 3.575 MHz, the resistance being 23 ohms. The SWR at resonance is 2.15:1, and the 3:1-SWR bandwidth for this configuration is 60 kHz, 1.68% of the resonant frequency. The impedance of this arrangement versus frequency is shown by Curve B of Fig. 6.

It is surprising to note that, by the standards of most amateurs, the characteristics of this antenna are not as good as those of the same length antenna with loading coils alone. The SWR at resonance for

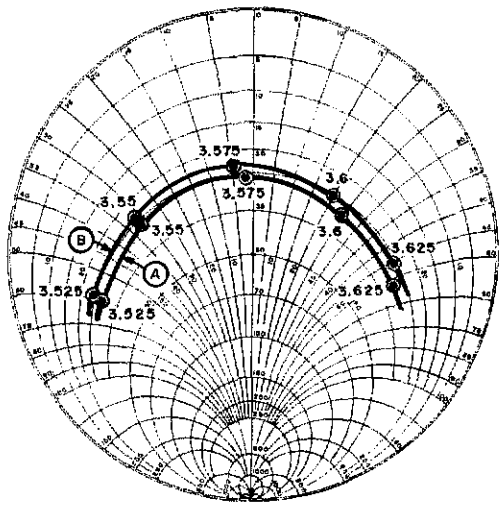


Fig. 6 — Curve A is the impedance plot of the antenna of Fig. 5A with 1.5-foot dangling end sections added and the coil trimmed to restore resonance near the original frequency. Curve B is a plot of the same antenna with X-shaped capacitance hats added at a point just outside the loading coils (dangling sections removed and coils trimmed to reestablish resonance).

the antenna with combination capacitive and inductive loading is higher (2.15 vs. 1.92), and the 3:1-SWR bandwidths are the same, 60 kHz. Perhaps a significant factor here, though, is that the diameter of the capacitance hats used for these measurements was small, only .011 wavelength. Supporting much larger hats presents mechanical problems with wire antennas, however, as even these were a bit flimsy and would require reshaping after gusty weather.

Capacitance Hats at Antenna Ends:

Finally, the X-shaped capacitance hats were moved to the outside ends of the antenna, just inside the end insulators. With the original 40-μH coils, resonance appeared at 3215 kHz. From calculations, it was as if the 17-foot end sections were actually 21 feet long. With 30-μH coils (22 turns) in place, the resonant frequency was 3560 kHz. At this frequency the resistance was 25 ohms and the SWR 1.98:1. The 3:1-SWR bandwidth is 73 kHz, or 2.05% of the resonant frequency. The impedance plot of this antenna is given in Fig. 7.

It is interesting to note that the position and shape of the plot for this antenna on Smith Chart coordinates is nearly identical to that for the same length antenna with loading coils only, the solid curve of Fig. 5B. For this antenna, however, the plot points for 25-kHz frequency increments appear closer together, which accounts for the increased bandwidth.

Conclusions:

The measured characteristics of these various configurations of loading for the 80-meter antennas are tabulated in Table 1. Remember that the overall "flat-top" length of each antenna arrangement is 66 feet, and that the loading coils are always positioned 16 feet each side of the center of the antenna, being pruned for resonance at approximately 3550 kHz. For comparison, information for a half-wave dipole is also included.

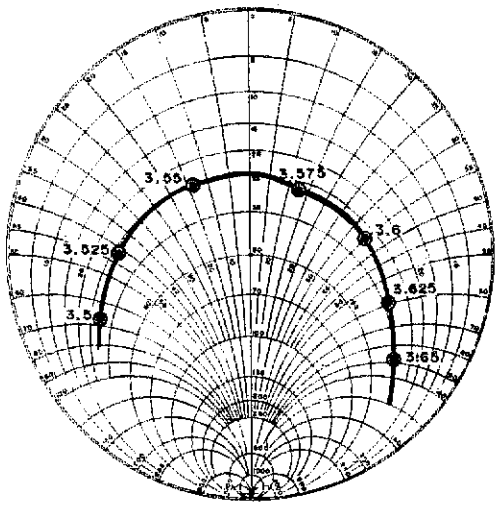


Fig. 7 — Impedance plot of a 66-foot dipole using a combination of off-center inductive loading and capacitive end loading. Of all the shortened configurations tried, this arrangement offered the greatest bandwidth.

Of the various arrangements, capacitive end loading decidedly provides the greatest bandwidth, excepting the full-size half-wave antenna, of course. Although there are slight differences in the resistance value at resonance, all are of the same order of magnitude. These values, as well as those for the 160-m antenna discussed earlier, tend to confirm a *broad* rule of thumb that the writer has formulated for this type of antenna: The feedpoint impedance value at resonance is roughly proportional to the length of the antenna. That is, a loaded antenna which is half the size of a half-wave dipole will have approximately half the radiation resistance of the full-sized antenna.

Eq. 1 given earlier or the chart of Fig. 2 allows one to calculate loading-coil values for antennas with loading coils only. Additional capacitive loading is not taken into account. Calculating the effects of various capacitive loading arrangements appears to be difficult, and work remains to be done in this area.

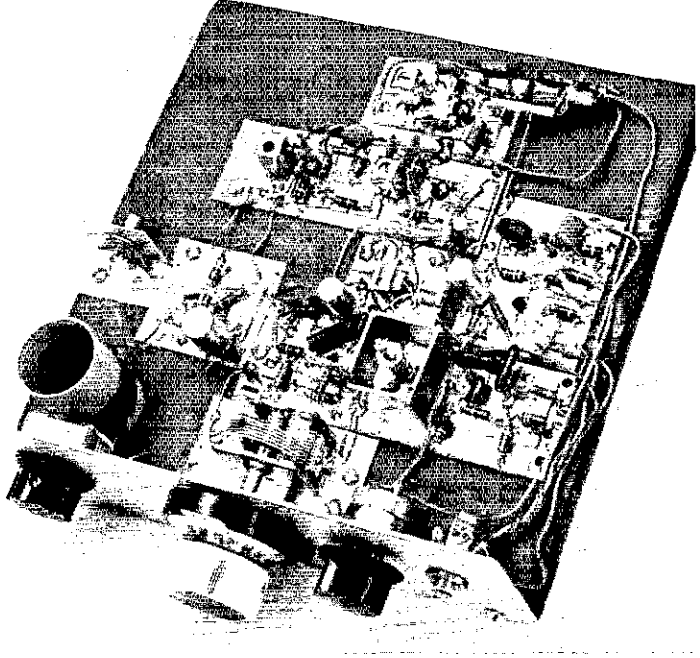
Multiband Antennas with Loading Coils

All of the foregoing material has been devoted to the loading of an antenna for resonance at a single frequency. Resonated as described, the antenna is electrically a half wave in length. It will, however, operate well on higher frequencies — frequencies at which it is an odd multiple of half waves in *electrical* length . . . three half waves, five half waves, etc. Because of the lumped loading of the shortened antenna, these higher frequencies will likely not be closely related to odd-order harmonics of the fundamental frequency, as the case would be for a nonloaded radiator. (For example, it is a well-known fact that a 7-MHz half-wave dipole operates well on its third harmonic, 21 MHz.)

A loaded dipole will become an electrical 3/2-λ antenna at some frequency *below* that which is three times the fundamental resonant frequency. Depending upon the overall antenna length, coil value, and coil position, it is possible for an 80-meter loaded dipole to become a 3/2-λ performer on 40 meters. With such an arrangement, one would have a dual-band antenna without requiring the use of traps. The idea can be expanded upon to arrive at a loaded antenna without traps which will operate on more than two bands. This scheme offers considerable constructional simplification as compared with trap arrangements.

The multiband loading-coil concept has been recognized for better than half a century, but little use of the technique has been made by amateurs. Some years ago a very good article on the subject was published by William Lattin, W4JRW.† That article is recommended reading for anyone inter-

(Continued on page 58)



This photograph shows the completed receiver. Study the layout and that shown in Part IV (July *QST*) to note the differences. The i-f strip is mounted behind the mixer assembly. Just to the rear of the i-f is the BFO.

The tuning mechanism mounted on the front panel is a vernier dial, No. 274-605. It is available from Radio Shack. We used a slightly larger knob than the one that comes with the dial drive to provide a better grip on the tuning knob.

Learning to Work with SEMICONDUCTORS

In Part V of this series we covered the basic design steps one can follow in building a simple i-f amplifier and product detector. A discussion was included which dealt with the benefits of single-signal reception and how to obtain it. In this concluding installment we discuss the design and application of a solid-state BFO, and show how to hook together all of the modules we have constructed in preparation for the final objective — a superheterodyne receiver for 80 meters.

BY DOUG DE MAW,* W1CER AND LEW McCOY,** W1ICP PART VI

OSCILLATORS ARE nifty devices, and without them we would be hard-pressed to carry on effective amateur-radio communications. Were it not for oscillators we would probably be communicating by means of high-power audio amplifiers and giant speakers, shouting back and forth across some residential neighborhood, much to the despair of those who lived nearby. Or we would be forced to regress to the use of spark transmitters and simple detector-type receivers. So let's appreciate the hidden beauty of the common oscillator and learn a bit more about how it operates. Some theory was offered in Part III, and we constructed the tunable local oscillator for the receiver we shall complete in this installment.

There are a great many names for oscillators . . . Meissner, Franklin, Pierce, Hartley, and such, commemorating the inventors of the various circuit configurations. However, the principle of operation is tied to a very basic set of events, and these events must take place if oscillation is to occur, regardless of the breed of active device we employ — tube, FET, or bipolar transistor. Each of these components has the *ability to amplify*, and this characteristic makes them suitable for use as oscillators. The device must have the capability of supplying its own input power to the grid, gate, or base by taking some of the energy from the output (a relatively high amount of power being available at the output) and routing it to the input through a positive-*feedback* coupling system, inductive or capacitive. When this requirement is met, the dc power supplied to the oscillator plate, drain, or

* *QST* Technical Editor,
** Beginner and Novice Editor.

[EDITOR'S NOTE: Enlarged copies (8 × 10 glossy photos) of the above photo are available from ARRL Hq. for $3 each, postpaid.]

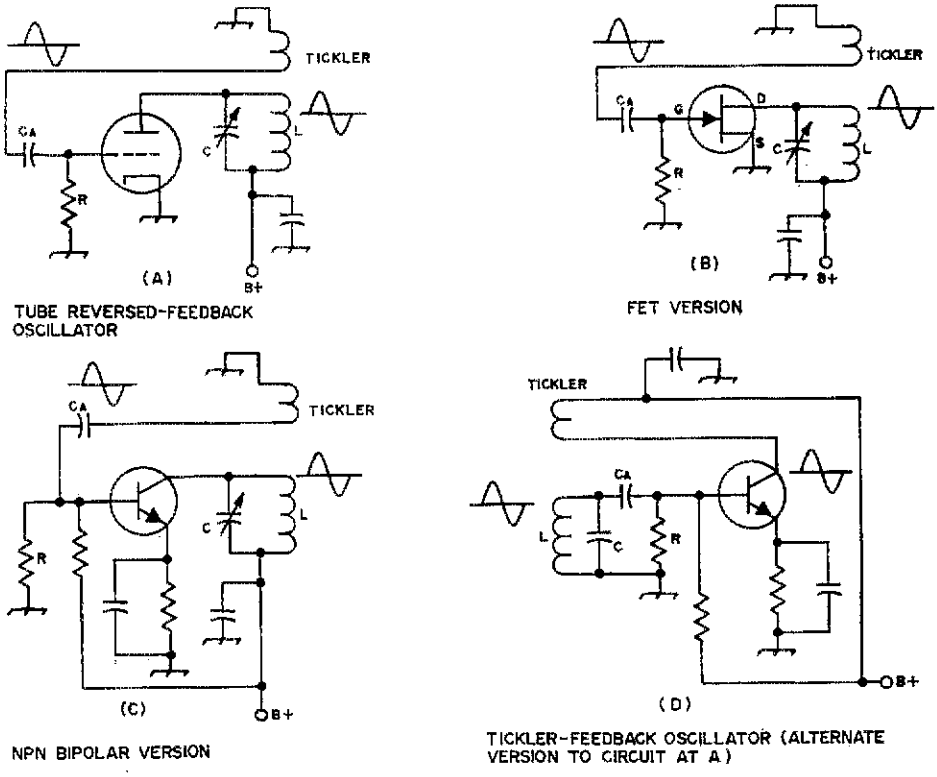


Fig. 18 — Illustrations of various *LC* oscillators showing the phase relationship between input and output sections of the circuits for positive feedback.

collector will be changed to alternating-current energy (ac) as the oscillations take place. The repetition rate (frequency) of the oscillations is determined by the values of inductance and capacitance used in the frequency-determining element of the oscillator circuit (*L* and *C* in Fig. 18). An important remaining requirement is that the feedback energy be in phase with that which resides at the plate, drain, or collector of the device used. The required phase relationship is shown in sine-wave fashion in Fig. 18.

Grid-leak bias is required to assure self-starting of an oscillator – C_A and *R* in the examples of Fig. 18. Detailed information on how grid leaks operate is beyond the scope of this presentation. (*The Handbook* gives thorough treatment to the subject in Chapter 3.) For our purpose it is significant to say that grid leaks (actually, base or gate leaks) are used in solid-state oscillators as well as in tube-type oscillators.

Building a BFO

In order to make cw and ssb signals intelligible it is necessary to mix the output of a beat-frequency oscillator with the rf or i-f energy in a receiver. Earlier in this course we used the VFO as a tunable BFO and mixed its output with the incoming 80-meter amateur signals in our direct-conversion hookup. Output from the detector was available as intelligible audio-frequency energy. In a typical superheterodyne receiver the BFO is used in conjunction with the i-f/detector system and not in the early stages of the receiver. In our project we have an i-f of 455 kHz, so it is necessary that our BFO operate at approximately 455 kHz to provide intelligible audio output from the product detector. Because it is not necessary to vary the BFO frequency above or below 455 kHz by a significant amount we shall consider our BFO as a fixed-tuned oscillator of the *LC* variety. Of course, a crystal-controlled BFO could be used in place of the circuit given in Fig. 19, provided the crystal was ground for the frequency needed (approximately 1.5 kHz above or below 455 kHz, lower or upper sideband, respectively). A solid-state BFO can be made very stable by using it as an *LC* oscillator, so in this application we have elected to avoid the expense of a crystal and go for what is called a *reversed-feedback oscillator.* The hookup is similar to that of Fig. 18D, which is commonly referred to as a *tickler-feedback oscillator.* A tickler-type oscillator was selected because it would lend itself to use with an inexpensive 455-kHz i-f transformer of the type contained in the Radio Shack assortment we specified for the i-f amplifier in Part V. The low-impedance secondary winding of T4 (Fig. 19) is suitable for the tickler if the correct phase relationship is assured by wiring the terminals to the circuit as shown.

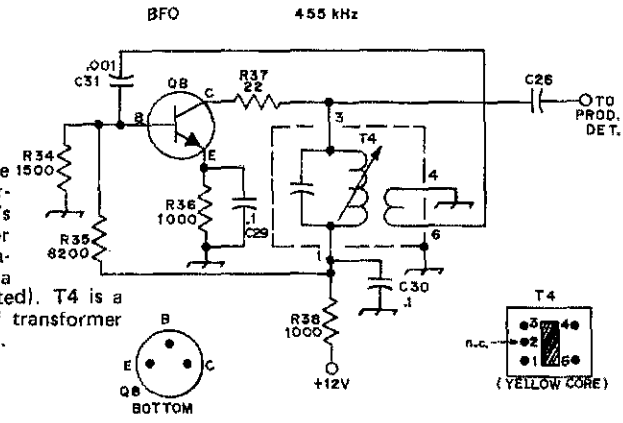


Fig. 19 — Schematic diagram of the 455-kHz BFO used in the superheterodyne version of the beginner's receiver. Resistors are 1/4- or 1/2-watt composition type. Capacitors are disk ceramic. Q8 is a 2N3641 (HEP736 can be substituted). T4 is a Radio Shack miniature 455-kHz i-f transformer (yellow core). N. C. = no connection.

Although the circuit of Fig. 19 is not a Colpitts type, as is the oscillator described in Part III, the biasing scheme discussed in that installment is applicable to the BFO. R38 serves two purposes in this instance. It lowers the collector voltage of Q8 to help minimize waveform distortion (see audio-amplifier design notes of Part II) and functions as part of the decoupling network formed by R38 and C30. Decoupling of the 12-volt supply line is desirable in the BFO module to prevent 455-kHz energy from being conveyed along the dc supply system to other parts of the receiver. BFO injection energy should reach only the desired point at the product detector. Were it to travel along the 12-volt bus it could be introduced at locations in the circuit where it might impair the performance of our receiver.

An f_T rating of roughly 200 MHz is typical for the 2N3641 used for Q8. Thus, there is a likelihood of unwanted vhf parasitic oscillation in the circuit. R37 has been placed in the collector line as a general preventive measure. It serves as a parasitic suppressor. The value of C26 was chosen to provide approximately 0.5 volts rms of BFO injection at the product detector. It should be measured between base and ground by means of an rf probe. The FET voltmeter and probe of Part I is suitable for the purpose. Larger values of capacitance at C26 will increase the amount of injection voltage. Smaller values of C will decrease it.

An RF Amplifier Stage

Early in this series there was mention of dual-gate MOSFETs. We said we would explain what they are and how to use them. In general terms they perform much like JFETs do. The notable difference is that dual-gate FETs have two control elements (gates), thereby making them more versatile than the JFET family. A JFET can be equated to a triode tube, while a dual-gate MOSFET is akin to a tetrode tube. MOS means metal-oxide silicon. The device is sometimes called an IGFET (*insulated-gate* FET).

Most radio amateurs prefer to work with gate-protected MOSFETs because the unprotected types — 3N141 for example — can be ruined by casual handling if whatever they come in contact with contains a static charge. Even the static which might be present on one's fingers could be high enough in level to destroy the micro-thin insulating material between the FET gates and the remainder of the inner device. Fig. 20D illustrates how a

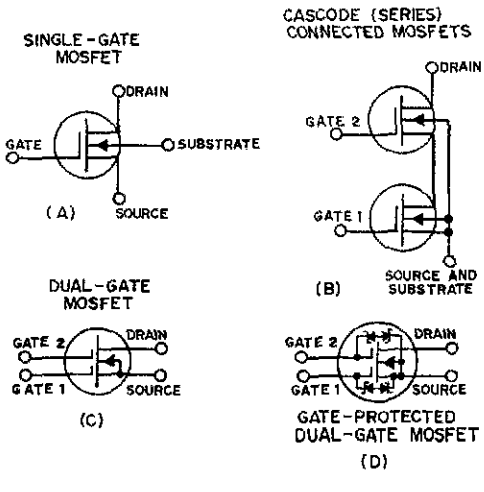


Fig. 20 — Illustrations of insulated-gate MOSFETs. The dual-gate variety (C and D) is the electrical equivalent of the series-configured single-gate MOSFETs shown at B. A gate-protected dual-gate MOSFET is shown at D (RCA 40673). Back-to-back internal Zener diodes protect the gates from damage (see text).

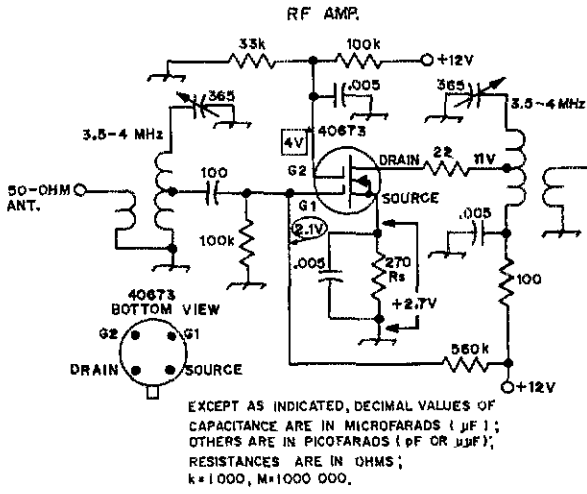


Fig. 21 — Schematic diagram of an 80-meter dual-gate MOSFET rf preamplifier suitable for use ahead of the beginner's receiver. Addition of the stage will increase the overall sensitivity of the receiver. Resistors are 1/4- or 1/2-watt composition. Fixed-value capacitors are disk ceramic. See text for coil and tuning capacitor information.

protected device is constructed. Zener diodes are formed on the substrate of the FET between each gate and the source element. The diodes will conduct if specific voltage levels below 10 are present on the gate leads, thereby preventing damage. Voltages greater than 10 will destroy the FET. The RCA 40673 dual-gate (protected) MOSFET is the choice of most amateurs. We do not, however, recommend use of the RCA SK-series equivalent. The cost of that component is so high that only the strong of heart or excessively affluent individuals should consider purchasing it. The writers like to think of the 40673 as the 6BA6 of the solid-state world. Gate No. 2 is normally used as an age control element in rf and i-f amplifiers, or as the local-oscillator injection gate in mixers. Gates No. 1 and 2 can be tied together to permit the device to be used as a single-gate MOSFET in place of a JFET. A small amount of positive voltage is required on gate No. 2 when the device is used in the dual-gate mode. This will assure optimum gain and linearity. Detailed information on MOSFETs is given (*a-la* plain language) in the *RCA Transistor, Thyristor & Diode Manual*, Tech. Series SC-115, $2.50 each. The book also contains a wealth of basic information on bipolar transistors and their applications . . . a worthwhile addition to any experimenter's library.

Fig. 21 shows how a dual-gate MOSFET can be used as an rf amplifier for the receiver in this course. Parts values and typical operating voltages are given so that those who wish to test their skill at laying out a module and assembling the circuit without our instructions can do so. Certainly, this would be a worthwhile finishing touch for the series. The tuned circuits used in the gate No. 1 and drain sections of the preamplifier can be duplicates of the one given for the mixer input of the receiver we have already described. Tap both coils approximately one third the way down from the high end. A two-section broadcast-band variable capacitor (365 pF per section) can be used to peak the preamplifier. Removal of half the plates from each gang will give greater bandspread, but "butchering" the variable capacitor is not mandatory. The coils should be mounted at right angles to one another, and separated by at least three inches. This will prevent unwanted coupling which could cause the amplifier to oscillate. The preamplifier should be connected between the antenna and the input to the mixer tuned circuit. Use

(Continued on page 41)

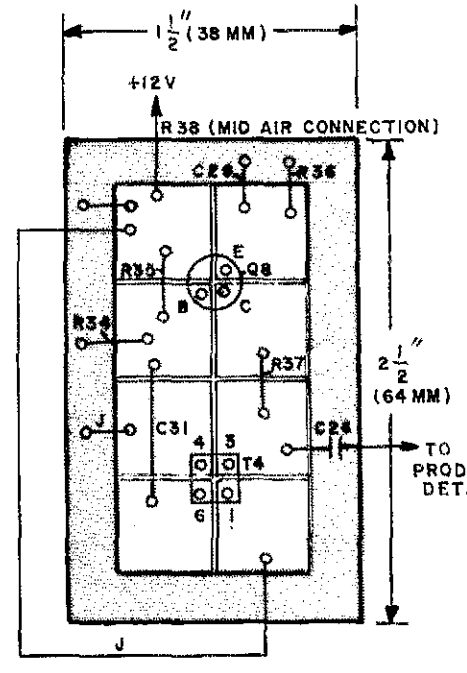
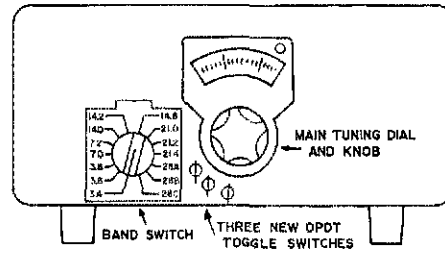


Fig. 22 — Layout details for the BFO unit. Study this and the photograph of the completed receiver before starting construction of the BFO.

Fig. 1



Additional Frequency Ranges for the Collins 75S-3

BY JOSEPH HERTZBERG,* K3JH

More Useful Coverage for a Popular Receiver

OWNERS OF the Collins 75S-3 are familiar with the limitations in frequency coverage when using this receiver. For example, WWV is available only on 15 MHz, which is a poor frequency for reception during night hours in many parts of the country, especially at times of low solar activity. Hence, the station frequency standard cannot be checked at night without a receiver capable of picking up WWV on a lower frequency. Further, FCC allocations now permit use of phone on frequencies below 3.8 and 7.2 MHz. The Collins user with the normal crystal complement has the phone bands split in two, which is cumbersome and troublesome at times. Also, for DXing on 14 MHz, it is desirable to have 14.2 MHz at the center rather than the low end of the dial, so that DX stations below 14.2 MHz can be received without band switching and dial spinning. And still further, use of one of the 200-kHz segments in the 28-MHz band for satellite reception reduces the available coverage on the rest of that band.

Modification of the 75S-3B to the "C" version is a solution to all these problems, but is quite expensive, and for most amateurs gives more coverage than is really needed. Many operators change crystals in the 75S-3B to eliminate the split in the ssb frequency bands, but that still leaves the other coverage deficiencies mentioned above, and introduces some other DXing complications.

Modification

A fairly simple modification of the 75S-3B has been made at K3JH, which resolves all the difficulties previously mentioned, and at very low cost. Provision is made for up to six additional 200-kHz frequency bands in the receiver. The six bands added are as follows:

Table I

Collins Band Switch Set At	*New Frequency Band*	*New DPDT Switch*
14.0 (1C)	9.8 to 10.0 MHz (WWV)	SW1
7.0 (1B)	4.8 to 5.0 MHz (WWV)	SW1
28 A (1E)	29.4 to 29.6 MHz (Oscar)	SW2
14.2 (2C)	14.1 to 14.3 MHz (ssb)	SW2
7.2 (2B)	7.1 to 7.3 MHz (ssb)	SW3
3.8 (3A)	3.7 to 3.9 MHz (ssb)	SW3

* 13 Landover Road, Bryn Mawr, PA 19010.

Three dpdt miniature toggle switches are used for control of these new channels. With all the switches "up," the receiver operates in the normal manner. By setting the 75S-3 band switch to the setting indicated in the table, and then throwing the corresponding dpdt switch "down," the new frequency band is activated in the receiver.

Small miniature toggles were used rather than a rotary switch, because of space limitations and mechanical interference problems within the receiver. The three small switches are mounted on the front panel just below and to the left side of the main tuning knob, as shown on Fig. 1. In this location the leads from the existing crystal bank and the rotary band switch are not excessive, and there is ample room to mount the switches without interfering with the dial.

When drilling the panel for the switches, and soldering the wires to them, it is important to take care that no drilling chips or solder drips get on the notched teeth on the edge of the main dial. A metal chip or solder splash will cause the dial to bind until any foreign material is removed. To prevent trouble, it is suggested that a V-shaped piece of paper be placed over the dial teeth underneath the switch location. This can be removed easily after drilling and soldering has been completed.

The new crystals are mounted on short pieces of No. 16 tinned wire, one end crimped and soldered to the crystal common bus, and the other end crimped and soldered to *one pin* of each crystal. The crystals are mounted with the flat sides parallel to the chassis base, and about a quarter inch above the wiring and terminals on the back of the crystal board. The crystals are very light, and the single wire support to one pin is adequate for ham use. International Crystal type EX units work very well in the 75S-3B, and are obtainable for $3.95 each, with an accuracy of .02% for any frequency needed for this modification. For WWV, it might pay to get .001% crystals if the MHz mark at the high end of the dial is against the stop. Otherwise the tolerance on .02% crystals could throw WWV outside the range. If you select a crystal which puts WWV at the low end of the dial, except at 5 MHz, .02% crystals can be used with no problem. The Collins instruction book for the 75S-3B specifies the required crystal

frequencies for a list of 200-kHz bands from 3.4 to 30 MHz, excluding 5 to 6.6 MHz. Straight interpolation can be used when the desired band falls between those that are listed. For example, 14.1 to 14.3 MHz for ssb, would use a crystal at 8627.5 kHz.

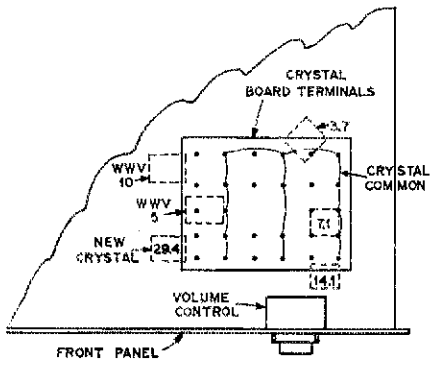


Fig. 2 — Bottom view of the 75S-3, removed from cabinet showing approximate mounting locations of new crystals.

Crystal Mounting

The crystals are mounted in the approximate positions shown in Fig. 2. There is sufficient space above the crystal terminal board to mount the six crystals for this modification, an MFJ cw filter, and an MFJ band-pass filter for ssb, so there is plenty of room. Before soldering in the new crystals, clip the proper six leads from the band switch to the crystal board terminals at the crystal board terminal end. Connect the clipped wires from the band switch, to the proper terminals of the toggle switches, being careful not to break off any terminals on the band-switch assembly. These connections are shown in the circuit diagram, Fig. 3. Then connect new wires from the crystal board terminals to the toggle switches, and another set of new wires from the remaining pin on each crystal to the proper terminal on the toggle switches, again in accordance with Fig. 3.

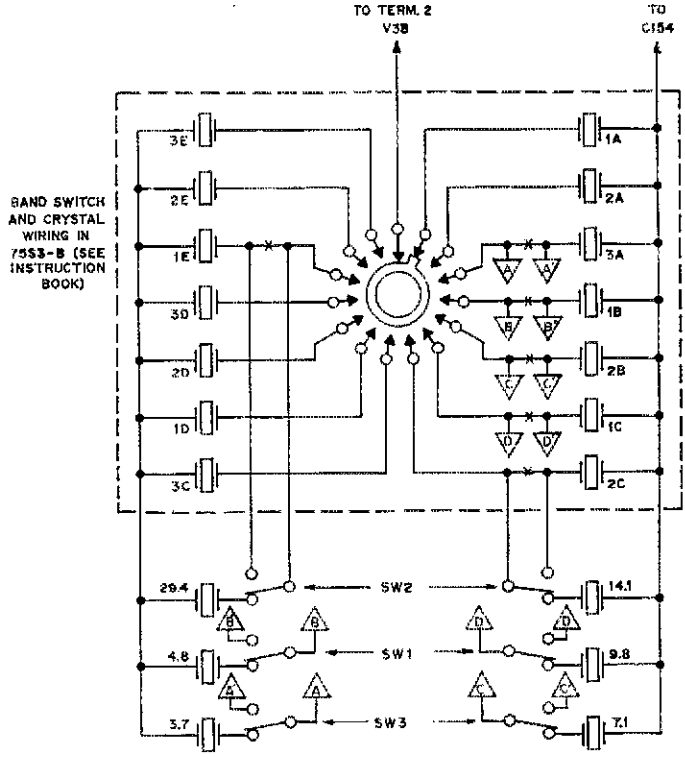


Fig. 3 — Wiring revisions to accommodate the six new crystals and associated switches. The latter are shown in the circuit in the "down" position.

It helps to have enough different wire codes to avoid any confusion, since there are quite a few wires in the small space. Very small wire can be used, such as surplus from telephone or computer switchboards. When soldering the wires to the crystal pins, heat sink the inside portion of the pin to avoid crystal damage. The wiring from the crystal board, crystals, and band switch to the toggle switches is not critical but keep the leads reasonably short and clear of the rotary switch shaft. It is easy to locate the proper terminals on the back of the band switch by observing which one is connected into the crystal circuit at each setting. Likewise, the terminals on the crystal terminal board are easy to identify by checking the frequency of the crystals already in the receiver against the crystal frequency list in the instruction book. Labeling tape can be used to identify the toggle-switch positions, and also to identify the frequencies connected to the different positions of the band-change switch.

Performance

Performance on the new frequency bands is identical to those in the unmodified receiver. The additional coverage is really very useful, and one wonders how the receiver could have been operated so long without it. Of course, crystals can be selected to fit each operator's individual needs. The only restriction is that any new crystal must be connected into the band switch on a position fairly close in frequency to that of the original crystal. This is necessary because the band switch, per se, is part of S1, which not only selects crystals

but also tunes the preselector input and the crystal oscillator output.

This is not a difficult modification, but the usual care must be taken not to damage terminals on the crystal terminal board, the rotary band switch, and other parts. Again, be careful not to get solder splashes or drill chips on the dial gear teeth.

Closing Comments

In conclusion, one to six frequency bands can be added to the 75S-3B for the cost of one or several toggle switches, plus the cost of crystals. This is much less expensive than the regular 75S-3C modification for this receiver, and is in many ways more useful to the average user. While especially designed for the Collins receiver, this principle should be applicable to other manufacturer's equipment as well.

Many think it is *sacrilegious* to drill a hole in a piece of Collins equipment, or for that matter any other piece of commercial gear. The equipment at K3JH was purchased for use, and not for trade-in at some remote date. If performance can really be enhanced, why worry about drilling a hole or changing a wire? Like anything else, one must be selective, and be careful not to botch a job, which can result in regrets if not ulcers. But a successful modification can be a source of real pleasure and pride for many years. At K3JH, the Collins changes now include the ones described here: Cw break-in and receiver muting, using the 32S-3 VFO on the receiver, built-in narrow-band cw and ssb filters, antenna attenuator, front panel adjustment of the crystal calibrator, digital readout on the transmitter and receiver, and several others. What an enhancement in performance and operating pleasure these all provide! QST

Semiconductors *(Continued from page 38)*

short connecting leads or small-diameter coax cable. A signal gain of at least 20 dB should be possible with the circuit of Fig. 21.

Final Construction and Adjustment

Once the BFO is completed you are ready to make the final hookup. Assuming you built the receiver for the direct-conversion mode, the conversion to superheterodyne operation is relatively simple. Refer to Part IV of the series and Fig. 13B. This shows the connections from the mixer to the i-f strip. The connection to transformer T3 (C19) is from the collector of Q7, Fig. 15, Part V. The BFO output is coupled to pin 4 of T2 (Fig. 15) via C26, a 68-pF capacitor. In addition to the above tie-ins, the 12-volt line should be connected where required, and chassis-ground hookups made between the various modules.

You should be ready now to adjust the completed receiver. Unmesh the plates of the tuning capacitor C10, just as you did when setting up the receiver in the direct-conversion mode. Adjust the VFO coil slug until you hear the chatter (or garble) of a sideband station. You'll probably find that the overall gain of the receiver is poor, because at this point you won't have the BFO adjusted properly. Next, adjust the slug in the BFO transformer and you'll hear the background noise come up strongly. The trick is to set the slug in the BFO transformer so that you obtain a readable signal from an ssb station. The BFO must be set so that it has the proper frequency relationship to the ssb signal in order to make the signal readable. This calls for tuning C10 slightly and readjusting the BFO slug. You'll find a setting that makes the ssb station come in clearly. Once you have the setting, the BFO need not be readjusted.

We could have added a trimmer capacitor of approximately 10 pF across the BFO transformer. However, this would add to the cost of the receiver, and it really isn't necessary to have a BFO frequency control because once the transformer slug is set, that setting is good for all signals.

You can now trim up the VFO so that it covers from 3.955 to 4.455 MHz. This should be easy to do, because in the evening you'll find the 80-meter band crowded with signals, particularly at the ssb end, up to 4000 kHz.

We didn't do any fancy packaging of the receiver. It would be a simple matter to make a cover for the unit, but we'll leave the final details up to you. It may be that you'll want to change the configuration of the various modules. Incidentally, there is nothing critical as to how they are arranged. In any case, we hope you liked the series and have learned a lot about semiconductors in the process. QST

NEW BOOKS

Ham Notebook, by the editors of *Ham Radio*. Soft cover, 6 × 9 inches. Publisher, Communications Technology, Greenville, NH 03048. Price: $3.95. Pages: 176, including index.

Ham Notebook is a compilation of the best ideas that have appeared in the "Ham Radio Notebook" column. The book consists of ten chapters as follows: antennas and transmission lines, fm and repeaters, keying and control, test equipment, oscillators, power supplies, receivers and converters, transmitters, uhf and vhf, and station and workshop.

This reviewer found many excellent ideas for the experimenter and builder. One chapter in particular (oscillators) provides hard-to-find information on the Seller and Vackar VFOs. To us, this information alone was worth more than the price of the book. Similar to ARRL's *Hints and Kinks*, this book should be in the library of any ham who likes to build his own equipment. — *W1ICP*

Hints and Kinks For the Experimenter

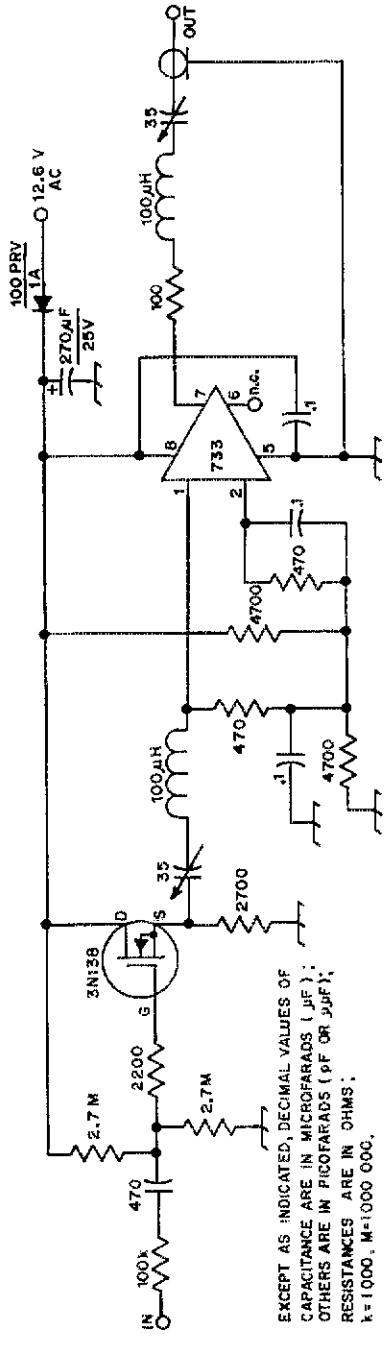
AN I-F PICKOFF AMPLIFIER

When coupling a waveform monitor or Panadapter to a receiver, care must be taken to prevent loading the receiver circuitry and thus adversely affecting sensitivity. With a waveform monitor it is desirable to pick the signal off at the grid of the last i-f amplifier to prevent picking up the product detector local-oscillator signal. The Panadapter requires a "wide" input signal to display signals up to 100 kHz away from the receiver center frequency, so the output of the second mixer is a good place to pick the signal off for this type of monitor. In either case, however, the full gain of the receiver can not be utilized by the monitor. The author experienced difficulty in obtaining an adequate display on the CRT face. The problem is compounded by the typical pickoff circuit, which consists of a large resistor or small capacitor in series with the coax cable to the monitor, attenuating the signal, particularly with i-fs of approximately 3.4 MHz.

To solve these problems I built an amplifier which uses a 3N138 as a source follower to drive a 733 operational amplifier. The 733 has a specified bandwidth of over 100 MHz with selectable gains of 10, 100 and 400. To increase the gain from 10 to 100, pins 3 and 10 are shorted together, and pins 4 and 9 are connected together (gain = 400). Shorting pins 3 and 10 gave the best compromise for my receiver-monitor combination. The series-tuned circuits were added for rejection of the receiver local oscillator frequencies as well as to compensate for selectivity in the rf and mixer stages. This will not be necessary when using the amplifier with a waveform monitor. The coupling circuit may be replaced with a 0.1-μF capacitor to provide a low-pass response.

The capacitance to ground measured at the 470-pF capacitor was 8 pF, which could not be adjusted out with the receiver tuned circuit. Adding a 100-kΩ resistor in series with the input reduced the capacitance to 3 pF. There was no measurable change in receiver sensitivity when using the internal calibrator as a reference, after the amplifier was added.

The 2200-ohm resistor at the gate of the FET and the 100-ohm resistor at the output of the IC were added to stabilize the system. Short leads, low-impedance grounds, and bypassing the IC power-supply terminals are also important measures to prevent oscillation. The amplifier was built on a piece of Vectorbord and mounted near the receiver mixer stage. The 100-kΩ resistor should be mounted between the receiver circuit

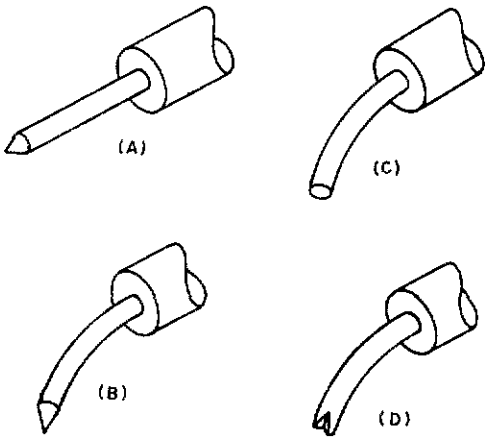


An i-f amplifier for use with a waveform monitor.

and the amplifier board. The 12.6-V ac filament line was used with a half-wave rectifier to provide a 15-V dc supply. The IC inputs were biased at 7.5 volts to simulate a plus and minus supply. – *Chuck Barrows, K7BVT*

TIP-TIP

After battling for years in trying to remove components from printed-circuit boards with the regular pointed miniature soldering-iron tips, I found a simple solution. First bend the regular pointed conical tip from shape A to shape B, as shown in the accompanying drawing. Then file off the conical point to get shape C. Finally, cut a V groove with a sharp triangular file into the nose of the bent tip to get shape D. Now you can get excellent heat transfer to the leads on resistors and capacitors merely by placing the V groove around their leads where they pass through printed-circuit boards.



Better heat transfer means you can get components out (and put them back, too) much faster than with the regular tips. You'll also reduce the risk of burning up the board. – *G. Scott Lindsay, VE3DSL*

BASE POWER SUPPLY FOR 2-METER TRANSCEIVERS

After getting my first two-meter transceiver, it amazed me how many hams beside myself were running their rigs from batteries with chargers. Feeling there must be a need for an inexpensive 12-volt power supply, I dug through the junk box and found the parts to build this unit. If all parts for this supply are to be bought new, the cost will come close to $30.

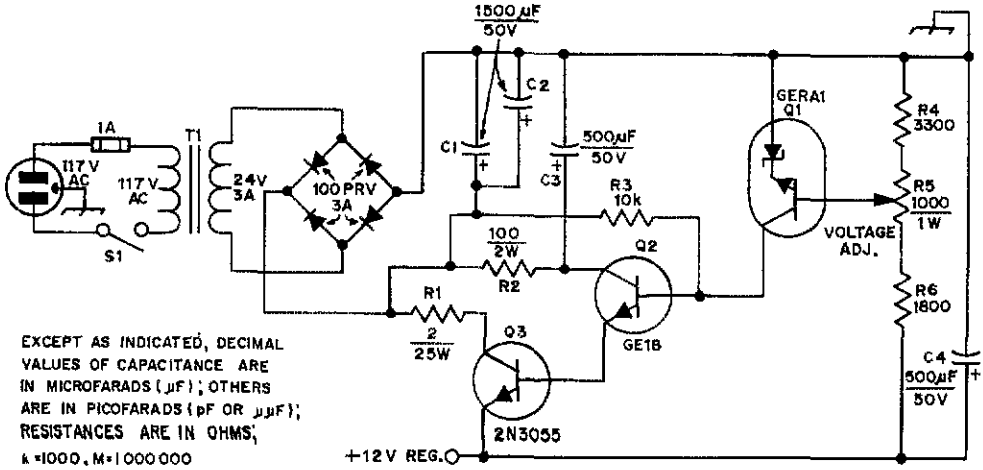
The unit is compact, considering its capability to handle over 2 A of current, because of the series regulator doing away with the need for large filter capacitors. This regulating unit has the capability of handling up to 15 A through Q3, so that it could be used to power a mobile linear amplifier as well as a transceiver. The power supply shown here is capable of the 3 A required to run a Regency HR2A.

The supply is able to go from no load to full load with only a 0.2-volt drop. This works out to be 1.6% regulation. The ripple voltage for the unit is not measurable at the 200-mA level needed to run the receiver. When the unit is supplying 2.2 A, the ripple voltage increases to a level of 0.06 volt or 0.5%.

Output voltage for the unit shown in the drawing can be varied from 11.5 to 12.5 by use of R5 in the ripple-sensing network.

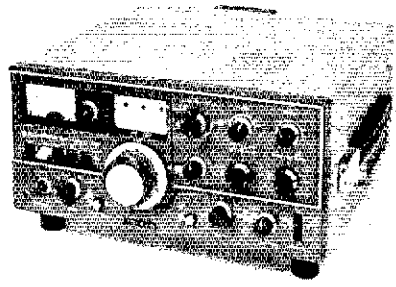
By varying the values of R4, R5, and R6 the builder can use the unit over a wider range of voltages. If the builder would like to increase the current capability of the supply, he need only increase the ratings of T1, CR1-CR4, and R1. Care should be taken not to make the wattage rating of R1 larger than actually needed, because R1 provides short circuit protection for Q3.

If the builder has difficulty in finding Q1 (GE RA1), a Zener diode in the range of 6.5 to 7.1 volts and a suitable npn transistor may be substituted. Component placement is not critical, and the only important requirement is the use of a large enough heat sink on Q3. Adjustment is accomplished by means of a dc voltmeter while adjusting R5 to provide the proper output level. – *Dennis Sommers, WB4TTY*



Recent Equipment

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



The *Henry Radio* Kenwood TS-520 Transceiver

THIS LATEST transceiver from Trio seems to be generating widespread interest. While it is similar to previously reviewed Kenwood models,[1] there are many new features that make it a truly remarkable unit. The review model arrived with optional cw filter, external VFO (VFO-520) and external speaker (SP-520). However, the power supply and transceiver are contained in one package with cooling provided by means of a very quiet fan. Also included, is a small speaker in the top side of the cabinet which eliminates the need for an external speaker when the transceiver is used in mobile or portable operation.

Using the TS-520

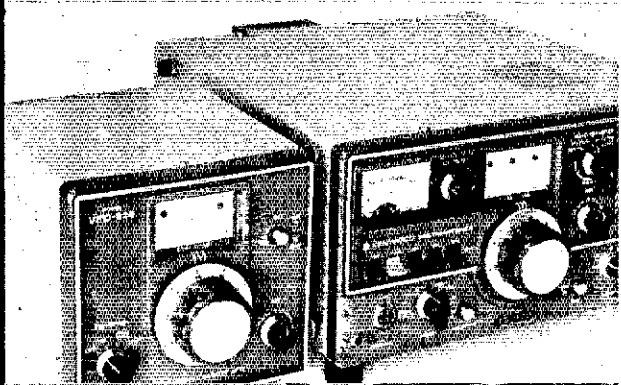
Placement of the various controls proved both convenient and comfortable for operation. While some are very closely spaced on the front panel, no difficulty was experienced in using the system. Band and mode changing is simple. Also, an LED-indicator system is provided which allows the operator to see instantly which frequency control is being used. For example, if the internal VFO was being used in the receive mode and the external VFO was controlling the transmit frequency, out-of-band operation could be possible. Because of the LED system, there is no confusion about where one is operating in the band if a careful watch is kept on the lights.

The tune-up procedure outlined in the manual is both simple and straightforward. The mode switch is placed in TUNE, with the carrier-level control set at minimum. The SEND-RECEIVE switch is moved to SEND. Increasing the carrier-control setting and adjusting the other controls (DRIVE, PA TUNE and LOAD) will establish the desired power level. The TUNE position provides reduced power input (one half), which is an excellent technique for preserving tube life. Final tuning is accomplished in the CW position, where full power can be obtained either by closing the key, or by removing it from the transceiver.

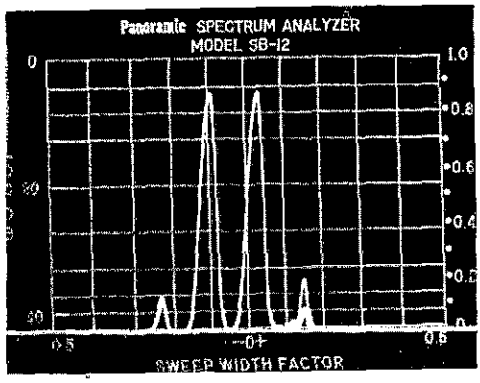
Control of the VOX circuitry, bias level, and sensitivity of the relative-output indicator is provided behind a snap-on metal plate on the left side of the cabinet. Although frequent adjustment of these controls is not required, they are within easy reach. The side-tone level adjustment is located underneath the transceiver and is reached by placing the unit in the "service" position. This control can then be adjusted with a small-bladed screwdriver without removing the bottom cover. Once set, the control need not be adjusted again unless headphones with a different impedance are used.

Provisions for monitoring a 10-MHz time and frequency standard are included in the TS-520. By

[1] Recent Equipment, *QST* for May and July, 1973.



The VFO-520 and TS-520 together. When the external VFO is wired into the system, all frequency control is determined by the switch at the left of the tuning dial on the VFO-520. A jumper plug is required for the TS-520 if this external VFO is not used.



Spectrum-analyzer display of the output of the Henry Radio Kenwood TS-520 with a two-tone 160-watt PEP input. 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 32 dB down may be seen here. 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 (PEP) is therefore four times that of a single tone, a 4:1 power ratio being equivalent to 6 dB.

pressing a button and setting the main tuning dial to 0.0, the signal will appear at this point (regardless of the band-switch setting). This mode is handy when checking the built-in 25-kHz oscillator. When using the monitor, the transmitting circuitry is deactivated so there is no chance of accidental output in this portion of the spectrum.

Another feature is that the age time constants can be selected from the front panel. This allows the operator to choose either slow, fast, or no age operation. Most operators prefer the slow time constant for ssb reception and the fast one for cw.

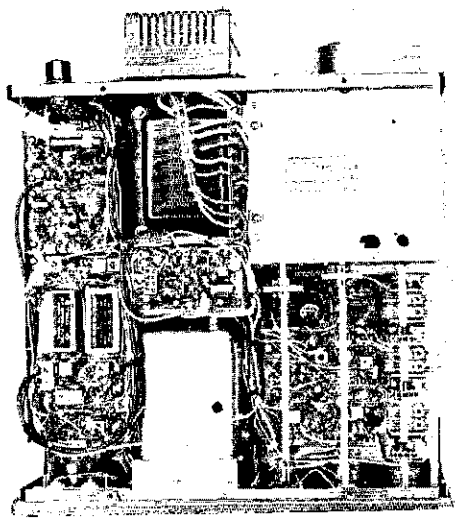
One desirable feature in the TS-520 is the multiple-option power supply. The transceiver can be powered from a 117- or 234-V source and provision is included for 13.8-V dc operation. Changes between the various voltages is accomplished simply by using different plugs on the back of the unit. Safety in carrying the transceiver is enhanced by a very hefty handle. Also, the filaments of the three tubes can be turned off for low-drain receive operation. A heater switch is provided for that purpose. In general, the package is ideal for those weekend trips and DX-peditions.

The noise blanker was found to be very helpful for eliminating ignition noise which is a common difficulty during mobile operation. One problem was encountered, however, and that was some cross modulation from strong signals on adjacent channels occured with the noise blanker switched in.

A front-panel control labeled DRIVE is actually a drive control *and* receiver preselector peaker. The receiver front end is peaked for each band with this control. At the same setting maximum drive occurs in the transmit mode.

Frequency flexibility of the TS-520 completes the picture of this versatile rig. With the optional VFO (VFO-520), any spit-frequency combination is possible on any of the five bands. Each VFO has RIT (receiver incremental tuning) which enables one to listen on either side (±3 kHz) of his transmit frequency. Actuation is accomplished by means of a push button. All of the VFO switching functions are controlled by the VFO-520 when it is connected, and otherwise by the internal VFO.

If one does not include the VFO-520 in the system, a smaller degree of flexibility can still be obtained while using any one of four optional crystals which can be selected from the front panel. Control of the fixed frequencies is by means of the FUNCTION SWITCH. All positions clockwise from the 12 O'clock position relate to the crystals. The first position utilizes the TS-520 VFO for receiving, and the transmit frequency is determined by the CHANNEL SELECTOR. The second spot provides the reverse effect (transmit on the VFO frequency, receive on the crystal frequency), and the third position is for transceiving on the



Top view of the Kenwood TS-520 transceiver. Modular construction is used throughout the unit. The final amplifier cage can be seen in the upper right of the photograph and the four crystal sockets for fixed-frequency operation are just below the power transformer.

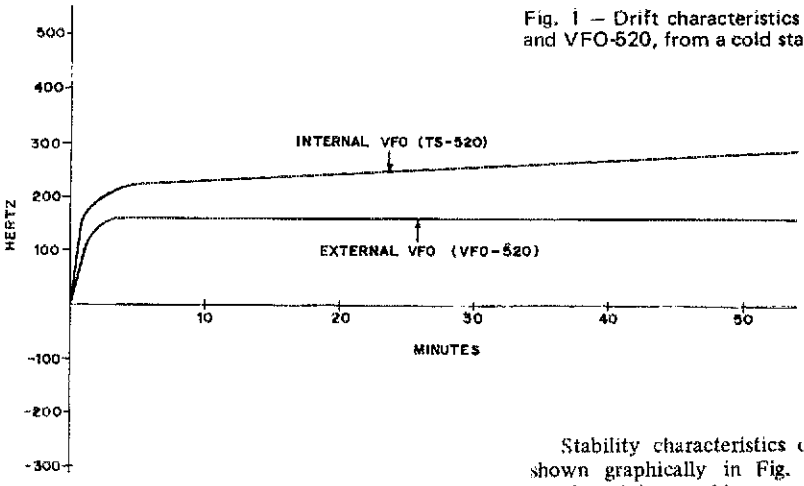


Fig. 1 — Drift characteristics for the TS-520 VFO and VFO-520, from a cold start.

fixed crystal frequency. An LED on the front panel indicates the use of this mode. The method of "spotting" the VFO-520 or fixed frequency on the TS-520 VFO is the same as with the Henry Radio TS-511S Transceiver, and described in *QST* for May, 1973. Matching of tones or listening to birdies is not necessary; just tune for perfect zero beat.

The Circuits

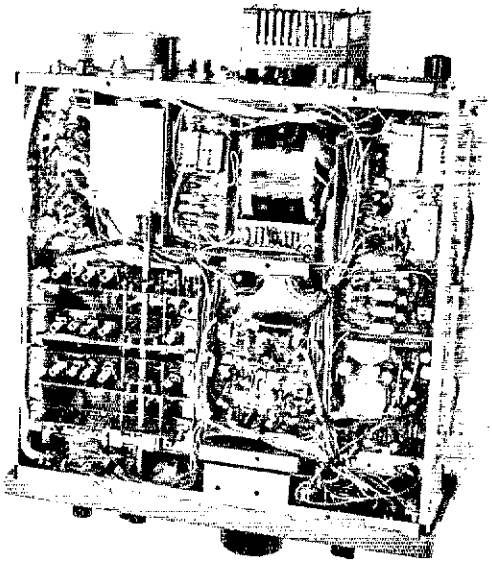
This Henry Radio transceiver is based on a hybrid design, using one 12BY7A tube as a driver and two 6146As in the final amplifier. The rest of the circuitry revolves around 84 diodes, 44 transistors, 18 FETs, and one IC. The instruction manual contains 52 pages of explanations, service information and circuit diagrams with photographs of the individual pc boards. A voltage measurements section is included for checking the different bias levels on each active device.

Stability characteristics of the two VFOs are shown graphically in Fig. 1. Both VFOs were monitored from cold start while using a frequency counter. This test revealed that the VFO-520 was the more stable one, as indicated by the nearly straight-line curve. However, the TS-520 VFO stability was well within the Kenwood specifications. Table I contains performance data for the transceiver. A dual-gate MOSFET is used in the rf amplifier stage and the overall sensitivity is quite good. On the 80-meter band there were signs of cross modulation because of some very strong signals, but the effect could be overcome by adjustment of the rf gain control. There is no selectable attenuation at the receiver front end to reduce strong-signal overload. Only two birdies were found, one at 3.738 and the other at 21.201 MHz. They did not interfere with the operation of the unit.

A speech processor is incorporated in the box and is actuated by pulling the DX PULL ON switch. The processing reduces the ALC action. Reports from on-the-air testing revealed that the processing did very little to the signal level, but it did improve the audio punch.

Extras

A transverter is necessary in order to use this transceiver on other bands (160, 6, and 2 meters). The required rf output, input and power connectors are on the rear apron of the unit. Switchable low-level rf output (1 watt) can be obtained by moving the screen switch to the OFF position. The Kenwood R-599A receiver VFO can be used in place of the VFO-520 if an additional interconnecting cable is purchased from Henry Radio. For the amateur who enjoys convenience in a portable package, the TS-520 will be more than suitable. — *WA1ABV*

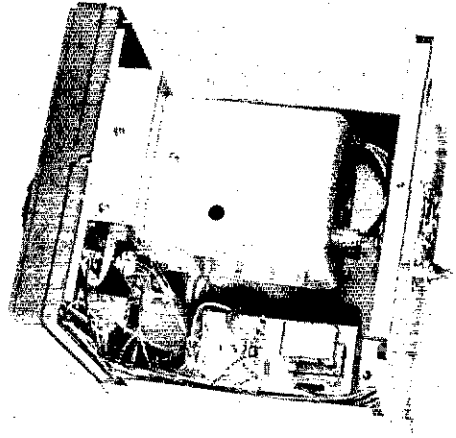


Bottom view of the transceiver. The VFO jumper plug is inserted at the upper right.

The Henry Radio
Kenwood TS-520 Transceiver

Frequency range (MHz): 3.5-4.1, 7.0-7.6, 14.0-14.6, 21.0-21.6, 28.0-28.6, 28.5-29.1, 29.1-29.7, and 10.00 MHz (receive only).
Modes of operation: Lsb, usb, cw.
Maximum input power: 200 watts PEP for ssb service, 160 watts for cw.
Sensitivity: See Table I.*
Stability: See Fig. 1*
Selectivity (at 6-dB points): 2.4 kHz for ssb, 0.5 kHz with optional cw filter installed.*
Audio output: 1 watt into an 8-ohm load.
Audio-output impedance: 4 to 16 ohms for speaker and headphones.
Amplifier tubes (rf): 6146A (2).
Power requirements: 117/234 V ac 50/60 Hz or 13.8 V dc, maximum power 280 watts (transmit).
Dimensions (HWD) and Weight: 5.9 × 13.2 × 13.2 inches, 37.4 pounds.*
Price Class: Transceiver, $630, accessories available, external VFO (VFO-520), cw filter, external speaker.
Color: Two-tone gray and brushed aluminum.
U. S. Distributor: Henry Radio, 11240 Olympic Blvd., Los Angeles CA 90064.

*Measurements made in the ARRL lab.



Top view of the VFO-520. The relay in the lower right handles the switching control.

Table I — Performance

Frequency (MHz)	*Power Output at 168 Watts CW Input*	*Receiver Sensitivity (for 10 dB Signal-plus-Noise-to-Noise)*
3.7	105	0.2 μV
7.2	105	0.18 μV
14.2	75	0.18 μV
21.2	78	0.18 μV
28.2	78	0.22 μV
28.7	72	0.25 μV
29.3	82	0.25 μV

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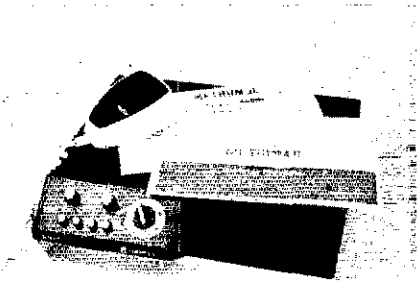


Motorola
Metrum II
2-Meter FM Radio

THE GROWTH OF amateur fm and repeaters, as a new field of endeavor and communications, has been bolstered to a great extent by the availability of rigs once used in commercial services. Motorola equipment of many types has been in the foreground almost from the start of this growth. Many hilltops are inhabited by machines built around strips that once saw duty in police, fire, taxi, or other services. Numerous mobile rigs that "talk" through the machine can be traced to a similar lineage.

The inevitable question was, "When will Motorola sell a rig for the amateur market?" The answer was provided last fall when the Metrum II made its appearance in amateur magazines and advertisements and at several conventions and hamfests. One could not help but notice the crowd of visitors around the Motorola display, peering at the transceiver from all angles, and asking questions.

Those who are astute in the communications-equipment field will recognize the Metrum II as a

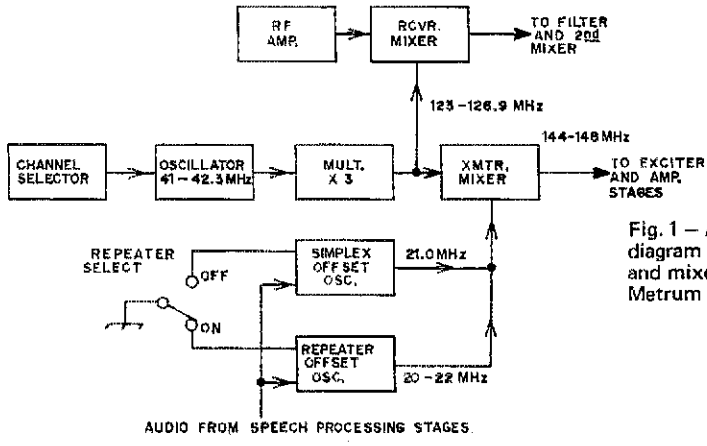


Fig. 1 – A functional block diagram of the oscillator and mixer portions of the Metrum II.

version of the Motorola line for marine use - the microphone still bears the name Modar and the white finish of that line of equipment. This is all to the good, since one would expect the circuit to be made to more exacting specifications than one for strictly amateur circles. Examination and use of the Metrum II shows that these expectations are fulfilled.

Operation

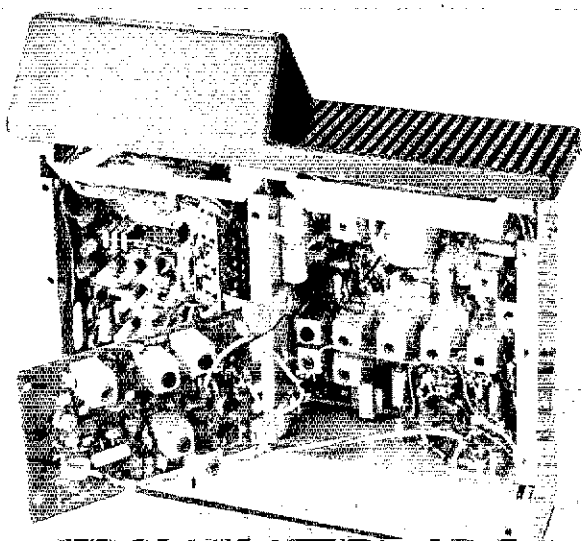
One of twelve channels may be selected by use of the front-panel control. A light behind the panel illuminates a number on the knob skirt, providing ease of viewing in dim light. There are four push-button switches on the control panel. One is for selection of high or low power, one is to change from simplex to repeat modes of operation (this means working through a repeater, not causing the transceiver to become a repeater), and the last two buttons are reserved for other use, being labeled AUX 1 and AUX 2. The knobs on the SQUELCH and VOLUME controls are large enough to be found and operated without taking one's eyes away from the road and traffic.

In the interest of reducing cost and saving crystals, the Metrum II uses a mixing system of generating the second set of frequencies needed in a transceiver. In this unit, the crystals selected by the 12-position switch are those that determine the received frequency; an offset crystal is used to provide injection energy to the transmitting mixer. Normally, this means that two offset crystals will be needed, one for simplex (same frequency) operation, and another for a 600-kHz frequency difference to work through repeaters, with the transmitted frequency being lower than that received. However, large areas of the country have elected to follow the "high-in, low-out" plan for repeaters operating above 147 MHz, thereby presenting three possible conditions of operation. Since the mode-selecting push button has only two positions, it presented a bit of a puzzle. As a temporary solution this writer elected to forego the simplex mode, and use the second position of the switch to select "backwards" repeater pairs. This is easily done by exchanging one crystal for another to obtain the correct amount of offset when transmitting.

The engineers at Motorola were also working on this problem, however, and now have a modification kit (PK 735) that will provide this additional mode plus one more at whatever separation the user finds desirable. The kit had not been received at the time of writing this review, but the author was assured that it could be installed in a short time by any technically competent person. A single-tone kit (for tone access) is also available, with the designation of PK 736.

Results

One of the difficulties facing this reviewer was to be objective in the evaluation, and to refrain



One of the circuit boards is mounted on a flexible plastic hinge, allowing it to swing out for access to components. The large oval speaker, behind the grillwork at the upper right, provides enough audio level to overcome even a car-pool discussion in full swing. The white heat sink (bottom) is quite effective in cooling the output transistors.

from comparisons. This is especially true when thinking about the size of the unit. Therefore, the question must be asked. "Does it take up more space than necessary?" Also,"Can it easily be mounted under the dash of the car?" The answer to the first is, "no," to the second, "yes," and the unit appears to be neat and impressive when fastened there. Besides, those rounded corners do not mistreat knees and shins. In all of the testing, operation, and thinking process, only one adverse thought came up: security. This is certainly no condemnation of the equipment, but rather a fact of life engendered by the times in which we live. Any user of this (or any other) equipment will do well to devise some type of alarm or security system to protect his investment. The Metrum II is held in place in the mounting tray by a pair of easy to operate snaps. More need not be said.

In general operation over several months, it can be said that the unit "performs good, like a Motorola should," to hackney an old phrase. The 25-watt output was found useful in some shadow areas, to assure a less noisy input to the repeater; the low-power (1 watt) output was sufficient most of the time. In receiving, the sensitivity leaves nothing to be desired, and adjacent-channel interference (splatter and overload) did not occur. Along with this selectivity there is one small problem that crops up – the i-f filter system is sharp, so that any repeater using more than normal deviation (±5 kHz) will chop right out of the passband on "heavy" modulation.

Each rig is shipped complete with microphone and an owner's manual. The manual includes a folded schematic diagram that opens out to an approximately 2 × 2-3/4-foot sheet. Both sides are covered with useful servicing information, including the location of alignment points, voltage charts, and alignment procedures for both transmitter and receiver. If the user desires to venture more deeply into the servicing aspect, a complete service manual is available upon request. For those who do not wish to work on the equipment, it is comforting to know that Motorola communications people can be found in all major cities. – *WISL*

Motorola Metrum II

Dimensions (HWD) and Weight: 2-3/4 × 11 × 9-1/4 inches, 7-1/4 pounds (does not include mounting tray).*
Power requirements: 13.8 V dc (nominal), 300 mA standby, 7.5 A transmit (25-watt model).*
Power output: 27.5 watts on 146.28 MHz, 25.5 watts on 147.96 MHz, without adjustment.*
Sensitivity: 0.2 μV for 20 dB of quieting; 0.1 μV to open the squelch.*
Channel capability: 12 (with provision to add more externally).
Transmitter deviation: Adjustable up to ±5 kHz.
Receiver bandwidth: ±25 kHz at –80dB.
Price Class: $500.
Manufacturer: Modar Electronics, Inc. Subsidiary of Motorola, Inc., 2100 North Meacham Road, Schaumburg, IL 60172.
*Measured in ARRL lab.

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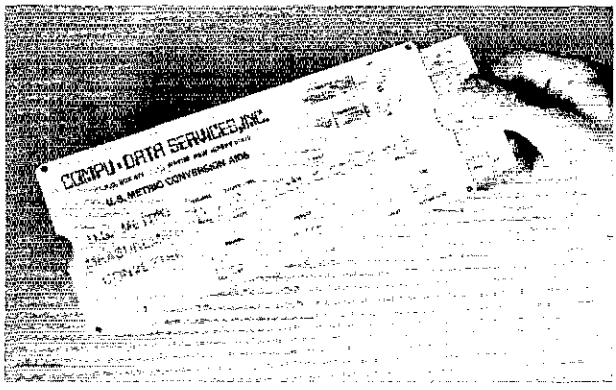
• New Apparatus

U.S.-METRIC MEASUREMENT CONVERTER

Converting between the measures commonly used in the United States (English) and the metric system is a cumbersome task at best. The slide-rule type calculator shown reduces the labor to a few simple steps. The known quantity is placed under one line and the desired measure is read off under another one. Scales are included to convert weight, liquid measure, pressure, temperature, square and cubic measure along with linear measure.

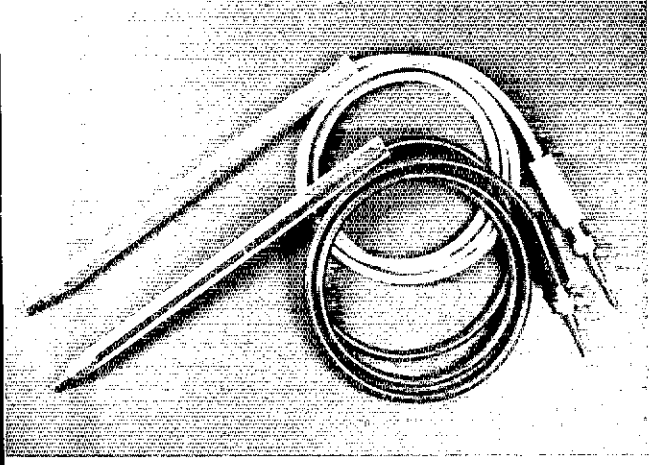
There are other aids available such as wall charts and smaller charts in loose-leaf notebook form. Among these are sizes for metric wrenches, tap drills, inch fraction to metric equivalent, and tables providing greater accuracy than is possible with the slide rule. The slide rule costs $2.50 and a listing of the other aids will be sent upon request. (The wall chart is $2 and the packet of smaller charts mentioned is 75¢. Write to Compu-Data Services, P.O. Box 471, Wayne, NJ 07470.)

When, and to what extent the United States will adopt the metric system is still a question. But economic factors are going to require that *both* systems be used in the United States for a long time to come. The above aids should be of interest to those who want to make the task of converting from one system to the other as painless as possible. – *WIYNC*



ARE YOU LICENSED?

• When joining the League or renewing your membership, it is important that you show whether you have an amateur operator license. Please state your call and/or the class of operator license held, that we may verify your classification.



•Gimmicks and Gadgets

Ball-Point Pen Test Prods

BY THOMAS G. SUCCI,* W2RUK

INSTEAD OF discarding expended ball-point pens, why not make test prods from them? Along with the usual tools for assembly, the following materials are also needed:

1) Two 3-foot lengths of test-lead wire (rubber or plastic-coated stranded wire with a different color for each lead).

2) Two connectors suitable for the instrument end of the leads, such as phone tips or clip leads. Be sure that the portion of the connector handled by the user is insulated.

3) Two discarded plastic ball-point pens.

Instructions for assembly are given for only one lead but they apply to both. First, remove the plug at the top end of the ball-point pen using the fingernails of the thumb and first finger. If any difficulty is encountered, use the sharp end of the blade if a knife, and the plug will lift easily. It can then be discarded.

Now remove the brass tip and ink tube with a pair of long-nose pliers. Grip the point on the part of the tip closest to the plastic barrel and rotate it slowly while at the same time easing it out of the barrel. Both the tip and the ink tube will slide out with little force applied.

Separate the brass point from the ink tube by pulling them apart. The empty ink tube may be saved and used as "spaghetti" for insulating wire when constructing other equipment. Next, clean the brass tip of any remaining ink by using household cleaner or solvent.

From one end of each test-lead wire, remove about 1/4 inch of insulation and tin the leads. As much insulation as necessary should be removed from the opposite ends, depending upon the type of test-instrument tip used. In the example illustrated, phone-tip type plugs were used and 1/2 inch of insulation was removed.

Insert the end of the test lead (from which the 1/4 inch of insulation was removed) into the top of the plastic barrel. Push the wire through the barrel until a length sufficient to work with comes through the tip end. Fig. 1 shows the partial assembly of one test lead. The brass tip has enough room for the wire to be inserted in the end from which the ink tube was removed. Heat the brass tip carefully with a soldering iron so as not to get solder on the outside of it. Insert the tinned lead and apply a sufficient amount of solder to flow into the brass tip around the wire.

After the tip has cooled, it may be reinserted into the plastic barrel while using a pair of long-nose pliers. The other end of the test lead is attached to the instrument phone tip by inserting the lead until the end protrudes from the opening near the threaded tip. It is then wrapped around the tip and the knurled barrel is screwed on, thereby holding the wire in place. The completed test leads with the ball-point pen test prods are shown in the title photograph. Test-prod polarity is easily identified since the different colors of the test leads show through the clear plastic barrels.

The plastic hexagonal shaped barrel lends itself to many other uses also. It may be cut to some desired length and used for hardware such as low-voltage standoff insulators, feedthrough insulators, nut starters, insulated control shafts, or tuning wands. There is no doubt that the reader can come up with a variety of his own ideas. QST

* 7 Charles St. Auburn, NY 13021.

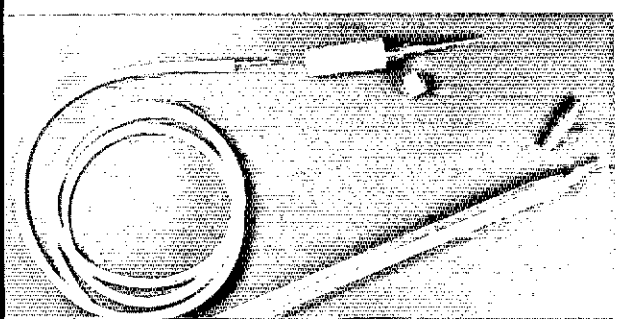
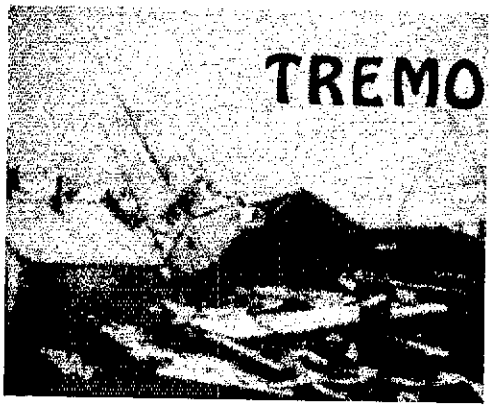


Fig. 1 -- Partial assembly of one test prod. While phone tips are shown in the photograph, other connectors may be used and the type will depend upon the particular application. However, be sure the connectors have adequate insulation in order to eliminate any shock hazard.



TREMOR HITS ALASKA

Simulated Emergency to Demonstrate Amateur Satellite Capabilities

ANCHORAGE, September 27, 1974. A massive earthquake has hit Alaska for the second time within a dozen years. With an epicenter somewhere in the Gulf of Alaska, the quake struck Anchorage late Friday evening when this community was experiencing its first snow of the season. The extent of injuries and property loss is yet unknown. Communications systems have been hard hit. Military technicians report that a severe solar storm has virtually crippled radio communication and is responsible for extreme interference to those critical few telephone lines which escaped quake damage and remain open.

Prophecy? Not exactly. This is the *simulated* situation that amateurs will be confronted with during an emergency-communications test to be conducted September 28. The purpose of the exercise is to use an amateur satellite – in this case Oscar 6 – as a primary means to facilitate disaster communications.

Several Alaskan amateurs will be originating priority (and maybe even emergency) *test* messages to locations in the lower 48 states, Hawaii and Canadian provinces and will accept messages destined to Alaska from other amateurs. Non-Alaskans are asked to originate a message or two to a fictitious person or organization in Alaska and be prepared to accept messages from the Alaskans for relay or simulated delivery. Radiograms in response to messages received are desirable. Complete preamble, address, text and signature – standard ARRL format – should be used. An example of a text in a message to Alaska might be "Please advise if you are safe." All communications into and out of Alaska must be through the satellite.

Amateurs who participate are encouraged to send a brief report including number of messages handled, precedences and how the messages were routed (e.g. through Oscar to KL7MF, made simulated telephone delivery, relayed through the Texas Traffic Net, etc.) and send the report to headquarters to aid in the evaluation of the test. Include your comments and suggestions.

Prepare now. Review amateur emergency and traffic handling procedures. Check equator crossings to determine which passes will be most successful for the desired communications. The same guidelines that apply to the annual ARRL Simulated Emergency Test (see December, 1973, *QST*, page 57) are applicable. If you haven't tried Oscar, set yourself up for 2-meter transmit/10-meter receive operation and experiment before the test, or visit another amateur who is an Oscar enthusiast. Write ARRL for a special packet "Oscar – Emergency Communications." Please include s.a.s.e.

The test period begins at 1600 UTC, September 28 and ends at 0600 UTC, September 29. The satellite will be on for the entire time. Most all U.S. and Canadian amateurs will be able to work into Alaska on at least two or more passes.

Here's an opportunity for us all to gain experience in emergency communications using one of the newest means available. Through this experience we may gain insight into a new way to supplement our emergency communications capabilities so that in a future disaster, we'll be in an even better position to provide the communications that have made amateur radio a *service*. QST

RULES FOR LIFE MEMBERSHIP

1. A paid-up Life Membership in the League shall be available to any Full or Associate Member, other than a Family Member, upon payment of a fee twenty times the annual dues rate, and upon approval of the application by the League's Executive Committee.
2. The Life Membership fee for U.S. applicants is currently $150, for Canadian applicants $170, and for other applicants $180, all in U.S. funds.
3. An applicant may choose an alternative time-payment plan of eight quarterly installments ($18.75 for U.S. applicants, $21.25 for Canadians, and $22.50 for others), to be completed within a two-year span. In such instance, he will be provided an interim two-year Full Membership certificate. Upon completion of the payments, Life Membership will be granted.
4. Life Memberships are non-transferable, and dues payments are non-refundable. In the event an applicant is unable to complete payments on the installment plan within the two-year span, he will be given a term of membership, at the annual dues rate, commensurate with payments received.
5. Other licensed amateurs in the same family, and at the same address, of a Life Member may retain or obtain Family Membership upon payment of the annual dues of $2, but without receipt of *QST*. The dues of the Family Member may be prepaid for any number of years in advance, but there is no special rate.
6. Life Membership is also available to blind amateurs upon payment of a fee of $40, without the receipt of *QST*. QST

RTTY DX Sweepstakes

1) The contest commences at 0200 GMT Sat. Oct. 5 and ends at 0200 GMT Mon. Oct. 7, 1974. The total contest period is 48 hours but no more than thirty (30) hours of operation is permitted. Time spent listening counts as operating time. The non-operating period can be taken at any time during the test and summary of times on and off *must be included in the score sheet.*

2) The contest will be conducted on the 3.5, 7, 14, 21 and 28 MHz amateur bands.

3) Use the ARRL Country list, except that KL7, KH6 and VO are to be considered as separate countries.

4) The message is to consist of a message number, time in GMT and zone.

5) All two-way RTTY contacts with stations in one's own zone will receive two points. All two-way RTTY contacts with stations outside one's own zone will receive points listed in the Zone Chart (shown below, provided by CARTG). Stations may not be contacted more than once on any one band. Additional contacts may be made with the same station if a different band is used for each contact.

6) *100 bonus points will be added for every VE* and VO station contacted. Bonus points to be added to total score at end.

7) Entries will be classified as either single operator stations or multioperator stations with one transmitter. Individual operators of multi-operated stations may submit their logs singly and compete as single operators instead of submitting a group log, if desired.

8) A multiplier of one is given for each country worked including one's own on each band. E.g. if one country is worked on 3 bands, 3 multipliers are given. *Each U.S.A. and Canadian District will be considered a separate country.*

9) CARTG log sheets are available for s.a.e. or IRCs. Separate pages will be used for each band. Information contained will be band, exchange numbers, times in GMT, station calls, zones, countries, exchange points and power. Logs must be received not later than December 1, 1974. Send them to: Canadian Amateur Radio Teletype Group, 85 Fifeshire Road, Willowdale, Ontario, Canada. M2L 2G9

10) To score, the total exchange points multiplied by number of countries worked, multiplied by number of continents (maximum 6). Finally bonus points added.

Awards

Ten plaques will be sponsored by the CARTG, the *RTTY Journal*, and a Group Member. Other awards include the following. High U.S.A. Score, Gold Medallion and Ribbon – *RTTY Journal*. High Canadian Score – Canadian Director's Award. High Score for Green RTTYer (no participation in previous RTTY test), Sidney Burnett Memorial Plaque. Most two-way 80 meter contacts, plaque – C.A.R.T.G. *SWL printer high* score, plaque – C.A.R.T.G. High score using low power (under 100 watts), plaque – *RTTY Journal*. High score for multi-operated stations, plaque – C.A.R.T.G. Certificates for top scores in each U.S.A. and Canadian District and each country. QST

YOUR zone / CORRESPONDENT zone

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
1	2	14	10	13	16	18	22	20	25	30	36	37	39	21	22	19	20	17	11	25	29	29	22	22	16	28	25	31	39	35	14	36	25	29	34	39	40	47
2	14	2	15	8	7	16	16	12	16	23	24	30	30	12	14	16	19	20	19	19	25	31	26	30	28	35	35	40	50	50	25	47	14	21	21	28	33	36
3	10	15	2	8	11	9	13	14	18	21	28	28	30	26	28	27	29	27	21	32	37	39	32	31	24	37	33	40	43	35	11	32	29	35	35	42	48	50
4	13	8	8	2	3	8	10	8	12	18	22	25	27	19	21	23	26	26	22	26	33	37	32	34	30	40	38	44	52	44	20	40	21	28	26	33	40	41
5	16	7	11	3	2	9	9	6	10	17	20	24	25	18	20	22	26	26	24	35	32	38	33	35	31	41	40	45	54	46	22	41	19	27	24	31	38	39
6	18	16	9	8	9	2	4	7	10	12	19	19	21	27	29	31	34	33	29	34	40	46	40	40	33	46	42	49	47	38	17	32	28	36	30	37	44	43
7	22	16	13	10	9	4	2	4	6	8	15	15	17	26	29	31	35	36	33	33	40	47	42	44	38	50	46	53	49	40	22	34	26	34	26	33	40	38
8	20	12	14	8	6	7	4	2	5	11	15	18	19	22	24	27	31	32	30	29	35	42	38	42	37	47	46	51	54	44	24	38	21	30	23	30	38	36
9	25	16	18	12	10	10	6	5	2	8	10	14	15	23	25	29	33	35	34	29	35	43	41	45	41	50	50	55	52	45	28	38	21	30	20	27	35	32
10	30	23	21	18	17	12	8	11	8	2	9	7	9	31	33	37	41	43	41	36	42	51	49	52	45	58	52	54	44	37	28	31	28	36	24	29	38	31
11	36	24	28	22	20	19	15	15	10	9	2	9	7	26	28	33	36	41	43	30	34	42	45	51	52	49	55	49	42	41	37	35	22	29	16	20	28	23
12	37	30	28	25	24	19	15	18	14	7	9	2	3	35	37	41	45	49	48	39	42	49	53	58	50	52	52	48	37	33	32	27	31	37	34	27	33	27
13	39	30	30	27	25	21	17	19	15	9	7	3	2	33	35	40	43	48	49	37	39	46	50	56	53	50	52	46	34	34	35	29	29	34	21	24	30	24
14	21	12	26	19	18	27	26	22	23	31	26	35	33	2	3	6	10	14	18	7	14	21	19	25	27	27	30	32	42	49	34	55	5	10	15	19	21	26
15	22	14	28	21	20	29	29	24	25	33	28	37	35	3	2	5	9	13	18	6	11	18	17	23	27	25	29	30	39	47	36	54	6	7	15	18	19	25
16	19	16	17	23	22	31	31	27	29	37	33	41	40	6	5	2	4	8	13	6	10	15	12	18	22	21	24	26	36	42	33	49	10	9	20	21	21	27
17	20	19	29	26	24	35	31	33	41	36	45	43	10	9	4	2	5	12	7	8	12	8	14	19	17	20	22	32	38	32	45	14	10	22	22	20	27	
18	11	19	21	22	24	29	33	30	34	41	43	48	49	18	18	13	12	7	2	18	19	16	10	10	9	16	15	20	30	32	21	36	23	21	33	34	30	38
19	25	19	32	26	35	34	33	29	29	26	30	39	37	7	6	6	7	12	18	2	6	14	14	20	26	21	26	25	34	43	39	49	8	3	15	16	15	22
20	29	25	37	33	32	40	40	35	35	42	34	42	39	14	11	10	8	12	19	6	2	9	11	17	24	16	21	20	28	37	40	43	14	6	18	16	11	19
21	29	31	39	37	38	47	46	42	43	51	42	49	46	21	18	15	12	12	16	14	9	2	6	10	18	17	13	11	21	29	36	35	22	14	26	22	15	22
22	22	26	32	32	33	40	42	38	41	49	45	53	50	19	17	12	8	6	10	14	11	6	2	6	13	8	12	14	24	30	31	37	22	16	29	26	21	28
23	22	30	31	34	35	40	44	42	45	52	51	58	56	25	23	18	14	11	10	20	17	10	6	2	8	6	6	10	20	24	26	30	28	22	35	33	25	32
24	16	28	24	30	31	33	38	37	41	45	52	50	53	27	27	22	19	14	9	26	24	18	13	8	2	13	9	15	23	30	18	27	32	28	41	40	33	40
25	28	35	37	40	41	46	50	47	50	50	49	52	50	27	25	21	17	15	16	21	16	7	8	8	13	2	6	5	16	22	31	29	29	21	33	29	21	27
26	25	35	33	38	40	42	46	46	50	52	55	52	52	30	29	24	20	16	15	26	21	13	12	6	9	6	2	7	15	18	25	25	34	27	40	35	27	32
27	31	40	40	44	45	49	53	51	55	54	49	48	46	32	30	26	22	20	20	25	20	11	14	10	15	5	7	2	10	17	31	24	34	25	36	30	22	26
28	39	50	43	52	54	47	49	54	52	44	42	37	37	42	39	36	32	30	30	34	28	21	24	20	23	16	15	10	2	9	15	32	42	33	39	31	24	24
29	35	50	35	44	46	38	40	44	45	37	41	33	34	49	47	42	38	45	32	43	37	29	30	24	30	22	18	17	9	2	24	7	51	42	47	40	33	32
30	14	25	11	20	22	17	22	24	28	28	37	32	35	34	36	33	32	29	21	39	40	36	31	26	19	31	25	31	15	24	2	22	39	42	46	53	52	56
31	36	47	32	40	41	32	34	38	38	31	39	27	29	55	54	49	45	40	36	49	43	35	37	30	37	29	25	24	32	7	22	2	57	48	47	42	38	34
32	25	14	29	21	19	28	26	21	21	28	22	31	29	5	6	10	14	18	23	8	14	22	22	28	32	29	34	34	42	51	39	57	2	9	10	14	18	22
33	29	21	35	28	27	36	34	30	30	36	29	37	34	10	7	9	10	15	21	3	6	14	16	22	28	21	27	25	33	42	42	48	9	2	13	12	12	18
34	34	21	39	26	24	30	26	23	20	24	16	34	21	15	15	20	22	27	33	15	18	26	29	35	41	33	40	36	39	47	46	47	10	13	5	7	15	15
35	39	28	42	33	31	37	33	30	27	29	20	27	24	19	18	21	22	28	34	16	16	22	26	33	40	29	35	30	31	40	53	42	14	12	7	2	8	6
36	40	33	48	40	38	44	40	38	35	38	28	33	30	21	19	21	20	24	30	15	11	15	21	25	33	21	27	22	24	33	52	38	18	12	15	8	2	7
37	47	36	50	41	39	43	38	36	32	31	23	27	24	26	25	27	27	31	38	22	19	22	28	32	40	27	32	26	24	32	56	34	22	18	15	8	7	2
38	44	37	52	44	42	48	44	41	38	38	29	33	30	26	24	25	23	27	33	20	15	16	22	29	33	20	26	19	20	29	51	33	23	16	19	11	5	6
39	15	6	20	14	13	22	22	18	21	29	27	34	34	6	8	9	12	14	16	12	19	24	20	25	25	29	30	34	44	48	28	50	10	16	20	24	28	32

1973 VE/W Contest Results

THE MEMBERS OF THE Montreal Amateur Radio Club Inc., take pleasure in announcing the results of the 1973 VE/W Contest.

Conditions were atrocious, with activity on 15 and 10 being practically non-existent. Northern lights created havoc on 20 for much of the contest period. However, this did not prevent Lee, VE7BDJ, from obtaining high scores in Canada once more. W4YWX took top honors for U.S.A.

SOAPBOX

Where were all the VE2s. – (W9UDK). Band condx during the better part of the contest really bad. – (WB8HWE). Enjoyed the contest. – (WA7QWF/7). Condx sure not good, didn't hear a single station on 10 or 15. 80, 40, and 20 very erratic. – (WB4SXX/4). When do you stop tapping CQ VE on your coffee cup in the morning? – (WB4BUL). What do I have to do to get Yukon on? Go there myself? – (WA3ATX). F.B. contest. Really enjoyed and appreciated here. – (WB2EOO). Very low activity. – (WB2EKW). Would like to have seen more VE participation. – (W1GNR). Only wish there were more VE stations available. – (WA1JSD). Always enjoy this contest. Looking forward to next year's already. – (VE7HQ). Can't explain it, but nothing went wrong, equipmentwise. – (VE6CAB). Three separate visits from "Murphy." – (VO1KE). Even the SB 220 doesn't help when you don't have the propagation. – (VE4IE). Lots of northern lights activity, which is only good news if you want to work short skip on 20. – (VE8OO). Sounded like a real good one this year. Back next year as usual. – (WA5SOG). First VE/W Contest. Had fun. – (W5UBW). Good contest. Second only to DX Contest. – (WA6LOS). My first contest, and it proved to be nothing spectacular. I got my feet wet anyway. – (WB8HWF). See you again next year. – (WB9BJO). Enjoyed the contest. Felt it was a great boost for my cw speed. – (VE3ECJ). Not enough VEs. – (WB6TYA). We had a ball. – (WA6TJV). If I don't win soon, I'll just have to increase my power to 10 watts. – (W4ZRJ). Looking forward for much greater activity in 1974. – (VE2IZ).

The station first listed in each section is the certificate winner for that section. Examples of listings: W6DGH – 3696-88-21 or final score of 3696 points, 88 contacts, 21 band sections.

HIGH SCORES

CW

VE7WJ	352,554	W4YWX	16,310
VE3LUE	186,960	WA3ATX	10,230
VE3BFK	123,372	K4CYU	9176
VE3DUS	98,648	K4PUZ	8632

PHONE

VE2DU	65,450	WB8IJI	5856
VE4IE	64,528	KØSGJ	5328
VE2GA	31,390	W4WSF	3640
VE7IQ	29,520	WA9MGY/7	2080

Scores

VE CW

Newfoundland

VO1KE 53,658-271-99

Labrador

VO2AG 5256-73-36

Prince Edward Island

CI1AXC 4096-64-32

Nova Scotia

VE1EK 22,578-159-71
VE1ARJ 7998-93-71

Quebec

VE2WA 81,360-339-120
VE2DGS 65,632-293-112
VE2RN 33,150-221-75
VE2OJ 32,250-250-75
VE2BYR 20,088-162-62
VE2GS 11,220-102-55
VE2IZ 6880-86-40
VA2MO (VE2AJD, opr.) 6396-82-39
VE2BZE 5270-85-31
VE2BKS 120-10-6

Ontario

VE3LUE (VE3EDC, opr.) 186,960-296-152
VE3BFK 123,372-447-138
VE3DUS 98,648-418-118
VE3GCE 77,504-346-112
VE3GFY 75,008-293-128
VE3FGU 70,286-311-113
VE3MI 58,206-327-89
VE3GYQ 50,160-264-95
VE3HUM 41,400-230-90
VE3ECJ 36,860-388-95
VE3BQL 18,330-195-47
VE3DH 17,010-135-63
VE3GQU 12,084-106-57
VE3EEW 782-23-17

Manitoba

VE4VV 17,537-137-64
VE4OK 10,148-118-43
VE4UN 3422-59-29

Saskatchewan

VE5XC 43,120-245-88
VE5XU 7360-80-46

Alberta

VE6CAB 6492-89-39
VE6AUR 1596-38-21

British Columbia

VE7WJ (VE7BDJ, opr.) 352,554-877-201
VE7QQ 36,960-231-80
VE7CE 32,072-211-76
VE7HQ 27,048-161-84
VE7AKJ 18,144-162-56
VE7BBL 10,476-97-54
VE7TO 2610-45-29
VE7BPB 1520-38-20

Northwest Territories

VE8OO 33,174-291-57
W3DNY/VE8 7396-86-43

U.S.A. CW

Alabama

K9JMA/4 4224-96-22
K4ZGB/4 1932-69-14
W4RAL 1500-50-15
WA4AUX 1118-43-13
WB4ZQF 682-31-11

Arizona

W7AYY 3520-88-20

Arkansas

WA5SOG 3168-72-22
K5KDG 1100-50-11

Colorado

WØOUI 3196-94-17
KØVFN 1980-66-15

Connecticut

W1GNR 2700-75-18
K1GUD 990-45-11

Delaware

K3KAJ 378-21-9

Eastern New York

W2AZO	3534-	93-	19
WB2EOO	1078-	49-	11
W2ECV	864-	36-	11

Eastern Pennsylvania

WA3ATX	10,230-	165-	31
W3ADE	2550-	85-	15
WA3ABN	1860-	62-	15
W3HMR	540-	54-	10

Eastern Massachusetts

W1AQE	1440-	60-	12
W1DMD	1272-	53-	12

East Bay

K6ZM	4400-	110-	20
W6BB (WB6CEP, opr.)	3852-	107-	18
WA6JKK	2108-	62-	17
WB6PLJ	1800-	50-	18
W6RQZ	616-	44-	7

Georgia

W4YWX	16,310-	233-	35
K4BAM	726-	33-	11

Hawaii

KH6IJ	1482-	57-	13

Idaho

W7HZL	748-	34-	11

Indiana

WB9IND	396-	33-	6

Illinois

W9UDK	7488-	144-	26
K9UIY	5250-	125-	21
WB9HAD	4452-	106-	21
W9LNQ	3244-	76-	22
K9YBC/9	1690-	65-	13
K9WR	1320-	55-	12
W9HVP	858-	39-	11
W9IPT	700-	35-	10
K9BQL	486-	27-	9

Iowa

WØMHK	4284-	102-	21
WAØVDK	2736-	76-	18
WAØTKK	2664-	74-	18

Kansas

WØIUB	1904-	56-	17
WAØTKJ	860-	43-	10

Louisiana

W5WG	5060-	115-	22
W5OB	3200-	80-	20

Los Angeles

W6DGH	3696-	88-	21
WA6TLV	492-	41-	6

Maryland-D.C.

WA3TDZ	1092-	39-	14

Michigan

W8KRR	5760-	120-	24
W8KPL	1300-	50-	13
WB8DSG	528-	24-	11
W8TZZ	480-	20-	12

Mississippi

W5AMZ	2272-	71-	16

Minnesota

WØHW	4104-	114-	18

Missouri

WØQWS	2208-	69-	16
WBØFLT	522-	29-	9
WBØFMT	36-	6-	3

Montana

W7GKF	7020-	130-	27

New Hampshire

WA1JSD	1764-	64-	14
WA1LNH	1240-	62-	10

New Mexico

WB5AXC (WA5MHR, opr.)	192-	16-	6

N.Y.C.-L.I.

WA2DLV	2720-	85-	16
W2FVS	2448-	68-	18
WA2LLF	1620-	54-	15

North Carolina

WB4SXX/4	3784-	86-	22
W4OMW	1056-	44-	12

Northern Texas

K5VTA	5100-	102-	25
WA5BFR	130-	13-	5

Ohio

K8MFO	7182-	133-	27
W8GOC	3528-	84-	21
WB8KMC	240-	15-	8

Oklahoma

WA5VAP	2448-	68-	18

Oregon

WA7GOO	720-	30-	12
WA7WGL	520-	26-	10

Orange

WA6ORJ	210-	15-	7

Sacramento Valley

W6KYA	1680-	56-	15

San Francisco

W6BIP	5852-	133-	22

San Joaquin Valley

K6TG	1222-	47-	13

Santa Barbara

K6QPH	5980-	130-	23
W6PRP	2808-	78-	18
WB6KBI	640-	32-	10

Santa Clara Valley

WA6GZG	660-	30-	11
WB6WFO	640-	32-	10
WB6IYA	120-	15-	4

Southern New Jersey

K2SBW	1012-	46-	11

Tennessee

K4PUZ	8632-	166-	22

Southern Texas

W5BWM	2112-	66-	16

Virginia

K4RDU	7668-	142-	27
WB4BIL	4240-	106-	20
K4IAF	3060-	85-	18
K4GEL	1040-	40-	13
W4ZRJ	10-	5-	1

Washington

K7KGP	1876-	67-	14
W7WMY	720-	36-	10
K7TAK	400-	25-	8
WN7UOV	20-	10-	1

Western Massachusetts

W1DWA	1404-	54-	13

Maine

W1GKJ	1504-	47-	16

Western New York

WB2FNS	792-	36-	11
W2ECW	770-	35-	11

Nebraska

WBØGOB	3740-	110-	17

Utah

WA7QWF/7	1200-	50-	12
WA7RCT	924-	42-	11

South Carolina

K4CYU	9176-	148-	31
WA4LBA	720-	30-	12

Canal Zone

KZ5NG	2816-	64-	22

Kentucky

W4KFB	560-	35-	8
WB4YAF	406-	29-	7

Southern Florida

K4IQJ	4752-	108-	22
K4KOD	4312-	98-	22
W4GUU	2204-	58-	19
W4ZTB	2160-	60-	18

Wisconsin

WB9BJO	2822-	83-	17
W9HE	2040-	60-	17
WB9JEB	576-	32-	9

MULTI OPERATOR CW

Ontario

VE3MRC/3 (VE3s BCC BRJ CJZ CXE CZA FBI FML GAS GZY)	108,960-	454-	120
VE3MCH (VE3s AXV CPU DDL)	10,304-	112-	46

Southern Florida

WA4BTR (+WN4s BTQ GAJ)	1060-	53-	10

Los Angeles

WA6TJV	1032-	43-	12

Ohio

WB8OFR (+WB8ILW)	1288-	46-	14

Tennessee

W4VSV	1472-	46-	16

Western Pennsylvania

K3CR (WA2QNT K3SDQ WA3s BHN GUL WB5BHN)	1690-	65-	13
WA3SES/3 (+K3OYB)	1034-	47-	11

VE PHONE

Nova Scotia

VE1DI	7474-	101-	37

Quebec

VE2DU	65,450-	385-	85
VE2GA	31,390-	215-	73
VE2IZ	6230-	89-	35
VE2GS	1000-	25-	20
VE2BIQ	8-	2-	2

Ontario

VE3AC	17,680-	136-	65
VE3GDO	1728-	35-	23
VE3EFX	1360-	34-	20

Manitoba

VE4IE	64,528-	296-	109
VE4AR	1386-	33-	21

Alberta

VE6MC	8034-	103-	39
VE6BAG	6888-	84-	41
VE6ATT	6248-	71-	44

British Columbia

VE7IQ	29,520-	180-	82
VE7JB	29,232-	252-	58
VE7DKI	320-	20-	8

Northwest Territories

WA4ZDE/VE8	3720-	60-	31

U.S.A. PHONE

Alabama

WA4UAX	36-	6-	3

Arizona

WA9MGY/7	2080-	80-	30
WA7SCS	480-	30-	8
W7AYY	368-	23-	8

Connecticut

WA1MNM	660-	30-	11

Delaware

WA3TVS	1472-	46-	16

Eastern Pennsylvania

WA3ABN	88-	11-	4

Illinois

WB9GLI	336-	24-	7

Iowa

WAØTKK	612-	34-	9

Michigan

WB8IJI	5856-	122-	24

Missouri

KØSGJ	5328-	111-	24
WØEEE	660-	33-	10
WBØFLT	408-	34-	6
WBØFMT	16-	4-	2

New Mexico

W5UBW	1872-	72-	13
WB6IPR/5	378-	21-	9

N.Y.C.-L.I.

WB2EKW	32	4-	4

Northern New Jersey

W2FCR	486-	27-	9
WA2BIQ	416-	26-	8

Northern Texas

WA5BFR	396-	22-	9

Ohio

WB8HWF	780-	30-	13

Oklahoma

WB5IOQ	156-	13-	6

San Joaquin Valley

W6PSQ	792-	44-	9

Santa Barbara

WB6KBI	168-	12-	7

Southern Texas

WB5DDI	1456-	52-	14

Virginia

W4WSF	3640-	91-	20

Utah

W7OGU	308-	22-	7
WA7QWF/7	48-	6-	4

San Diego

WA6LOS	434-	31-	7

MULTI OPERATOR PHO

Ontario

VE3FKU (+VE3US)	110,644-	398-	13
VA3KAR (VE3s DCX DXY)	37,464-	223-	84
VE3MCH (VE3s AXV CP DDL)	12,420-	136-	45

British Columbia

VE7UBC	144,838-	521-	13

Tennessee

W4VSV	1380-	69-	10

Los Angeles

WA6IJV	240-	15-	8

New Mexico

WB5AXC (WA5s MHR VA WA6FCB)	522-	29-	9

CHECK LOGS

VE2PJ, VE3FAH, VE6U VE7AJ, W3ARK, K5DE WB8NTY, WØEEE, SH W4-12

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

FCC Chairman Speaks . . .

An Address by Richard E. Wiley before the
ARRL National Convention in New York City

President Dannals, distinguished guests, ladies and gentlemen:

IT IS A GREAT PLEASURE to help you celebrate the 60th birthday of the American Radio Relay League at this well attended national convention. This year, of course, also marks the 40th anniversary of the Communications Act of 1934 and the FCC it created. Furthermore, it is the centennial of the birth of Herbert Hoover who, as Secretary of Commerce before he became president, was deeply involved in planning for the regulation of radio as a national resource. Mr. Hoover comes easily to mind in these surroundings, since for some 20 years up to his death in 1964 he resided here in the Waldorf Astoria. There are, moreover, other reasons why the name Hoover would be favorably considered by this audience. I understand that the President's older son, the late Herbert Hoover, Jr., (perhaps better known as W6ZH) was President of ARRL from 1962 to 1966, and that several of the Hoover grandchildren are also hams.

Herbert Hoover once told the story of the representative of a religious sect in southern Illinois who, in those days just prior to the formation of the old Federal Radio Commission, called on Hoover and his aides at the Radio Division of the Department of Commerce. He asked for the assignment of a frequency to the broadcast station the sect proposed to build. The representative explained that the world was coming to an end in about six months, and that broadcasting the news of this climax would be the best way to notify as many people as possible to get ready. With the engineer's practicality for which he was famous, Hoover asked how much money the sect had. The reply was $200,000 -- representing life savings and proceeds from sale of the members' property. "We suggested to them," said the Secretary of Commerce

> (T)hat they use the $200,000 to buy time on existing stations instead of building a single station for themselves. Thus, they could get a lot wider audience (and besides) a station would be of little use to them after the world had come to an end.

Today, of course, an even more practical and less expensive solution would be available. Anyone claiming such a momentous natural disaster as the end of the world could call upon the nearly 800,000 amateur radio operators around the globe to get the word out. Based upon their magnificent past records of emergency relief in war and peace, I am convinced that many hams would still be at their sets when the very crack of doom reverberated through the atmosphere.

In that connection, let me commend those radio amateurs who rendered prolonged and very humane service to the American Red Cross last April when a tornado ripped through the city of Xenia, Ohio, killing 30 persons, wounding more than 1,000 and rendering nearly 5,000 persons in the area homeless. As the FCC was informed by a letter from the Red Cross's Dayton chapter, the relief effort "was immediately provided excellent communications by a well organized and well disciplined contingent of radio amateurs." This service was sustained for eight days until telephone service was restored to the necessary aid stations, shelters, medical facilities and supply depots. For the first four of those days, the service continued 24 hours a day.

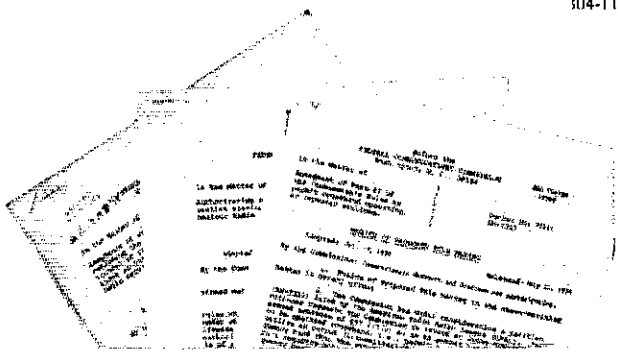
Although I have recounted this story at some length, it is far from unusual. Hardly a week goes by in the national press without a similar recounting of yeoman efforts by amateur radio operators to speed relief in an emergency or simply to perform a good deed for someone in need. Thus, I am glad to share with you the concluding words of that letter from the Dayton Red Cross:

> After observing these dedicated hams in operation, it hardly seems proper to allude to them as radio 'amateurs,' for their performance can only be regarded as 'professional' in every way; and we would like to voice our firm support of the Amateur Radio Service.

And today, ladies and gentlemen, I would like to voice *my* personal firm support of the Amateur Radio Service. I began my speech this afternoon by

"I would like to voice my personal firm support of the Amateur Radio Service"

mentioning a few anniversaries which we celebrate this month and this year. Perhaps one of the most important -- for the FCC and for you as licensees -- relates to an event which took place just one year ago. I refer, of course, to the presentation made by the ARRL before a special meeting of the full Commission in July of 1973. As a result of that discussion, and others that we have held at the



FCC with various groups of hams, the Commission – and particularly this Commissioner – has developed a much greater understanding of amateur radio's needs and interests. And it seems to me that this is in your interest, our interest and, indeed, the public interest.

In this connection, I was particularly pleased with the most recent visit of the League's officers and directors to the Commission on May 10 and with the extensive interchange of views which took place on that occasion. Although League attendance was limited to board members and key staff, I see by your July issue of *QST* that the ARRL membership has been fully apprised of the details of this gathering.

Compliments W1AW

Speaking of rapid dissemination of information, I can't let this opportunity pass without recognizing the dedicated effort that goes into programming your organization's headquarters station, W1AW. This station not only provides a wealth of instructional and technical material to its amateur listeners but also makes possible prompt dispatch of the latest news from the FCC. As you know, the Commission expressly recognized the value of this and similar services last February when it amended Section 97.112 of the Rules to permit the control operators of certain amateur club stations – engaged primarily in instructional and informational transmissions – to be paid for their services.

While your amateur news network undoubtedly is accurate and very current, I thought it might be useful nonetheless for me to recount some of the more recent actions the Commission has taken – notably since the visit of the ARRL board in May – to simplify and hopefully improve our regulation of the Amateur Radio Service.

Let me begin by discussing repeater stations. This continues to be the fastest growing segment of amateur radio, with well over 1,000 stations having been licensed to date. As you know, the Commission reached a decision in rule making Docket 18803 in September of 1972 and – with the very considerable assistance of the ARRL – issued guidelines to the new rules in January of 1973. Throughout the rest of that year, up to and including the present, cooperation between the League and the Commission has been outstanding in developing licensing procedures under the new rules and in disseminating vital information. Among the results of this pragmatic working relationship have been the following modifications of those 1972 repeater rules:

Height above average terrain (HAAT) and effective radiated power (ERP) information now constitute logging information only, rather than data required for an application;

Maps submitted to show ERP no longer are restricted to those with 50-foot contour intervals;

Shutdown of stations in case of malfunction need not be strictly automatic; and

Requirements for antenna information have been simplified.

More recently, of course, the Commission has acted on two repeater petitions filed by the ARRL and has offered, on its own motion, a third proposal generally endorsed by the League. The three actions, all in the form of notices of proposed rule making, are:

1) *Docket 20073*, to permit linking of amateur repeater stations beyond the two-station operation now allowed by Section 97.89(c) of our Rules. In filing its petition for rule making, the League argued that (a) such repeater networks are valuable in emergencies, but that amateurs would be unwilling to construct them unless they could also be used for other purposes and (b) chains longer than two links would be fashioned mostly in less-populated areas where the relative spectrum inefficiency of repeaters is not so critical.

2) *Cross-band Operation.* Acting on an ARRL petition, the Commission approved just last week a notice of proposed rule making asking comments on whether to permit cross-band operation by repeater stations. As you know, present rules require a station to have the input or receiving frequency within the same frequency band as the output or transmitting frequency. Although the League felt that such permission would involve only the mere lifting of a current restriction, and thus could be accomplished without rule making, the Commission believed that there may be sufficient differences of opinion – and other reasons as well – to warrant the notice-and-comment approach.

3) *Automatic Control.* In deciding on its own last week to issue a notice seeking comments on this topic, the Commission pointed to significant improvement in repeater station operating practices since adoption of the repeater rules in late 1972. It accepted the staff's recommendation that

"I was particularly pleased with the most recent visit of the League's officers and directors to the Commission"

it is "now timely to consider rules for repeater control systems which do not require the full-time personal attention of the control operator." The staff noted that the proposal had been discussed with the ARRL in general terms, and endorsed by the League to that extent. By automatic control, the notice of rule making is referring to "some means other than having the control operator on duty at all times." Only repeater stations and auxiliary link stations used in repeater systems are being proposed for automatic control in the Amateur Radio Service.

Exam Procedures and Call Signs

While repeater stations clearly are a hot topic just now, we recognize that radio amateurs have

other important interests. Among these are the procedures and the identifying symbols, or call signs, by which you and your stations are certified or licensed. In this area the Commission has:

Undertaken a joint experiment with the Civil Service Commission – initially confined to areas served by FCC field offices in Anchorage, Chicago, Detroit, Honolulu and Seattle – which is designed to increase substantially the number of locations where candidates may be examined and to improve generally the services provided to applicants;

Requested comment on a proposed amendment to Part 97 (Docket 20092) which would make any Amateur Extra Class licensee eligible to apply for any available call sign of his choice;

Approved, just last week, the issuance of a notice of proposed rule making which would formalize the procedures and standards by which

"The Commission is required to look to the overall public interest in each and every one of the services it regulates"

applications for commemorative amateur station licenses – such as the 87 we granted in connection with the 1974 World Telecommunication Day – may be received and evaluated. The application criteria are broad enough to be liberal, but the mere stating of them should reduce what might be an undue subjectivity in our present practices. We also hope to simplify the present application. I might mention that, in recognition of the value to the recipient in awarding such licenses, we have of necessity imposed a filing fee not now required.

Some of you will recall that while I was a Commissioner, Chairman Burch assigned to my supervision the work of a Broadcast Re-Regulation Task Force. That effort, which has produced more than 200 specific rule changes – notably in the area of technical simplification – not only continues apace, but the idea has spread to other bureaus as well. In April, the Cable Television Bureau appointed a re-regulation task force of its own. And, of most importance to you, the Safety and Special Radio Services Bureau – under the very competent leadership of Charlie Higginbotham – has been engaged for a number of months in a variety of rule consolidations and simplifications.

These efforts reflect, I hope, my concern that the Commission avoid what I call "over-regulation," a danger to be avoided as much as a failure to regulate where needed. I think such a concern is particularly well placed when we deal with what is, after all, an amateur service conducted by people who have an abiding love affair with their favorite hobby and avocation. Moreover, there is an additional factor which justifies, in my mind, a measure of re-regulation in the amateur service. I refer to your well-known record of self-policing and self-regulation. In this connection, I particularly commend the League's splendid Official Observer program which I understand has sent out thousands of notices – *from* amateurs *to* amateurs – pointing out errors and deficiencies in operating practices.

Other Rules Actions

Let me specifically point to recent Commission actions, in addition to the modifications in our repeater rules, which reflect the spirit of re-regulation:

In response to a petition by the Maryland FM Association, the Commission in June amended Section 97.103 of the Amateur Rules to delete requirements for the logging of certain information by amateur stations. Basically, we concluded that the individual amateur could best decide what entries he should make in his log – for his own protection, if for no other reason. We deleted such previously required entries as power input, emissions, frequencies, call signs of stations contacted, and time and dates of operation. All that is now required is an entry of the date operation was initiated and terminated at any specific location unless third party traffic is handled or unless another amateur is designated as control operator of the station. Our guess is, however, that most amateurs will continue to keep logs simply because they want to.

Following an initial notice of inquiry, the Commission in June of this year issued a notice of proposed rule making which essentially would permit local civil defense organizations to enroll amateurs and their stations into whatever kind of emergency communications system they desire. Authorizations of each individual operator by the Radio Amateur Civil Emergency Service (RACES) would no longer be obligatory. Deadline for comments, incidentally, is September 15.

I should caution, by the way, that much of this re-regulation in the Amateur Service is premised on the strong self-policing capability among amateurs

"Congratulations on your 60th anniversary. May you have many more!"

that I previously mentioned. Should that commendable discipline relax too far in the future, the Commission may need to re-examine its approach.

Finally, let me complete my report on Commission activity in your area by mentioning two miscellaneous items of interest to you: first, the Commission's recent decision not to reallocate to Emergency Medical Services (EMS) frequencies in the 420-450 amateur bands (ARRL, as you know, had opposed such a reallocation); and second, the Commission's April grant on waiver – pending adoption of rules – of the first license in the forthcoming Amateur-Satellite Service. For the interim, the license to Space Station W3OHI specified operation under the regular amateur service, with waivers approved where applicable.

CB Matters

Even as I list a few of the "things that we've done for you lately," I recognize that a considerable shopping list of amateur problems remains. Still at the head of the agenda, perhaps, is the rule making proposing creation of a new Class E Citizens Radio Service by transferring 224-225 MHz from the Amateur Service. The several thousand ARRL members who commented on this

proposal before October's deadline – and the League's General Counsel in his formal filing – pointed out that Class E problems potentially are international as well as national, and that the request for the reallocation (from the Electronics Industries Association) was based on a number of unjustified assumptions. At this time, I cannot comment any further on the Class E matter – except to say that any rumors that the Commission has prejudged the issues (rumors to which the League's 1973 annual report alludes) are speculative indeed.

Citizens band operation also exists in Class D, of course, and we at the Commission are aware of continuing amateur concerns over this service. Without in any way detracting from your position as a largely self-disciplined and indeed highly professional force of radio operators, I feel I must repeat that the Commission is required to look to the overall public interest in each and every one of the services it regulates. Because we recognize the need for strict enforcement of justifiable rules, the Commission during fiscal year 1974:

Created three specially trained and equipped teams to devote themselves entirely to Class D enforcement, with a fourth team being added this summer;

Initiated approximately 1,000 actions involving monetary forfeitures, some 700 revocation proceedings and 100 cease and desist proceedings;

Obtained with the aid of the Justice Department some 20 criminal convictions, including the well known Bennett case tried in Detroit; and

This past June, in conjunction with local police authorities, operated 40 special inspection stations in 21 states for two days for the purpose of checking licenses in CB use by truckers. Of the 36,000 trucks passing through the stations, nearly 20 per cent were found to be equipped with Class D equipment, and more than half of these units were found to be unlicensed.

These figures leave no doubt of the magnitude of the CB enforcement problem. On the other hand, we are also aware of the growing interest in the Citizens Radio Service, in which, in 1973-74, the Commission received some 342,000 applications – a nearly 50 per cent increase over the previous year. As in any popular activity, where the numbers engaged far outman those who monitor the activity, a regulatory body must strike some public-interest balance between too many regulations, which it cannot enforce, and too few regulations, which may result in harm to other users of radio-frequency equipment and to the public generally. I can assure that we are working hard at the Commission to achieve such a proper balance and also a program which will make the Citizens Radio Service a useful one to those American citizens who desire to utilize it.

The theme of cooperation between the FCC and the League, as well as amateurs generally, has been sounded several times during my remarks – and it is fitting one on which to conclude. Of the 75 petitions from radio amateurs and their organizations now on file at the Commission, 44 deal in some way with changes in the present system of operator privileges and requirements. The Commission now refers to its study of this area as the "restructuring of the Amateur Service," although that phrase is not necessarily intended to signal wholesale revisions. It appears wise to make some changes in licensing structure, but these will not be sprung upon you by surprise. Instead, we will continue to brief amateur groups and their media to try to get early reactions to our proposed regulatory actions. Later, the formal process of rule making will take place with an opportunity for written comments.

Because we particularly value the comments of the League – whose 90,000 members represent about a third of the amateurs licensed in the United States and Canada – let me stress that they are helpful not only in ultimate rule making but also in the earlier petition stage. To the extent that your hard-working staff can manage it, we at the FCC would welcome ARRL's reactions to petitions that may affect the Amateur Service – which I guess is another way of saying that if you want a job done right, give it to a busy group.

Thank you, and congratulations on your 60th Anniversary. May you have many more! QST

Dipole Antennas *(Continued from page 34)*

ested in more details on the concept. Supplemental information has been published by Buchanan.† Attempts by this writer to calculate antenna sizes and coil values for dual-band antennas have met with some success. From calculations and experiments to date, it appears that with only two loading coils (one each side of center), the antenna must always be greater than a half wave in physical length for the higher of the two frequency bands. In other words, any 80/40 meter arrangement, for example, apparently would need to be longer than 66 feet from tip to tip. However, much work also remains to be done in this area.

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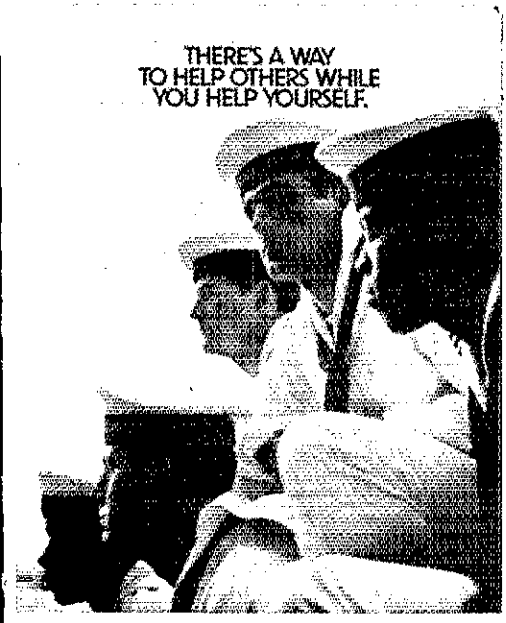
Strays



WA8RGJ (top center) is one of several U.S. Coast Guardsmen on the color cover of an elaborate CG recruiting brochure. While serving at the Loran station, Baffin Island, Ed worked 165 countries from /VE8. He is now assigned to the Hq. radio station at Alexandria, Va., and active from club station K4CG.

During a recent visit to the Goddard Amateur Radio Club, Skylab Astronaut Dr. Owen Garriott W5LFL was presented with the original artwork for the WS3SKYIQSL card by club president Hugh Turnbull W3ABC. Others participating (l to r), Wade Stonesifer W3QND, Juan Jaramillo HC1JJ President of the Ecuador Radio Club, David Friedman WA3MJV, Ted Jaramillo WA3FUM, and Robley Sawyer, WA3PTO.

I would like to get in touch with . . .

. . . amateurs in the Philadelphia-South Jersey area interested in BASIC and FORTRAN IV computer program who would like to form a net on 20 meters. WA2FXO.

. . . anyone interested in starting a chess net on Tuesdays and Thursdays at 2300 GMT. WN2UAF.

. . . amateurs who are chefs, pastrycooks, or in the bakery trade. G2DRT.

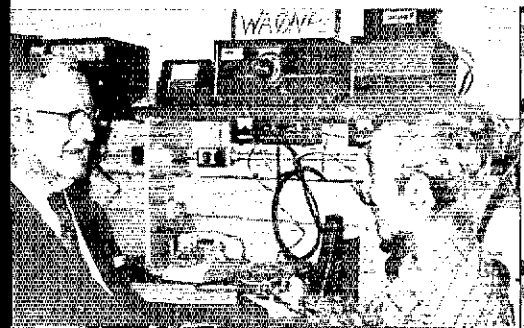
. . . those interested in LF and VLF listening and constructing equipment for those frequencies. W8BHO.

. . . amateurs who are emergency medical technicians or who are active in volunteer amateur service. WB2BRQ.

Sometimes old duffers who have a habit of operating their ham station everyday will get the OW worried about the electric bill. I'm an old duffer myself but I solved the problem by using what I call my "fun fund." I picked up a little piggy bank and placed it near my transmitter and everytime I go on the air I drop in a nickel, a dime, or a quarter and at the end of the month I never worry about the electric bill. So put in a fun fund and enjoy yourself. — *W1VA*

No generation gap here! The Saint Paul Radio Club's oldest and youngest members, George Lovering, KØQOQ, a spritely 90, and 11-year-old John Sederberg, WNØKZF, are shown operating the Ramsey County, Minnesota, Civil Defense Station, WAØNPZ, during a recent club meeting.

For nearly 40 years there probably hasn't been a more famous or familiar piece of ham apparatus than the Astatic D-104 mike. Its creator, Creed Chorpenning (center), now retired and active from Vero Beach, Florida as W4TZ, recently enjoyed a reunion after more than 50 years with an old friend, W3TTV (left), at a hamfest in Pittsburgh. Sharing the happy occasion was W3LFS.



Sister Cities

"Communication is the Key"

THE OAXACA

BY JOHN TROSTER,* W6ISQ AND
M. C. "CHUCK" TOWNS, ** K6LFH

This is a story about how amateur radio got together with the Sister City program in Oaxaca,

IT WAS a great day in the south central Mexican city of Oaxaca(pronounced Wah-hocka). Bands played, citizens cheered and fiesta was in the air. The Governor of the State of Oaxaca cut the ribbon stretched across newly-paved Copernicus Road and then, with the band playing, led an entourage of mayors, civic leaders and other dignitaries on a delightful walk up the hill to a new observatory which was then properly dedicated.

Any casual radio amateur observer moving along with that holiday crowd would have to reflect that perhaps this day marked the beginning of a potentially new, productive and exciting area of involvement for amateur radio – because in a new building adjacent to the observatory was a new amateur antenna, and inside the building was a specially built room housing an amateur station. The entire celebration, together with the observatory and amateur station, was a direct result of the cooperative Sister Cities International program which linked Oaxaca, Mexico, with Palo Alto, California.

The Sister Cities program is sponsored by the private, non-profit Town Affiliation Association which is headquartered in Washington, D.C.[1] The purpose of this group is to further international understanding through the affiliation between cities of the U.S.A. and cities in other countries, each pair dedicated to the exchange of cultural things, ideas and people.

* 82 Bellbrook Way, Atherton, CA 94025.
** President, Project Oscar, 1305 Regan Lane, Saratoga, CA 95070.

Oaxaca and Palo Alto have been Sister Cities some 12 years. Until this dedication, however, the extent of the civic exchanges between the two cities had been principally those of town leaders and the annual north-south migration of high school students of both cities during the summer. However, in March 1970, Marvin Vann, Observatory Manager and Technical Director of the Space Science Center at Foothill College led an expedition of astronomers to a small town near Oaxaca to witness solar eclipse. Upon Mr. Vann's return, he was invited to show his pictures at the annual meeting of the local Sister Cities program. This was his introduction to the Sister Cities idea, and he was impressed.

Mr. Vann re-visited Oaxaca and offered to construct and equip an observatory if that city would provide the architecture, labor and location. The offer was accepted and the cooperative planning and construction began.

At about the same time the idea of using amateur radio in Sister Cities started. The Project OSCAR Board of Directors authorized purchase of amateur equipment which was to be used in a special radio room at the new observatory, and Chuch Towns, K6LFH, was named as project coordinator. In due course, the observatory was constructed as a civic project and Mr. Vann emplaced his astronomical equipment. Two days before the dedication, the radios were set up with the help of several local Oaxaca amateurs who had been located by the Oaxaca Sister Cities people.

EXPERIENCE

Amateur Radio and Sister Cities International
A chance to help each other

Mexico. Some ideas are discussed about possible Sister Cities Communications Nets and how the potential goodwill generated could work for the benefit of both the cities and amateur radio.

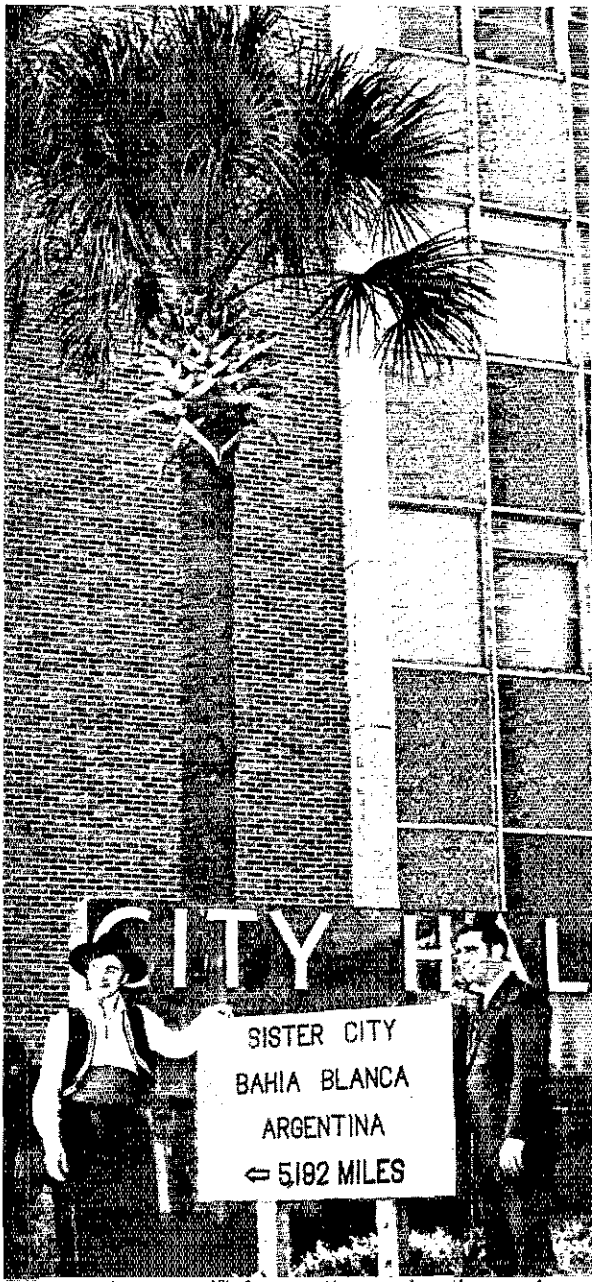
For amateur radio, the entire Oaxaca experience created a new and exciting vehicle – a city-to-city radio link which could now furnish a service for international goodwill between neighbors.

If you, the reader, are intrigued with the Sister Cities idea for your home town, and the potential role of amateur radio in sustaining and complementing the friendship, and you would like to do something about it, contact City Hall to find out if your town has a Sister City, or contact the Town Affiliation Association[1]; they will be happy to send you a list by state and foreign country of all Sister Cities.

Getting Involved

You can then present your radio club with the idea that they work with your local Sister City group to give direct amateur communications. A good way to start is to get the local DXers involved. Ask them to write a ham in your Sister City and take it from there. If the other station does not have all the required equipment (or whatever) or even if there is a language barrier, do not pull the switch. There are ways to overcome these obstacles which an imaginative and resourceful group can conjure up. If your Sister City does not have amateurs, you might work through your own school to see if some local high school hams

[1] Town Affiliation Association, Suite 206 City Building, 1612 "K" St. NW, Washington, D.C. 20006.



Long-time Sister Cities enthusiast Ernie Bracy, W1BFA. *(Far left.)*

◀ Guests of the Town Affiliation Association discuss amateur radio participation. L. to r., Vic Clark, W4KFC, ARRL First Vice President; L. Arthur Minnich, Bureau of Educational and Cultural Affairs, Department of State; M. C. "Chuck" Towns, K6LFH, Project Oscar President; ARRL General Manager John Huntoon, W1RW.

A number of U.S. cities have active programs of Sister City cooperation; Jacksonville, Florida and Bahia Blanca, Argentina, are examples. ▶

would undertake the project of introducing students in the other city to amateur radio and to help and encourage them to get licensed. In short, don't be limited just because nothing in the way of amateur radio exists there now. Take it on as a challenge, and club project, to work through your Sister Cities group to develop two-way communication. *You might even consider a visit there on* vacation to develop personal acquaintance and to survey the needs. Once the avenue is opened, the entire civic program should unfold easily and those resulting warm, rewarding results will begin to flow.

It is important that the operator on the other end be a national of that country. Although this may not be possible in the beginning stages where there are a limited number of licensed operators, one of the objects of the entire exercise is to help train your friends in your neighbor city.

Before attempting any third party communication on behalf of a Sister Group, be sure to find out if such third party traffic is allowed in the other country. Many countries do not allow this sort of communication at this time, in which case you will be limited to amateur-to-amateur contacts only. However, don't let that deter you. Much goodwill can be generated by the amateurs themselves. Perhaps successful amateur participation in handling worthwhile communication between Sister Cities (where third party traffic is allowed) can be used to show the non-participating countries that it would be to their advantage to allow such communications.

Amateur radio communication within the Sister Cities program need not be limited to civic and cultural exchanges. For example, a group of amateur operators and technical people might be trained to establish life-saving communication for your Sister City in times of emergency or disaster. Not only could they handle the usual generalized communications needs at such a time, but they could also tie in with the Medical Amateur Radio Council (MARCO) which offers the possibility of giving immediate and continuing on-the-air medical advice through this active group of hams in the medical profession.

Regardless of how you and your Sister City get together on the air, remember to stay rigorously within the amateur regulations of that country (and your own too, of course). For example: do not supply your counterpart operators with equipment that will operate at higher power levels than allowed. If your Sister City is within a country which does not allow third party traffic, you will hardly impress them about your good intentions if you encourage your counterpart to operate illegally. And be assured that the other country will know what its amateurs are doing.

Advantages to Amateur Radio

There is potentially some very beneficial "fall out" from any such cooperative program between amateur radio operators of the world and Sister Cities. In 1979, there will convene a World Administrative Radio Convention (WARC).

Suppose that amateur radio can expand its work with the Sister Cities concept as a vehicle. Beginning in countries where third party traffic is permitted, amateurs could demonstrate their ability to fill a communities communications needs. Surely, a country which witnesses first hand what the amateur can do to fill a civic – even national – need will be much more favorably disposed to cast *its vote for the amateur position at the WARC. The* goodwill which the amateur can generate via Sister Cities could, just possibly, be reflected someday by a "thank you" vote from some country. And let there be no doubt about it – amateur radio will need every kind thought and vote they can muster at that conference.

The annual meeting of the Sister Cities International will take place September 18-21 in Phoenix, Arizona, with the appropriate theme, "Communicating For World Peace." About 500 delegates from over 12 countries are expected to attend. And this year for the first time amateur radio will be there. There will be a symposium by amateurs, led by ARRL Vice President V. Clark, W4KFC, to discuss the potential role for the amateur in the Sister Cities program, and, in addition, there will be an amateur booth where delegates may ask questions. Barry Goldwater, K7UGA, who lives in Phoenix, will be principal speaker. He will also put his station on the air from the convention headquarters so delegates can observe amateur radio in action. Maybe some of them could even talk home! And the delegates who come from countries who do not allow third party traffic will perhaps begin to ask, "why not?"

It may appear that there is not much in common between a radio station in an observatory in Oaxaca, Mexico and a World Administrative Radio Convention in 1979. However, if the friendship and exchanges of ideas which that little Oaxaca station can provide could be multiplied by *many pairs of Sister Cities throughout the world*, the case for amateur radio could be greatly strengthened amongst those who now lack understanding.

Both ARRL and the Sister Cities headquarters group in Washington believe wholeheartedly that amateur radio can provide a significant and vital communications role by way of giving that personal touch so important to international understanding. And in so doing, the amateur can gather tremendous good will for his own cause. You can help. QST

Strays

W7SLZ claims Utah is a "rare" state because most of its urban areas are separated from the east by a mountain range which blocks low angle radiation headed east. We think it's those wide, open spaces and just plain not enough ham-type people.

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Remember the "Let's Talk Transistors" series by Robert E. Stoffels, WB9ESH? We've put together a reprint booklet of this 9-part transistor primer and it is available from ARRL for $1 including postage.

Mutual cooperation is the theme and this is the second meeting of the Western Pennsylvania Repeater Council held on June 30, 1974. The council has a membership of repeater trustees from Western Pennsylvania and West Virginia. Shown in the photograph; seated left to right: Donald Zupon, W3MIF, frequency co-ordinator for Western Pennsylvania and Bob Ketzel, WA3OKK, EC for Washington County. Standing left to right are: Dan Rabinovitz, K3ISO, secretary for the WPRC, Matt Adrian, WA3LOP, chief engineer for WR3ACH, 22/82, Dave Mays, K8MYU, trustee for WR8ABB, 28/88, Dennis Presky, K3PSP, trustee for WR3ADG, 1979, Dick Hanna, K3VYY, president of the Beaver Valley Amateur FM Association, WR3AAA, 25/85.

450 MHz Repeater Band – High In

After a great deal of deliberation, much soul searching, and the donning of suits of armor, the VRAC has made its decision for the ARRL Band Plan for 450 MHz. The decision is high in/low out. And all we can tell you after counting the votes, studying the number of methods on the 450 MHz repeaters in the USA and Canada, and much head scratching, high in appeared to be the answer. We found that in the Northeast section of the country, most machines were low in. California is split with one half high in, the lower half favoring low in. Texas runs high in. Most of the Midwest goes for high in. The 1974 edition of the ARRL Repeater Directory shows 47 repeaters high in, 45 low in. No matter what happens, just about 50% of the 450 gang is going to be unhappy. But that's the decision of your committee. Next month we'll run all the details.

At the same time, the advisory committee completed the band plan for 6 meters. Details for both plans will appear next month. – *W1ICP*

Strays

ARRL Technical Information Service

Any member of the League is welcome to appropriate help from the Hq. technical staff in connection with equipment problems he may encounter. We ask that you observe the following guidelines so that we may provide the best possible service to the greatest number.

1. Before writing for technical assistance, search your files of *QST* and other ARRL publications. The answer you need is probably there. Consult the annual index of articles in each December issue.

2. All inquiries must relate to amateur radio. (We cannot respond to questions about CB, marine radio, hi-fi, etc., unless they concern TVI or RFI caused by amateur gear.) Please be reasonable in the number and kind of questions you ask. Limit the number of questions to three per letter.

3. Use a typewriter if possible; otherwise, write or print clearly, on one side of each sheet. Circuit diagrams should be on separate sheets. Put your name and address (including zip code) on each sheet, not just the call. Staple or clip the pages together. Include a self-addressed, stamped *business-size* envelope. (No stamp required for foreign inquiries.)

4. For practical reasons there are certain things we cannot do. Please do not ask for comparisons between commercial products, or ask for advice on repairing in-warranty commercial equipment (write the manufacturer for assistance). Do not ask for advice or information on articles published in other magazines; write to the magazine editor or author of that article. Do not request custom designs for amateur gear.

5. We may refer you to a back issue of *QST*. If so, and if that issue is still available, you may purchase it. If not, photocopies of a particular article are available at 25 cents per page. Include payment with your order.

6. Address all technical questions to: Technical Information Service, American Radio Relay League, 225 Main Street, Newington, CT 06111.

FEEDBACK

WA4JNA apologizes for the errors in his article, "A Character Generator for ATV," in the July issue of *QST*. Here are his corrections: On page 14, Fig. 4, those wires going to pins 8, 9, 11, and 13 of U3 should go instead to pins 8, 9, 11, and 13 of U4. Also, the power requirement should be 5V at 600 mA, instead of 400 mA as given in the text. In Fig. 6, substitute an LM335 or LM309K for U18.

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The opening paragraphs of the World Above 50 Mc. in July *QST* reporting the moonbounce work at WA6LET, credited Stanford University and the University's radio club. The 150-foot dish and the amateur station using it are at the Stanford Research Institute, Menlo Park, Cal., an entirely separate entity from Stanford University. The club call, WA6LET, is held by the SRI Amateur Radio Society, not the Stanford University Radio Club, whose call is W6YX. Also participating in the WA6LET moonbounce project was the UHF Radio Society, W6GD. We apologize to all hands for the mixing of identities in this report.

only the mere firing of a current restriction, and

Hamfest Calendar

Connecticut – Hamfest, September 8, 9 AM to 3 PM at Rt. 161, Camp Meskill, Niantic. See in operation, the Conn. National Guard's latest tactical communication equipment including a-m, ssb, cw, RTTY, fsk and 24 channel repeaters and terminals. Large swap corner, Hamburgers, hotdogs, nominal charge. Free parking. Write: John Leverton, WA1TMA, 12 Pine Court, Cromwell CT 06416. Tel. (344-3648).

Illinois – Radio Expo '74 is September 14-15 at the Lake County Illinois fairgrounds. Manufacturers and club exhibits, seminars, giant indoor flea market. Gates open at 6 AM, exhibit hall at 9 AM. Free camping at the fairgrounds. Reserved rooms *two weeks ahead at the Mundelein, Holiday Inn*; meals available at Expo fairgrounds. Cocktail Party Saturday evening at Holiday Inn. Location at Rt. 120 and 45; take Tri-State 294 from Chicago to Route 120, west to the Fairgrounds. Talk-in on WR9ABY 16/76, as well as 34/94, 52.525 and 443.75. *Tickets $2 for the entire weekend, $1.50* advance. Sponsored by the Chicago FM Club, WA9ORC/WR9ABY, PO Box 1014, Arlington Heights IL 60006.

Illinois – September 21 at Holiday Inn in Itasca the annual W9DXCC affair with LU5HFI as one of its principal speakers. Contact W9KNI, Bob Locher, 1145 Osterman, Deerfield IL 60015.

Indiana – Grant County ARC's annual hamfest is September 29 at the 4-H Fairgrounds. Admission $1 advance; $1.50 at gate. Large flea market, technical sessions, bingo for XYL. Large inside pavillion, plenty of parking. For more info or advance tickets, write: W9EBN, PO Box 815, Marion IN 46952.

Manitoba – The Winnipeg Amateur Radio Club centennial hamfest is October 5-6 in Winnipeg, at *the International Inn (Wellington Ave. and Ferry* Rd.). Technical talks, code test, equipment displays, transmitter hunt, ladies' events. Banquet Saturday evening, auction Sunday afternoon. Accommodations available; registration $1; dinner $4. Talk-in on 3765 kHz., 46/94, 147.33. Info and advance registration from Winnipeg ARC, Box 352, Winnipeg MB R3C 2H6.

Massachusetts – Sharon Amateur Radio Assn. auction is September 15 at 1 PM at the Sharon Community Center on Massapoag Ave., Sharon. Free refreshments. Sell your own gear. For more info contact: Ed Levine, WN1RFD, 6 Carlton Rd., Sharon MA 02067.

Michigan – Grand Rapids swap and shop is Saturday, September 21 at the Hudsonville fairgrounds (*M-21 at 40th St., three blocks west of the* Hudsonville traffic light). Admission $1.75 at the gate, no charge for tables or trunk sales. Talk-in on 16/76 and 146.94. Write: Alan Bishop, K8UGM, 451 Eleanor N.E., Grand Rapids MI 49505.

Michigan – L'Anse Creuse ARC swap n' shop is September 22 from 9 AM to 3 PM at L'Anse Creuse Central Jr. High School, 3800 Reimold Rd., Mt. Clemens. Free parking, good food, tables $1, admission $1. Talk-in on 146.94. Write: 38024 N. Bonkay Dr., Mt. Clemens MI 48043.

New York – 1974 USAF MARS Region I Convention is September 20-22 at Grossinger's in Liberty. Informal get-together 6 PM Friday. Seminars 9 AM to 4:30 PM on Saturday, followed by the annual cocktail party and banquet. Also features a special Saturday activities program for the XYLs and harmonics. For further info contact: USAF MARS Region I Convention Committee, PO Box 1974, Boiceville NY 12412.

New York – Hamburg international hamfest, which is dedicated to our Canadian friends, is near *Niagara Falls on September 21. Guest speaker is* ARRL president W2TUK, Harry Dannals. For info write: Lin Brownell, WB2HCL, 210 Buffalo, Hamburg NY 14075.

New York – Annual meeting, Northeastern States 160 Meter Amateur Radio Assn., at Kozel's restaurant, West Ghent NY on Saturday October 5 (a few miles north of Hudson on Rt. 9H). Flea market 2-4 PM. Social hour 4-5 PM. Business meeting 5-5:45 PM. Dinner 6-7 PM. Open to all amateurs, especially those interested in 160 meters. Bountiful family style dinner. Tickets $5.75 per person. Write: S.B. Leland, W1JEC, Box 44, West Granby CT 06090.

New York – Radio Amateurs of Greater Syracuse 10th annual hamfest is October 12 at the Auto Auction Bldg. (Rt. 11 – 4 miles south of Syracuse, NY). Open 10 AM to 6 PM indoors, outdoor market, rain or shine. Exhibits, technical talks, contests. Lunch available on grounds. Exhibitors welcome. For more info write: RAGS Hamfest, Box 88, Liverpool, NY 13088.

Ohio – Findlay, Ohio Amateur Radio Club's annual hamfest is Sunday, September 8, at Findlay's Riverside Park. Talk-in on 146.94, 52. Clubs wishing tickets write: Clark Foltz, W8UN, 122 W. Hobart, Findlay OH.

Ohio – 37th Annual Cincinnati hamfest Sunday, September 15, at New Stricker's Grove on State Rt. 128, one mile west of Ross (Venice). Flea market, contests, model aircraft flying, food and beverages all day. $7 covers all costs. For further info write: Ray Clark, WB8BUF, Box 1521, Cincinnati OH 45201.

Ontario – Radio Society of Ontario Convention hosted by the Ottawa Radio Club is October 3-4 in Ottawa at a location to be decided.

Pennsylvania – Uniontown Amateur Radio *Club's 25th annual gabfest is September 7, after*noon and evening, at the club grounds, on the old Pittsburgh Rd., north of town, just off Rt. 51. Further info from: Joseph M. Sofranko, 438 Braddock Ave., Uniontown PA

Pennsylvania – Hamfest sponsored by Central Pennsylvania Repeater Assn., Sunday, September 22, at Park-n-Shop parking lot, 700 block of Walnut St., Harrisburg. Eleven levels of parking for 1100 cars, under one roof; the first high rise hamfest in the world. Admission – $2 per ham. Gate opens at 9 AM. Talk-in 16/76, 146.52 and .94. For more info write: K3SWZ, Glenn R. Kurzenknabe, 403 Centerview Ave., New Cumberland PA 17070.

Pennsylvania – Mount Airy VHF Radio Club's *annual Pack Rat Hamarama is Sunday, October 6* at the Bucks County drive-in theatre, Rt. 611 in Warrington (near exit 27 of the Penn Tpk. and north of Willow Grove). Huge flea market, auction, home brew display van, ATV demonstration, free playground for the children, parking for 400 cars. *Festivities begin at 9:30 AM; auction at 2 PM rain* or shine. Food concession on premises; nearby motels and restaurants. Registration $1, tailgate selling $2. Talk-in frequencies are 146.52, 52.525 and the club repeater WR3ACD - 222.98 in and 224.58 out. For info and flyer with map write S.a.s.e. to *K3MXM*, Lee A. Cohen, 8242 Brookside Rd., Elkins Park PA 19117.

Tennessee – Music City hamfest is September at the National Guard Armory on Sidco Dr. in Nashville. Flea marketers are most welcome. Satu

day night is a banquet engineered by Delta Division Director Max Arnold.

Texas – El Paso Texas hamfest and swapmeet is Saturday and Sunday October 12-13. Seminars, hospitality and fleamarket. For info: WB5CMB, 7772 Gran Quivira, El Paso TX 79904.

Virginia – DXPO 74, Saturday, September 28, Sheraton Inn and International Conference Center in Reston Va., close to Washington, D.C. and Dulles International Airport. Friday evening "attitude adjustment," propagation, DXpeditions, antennas, QSLing, ARRL Hq brass, gala ladies program, Saturday evening banquet. Write: Lynn Lamb, W3BWZ, Registration Chairman, DXPO 74, Rt. 1, Box 207A, White Plains MD 20695.

Washington – Walla Walla Valley Radio Amateur Club's 28th annual all family picnic and hamfest is September 21-22 at the Milton-Freewater Oregon Community Building. Two big days of fun with swap n' shop, bingo, contests, home brew, MINOW bazaar and antique, new gear, and repeater displays. Free registration, 200 block of Walnut St., Harrisburg. Eleven levels of parking for dinner at 12:30 Sunday. Talk-in on 28-88 or 04/64 repeaters and 146.76 simplex. Write: Pat Stewart, W7GVC, 1404 Ruth Ave., Walla Walla WA 99362.

MIDWEST DIVISION CONVENTION

South Sioux City, Nebraska **October 4-6, 1974**

The 3900 Club invites you to attend the 1974 ARRL Midwest Division Convention at the spacious Marina Inn in South Sioux City, Nebraska, October 4-6. Registration begins at noon Friday. Special meetings of a preliminary nature will take place Friday afternoon. The Handi-Hams organizations of Iowa and Minnesota will be well represented and the theme of the convention will be paying tribute to handicapped amateurs. Special presentations will be made at the Saturday evening banquet. Get-acquainted dinners for OMs and XYLs are planned for Friday night – no programs, just old fashioned rag chews. The convention program will feature SSTV, fast scan TV, a portable repeater demonstration, SCM meeting, Handi-Ham session, 2-meter repeater forum, Grand Island monitoring station presentation, QCWA meeting and dinner, Amsat demonstration, traffic forum, QRP session, demonstrations of the $30 counter from January *QST* and the satellite locator described in the May issue. There will also be a MARS meeting and DX session.

The convention will feature the largest flea market in the midwest, all indoors in a 40 X 80 foot room at no charge. Come and sell and trade. There will also be a commercial exhibitor area. League President Harry J. Dannals, W2TUK, will attend and will participate in the ARRL Forum with Midwest Division Director Paul Grauer, WØFIR, and other League officials. Special activities are planned for the ladies, including a luncheon and tour of the new downtown Sioux City shopping area and mall. Talk-in on 34/94, 94 simplex and 3900 kHz.

Banquet tickets are $6 each. Pre-registration for the convention up to October 1 is $6, later $7. Send registrations to Cliff Taylor, WØEQN, 3818 Fifth Avenue, Sioux City, Iowa 51105. For motel information and rates write Dick Pitner, WØFZO, Convention Chairman, 2931 Pierce Street, Sioux City, Iowa 51104.

COMING ARRL CONVENTIONS

August 30-September 1 – Maritime Provinces, Fredericton, New Brunswick, Canada.

October 4-6 – Midwest Division, South Sioux City, Nebraska.

October 5-6 – Tennessee State, Memphis.

October 25-27 – Pacific Division, San Mateo, California.

November 1-3 – Southwestern Division, San Diego, California.

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

TENNESSEE STATE CONVENTION

Memphis **October 5-6, 1974**

The Mid-South Amateur Radio Association and Delta Amateur Radio Club are sponsors of the 1974 ARRL Tennessee State Convention to be held at the State Technical Institute in Memphis on October 5-6. Informal dutch treat dinners are planned for Saturday evening at the Hungry Fisherman across the street from the convention site and other nearby restaurants. There will be dealer and distributor displays, MARS meetings, and a flea market. FCC Commissioner Hooks is scheduled to attend, and a representative from the Commission's Atlanta office will be present. The League will be represented by a member of the headquarters staff. Delta Division Director Arnold will conduct an ARRL Forum, providing an opportunity to obtain the latest news and an exchange of ideas and opinions on matters of concern to all amateurs. Special entertainment is planned for the ladies. Talk-in on 22/82, 34/94, 3,980 kHz and Army MARS 148.01/143.99.

The State Technical Institute is conveniently located on Interstate 40 at Macon Road (Exit 11). The Welcome Inn, located across from the Institute, includes facilities for campers and trailers. Their phone number is (901) 363-1300. Also close-by is the new Holiday Inn (901) 363-3400. For convention information call Harry Simpson, W4SCF, (901) 358-5707 or 362-7510. QST

AMATEUR RADIO PUBLIC SERVICE

NTS RACES AREC

In the Public Interest, Convenience, Necessity HRH

CONDUCTED BY BILL MANN,* WA1FCM

Get the Gang Going

AS THE SUMMER DRAWS TO A CLOSE, cooler weather approaches and suntans fade, amateurs naturally begin spending more time engaged in amateur activity. We hope some of this activity concerns public-service operation. In the March, 1974, issue (see page 56), this column suggested ways in which individuals can become involved in public-service activities. Let's examine a few of the ways your radio club, repeater organization, Amateur Radio Emergency Corps group or assemblage of the "locals" can provide valuable public service.

Excellent exposure to amateur radio can be obtained by setting up an exhibit station at a fair, a shopping mall or other large gathering place. Posters can illustrate and describe some of the amateur's services. Radiograms can be handled on behalf of onlookers with special schedules set up to route traffic to appropriate nets. For tips on demonstrations of amateur operation, write ARRL (enclosing s.a.s.e. please) for "Exhibit Station Operation" (CD-26).

College or school students may elect to establish a message service for other students. A message box with complete instructions should be placed at some conspicuous location. It is usually necessary to publicize the service and give full details of how messages are sent (and the fact that recipients do not need to be hams!). Shortly before net time, someone drops by the message box, picks up the radiograms and sends them on the appropriate net(s).

Seasonal events which lend themselves well to amateur communications include Halloween and Christmas. Many groups sponsor "Spook Patrols" to assist local authorities on Halloween by reporting suspicious activity through a repeater or local net. Shortly before Christmas is a fine time to provide children with an opportunity to talk to Santa via amateur radio. One or two amateurs, perhaps dressed in Yuletide attire, visit local hospitals, schools or orphanages with hand-held rigs and invite children to talk with Santa, another amateur (with a good "Ho, ho, ho" voice) positioned outside the building or at some other location.

In some areas, amateurs are becoming involved in severe-weather observations – tornadoes, hurricanes, etc. – in cooperation with the National Weather Service, usually as part of the Skywarn program. Activity centers around a net or repeater network which is activated when a severe weather warning is issued. Amateurs report weather conditions at their locations, thus providing NWS with detailed information. Is there a Skywarn program in your area? Check with NWS or local Civil Defense officials.

Also, many communities have a Community Radio Watch as an adjunct to the city police department. This program is usually open to all radio services which have mobile two-way equipment. Suspicious or unusual occurrences that may endanger life or property are reported by radio to police. Activity is confined to observing and reporting. Contact the local police department to see if there is a CRW program in your locality.

These are but a few of the ways amateur groups can provide public service. Bring up some ideas at the next meeting or get some of your fellow amateurs in town together and discuss these and other possibilities. Don't forget parades, walk-a-thons, races, etc. In all cases, planning and preparation are required. With reasonable effort, a valuable service by amateurs is provided, a sense of accomplishment will be felt and you'll probably have fun!

Bits 'n' Pieces

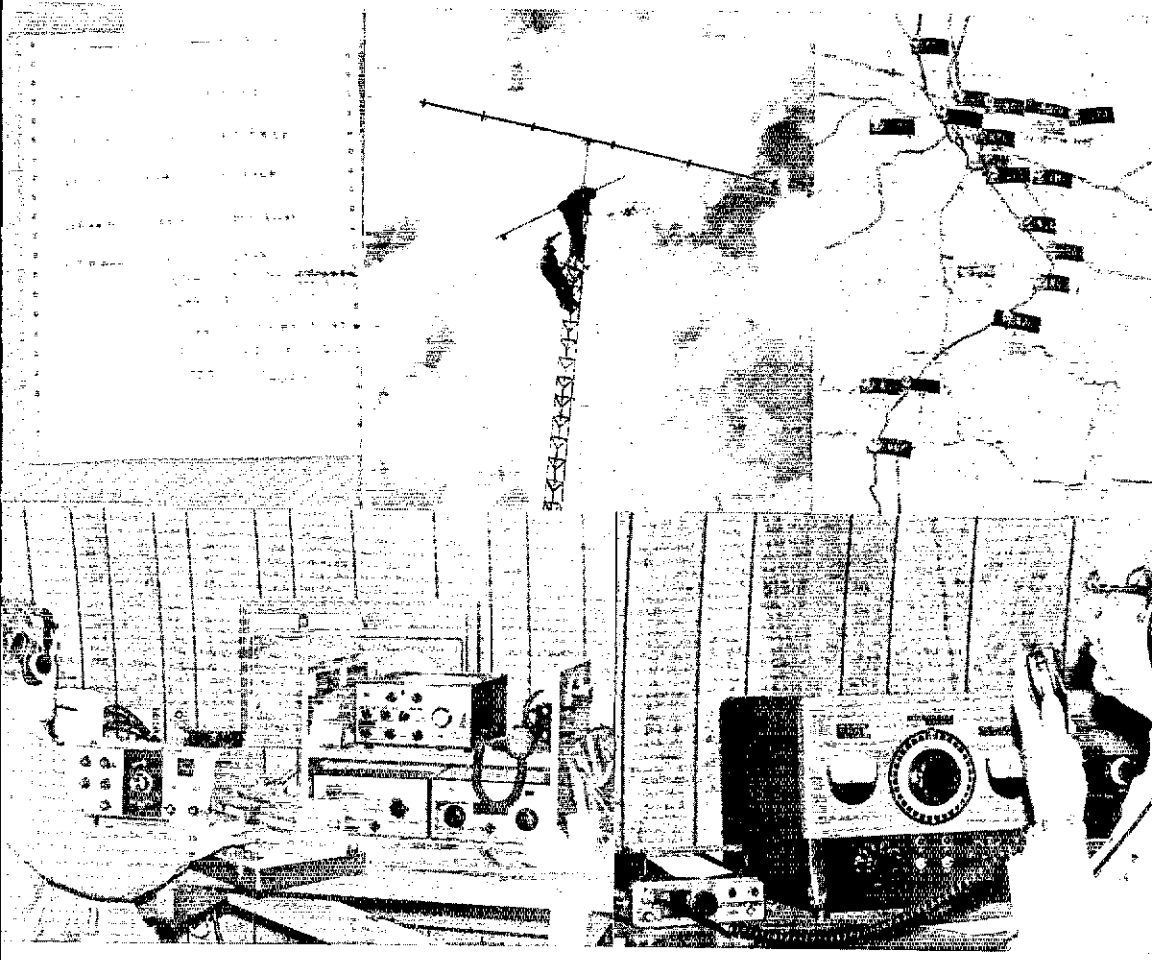
Oscar 6, a "prime factor": In a summary of Field Day activities of the Baltimore Amateur Radio Club, K2UBC made the following observation: "Considering emergency preparedness, I think it's especially important to note: (1) At 7:30 PM Saturday the high winds almost brought all hf operation to a complete halt – the only setup still operating was on a nearly dead 20 meter band using the triband beam which had been fully lowered. Local communications via 2-meter fm and long distance communications via satellite were essentially unaffected!!! (2) The simplicity and small size of the satellite antennas, coupled with the fact that they are mounted at ground level, makes it possible for one man to erect them in just a few minutes."

In these times of the "depleted sunspots," prime reliance on satellite communications may become reality. Can you talk to Oscar?

– . . . –

On the drug scene: In May, WB2HTJ handled a request for an urgently needed drug for a Monrovian (Liberian) hospital. Tom advises that he was helped in this endeavor by the Medical Assistance Program in Wheaton, Illinois, and says that organization will help other stations with similar requests. Collect calls are accepted, but charged to

* Assistant Communications Manager, ARRL.



A set of pictures from the bicycle Tour of the Scioto (Ohio) River Valley — TOSRV — include: color coding system for a master map (top left), antenna at a fire tower to coordinate checkpoints (top center), partial map of the route showing suffixes of calls and locations of hams manning the checkpoints (top right K8IKD handling traffic on 10 meters (bottom left) and W8ERD at the 2-meter position (bottom right).

the hospital. The telephone number (312) 653-6010.

— • • • —

Don't just think it, write it: Do you have an idea for a short public-service "article" that would be of interest to the *QST* readership? Are there ideas you haven't seen expressed here, in "Traffic Talk," "With the AREC" or "Public Service Diary" which you feel should be covered in the Public Service column? Write 'em down – Send 'em along. We can't make any guarantees for appearances, but all submissions will be carefully considered.

— • • • —

The deleted digit: Oops, the Simulated Emergency Test results in July *QST* listed the Mississippi Sideband Net with a total of 121 points. That should have been 1212 points. Sorry, Miss.

Traffic Talk

Every so often a traffic man will be heard griping over the scarcity of traffic. This is natural, of course, since traffic is to the traffic hound what butter is to bread. However, I often wonder if it never occurred to these lads to *originate* traffic. That is one sure way to create something to handle! Why not each ham send as many messages as he can to friends, relatives, other hams, etc.? I don't mean originate any old kind of traffic – but originate good, non-rubber stamp messages. There must be plenty of hams who have never originated a single message. Just think of the amount of traffic there would be, if every active ham originated but one message per month! Being a traffic man myself, I can deplore lack of traffic, too, but we wail too much, let's *boost originations!* — W3DNU from June, 1936, *QST.*

■ *Procedural Points:* "Roger your message number seven routine." It's a fine point, but why include precedence when rogering for a message? The message number and precedence are two separate parts of the preamble just as the precedence and station of origin are separate. Or, for that matter, why include the message number? A shorter, seemingly more logical response is simply "Roger." or "Roger message." That says it all, doesn't it?

The Gulf Coast Section of the Central Texas Emergency Net members got together in May at Crosby, Texas, for a social event. Left to right are: WB5ICV, WA5ZLI, WB5JFP, WA5YBC, W5OPW, K5MMV, WN5JCQ and WA5UNW.

■ *National Traffic System.* Function skeds, says RN5 Mgr. W4HFU, are like quicksilver – hard to keep covered! EAN Mgr., K2KIR knew traffic was holding up much too well in May; in June representation paid the price. Representation from Maine needs to pick up thinks WA1PGY, 1RN(D) Mgr. With practically the same section representation, average per session and rate, reports 3RN Mgr. W3NEM, maybe we're in a rut. However, he goes on, it is high and consistent; thanks for small favors. Net certificates for RN7(D) were earned by WA7IZR and VE6AVZ. WBØHOX, Mgr. TRN(D) states KØDDA did an outstanding job of keeping the net going while she was replacing antennas lost in a storm and the assistant was in summer school. She reports skip is too long and absorption is too high; they need a band between 75 and 40 meters for their region, she says! *8RN(D) Net Certificates went to W8s CHT CUL GVX MOK, K8s IKD KMQ, WA8s HGH ZNC, WB8s BPY BZX CJU DKQ FBG GKB HWE IJW JAD NCD.*

June Reports

Net	*Sessions*	*Traffic*	*Avg.*	*Rate*	*%Rep.*
EAN	30	1186	39.5	.964	94.4
CAN	30	829	27.6	.656	97.2
PAN	30	800	26.7	.665	88.9
CTN	29	287	9.9	.193	71.8
1RN	60	516	8.6	.410	93.0
1RN(D)	28	135	4.5	.271	69.6
2RN	59	365	6.2	.570	100.0
3RN	60	456	7.6	.417	97.7
RN5	60	544	9.1	.294	88.3
RN5(D)	26	51	2.0	.098	50.8
RN6	60	647	10.8	.450	97.7
RN6(D)	30	166	5.5	.151	63.9
RN7	58	298	5.1	.440	73.3
RN7(D)	27	45	1.7	.115	46.1
8RN	53	250	4.7	.203	73.9
8RN(D)	30	61	2.0	.239	63.3
9RN	59	400	6.8	.346	81.3
TEN	60	365	6.1	.315	81.3
TRN(D)	23	39	1.7	.134	35.6
ECN	60	201	3.4	.331	92.2
TCC Eastern	102[1]	507			
TCC Central	73[1]	292			
TCC Pacific	103[1]	572			
Sections[2]	4123	18421	4.4		
Summary	*4995*	*26062*	*5.2*		
Record	*4003*	*23817*	*15.9*		

[1] TCC functions not counted as net sessions.

[2] Section and local nets reporting (130): APSN (AB), MTN (MB), APN (Mar.), CMN GBN ODN OPN OQN WEN(ON), WQ-V/UHF (PQ), AENB AEND AENM AENR (AL), ASN (AK), ATEN HARC (AZ), ATN OZK (AR), NCN NEN SCN (CA), NVHFTN SSN (CO), CN CPN CSN (CT), DEPN DTN (DE), FAST FMTN GN NFPN QFN QFTN VEN (FL), GSN (GA), IMN (ID,MT), ILN (IL), ITN (IN), I75MN TLCN (IA), KSBN KWN QKS (KS), KNTN KTN KYN MKPN (KY), LAN LRN LSN LTN (LA), MDCTN MDD MEPN (MD), EMRI EM2MN WMEN WMN WMPN (MA), MNN NENN QMN WSBN (MI), MSPN PAW (MN), MNN MTN (MS), ACE BCE JC2AN MoAREC MON MoSSB MSN PHD WEN (MO), MTN (MT), WNN (NE), NHVTN (NH, VT), NJN NJPN NJSN (NJ), NMN (NM), MRA NLI NYS (NY), CN NCSSBN THEN VHFTN (NC), BN OSN OSSBN O6MN (OH), OLZ OPEN OTWN STN (OK), BSN OSN (OR), EPA EPAEP&TN KSSN PEN PTTN WPA (PA), EMN LEN NJQ SDN (SD), ETTMN ETVHFN TN TNN (TN), TEX TEX-SS TTN (TX), BUN UCN (UT), VFN VSN (VA), NSN WSN (WA), WVN WVPN (WV), BEN BWN WIN WSBN (WI).

Transcontinental Corps

A new assistant director for the Pacific Area is actively being sought by K5MAT. KØAEM writes he agrees with K5MAT that there must be a better way – and conditions don't help any.

Area	*Functions*	*%Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern	120	85.0	1476	507
Central	93	78.4	718	292
Pacific	120	85.8	1182	572
Summary	*333*	*83.1*	*3376*	*1371*

The TCC roster (June): Eastern Area (W3EML, Dir.) -W1s NJM QYY, W2s FR GKZ KAT/3, WA2s CXY PJL UWA, WB2s RKK VEJ, W3EML, K3s CB MVO, WA3OGM, W4s SQQ UQ, K4KNP, WB4s OMG SGV, W8s PMJ VDA/4, K8KMQ, VE3SB. Central Area (KØAEM, Dir.) – *W5s GHP* MI QU SBM UGE, K5ETX, W9s CXY DND NXG, WA9EED, WB9NJA, WØs HI LCX ZHN, WAØROK, KØDDA. Pacific Area (K5MAT, Dir.) – W5s RE ITK, K5MAT, W6s BGF EOT IPW MLF RSY VNQ VZT, WA6DEI, WB6s AKR OYN, W7s BQ GHT KZ, K7s IFG NHL QFG, WØLQ, KØOTH, WBØHCK.

Independent Net Reports (June)

Net	*Sessions*	*Traffic*	*Check-ins*
IMRA	45	597	1496
7290 Traffic	40	571	1551
Clearing House	23	160	350
North American Traffic	25	220	495
20 Meter ISSB	20	1622	317
Hit & Bounce	30	628	325
Hit & Bounce Slow	16	73	137
Ohio Valley Teenage	28	107	310
75 Meter ISSB	30	270	972

With the AREC

Amateur Radio Emergency Corps members and all others interested in emergency preparedness and amateur radio's role in emergency communications are invited to keep members of the ARRL Emer

gency Communications Advisory Committee advised of their feelings regarding emergency-communications matters. The committee has been actively studying the question of revision to the Radio Amateur Civil Emergency Service regulations and ramifications of the Notice of Proposed Rulemaking which has been released concerning RACES (see August, 1974, *QST* beginning on page 73). Numerous other topics are currently under consideration.

At the July meeting of the Board of Directors, the ECAC was asked to explore possibilities for an international plan for amateur emergency communications. Amateurs who were active in connection with the Managuan and/or Peruvian earthquakes or other emergency situations involving foreign countries are especially encouraged to relate pertinent experiences and suggestions to committee members.

Committee members are receptive of any emergency-related topics/suggestions you may have. The following are ECAC members, with parenthetical description of area covered by each member: Jim Collinsworth, WB2EDT (New England, New York); Woody Haldeman, W3PST (New Jersey, Third Call Area); Chairman Bud Cone, WA4PBG (North and South Carolina, Tennessee, Virginia); Andy Clark, W4IYT (Alabama, Canal Zone, Florida, Georgia, Kentucky, Puerto Rico, Virgin Islands); Bill Mixon, K5SVD (Fifth Call Area); Art Smith, W6INI (Sixth Call Area); Bob Klepper, W7IEU (Seventh Call Area, Alaska, Hawaii); Bob Dixon, W8ERD (Eighth Call Area); Bob Hajek, W9QBH (Ninth Call Area); Harry Legler, WØPB (Tenth Call Area); and Holland Shepherd, VE3DV (Canada).

■ For June we received 40 SEC reports representing 13095 AREC members, 1440 more members than at this time last year and 6 more reports. These sections reported: Alta, Ark, Colo, Conn, Del, EBay, EMass, Ill, Ind, Kans, Ky, Mar, Mich, Miss, Mo, Mont, Nebr, Nev, NLI, NC, NFla, NTex, Okla, Ont, Org, RI, SV, SDgo, SJV, SBar, SCV, Sask, SNJ, STex, Utah, Va, Wash, WVa, WMass, WNY.

As a half-year summary, 227 SEC reports have been sent in from 54 different sections. At the same time last year, 242 reports were received from 49 different sections. So far, sections with 100% reporting this year are: Alta, Colo, Del, EMass, Ill, Kans, Mich, Miss, Mo, Mont, Nebr, NC, NFla, NTex, Okla, Org, SDgo, SCV, Sask, STex, Utah, Va, Wash, WVa, WMass, WNY.

Public Service Diary

■ A California girl believed to be sailing somewhere between Haiti and Puerto Rico needed to be advised of her father's death, April 8. Efforts to reach her were unsuccessful until K6ZRY relayed information to a ham in Hawaii who contacted the American Consulate and the Sacred Hearts Missionary radio net in Port-Au-Prince, Haiti, who contacted the girl. – (K6ZRY)

■ A horse-trailer with a broken axle which was tying up traffic near Glendive, MT, May 13, was seen by WA7GVT/mobile. He contacted W7DXQ who notified police. – (WA7GVT)

■ Maintenance officer for the Indianapolis Police, WB9AWH received reports of severe interference, May 18, on a channel shared with a local law enforcement department. After trying to pinpoint the problem, the Marion Co. RACES was alerted via one of the local repeaters. Soon a red-faced patrolman was invited to open his garage where his motorcycle was, the rig with mike button stuck down. – (K9DUR, EC Marion Co., in *Indy Ham Radio Newsletter*)

Public Service Honor Roll June 1974

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 (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.

WA5ZOO	122	WA1PHJ	49	K4UNW	44
W4OGG	68	WA1SHO	49	W5EIJ	44
WB5EAY	68	W2OE	49	WB5JBW	44
WA2UWA	64	WA3PXA	49	W5UGE	44
WA1MSK	61	WB4DXN	49	WB6AKR	44
WA3DUM	61	WB5KAN	49	WA6DET	44
WA3SCR	61	W5MYZ	49	W6RFF	44
W4RQS	61	W7GHT	49	WA7MFI	44
WB4SVH	61	WB8KKI	49	WB8BZX	44
WB5AMN	61	KØMRI	49	WB8JGW	44
WB5BFW	61	WAØTNM	49	WB9JGV	44
W5GHP	61	VE3FRG	49	WØOYH	44
WB5GWB	61	VE3GFN	49	WAØROK	44
WA5ZZA	61	WA1MXV	47	VE3FQZ	44
W7OCX	61	WA2BSU	47	VE3GJG	44
W7UTM	61	WB2LZN	47	VE3SB	44
WA2DSA	59	WB2RKK	47	WA1RGA	43
K7NHL	59	WA2SHT	47	WA6DMB	43
KØBIXC	58	WB5DBK	47	WA6IDN	43
WB2FLF	57	K6UYK	47	W6JXK	43
WA1LIR	56	WBØDGA	47	K1PNB	42
WA1RFR	56	W1DVW	46	WA5VBM	42
WB2CHY	56	WB4OXT	46	W6AUC	42
WB2OYV	56	WB5FMA	46	WBØHTR	42
WA8HGH	56	WA6IVA	46	WAØMLE	42
WBØCZR	56	W3ABT	45	KL7JDO	42
VE3DVE	56	W5GSN	45	WA1MJE	41
WA5IQU	55	WA9QVT/9	45	WB5HJV	41
K6GMI	55	W1BVR	44	K5ROZ	41
WA6SCY	55	WA2OVE	44	WA5YEA	41
WA1FCM	53	WA3PHQ	44	VE1ARB	41
K8MLO	53	WA3SWF	44	WA2PJL	40
VE1AMR	53	WA3SXU	44	WB2RKE	40
WA1POJ	52	W4AAY	44	WA3RCI	40
WB8NCD	52	WB4ECB	44	WB4GHU	40
W5RBB	51	WB4EKJ	44	K4JJQ	40
K3OIO	50	K4KCK	44	W9MMP/9	40
WB5GZG	50				

*Denotes multioperator station.

■ While vacationing in Utah on May 29, WA6TTY/mobile came across a camper truck off the road in flames. He called W7KAX who relayed information to the Wayne Co. Sheriff who quickly arrived with fire fighting units. – (WA6TTY)

■ Information was relayed to the proper agencies by Long Island (NY) Mobile ARC members during May and June concerning 15 traffic accidents, 14 disabled vehicles, two brush fires, a truck fire, and a medical emergency phone patch. – (K2QPF, EC Oyster Bay)

■ The Red Cross Disaster Survey Team was dispatched June 7 to Tontitown, AR, to survey damage from a tornado. With the team was WB5FAN with mobile equipment. A base station was set up by WA5VNV at the Red Cross in Fayetteville, who relayed information via W5TXA to the divisional office in Little Rock. The following day the same system was used to check reports of flooding in Siloam Springs with the assistance of the same amateurs and WB5EPD and W5QEK. The volume of traffic required 7 more amateurs to be activated in the disaster area and Red Cross station. – (W5TXA, EC Washington Co.)

■ A tornado hit Emporia, KS, June 8. The Mid-States Mobile Monitor Service was activated and KØEFU was sent to the Red Cross to set up an emergency center. The Red Cross expressed a need for more radio equipment and many hams sent theirs. Traffic was handled by area amateurs until the Red Cross was organized. – (WBØHUX, EC Allen Co. and KØJMF, SEC KS)

■ A storm system in the Drumright, OK area June 8 was called in by WAØFAC and WBØFNI via Springfield, MO repeater WAØVVV. Southwest Missouri ARC members were dispatched by EC WØSIV via radio, and weather reports were given to the local c.d. and Red Cross. After the storm reached Springfield, damage reports were relayed, and traffic from areas hit in AR, MO and OK was handled. – (WØSIV, EC Greene Co.)

■ Tornadoes and flooding occurred June 8-11, from Oklahoma City to Tulsa (OK). Back-up communications were provided for the Red Cross evacuation unit, disaster relief and the disaster survey teams, health and welfare traffic was handled and weather reports were relayed involving 25 amateurs. – (WA5FSN, SEC OK)

■ For the 6th year the Owensboro (KY) Governor's Cup Regatta for unlimited hydroplanes, June 8-16, was coordinated by area amateurs. One of the several accidents reported by the 21 amateurs would have resulted in a fatality if not for W4YWO. – (W4OYI, ADir)

■ A gas line exploded into a bad fire near Bealton, VA, June 9. After learning authorities could not pinpoint its location or origin, K3PCC/4 flew his plane to the area. He relayed information to WB4DRI who phoned the gas company. The Ole VA Hams Club repeater WR4ADZ transmitted the information, asking as many hams as possible to check in, in case they were needed. – (WB4TBO)

■ The Overland Park (KS) Police called WBØBMB on June 14 to ask for help in searching for a kidnapped girl. Mobile stations were dispatched via the Kansas City repeaters. KØHNK served as a base station at the Police Command Post. It was determined the abductor escaped with the girl by car and the local searchers were disbanded. – (WBØBMB)

■ A telephone call was received by XE2QW, June 15 in Ensenada (Mex.) about a badly injured man who needed to contact persons aboard a ship off the coast of Baja California (Mex.). The amateur contacted XE2MMP who relayed to W7JQM, in turn answered by WB6UIB who notified the Coast Guard. – (W6GBF, SCM San Diego)

■ On June 15, WB2KCT was on her way home near Huntington, NY, when vandals began throwing stones at the car. A call on WR2ABA repeater was answered by WB2ZZB who called police. – (W2GLE, EC Huntington)

■ A stalled car on the Northern State Parkway (NY) was spotted by WB2EVV on June 15. He placed two calls through the WR2ADM repeater to members of the driver's family, and stood by till help arrived. – (W2GLE, EC Huntington)

■ While traveling near Washington, PA, June 16, WA3OKK came upon a tree blocking the road. He called WA3TOB through WR3ADG who called police. – (WA3OKK, EC Washington Co.)

■ On June 16 while riding his motorcycle, WA2TSN stopped to aid a motorist in a disabled car near Huntington, NY. He used his two meter fm rig to get help. – (W2GLE, EC Huntington)

■ The sheriff called the Communications Section of the Owensboro (KY) AREC June 18, concerning assistance with recovering a vehicle with an occupant in the Green River. K4UDZ and WB4TNZ went to the scene and kept in contact with K4IV. Other amateurs stood by until the body was recovered. – (K4UDZ, EC District 4)

■ A call was received by WB8APN from WB8RPL/mobile about a dwelling fire in Crawford Co., MI, June 21. The sheriff was called and upon arrival at the fire, was unable to contact the fire department with his radio. WB8RPL then called via two meters, WB8EYM who reached the fire department. – (WB8APN, EC Crawford Co.)

■ For the third year, members of the HAMS Club were stationed on banks and patrol boats for the Ebey and Steamboat Sloughs Race near Marysville, WA, June 23. One of the boats flipped and W7QPZ called in for a boat to rescue the driver and for an ambulance. – (W7IEU, SEC WA)

■ During Field Day operation, June 23, VE7FG – club station of the Fort George (BC) ARC – received a call from W6ZMT/MM requesting assistance for a powerless motor yacht adrift off Pt. Pederales, CA. VE7CBJ contacted VE7AWO on two meters who contacted the Coast Guard via telephone. – (VE7DSN)

■ A person wanted for felony charges was recognized by K4PPZ June 23 in Memphis, TN. The WR4ABS repeater was employed to contact Memphis Police and the subject was apprehended by policeman WB4OJZ. The dispatcher was WB4KIE. – (W4OQG, EC Shelby Co.)

■ A message was received June 23 by WA5BNH from W5HTV and WB5AHZ who were stalled in a boat heading for their field day site off Ocean Springs (MS). A replacement part for the boat was then delivered. – (WA5FII, SEC MS)

■ A civil defense representative came to the site of the Dial Radio Club's (W8BLV) Field Day near Middletown, OH, June 23. Manpower and generators were needed at Lebanon because of a flash flood disabling the municipal power plant. With phone service and electricity not available, members set up communications for repair crews, to aid victims, to facilitate security and coordinate c.d. activities. – (WB8EMH)

■ An automobile accident was spotted by K1HHC and W1HUL near New Sweden, ME, June 29. They contacted WA8YVM/1 and K1TFX on two meters and an ambulance and police arrived in minutes. – (K1TEV, SCM ME)

■ Assistance was requested by the Hatboro (PA) police, June 30, to help locate a missing family enroute to Florida. Five area amateurs transmitted a description of the car via their stations and repeaters and the family was located July 4. – (W3ID, EC Montgomery Co.)

■ First reports of 7 automobile accidents and summoning aid were provided by Harris County (TX) amateurs in June. – (WA5ABA, EC Harris Co.)

■ Echo Repeater Association of Jackson, MS, affiliated with the local police department's community radio watch, reported 8 traffic accidents, 3 suspicious incidents, and a fire during June, via repeater, WR5ABT. – (WA5FII, SEC MS)

■ The Boeing Employees ARS sent two mobile units to the North Bend (CA) Ranger Station July 3 to help in the search for two lost hikers. Phone patches for the mission were handled by W7LIO. – (W7RJW, EC BEARS)

■ A butane storage tank in Vicksburg, MS exploded July 3. The National Guard was called via

The Pacific Area Staff of the National Traffic System held a meeting in Albuquerque, New Mexico, on May 25 to discuss NTS matters in the Pacific Area. In attendance were: (front, l. to r.) WØLRN, K7NHL, W6BGF and W5TLK; (back, l. to r.) W7KZ, W5RE, K7IFG and K5MAT.

WR5ABT and amateurs handled traffic in a watch situation after the explosion. – (WA5FII, SEC MS)

■ The Ottawa (ON) AREC under VE3CRX assisted with communications during a search for a drowning victim near Wakefield, Que., July 6-9. Repeater VE2CRA was used by 10 area amateurs on foot, in cars, boats and helicopters. The body was later found by loggers. – (VE3CRX, EC Ottawa)

■ Rangely, CO, amateur WØQOT coordinated communications with the help of many Colorado and Utah amateurs during a 4 day telephone outage ending July 11. – (KØWGC)

■ The Mecklenburg (NC) AREC Net was activated for 3 hours on Apr. 3 because of a tornado sighted in the area. – (WB4CES, EC Mecklenburg Co.)

■ The Zone 4 Two Meter Topeka (KS) Emergency Net was called by the National Weather Service to activate 3 times during May and June. When tornadoes were sited, base stations and mobiles were set up in pre-arranged locations, including at the Weather Service, Red Cross and county c.d. Each station gave a weather report on request of the Weather Service and stayed on alert for periods up to 4 hours. – (KØJMF, SEC KS).

■ The Arkansas Weather Net was activated June 7 and 8 because of severe thunderstorms. Reporting kept the net active for most of the evening hours. – (W5RXU, SEC AR)

■ A weather reporting operation was conducted between the Wisconsin Weather Bureau and 33 amateurs in southern Wisconsin, via two meters, June 9, as rough weather moved through. – (K9PKQ, SEC WI)

■ The AREC was alerted during severe weather conditions in Minooka, IL through the Gypsy Repeater, WR9AAA on June 20. Taking part were 27 area amateurs. – (W9UCW, EC Will Co.)

■ The repeater WR5ADC was utilized June 23 by WA5BNH to report to the National Weather Service a waterspout heading towards shore off Ocean Springs, MS. – (WA5FII, SEC MS)

■ On June 23, WA6TVA, W6CPB and K6CID were called by WA6DUC in regard to 4 missing persons in the Upper San Juan (CA) Camp Grounds. An established frequency was monitored for two hours in case assistance was requested. – (W6CPB, SCM Orange)

■ A tornado watch was activated on the Allegheny-Westmoreland (PA) AREC Net via WR3ACH, June 30. Seven stations checked in and stood by on alert for an hour. – (K3ISO)

■ *Special Events. April.* Liaison was maintained by 38 amateurs with Memphis (TN) Police and Red Cross for 26,000 March of Dimes-walkers, Apr. 28. WR4AEX auto patch was used for aid to stranded walkers. – (W4OQG, EC) *June.* The 20 mile Great Bicycle Race of Kenai, AK, was sponsored by the Moose Horn ARC, June 1, with 9 amateurs assisting with communications. – (KL7EKO, EC) Under the direction of WA6HJW, 40 stations set up at shopping centers and naval air stations to provide communications through WR6ACF and W6NWG repeaters to the San Diego (CA) Heart Association community hypertension evaluation clinic, June 1 and 2. – (W6GBF, SCM) A communication network with 5 checkpoints and cruisers was established for a 9 hour Heart Association bike-a-thon, June 2 in Shelby Co., TN, by 18 amateurs. Liaison was kept with the Red Cross for first aid. – (W4OQG, EC) The Seattle-Spokane (WA) Expo '74 bicycle expedition, June 18-21, with 620 pedalers was assisted by Boeing Employees ARS. Messages of broken down bikes and worn out riders were handled. – (W7RJW, EC) Members of the HAMS Club and AREC combined to provide communications for a homemade tricycle race by manning checkpoints, pit stops, and a base station at police headquarters, Marysville, WA, June 21. – (W7IEU, SEC) The Burlington (VT) ARC provided communications support for the Olympic Development Bicycle Race, June 22, with mobile and fixed units. At one point an ambulance was summoned to aid a fallen rider. – (W1BRG, SCM) The Marysville (WA) Strawberry Festival Parade, June 22, was coordinated by 6 amateurs of the HAMS Club, using portable base and mobile units. – (W7IEU, SEC) A Scouting Canoe Relay, June 22-23 on the Delaware River (PA) was assisted by 16 Philmont Mobile ARC members. Checkpoints were manned to relay timings and accidents. – (WB2LGY) The Columbia Co. (NY) AREC set up the start and finish for an antique car rally and hill climb June 23 at the Olana State Historical Site. – (W2KHQ, EC) Messages regarding the order and accuracy of planes landing at area airports were handled by local amateurs in part via WR2ABS, June 23, in the Broome County (NY) Air Rally. – (K2VIV, EC) *July* The Toronto (ON) AREC set up 4 mobile and base stations for coordinating the Scarborough Dominion Day Parade, July 1. – (VE3GFN, EC) Six area amateurs aided in parade lineup, July 4 at Fairlawn Plaza, OH, for the Fairlawn Women's Club. – (K3EIO, EC) The Redwood City (CA) C.D. and Disaster Communications Service helped furnish communications for a 300-unit Fourth of July Parade by relaying parade information and accounting for lost children. – (W6DEF, EC) QST

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for June, 1974 Traffic

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W3CUL	207	977	931	29	2144
WØWYX	38	676	144	532	1390
KØONK	118	552	531	12	1213
K9CPM	36	410	206	471	1123
K1BCS	416	318	32	15	581
W3VR	201	197	160	11	569
W6RSY	23	290	209	17	539
WA2UWA	15	270	230	4	519
WA2DSA	49	224	222	12	507
K1BCS (May)	480	114	14	30	638

BPL for 100 or more originations-plus-deliveries

WAØAUX	211	WN3UDV	146	K1PNB	103
K9MWA	209	W5TI	125	WB8NYH	102
WA8WZF	200	K6UYK	124	WN3VBM	100
W6RFF	192	WA1LIR	112	WAØAUX (May)	184
W8QCU	147	WA1RYL	106	WN4EVY (May)	121
		WA3UCC	105		

BPL Medallions (see December, 1973 *QST*, p. 59) have been awarded to the following amateurs since last month's listing: WA1RYL WBØHBM VF3ASZ.

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.

Which one is VE3DV? Neither. On the left is VE3GFH, an Emergency Coordinator and Route Manager, and VE3FMY on the right. But it is the shack of VE3DV and Shep snapped the picture.

Correspondence From Members-

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

THANK YOU

● I realize that the *QST* membership price cannot pay for all the services the ARRL provides; however, I'm enclosing a check for renewal of my membership. The $7.50 is a small price to pay for the benefits I've received. Keep up the good work. – *Ed DeLap, WN8OTX, Cincinnati, OH*

● Repeater directory, please. But I don't think it should be free – here's a buck. – *Robert M. Seals, K9AHK, Chicago, IL*

● I recently received my very decorative and impressive Life Membership plaque, along with the pin, decals, etc. I cannot express the pride it gives me.

There are few organizations that have contributed so richly to any avocational activity, and, in doing so, simultaneously contributed to the advancement of scientific knowledge. I might add that such contributions have also fostered increased international goodwill. . . . The League may not always have done the best thing under the circumstances (hindsight is always 20-20), but every action has always been with the best interests of amateur radio at heart, whether popularly received or not. – *Paul H. Bock, Jr., K4MSG, Petersburg, VA*

● I am a new learner in the field of electronics and about half way through my CIE course. I must say that ARRL books and *QST* contain more than my CIE course and it is presented better and is easier to study. Thanks ARRL for being in existence. I shall strive mightily. – *Bill Lee, San Francisco, CA*

● Just a note of appreciation for your fine assistance in making me a "Ham." You had a job on your hands.

At the age of 67, in 1971, I joined your ranks as a Novice. I had had no experience in electronics or code. In May 1972 I received my General and Advanced ticket. During the past year I have received from you WAS, WAC and certification for 25 wpm.

Primarily, most of the credit belongs to the ARRL. Without *QST* or other helpers, and code practice schedules by W1AW, my small accomplishments would not have been possible.

The local Yellow Thunder Radio Club gave me the start and ARRL sustained my efforts.

Now, nearing 70, I have a fine rewarding hobby to help me enjoy my later years. A finer organization, or group of "Air Friends," I have never known. My only regret is the years I missed being a ham. – *Ray J. Husebo, WB9GVG, Merrimac, WI*

● I spent the better part of last evening with my copy of the new *ARRL Antenna Book*. The "troops" are to be congratulated! The rewrite effort has taken it from being just another antenna book into the category of being a definitive reference work – something very much needed and, consequentially, it belongs in every ham's library. – *Herbert Hoover, III, W6APW, Los Angeles, CA*

● The new *ARRL Antenna Book* is better than ever and probably one of the best buys in a technical book on the market today. Thank you ARRL. – *Bob Wexelbaum, W2ILP, Commack, NY*

SUSPECT ACTIVITY

● Cheers to W7GLC for calling attention to a much suspect activity of Amateur Radio (Correspondence, June *QST*). Churches and missionaries are not exempt from obeying the law, but many habitually carry on church and missionary business via ham radio in direct violation of both the rule and the law. This practice, if continued, may do great damage to ham radio in the countries involved, which would hurt all of us. It is strange that some concepts of morality do not include obeying the law. – *J. Weldon Butler, W5ILJ, Amarillo, TX*

[EDITOR'S NOTE: Mr. Butler is a district superintendent in the United Methodist Church.]

REGULATORY RUMBLINGS

● Members of the Estero Amateur Radio Club voted at the July 11 meeting that they wished to make known to the League their opposition to discontinuing the practice of logging, as it can contribute to increased lack of discipline among amateur operators. Discipline seems to be the chief difference between the ranks of Amateurs and those of the CB operators. – *Roxanna Griggs, K6ELO, President, Estero Amateur Radio Club, Morro Bay, CA*

● Having recently experienced a few sad moments on a local repeater due to amateur operators misrepresenting the actual conditions while rendering assistance to automobiles, I was concerned with the liberal interpretation by your "Happenings" editor in the June issue of the stalled car comments from Chief Higginbotham.

I believe that the article heading was deliberately misleading, since there are those who, being prone to dramatics and anxious to prove their usefulness, would clutter up the local frequencies with so-called "emergencies." The clutter is not as hard to take as the phoney priority and needless excitement which such situations cause . . . .

A little "common sense" is required of the reporting station, the same common sense which

your editor failed to show in his interpretation of the chief's comments. Obviously, the primary definition for emergency must apply, that of "relating to the immediate safety of an individual's life or immediate protection of property." – *C.F. Bino, K4CJZ, Greensboro, NC*

[EDITOR'S NOTE: The discussion was on whether one could handle third-party traffic of a business nature if the object was relief to a disabled car, and FCC's answer was affirmative. K4CJZ's points about overuse of the word "emergency" are, however, well taken.]

● Reference to the editorial in July *QST*, "FCC-ARRL Liaison." It is gratifying to know that a better understanding now exists between the two bodies and that ARRL will now understand FCC thinking. I am sure I would like to understand FCC thinking. The lax attitude that exists today, the obscene language, the extreme license taken on the air by CBers are all difficult for me to understand. I can expect to have this clarified, I presume, in future issues of *QST* because this has all been explained to the ARRL. – *Pete Peterson, W2FMX, Waterville, NY*

● Just a brief note to lend my support to the FCC proposal concerning immediate eligibility for 2-letter calls for Extras. Simple math shows the limited number of these calls and many of us are afraid that after waiting many years, we won't get one except by waiting for someone to die! I've waited 16 years and have the Extra and I think that's way too long. The 2-letter call is a fitting reward.... I urge the League to support this proposal. – *Tom Champlin, K5TLG, Tulsa, OK*

● In reading the "Happenings" from your July *QST*, I find a few things upsetting. First, on this list is the so-called "dual ladder" concept of licensing. I see this as an "out" for the CBers to obtain more space, especially in the no code "communicator" class. This is not only a lowering of amateur standards – which have been always high, i.e. incentive licensing – but taking away a very valid form of communication.

I hold my license with great respect for the law and have a great deal of my spare time centered about this fine activity. On the other hand, the intent of a large part of the eleven meter group is violation of the law. For example, the giving away of converted state-of-the-art amateur gear and using over-powered equipment. I believe it is human nature to value that which is earned, and to abuse that which is easily obtained. Please consider this fact when talking with Mr. Walker, W4BW. I realize that frequency allocations are on everyone's mind, but don't let's erode the privileges which many of us amateurs enjoy. – *Dr. Carter W. Rae, WA8YVM/1, Loring AFB, Limestone, ME*

NAME STEALING

● I came across an application for H.A.M. in a truck stop along Interstate 80 in Pennsylvania. Although I am content to let CB people go about their own doings I feel that an organization calling itself H.A.M. ("Highway Assistance Modulators") is getting too close to HAM radio.

Truck drivers and others are getting a bad name by putting CB radio to unorthodox uses and I, for one, am not happy to see an organization which solicits these people using a trademark so closely approaching amateur radio.

The only way to keep our good name is to stay isolated from this element. To permit our name to be used in such a manner can only cause unnecessary and unjustified accusations from the general public. Knowing full well the public has a hard time separating the difference between CB and HAM in the first place, I *strongly* recommend some effort be made to at least keep the names separate. – *Ellwood E. Brem, K3YVV/3, State College, PA*

MUFFED

● On page 81 of July *QST*, W2ZT suggests a device for high quality fone. I don't think it will sell in view of the preponderance of ARRL *Handbook* material on how best to mutilate the human voice.

I suggest that a more profitable device would be waterproof ear muffs to keep all the amateur tin ears from rusting. – *Jim Veatch, W4CJJ, Orange City, FL*

POSTAL PLOY EXPLAINED

● Referring to "Postal Ploy" in July Correspondence From Members.

The remarks in my letter in May *QST* ("Postage Due") were based upon inquiry of the local postal people, who thought that for a time during the transition period of the postal rates, in order not to create any delay by returning short-paid letters to the sender, they would be agreeable to accepting letters, and to affixing the "postage due" stamps. It was not, of course, intended that this practice be followed generally.

Neither was it intended, as an active ham and ARRL member since 1936, to work any hardship on the Bureaus. No one could be any more aware of the magnificent job they have always done, than I am. They are certainly due our eternal gratitude. – *G. T. Magee, K4GUS, Birmingham, AL*

ROTTEN OPERATING

● Disgusting! and Regrettable!

The deliberate interference, self-proclaimed police, needless calling, and resultant obnoxious behavior by a small group of amateur (?) operators during the recent Kingman Reef operation casts a shadow over the entire Amateur Service.

As users of the high frequency spectrum, we must constantly be aware of our actions, for they are on display for all the world to see. Operations such as those heard on 14,203 kHz during KP6KR's transmissions serve only to degrade the Amateur Service, and to threaten its very existence. After all, if we are to convince the participants in the 1979 World Frequency Allocation Conference that the existence of an Amateur Service is in their national interests, we must at all times conduct our operations in such a manner as to enhance our reputation with the government of the United States, as well as with the governments of the world.

Think about it . . . recordings of the activity related to the Kingman Reef operation, if played back at the frequency allocation conference, might cause the participants to reduce, if not to eliminate entirely, the high frequency allocations we now hold. In short, either we clean up the frequencies assigned to us *now*, or the governments of the world will do it for us in 1979. – *Theodore J. Cohen, W4UMF, Alexandria, VA*

Happenings of the Month

- Board Meeting Minutes
- Election Notice
- Extra Class Call Proposal
- Easy Logging
- EMRS Threat Gone
- Advisory Committees

BOARD MEETING HIGHLIGHTS

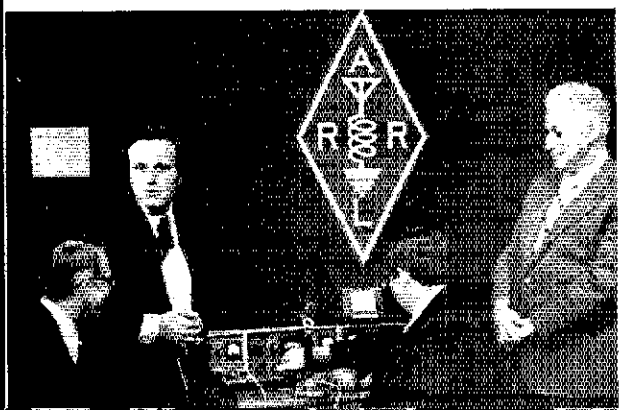
The second Board of Directors meeting for 1974 was held at the Waldorf-Astoria Hotel in New York City on July 17-19, just prior to the ARRL National Convention. The full minutes appear at the end of this section. In the highlights here, numbers in parentheses refer to the paragraph numbers in the minutes, where more detail may be found.

A long informal discussion on the League's finances resulted in the Board reaching a conclusion that a dues rise, long anticipated, was absolutely necessary now to cope with inflation, particularly in *QST* production and forwarding (postage) costs. It also led to higher pensions for those already retired from League service (all of whom retired before the League entered the social-security system!) and to a study of professional portfolio management for the League's reserves in stocks and bonds (13, 14, 15/23). In internal League affairs, a new associate counsel was appointed (1) for Canada – Bob Benson, VE2VW – replacing the Hon. Arthur Meen, Q.C., VE3RX, who resigned because of the pressures of his ministerial post in the Ontario Provincial Cabinet. Saratoga, Warren and Washington counties in New York state were transferred from the Western New York section of the Atlantic Division to the Eastern New York section of the Hudson (45) in accordance with a membership poll conducted earlier. Cloth emblems bearing the League logo were authorized (9), and the title of Past Director recognized for organizational purposes (34). National Conventions got the okay for Northern Virginia in 1975 (36) and Ontario in 1977 (37); there will also be a look at guidelines for these conventions (44) by committee, and phone DXCC will remain available (22).

On the regulatory front, the Board congratulated the Federal Communications Commission on its fortieth anniversary, and then decided on some tasks it wanted FCC to perform at the start of the second 40: rulemaking to start the six-meter repeater band at 51.5 MHz with powers up to 500 watts (62); a request for remote-control (63) of repeaters when they are in portable status; and authorization for SSTV and facsimile through fm repeaters (64). There is to be League support for special temporary authorizations (STAs) to determine the feasibility of running facsimile on the same hf and vhf bands where SSTV is already authorized (16). The League will seek rules (25) permitting multiplexing of control and voice transmissions, necessary for "remote base" work; will ask (18) for exams in the Spanish language for Puerto Rico; and express its support for repeater linking in Docket 20073. The Executive Committee will gather information from directors and the membership on the Extra Class call sign proposal, Docket 20092, and will decide at its September meeting on the League filing (32). No action yet until the FCC proposal surfaces, but the Board devoted about an hour to the philosophies behind "restructuring" (70) particularly the "technical-exam, but no-code" license for 220 and up.

There was discussion, too, about philosophies involved in type approval and type acceptance of amateur equipment. If there is to be any such, the Board will urge continuation of the amateur's right to build, to modify and to adapt surplus to his own uses. There was also concern about use of these terms in advertising, where under present conditions it can be misleading, and the General Manager was given authority (69) to handle it. The RFI Task Group, working on long term solutions to radio frequency interference problems – including such legislation as HR 3516 – received (26) full support of the Board. And a periodic column on theory and practical aspects of propagation is to be started for *QST* (65).

Studies were ordered for worldwide communications alerting procedures in times of disaster; development of public-service spot announcements in recorded form; a special emergency coordinator



Amateur Radio Week in Tennessee served as opportunity for good all-around publicity for the fraternity. Here, during an hour-long talk show on WLAC-TV, are Pat Patterson, WB4VNJ; host Stanley Siegel; Butch Smith, WA4JSX and Delta Director Max Arnold, W4WHN. During the show a real-time QSO was carried out on the air with Senator Barry Goldwater, K7UGA – we guess that "Murphy" was on vacation!

Since 1940 there has been a cooperative understanding between the American National Red Cross and the American Radio Relay League concerning disaster communications. The agreement was brought up to date and reaffirmed this summer. At the signing: George M. Elsey, president of the American National Red Cross and Harry J. Dannals, W2TUK, ARRL president. Looking on: Milford "Bud" Fink, Chief, Emergency Communications, National Disaster Services ANRC, and George Hart, W1NJM, Communications Manager, ARRL.

appointment to handle planning for areas larger than a section; ways of expediting *QST* to members in Alaska, Hawaii, Puerto Rico and the possessions; a possible ARRL Newsletter; a patron or similar grade of membership; availability of ARRL publications in a "package" format; code practice on cassettes; a standard QSL card design for the League's "official family," and finally, ways of coping with malicious interference within amateur radio.

ELECTION NOTICE

To All Full Members of The American Radio Relay League Residing in the Central, Hudson, New England, Northwestern, Roanoke, Rocky Mountain, Southwestern and West Gulf Divisions:

Nominations are now in order for director and vice director in these eight divisions of ARRL. Only ten Full Members need to join together in naming a candidate, by a petition which must reach the Secretary of ARRL by noon EDST September 20.

Democracy within our League starts with these nominations. If more than one candidate is nominated, and each meets the requirements explained below, then all Full Members of the League in the division will have a chance to choose from among the candidates by secret ballot between the week of October 7 and noon of November 20.

The election procedures, outlined briefly here, are specified in the Articles of Association and Bylaws; copies will be sent to members free upon request. An informational pamphlet generally outlining duties and responsibilities of elected League officials is also available for the asking.

Any eligible Full Member of the Central, Hudson, New England, Northwestern, Roanoke, Rocky Mountain, Southwestern or West Gulf Divisions can be nominated for either director or vice director. If one person is nominated for both offices, his nomination for director will stand and that for vice director will be void; no person may simultaneously be candidate for both positions.

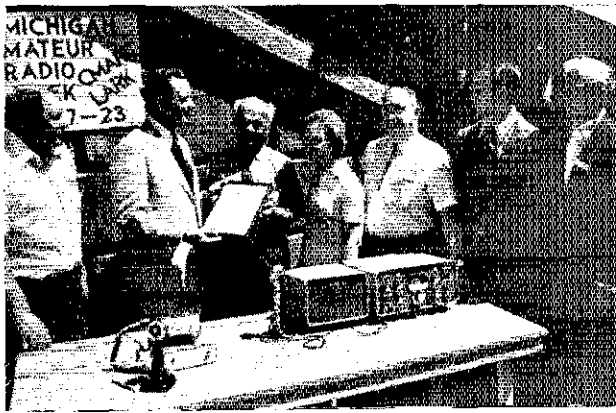
Since all the powers of the director are transferred to the vice director in the event of the director's death, resignation, removal outside the Division, or inability to serve, careful selection of candidates for vice director is just as important as for director. The following form for nomination is suggested:

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

We, the undersigned Full Members of the ARRL residing in the ..... division, hereby nominate ..... of ..... as a candidate for director; and we also nominate ..... of ....., as a candidate for vice-director; from this division for the 1975-1976 term.
(Name Call City Zip Date)

The signers must be full members in good standing. The nominee must be the holder of at least a General Class amateur license, or a Canadian Advanced Amateur Certificate, must be at least 21 years of age, and must have been licensed and a Full Member of the League for a continuous term of at least four years at the time of his election. No person is eligible who is commercially engaged in the manufacture, sale or rental of radio apparatus capable of being used in radio communications, is commercially or governmentally engaged in frequency allocation planning or is commercially engaged in the publication of radio literature intended in whole or in part for consumption by radio amateurs.

All such petitions must be filed at the headquarters office of the League in Newington,



Here is W8MAA/8 near the State Capitol in Lansing for Michigan Amateur Radio Week, June 17-23. With Governor William G. Milliken (second from left) are W8QQL, K8HXW, WA8LMR, W8CRP, WA8QCW and WA8MVH. The Central Michigan Amateur Radio Club and the Livingston Amateur Radio Klub cooperated in the celebration. *(CMARC photo)*

OVERSEAS AND ABSENTEE BALLOTS

ARRL members licensed by FCC or DOT but temporarily resident outside the U.S. or Canada are eligible for Full Membership. These members overseas who arrange to be listed as Full Members in an appropriate division prior to September 20 will be able to vote this year where elections are being held.

Even within the U.S., Full Members temporarily outside the ARRL division they consider home may now notify the Secretary prior to September 20, giving the current *QST* address and the reason why another division is considered home (e.g., holding an amateur call appropriate to the division). So if your home division is the Central, Hudson, New England, Northwestern, Roanoke, Rocky Mountain, Southwestern or West Gulf, but your *QST* goes elsewhere because of a different residence, please let the Secretary know, as soon as possible but no later than September 20, so you'll receive a ballot for your home division.

Conn., by noon EDST of the 20th day of September, 1974. There is no limit to the number of petitions that may be filed on behalf of a given candidate but no member shall append his signature to more than one petition for the office of director and one petition for the office of vice director. To be valid, a petition must have the signature of at least ten Full Members in good standing; that is to say, ten or more Full Members must join in executing a single document; a candidate is not nominated by one petition bearing six valid signatures and another bearing four. Petitioners are urged to have an ample number of signatures, since nominators are occasionally found not to be Full Members in good standing. It is not necessary that a petition name candidates both for director and vice director but members are urged to interest themselves equally in the two offices.

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

Voting by ballots mailed to each Full Member will take place between the week of October 7 and November 20, except that if on September 20 only one elegible canditate has been nominated, he will be declared elected.

Present directors and vice-directors for these divisions are: *Central*: Philip E. Haller, W9HPG and Edmond A. Metzger, W9PRN. *Hudson*: Stan Zak, K2SJO and George A. Diehl, W2IHA. *New England*: Robert York Chapman, W1QV and John C. Sullivan, W1HHR. *Northwestern*: Robert B. Thurston, W7PGY, and Dale F. Justice, K7WWR. *Roanoke*: L. Phil Wicker, W4ACY and Donald B. Morris, W8JM. *Rocky Mountain*: Charles M. Cotterell, WØSIN and Allen C. Auten, WØECN. *Southwestern*: John R. Griggs, W6KW and Arnold Dahlman, W6UEI. *West Gulf*: Roy L. Albright, W5EYB and Jack D. Gant, W5GM.

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

For the Board of Directors:

July 1, 1974

JOHN HUNTOON, W1RW
Secretary

PROPOSAL FOR EXTRA CLASS CALLS – DISCONTINUANCE OF MEMORIALS

FCC has published a Notice of Proposed Rulemaking, Docket 20092, which would allow Extra Class licensees, regardless of time in amateur radio, to pick a call of their choice – including "1 by 2" and "1 by 3" calls – limited only by the numeral of the call area and availability of the call desired for assignment. In the same docket, FCC proposes to terminate memorial calls, under which a club has been able to ask for the call of one of its former members who is now a "Silent Key." Verification of claims has been difficult and time consuming, the Commission says. Anyone interested in either matter may comment directly to FCC by October 9; reply comments will be received through October 24. League members may wish to express their views to their own director (see page 8) early this month; the Executive Committee will be compiling the views forwarded by directors at its September 28 meeting, in order to file comments by the deadline.

The text follows:

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of		
Amendment of Part 97 to make Special Call Signs available to stations licensed to Amateur Extra Class operators	)	Docket No. 20092

NOTICE OF PROPOSED RULE MAKING

Adopted: June 26, 1974 Released: July 2, 1974

By the Commission

The Arizona Repeater Association has donated a complete set of League publications to the Phoenix Public Library. Howard Nutter, K7GHS, ARA president (right) hands them over to W. R. Henderson, library director. *(Photo thanks to WA7KBN)*

Amateur Radio Week in New Jersey was July 15-22, marking the fifth anniversary of the Apollo Moon Landing and of the VHF Space Net. From left: Assemblyman Walter Kozlowski; Governor Brendan Byrne; ARRL assistant director W2CVW; and WA2DHR. Standing, from left, Joseph C. Piotroski, of NJ Civil Defense; WB2BCY; SNJ SCM W2YPZ; NNJ SCM WB2RKK; George Zitzler, of NJ Civil Defense; WB2MTU, who had lots to do with the observance, is unhappily missing from the photo.

1. Notice of proposed rulemaking is hereby given in the above captioned matter.

2. Frequently, the Commission receives a request from an amateur radio operator asking to have a specific call sign, or call sign format, assigned to his amateur radio station. The reasons given to justify these requests vary, but the requests in themselves indicate the very special significance a station call sign can hold for an amateur operator. Under the present rules, there are no provisions for satisfying requests of this type.

3. While we would like to be able to assign every amateur station the exact call sign of the licensee's choice, there are practical limitations imposed by administrative considerations. The assignment of station call signs on a request basis would require new processing systems requiring more clerical manpower, since most call sign assignments are now made by automatic data processing methods. Additionally, more manpower would be required to resolve conflicts arising from the inevitable cases of several amateurs desiring to obtain the same particular call sign. For reasons such as these, under our present systems and resources, we could not possibly offer to assign call signs on a request basis to all of the 265,000 amateur radio stations now licensed.

4. Until such time as the necessary systems and resources may become available, we believe it is possible to satisfy at least some of these requests. The Amateur Extra Class deserves first consideration in this matter. This group represents the highest skill level licensed in the Amateur Radio Service. Since they also represent the operator class having the smallest number of stations (over 14,000), and since many, if not most, of these stations already have preferred call signs or call signs of long standing, the number of requests for special call signs should come within reasonable limits. Making special call signs available to this group should provide amateurs, and the Commission, with information and experience in this matter so any future possibility of expanding the system can be better considered. Moreover, it would offer amateurs a way to obtain the call sign of their choice for their station.

5. Therefore, we propose to amend the applicable sections of Part 97, as shown in the Appendix. The current 25 year eligibility requirement for a 1X2 (single letter prefix, two letter suffix) call sign would be deleted. The amateurs meeting the 25 year requirement have had ample opportunity to exercise this option. The manpower recovered from deleting this provision can be applied to administering the proposed new system. Under these proposals, any Amateur Extra Class licensee would be eligible to apply for and receive any available station call sign of his choice, including 1X2, 1X3, or 2X3 formats, consistent with the numeral designated for the area. The limitations on only one 1X2 format call sign per licensee, except for those already holding more than one, would remain. However, the same licensee would be eligible to also hold one or more 1X3 or 2X3 format station call signs.

6. The proposals would undoubtedly result in the limited number of 1X2 format call signs becoming rapidly exhausted. This eventually is only a few years off anyway, since the number of amateurs completing 25 years in the Amateur Radio Service should begin to increase sharply, reflecting changes in the operator license structure in the early 1950's. For this reason, we are proposing to delete the availability of *in memoriam* call signs to club stations. This will make a few more 1X2, and even desirable 1X3, format call signs available for the proposed system. Additionally, verification that the deceased former licensee was actually a member of the organization has, at times, been difficult for both the club and the Commission. Again, the manpower recovered from this deletion can be applied to the proposed new system.

7. The Commission has a number of petitions on file concerning the assignment of amateur station call signs. This proposal is not intended to preempt future consideration of those petitions. In fact, should our proposal be adopted, the resulting experience will enable us to better consider these petitions. Only call signs having prefixes in the series now normally assigned to primary and secondary stations would be available initially, although additional prefix series may be added at a future date. Available immediately would be those having the prefix K, W, WA, and WB, in addition to those call signs normally assigned to stations not within the 48 contiguous United States. For stations outside the 48 contiguous United States, only a choice of call sign suffix could be made.

8. Authority for the proposed rule changes herein is contained in sections 4(i) and 303 of the Communications Act of 1934, as amended.

9. Pursuant to applicable procedures set forth in 1.415 of the Commission's Rules, interested persons may file comments on or before October 9, 1974 and reply comments on or before October 24, 1974. All relevant and timely comments and reply comments will be considered by the Commission before final action is taken in this proceeding. In reaching its decision on the rules which are proposed herein, the Commission may also take into account other relevant information before it, in addition to the specific comments invited by this Notice.

10. In accordance with the provision of 1.419 of the Commission's rules and regulations, an original and 14 copies of all comments, pleadings, briefs, or other documents shall be furnished the Commission.

11. All filings in this proceeding will be available for examination by interested parties during

All "Lifers" — Harry F. Legler, WØPB of the ARRL Emergency Communications Advisory Committee (second from left) and two grandsons, Steve WBØJFJ and Mike, WAØTVH, received their Life Membership pins from Midwest Director Paul Grauer, WØFIR, (right) himself an LM, at the Central Kansas Amateur Radio Club hamfest in June. *(Photo by KØFPG)*

regular business hours in the Commission's public reference room at its headquarters in Washington, D.C. (1919 M Street, NW.)

FEDERAL COMMUNICATIONS COMMISSION,
Vincent J. Mullins,
Secretary

APPENDIX

Part 97, of Chapter I of Title 47 of the Code of Federal Regulations is amended as follows:

1. Section 97.51(a)(3) is deleted and reserved, and 97.51(a) and 97.51(a)(5) are amended to read as follows:

97.51 *Assignment of call signs.*

(a) The Commission will systematically assign every amateur radio station a call sign consisting of a sequence of two letters, a numeral, and three letters, with the following exceptions:

* * *

(3) [Reserved]

* * *

(5) Upon request for a Special Call Sign, any available unassigned station call sign may be assigned to a primary or secondary station licensed to an Amateur Extra Class operator.

* * *

2. Section 97.53 is revised to read as follows:

97.53 *Policies and procedures applicable to the assignment of call signs.*

(a) An eligible licensee will be permitted to hold only one two-letter call sign. However, licensees who, by reason of former rule provisions, presently hold more than one such call sign may continue to hold those call signs in the same call sign areas.

(b) Subject to availability, a primary station will be assigned the same type of call sign as the one relinquished, upon modification of license to show the fixed station operation location in a different call sign area.

(1) Stations will not be assigned specific call signs of the licensee's choice, nor counterpart call signs (call signs having identical suffix letters), under this provision. However, these limitations will not preclude qualification for a Special Call Sign.

(2) When a two-letter call sign is not available in the new call sign area, an eligible licensee may be assigned an available unspecified three-letter call sign.

(c) Call signs which have been unassigned for more than one year will normally be available for reassignment.

EASY LOGGING

In somewhat of a surprise move, FCC acted on June 25 to reduce drastically the requirements for logging in the amateur radio service along lines proposed by the Maryland FM Association, Inc., only weeks earlier. Fixed station logging has been reduced to the call of the station; signature of the licensee (or a photocopy of the license); dates upon which fixed operation of the station was begun and terminated; and where applicable, locations and dates of portable operation. Additionally, the fixed or mobile log should contain the signature, call and operating periods of each control operator other than the licensee; and a notation on third party traffic, including phone patches, with the names of the third parties and a brief description of the traffic content. This last can be in a form other than written (as for instance on a cassette) provided that it can be transcribed readily into written form. FCC is reserving the right to require the recording of additional information by particular stations if conditions warrant. The changes took place July 10.

At the same time, FCC encourages the continued keeping of the traditional log, pointing out it can be used to prove or disprove some aspect of prior operation and to prove that minimum operating requirements for renewal of license have been met.

The text of the order follows:

The ARRL Technical Merit Award for 1973 was conferred on Larry Kayser, VE3QB by the ARRL Board of Directors at its annual meeting in January, recognizing Larry's work in developing "Smart," the automated control system for Oscar 6. Making the presentation at the Western New York Hamfest in May is Canadian Director George Spencer, VE2MS (right). *(Photo via WA2KND)*

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D. C. 20554

In the Matter of

Amendment of Part 97 to delete certain amateur radio station log requirements.	)))))	RM-2382

ORDER

Adopted: June 25, 1974; Released: July 2, 1974

By the Commission:

1. The purpose of this Order is to amend the rules for the Amateur Radio Service to delete requirements for certain information to be entered into the log for an amateur radio station.

2. The Maryland FM Association, Inc., in petition RM-2382, requests amendment of 97.103 in order to effect such deletions. Petitioner claims the practical aspects of maintaining a station log at times can be very cumbersome and inconvenient. They point out other services regulated by the Commission where logs are not required, and question if amateur station logs are essential to the Commission's task in inspecting amateur stations and reviewing their operation.

3. The logs required by 97.103 do not, in fact, play a major role in the Commission's enforcement efforts, and we have no information on the role they play in the amateurs' self-enforcement efforts. A station log is sometimes presented to the Commission by an amateur operator attempting to prove, or disprove, some aspect of his past operation. For instance, he may wish to prove his station was not in operation during a period for which a complaint was received or a violation of the rules was observed. Or he may wish to prove he had accumulated the operating time required by 97.13(a) at the time of license renewal. A well kept log can, therefore, serve the amateur operator. For this reason, we feel most amateurs will probably continue to log data in addition to that required, a conclusion shared by the petitioner.

4. The present rules do provide exceptions to the logging requirements, most notably for those stations in mobile operation. The underlying purpose for this exception is safety considerations during times the amateur is simultaneously driving an automobile and operating an amateur station. There has been no noticeable impact resulting from this exception, and based upon this experience, it can be predicted there will be no significant degradation of the Service by extending the relaxation.

5. Petitioner recommends rule provisions such that, in specific instances, a station may be required to enter additional information into the log as may be deemed necessary by the Commission. We are in agreement with their suggestion. Furthermore, we believe the following should be logged: the location and dates for any operation, except mobile; signatures of visiting control operators; and third party traffic. Petitioner states his agreement with these requirements.

6. The amendments are given in the Appendix. It should be noted the requirements for logging certain technical data in 97.111(f) remains unchanged. The amendments adopted herein are editorial revisions, and deletions and relaxations of existing rules provisions which we consider no longer necessary. We believe they will inure to the benefit of many and to the detriment of none, and they will better serve the public interest. Therefore, prior notice of rule making and effective date requirements are unnecessary, pursuant to the Administrative Procedure and Judicial Review provisions of 5 U.S.C. 553(b) (3) (B).

7. Therefore, IT IS ORDERED, that, pursuant to 4(i) and 303(j) and (r) of the Communications Act of 1934, as amended, Part 97 of the Commission's Rules and Regulations are amended as set forth in the attached Appendix, effective July 10, 1974. IT IS FURTHER ORDERED That RM-2382 is TERMINATED.

FEDERAL COMMUNICATIONS COMMISSION
Vincent J. Mullins, Secretary

APPENDIX

97.103 of Chapter I of Title 47 of the Code of Federal Regulation is amended to read as follows:

97.103 *Station log requirements.*

An accurate legible account of station operation shall be entered into a log for each amateur radio station. The following items shall be entered as a minimum:

(a) The call sign of the station, the signature of the station licensee, or a photocopy of the station license. (b) The locations and dates upon which fixed operation of the station was initiated and terminated. If applicable, the location and dates upon which portable operation was initiated and terminated at each location.

(1) The date and time periods the duty control operator for the station was other than the station licensee, and the signature and primary station call sign of that duty control operator.

(2) A notation of third party traffic sent or received, including names of all third parties, and a brief description of the traffic content. This entry may be in a form other than written, but one which can be readily transcribed by the licensee into written form.

(3) Upon direction of the Commission, additional information as directed shall be recorded in the station log.

NEW CANADIAN COUNSEL

B. Robert Benson, VE2VW, of Westmount, Quebec, has been appointed by the Board as ARRL Associate Counsel for Canada. Bob was admitted to the bar in 1959 and currently practices law in the partnership of Schwisberg, Golt &

Amateur of the Year honors at Rochester went to Clara Reger, W2RUF, a top traffic handler. ARRL President Harry J. Dannals, W2TUK, makes the award, watched by Bruce Kelley, W2ICE, at left, and Harry A. McConaghy, W3SW, Atlantic Director. *(Thanks to WA2KND for the photo)*

Ben Lowe, K4VOW/WA5UVM, coauthor of the April *QST* article, "A Simple & Efficient Mixer for 2304 MHz," displays the cover plaque he won with the story. (Last month we showed the other author, Leroy May, W5AJG/W5HN, with his plaque). In the background is the 12-foot dish Ben uses for moonbounce on 432 MHz.

Benson, after receiving a BA from Harvard and BCL from McGill; he has also done graduate work in business administration at Columbia University. Originally W2PJP in the forties, Bob got active again in 1969 and currently holds the Canadian Advanced Amateur certificate of proficiency, used in DX ragchewing on the hf and 2 meter fm. Off the air he is honorary legal counsel to the Montreal Amateur Radio Club and to VE2RM Inc., a repeater club. Bob and Norma Betty, VE2AJV, have three children, none hams as yet. His address for League affairs will be his law address: Suite 804, 1010 St. Catherine Street West, Montreal, Quebec H3B 3R4.

Our best wishes to retiring counsel, the Hon. Arthur K. Meen, Q.C., VE3RX, who found himself, as a minister in the Ontario Cabinet, much too QRL for League affairs!

KENTUCKY CALL PLATES; AMATEUR RADIO WEEK

There was good news and bad for Kentucky amateurs recently. Governor Wendell H. Ford had some fine things to say about amateurs when he proclaimed Amateur Radio Week for June 17 to 23; his remarks covered emergency preparedness, civil defense, international understanding and good will and Field Day activities. The attorney general, on the other hand, sought an injunction prohibiting the issuance of call letter license plates to amateurs by the motor vehicle department, claiming that this was unconstitutional under Kentucky law. SCM Ted Huddle, W4CID and former SCM George Wilson, W4OYI, are on top of the situation so far, winning the first round with a denial of the injunction. The attorney general is expected to appeal, so Kentucky amateurs will want to keep in touch with the latest from Ted and George.

EMERGENCY MEDICAL RADIO SERVICE

Earlier this year amateurs were most concerned by a suggestion of the Interdepartmental Radio Advisory Committee (IRAC) to FCC that three frequencies between 449 and 450 MHz be used for paging in a proposed emergency medical radio service, Docket 19880. The League filed an extensive opposition, also proposing alternative frequencies which could be used.

On July 16 FCC released a Report and Order, effectively creating the new category of service, but did not include in it any frequencies now authorized to amateurs. Though most of the subject matter is beyond our field of reportage, a couple of passages are of interest:

> . . . For paging channels, a large number of comments were submitted by amateur radio operators and organizations opposing use of the government band 449.850-499.950 MHz for this purpose . . .
>
> . . . One type of operation we are not providing on these UHF frequencies is paging communications. Paging operations have generally proven to be incompatible with regular two-way radio systems shared on the same channels and we are requiring that they be conducted on separate paging-only frequencies. It had been proposed that frequencies in the 449.850-449.950 MHz band be reallocated for these paging operations. These frequencies are presently available primarily for government radiolocation operations and, secondarily, for amateur stations. However, under treaty agreements to which the U.S. is a party, use of these frequencies is restricted along border areas. Further, there is no apparent need for paging to be conducted on UHF frequencies and these operations will be permitted instead in lower frequency bands . . .

Thus ends this particular threat!

ALIEN LICENSING BILL

Part of the legislative package sent to Capitol Hill by FCC this year is S 2457, which would give the FCC authority to issue station licenses to aliens in the safety and special and experimental radio services, and also to grant them operator licenses. While amateurs from countries which have reciprocal operating agreements with the U.S. and those who have signed "first papers" on the road to U.S. citizenship already can get on the air here, this bill will be helpful to youngsters under 18 who are not eligible for the filing of "first papers" and thus have been barred from operating. It will also speed the issuance of licenses to the first-papers group, since it does not require the time-consuming clearance of each application with other agencies of the government. Thus, amateurs interested in supporting these changes should be in touch with their Senators and Representatives.

West Virginia's Amateur Radio Week, July 1-7, coincided with the ARRL State Convention at Jackson's Mill. Governor Moore signed the proclamation under the gaze of, from left, K8WMK; WA8OKG, ARRL Vice Director W8JM; WB8LAI (partially hidden); W8DUV; W8DUW and K8LOU. *(WVSRC photo)*

R. REX ROBERTS, W7CPY
VICTOR CANFIELD, W5BSR

We regret to report the deaths of two former ARRL directors, R. Rex Roberts, W7CPY, of the Northwestern Division, and Victor Canfield, W5BSR, of the Delta Division.

Rex made his home in Billings, Montana. He served as alternate director from the Northwestern Division from 1941 to 1949; then as director until 1965, and again as vice director to 1969. He was also SCM of Montana for a number of years. Prior to retirement several years ago, Rex had served as manager of telephone exchanges belonging to Mountain States Telephone and Telegraph Co.

Vic lived in Lake Charles, Louisiana, and was a Certified Public Accountant. He was director from the Delta Division from 1948 through 1951 and from 1956 through 1959. The following term he served as vice director from Delta. Licensed since 1930, W5BSR was an official phone station appointee, member of the AREC and former director of the ARC of Southwest Louisiana. While on the Board he served for several years on its Finance Committee, including its Chairmanship.

ADVISORY COMMITTEE NOMINATIONS

One of the many ways in which members help steer the course of the League is through advisory committees in specialized fields – presently contests, VHF repeaters, DX, and Emergency Communications. There is a maximum of eleven members in each group, and initial appointments of terms up to three years are authorized. The full rules may be found as an addendum to the Articles of Association and By-Laws, edition of August 1, 1974. (Copy on request to members; a stamped, self-addressed envelope of standard business size would be appreciated with the letters "AABL" on it.)

Candidates for committee membership may be nominated at any time by three sponsors, each of whom is a Full Member of ARRL. Each candidate must have been a League member for a minimum of two years; licensed as a Technician or higher for three or more; and currently and consistently active and qualified in the specialty area of the field served by the advisory committee.

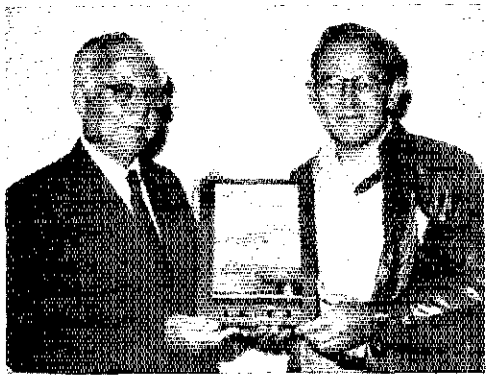
This is a call for nominations; convenient forms may be obtained by writing the secretary at ARRL Hq. The President, in consultation with the committee chairman and liaison members, on or about November 1 of each year, will select replacements for members whose terms are expiring, or shall reappoint them for a subsequent term as appropriate. A file of eligible nominees will be maintained for use as a source of replacements.

A member's initial term of office will be either for two or three years as designated by the President, with approximately one-half the initial members having two-year terms. Members may be reappointed for no more than two consecutive two-year terms, but are again eligible for appointment to committee membership after a lapse of one year.

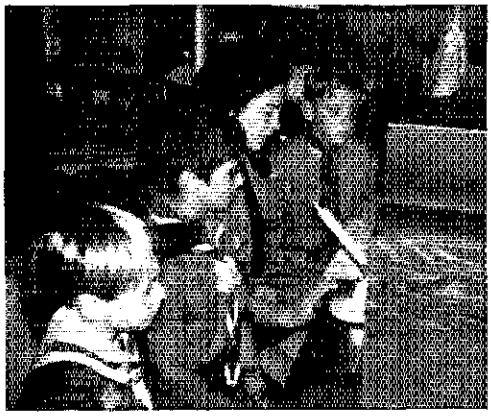
The incumbents, with date of expiration of current term, are:

Contest Advisory Committee

Peter Chamalian, W1BGD, Chairman, 52 Chestnut Ct., Cromwell CT 06416; January 1, 1976.
Stephen P. Branca, WA2BLV, 202 Minnetonka, Hi Nella, NJ 08083; January 1, 1976.
Eugene Zimmerman, W3BQV, 33 Brighton Dr., Gaithersburg, MD 20760; January 1, 1975.
John T. Laney, III, K4BAI, Box 421, Columbus, GA 31902; January 1, 1975.
Malcolm P. Keown, W5RUB, 213 Moonmist, Vicksburg, MS 39180; January 1, 1976.
Kenneth E. Keeler, W6PAA, 3308 Plateau Dr., Belmont, CA 94002; January 1, 1976.



The March *QST* article, "The Half-Square Antenna," won for its author Benjamin H. Vester, Jr., K3BC, the cover plaque award. Making the presentation is Maynard R. Briggs, W3HWZ, assistant director from the Atlantic Division.



The annual chance to show Scouts what amateur radio is like comes up October 19 and 20, during the 17th annual Jamboree on the Air. The event is not a contest but rather an opportunity for Scouts to see and participate in ham communications, hopefully including chats with other Scouts around the world. Reports of participation should be sent to Walt Maxwell, W2DU, trustee of K2BSA, Boy Scouts of America, North Brunswick, NJ 08102. The party starts unofficially on Friday night, the 18th, and continues through Saturday and Sunday, local times. The photo shows Scouts at CT2AZ, the Azores, during the 1972 Jambo.

Albert K. Francisco, K7NHV, Buckskin Rd., Pocatello, ID 83201; January 1, 1975.
C. La Mar Ray, W9UT, RR 1, Box 316, Grabill, IN 46741; January 1, 1976.
Albert W. Vitt, WAØCVS, RFD 1, Box 325, Broomfield, CO 80020; January 1, 1976.
Katashi Nose, KH6IJ, 4207 Huanui St., Honolulu, HI 96816; January 1, 1975.
Leslie G. Sawkins, VE7CC, 30353 Merryfield Ave., Mount Lehman, B.C. Canada; January 1, 1976.
Director Liaison – Larry Shima, WØPAN, 2263 Overlook Dr., Bloomington, MN 55431.
Hq. Liaison – Ellen White, W1YL.

DX Advisory Committee

Ted M. Marks, WA2FQG, Chairman, 924A Village Dr. W., North Brunswick, NJ 08902; January 1, 1976.
John H. Thompson, W1BIH, P.O. Box 1, Torrington, CT 06791; January 1, 1976.
Layfield L. Lamb, W3BWZ, Rt. 1, Whippoorwill Lane, White Plains, MD 20695; January 1, 1975.
William F. Christian, K4IKR, 2800 Cave Ave. NW Huntsville, AL 35810; January 1, 1975.
Robert E. Shank, W5AO, 105 E. Porter St., Jackson, MS 39202; January 1, 1975.
Robert B. Vallio, W6RGG, 18655 Sheffield Rd., Castro Valley, CA 94546; January 1, 1975.
Norman G. Ray, W7LFA, 14005 - 132nd Ave. NE, Kirkland, WA 98033; January 1, 1975.
Dr. John R. Sheller, WA8ZDF, 4925 Hamilton Rd., Groveport OH 43125; January 1, 1976.
Robert E. Baird, W9NN, P.O. Box 498, Plover, WI 54467; January 1, 1976.
Clyde F. Norton, WØELA, 14 Westwood Cir., Minnetonka, MN 55343; January 1, 1975.
Jack Ravenscroft, VE2NV, 353 Thorncrest Ave., Dorval, P.Q. Canada; January 1, 1976.
Director Liaison – Robert York Chapman, W1QV, 28 South Rd., Groton, CT 06340.
Hq. Liaison – Robert White, W1CW.

VHF Repeater Advisory Committee

Howard L. Lester, W2ODC, Chairman, Box 6, Alplaus, NY 12008; January 1, 1975.
Richard G. Bromley, K1ABR, 12 High View Dr., RFD 5, Cranston, RI 02920; January 1, 1975.
William C. Parris, K4GHR, 6210 Gothic Court, Charlotte, NC 28210; January 1, 1975.
George F. Munsch, W5VPQ, 11314 Janet Lee Dr., San Antonio, TX 78230; January 1, 1975.
Charles R. Flanagan, W6OLD, 6427 West 83rd St., Los Angeles, CA 90045; January 1, 1975.
Bob Dreste, K7VOR, 5040 N. 13th Ave., Phoenix, AZ 85013; January 1, 1976.
George R. Cryder, W8LGL, 15 N. Franklin St., Delaware, OH 43015; January 1, 1975.
Gilbert J. Kowols, W9BUB, 216 Belle Plaine Ave., Park Ridge, IL 60068; January 1, 1975.
D. J. Manson, KØTVO, 2302 N. Oakland, Columbia, MO 65201; January 1, 1976.
Howard Cowling, VE3WT, 64 Dunkeld Ave., St. Catherines, Ont., Can., L2M 4A7; Jan. 1, 1976.
Director Liaison – Carl L. Smith, WØBWJ, 1070 Locust St., Denver, CO 80220.
Hq. Liaison – Lewis G. McCoy, W1ICP.

Emergency Communications Advisory Committee

M.F. "Bud" Cone, WA4PRG, chairman, 317 Van Buren St., Falls Church, VA 22046; January 1, 1977.
James P. Collingsworth, WB2EDT, 1040 W. Walworth Rd., Macedon, NY 14502; January 1, 1977.
Ellwood W. Haldeman, W3PST, 1732 Loney St., Philadelphia, PA 19111; January 1, 1976.
Andrew C. Clark, W4IYT, 41 Lenape Dr., Miami Springs, FL 33166; January 1, 1977.
William E. Mixon, K5SVD, 1007 Green Oaks Dr., Baton Rouge, LA 70815; January 1, 1977.
Arthur R. Smith, W6INI, 4515 Melisa Way, San Diego, CA 92117; January 1, 1977.
Robert L. Klepper, W7IEU, 7027 51st N.E., Marysville, WA 98270; January 1, 1976.
Robert S. Dixon, W8ERD, 2073 Highlandview Dr., Powell, OH 43065; January 1, 1976.
Robert J. Hajek, W9QBH, 235 Lawton Rd., Drawer H, Riverside, IL 60546; January 1, 1976.

"A Simple Computing SWR Meter" was voted best article in July 1973 *QST*. Its author, David L. Fayman, WØGI accepts the cover plaque from past director Ralph V. Anderson, KØNL of the Midwest Division. *(Thanks to WBØBIY for the photo)*

The Roanoke Division League officials, at their annual get-together in Richmond, honored ARRL First Vice President Victor C. Clark, W4KFC, for his service to the division as director. Vic is surrounded, here, by (from left) W4FMN, W4YDY, WA4DKZ, K4CIA and W4RUH. *(K4FBG photo)*

Harry F. Legler, WØPB, 304 Miami St., Hiawatha, KS 66434; January 1, 1977.

Holland H. Shepherd, VE3DV, 3016 Cowan Crescent, Ottawa, ON, Can., K1V 8LI; Jan. 1, 1976.

Director Liaison – Max Arnold, W4WHN, 612 Hogan Rd., Nashville, TN 37220.

Hq. Liaison – William C. Mann, WA1FCM.

Minutes of EXECUTIVE COMMITTEE MEETING

No. 250 July 16, 1974

Pursuant to due notice, the Executive Committee of The American Radio Relay League, Inc., met at the Waldorf Astoria Hotel, New York, N.Y., at 2:20 P.M., July 16, 1974. Present: President Harry J. Dannals, W2TUK, in the Chair; First Vice President V. 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. Also present were a number of other directors, officers and staff.

On motion of Mr. Griggs, unanimously VOTED to confirm an earlier grant of approval for the holding of a Maritime Provinces Convention, at Fredericton on August 30-September 4, 1974; and to grant approval for the holding of a Tennessee State Convention, at Memphis on October 5-6, 1974; and tentative approval for a Midwest Division Convention in Omaha, Nebraska, on October 8-10, 1976.

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

Alamo DX Amigos, San Antonio, Texas; Beachwood Amateur Radio Club (of Beachwood High School), Beachwood, Ohio; Calder School Amateur Radio Club, Buena Park, Calif.; Chicago FM Club, Chicago, Ill.; Crotched Mountain School Radio Club, Greenfield, N.H.; Hersey High School Amateur Radio Club, Arlington Hts., Ill.; L'Anse Creuse Amateur Radio Club, Mt. Clemens, Mich.; Northeast Philadelphia Amateur Radio Club, Philadelphia, Pa.; Ohio Valley Teenage Network, Russel, Ky.; Radio Active Students Club – Edison Freshman School, Midland, Texas; Stamford Amateur Radio Association, Stamford, Conn.; York North Amateur Radio Club, Newmarket, Ontario; Fredericton Amateur Radio Club, Fredericton, N.B.

On motion of Mr. Arnold, Life Membership was unanimously GRANTED to the following applicants:

Wilson E. Anderson, Jr., WB6RIV; Kerry J. Andres, WAØUZQ; Anthony E. Baltuz, K3QJJ; Joe H. Beler, W5WY; David P. Bennett, VE7AZG; Alan J. Blank, K1TFA; David A. Bollinger, W2HOP; H. R. Booher, K8JPM; Florian J. Brungardt, WØNEE; Roland S. Carpenter, WB6YID; James P. Collinsworth, WB2EDT; David L. Costello, K9SJI; Richard S. Czuchra, WA9GIK; Neal W. Degner, WA9WYI; George W. Daly, Jr., WB6NLD; Royce D. Detwiler, W6SXO; Dick L. Eilers, WØYZV, John T. Estes, KØOLI; William F. Fenn, WB4WYC; Bronce Fitzgerald, WA4ZCX; George H. Flammer, III, WB6RAL; James H. Fox, WA9BLK; W. Harrell Freeman; James A. Gallagher, K8VTS; William R. Gardner, WB8ATY; Joseph R. Getlein, Jr., W1FAI; James H. Glowinski, W9KZP; Donald L. Goodwin; Eric Hafler; Benjamin S. Hale, KH6HSQ; Alfred C. Harazda, W2QIY; Darryl E. Harvan, WA2AYF; Arthur D. Hendricks, K4CTZ; William M. Herr, Jr., W6MQZ; James R. Hoogesteger, W8FVH; Woodrow Huddleston, K4SCL; Frank E. Huffman, K8OVP; William T. James, II, WA2QHL; William R. Johnson, W6PYZ; Doug P. Jones, WB4MYZ; Harold R. Jones, W6ZVV; Frank B. Jordan, Jr., WA2KUL; Mark T. Jordan, Jr., W5VCW; Walter T. Kapica, WA2NXK; George G. Kass, K2TMB; Kenneth E. Keeler, W6PAA/WA6DKF; Harry Jay Kessell; William H. Kindler, W3STV; Jan A. King, W3GEY; James Knott, VE3CVM; Robert A. Lange, WØILB; John L. Leonard, K4AUI; Gary L. Lewis, WA7BBJ; Gilbert Lester Lewis, WA9MXI; Richard O. Lust, WB9DWG; David R. Margolis, Jr., WB8HIB; F. W. Marsh, VE3SB; Dick B. Martin, WAØRXQ; Richard K. Massett, VE6FM; Reverend J. R. McAvey, O.P.; Thomas R. McClure, W9MHO; E. Scott Medling, WB6OFX; Leo I. Meyerson, WØGFQ; Nick Morvay, VE3EIB; Curtis W. Myers, WA2JSG; Paul M. O'Brien, K1OJQ/E14CM; Richard L. Oppelt, Sr.; Gene R. Owens, W6ORZ; Lionel P. Parker, VE7BXB; Allie C. Peed, Jr., K2DHA; Kendall H. Pinion, K4JKK; Glen W. Pladsen, WAØVPK; Maxwell Powell, Jr., VO1HH; Mark S. Pride, WA1ABV; Lafe H. Rees, WØUUH; Theodore Riemann, WB5JBH/WØULK; Raymond G. Roy, VE2AKO; Fred A. Salas, K5HOB/W5IBZ; Carl M. G. Scherer, VE2AWO; Jacob O. Schock, WA7IHU; John L. Schroeder, W6UFJ; Robert A. Selzer, W2HIJ/KH6AGS; Pedro R. Serrano, KP4AWM; Peter M. Skorpen, K6VBX; Gary L. Spencer, WN9JMY; Lester A. Stay, WA2KPD; John W. Swofford, WB9GFZ; Glenn S. Taylor, WA2NJY; James L. Tourigny, WA1SER; Richard F. Vogt, WA9JRY; Earl L. Weaver, W6JPH; Raymond C. Webb, K1YPZ/WAØWPR; M. Leroy Weinstein, W4TZC; Robert Bruce Weinstock, WB2TJR; James K. Welsh, VE3CIR; Bruce F. Whitney, WA8EEQ; Eugene C. Wilson, WA8TSG; Gunther E. Wurthmann, K2JKU; Wilbur Lane Younts, W4ANM; Jonathan O. Zabel, W7WMY.

In the course of its meeting the Committee discussed, without formal action, a number of subjects including the NYC-LI section SCM election, section newsletters, recent FCC actions on logging (prompted by The Estero Amateur Radio Club) and repeaters, and advisory committees.

There being no further business, the Committee adjourned, at 4:20 P.M.

Respectfully submitted,
JOHN HUNTOON, W1RW
Secretary

Pete Rhodes, K4EWG, earned the November 1973 *QST* cover plaque with his article, "The Log-Periodic Dipole Array." Presentation was by Southeastern Director Larry E. Price, W4DQD.

BOARD MINUTES

Minutes of the 1974 Second Meeting of the ARRL Board of Directors July 17-19, 1974

Pursuant to due notice, the Board of Directors of The American Radio Relay League, Inc., met in second session at the Waldorf-Astoria Hotel, New York, New York, on July 17, 1974. The meeting was called to order at 9:34 A.M., with President Harry J. Dannals, W2TUK, in the Chair, and the following directors present:

Roy L. Albright, W5EYB, West Gulf Division
Max Arnold, W4WHN, Delta Division
Robert York Chapman, W1QV, New England Div
Charles M. Cotterell, WØSIN, Rocky Mountain Div.
Richard A. Egbert, W8ETU, Great Lakes Division
J. A. Gmelin, W6ZRJ, Pacific Division
Paul Grauer, WØFIR, Midwest Division
John R. Griggs, W6KW, Southwestern Division
Philip E. Haller, W9HPG, Central Division
Harry A. McConaghy, W3SW, Atlantic Division
Larry E. Price, W4DQD, Southeastern Division
Larry J. Shima, WØPAN, Dakota Division
A. George Spencer, VE2MS, Canadian Division
Robert B. Thurston, W7PGY, Northwestern Div.
L. Phil Wicker, W4ACY, Roanoke Division
Stan Zak, K2SJO, Hudson Division

Also in attendance, as members of the Board without vote, were Victor C. Clark, W4KFC, First Vice President; Noel B. Eaton, VE3CJ, Vice President; Carl L. Smith, WØBWJ, Vice President; and John Huntoon, W1RW, General Manager. Also in attendance at the invitation of the Board as non-participating observers were the following vice directors: Jesse Bieberman, W3KT, Atlantic Division; Howard Cowling, VE3WT, Canadian Division; Edmond A. Metzger, W9PRN, Central Division; John H. Sanders, WB4ANX, Delta Division; George A. Diehl, W2IHA, Hudson Division; Richard W. Pitner, WØFZO, Midwest Division; Albert F. Gaetano, W6VZT, Pacific Division; Donald B. Morris, W8JM, Roanoke Division; Ted R. Wayne, WB4CBP, Southeastern Division; Jack D. Gant, W5GM, West Gulf Division. There were also present Honorary Vice President Charles G. Compton, WØBUO; General Counsel Robert M. Booth, Jr., W3PS; Assistant General Manager Richard L. Baldwin, W1RU; Communications Manager George Hart, W1NJM; Senior Assistant Secretary Perry F. Williams, W1UED; *QST* Technical Editor Doug DeMaw, W1CER and Public Relations Consultant Don Waters.

1) On motion of Mr. Spencer, seconded by Mr. Eaton, unanimously VOTED that B. Robert Benson, VE2VW, is named ARRL Associate Counsel for Canada (Applause). Whereupon Mr. Benson was seated.

2) On motion of Mr. Thurston, seconded by Mr. McConaghy, unanimously VOTED that the Minutes of the 1974 Annual Meeting of the Board of Directors are approved in the form in which they were issued by the Secretary.

3) At this point, extensive oral reports were offered by the officers and General Counsel of the League, during the course of which the Board was in recess from 10:50 A.M. to 11:16 A.M., and again for luncheon from 11:47 A.M. to 1:08 P.M. Apologies were offered for the absence of Treasurer David H. Houghton, because of the illness of his wife.

4) Mr. Albright, as Chairman, presented the report of the International Affairs Committee; Mr. Zak, as Chairman, presented the report of the Plans and Programs Committee; Mr. Griggs, as Chairman, presented the report of the Membership Affairs Committee; Mr. Shima, as Chairman, presented the report of the Management and Finance Committee along with supplementary information; Mr. Price, as Chairman, presented the report of the Legal and Regulatory Committee. During the course of the above, the Board was in recess from 2:46 P.M. to 3:03 P.M.

5) As liaison directors, Mr. Smith reported for the VHF Repeater Advisory Committee; Mr. Shima for the Contest Advisory Committee; Mr. Chapman for the DX Advisory Committee, and Mr. Arnold for the Emergency Communications Advisory Committee. Mr. Clark reported for the Amateur Satellite Service Council. During the course of the above, the Board was in recess from 4:32 P.M. until 4:55 P.M.

6) On motion of Mr. Albright, seconded by Mr. Wicker, unanimously VOTED that the Emergency Communications Advisory Committee study the problems and make recommendations to the Board concerning the establishment of a world-wide communications alerting procedure for use when a disaster occurs which requires assistance beyond the capability of national facilities.

7) On motion of Mr. Haller, seconded by Mr. Griggs, after discussion, unanimously VOTED that mail communications to members in the U.S. and Canadian territories and possessions, including Alaska and Hawaii, be sent by airmail and that Communications Department Bulletins normally now sent by third class mail to these areas be sent by First Class mail.

8) Moved, by Mr. Haller, seconded by Mr. Price, that SCMs and SECs for ARRL sections located beyond the continental limits of the U.S. be permitted by the Communications Department to make one trip each, annually, at League expense, for the purpose of attending a League convention in their division of the League or attending a director-called meeting. After extended discussion, on motion of Mr. McConaghy, seconded by Mr. Gmelin, VOTED that the matter is laid on the table.

9) On motion of Mr. Grauer, seconded by Mr. Griggs, after discussion, unanimously VOTED that cloth emblems bearing League logo suitable for wearing on coat, jacket and shirts, shall be made available by the League and advertised in *QST*.

Paul F. Hampton, WØAU, has just retired as Engineer in Charge of the FCC office in Kansas City. Midwest Director Paul Grauer, WØFIR, presented a Gold Cross pen and pencil set to the "RI" on behalf of amateurs in the Division.

10) Moved, by Mr. Smith, seconded by Mr. Griggs, that the format of the standard questionnaire form furnished all candidates for director or vice director be revised to expand the list of achievements, qualifications and pertinent biographical data to provide more comprehensive information to the electorate. After extended discussion, moved, by Mr. Gmelin, seconded by Mr. Price, to amend the motion to provide that the Headquarters shall include on the ballot all information contained in the questionnaire form. After further discussion, moved, by Mr. Albright, seconded by Mr. Arnold, to further amend the motion to require the secretary to include on the ballot all items which can be accommodated on the form and which in his judgment are pertinent. After further discussion, on motion of Mr. Cotterell, seconded by Mr. Price, VOTED that the matter is laid on the table.

11) The Board was in recess for dinner from 5:45 P.M. until 8:15 P.M.

12) On motion of Mr. Cotterell, seconded by Mr. Shima, unanimously VOTED that the Board now engage in informal discussion concerning League finances. Whereupon there ensued a discussion of investment management of the League portfolio, membership dues, adequacy of pensions for League retired employees, and other financial matters. Moved, by Mr. McConaghy, seconded by Mr. Price, that the discussion be terminated; but the motion was rejected, 7 in favor to 9 opposed. After further discussion, and a recess from 9:32 until 9:48 P.M., on motion of Mr. Arnold, seconded by Mr. Zak, unanimously VOTED to terminate the informal discussion.

13) Moved, by Mr. Shima, seconded by Mr. Cotterell, to amend By-Law 4 effective January 1, 1975 to read : "The dues of members of any class shall be $9.00 per year in the United States and Possessions, or the Commonwealth of Puerto Rico, and $10.00 in Canada, payable annually in advance." On a roll call, the question was decided in the affirmative, 15 votes in favor to 1 opposed. All the directors voted in favor except Mr. McConaghy, who voted opposed. So the by-law was amended.

14) Moved, by Mr. Shima, seconded by Mr. Chapman, to amend By-Law 5 to substitute the figures "$9.00" for the figures "$7.50," and the figures "$10.00" instead of the figures "$8.50." On a roll call vote, the question was decided in the affirmative, 15 votes in favor to 1 opposed. All the directors voted in favor except Mr. McConaghy, who voted opposed. So the by-law was amended.

15) On motion of Mr. Egbert, seconded by Mr. Cotterell, after discussion, VOTED that the Management and Finance Committee undertake a study to determine the feasibility of engaging a professional investment manager to manage the League's investment portfolio.

16) On motion of Mr. Gmelin, seconded by Mr. Price, after discussion, unanimously VOTED (Mr. Spencer abstaining) that the General Manager in cooperation with the General Counsel support and seek expeditious granting of requests to FCC by a selected group of amateurs for a one-year experimental authorization for facsimile transmission on all present slow scan TV bands. The purpose of the experiment will be to test the feasibility of using this mode without undue interference to existing modes in use. Headquarters staff to coordinate the experiment.

17) On motion of Mr. Price, seconded by Mr. Thurston, after discussion, unanimously VOTED (Mr. Spencer abstaining) that the General Manager is directed to prepare for filing by the General Counsel comments in the matter of Docket 20073 urging the adoption of the proposed proceeding to remove the prohibition against linking more than two repeater stations.

18) On motion of Mr. Price, seconded by Mr. Arnold, after discussion, the following resolution was unanimously ADOPTED (Mr. Spencer abstaining):

WHEREAS, the term *commonwealth* when used in the context of American territorial relations, means the status currently held only by Puerto Rico, and

WHEREAS, the term denotes a high degree of local autonomy, under a constitution drafted and adopted by the residents of that area,

(Continued on page 158)

The February Cover Story, "Energy Crisis," topped the voting by directors to garner the cover plaque for Jim Sencenbaugh, K6TPS, here presented by J. A. Doc Gmelin, W6ZRJ, Pacific Director. The photo was taken by Ann Gmelin at the plant in Mountain View where the office lights are run by the wind charged battery system.

The World Above 50 Mc.

CONDUCTED BY BILL SMITH,* W5TVB

The July Aurora

AS VHF AMATEURS will attest, a preliminary report by the Space Environment Services Center, Boulder, Colorado, says that solar activity was "high to very high," July 2 through 8, as the result of complex activity appearing on the eastern face of the sun. By June 29 the region was magnetically complex, and by July 4 it had reached maturity.

As the region moved across the sun's face numerous major flares and many smaller energetic events were generated, though the physical size and effects of these flares were not as large as those of flares in early August, 1972. During the week of July 2 through 8, eight Class-X flares and 19 Class-M flares were noted, with the most notable reaching maximum at 2142 GMT, July 5. Major radio noise bursts and shortwave fades were associated with this flare, and with other flares in the same region.

The near-earth proton enhancement began about 1200 GMT July 3, probably generated by an earlier flare. Unsettled geomagnetic conditions began July 2, followed by active conditions around 0120 GMT, July 4. A distinct sudden commencement came some 14 hours later, and minor storm conditions soon developed. This was the beginning of the aurora, but what followed was even more intense.

At approximately 1930 GMT, July 5, another sudden commencement was noted, followed by another, and a third, at 0322 GMT, July 6. At that time a major magnetic storm began, with the most severe activity continuing until approximately 1000 GMT, July 6. Thus the major auroral activity in amateur vhf circles started late in the evening, USA time, for most of us, as will be seen from activity summaries given later. The disturbance was associated with visual aurora displays, disruption of telephone service, and other effects, over much of the northern half of the country, and adjacent Canada. Propagation was affected on 50 and 144 MHz down to lower latitudes than is normally expected of auroras in or near the bottom of the solar cycle.

There was a good possibility of renewed magnetic activity in the period just after this column's deadline, late July and early August. Because of the unusually high level of solar and related geophysical activity, the Space Environment Services Center is interested in reports of solar observations, utility disruptions, radio, and visual aurora, effects on human and animal behavior, and the like. Address: Radio Bldg, Room 2020, 325 Broadway, Boulder, Colorado 80302. Our thanks to the Center, and to WØEYE, for making the synopsis of the Center's report available immediately.

Now some amateur vhf observations, reported before our deadline, approximately July 20. The following were selected to show geographical distribution, time spread, exceptional signal characteristics, and so on. If your report is not mentioned, do not feel that it was useless to have sent it in. Everything on such events is read with interest, and is helpful in seeing the overall picture.

WØEYE, Boulder, CO: Understand K8III was hearing me. Wish I'd known signals were getting that far east, but QRM around 144.1 makes long-haul aurora work all but impossible. Real DX via the aurora is weak, and easily lost in QRM, so it is no good for everyone to pile into one narrow band segment. Before VFOs, you could tell who was on, just by spotting known frequencies. From now on during auroras I'll be transmitting on 144.012.

W4FJ, Richmond VA: K8RYU and I ran CQ's on 432 during the aurora peak, but nil heard though I'm sure the aurora was strong enough. WA4CQG worked 2, 3, 8, and 9 on 144 MHz.

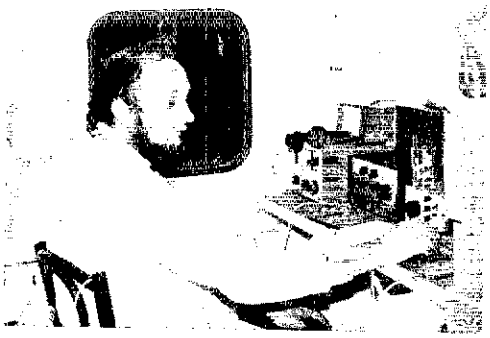
W4LNG, Atlanta, GA: All hf bands dead at 2400 GMT; first time observed in 27 years as a ham. Hf back to life at 0330; no buzz on vhf. First buzz on 50 (K8MMM and WA9RDF) at 0408; no buzz on 144, 0508 to 0720 – W9YFF, W3RUE, K2TXB, W3ANX, K2RTH, WA9KRT, K8RYU, W9SUV, W9MAL, K9UNM, K3PGP, K8UGA worked on 144. W8SDJ last signal heard on 144, at 0720, though 50 still open, with ssb quite readable. WA4CQG, Auburn, AL also active on 144. Best buzz ever heard on 144, lasting longer than best openings in 1950s. Operating techniques very good, with no QRM from unthinking or unskilled callers, on 144.

W4CSS, Shalimar, FL (Gulf Coast, near Pensacola): Heard aurora on 50 MHz. First time in years.

WB6KAP, Woodside, CA (near SF): On nightly 20-meter cw sked with ZK1AA and FO8DR, 0500 GMT, July 5, the latter had two signal components, one specular and the other spread and shifted. Sounded like vhf aurora. ZK1AA clean. TE-propagated TV Channel 2, from Hawaii, in at FO8DR earlier than usual. TE lasted 6 hours at ZK1AA, and even fm stations were heard much of the time.

Next night (the auroral period) both ZK1AA and FO8DR were distorted on 20, and at times no specular component could be heard. Auroral hiss also heard on 20-meter signals from VE6, VE7, KH6, ZL and VK. 5-MHz WWV had auroral flutter,

*Send reports and correspondence to Bill Smith, W5TVB, ARRL, 225 Main St., Newington, CT 06111.



F5SE was at the 'paddle' of F9FT/M for the WA6LET contact running one kilowatt. The F9FT/M van is widely used through France, Holland, Belgium and West Germany for vhf outings and is completely equipped including a diesel generator. Soon to be added is a 432-MHz moonbounce station. Several other French stations heard or worked WA6LET including F6CCN, F1AUQ, F8SQ, F5XU and F2TU. *(F1PL photo)*

seldom heard this far south. No results with FO8DR on 50. Heard W7UBI, Boise, Idaho, and had brief exchange on 50-MHz ssb with W7VDZ, Casper, Wyoming, before the aurora dropped out. Later (0647 to 0710 GMT) heard WA7ECV, Oregon, and W7SFA, Washington, on cw. No aurora heard on 144.

K1WHS, W. Lebanon, ME: First heard aurora on 50 MHz, at 2230 GMT July 5. Went to 144, but heard little, so back to 50 for several QSOs with 8s. When 144 came alive I worked 2, 3, VE2-3, W4FJ and K8RYU, the band folding just after a QSO with WA4QVN in Maryland. Then we worked direct (420 miles) with good ssb signals. Buzz came back on 144 about 0330 GMT, July 6, and I worked K8IIT on two-way ssb, with good voice quality, followed by more 4s in Virginia, and Ohio 8s, Canadians, and many Western New York and Pennsylvania stations, and a partial QSO with W9YYF. Band all but closed by 0530, but I stayed around and at 0600 GMT the band came really alive on long paths. Worked W9YYF S9, at 0600, and then heard him build to 9-plus, soon after. Worked K9UNM, W8HWW, W9CAW, and others in Michigan-Indiana-Illinois area in the next 20 minutes. The more distant stations (900-plus miles) then dropped off, but 3s and an 8 or two remained good, and WA4TTG, Chesapeake, VA, nearly 650 miles to the southwest, had a good signal, up to 0700.

I went to 6 again after things quieted down on 2, and around 0800 GMT I heard an aurora-free signal, calling WA1MAG, in Vermont. It was W7SFA in Washington! He worked WA1MAG, for his first New England contact on 6 (how about *that*!) and I called him and exchanged S9 ssb signals. WA1NNW also worked W7 and VE7 around 0600 GMT. I quit at 0900, with WA2VFA, VE2DFO and K3PGP still ragchewing on 144 MHz via the buzz, though by now dawn was breaking in New England.

K9UNM, Ft. Wayne, IN: Heard 21 states on 144-MHz aurora, through 0715 GMT, the 6th – Maine to Colorado, Georgia to Oklahoma, and VE2 and VE3. Worked K1WHS, for state No. 34, and W4LNG, WA4TTG, and many others were heard, including WØEYE, my first 2-meter reception from Colorado. Signals unbelievable in strength – best in the years I've been on 2 meters.

Sporadic E, Summer, '74

The sporadic-*E* season will be largely over by the time these lines are read. Summer, 1974, has been notable for the DX worked outside the United States, and for the geographical coverage and duration of some openings. Opinions are sure to differ as to how "good" a given season is, and this year is no exception. Some, both professional and amateur observers, feel that the summer has not been unusually good, while others, including W1HDQ, feel that the season, especially that part of it from late May through July, has been almost unequalled. Probably all would agree that equipment, antennas, and propagation awareness – all improved over earlier years – have helped to make 1974 memorable.

Below we look at the record, chronologically. As with the aurora, don't feel that your report wasn't important if it does not appear in these pages. We need, and use, them all.

June 21 W5KHT and W5TVB, Oklahoma City, worked K4EBK, W4BCZ, and WB4BND, Florida, on 146-MHz fm, 2300 to 2351 GMT. Northeastern US worked XE1GE on 50 MHz, running into the 22nd, GMT.

June 22 Typical E_s opening on 28 MHz, heard in northeastern USA. W1HDQ heard transatlantic 10-meter E_s as early as 1200 GMT. Did anyone hear European video buzz on 6 this date? It's as good an indicator of vhf transatlantic vhf propagation as we're likely to get. WB6ECD/6, SoCal, heard on 6 at W1HDQ at 1425 – exceptionally early for West Coast via E_s. Worked K7ZCB, Oregon, at 2100. VE3AQJ calls session with California, Arizona, and Nevada "best since F-layer DX of 1958." WA1DFL thinks this best he's seen on 6. Band opened before 1100 GMT, and covered the entire country, plus Puerto Rico, in the course of the day.

June 25 Coast-to-coast multihop E_s, widely reported. WB2YQU, Millbrook, NY, heard TI2NA beacon, early evening, and worked W1HOY/KP4, 2335 GMT. More transatlantic 10-meter E_s, at W1HDQ, 1200 to 1300 GMT. EA30J worked on 10, confirmed widespread short-skip conditions at European end. Note how this ties in with the Azores report given later in the column.

June 26 More good double hop. K1BXC caught aurora on 6, beginning late evening. Many, including WA1PWY and WA1IFE, reported intense single hop earlier. W1KZS and W1HDQ in multistation 5-call-area 50-MHz QSO via North Atlantic backscatter 1400-1430 GMT. W1HOY/KP4 joined in this at end, beam west. All others (1,2,3,8,9) aimed east or northeast. WA1NGR, Chester, CT heard TI2NA 90 minutes, beginning 2230 GMT. W2AXU, Trenton, NJ heard him 2317 - 0115.

June 28 TI2NA heard by WB2YQU, 2330 GMT. Eric heard all over Northeast, especially between 0015 and 0045 GMT the 29th.

June 30 TI2NA reported by W1HOY/KP4 in evening. WA1OUB, NH, worked TI2NA at 2252, one of the first of many in Northeast, as Eric was in until after 2330 GMT. K4MSG, Petersburg, VA, heard TI2NA, W1HOY/KP4, and XE1GE, in 2-hour period beginning 2245 GMT. KH6IJ heard as far east as W5SFW, Amarillo, working California and New Mexico. WB6KAP worked KH6IJ, 2035 and 2046 GMT on 50. Strength comparable to KH6EQI beacon.

July 1 More transatlantic E_s to Portugal, on 28 MHz, as early as 1125 GMT. Excellent trans-

ARRL Assistant Director Leland Smith, W5KL, helps make Arkansas workable for FM DXers on 146.52. W5KL enjoys a mountaintop location near Jasper in northwestern Arkansas. His 22-element 146-MHz array is nearly 100 feet in the air, just above a 2-element Yagi on 40 meters. He has worked about 20 states on 2 meter fm.

continental 50-MHz double hop, beginning about 1940 GMT and running on into next GMT day. Many California and Arizona stations worked from Northeast. T12NA heard by many in Northeast, around 2130.

July 2 Continuation of above opening W5KHT and W5TVB heard and/or worked the following on 146-MHz fm: W7EKB, Montana; W7GFW, W7FOF, and W7OHM, all Idaho; W7NO, Oregon, and W7KFM, Washington, 0000 to 0031 GMT. Between 0011 and 0120 the Yakima 34/94 repeater was full-quieting in Oklahoma City, but WA7LML was convinced that the W5 signals were not "legit" so no contacts were made.

WB6IEX, Livermore, CA, is reported to have worked WB8FEQ, Huntington, WV, around 0230 GMT, on 146.52. If this can be confirmed, it could be the first double-hop E_S and a record for *that mode and band.*

Strong solar noise bursts heard at W1HDQ on 50 and 28 MHz, 1920-30 GMT. Large sunspot group seen in daily sun projection, so was watching for this effect.

July 3 K5EFW, Albuquerque, S9 at W1HDQ, 2032-2115 GMT. W5SFW, also double hop (Amarillo) heard well at 2100. W5WAX worked T12NA.

July 4 Transatlantic E_S (Azores) on 28 MHz.

July 5-6 See detailed aurora report.

July 7 W5KHT heard W5VY via backscatter, 1533 GMT, 135°, and K8MMM, 2200 to 2225, 130°, on 50 MHz. T12NA worked by W2AXU, 2113 GMT; strong there, *but barely audible at* W1HDQ.

July 8 Good aurora in Northeast, 2150 - 2230, 50 MHz. KH6IJ heard by W5KHT, 0259 GMT, and TG9KJ 45 minutes beginning 0200.

July 10 XE1GE very good in Northeast, around 1530 GMT, amid strong single hop in same direction. 1610 – Oklahoma station heard calling "CQ Hawaii."

Special Report de Azores

It's not often that we run an entire letter in this column, but we think you'll agree that this one, *from Phillip Wilson, WA6GKJ, with the U.S. Navy* the Azores, warrants it. Wilson's report, when tied to others in this column, indicates that on June 25 and 26 vhf *E*-layer activity extended nearly one-third the distance around the globe! Here is what WA6GKJ has to report.

"On Monday, June 24, my wife complained of interference on the fm broadcast band, while trying to listen to the local Armed Forces Radio Service outlet. This I questioned because the AFRS has the only fm in the Azores, and the nearest other station is in the Canary Islands, 350 miles away. I turned on the fm radio in the car at 1700 GMT, and sure enough, *I heard a Portugese station* almost wiping out AFRS. Then tuning around the fm broadcast band I counted 25 different stations! Most were mainland Portugese and Spanish, at distances of 900 to 1000 miles. The signals were quite strong, but deep fading led me to believe they were *E*-layer skip. The signals faded out at 2100 GMT, but this was only the beginning.

"Tuesday, June 25 found the band open at 1200 GMT. *I logged stations mostly in Germany and* France; Portugal and Spain were not heard. The distance to Germany is a good 1800 miles, suggesting multiple-hop *E*-layer. The band closed about 2000 GMT.

"I began to hear signals again the following day at 1250 GMT. Strengths built rapidly, and by 1300 the fm broadcast band was loaded. Again, the skip was entirely different this time. The signals were from England and Ireland. At 1330 GMT I began hearing American fm broadcast stations! I heard at least six different stateside stations, but was able to identify only WFPG-FM in Atlantic City, NJ 96.9 *MHz at 2600 miles. (WA6GKJ does not say when* the opening ended.)

"June 27 and 28 were poor compared to the previous days. The band was erratic with signals fading in and out all day. On June 29 I heard only one stateside station, for about 5 minutes, and was unable to identify it. No other stations were heard. (No time was given).

"What makes this more amazing is the fact that I'm using rabbit ears for an fm antenna, and I'm in a poor location. I can imagine what 6 and 2 meters were like. Unfortunately there isn't a six-meter band here and I haven't received my CT2 call yet anyway. I have been told that stateside TV and fm have been heard here previously. My wife did see a color TV program June 26 on channel 4 we believe to have been from the U.S., but the station was not *identified.*"

We thank WA6GKJ for his interest, and exciting report. An offer of equipment has been extended to WA6GKJ by W5KHT and your editor. Perhaps Phil can be enticed to become a confirmed vhf DXer; certainly he has one of the more promising locations for it!

Radio Telescope Under Construction

Those of us faced with the decision of whether to stack two or four Yagis might take into consideration what will become the world's largest telescope, *now under construction near Socorro,* New Mexico. The array, being developed by the National Radio Astronomy Observatory, will consist of *twenty-seven* 82-foot dish antennas arranged

in a Y formation!! Two legs of the Y will cover 13 miles each, with the third being slightly less than 12 miles long. The purpose of the array is to study cosmology and extragalactic radio sources, to a resolution equal to that of the finest available optical telescopes. To obtain this resolution a single radio telescope having a diameter of *69,000 feet* would be necessary; hardly a practical single antenna to build!

The array will operate in the 1, 4, 14 and 22-GHz ranges and is scheduled for completion in 1976. A Dallas firm is building the 27 dishes under a 17-million dollar contract.

OVS and Operating News

50-MHz news was largely covered earlier in the *E* activity report, but here are some random notes. W1HOY/KP4 finally added Washington and Wyoming to her six meter states worked. VE5MG favors 50.145 ssb in rare Saskatchewan. TG9KJ has a beacon on approximately 50.075 and listens in the low end of the U.S. phone band. TI2NA writes your editor that his 50.098 beacon is a pair of 807s running 30 watts to a north-south facing dipole. He listens at 50.15 ± 5 kHz, and can operate while the beacon is running. K6RNQ has been briefing W5KHT on techniques for raising red worms(!). KL7IBG, active in May, is the new call of KL7H1F. He apparently came to the lower 48 around June 1, which would explain his disappearance. On June 5 at 2005 CDT, K8USC in Michigan worked KH6EQI and has the QSL confirming the contact. There's still hope for Easterners! WBØWLN, a popular South Dakota catch, has moved to New Jersey and hopes for the return of his former call, WA2QVL.

From Albuquerque, WA5MHR writes that the University of New Mexico club station, WB5AXC, has a kilowatt and stacked 3-element Yagi on 6 meters and similar power on 2 meters, with a 60-element array. Schedules will be accepted on both bands. Also from New Mexico, WØOPN/5 reports XE1FE, Mexico City, has converted a DX-35 to six and is active on cw at 50.12 most evenings.

144-MHz operators found little doing on tropo during June and July with large, dry, high-pressure areas dominating most of the country, and producing record-breaking temperatures in many areas.

Previously unreported 2-meter *E* contacts include those June 15 by WA4BMC, Lake Worth, Florida, who worked WB9DGD and WB8MWW/9, both Indiana; and W8KPY and W8KWD, both Ohio; between 1322 and 1337 EDT, on fm simplex frequencies. K8ZQH, Lansing, worked W4FCP, Florida, June 17 at 1100 EDT on 146.94, during a one-hour opening.

Word has it that the talk-in station at the Orlando Hamfest, June 15, was confused by sporadic-*E*-propagated W8s thought to be checking-in (!). Two meters was apparently open for E skip some four hours that day between Florida and the 8s, beginning about 10 AM EDT.

WA9QZE/5 is now WB5LUA at Richardson, Texas (near Dallas) in a new home, with arrays ready on 144 and 432.

K5BXG, Tulsa, says his 88-element Yagi array has exceeded expectations for meteor scatter. It has eight 11-element Yagis stacked 4 high and 2 wide, and spaced 80 inches, at 65 feet. "I hear many more pings on short-haul schedules and the large array is certainly better on long-haul," reports Charlie. Early this fall the array spacing will be increased to 10 to 12 feet, and used on moonbounce during the winter. Charlie says the array will be lowered to about 30 feet, hoping wind and ice will leave it there.

WØLCN has returned to Minneapolis and vhf after a 2-year plus business assignment in Germany.

In Europe, the *Veron Vhf Bulletin* quotes OH2RK as saying there is much vhf activity in Finland but that the Baltic Sea seems to cut off tropo openings to Central Europe. Most of the Finnish activity is concentrated on fm, with some 300 OHs active on the mode. Most of the DX work from Finland on 144 is via aurora. On Oscar, OH2RK says 23 Finnish stations have used the satellite, but now only 3 or 4 are active. OH2RK has worked some 350 stations through Oscar, in 48 countries and 4 continents. His best DX is JA1LRK near Tokyo. For his satellite work, OH2RK runs 10 watts into one of two 8/8 J-slot Yagis.

432-MHz news this month mostly concerns moonbounce. KH6GRU says he is working on an array of sixteen Yagis. W6FZJ/1 has a 64-element extended collinear in the air and has likely now completed a new transmitter, preparing for some of that good East Coast tropo. W1SL says VE7BRG is schedule coordinator for 432 EME. Window information is available from him. WA3DMF and W3TFA are now on 432 nightly in the Washington DC area, but wish they could find more activity. WØLER advises he is on 432.012 nightly after 2230 CDT, looking for contacts. His EME antenna is taking shape. W4FJ, Richmond, is testing on EME cunning schedules with K2UYH. He has an array of 16 11-element Yagis, with only a small range of movement thus far. W1GGM has a new 200-watt-output transmitter and 4-bay Yagi array. He and friends will be signing that call during the September contest from Mt. Equinox, in Vermont, with 432 and 1296 gear in operation. And WA4SIQ, Virginia, plans fall 432 activity with 50 watts and 44 elements. QST

Near Reims, France May 26 F9FT, F5SE, F1PL and F8VN operating from this mobile moonbounce installation, F9FT/M, worked WA6LET. On the roof of the van is F5SE assembling the 16-element 20-foot Yagi used for the contact. *(F1PL photo)*

anyway. I have been told that stateside TV and FM

CONDUCTED BY LOUISE RAMSEY MOREAU,* W3WRE

YL Hunting?

AFTER EACH YL-OM contest the comments on the OM logs usually ask the same question: "Where were the YLs?" Often there are letters from people anxious to find YL contacts for the certificates offered by the YLRL and CLARA, asking the times and frequencies that the gals can be found.

YLs are as diversified in their favorite forms of emission and activities on the air as are all amateur radio operators. True, some of us can be found on the YL nets and that is about the only sure way to spot us for that needed feminine contact. For the rest, just name the activity and it is an almost sure bet that there will be a YL in there working somewhere.

We are found among the busy professional women in MARCO where we may be giving medical assistance if needed. We're working in Eyebank activity helping to locate that priceless gift of sight for some hospital. We may be on RTTY, or phone, or cw in any of the three MARS systems, giving all our time on those special frequencies that are assigned to MARS operation and using our MARS assigned call letters.

A few of us are busy following the peculiar type of operation required to work with Amsat, while others are operating SSTV and ATV, so that it may be necessary to check for a picture as well as a voice on a call.

For those who can copy the old code it is very possible that there are a few feminine fists on the Morse nets, following the eleven different code characters as easily as they handle Continental Code, with the spaced sending that marks a telegrapher.

The YLs may be handling traffic in NTS so that the only way they can be recognized is by their calls since cw masks them completely. They're on AREC nets as members, and as busy ECs working to improve their local facilities in case of emergency. And they are in the global YLISSB system helping to cement international friendship through amateur radio.

We're found in the Novice frequencies working with a newcomer, or giving that badly needed assistance to increase code speed and know how to someone getting ready to upgrade to General Class.

We are there, and not too hard to find. We are YLs from 7 to 90 in age, in 115 countries, on all continents, using our favorite form of emission in the activity that each of us prefers.

New YLRL Certificate

In answer to the many requests that YLRL has received for a certificate available to all amateur radio operators that acknowledges contact with DX YLs, YLRL announces their sixth certificate, the DX-YLCC award.

The rules committee, Pat Sanner, WAØKVL, chairman, Onie Woodward, W1ZEN, Verda Siebenthaler, K7UBC, and Ursula Buerger, DL3LS, have set up the following rules for DX-YLCC. (1) Two-way communication must be established on authorized amateur bands with stations, fixed or mobile, operated by 100 different licensed DX YLs with not more than two YL contacts from any one country, to total the 100 contacts. (2) All contacts must be made from the same location, or community, not to exceed 25 miles from the base station. (3) Any mode, or band, except cross-band contacts may be used. (4) Contacts with all DX YLs located in countries located on the present ARRL countries list to be counted, provided that the confirmation clearly indicates that the station was operated by a duly licensed woman amateur radio operator. (5) QSLs are to accompany all requests for the certificate, along with a list in alphabetical order by countries of call, name, band and mode. Sufficient postage, or IRCs, must be sent to finance the return of the cards by First Class mail. YLRL will not be responsible for any loss or damage to the cards. (6) Endorsements: After receiving the certificate, a silver sticker will


Certificate of Award

THIS CERTIFIES THAT

Date

Certificate No

YL DXCC

has submitted satisfactory evidence of having conducted two-way communication with one hundred different licensed DX-YLs, with not more than two (2) YL contacts from any one country, to total the 100 contacts for Certificate.

Young Ladies' Radio League

Certificate Custodian

YLRL President

DX-YLCC, the newest YLRL sponsored certificate that is available to all licensed amateur radio operators.

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

be awarded for *any* different DX YL contacts, representing 5 countries. The same list and postage requirements as on the original application (7.) The decision of the custodian, regarding interpretation of these rules, or later amended, will be final.

The custodian of the DX YLCC certificate is Phyllis Shanks, W2GLB, Gardinier Road, RD 6, Oswego, NY 13126.

YLRL "Howdy Days"

The YL contest calendar will begin with the annual "Howdy Days" scheduled to begin Wednesday, Sept. 18, 1974, at 1800 GMT, and end Friday, Sept. 20, 1974, at 1800 GMT.

This get acquainted contest is sponsored by YLRL to enable licensed women amateur radio operators to get to know each other, renew former acquaintances and to give newly licensed YLs an opportunity to meet other women on the air in an informal manner, rather than the usual formal procedure followed in the major contests.

The rules are given in detail in the Operating Events section of *QST*.

1974 YL Anniversary Party

WB2YBA, Christine Haycock, 1974 YLRL Vice president, has announced the dates of the YLAP 1974. The cw contest will start on Wednesday, October 16, at 1800 GMT, and end on Thursday, October 17 at 1800 GMT. The phone contest will be Thursday, November 7, at 1800 GMT, and end Friday, November 8, 1974 at 1800 GMT.

The rules governing this "For YLs Only" contest are listed in the Operating Events, *QST*.

Certificates are offered by most of the Nets and by the YLISSB system for participation under the rules of each net. The YL Open House, and the Honeybee Nets do not offer a certificate.

YLISSB Award to WA8VXE

Rosemary Davidson, WA8VXE, was the YL recipient of the YLISSB "Top Flight Operator" award, number 127, listed in the *SSBer's Voice*, the official publication of the System.

The certificate is awarded monthly to the System member who, in the judgement of all former holders of this award, qualifies for this honor. Rosemary was the only YL so honored among five other recipients of this certificate.

W2GLB, Phyllis Shank, YLRL custodian of the DX-YLCC certificate. Phyllis was awarded YLISSB Sidebander of the Year Trophy in 1971.

YL Net Listings

Day	*GMT*	*Freq.*	*Net Name*	*NCS*
Sunday (1st of Month)	1330	3.990	Western Pa YL	K3ENM
Monday	2200	3.917	Honeybee	W7HHH
	2330	28.650	PJ YL	K3ZDN
Tuesday	1330	3.933	Floridora	Varies
Wednesday	1800	14.288	YL Open House	K6KCI/W2GLB
Thursday	1400	7.277	Georgia Peaches	WB4NTW
	1300	3.940	TYLRUN	K5MPI
	1500	7.280	TYLRUN	K7MPI
	0000	3.695	Trilliums (cw)	VE3ASZ
Friday	1600	4.916	MINOW	Varies
0130	0130	3.970	PJ YL	K3ZDN
	1830	14.313	MINOW	Varies
Saturday	1600	14.140	Trilliums	VE3BFN
	2000	3.770	Trilliums	VE3EYL
daily	1600	14.330	YLISSB	Varies

W2GLB, Phyllis Shanks

A private pilot who enjoys fishing, playing the organ, and all water sports, with an advanced sailing credit, Phyllis is the YLRL custodian of the new DX-YLCC certificate.

Amateur radio was a family project when she started with the OM, and three children all taking their Novice at the same time, and once Phyllis got her feet wet, there was no stopping her. She enjoys rag chewing, and traffic handling on 20 meters, particularly overseas phone patches. And also is active furnishing public service communications in the March of Dimes, and Cancer drives.

A member of ARRL, YLRL, she has been active in YLISSB since 1961 with a two year break when they lived in Spain. She was a charter member and past President of the MINOW Net, and the first YL President of the Richland, Washington, ARC. A member of CHC/FHC, NY PON, Navy MARS, BAYLARC, Phyllis regularly participates in the YLRL sponsored contests and has held YLRL Stateside Phone Trophy, and the DX-YL to Stateside YL, First Place Phone this year. In 1971, YLISSB nominated her as "Top Flight Operator of the Year."

Recently Phyllis has been doing technical recording for blind amateurs. QST

VE3AST, Betty Peterson, WA2FGS, Rose Ellen Bills, WA8EBS, Ella Russell, 1974 President YLRL at the Dayton Hamvention. *(K3AU Photo)* ▼

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

WARC – MARITIME RESULTS

While the WARC – Maritime Conference held in Geneva this spring had only a slight potential for impact on the amateur service, the IARU made full use of the opportunities presented by the Conference to make contact with the delegates who attended and to give them some exposure to the amateur radio service. Attendance at the Conference gave our Union officials a chance to analyze the trends of thought within the ITU and its member-administrations which may be significant to us in the years to come. The IARU observer team is pictured elsewhere in this column.

The Conference had on its agenda the improvement of the present use of the bands between 1605 kHz and 4000 kHz by the maritime mobile service. Presently there is no plan for channel assignments on these frequencies in that service. As the amateur service shares its 160- and 80-meter allocations with the maritime service, the possibility of increased occupancy of these bands by maritime stations was of some concern to the IARU. The conclusion of the Conference, however, was that it was not authorized to deal with a question as broad in scope as creating an international channel plan for one service in shared bands. It invited the Administrative Council of the ITU ". . .to include in the draft agenda of the next competent World Administrative Radio Conference such items as will enable that Conference to take the necessary decisions."

No other matters affecting the amateur service came to the attention of the Conference except the near-usurpation of the Q-signal "QST" mentioned in "League Lines" last month.

DX OPERATING NOTES

Reciprocal Operating

United States reciprocal operating agreements exist only with: Argentina, Australia, Austria, Barbados, Belgium, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Denmark, Dominican Republic, Ecuador, El Salvador, Fiji, Finland, France,* Germany (Federal Republic), Guatemala, Guyana, Honduras, India, Indonesia, Ireland, Israel, Jamaica, Kuwait, Luxembourg, Monaco, Netherlands,* New Zealand, Nicaragua, Norway, Panama, Paraguay, Peru, Portugal, Sierra Leone, Sweden, Switzerland, Trinidad and Tobago, United Kingdom,* Uruguay, and Venezuela. Several other foreign countries grant FCC licensees amateur radio operating privileges on a courtesy basis; write *ARRL* headquarters for details.

Canada has reciprocity with: Belgium, Brazil, Costa Rica, Denmark, Dominica, Dominican Republic, Ecuador, France, Germany (Federal Republic), Guatemala, Honduras, Israel, Luxembourg, Mexico, Netherlands, Nicaragua, Norway, Panama, Peru, Portugal, Senegal, Sweden, Switzerland, U.S., Uruguay, Venezuela, and Commonwealth countries.

Third-Party Restrictions

Messages and other communications – and then only if not important enough to justify use of the regular international communications facilities – may be handled by U.S. radio amateurs on behalf of third parties *only* with amateurs in the following countries.** Argentina, Barbados (only U.S. stations /8P), Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Greenland (XP calls only), Guatemala, Guyana, Haiti, Honduras, Israel, Jordan, Liberia, Mexico, Nicaragua, Panama, Paraguay, Peru, Trinidad & Tobago, Uruguay and Venezuela. Permissible prefixes: CE CM CO CP CX EL HC HH HI HK HP HR JY LU OA PT PY TG TI VE VO W or K/8P XE XP YN YS YV ZP 4X 4Z

* Agreement includes overseas entities.

** By special agreements, third-party traffic is also permissible with amateurs in Australia and the Federal Republic of Germany for traffic regarding amateur satellites, with 4U1ITU, and with personnel of Project Hope in Jamaica.

Here is the IARU team of four observers which attended the WARC – Maritime (*QST* for June, p. 77, and July, p. 83); (left) Geneva resident HB9AJU, photographed during a recent visit to *ARRL*/IARU Headquarters; (right) Region 1 Division Secretary G2BVN, IARU President VE3CJ, and Region 1 Executive Committee member SP5FM.

A highlight of the World Telecommunication Day observance at ITU headquarters was the dedication of new equipment and furniture at 4U1ITU. Here, IARU President Eaton, VE3CJ, presents the equipment to M. Mili, Secretary-General of the ITU and patron of the International Amateur Radio Club, which maintains and operates 4U1ITU. Looking on are (l-r) R. L. Billington, Chairman of the WARC – Maritime; IARC Secretary G3OQF; ITU Information Officer DL1YJ; IARC President OK1WI; IARC Vice-President HB9AAB; and IARU WARC – Maritime observer SP5FM.

8R and 9Y4. Canadian hams may handle these same type third-party messages with amateurs in Bolivia, Chile, Costa Rica, Dominican Republic, El Salvador, Guyana, Honduras, Israel, Mexico, Nicaragua, Peru, Trinidad & Tobago, U.S., and Venezuela. Permissible prefixes are: CE CP HI HR K OA TI W XE YN YS YV 4X 4Z 8R and 9Y4.

DX Restrictions

Amateur licensees are warned that international communications are limited by the following notifications of foreign countries made to the ITU under the provisions in Article 41 of the Geneva (1959) Conference.

Canadian amateurs may not communicate with Cyprus (except ZC4 and special 5B4 stations), Gabon, Iraq, Pakistan, Turkey, Khmer Republic (except XU1AA), Vietnam, Libya, and Yemen. Prefixes to be avoided by Canadians include AP TA TR8 XU XV YI 3W8 4W 5A. QST

September, 1924

. . . Eureka! says the editor – amateur radio finally has its own official shortwave bands: 80, 40 and 20 meters. They result from the 1924 Hoover conference, at which ARRL represented amateurs, and are in addition to the basic 1500-2000 kc. assignment. Special "Z" licenses will permit continued 100-meter experimentation.

. . . Technical editor Kruse has been busy producing material to help amateurs adjust to the new setup; there's his story on wavemeters to ensure staying inside the new ranges, and an extensive one on how to build gear for them. "Sockets and tube bases should be removed – they have no business in a 20-meter set." Hartleys and Colpitts are the main themes, often with Reinartz modifications.

. . . "A Five Watt Sending Set for $25," aimed at the beginner, will actually have 30 watts in the plate circuit and 10 or 20 in the radiating system, says author and department editor Mason, with a promise that "stations from 25 to 50 miles away will be able to hear you in the daytime regularly." Of course you wind your own coils and make your own condensers (with glass photo plates).

. . . After a long Arctic silence, we learn that all's well at WNP – the message comes through 1BVR (Percy C. Noble, still active with the same call, and a former director and vice president of ARRL).

. . . Three pages are devoted to the "Amateur DX Report Card" without once using the word, "QSL." Author Howard Pyle points up the essentials needed for valid confirmation, and decries the waste of space on unimportant trivia.

. . . The first ARRL Board meeting under the new Constitution brings together representatives nominated and elected by members. Principal accomplishments, reflecting important objectives of the day, were formation of a Legal and Regulatory Committee, and an International Relations Committee.

September, 1949

. . . Strenuous League opposition to FCC proposals to restructure the amateur service commands the first four editorial pages. ARRL says that, unlike the Commission, we perceive no "unusual situation" requiring wholesale changes and blueprinting of our future. While the League takes issue with principles, it is also concerned over FCC's proposal to require the Extra Class license for *all* phone operation other than 10 and 160 meters.

. . . Can't afford a receiver with crystal filter? Try W1DF's economical substitute, an audio phase shift gadget with a sharp rejection notch. And you can choose your own preference of beat notes.

. . . Nations of the western hemisphere got together in Washington for the Fourth Inter-American/Region 2 Radio Conference. Our 80-meter band got a hard time from Latin countries, where amateur activity was small and the need was great for short-distance commercial circuits; but with a couple of reservations, the band was preserved. And every nation agreed to authorize third-party traffic.

. . . What's a "gamma" match? Why, half a "T" of course. W3MTE outlines the logic in balancing and matching a 3-element beam. And W5DF gives us the lowdown on experiments with 14-Mc. vertical beams.

. . . Asst. Communications Manager W1NJM presents a "New National Traffic Plan," forerunner of NTS and still pretty much the basic setup for organized message traffic networks of the League.

. . . Five tubes seem a lot just for a 15-watt VFO exciter – but author W1DX is a fanatic on stability and keying, and he presents a number of ideas for VFO improvement. – *W1RW*

Silent Keys

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

W1CPS, Robert W. MacIntosh, Presque Isle, ME
W1ECM, Arthur Owens, Falmouth Foreside, ME
W1HQC, Theodore R. Love, Norwell, MA
W1JEO, Edmond F. Edmunds, Bridgewater, MA
W1OT, Sheldon S. Heap, N. Quincy, MA
W1TJP, Lawrence E. Stone, Saugus, MA
W1TWG, Robert F. Thompson, Hyannis, MA
W1WHI, Thomas L. Goss, Kittery, ME
W2BNI, Elmer Bintliff, Cinnaminson, NJ
W2CSY, Murray G. Crosby, Syosset, NY
W2DQV, Nathan Abrams, Bronx, NY
WB2ICJ, Alfred G. Hook, Bellmawr, NJ
W2MA, Kenneth J. Chase, Rochester, NY
W2NXT, Elias Shapiro, Brooklyn, NY
Ex-3CD, Daniel D. Moore, Sr., Baltimore, MD
K3KYY, Louis R. Vitarelli, DuBois, PA
W3TDT, Roderique Rohas, Seaford, DE
WB4ALE, Dempsey Coburn, Jr., Evergreen, AL
W4BQG, James A. Bryant, McKenzie, TN
W4FTF, Willard L. Parrish, Jr., Rocky Mount, NC
W4NLH, William S. Neighley, Gordonsville, VA
W4ROS, John McFarland, Port Richey, FI
W5APG, Kenneth M. Ehret, Oklahoma City, OK
W5AY, Kermit F. Tracy, Little Rock, AR
W5BSR, Victor Canfield, Lake Charles, LA
W5DA, James L. Young, Jr., Dallas, TX
K5DAA, Allan S. Hargett, Sr., Carlsbad, NM
K5EDE, Ralph P. Rushing, Odessa, TX
W5TTX, Robert L. Whitener, Jr., Naples, TX
WB5KFV, Samuel Greene, Jr., Kaplan, LA
W5NHN, Irving H. Gray, Lake Charles, LA
WA5PXQ, Floyd M. Oliver, Arlington, TX
WA5ZTA, Jamie A. Peck, Barnsdall, OK
W6AAV, Walter G. Ryberg, San Francisco, CA
W6BPT Roy E. Pinkham, Santa Clara, CA
W6CSS, Earl O. Fuller, Whittier, CA
WA6HTN, Leo B. Gardner, Costa Mesa, CA
W6JXB, Horace K. Winterer, Sherman Oaks, CA
W6LGE, Leroy J. Coelho, Hayward, CA
WB6UDV, Robert W. Altman, Santa Maria, CA
W6VDY, Donovan V. Mackay, Oakland, CA
W6YQS, M. Zeidell, San Francisco, CA
W7CPY, R. Rex Roberts, Billings, MT
W7DG, Raymond E. Sechler, Longview, WA
WA7DLS, Wallace J. Furman, Black Diamond, WA
W7ESP, Arthur A. Johnson, Mesa, AZ
W7HI, Raymond S. Thomas, Reno, NV
W7JGV, Donald K. Carlson, Spokane, WA
WA7KYQ, Robert T. Astle, Anaconda, MT
W7RCZ, Donald W. Knudsen, Kanarraville, UT
W7VW, Maurice R. Houser, Klamath Falls, OR
W8CSS, Ralph O. Cyre, Columbus, OH
W8DVD, Nelson F. Bean, E. Tawas, MI
W8GJB, Dwight D. Hall, Scottville, MI
WA8HGI, Lester J. Bowman, Akron, OH
W8PIY, Paul W. Nosker, Yellow Springs, OH
K8SWJ, Rex H. Beadle, Newberry, MI
W8WZ, Harold E. Stricker, Marysville, OH
W8ZLK, Ralph F. Bieser, Elk Rapids, MI
W9BDX, Clarence L. Swearingen, W. Frankfort, IL
Ex-W9CEK, Cecil W. Goff, Evarts, KY
WA9CYP, James H. Scott, Jr., Mount Prospect, IL
W9DPL, Howard O. Severeid, Indianapolis, IN
W9DXV, Lyall P. Buestrin, Menasha, WI
K9EGE, Ralph B. Patterson, Chicago, IL
W9FUR, Robert A. Lundstrom, Sterling, IL
W9HRA, Howard F. Mock, Indianapolis, IN
W9HUZ, Henry B. Van Voorst, Belleville, IL
Ex-9NN, Harmon B. Deal, Indianapolis, IN
K9TUP, Wayne G. Schmidt, Ft. Wayne, IN
WA9YXB, Everett L. V. Haraldson, Chicago, IL
WØGYM, Victor P. Clarence, Bellevue, NE
WØHLX, Francis A. Thompson, Denver, CO
KØMVT, Phillip G. Wilkinson, Pueblo, CO
WAØPVU, Herbert A. Weidman, Kansas City, MO
WØRCV, Jack Calder, Springfield, MO
WØRFT, Vernon D. Strang, Waterloo, IA
WØSWN, Francis M. Quiggins, Englewood, CO
VE1AWF, D. J. Deveaux, Glace Bay, Cape Breton, NS
VE4UJ, Joseph A. Jordan, Winnipeg, MB
VE6LA, William Harwood, Strathmore, AB
F3YR, Georges Duranceau, Nice, France
HP1LM, Mario E. Chang, Panama, Panama
ZL2ABP, A. F. Smith, Napier, NZ

ARRL QSL Bureau

The function of the ARRL QSL Bureau is to facilitate delivery to amateurs in the United States, its possessions and Canada, of those QSL cards which arrive from amateur stations in other parts of the world. All you have to do is send your QSL manager (see list below) a stamped, self-addressed envelope, about 5 by 8 inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

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

W1, K1, WA1, WN1 – Hampden County Radio Association, Box 216, Forest Park Station, Springfield MA 01108.
W2, K2, WA2, WB2, WN2[1] – North Jersey DX Assn, PO Box 8160, Hatedon, NJ 07508.
W3, K3, WA3, WN3[1] – Jesse Bieberman, W3KT, RD 1, Box 66, Valley Hill Rd., Malvern, PA 19355.
W4, K4 – National Capitol DX Assn, Box DX, Boyce, VA 22620
WA4, WB4, WN4 – J.R. Baker, W4LR, P.O. Box 1989, Melbourne, FL 32901.
W5, K5, WA5, WB5, WN5[1] – ARRL W5 QSL Bureau, Box 1690, Sherman, TX 75090.
W6, K6, WA6, WB6, WN6 – **W6LS, 2814 Empire Avenue, Burbank, CA 91504.**
W7, K7, WA7, WN7 – Willamette Valley DX Club, Inc., PO Box 555, Portland, OR 97207.
W8, K8, WA8, WB8, WN8 – Columbus Amateur Radio Assn., Radio Room, 280 E. Broad St., Columbus, OH 43215.
W9, K9, WA9, WB9, WN9 – Northern Illinois DX Assn., Box 519, Elmhurst, IL 60126.
WØ – Reggie Hoare, WØOYP, P.O. Box 115, Mitchellville, IA 50169.
KØ, WAØ, WBØ, WNØ – Dr. Phillip D. Rowley, KØZFI, 5209 Loma Linda Road Alamosa, CO 81101.
KP4, WP4[1] – Alicia Rodriguez, KP4CL, P.O. Box 1061, San Juan, PR 00902.
KV4 – Graciano Belardo, KV4CF, P.O. Box 372, Christiansted, St. Croix, VI 00820.
KZ5 – Lee DuPre, KZ5OD, Box 407, Balboa, CZ.
KH6, WH6[1] – John H. Oka, KH6DQ, P.O. Box 101, Aiea, Oahu, HI 96701.
KL7, WL7 – Alaska QSL Bureau, Star Route, Box 65, Wasilla, AK 99687.
VE1 – L.J. Fader, VE1FQ, P.O. Box 663, Halifax, NS.
VE2 – A.G. Daemen, VE2II, 2960 Douglas Avenue, Montreal, Quebec, H3R 2F3.
VE3 – R.H. Buckley, VE3UW, 20 Almont Road, Downsview, ON.
VE4 – D.E. McVittie, VE4OX, 647 Academy Road, Winnipeg MB R3N ØE8.
VE5 – A. Lloyd Jones, VE5JI, 2328 Grant Road, Regina, SK, S4S 5E3.
VE6 – D.C. Davidson, VE6TK, 1108 Trafford Dr. N.W., Calgary 47, AB.
VE7 – H.R. Hough, VE7HR, 1291 McKenzie Rd., Victoria, BC. V8P 2L8.
VE8 – Frank Van Der Zande, VE8OO, P.O. Box 72, Fort Smith, NWT XØE ØPØ.
VO1 – William Coffen, VO1KM, P.O. Box 6, St. John's NF.
VO2[1] – Stan L. Parsons, VO2AS, P.O. Box 232, Goose Bay, LB.
SWL – Leroy Waite, 39 Hannum St., Ballston Spa, NY 12020.

[1] These bureaus prefer 4-1/4 by 9 1/2 inch or No. 10 business envelopes.

QSL Bureaus for other U.S. Possessions and for other countries appear in the "IARU NEWS" section of the June and December issues of *QST*.

IS YOUR ENVELOPE ON FILE WITH YOUR QSL MANAGER?

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

W h o :

W6FKF's happy return to ham radio and DX after 41 years of normality, noted in June's "How's," turns out to be no record after all. We established that personally on 40 cw one sticky night this June. Just about to pull the switch for the sack, a smooth bug-sent CQ near 7090 kHz offered a contact we couldn't refuse. WB4ZUK/1 was the call, and Hank had a fine signal from his mobile home anchored at Enfield, Connecticut.

WB4ZUK returned to the air in '72 after a *fifty*-year layoff. He's rightly proud of his listing in the Department of Commerce callbook of 1922 as an Illinois 30-watter. What was Henry Harvey up to all this time? Well, he's really been around, just a little too busy to rejoin the flock. Went to sea to pound brass, then manned airline point-to-point cw circuits, pioneered radiotelegraphy aboard Pan-American Airways' old Flying Clippers, finally retiring six years ago as a top PAA communications exec.

We discovered something curiously coincidental about our ancient origins. We both had lived on farms four miles outside little Harvard, Illinois, in the '20s. Hank's hangout was north of town. He had departed for his nomadic wireless career by 1929 when the future W9BRD's family settled on a farm four miles *south* of Harvard. Guess we both eventually left that rustic region for the same rugged reason: those bad-news prairie winters!

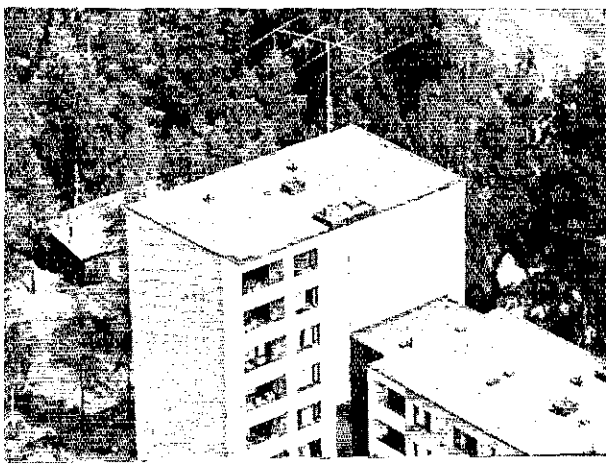
Anyway, WB4ZUK now gads about the continent in his Land Yacht with a Yaesu 570 and vertical, mostly working cw with old pals, young squirts and DX near 7090 or 14,045 kHz. No more Illinois snow for Hank, though. It's home to Hollywood, Florida, when the cold winds blow. "Sure great to be back in ham radio!" he writes. And we'll bet WB4ZUK is struck by a few changes in the game since he last burned midnight radio oil for pure fun half a century ago. The late Pat Jessup, W2GVZ, surely knew what he was talking about in his undying June '48 *QST* classic, "They Always Come Back." Reread it lately?

But here's the real kicker in our chance 7-MHz encounter with old-timer Henry Harvey who was licensed a year or so before your conductor was born: Checking the current *Callbook* during QSO we realized that his name was vaguely familiar. Hank explained why. We had seen it years ago while researching yellowed ham literature of yore. He was the original 9BRD.

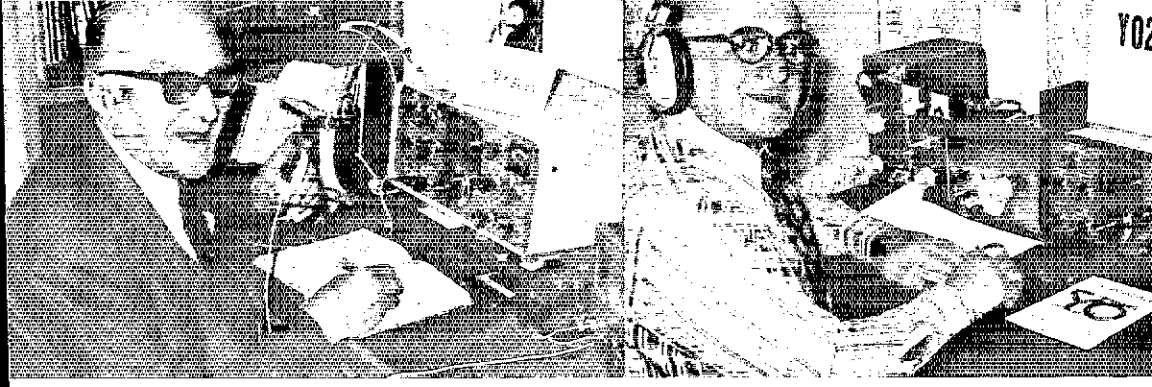
W h e r e :

NORTH AMERICA — I think best results are obtained with International Reply Coupons if they are well concealed in opaque envelopes bearing no callsigns or other looting encouragements. (K6SF) . . . My own QSLing experiences have been quite satisfactory. After becoming active in DX once again two years ago I've confirmed 230 of 242 countries worked on ssb. I hold to the usual self-addressed envelope, IRC's and U.S. commemoratives on outside covers. (W9LQ) . . . Some 2000 QSLs received here for last year's ZF1CW operation by K4SHB were collected and forwarded to him in July. I was ZF1CW in '69, and WA8TDY can confirm my Caymans QSOs. John also takes over my QSL management for FG7TD. (WB8ABN) . . . Apparently someone misused my callsign on 7 MHz this February. Sorry to disappoint many OMs but I wasn't on 40 at the time. (KL7PI) . . . I have TI2GI logs only for brief March '73 operation while Darleen was signing WA6FSC/TI2. All other QSOs from TI2GI's location must be QSLd direct to Costa Rica. (VE6AKV) . . . My arrangement as QSL manager for FG7AQ became effective in March. (VE2JQ) . . . K1ZES and WA1TNC operated portable HI8 on a business trip to Santo Domingo. They ask for QSLs via the ARRL Bureau's Oneland branch. (W4WFL/1) . . . Thanks to everybody for those joyful QSLs! It's nice to help confirm the islands for the gang. (K2FJ-PJ8DX-VP2EEC-VP2VAN) . . . Reminder to Sixlanders that they'll have a new ARRL QSL Bureau branch address by October. Final mailings go out from Los Altos this month. All QSLs unclaimed by s.a.s.e. for more than one year must

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



OH2BH offers your QTH of the Month, a fine radio location at Hakunila. Martin's 150-foot-high 204BA is fed by a CX7A and Henry linear when he's home relaxing between DXpeditions. Is that a traditional sauna to the left amid the pines?



SV1AA, retired general and past president of RAAG, was among many active east European hams visited by WB2AOC and XYL WA2BAV this spring. YO2BGP, right is Eva's father and an avid 40-meter cw man.

be destroyed. (SCDXC) . . . WØBN now holds complete logs for the W9WNV DXpeditions of some years back. (WCDXB) . . . This year's VP2DAJ contacts can be confirmed via VE3GCO but QSLs for QSOs in 1970-'73 should go via VE3EWY. (DXNS) . . . I'm available for QSL chores in behalf of busy ops at the far end. (WB5KUI) . . . 'Alp! W1OPJ would like to trace FAs 8CR 8ZZ and 9VE of the '50s, PZ1AN, SK5AL, ZD3X, K6SF will settle for info on HC8FN, KB6CV, SVØWK, VR1PA, YN1HSM, YSs 1FEA 2RU, 8P6AE. KØALL would give his all for hints toward JY5HC, M1B and VR6TC pasteboards. any 'alp? . . . Hooray for this month's "QSLers of the Month" all revered for recent returns reliability in "How's" correspondence from Ws 1OPJ 4WFL, Ks 2JFJ 4SD 6SF, WA3s DIJ SWF and WB8BPY: CN8CC, CR6IP, EA6BH, FL2DT, FØAVG/FC, FC2CH, FGs 7AO 7TG ØZZ/FS, FP8DH, HA5KDQ, JTØAE, JY9AA, K2QHT, KA2DF, KS6CC, KX6GS, OE9AHL, OH2BGH, OX3CS, PAØINA, PZ1AH, SV1DH, TU2DD, UA1ZAV, UC2OAF, OD6AM, UF6s CX VAA, UKs 1NAB 2PAF 4WAC, UL7s BAA WL, UO5OBE, UP2SA, UQ2GBW, ZF1s AH CQ, ZS6ZE, 3B8DA, 5T5FP, 8R1AG and 9J2BO, the Russians doing the best they can via bureau. UL7BAA, incidentally, is a YL. Any praiseworthy promptitude in your current comebacks?

AFRICA — VQ9HCS reports continuing direct receipt of requests for confirmations. Harry has no QSLs at remote Astove Island, no time for the paperwork, no facilities for IRC conversion, etc. I have VQ9HCS logs through April 30, 1974, and all QSLs must be requested through my address on the customary s.a.s.e., or s.a.e. plus IRCs, basis. This goes for QSOs from previous VQ9HCS locations as well. (WA1HAA) . . . Angola was a big QSL jinx here until CR6IP broke the spell. (K2JFJ) . . . F8US is to be commended for two-week QSL service for such goodies as FB8s WB ZB ZC ZD ZZ, 5R8s CO CS CU SD, 9V1PQ and FR7ZL/t. (WCDXB) . . . JAØCUV/1 now has solid 3B6CF logs for QSOs from April 22, 1973, to May 26, 1974, and is hard at work bringing things up to date. (WCDXB) . . . FR7ZU/j specifies QSLs be sent direct to his Reunion QTH. (DXNS) . . . If those Seychelles VQ9s make it to Desroches this month the QSLs will go via Box 220, Mahe. (WCDXB) . . . FRØBCS promises 100-percent QSL from his F9MD address. Claude expects to be home from Malagasy by December. (DXNS)

EUROPE — My card to SK5AL via Sweden's SSA bureau was returned to me marked "nonmember." (W1OPJ) . . . That's a point we W/K/VE/VOs often overlook. The ARRL QSL Bureau forwards cards for league members and nonmembers alike. Other bureaus sometimes operate on a members-only basis, and QSLs they receive for nonmembers are neither forwarded nor necessarily returned. Entrust your QSLs to bureaus only when instructed to do so by stations worked. Unless, of course, you don't mind a mediocre returns average. (W9BRD) . . . During three years I have 89 QSLs from the U.S.S.R. for some two hundred Russian stations QSOd. (K6SF) . . . UA1GZ/m of Vostok base near the south magnetic pole came through with a QSL in 22 months. (W7YF) . . . My Russian returns are running about thirty percent, 173 cards for a two-year operating run, almost all via bureau. (K2JFJ) . . . SPs again switched to their SQ prefix for the summer, suffixes mostly the same. (DXNS)

SOUTH AMERICA — Effective March 15, 1974, I've assumed QSL chores for HC1WW using the usual s.a.s.e., or s.a.e. plus IRCs procedure. (K1ALP) . . . QSOs with eight Peruvians finally produced one lonely QSL thanks to OA4AHA. VP2 cards elude me, too. (K6SF) . . . On lower frequencies I find it very difficult to collect QSLs from Statesiders for my five-band WAS. (OA4OS) . . . W6DAB has K6JAN's ZF1JN and K6JAN/HKØ logs dating from May, 1973. (WCDXB)

TA1YL (WA2BAV) unravels pile-ups from Istanbul's European sector where she and OM George had plenty of QSOs despite so-so conditions. At right is Erici, chief operator at factory club station HA5KFZ.

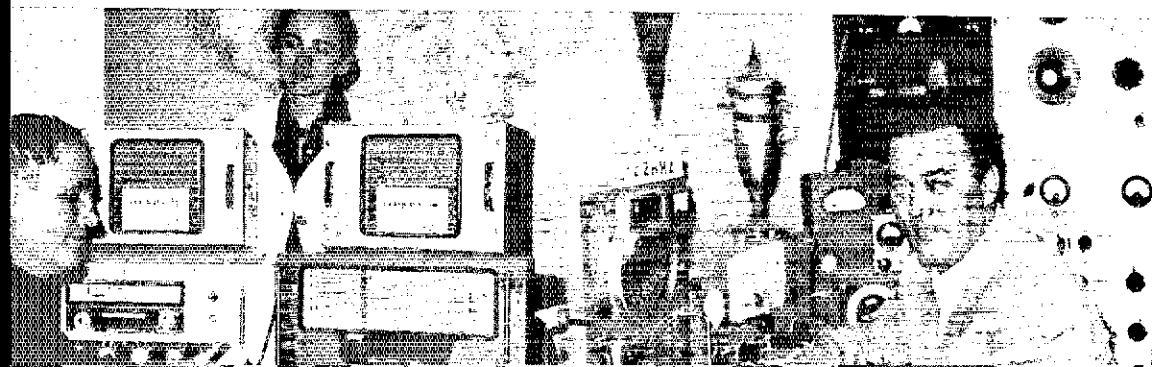
TA2QR radiates from the Asian side of Istanbul. Enqin commutes for work daily between two continents. YU1BKL, right, logs many W/K/VEs and is very active from Belgrade's widely worked club station.

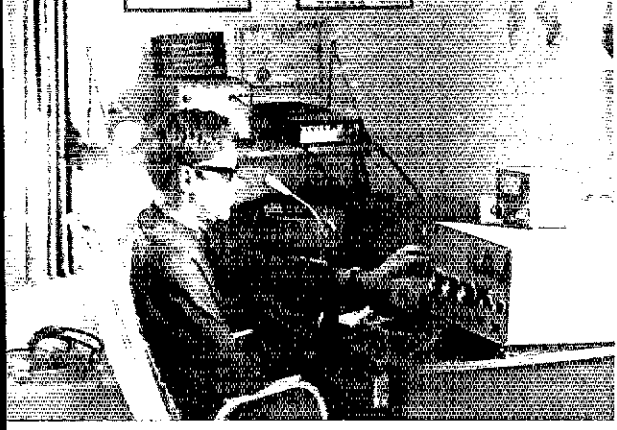
OCEANIA - KC6SX operation from Ponape can be QSLd to W5KXO but cards for contacts from Truk by JH1JGX & Co. under that call should go via JH1ECG. (DXNS) . . . I'm having an awful time getting all my mail forwarded to Hawaii so please note my new QTH for direct QSLing. (WØNQQ/KH6) . . . W7TE, despite postal indications to the contrary, has no QSL managerial arrangements with VKs and/or ZAs. (WCDXB)

ASIA - AP2AD's logs for QSOs from February 14 to June 14, 1974, are on hand here. S.a.s.e., please. (WA9LZA) . . . Still only one UZØ in circulation, according to UZ3TC, and only about ten UZ3s. Same as UA-UV-UW in the Russian scheme of things. (DXNS) . . . Now for the month's input of specific postal recommendations. Keep in mind, of course, that each suggestion is neither accurate, complete nor "official" . . .

A6XG, P. Small, P.O. Box 2370, Dubai, U.A.E.
A9XE, R. Wilkinson, Box 63, Awali, Bahrain
A9XP, R. Hollow, P.O. Box 14, Manama, Bahrain
A9XQ, D. Roberts, Box 116, Bahrain
A9XU, P.O. Box 14, Awali, Bahrain
C21NP, P.O. Box 225, Nauru
DA2QC/HBØ, W. Moore, Box 533, APO, New York, NY 09611
DU1NRS, Box 1381, Manila, P.I.
EA8JT, Box 215, Tenerife, Canary Islands
EIØs V W X Z (to EIs 2CN 2CL 7CC 8CC)
EL5C/7, Box 2077, Monrovia, Liberia
EP2VJ, W. Jones, Box 12-1135, Tehran, Iran
FØAHY/FC (via DJØUP)
FØAYC/FC (via DJØHP)
FØAYZ/FG (to K5QHS)
FØBCL/3A (via DK4YM)
FG7AN, P. Canavy, P.O. Box 460, Pointe-a-Pitre, Guadeloupe
FM7WR, P.O. Box 444, Ford-de-France, Martinique
GB2BA (via G3s HZL or NAF)
GMs 3SON 5IW (to GWs 3SON 5IW)
HC1MM/5 (via WAØTDY)
HK4DHR, Box 55195, Medellin, Colombia
I3GRX/IL7 (via I2YDX)
IW5ADT, P.O. Box 99, Pistola, Italy
JD1s ACA ACG ACT AEW AIZ YAI YAJ YAK, Box 42, Chichi-Jima, Ogasawaras Islands, Japan
JY5HFM, F. Salma, Box 504, Zarqa, Jordan
K1ZES/HI8 (see text)
K5QHS/VP2 (to K5QHS)
K9KGA/6W8 (to K9KGA)
KG4CX, G. Salinas, USNAS, 41, FPO, Norfolk, VA 23593
OE2s EM/un HZL/un (to OE2s EM HZL)
PA9TOM, T. Stiehl, Hoofdweg 55, Post de Cocksdorp, NL1822, Eierlan-Texel, Netherlands
SM2EOB/SU (via SM2CEV)
SVØWXX, Box 658, APO, New York, NY 09291
VEØNEB/HH (via VE1AYE)
VP2MC, Box 209, Montserrat, W. I.
VP8NU, P.O. Box 112, Port Stanley, Falkland Islands
Ex-VS9OC, T. Owen, 5 Station Close, Holden Rd., London, N12 7EG, England
W7MPZ/HK3 (to W7MPZ)
WØNQQ/KH6, D. Shaw, 47-594 Hui Ulili St., Kaneohe, HI 96744
WA1TNC/HI8 (see text)
WA4RXS/HI8 (via W4OUX)
WB2VUO/VQ9 (via WB2UQM)
WB8ABN/HC5 (via WA8TDY)
WB9BZL/HI8 (via WA9UNR)
WB9s FGZ/6W8 FRG/6W8 (to WB9s FGZ FRG)
XT2AQ, P.O. Box 535, Ouagadougou, Upper Volta
YI8CS, Radio Dept., Santo, New Hebrides
YV7WB, Box 573, Carupano, Venezuela
ZK1CL, Radio Stn., Aitutaki, Cook Islands
5B4AV, Box 310, Limassol, Cyprus
5R8SD, S. Deschamp, B.P. 3014, Tananarive, Malagasy (or via F8US)

YO3CB is head man at Bucharest Pioneers' Palace club outfit YO3KPA. That's WA2BAV looking on. LZ2HK, right, is chief op at LZ2KKZ, club installation at Bulgaria's Varna shipyard. *(Photos courtesy WB2AQC)*





OZ6RT found sightlessness no insurmountable obstacle in gaining ARRL Five-Band DX Century Club membership. Ron has been blind for twelve years, a radio amateur for five, and does his logging and QSLing with the help of OZ1LO and other ham buddies via local vhf facilities.

5U7BB, P.O. Box 309, Niamey, Niger
5V4PW, P.O. Box 33, Atakpame, Togo
5V7AR, Box 123, Lome, Togo
5Z4PD, P.O. Box 14829, Nairobi, Kenya
9J2BO, B. Otter, P.O. Box 17, Lusaka, Zambia

A35AF (via JA1SWL)	TG8KT (via DK3HL)
A6XS (via G3SUW)	TI2GI (see text)
AP2AD (see text)	TN8BK (via JA4BLY)
AP2ED (via PAS)	TU2EM (via F6AHH)
CR3ON (via CT1BH)	VK1PW (to WØOPW)
Ex-DL4GX (to W7MPZ)	VK9YV (via VK6SW)
DU1PB (via W9OWZ)	VP1B (via W3FVC)
EL8G (via OH6HS)	VP2EEB (via W4REI)
FB8ZC (via F8US)	VP2GFA (to KL7FA)
FC2CH (to F2CH/FC)	VP2GJI (to W2BJI)
FCØUH/m (to G3FNQ)	VP2GLC (to K6GLC)
FG7TD (via WA8TDY)	VP2MHK (to WØMHK)
FG7XZ (via WB4SRX)	VQ9HCS (see text)
FGØAZZ (to F9MD)	VR3AG (via W6WX)
FMØAZZ (to F9MD)	VR3AL (to KH6CHC)
FR7ZQ/e (via F8US)	W6WX/mm (to W6WX)
FRØBCS (to F9MS)	YB7AAJ (via W7PHO)
GM3COX (to G3COX)	YI8KM (via VK3EW)
HC1WW (via K1ALP)	YK5CDL (via OK3OO)
HC1XG (to G8VG)	Ex-YS1RFE (to W7MPZ)
HS4AGZ (via K5LGL)	ZD3O (to OZ1OO)
IBØJN (via I8KDB)	ZF1BS (via VE3EMR)
KA8AA (via W7PHO)	ZF1CW (see text)
KA8JN (via W7HPO)	ZF1GO (via VE4XN)
KC6BE (via W7HPO)	ZF1WE (via WB4SPG)
KC6SX (see text)	ZK1CY (via W6KNH)
KP6AL (to KH6CHC)	3A2GX (via I1SCL)
KZ5BC (via W4YWX)	3B8DL (via WA5ZWC)
LH2A (via LA2AD)	3B8DR (via G3SUW)
ON4CW (via ON6KW)	3D2ER (via K4FCZ)
P29GG (via K7UW)	5U7AZ (to F6BCL)
P29KE (via RSGB)	6W8GE (via F6AZN)
Ex-SVØWO (to W7MPZ)	7X3OM (via ARA)

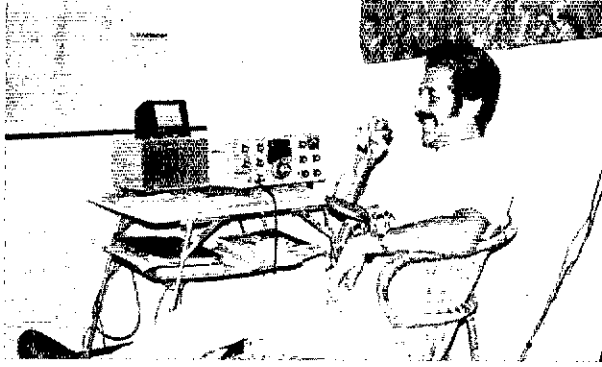
Our QTH advisory committee on this trip: Ws 1CW 1OPI 1VG 4WFL 6NLG 7YF 9DY 9KA, Ks 1ALP 2JFJ 4RM 4SD 9KGA, WA4RXS, WBs 5KUJ 8ABN 9FRG 9EGZ ØLVR, G. Harris, Columbus Amateur Radio Association *CARAscope* (W8ZCQ), *DX News-Sheet* (G. Watts, 62 Bellmore Rd. Norwich, N.72T, England), International Short Wave League *Monitor* (E. Chilvers, 1 Grove Rd., Lydney, Glos., GL15 5JE, England), Japan DX Radio Club *Bulletin* (JA3GZN), Long Island DX Association *DX Bulletin* (K2KGB), Newark News Radio Club *Bulletin* (M. Witkowski, Rt. 5, Box 167, Stevens Point, WI 54481), Northern California DX Club *DXer* (Box 608, Menlo Park, CA 94025), Southern California DX Club *Bulletin* (W6EJJ), VERON's *DXpress* (PAØs INA TO), West Coast *DX Bulletin* (WA6AUD) and Western Washington DX Club *Totem Tabloid* (WA7JCB). We can use *your* input, too.

† † †

W h e n c e :

SOUTH AMERICA — UK5IAZ has been adjudged world-wide winner of last year's Colombian Independence Day Contest, a well-attended affair. Other continental leaders were CN8BO, LU5HFI, UK9AAN, VE3EDC and ZM3NS. To complete a Russian sweep UB5JW took single-op single-band honors, UW9WB ran off with the single-op multiband trophy, and UK2PAF's gang captured the multi-multi top spot. Stateside scoring was led by WB9EEF, Ws 2FVS 6IUV 5KGJ, WA2EAH, K2FE, WB9BXX/3, Ws 3ARK IOPI, LU1AR/W3, HK1AMW/W3, W4s JUK KMS and WBØBQG in that sequence. Kingpins per country were CR6QE, CT1MZ, DL1JC, DM3YBF, EAs 2IA 8ET, EI5F, F6APJ, G3ESF, HG5A, HI3XEG, HP1KC, I6PLN, JA2HNP, LA5KO, LZ1WI, OA4AKL, OD5LX, OH6RC, OJØMA, OK1KOK, OZ7HT, PAØVB, PY4KL, SM5AQE, SP7PBC, TG9LN, UA2FAT, UD6BQ, UF6VAA, UH8BO,UJ8AC, UKs 2GAA 3SAB 8AAK, UL7BAB, UM8MAL, UO5AP, YO5AVN, YU4EBL, YV3ACG and 9M2CJ. On the home front HE3BAE turned in the top tally with HKs 1CMX 4CJB 5DH, WBØDPB/HK6 and HKØBKX pacing other reporting Colombian call areas. (LCRA) . . . XYL HC1MM and I are moving to Ecuador where we expect to be active for at least eight years as HC1MM/5 and WB8ABN/HC5. We also intend to be heard from other HC call areas. (WB8ABN) . . . After previous Embassy stints as DL4GX, SVØWO and YS1RFE, I now look forward to receiving *QST* in Bogota. (W7MPZ/HK3) . . . SM2AGD, recently noteworthy as HKØAB, has a fresh foreign ministry post that should get him around to many a juicy DX location . . . HC2YL (WA6FSC) and OM HC2OM traipsed Statesward this spring. Darleen reports dozens of new HCs on the air and prefers 21 MHz to 14 MHz's soaring local QRM. (WCDXB)

OCEANIA — Difficulties with squally weather didn't keep W6OAT, K6AHV, WA9UCE and WB6OOL from scoring some 5300 QSOs as KP6KR from Kingman Reef in early July. Northern California DX Foundation's vigorous venture also rang up 7100 contacts on Palmyra as KP6PA, 1600 from VR3AG. Even Old Sol was caught up in the enthusiasm, substantially beefing up the ionosphere for the event. (NCDXC) . . . Those KP6KR pile-ups produced antics shameful to amateur radio. Too many DXers apparently have completely forgotten hamdom's traditional spirit of friendliness and fraternalism. (WB8KTR/8) . . . It's a real kick operating from Kaneohe and giving the mainland 80-meter gang a tough 3.5-MHz state toward 5BWAS. (WØNOQ/KH6) . . . W6UFE, WA6DEI, WB6COQ and other locals enjoyed meeting ZL2BCX during the latter's visit to W6MHK. John was intrigued by the famous 'MHK indoor flatloop DX antenna. (WA6DEI) . . . K5LTH called it quits on Kure Isle after logging 11,053 KH6HDB QSOs. Gene expects USCG reassignment to Germany. (WCDXB) .. . . . VR1AR, infesting the 14,265-kHz Pacific DX Network around noon GMT, anticipates a two-year Tarawa tour. (VERON) . . . WB6CZB thinks it's time to reactivate FW8-land in force after a Tokelaus try. Jim has previous A35 and 5W1 DXperience. (WCDXB) .. . . . ZL1NG's efficient and thorough logging habits enable him to instantly replay your transmissions to him of years and years ago. (CARA)



YBØABO obviously enjoys his DXing. Uwe feeds a two-element quad with this Djakarta layout. You may have worked him previously as OA4AGM. *(Photo via YBØABN)*

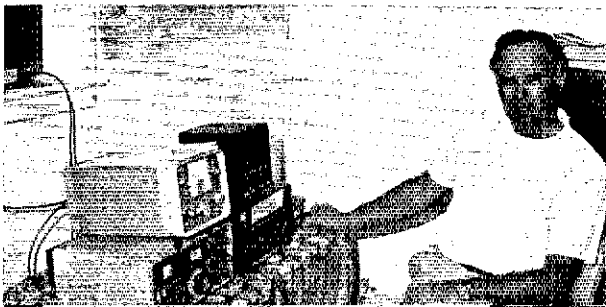
AFRICA – WB9s EGZ FRG, WA4RXS and I will be operating portable-6W8 from the Dakar region until October. We're with the Global Atmospheric Research Program and have a 500, SR102, HW101, 4BV vertical and other assorted skywires going on 10 through 80 meters. (K9KGA) . . . Roman Catholic priest 7XØWW first fired up in north Africa back in '38 as FA3WW (K2JFJ) . . . Africa addenda courtesy literature of aforementioned clubs and groups: TN8BK should be back in the C.R. next month after European furlough. Watch 21,305 around 1400 . . . This is target month for Desroches doings by VQ9s BP D and DM . . . FR7ZL/t left Tromelin Isle in July for Reunion and should be active on Juan de Nova by late fall . . . CR5AJ may pull stakes shortly for another choice CR spot . . . OE2s EM/un and HZL/un join the Suez crowd on 14,295 kHz at 1715 GMT, the subsuffix indicating United Nations affiliation.

ASIA – The gang may remember my activity from Sultanate of Oman around 1960. I've finally settled down in the U.K. and, after regaining my amateur license, I hope to be dishing cw out again to W/K/VEs on 14 MHz. For the past three months I've been QAP (SWLing) on DX bands with great interest. (ex-VS9OC courtesy W1VG) . . . BV2A had his HW32 and coax-fed dipole ready to hit 14,218 kHz in July but Tim was still stalled by an official amber light ssb-wise. (W6ATC) . . . PAØIWH/S2, often offering Bangladesh on 14,280 kHz at 1500 GMT or so, is also available on 40- and 75-meter sideband for 5BDXCC purposes. (VERON) . . . A9XW (W5WC), preferring 20 cw's lower reaches, may soon try his fist in other oil-rich regions like A6 A7 9M and VS5. (WCDXB) . . . This year's All-Asia DX Test barely made noise past the Rockies but our west coast obviously had little trouble harvesting JAs by the logful. (CARA) . . . UAØFGM, 14,280 kHz at 0500 GMT on weekends, digs for rare California counties. (WCDXB)

EUROPE – OZ6RT, 5BDXCC No. 344 with 272 countries confirmed, was a radio TV serviceman until he lost his sight twelve years ago. Undaunted, Ben now is a professional telephone operator and teaches other blind candidates to qualify for similar work. OZ6RT has an exceptionally keen sensitivity to rare DX signals! He uses a T4XC, R4C, SB220, TH6DXX, inverted Vs at 65 feet and an 18AVQ. (OZ1LO) . . . FC2CH likes cw near 14,060 kHz and is very interested in the history of our southern states. Roland wants to work more U.S. Fours. (K2JFJ) . . . During a recent jaunt to Europe I had the special pleasure of personally presenting ARRL's 5BDXCC plaque to my good friend F9MD. Marcel recently visited the States with a French group of International Police Association members. (W4WFL/1) . . . On my April visit to Eire I enjoyed attending the annual general IRTS meeting in Dublin. EIs 2BB 2CA 2CL 4OO 7CC and 8CC were there representing EI1AA, the Irish Leprechaun Contest Group. (K1OJQ-EI4CM) . . . A recent amateur radio class in Torshavn turned out nine new OYs for your future Faeroes DX pleasure. (WCDXB)

NORTH AMERICA – Surprisingly good 28-MHz openings continued into June with solid voice signals from A2CCY, CR6s HI NO, EA9EJ, EL2DG, F6BJY, FP8CT, FY7AN, GC3YIZ, HKs 2JN 3CTJ, KH4FS, KZ5JM, LU7FAG, PJ1HR, TI2WD, VK2BX, VPs 1SYL 2GBL 2KH 2LAW 2MDX 2VBU 8KF, YN1AA, YV4YC, ZDs 3Z 7FT, ZK1DX, 6W8DY, 9J2EP and 9X5VA. Don't pass up 10! (WB2MAN) . . . K2OLG reports working or hearing 45 countries on 28 MHz in June. (LIDXA) . . . WB9BZL/TI8 assists his parents at an experimental fresh water shrimp farm. Bernard hopes to find time for DX activity from Puerto Jiminez. (WA9UNR) . . . San Antonio DXers have organized the Alamo DX Amigos Club. Among our group's purposes is the promotion of favorable amateur radio relations with neighbor countries to the south, and the encouragement of DX newcomers. (W5LPO) . . . Last month's scheduled VP2EEB outburst came thanks to Anguilla visitors W4s GTS REI and WB4ZNH. (SEDXC) . . . Good to get back into DX after an 11-year QRT. My SB401/303 and inverted-V do right well on 20 cw. (K4DAS) . . . Loading my apartment fire-escape with a few 7-MHz watts produced cw QSOs with assorted Europeans, VK3MR and ZL1ADD. (WB2EDW) . . . W1s BB HGT and WA2MRZ should be credited with getting me to try 160 with considerable success from PJ8DX/PJ7 and VP2FEC. After days of constant pile-ups a very sore throat finally QSYd me to cw. (K2FJ) . . . Speaking of long QRTs, I was off the air for twenty years before firing up once more in late '69. Lots of changes in the game since I first joined the fun in 1936! Now, despite those big holes in the sky, I'm nearing the 200-country mark (K6SF) . . . A mere eighteen months was too long away from DX-citement for me, so back I go to the 20-ssb wars! (K4SD) . . . WCDXB and LIDXA supply closing localisms: W4BRB is mentioned together with an imminent increase in Haiti emanations . . . W6ISQ, K6CQF, W6SC and K6RXZ take over as newly elected prez, veep, sec and trez of Northern California DX Club . . . Some dish! PJ8HS (KV4FZ) sampled 20 meters at the floor of an inactive 2000-foot-deep Saba volcano . . . Frontpage DX personalities will emblazon annual W9-DXCC festivities near Chicago on the 21st of this month. Rush registration inquiries to W9KNI. On the agenda too is DXPO at Reston, VA, Sept. 28 - info. de W4UMF.

QST



A9XD was MP4BBD at the same Bahrain location for many years. Roy, a former W6, runs at FT101, 2B and a fixed two-element Yagi on good old 20.

Operating Events

de W1YI.

SEPTEMBER

Aug. 31-Sep. 1 *Ohio QSO Party*, p. 86 August.

1-8 *Brazil Independence Week Contest*, p. 86 August.

1-Oct. 31 *RTTY ART Contest*, p. 86 August.

2 *First Labor Day Zip Code Contest*, sponsored by the South Eastern Virginia Wireless Assn., full 24 hours UTC. The object of the contest is to work as many different zip codes as possible. Recommended frequencies are: cw, 60 from the band edge; novices, 3710 7110 21110 28110; phone, 3900 7260 14280 21360 28550. Exchange RS(T), zip code on the station license address and state. Log info, required: time(Z), stations, exchanges, frequency, mode and state. Scoring is based on the sum of the last two digits of all zip codes worked on all bands (example, zip 23518 is worth 18 points). DX stations use a zip of 00025. Cw and phone are separate contests. Awards as warranted. Entries must be postmarked no later than Oct. 1, send to SEVWA, Box 14411, Norfolk, VA 23518. (Note, the same station may be worked once per band on phone and on cw.) Check sheets required for entries with more than 100 QSOs. Send s.a.s.e. for contest results (business size envelope).

4 *West Coast Qualifying Run* (W6ZRJ prime, K6DYX alternate), 10-35 wpm at 0400 UTC (Universal Coordinated Time, calculated as per GMT) on 3590/7090 kHz. This is 2100 PDST the night of September 3. 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 and send to ARRL for grading.

7-8 *VHF QSO Party*, p. 52 August. *Sarasota C.C.S. Contest (HA)*, p. 86 Aug.

7-9 *Aloha-Hawaii QSO Party*, p. 86 August.

8 *Frequency Measuring Test*, p. 86 August.

11 *WIAW Qualifying Run* (10-35 wpm at 0130 UTC) on 1,805 3,580 7,080 14,080 21,080 28,080 50,080 and 145,588 MHz. *This is 2130 EDST (9:30 PM EDST)* the night of September 10. 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.

14-15 *CLARA Day Contest*, p. 86 August. *WAEDC phone*, p. 94 July.

14-16 *Washington State QSO Party, Pennsylvania QSO Party*, p. 86 August. *Maryland-D.C. QSO Party*, 8th annual, sponsored by the Maydale Amateur Radio Soc., starts at 2300Z Sept. 14, ends 0100Z Sept. 16. The same station may be worked on each band/mode for QSO points as well as band multiplier. Exchange QSO no., RS(T) and *QTH (county for MD stations except Baltimore City and* Washington, DC; ARRL section and country for all others). Score 2 points per complete QSO. The same station may be worked on each band/mode for additional QSO points. For multiplier MDC stations use ARRL sections and countries. All others use MD counties and Independent Cities. Score: sum of MDC counties/cities or sum of ARRL sections, countries, from each band multiplied by total QSO points. Freqs.: on hf bands 75 kHz from low end of cw bands on even hours, 25 kHz from top of band on phone on odd hours. On half hour try 10 and 15, 6, 2 and 220 may be worked through repeaters. Awards. A separate log should be submitted for each band/mode as well as a check sheet for same if over 100 QSOs. An overall summary must be included with name, address and call (block letters, please) and usual signed declaration. Mailing deadline is Oct. 4, send to Maydale ARS, c/o E. E. Andersen, W5IWT/3, 14601 Claude Lane, Silver Spring, MD 29094.

18-20 *YLRL Howdy Days*, p. 87 August.

21-22 *VE/W Contest*, p. 53 August. *Scandinavian Activity Contest (SAC)* cw, p. 87 August.

23 *WIN1M/CWA High Speed Code Test*, p. 87 August.

24 *WIAW Morning Qualifying Run* 1300 UTC (this is 9 AM EDST). Same frequencies and details as under the Sept. 11 listing.

28-29 *SAC phone*, p. 87 August.

28-30 *Delta QSO Party*, p. 87 August.

OCTOBER

3 *West Coast Qualifying Run.*

5-6 *VK/ZL/Oceania DX Contest* phone, from 1000Z Sat. Oct. 5 to 1000Z Sun. Oct. 6. Score 2 points for each QSO on a specific band with VK/ZL; 1 point with Oceania stations other than VK/ZL. Final score is derived by multiplying total QSO points by the sum o VK/ZL call areas worked on all bands (the same VK/ZL call are worked on different bands counts as a separate multiplier). Sen RS(T) plus consecutive serial number starting with 001. Logs mus show: date, time(Z), calls, bands, serials; notation of each new VK/ZL call area per band. Use separate logs for each band. Singl band and all-band scores. Summary sheet should show call, nam and address (block letters, please), equipment details and scoring fo each band and all band. Include usual declaration. Awards. Log should be posted to reach the NZART before January 25, 1975 Send either to: NZART Contest Mgr., Box 489, Wellington, Nev Zealand; or, NZART Contest Mgr., 152 Lytton Road, Gisborne New Zealand. *CQ-WE HF*, annual CQ Western Electric Contest, hos BTL Holmdel. Open to all employed or retired W.E., Bell, Teletyp Corp. amateurs. Periods each day are from 1800-2300Z. Fo operating times, rules, logs, etc., contact your local coordinator *Missouri QSO Party*, sponsored by the St. Louis ARC (11th annual; starts 1800Z Sat. Oct. 5, ends 2300Z Sun. Oct. 6. The part wi include several mobile operations passing through some hard to ge MO counties plus many fixed stations. All MO amateurs are urged t *participate. Exchange QSO no., report, QTH (county for MO* state/province or country for others). MO mobile stations will star with 001 from each county activated. Frequencies on most band will be 60 to 70 up from the low end. The same station may b worked once per band/mode, i.e. once on cw, once on ssb, on each band. Mobile MO operation will be considered to be a differen station from each different county. MO stations may work each other (count as one state for multiplier). Hawaii and Alaska count a states only; U.S.A. and Canada do not count as countries. Score point per QSO. MO stations multiply total points by the sum o *states, provinces and countries. Others multiply* points by the no. o MO counties worked (max. 115). Mobile MO stations multiply tota points from all counties activated by the sum of states/province and countries. Awards. Mailing deadline Dec. 1, 1974. Send to St Louis ARC, K0LIR, 842 Tuxedo Blvd., Webster Groves, MO 63119

5-7 *CARTG RTTY DX Winnipeg Centennial Sweepstakes* rules this issue. *California QSO Party*, 9th annual, cosponsored b the North Hills Radio Club and the Northern California Contes Club. Dates/times: 1800Z Sat. Oct. 5 through 0600Z Sun. Oct. and 1500Z Sun. through 0300Z Mon. Oct. 7. Use all bands, cw an ssb. The same station may be worked only once per band/mode *Send QSO no., RS(T) and QTH (county for CA stations,* ARR section or DX country for others). California stations may work each other. Contacts between stations outside of California have n contest value. Each QSO is worth 1 point. CA stations use ARR sections and DX countries for multipliers; others use the no. of CA counties worked. Suggested frequencies: cw, 1805 3560 706 *14060 21060 28060*; ssb, *1815 3880 3980 7280 14280 2128* 21380 28580; novice, 3725 7125 21125 28125. All logs must show date, time, band, mode, exchanges. Logs cannot be returned. B sure your call is on each page. A summary sheet must be include with each entry. List counties or ARRL sections and DX Countrie worked. Show breakdown of QSOs per band and scoring on thi page. Include your name, call and address in large block letters Awards. All entries must be postmarked no later than Nov. 1 to b eligible for awards and must include a size 10 s.a.s.e. (or s.a.e. wit IRC) for results. Mail entries to John Minke, W6KYA, 6230 Ri Bonito Drive, Carmichael, CA 95608. All comments and suggestion will be appreciated.

10 *WIAW Qualifying Run.*

12-14 *CD Party, phone. VK/ZL/Oceania Contest* cw (see Oct 5-6 listing). *RSGB 21/28 MHz* phone contest, open to all. Start 0700Z Oct. 12, ends 0900Z Oct. 13. A station whether fixed portable, mobile or alternative address may be worked only one per band. Each complete QSO with a British Isles station will coun 5 points. In addition, a bonus of 50 points may be claimed for th first contact on each band with each of the following British Isle prefixes: G2 3 4 5 6 8, GC2 3 4 5 6 8, GD2 3 4 5 6 8, GI2 3 4 5 6 8 GM2 3 4 5 6 8, GW2 3 4 5 6 8. Separate check lists showing th bonus points claimed for each band should be included with entrie Send to RSGB hf Contest Committee, c/o M. Harrington, 12 Clensham La., Sutton, Surrey, England. Entries should be posted t arrive not later than Mon. Dec. 4, 1974. Note that the top U.S entrant in each call area will receive an award.

16-17 *YL Anniversary Party*, cw, starts 1800Z Oct. 16 and end 1800Z Oct. 17. All licensed women operators throughout the worl are invited to participate. YLRL members only are eligible for th

(Continued on page 156)

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.

Your Station Log. Now that FCC, in all its magnanimity, has come forward with reduced logging requirements for amateur stations, the amount of paper work in connection with operating an amateur station figures to decrease drastically. Since these changes are "editorial revisions," no Notice of Proposed Rule Making was necessary, and the rulemaking petition by the Maryland FM Association was thus magically transformed directly into law.

"Editorial" or not, not keeping a record of the identity of other amateur stations worked is going to be a hard habit to break. All you have to do is enter the basic licensing data, the starting and terminating dates of operation and that's *it*, except for some exceptions depending on circumstances. No power entry, no mode entry, no notation of frequency or band, no beginning and ending times. A day to day log will no longer exist, under normal circumstances. Only if you operate from a different-from-normal location, or someone else operates, or if third party traffic is handled (and even this doesn't have to be written, can be recorded), or if the Commission specifically directs, must other data be included in the log.

Thus, for an "editorial" change, it's a pretty revolutionary one. Amateurs have been keeping logs ever since amateur radio came into existence, back almost to the turn of the century. Some of them are historical documents. Many will continue doing so, even though minimum logging rules no longer require it. At least we hope so; because an amateur station log is not just a legal requirement, it's a recorded diary or history of your amateur operation, something you can look back upon and refer to. When did you work that rare DX you never got a card from? How many messages did you exchange with W3CUL on that sked two weeks ago, or two years ago? What was the call of that fellow you had the enjoyable ragchew with? When did you start using your high-power linear? None of these questions could be answered if your "log" contains nothing but dates. In fact, all your log will really tell you is when (i.e., what date) you started operating from your present location, and the dates between which you operated from any previous locations.

This is a log? Not really. For the average amateur, this is a piece of paper at his operating position, on which some notation is made once in a great while, even if he operates every day. But for the average amateur of today, this will not be enough of a record of station operation to meet his own requirements, never mind those of FCC.

You might think this is a pitch on the part of the League to continue selling log books, but we urge all amateurs to continue to keep an accurate and detailed log of their station operation, just as you have always done – whether required by FCC rules or not. You'll be glad, some day, that you did. Few things are more enjoyable than poring over records of operating experiences of many years ago and letting them recall memories of the details of those experiences – details that would be gone forever without such reminders. Don't deprive yourself of this. Keep accurate, detailed records and logs, OMs and YLs!

WNY to ENY. With the change of three Western N.Y. counties from the Atlantic to the Hudson Division (per July ARRL Board Meeting, see minutes elsewhere), these three counties are herewith changed from the Western New York to the Eastern New York section of the Communications Department Field Organization. The counties involved are Saratoga, Warren and Washington. Members therein will henceforth report to the Eastern New York SCM instead of the SCM of Western New York as heretofore. This change was a result of a petition of the membership concerned, a poll of the membership and consequent action by the Board.

Contest Advisory Committee. Items under a continuing review by the CAC include the entire aspect of the ARRL club competition, evaluation of questionnaire returns from DX Competition winners of the 1973 event, and effect of rules changes in the June and September VHF QSO

DXCC Notes

Announcement is hereby made of the addition to the ARRL Countries List of *Kingman Reef*, KP6. Geographically, Kingman Reef is located at the northernmost tip of the Line Islands in the Pacific Ocean. It is owned by the United States. This addition to the ARRL Countries List is made under point 1 of the criteria (see October 1972 *QST*, p. 131) by virtue of its separate administration from that of Palmyra and Jarvis Islands. Submissions of Kingman Reef confirmations for DXCC credit may be made starting October 1, 1974.

New A-1 Operators
WB6ZEQ W3LE YS1AG

Parties and Field Day. The CAC wants *your* input, either via Hq, or: W1BGD (Chairman), WA2BLV, *W3BQV, K4BAI, W5RUB, W6PAA, K7NHV,* W9LT, WAØCVS, VE7CC, KH6IJ.

Your Station Call. Old timers are prone to feel that "the old days were better." At one time, one's station call was accepted as his identity, not only on the air but at ham gatherings as well. A favorite pastime at hamfests and conventions was to toot your call on a little whistle provided all registrants, and locate your on-the-air cronies by identifying their tootings. Talk about QRM! Once such parties had located each other, the exchange at handshake was something like "Hi, ABC, I'm DEF!" instead of "Hi, Jim, I'm Joe!" On the air, no thought was given to exchanging "handles." Your handle was your call.

Well, guess we've long since gotten away from most of that, and today one's call letters are simply an identification number, like your Social Security number. The difference is that you can change your call (for a fee), whereas your SS number remains the same and not much you can do about it. Why can't I have a two-digit SS number if I'm willing to pay for it? Think of the revenue . . . . .

But nobody goes around calling me 043-38-8982, and isn't likely to – at least, I hope not! In the 1930's I was often referred to as "AMR," and since then sometimes as "NJM." No one else was ever the beneficiary of these appellations. When someone said W1NJM, he could mean no one else but me, whereas if he said my christened name he could be referring to any one of thousands of other people bearing the same name. In amateur radio, the call is thus often used instead of the name, even *off* the air.

Some calls are rather long, and the desire is *often present to seek a shorter call – one easier to* send and easier to remember; also, one carrying a little more prestige (how important this is!). For example, who could blame the holder of a call like WB1QJP for being willing to pay $25 to get a call like K1EA? On the other hand, "what price change of identity?" For a time, if you change your call, you'll have to tell all your old cronies who you "really" are. The better known you were under your previous call, the more often this will have to be repeated. Of course the preening opportunity this affords may be worth it, but this depends on your personality.

Even this will be less a factor if FCC's Even this will be less a factor if FCC's new Notice of Proposed Rule Making (Docket 20092) becomes a regulation, because old timers will be less distinguishable from younger amateurs by their call letters. Extra Classers will be able to get any call they want, provided it is not already assigned. The holding of two or more call signs will become more commonplace, and some will attempt to attach distinction to this also. (E.g., can anybody beat *five* calls?)

Well, to each his own. Remember, your call is your specific identity on the air. At other times it can also serve to identify you, especially in amateur radio circles – identify you beyond possibility of confusion with someone else, because no one else holds it. Therefore, *use* your call in all amateur radio parlance or palaver, whether on the air or not. If you use your call without your name, you can be readily identified. If you use your name without your call, you could be mistaken for any *number of other people* – depending on how unusual your name is, but no matter how rare, don't bet that there is none other like it! As for this OM, as long as he resides in the First Call Area, the good FCC permitting, the call will be only – *W1NJM.*

STRAIGHT-KEY NITE W1YL

The first summer SKN (July 3-4) brought in lots of comment on the high degree of activity, but few reports were actually received. Just 91 individual reports arrived by copy time indicating participation by 482 different amateurs.

Numerically, 66 individuals received votes for "best fist" (and there were a number of self-declared "worst fists!"). The undisputed best-fist champ of the night was W1GVV with 5 votes, followed by three votes each for W2LYH W5UBR W7YX, two votes each for W1HV W2QL W3EEK W4KFC W4YZC W6LON W7KEI W8HRV W9ACU WØGMO WAØYDN VE3HBP, one vote noted for 50 others including WN3VBM, fb!

Analysis of comments revealed areas which could be improved without detracting from the fun format. How about trying the following suggestions this coming New Year's Eve? Concurrent starting times for all (instead of local) - a six-hour stretch starting at 0100Z for all; suggested areas, 80-40-20 from 060-080 kHz up from the bottom edge, 10kHz up from the bottom of the Novice segments; as an aid towards identifying participants more easily instead of RST followed by the *reports, how about trying SKN plus the numerical* report.

Very little wrong was noted; participants like the absence of scoring and unpressured QSOs. *Lets keep it that way.– W1YL.*

Soapbox

A jolly nite! For once I was pleased to hear such fierce QRM. - W4NG. My only suggestion for improvement would be to ask all participants to limit power input to 200 watts. - *W5MJ.* When QRN got up to S-9, I quit! How about including 20 meters? - W9RC. QRM around 7030 was bad. Maybe a better choice would be 060-080. - WBØEMI. Worked three stations before a line of thunderstorms moving through the area put me voluntarily off the air. - WØMYM. Thanks for all *the fun.* - WB9OZL. *Good to have one non-contest* with time for rag chews. Don't change anything. - W2WSS. How about starting/ending 2 or 3 hours earlier? - WA4BIB. Need a better i.d. method for recognizing participants. In lieu of RST 599, how about SKN 599? - W7YX. I didn't like it at all. WBØGUU. My vote for W5UBR. Any cw man who

W1AW SCHEDULE

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 Jan. 1, Feb. 18, April 12, May 27, July 4, Sept. 2, Nov. 28, Dec. 25, 1974.

Times/Days GMT	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0000	.....	← CW Bulletin[1] →					
0020-0100[4]	.....	.....	3.7 Nov.[5]*	14.080*	14.080*	7.15 Nov.[5]*	14.080*
0100	Oscar[10]	← Phone Bulletin[2] →					
0105-0130[4]	.....	.....	3.990*	50.190*	145.588*	1.820*	21.390*
0130	CODE PRACTICE[1] (35-15 wpm TThSat, 5-25 wpm MWFSn) Details Below						
0230-0300[4]	.....	.....	3.580*	.....	1.805*	.....	3.580*
0300	RTTY Bull.[3]	.....	← RTTY Bulletin[3] →				
0330	Phone Bull.[2]	.....	← Phone Bulletin[2] →				
0335-0400[4]	.....	.....	7.290*	3.990*	7.290*	3.990*	7.290*
0400	CW Bull.[1]	.....	← CW Bulletin[1] →				
0420-0500[4]	.....	.....	3.7 Nov.[5]*	7.080*	3.990*	7.15 Nov.[5]*	3.580*
1240	.....	← Oscar[9] →					.....
1300	.....	CODE PRACTICE[1] (5-25 wpm MWF, 35-15 wpm TTh) Details Below					.....
1700-1730	.....	21/28 cw[7]*	21/28 ssb[8]*	21/28 cw[7]*	21/28 ssb[8]*	21/28 cw[7]*	.....
1730	.....	CPN[6]	.....	.....	.....	.....	.....
1800	.....	← Oscar[9] →					.....
1900-2000	.....	7.080*	7.290*	14.095 RTTY*	7.290*	7.080*	.....
2000-2030	Oscar[11]	DLRN[6]	21/28 cw[7]*	21/28 ssb[8]*	21/28 cw7*	21/28 ssb[8]*	.....
2030	.....	.....	CW Bull.[1]	.....	CW Bull.[1]	.....	.....
2100-2130	.....	7.15 Nov.[5]*	21.1 Nov.[5]*	7.15 Nov.[5]*	21.1 Nov.[5]*	7.15 Nov.[5]*	.....
2130	.....	.....	RTTY Bull.[3]	.....	RTTY Bull.[3]	.....	.....
2200	.....	CPN[6]	3.095 RTTY*	3.625 RTTY*	14.095 RTTY*	CPN[6]	.....
2300	.....	.....	CN[6]	RTTY Bull.[3]	CN[6]	.....	.....
2330	← CODE PRACTICE[1] (10-13-15 wpm) Details Below →						

[1]CW Bulletins (18 wpm) and code practice on 1.805, 3.580, 7.080, 14.080, 21.080, 28.080, 50.080 and 145.588 MHz.**
[2]Phone Bulletins on 1.820, 3.990, 7.290, 14.290, 21.390, 28.590, 50.190 and 145.588 MHz.**
[3]RTTY Bulletins, on 3.625, 7.095, 14.095, 21.095, and 28.090 MHz.** Bulletins repeated when time permits.
[4]Starting time approximate, following conclusion of bulletin or code practice.
[5]W1AW will tune the indicated bands for Novice calls, returning the call on the frequency on which called.
[6]Participation in traffic nets.
[7]Operation will be on one of the following frequencies: 21.02, 21.08, 21.1, 28.02, 28.08, 28.1 MHz.
[8]Operation will be on one of the following frequencies: 21.260, 21.390, 28.590 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 RTTY frequencies.
[11]Oscar orbital data for the coming week, on cw frequencies.
*General contact period.
**No 10- or 15-meter activity from 0130-0500.

NOTE: W1AW will be closed for the annual ARRL office outing on September 5, 1974.

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
5-7½-10- 13-20-25	9:30 PM EDST SnTThS 6:30 PM PDST	0130 MWFSn
5-7½-10- 13-20-25	9:00 AM 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

The 0130 UTC practice is omitted four times a year on designated nights when Frequency Measuring Tests are sent in this period. To improve your fist by sending in step with W1AW (but not over the air!), and to allow checking the accuracy of your copy on certain tapes, note the UTC dates and *QST* practice text (from the issue 2 months previous) to be sent in the 0130 UTC practice on the following dates.

Sept. 6: It Seems to Us
Sept. 12: Correspondence
Sept. 16: League Lines
Sept. 24: ARPS
Sept. 27: World Above
Oct. 2: YL News

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has the courage to join SKN with a QTH like Waxahachie TX deserves an award for courage. - WBØGGO. A lot of fun. - VE3GVH. How about a frequency in the Novice bands to aim at? - WA4CMS. Please run SKN on GMT so everyone is on at the same time, require a 10-minute minimum rag chew (unless QRM, QRN or QSB cuts it short). - WB2DYY. How about an SK category in the Nov. SS? - WA3THD. Why change it? - K4MD. Try to find a time when there is a holiday next day in both U.S.S. and Canada and then more of us could participate. VE3EZU. It was fun to hear as well as work. - W8LJH. W1CW - what a call for SKN! - WØGMO. Congratulation on another well executed operating event. In this day of the keyer, I'm delighted to hear some good ole human cw and its inherent mistakes. - K4LNC. Best experience of SKN was working W4KFC, whom I first worked

DX CENTURY CLUB AWARDS

HONOR ROLL

The DXCC Honor Roll consists of the top ten numerical totals in the DXCC. Position in the Honor Roll determined by the first number shown. The first number represents the participant's total countries less a credits given for deleted countries. The second number shown represents the total DXCC credits given includi deleted countries. All totals shown represent submissions received through June 30, 1974.

DL3RK	320/346	W8LKH	319/347	W7SGN	317/342	K2YXY	315/332	W7ENW	314/347	K4TJL	312/
G3FKM	320/346	W8QK	319/339	W8CT	317/330	K3BW	315/338	W8CUT	314/330	K5AAD	312/
GW3AHN	320/348	W8ZCQ	319/342	W9RCJ	317/338	K4YYL	315/324	W8EVZ	314/326	K5LIL	312/
HB9MQ	320/347	W9DWQ	319/341	W9RKP	317/343	K6AN	315/345	W8HN	314/348	K6KA	312/
K2BK	320/343	W9GFF	319/340	WØCJZ	317/330	K6LGF	315/336	W8KBT	314/336	K6ZM	312/
LU6DJX	320/353	W9HB	319/342	WØLWG	317/336	K6OW	315/331	W8LY	314/336	OH2LA	312/
OE1ER	320/351	W9LNM	319/351	YV5ANF	317/324	K6QH	315/324	W8UAS	314/343	OK3MM	312/
VE2NV	320/347	WØKF	319/345	4X4JU	317/341	K6WR	315/330	W9QLD	314/325	OZ3Y	312/
W1AX	320/352	WØMLY	319/344	DJ5DA	316/326	K7GCM	315/332	W9TKD	314/333	PY2BKO	312/
W1AZY	320/343	WØSYK	319/346	DL6LN	316/340	K8OHG	315/329	WØAUB	314/331	PY2CO	312/
W1BIH	320/352	G2BOZ	318/345	DL7HU	316/334	K8RTW	315/333	WØBK	314/332	PY2SO	312/
W1HX	320/349	JT9TAI	318/343	G2BVN	316/343	LU4DMG	315/340	X6JAE	314/332	SM7ANB	312/
W2BXA	320/353	JA1BK	318/335	G3AAE	316/344	OH2BH	315/326	YV5AIP	314/332	W2AYJ	312/
W2CTO	320/349	K1FXG	318/334	G4MJ	316/342	PY7YS	315/335	CR6BX	313/338	W2RDD	312/
W2DXX	320/335	K2LWR	318/341	K1SHN	316/329	SM3BIZ	315/341	DL1BO	313/339	W2WZ	312/
W2NUT	320/345	K4EZ	318/333	K2UVU	316/337	VE2WA	315/335	GI3OQR	313/327	W5EGK	312/
W2RGV	320/345	K6DC	318/343	K4JC	316/329	W1BAN	315/337	HB9KB	313/336	W5EJT	312/
W2SSC	320/345	K6EC	318/341	K4KQ	316/344	W1BPW	315/333	JA1ADN	313/329	W5FI	312/
W2TP	320/338	K8LSG	318/337	K4MOG	316/328	W1HH	315/335	JA1AG	313/335	W5WZQ	312/
W3KT	320/352	OH2NB	318/348	K4VW	316/334	W2CYS	315/346	JA2JW	313/333	WA5EFL	312/
W3LMO	320/342	ON4NC	318/347	K6NA	316/346	W2PDB	315/335	JA3UI	313/331	W6OME	312/
W3MP	320/351	W1JNV	318/343	K8ONV	316/334	W2QK	315/328	K3UZY	313/320	WA6EPQ	312/
W4EX	320/353	W1MV	318/344	K9BGM	316/325	WA2DIG	315/333	K4ID	313/324	W7AC	312/
W4GXB	320/350	W2BMK	318/339	K9ECF	316/334	W3RNQ	315/342	K4IKR	313/321	W7QK	312/
W4OM	320/351	W2DOD	318/345	LU5AQ	316/340	W4BOY	315/338	K4MZU	313/323	W7OPK	312/
W4VPD	320/346	W2FXA	318/340	OK1ADM	316/330	W4DOS	315/331	K4PDV	313/334	W8EV	312/
W5AO	320/347	W2GKZ	318/329	PAØFX	316/345	W4EFE	315/340	K5QHS	313/318	W8JQ	312/
W6AM	320/354	W2YY	318/335	W1CKA	316/335	W4JC	315/329	K6CH	313/341	W9HJ	312/
W6KZL	320/344	WA2RAU	318/328	W1DGJ	316/329	W5EFW	315/341	K6EV	313/324	W9JOD	312/
W6PHO	320/347	W3AFM	318/337	W1GKK	316/350	W5HJA	315/333	K6KII	313/334	WØNVZ	312/
W8BF	320/350	W3GRS	318/339	W2CR	316/343	W5KTW	315/327	K6OJ	313/343	YV5AHR	312/
W8BT	320/345	W3LMA	318/349	W2GT	316/344	W6EUF	315/323	K6YRA	313/323	DJ1CG	311/
W8DAW	320/353	W4BJ	318/339	W2HO	316/341	W6HX	315/347	ON4QI	313/327	DJ7CX	311/
W8GZ	320/352	W4ML	318/347	W2MJ	316/336	W6PO	315/338	SM6AFK	313/321	DL3BK	311/
W8MPW	320/347	W4NJF	318/330	W2PV	316/327	W6RGG	315/325	SM6CKS	313/318	G3DO	311/
W8PHZ	320/344	W5PQA	318/345	W2ZTV	316/326	W6TZD	315/344	VE1VR	313/321	G3IEL	311/
W9BG	320/354	W6CHV	318/345	WA2RLQ	316/326	W7ADS	315/342	VE3MJ	313/321	I3PRK	311/
WØBW	320/350	W6CYV	318/345	WB2HXD	316/326	W8DMD	315/345	VE3WT	313/322	IØJX	311/
WØDU	320/351	W6KTE	318/328	W3DJZ	316/332	W8KIT	315/330	VK4QM	313/345	JA1DM	311/
WØELA	320/352	W6WWQ	318/344	W3WGH	316/340	W8KPL	315/341	W4BFR	313/330	JA1MCU	311/
4X4DK	320/347	W8WZ	318/349	W4IF	316/337	W9ILW	315/330	W4HOS	313/323	K2DCA	311/
DJ2BW	319/345	W9GIL	318/344	W4MCM	316/336	WØAIH	315/339	WA4WIP	313/321	K4SCT	311/
DL9OH	319/339	W9SFR	318/342	W4OPM	316/340	WØGKL	315/336	W5GO	313/335	K8DYZ	311/
G3FXB	319/345	WØPGI	318/343	W4PLL	316/340	WØNK	315/346	W5HE	313/323	KP4RK	311/
G5VT	319/348	WØQGI	318/343	W5ABY	316/342	CE3AG	314/346	W5UC1	313/333	OZ6MI	311/
G8KS	319/344	ZL1HY	318/351	W5IO	316/344	DL1IN	314/339	W5MMD	313/341	UA1CK	311/
I1ZL	319/339	ZL3IS	318/340	W5TIZ	316/337	DL8NU	314/319	W5NMA	313/339	VE5RU	311/
IØAMU	319/346	DL1HH	317/335	W6BZE	316/344	F9RM	314/332	W5OB	313/333	W1YRC	311/
K2BZT	319/345	DL1JW	317/338	W6EL	316/328	HB9TL	314/339	W5PWW	313/333	W2CKY	311/
K2FL	319/344	DL1KB	317/346	W6EPZ	316/346	I8KDB	314/337	W6CAE	313/342	W2NQ	311/
K4LNM	319/342	DL7FN	317/342	W6FZJ	316/330	JA1BN	314/328	W6DOD	313/321	WA2HOK	311/
K6ZO	319/352	G6TA	317/341	W6ID	316/344	K2YUM	314/323	W6FOZ	313/340	WA2IDM	311/
W1DK	319/345	GI3IVJ	317/341	W6KG	316/337	K6AHV	314/327	W6HOC	313/335	WB2UKP	311/
W1HZ	319/346	HB9J	317/350	W6REH	316/331	K6GA	314/332	W6KNH	313/318	W3BWZ	311/
W1NU	319/343	K2TQC	317/333	WB6OOP	316/331	K9KYF	314/331	W6LN	313/342	WA3ATP	311/
W2AO	319/345	K6RQ	317/336	W7AQB	316/337	K9LUI	314/330	W6SOP	313/337	W4MR	311/
W2BOK	319/345	K8IKB	317/337	W7CMO	316/335	OH2QV	314/328	W6TA	313/335	W5GR	311/
W2GLK	319/341	LA7Y	317/348	W7KH	316/348	PY1BX	314/339	WA6GLD	313/323	W5HDS	311/
W2HTI	319/344	PY2CK	317/349	W7OE	316/342	PY2PE	314/324	WA6MWG	313/323	W5KBU	311/
W2JVU	319/349	PY2PA	317/327	W8ARH	316/328	PY4AP	314/321	W7JG	313/330	W5LZZ	311/
W2LV	319/347	W1CBZ	317/341	W8JBI	316/344	W1GYE	314/338	W8DA	313/332	W5UKK	311/
W2OKM	319/346	W1FZ	317/344	W8NGQ	316/342	W2GQN	314/324	W8MB	313/333	WA5TSI	311/
W2QHH	319/349	W1GL	317/329	W8QJR	316/342	W2FZY	314/336	W8ONA	313/338	W6DZ	311/
W2QM	319/343	W2AGW	317/350	W9FKC	316/345	W2PCJ	314/339	WA8NYB	313/316	W6HVN	311/
W3CGS	319/347	W2BHM	317/340	W9HUZ	316/344	W2SAW	314/340	W9QQN	313/323	W6IKJ	311/
W3EVW	319/349	W2CP	317/332	W9IUV	316/343	W2PN	314/324	W9ZTD	313/330	W6UOQ	311/
W8NKM	319/345	W4AIT	317/349	W9NDA	316/349	W2WMG	314/334	WØBFB	313/340	W6WX	311/
W4BYU	319/346	W4SSU	317/334	W9WYB	316/338	W2ZX	314/341	WØBL	313/318	W6YMV	311/
W4LRN	319/340	W5GC	317/335	WØBN	316/330	WB2FMK	314/324	DL3OH	312/318	W7BA	311/
W4QCW	319/344	W5QK	317/337	YV5AB	316/343	W3GAU	314/342	F3AT	312/333	W8KIA	311/
W5KC	319/351	W5QKZ	317/333	ZS6LW	316/338	W4IDR	314/338	G2FYT	312/333	W9GB	311/
W5MMK	319/349	W6ABA	317/328	DJ7ZG	315/325	W4LYV	314/343	IT1ZGY	312/334	W9LKJ	311/
W5UX	319/343	W6GPB	317/347	DJØKQ	315/325	W4ZXI	314/320	JA1BRK	312/324	W9MQK	311/
W6ANN	319/347	W6ISQ	317/333	DL7AA	315/346	W5GJ	314/330	JA1MIN	312/319	YS1O	311/
W6PT	319/345	W6NJU	317/340	G3HCT	315/335	W5QLG	314/344	JA4ZA	312/323	YU2DX	311/
W6ZO	319/349	W6OSU	317/338	GI3JIM	315/336	W5PM	314/336	JA8ADQ	312/321	YV5BNW	311/
W7MB	319/352	W6RKP	317/340	I2KMG	315/324	W6DZZ	314/345	K1YZW	312/320	YV5BOA	311/
W8EWS	319/352	W6ZM	317/336	K2PXX	315/328	W6KZS	314/325	K4HJE	312/317	YV5BPJ	311/

Radiotelephone

W2BXA	320/351	PY2PA	317/327	K4HEF	315/332	K4JC	314/323	K4MQG	313/321	W6CHV	312/334
W2RGV	320/343	W4OM	317/342	K5JEA	315/334	K4YYL	314/321	K4TJL	313/330	W7QPK	312/325
W2TP	320/335	W5GC	317/335	K8RTW	315/333	K6WR	314/329	K6LGF	313/331	WA8AJI	312/322
W4EX	320/351	W5JWM	317/337	K9ECE	315/332	K9KYF	314/331	ON4DM	313/341	W8CUO	312/326
W6AM	320/352	W6ZM	317/331	LU4DMG	315/340	K9LUI	314/330	PY2PE	313/323	W9HB	312/333
W8BF	320/350	WØCM	317/347	SM5CZY	315/327	LU9DAH	314/335	VE3MJ	313/321	W9JJF	312/337
W8BT	320/345	YV5ANF	317/324	W1DGJ	315/328	OK1ADM	314/323	VE3MR	313/325	W9WHM	312/338
W8GZ	320/352	4X4DK	317/344	W2FGD	315/325	SM3BCO	314/333	W2LV	313/335	WØAAA	312/322
5Z4ERR	320/350	4X4JU	317/337	W2PV	315/326	VK5MS	314/342	WA2EOQ	313/322	YV5AHR	312/324
DL9OH	319/339	G8KS	316/339	W2QK	315/325	W1BAN	314/335	W3AZD	313/325	ZL3NS	312/320
IØAMU	319/346	PAØHBO	316/341	W3KT	315/342	W1ONK	314/339	W4PDL	313/332	DL8NU	311/316
TI2HP	319/350	VE3QA	316/339	W4EEE	315/340	W2GKZ	314/324	W4SSU	313/327	EA4JL	311/316
W1JFG	319/343	W2OKM	316/341	W4SKO	315/338	W2ZY	314/341	WA4WIP	313/321	G3JEC	311/318
W2GLF	319/341	W2ZTV	316/325	W6EL	315/326	W4IC	314/322	W5SZ	313/320	I3PRK	311/315
W2HTI	319/343	W3DJZ	316/329	W6EUF	315/322	W5LZW	314/330	WØGAA	313/325	I5TDJ	311/325
W4QCW	319/340	W3NKM	316/341	W6NJU	315/332	W6KTE	314/324	YV5BNW	313/319	IØLLZ	311/315
W6GVM	319/349	W3WGH	315/333	W7SGN	315/330	W9JT	314/322	ZL1KG	313/337	K6YRA	311/321
W7PHO	319/346	W4NJF	316/327	W9ILW	315/330	W9LNM	314/334	DL1IN	312/336	K8IKB	311/319
WØBW	319/343	W5IO	316/343	WØGKL	315/335	W9RNX	314/340	DL7HU	312/329	KP4CL	311/323
G3FKM	318/340	W6REH	316/327	YV5BBU	315/324	XE1AE	314/332	EA7ID	312/332	OZ3SK	311/325
G5VT	318/347	W6RKP	316/334	ZP5CF	315/340	YV5AIP	314/332	I2KMG	312/321	PY2CYK	311/318
K1IXG	318/334	W8QJR	316/342	DJ7ZG	314/324	DL7FT	313/323	K2BZT	312/331	W3JK	311/319
W2YY	318/330	W9DWQ	316/327	DL6EN	314/335	F2MO	313/326	K4HJE	312/317	W5LZZ	311/318
WA2RAU	318/328	W9NDA	316/345	F9RM	314/332	HB9J	313/342	K5QHS	312/317	W5NMA	311/332
W8MPW	318/336	W9NZM	316/329	I8KDB	314/337	HB9TL	313/337	ON4DH	312/337	WA5EFL	311/321
DJ2YI	317/341	YV5AB	316/343	IØZV	314/330	I2KMG	313/322	PY2PC	312/319	W6BAF	311/330
G6TA	317/340	ZL1HY	316/348	IT9GAI	314/319	I6FLD	313/329	SM3BIZ	312/337	W6KNH	311/316
GI3IVJ	317/339	ZS6LW	316/337	IT9JT	314/319	I8AA	313/320	W3GRS	312/325	W6YMV	311/325
K2FL	317/333	DJ2BW	315/334	K2YLM	314/323	JA1BK	313/328	W5PQA	312/335	W7CMO	311/323
PY2CK	317/348									W9SFR	311/327

New Members

Radiotelephone listings follow the general-type "New Member" and "Endorsement" listings – *June 1-30, 1974*

K6ZXW	295	SM6CVE	163	W8HU	116	HS3ACP	106	ZS2EM	102	DJ9QY	100
W4AAV	294	W1KIO	158	WA3SZV	111	YU1INO	106	DJ2MH	101	JA2RGH	100
W3KVS	250	JA1IST	155	JA8CXY	110	DK1OU	105	VE4EA	101	K2SJN	100
JH1BAY	246	F6CDJ	128	W1DGL	110	YU1KJ	104	VE5XV	101	K3BN	100
CP1EU	231	G3YSK	126	WB4TBO	110	JR3ISM	103	VE6CV	101	SP2FBC	100
JA1DDZ	220	W4DJD	126	WA7TUS	109	DLØVK	102	W1ERW	101	W4RW	100
W6HEW	206	JA6WHS	124	WB8OBA	109	G3ZRH	102	W3KYL	101	WA5LTQ	100
YV5DDF	206	HB9AKG	122	WA7NXS	108	OE3EVA	102	WA3RBN	101	W7AWH	100
YV5DEL	182	W4HAM	122	KX6LA	107	OH6RI	102	XW8EV	101	W9ZJC	100
DL7KI	166	W4VK	116	HA4YF	106	VE7BEF	102	YU3TFC	101	ZS6ADT	100

K6ZXW	287	W6HEW	204	SM6CVE	149	4W1AF	110	JR3ISM	102	WA5VRT/VO2	101
F5II	285	JA1DDZ	193	JA6WHS	124	KØTVJ	105	W2ARC	102	W6ID	101
WB8CGC	234	YV5DEL	182	WA8NYB	123	WB8LVA	104	W7WT	102	G8PY	100
YV5DDF	206	W7YR	183	LU7QB	118	OE6HTG	103	WA7TUS	102	K3BN	100
JH1BAY	205	ZL1ARO	156	W1QMS	112	W7DQH	103	K4HGZ	101		

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.

W1IAS	330	K2BT	305	K4BHG	280	DL1ID	250	K4SGL	180	WA4BTC	140
PY1HQ	325	W6AQ	305	K4CKA	280	K4ON	250	OZ2NU	180	WA5IGD	140
I7ZPB	320	W6BIL	305	SM6EOC	280	W6ITD	250	WB2EXK	180	WA5STI	140
K4TWK	320	W8ILC	305	SMØMC	280	DL7MQ	240	WB2JBJ	180	VE7AUA/W6	140
W9WNB	320	OE1HGW	305	W2OST	280	PY2DBU	240	WB2QKG	180	W7OK	140
K1DRN	315	VE3GCO	305	WA4DRU	280	WA5EEM	240	W6OKX	180	DK3QE	120
K2LGJ	315	DJ4PI	300	WA8TNJ	280	WA9FHK	240	YU3TFA	180	K4QG	120
W4NJU	315	EP2TW	300	JA2AN	270	EA3NA	220	PY4KB	160	K8IFK	120
W4UKA	315	I1WL	300	JA8JO	270	PY8JO	220	W3LC	160	OZ1TD	120
W6KYJ	315	W4ZSH	300	K6UIS	270	W3KHU	220	W4DGJ	160	VE3EZM	120
DJ2AA	310	WB6PNB	300	KP4DJE	270	W6QQW	220	W4DJT	160	W1OFJ	120
HB9AHA	310	K4EKJ	290	W2FB	270	DL2IT	200	WB4ONC	160	W4EWR	120
K5RFJ	310	W4BBP	290	W4RNP	270	DL7QE	200	WB5HIH	160	WB4RFZ	120
W2QT	310	W6MI	290	W4GIW	260	W5GTW	200	W8BPO	160	WA9BHH	120
DK2BI	305	JA2IOD	280	WA8GPX	260	I2AY	180	DJ8CR	140	WØEU	120

W4CWV	325	OA4OS	310	YV5ANQ	300	KP4DJE	260	W5GTW	200	WB2QKG	160
WØQGI	325	W1BIH	310	DJ2AA	290	SK6AW	260	WA6MWG	200	WB4ECE	160
VE2WY	320	W1SEB	310	W6ISI	290	W4GIW	260	YJ8BL	200	WB5HIH	160
W2GQN	320	W6KZS	310	DJ9ZB	280	W1BAL	250	9X5VA	200	CT1TZ	140
WB2HXD	320	W9JQD	310	W7VRO	280	WB4JLO	250	KL7HFQ	180	PY4KB	140
WØPGI	320	W9KRU	310	K4CKA	270	DJ2UU	240	SM6BD	180	WA1PEL	140
JA1ADN	315	DL7EN	305	K4HS	270	K4BHG	240	W4GKF	180	VE3FFA	140
JA1MIN	315	HB9AHA	305	OZ6RT	270	WA4GVE	240	WA6LFN	180	VE8OO	120
K1DRN	315	HP1JC	305	SMØMC	270	EA3SA	220	W7RCF	180	WB4NXR	120
K4IKR	315	WB2NYM	300	WA4DRU	270	VE6MJ	220	3B8CV	180	WB4VBL	120
K8ONV	315	W6KYJ	300	EA4CX	260	WA4YJJ	220	I5FCK	160	WA9BHH	120
W4NJU	315	W9WYB	300	K2LGJ	260	EA4EP	200	W2MOY	160	ZS1OF	120

5-BAND AWARDS

(Updating the August 1974 listing.)

5BDXCC: (Starting with number 344), WA8NYB W2MB W9KYZ PAØLOU YO2BB W8FAW W9MAF W1FJJ K8DYZ.

5BWAS: (Starting with number 178), W5UUM K4FJC.

when he was W6KFC in Phoenix AZ and I was W6KZG in San Jose CA in 1934! - W7VIU. Blew the dust off the old Bunnell sideswiper and was surprised to feel a semblance of the old "Erie Swing" returning. - W3KV. Lets all start at the same time, how about 0100Z? - K6ARE. I was a little miffed, thought my WW II hand pump was an oldie until WA7ZGL/6 told me he was using a straight key from a WW I destroyer! - WB6RSY. Suggest using 20 to add geographic diversity. My old J-38 forgot how to spell. - WB6BDL. Many thanks for organizing this pleasant activity. - G8NV/W4. The evening went so fast I couldn't believe it. What a wonderful way to spend an evening. - W5IL. Thunderstorm activity was so bad I didn't dare unground my longwire antenna, so I couldn't participate. How about a sideswiper nite? - W8BHD. When I stopped at midnight my rig was so hot I could have cooked breakfast on it. - WN4IAM. I bought a 99 cent straight key the day of SKN. Had a ball. - K9DDA. Hey, this was fun! - W3TN. How about exchanging the name of the maker of the key, i.e. W.E. Co., Bunnell, etc.? - W3ADE. Surgical removal of splinter from under the nail of my right index finger is the *real* reason I sounded the way I did. - WIYL. Sure makes you appreciate your bug. - WB5KUJ. How about participants stating the type of key used, year purchased or built. Mine was a 1939 Signal (of Menomonie) which cost less than an 807 but which would be worth a small fortune melted down for the silver and brass content of today's prices. Not quite as friendly a shindig as January 1. - W2NZH. Couldn't believe it! Called SKN on 40 and got an immediate reply from an unidentified station who told me SKN was on Dec. 3 not July 3.Clued him in but he continued to harrass me so that I couldn't operate on 40 or 15, my only 2 bands. Am disappointed that I was forced out of the activity by an inconsiderate lid. - WN6DHN. Forty good shape here in the midwest and the group of eager (albeit crazed) hams was larger than ever. The old arm has a different resonant frequency when the room temperature is 90! - W9LNB. Best station worked was W8HRV who used a 25-year old home brew rig with an 833 in final and primary keying. A very pleasant note and the best fist heard in a long, long time. - W7QXR. If the sound of bees is any indication, SKN was a huge success. - WA7NNU (ex-7HM in 1920). A lot of fun and nice to be able to shoot the breeze although seemed like a few of the boys cut it kinda short! Lets have it a little slower with an accent on more accuracy. - WA7ZGL/6. QST

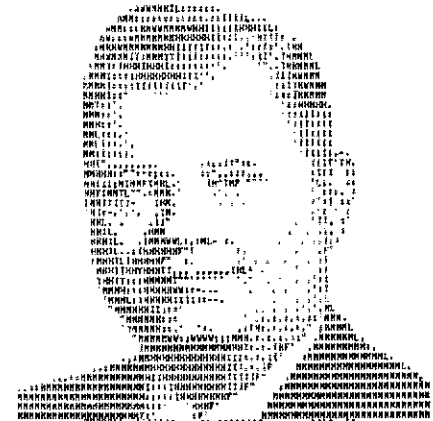
Strays

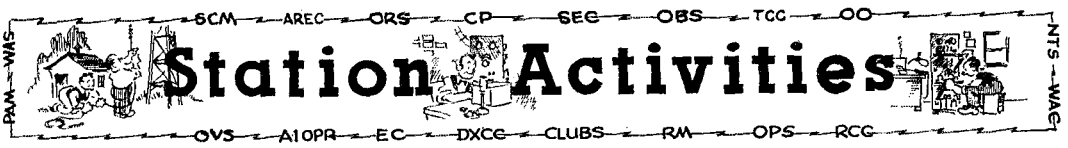
U.S. military recruitment poster seen at various spots recently . . . photo thanks WA6TQA. ▼

Honolulu Mayor Frank F. Fasi is shown presenting the proclamation which designated June 17-24 as Amateur Radio Week to Honolulu Amateur Radio Club President WH6IEN. Thanks to SCM KH6GQW, a similar proclamation was signed by Acting Governor George Ariyoshi. WH6IEN reports that one probable result of the government liaison related to seeking these proclamations is that Honolulu has established a special procedure eliminating expensive engineering fees which had been necessary to obtain amateur tower permits. *(Photo via WØBWJ)*

◀

RTTY portrait of ARRL President W2TUK presented at the National Convention in New York by K2AGI ▼





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. PAM: WA3DUM. RM: W3EEB. PSHR: WA3DUM 61.

Active Delaware Nets
Delaware Traffic Net M-F 2230Z
Delaware Emergency Phone Net Sat. 2200Z
Both above nets 3905 kHz
Delaware Six Meter Net Sun. 1400Z 50.15 MHz

K3YHR is operating portable from near Georgetown on week ends while clearing his new property. WA3AVD is back on the air at his new QTH. WA3QLS has a new travel trailer to house his mobile gear. W3DKX kept in touch with the traffic nets while mobile in the Finger Lakes and Niagara Falls area of N.Y. Anyone see the DARC Balloon that disappeared during the night of Field Day? DTN: QNI 214, QTC 72. DEPN: QNI 60, QTC 3. Traffic: WA3DUM 94, W3DKX 27, WA3LMY 11, WA3SYT 3, WA5KUD/3 2, K3HYR 1.

EASTERN PENNSYLVANIA – SCM, Allen R. Breiner, W3ZRQ SEC: W3FBF. PAMs: WA3PZO, K3BHU. RMs: K3PIF, W3EML, K3MVO, WA3QLG. 1974 Field Day is now history and reports show Murphy had struck in many mysterious ways. The FD receiver at W3EU just konked out the day before. WA3QLG washed out a beam FD week end. W3QT/3 raised the traffic count FD week end. Murphy readjusted the bias on the 40-meter rig at W3ZRQ/3 and demolished a pair of finals. Weatherwise, Ughhh. WA3ATQ notes cool weather and fair conditions, while W3CUL had wet, hot and humid conditions. These gals should get together. Experiments at W3HK consist of dieting on Peanut butter bacon and jelly sandwiches. New officers of the Mt. Airey VHF RC; WA3AXV, pres.; W3HMU, vice-pres.; K3KTY, secy.; W3FQD, K3ACR, WA3JUF, K3KMN, W3YXF, Dir. WN3VDQ now General Class and plans to enter our traffic nets. WA3UCC vacationed in the editors neighboring town of Lansford. W3BUR spent his extra time in Fla. and Jamaica. WA3TYQ spent vacation time at Boy Scout camp in New Mexico. The jr. op of W3CMA who is W6PEN visited home and assisted in W3ZRQ/3 Field Day. WB2FWW/3 operating from W3ABT has been appointed net mgr. of 3RND. WA3SXU received the CP 30 proficiency award. New gear dept.; to K3BFA a 75S-3B, to W3BNR an eleven-element beam for 2 meters, to W3GOA a Swan-250C and four-element hi-gain beam. K3HXS increased the Frackville population by one harmonic. W3VR, W3ID, W3LC, and ye editor all making repairs, changes or modifications to the shack. Shades of T.O.M., W3AXA is back on the EPA traffic nets after a long absence. Healthwise at W3EML has improved greatly and he spent a few weeks at the shore. Field Day messages were received from W3SK/3, W3OK and WA3RCA. Section Nets: EPA CW 3610 kHz daily 2300 & 0200Z QNI 463, QTC 332, K3PIE mgr. PTTN (training) 3610 kHz 2230Z daily, QNI 157, QTC 75, WA3QLG mgr. EPA EP&TN 3917 kHz daily QNI 380, QTC 126, WA3PZO mgr. PFN 3960 kHz M-F no report, K3BHU, mgr. An average of 90 to 120 station, club, and net activity reports are received monthly. From this information we must compile material for this column. Please write or print your comments so they are legible. Your SCM is not a mind reader, he's either a do-gooder or a no-goodnick. Traffic: W3CUL 2144, W3VR 569, W3EML 413, WA3QYY 271, WN3UDV 220, WA3SXU 161, WA3UCC 158, K3DZB 154, WA3ATQ 139, W3WRE 104, WA3PZO 102, K3OIO 101, K3MVO 72, W3ZRQ 54, WA3LMO 48, W3VA 48, W3ADE 46, W3IPX 46, WA3QLG 46, W3AVJ 27, WA3UKZ 27, W3ABT 25, WA3AIB 24, W3AXA 20, W3ID 19, W3BNR 15, W3CL 12, W3HK 12, K3BHU 11, W3OY 11, W3QT/3 11, K3KTH 10, K3HXS 8, K3KNL 8, WA3SVL 7, WA3SVJ 6, W3VAP 6, WN3VDQ 6, WA3SFN 5, W3CBH 4, WA3PHQ 4, WA3PHQ 4, WA3BJQ 2, WA3CKA 2, W3KCM 2, K3BFA 1, W3BUR 1, W3EU 1, W3GOA 1, W3KEK 1, W3LC 1, WA3RKH 1, WA3TLF 1, WA3TYQ 1.

MARYLAND-DISTRICT OF COLUMBIA – SCM, Karl R. Medrow, W3FA – SEC: K3LFD. RM: W3QU. PAM: K3TNM. NCM: WA3RCI. No June BPL man, but WA3SCR and WA3RCI made PSHR. MDD top brass W3FA, WA3PJG and WA3DUM says W3QU who does a little recuperating on the Eastern Shore and in Maine. WA3RCI lists MEPN toppers W3ADQ and W3LDD. Others W3DKX, WA3GXN, W3HWZ, WA3IIV and K3JQN. WA3IIV has got that airstream moving again. WA3GXN already in Miss. W3CDQ says look out for her in the CD Party. W3JZY up for renewal with the FCC adding to those 33 years with the same call. WA3RCI will be starting out on the bottom rung of the Navy this fall. Good luck. WA3SEE and WA3PKS have a 2-meter AREC net going on 146.52 MHz 1st and 3rd Mon. 2000 local time. W3JPT was 6 weeks in Geneva, and activated 4U1ITU for the QCWA test. W3EOV shows up in the Penna RACES nets. WN3VGV turns EEFN over to WB2RKF. WN3WSF surprised dad, W3ABC, by independently getting his Novice ticket. Congrats. WA3URR renewing ARRL membership. WA3EOP activates W3CWC for his many NCS duties. WA3SCR says the summer doldrums are here. WA3SJS makes much noise from the new QTH. K3TEZ says he is all set for that antenna farm this Dec. W3FCS has been adding new ones on 20 meters. WA3GVP renews as OO. WA3AFQ is steady as a rock with his skeds. The PVRC reunion had W3FZV making a big splash. WA3PJG misses old CW regulars W3TN, WA3LFU, WA3QDH, W3FCS and K3BA. Vacations disrupt his radio work opines WA3RVU. K3TNM is in a big construction phase with solid state. W3JZP is back stirring up things. He is ex-KG6AB. WA3SJY turned his Conditional ticket into an Advanced one. Congrats. WA3UFW U of Md ARC pres. says the Novice class was a big success with 18 getting their new tickets. WA3UYF was old CO6NF in Cuba and says the new call doesn't raise 'em like the old call did. K3STU renews his OO Class I. WA3JSZ is an active OO. WA3SWS is the new EC for Howard County. MEPN met 22 times, QTC 77 and QNI average 22.0. MDCTN met 18 times, QTC 53 with QNI avg. of 16.0. Look for that MDC QSO party start 2300Z Sept. 14 to 0100Z Sept. 16 75 kHz from the low end CW and 25 kHz down from the top on fone. Traffic: (June) W3QU 154, W3FA 145, WA3SCR 125, WA3EOP 109, WA3RCI 59, WA3PJG 49, WA3AFQ 38, WA3SJS 27, K3TNM 21, WA3RVU 17, W3EOV 16, W3FZV 14, W3FCS 12, WA3IIV 9, W3JZY 3, WA3SJY 3. (May) W3QU 86, K3TEZ 8.

SOUTHERN NEW JERSEY – SCM, Charles E. Travers, W2YPZ – Acting SEC: W2YPZ. PAM: WB2FJE. RMs: WB2RJJ, WA2DIW, W2JI. ORS/OPS: WA2SHT.

Net	*Freq. Time (PM)*	*Sess.*	*QNI*	*Tfc.*	*Mgr.*
NJPON	3930 6:00 Su	4	79	14	WB2FJE
NJPN	3950 6:00 M-S	29	458	192	WA2SHT
NJN E	3695 7:00 Dy	30	486	124	WB2RJJ
NJN L	10:00 DY	30	226	60	
NJSN	3695 5:00 Dy	30	245	69	WA2DIW

It is with extreme sorrow that we report the passing of our Dean of CW operators WB2VEJ, a most dedicated and able operator and friend of amateur operations. The recent Field Day brought forth a display of fine spirit in spite of the adverse weather conditions. A phase of this important program was the excellent and widespread activity of AREC members. It is gratifying to receive so many applications for AREC membership. This is the time to plan for the next SET. Keep sending in your requests for appointment and also kindly indicate your willingness to accept EC responsibilities for your immediate community or your county. Congratulations go to WA2EWB, a new General Licensee in the Mercer Co. area. The first meeting of the Pine Barrens RC was held June 12 in the Leisure Town Rec. Hall. W2BAR was chosen pres.; K2AXQ, treas. John reports that the thrust of this club will be thru 2-meter fm and will operate on 146.52 simplex at 10:30 PM each nite and at 11:30 on Sun. mornings. Please keep us informed of activities. Traffic: WB2FCD 108, WB2FJE 17, W2JI 11, W2YPZ 8, W2IU 5, WA2TRK 4.

WESTERN NEW YORK – SCM, Richard M. Pitzeruse, K2KTK – Asst. SCM: George Hippisley, K2KIR. SEC: W2CFP. Remember, effective immediately, all reports should be sent to K2KIR, George

Hippisley, 112 Kennedy Lane, North Syracuse, N.Y. 132[1] WA2DRC notes the slow traffic this month – his quote w "terrible." The first annual Field Day head busting contest was we by W2FXA/2's victory over W2FR/2. WA2PJL published a real l and interesting NYS Bulletin. Same is true of the ESS Bulletin wr WR2VND as the Editor. NYS handled 289 messages with 6[7] check-ins for June while ESS did 111 with 423. WA4PDM/2 ba for 8th year of operation at Camp Idylwood. WA2LUF has a ne T-4X and R-4B. K2BKU meanwhile the proud daddy of an SB-10 The Rochester Radio Repeater Assn. held a Hidden Transmitt hunt with K2LZG hiding – found first by KJOEQ and K2LD using five-elements mounted through the sun roof on the c WN2RXL would like to hear from amateurs interested in forming Atlantic Division Traffic Net. WA2HUP of Rock Hill having troubl working people on 6 and 2 meters. Any help out there? W2CK K2KIR and K2KTK each managed QSOs with KP6KR on Kingma Reef just hours before storms forced the operation off the re Whew! A reminder that this column is a linear – little input, litt output. PSHR this month to W2OE. Traffic: W2OE 229, W2RU 209, W2ER 121, W2MTA 101, WB2VND 90, W2HYM 68, W2RC 61, WA2PUU 51, WB2OIX 49, W2RUT 48, K2UIR 41, WA2TF 38, WA2TSR 34, WA4PDM/2 27, WA2LUF 24, WA2DRC 1 W2EAF 18, K2OFV 18, K2DNN 10, WA2ICB 10, WB2QDN WB2JRX 6, K2KTK 5, WA2AIV 2, WA2GLA 1.

WESTERN PENNSYLVANIA – SCM, Donald J. Mysiewsk K3CHD – SEC: W3KPJ. PAM: K3ZNP. RMs: W3KUN, W3LC WPA CW Net meets daily on 3585 kHz at 7:00 PM local time. P Phone Net meets Mon. through Fri. on 3960 kHz at 5:30 PM loc time. Keystone Slow Speed Net meets daily on 3709 kHz at 4: PM local time. Those amateurs interested in joining the Atlan Division Traffic Net should contact Ken Rambach, WN2RXL, 1 Dellwood, Amherst, N.Y. 14226. Field Day 1974 with rain addi to the simulated emergency conditions did not stop WPA section participation. Heard were Crawford Amateur Radio Society, Tw Rivers ARC, South Hills Brass Pounders & Modulators, Foothi ARC, Steel City ARC, Mercer County ARC and many individu stations making contacts. The Nittany Amateur Radio Club receiv their repeater license WR3ACY (.16-.76). K3ZOB has been elect Net Mgr. of the Pa. Phone Net. I would appreciate any radio clu society, repeater group that publishes a newsletter to mail me copy on a regular basis. League members currently holdi appointments within the WPA section will be contacted in the ne three months so as to update their status. Check your licen expiration date, renew early. The WPA CW Traffic Net had sessions, 353 stations check in, and handled 215 messages. The Phone Net had 20 sessions, 459 stations check in, and handled 2 messages. PSHR credits for June: WA3SWF 44, WA3PXA 4 Traffic: W2KAT/3 378, WA3PXA 324, WN3VBM 143, WA3SV 132, WA3UJP 128, WA3VWJ 58, W3LOS 52, WA3TTS 29, K3HC 22, K3CHD 21, WA3FIO 19, W3SN 14, WA3QQR 11, W3KUN K3VQV 9, W3ATQ 7, WA3TMR 7, K3SJN 5, W3ZUH 5, W3IDO WA3SWC 1.

CENTRAL DIVISION

ILLINOIS – SCM, Edmond A. Metzger, W9PRN – Asst. SC Harry J. Studer, W9KYU. SEC: W9AES. RM: W9NXG. PA WA9LDC. Cook County EC: W9HPG.

Net	*Freq.*	*GMT/Days*	*I*
IEN	3940	1440 Su	no rep
ILN	3690	2330 Dy	
		0300 Dy	
NCPN	3915	1300 M-S	
		2300	
ILPON	3915	2245 Dy	
	3915	1430	
	145.5	0200 MWF	

K9ZTV is using a new SB 220 Linear to work the hard ones. Dewitt County Emergency Net started this month on 75 and als meters. MARCO held its 8th meeting at the Executive House Chicago. WB9AQO has a new son, William Joseph and is grandson of WA9ZLN. K9DDA received the 1-0-A award from JA0 Radio Club. Field Day reports received indicate that it wa wet week end in IL. Scores are not bad for such weather. New c in the Bloomington area are WN9OVR, WN9OVS, WN9OVU WN9OVE. WN9OVE received his call in the mails the day after joined the ranks of Silent Keys. Our sympathy to his family many friends. The Jacksonville Radio Club Hamfest and also Breakfast Club Hamfest were well attended and many an eyel QSO were held. The Chicago FM Club will hold their EXPO '7 Sept. Contact WA9LRI for details. New appointees this mo include: W9KYU as OBS; WB9NWA as OVS and W9MZE as WB9OQH is a new General Class licensee. The high winds

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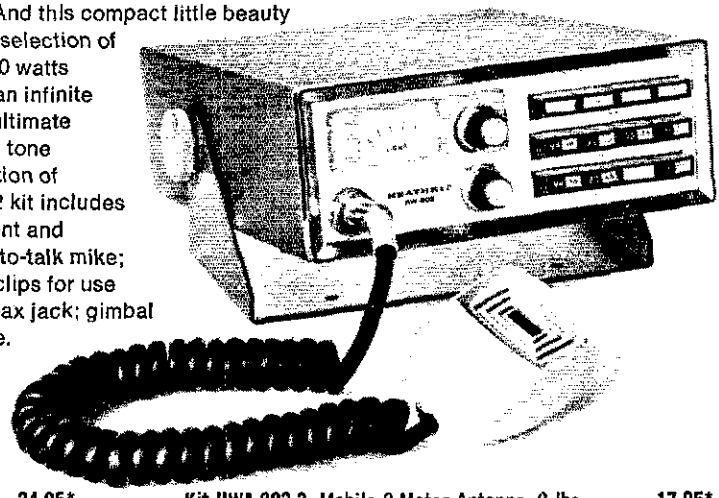

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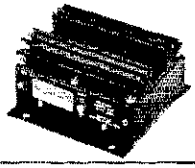

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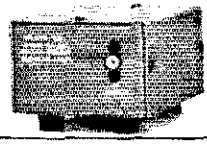

HW-202 SPECIFICATIONS — RECEIVER — Sensitivity: 12 dB SINAD* (or 15 dB of quieting) at .5 μV or less. **Squelch threshold:** 3 μV or less. **Audio output:** 2 W at less than 10% total harmonic distortion (THD). **Operating frequency stability:** Better than ±.0015%. **Image rejection:** Greater than 85 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.

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tornadoes last month were the cause of considerable loss to variou types of antennas. W9QLZ of the Starved Rock Radio Club fam was one. W9LNI a former member of the SRRC passed away o their Hamfest week end. Our sympathy to his family and friend The Gypsy Amateur Radio Society, Inc. cooperated with the Bik Hike on June 8. Those participating were WB9GIU, W9KPC W9MTW, W9TUD, W9ZIM, W9DBI, WB9GIW, WA9IMB an W9MPE. W9PRN stopped by on the way to the Six Meter Clu Picnic and was shown the operation by W9OKM, pres. of th Gypsies. Traffic: W9NXG 450, K9MWA 419, WB9JPS 173, W9JX 118, W9LNQ 96, K9ZTV 76, W9OYI 67, W9AES 53, WA9LDC 5 WB9DED 49, W9KR 38, W9HOT 32, WB9KDY 32, WA9ULP 2 K9RGL 16, W9KYU 14, W9PRN 14, WB9LHU 13, WB9SNT WA9MZS 6, W9VEY 6, WB9ELP 2.

INDIANA – SCM, *Michael P. Hunter, WA9EED* – SFC WA9UMH. PAMs: W9PMT, WA9OAD. RM: WB9NJA.

Nets	*Freq.*	*GMT/Days*	*QNI*	*QTC*	*Mgr*
ITN	3910	1330,2300 Dy 2130 M-S	3090	527	WA9OA
QIN	3656	0000,0300 Dy			WB9NJ
EC	3910	1st T			WA9UM
IPON	3910	1300,2130 Su 2000 S	169	25	WB9AH
IPONCW	3714	2330 Dy	12	3	WB9AH
IPONVHF	50.2	0200 Dy	106	10	WB9AH
CIPON	50.7	0100 MWF	114	0	WB9UI
Hoos. VHF			397	8	W9PM

This month's deadline snuck up on me with vacation, work on th house, etc. I got the gear moved out of my closet shack into the ne room (the records and paperwork should follow shortly). Ther were enough new appointments this past month to almost fill th *entire column. The majority were new ECs. I wish to thank each* them for their assistance to this program and to thank WA9UMH fo his fine work. I assume by now that everyone has received word c the new logging requirements from FCC. Just one reminder to th traffic fellas that all third party traffic must be logged in the sam manner as before. Congrats to the new Life Members in the stat Field Day now past history and several groups had fine score WB9NGM received his General this month and now chasing DX wit his dad's (K9SIJ) rig. AP2AD visited in Indpls. and had only kin words for the fellas in the US. Daytime NTS badly needs yo support. The ninth region is the last to get organized. We have som great ops with a little free time so why not lend a hand? Traffi K9EZX 269, WA9UMH 144, W9EI 129, WA9OAD 89, W9OLW 8 *WB9FOT 84, W9FWH 57, WA9OHX 57, W9UEM 37, K9EQT 3* K9RWQ 36, W9DZC 25, W9DKP 22, K9LZN 22, K9RPZ 2 K9WWJ 20, WA9TJS 18, K9CRY 16, W9ENU 15, WB9IBH W9PMT 15, WB9NAQ 14, WA9OKK 13, WB9CAC 10, W9RTH WN9MAM 9, K9JQY 8, W9KWB 7, WA9OKK 7, K9YBM 7, K9D 6, WB9BAP 3, W9FC 2.

WISCONSIN – SCM, Roy A. Pedersen, K9FHI – SEC: K9PK PAMs: WA9OAY, WB9CVB, K9UTQ. RMs: K9LGU, W9MF K9KSA.

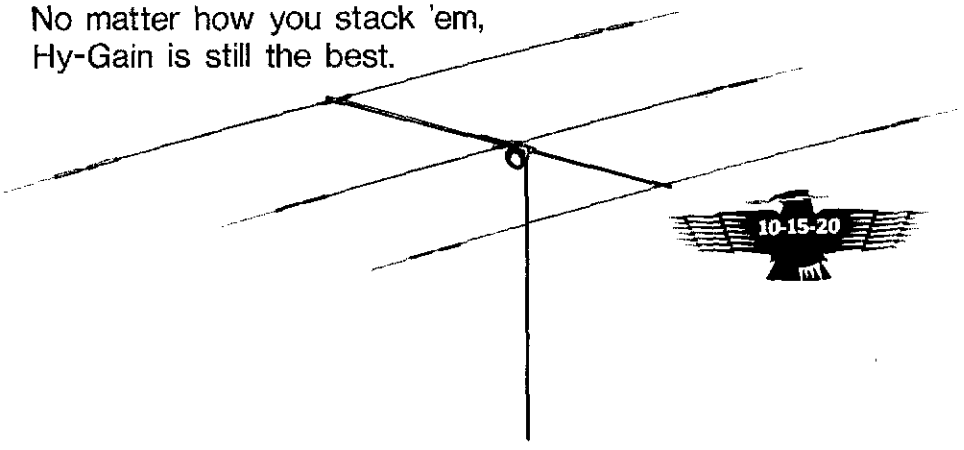
Nets	*Freq.*	*Time(Z)/Days*	*QNI*	*Tfc.*	*Mgr*
BWN	3985	1145 M-S	439	319	WA9O
BBN	3985	1700 Dy	545	155	WB9C
WIPON	3925	1701 M-F	578	47	WA9N
WSBN	3985	2230 Dy	1052	319	K9U
WIN-E	3662	0000 Dy	217	127	W9MI
WIN-L	3662	0300 Dy	160	117	K9LC

WIN-L certificate to WB9IGV, WB9KPX, WA9QVT/9. WSBN WB9HRP, K9UTQ Life Member of ARRL. RM endorsed K9LC Please fellows we need more liaison between nets, why not giv hand? With deep regret I report W9DXV a Silent Key, he will missed by all. How did you do on FD? WIN-E certificate to K9V MRAC, Inc. has a new pres. K9WRU, congrats Lee. The N Holstien High School Yearbook was dedicated to K9LGU, congr Denny. If your certificates are due for renewal, drop me a card radiogram informing me of such and I will send endorsem stickers. QCWA had a dinner meeting in Oshkosh with 39 hams 23 XYLs attending. Next QCWA meeting Oct. 5 in the Madis Lake Delton area. W9CCD received a 50-year pin and plaque letter from ARRL for being a member for 50 years. W9GF and X *in KL7-Land for the summer. Remember, if you handle third-pa* traffic – such is to be noted in your log, put a number or W9DND is certified by ARRL at 35 wpm, at 60 wpm by *Connecticut Wireless Assn. K9CPM made BPL and now ha* medallion. W9NGT, K9FHI went to West Allis RC meeting. K9C worked XE2AAS, VE5MG and W8EVE/8 on 6-meter spor openings. Traffic: (June) K9CPM 1123, W9CXY 230, WB9JGV WA9QVT/9 157, W9MFG 110, K9FHI 107, K9LGU 91, WB9I 90, W9DND 87, WB9LSP 75, W9PD 71, WB9GJU 64, WB9LSS K9UTQ 60, WA9PKM 59, K9VSO 52, W9MMP/9 50, WA9KAD

hy-gain TH3Mk 3

10-15-20 Meter Tri-Band Antenna

No matter how you stack 'em,
Hy-Gain is still the best.



Outstanding performance makes the difference in Hy-Gain's popular 3 element TH3Mk3 tri-band beam. Superior construction makes it the best. The Hy-Gain TH3Mk3 superior construction includes a cast aluminum, tilt head, universal boom-to-mast bracket that accommodates masts from 1¼" to 2½". Allows easy tilting for installation, maintenance and tuning, and provides mast feedthru for beam stacking.
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Extra heavy gauge machine-formed, element-to-boom brackets with plastic sleeves used only for insulation. Bracket design allows full support.
"Hy-Q" traps for each band are tuned at the factory. You can tune the antenna, using charts supplied in the manual, for optimum performance on your preferred mode, phone or CW.
Hy-Gain's exclusive Beta Match for optimum matching, balanced input on all 3 bands and DC ground to eliminate precipitation static.
For best results, use with Hy-Gain BN-86 balun is recommended.

- Net weight...36 lbs.
- VSWR less than 1.5:1 at resonance.
- 1 KW AM, 2 KW PEP power capability.
- Turning radius...15.7'.
- Boom length...14'.
- Longest element...27'.
- Surface area...5.1 sq. ft.
- Nominal 50 ohm input.

Other great Hy-Gain Tri-Band beams...

TH6DXX	6-element Super Thunderbird	Order No. 389
TH3JR	3-element Thunderbird Jr.	Order No. 221
TH2Mk3	Inexpensive 2-element	Order No. 390

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hy-gain

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3001 Phone patch 74

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600L Linear 199
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Interceptor Rec. 219
Challenger HF tuner 69
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FM-27B 2m FM 229

COLLINS
75A-4 Receiver $269
75A-4 (ser.#1023) 349
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75A-4 (ser.#2556) 375
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75S-3B Receiver 435
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312B-4 Speaker 19
312B-4 Sm. control 169
KWM-1 Transceiver 625
351D-1 Mount 15
KWM-2 Transceiver 595
351D-2 Mount 75
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R-4A Receiver 289
R-4B Receiver 339
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CPS-1 Supply 15
TR-4 Transceiver 299
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DC-3 DC supply 75
TR-4 Transceiver 389
AC-4 AC supply 85
TR-4 w. blanker 459
T-4 Reciter 175
T-4B Reciter 249
T-4X Transmitter 299
T-4XB Transmitter 375
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SC-35 speaker 9
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SX-71 Receiver 99
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SX-101A Receiver 159
S-108 Receiver 59
S-108 Receiver 79
SX-111 Receiver 129
SX-130 Receiver 139
SX-146 Receiver 175
HT-32A Xmtr 199
HT-32B Xmtr 269
HT-37 Transmitter 159
HT-44 Transmitter 159
HT-146 Transmitter 199
SR-150 Transceiver 249
SR-160 Transceiver 169
PS-150-120 AC sup. 75
PS-150-12 DC sup. 49
SR-400 Transceiver 495
PS-500AC AC supply 89
SR-2000 Xcvr/AC 849
SR-14 (AL) Xcvr 175
SR-46A 6m Xcvr 79
HA-19 cal.(SX-130) 15

HAMMARLUND
HQ-100AC Rec. $149
HQ-105TR Receiver/ DB Transmitter 119
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HQ-170AC-VHF 259
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SB-310 Receiver 229
XC-2 2m converter 25
XC-6 6m converter 25
DX-20 Transmitter 29
DX-40 Transmitter 59
DX-60B Transmitter 69
TX-1 Transmitter 99
SB-10 SSB adaptor 25
HX-10 Transmitter 189
HX-20 Transmitter 125
HX-30 6m Xmtr 149
HW-12A 2m Xcvr 85
HW-32 20m Xcvr 75
HW-16 Transceiver 89
SB-400 Xmtr 225
SB-200 Linear 219
SB-610 sig.monitor 69
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VHF-1 (Seneca) 79
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HP-20 AC supply 24
HP-23 AC supply 45
HP-23A AC supply 49
HRA-10-1 calibrator 9
HO-10 direct. keyer 24
HM-15 SWR bridge 15
HW-17A 2m Xcvr 95
HWA-17-2 FM adapt. 25
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HA-800 Receiver 89

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SB1-MIC mike 9

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500CL Transceiver 329
117XC AC supply 85
14-117 DC supply 69
160X 160m Xcvr 299
260 Xcvr 249
270 Transceiver 329
1200W Linear 199
1200X Linear 309
14A DC module 29
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FTV-650 Am Xvertr. 109
SP-5 Speaker 15
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FL-200B Transmitr 169
FTDX-560 Xcvr 375
SP-101P speaker 15
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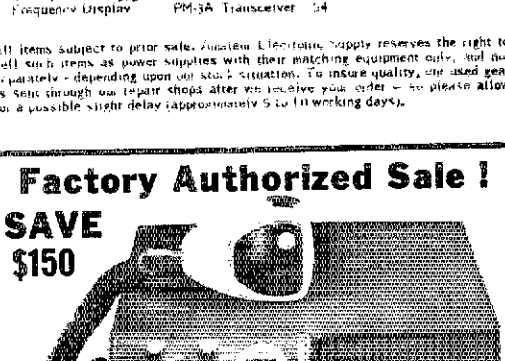
6/23/74

All items subject to prior sale. Amateur Electronic Supply reserves the right to sell such items as power supplies with their matching equipment only, and not separately - depending upon our stock situation. To insure quality, our used gear is sent through our repair shops after we receive your order - so please allow for a possible slight delay (approximately 5 to 10 working days).

Factory Authorized Sale!

SAVE $150



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To make this Quality unit available to more Hams, Motorola is authorizing (for a limited time) this special SUMMER Sale — Save 30% on 10 or 25 watt Metrum II's.

	reg.	Now
10 watt Metrum II	$399	$279
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Crystals (one per channel)	9.00	*K-735 Multiple Repeater Offset Modification Kit	39.00
Repeater Offset Crystal	13.50	PK-736 Tone Encoder Kit	45.00
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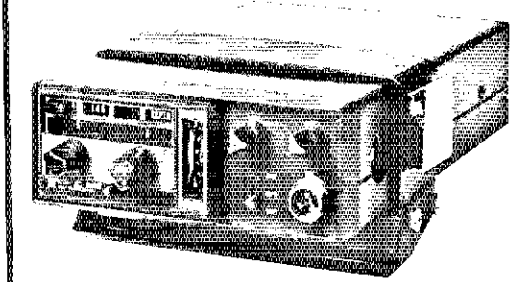
SAVE $50 ICOM



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AA-10 10 watt 2 meter Amplifier	19.95
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me & Freq. Std, WWV – 5 crystals	22.00
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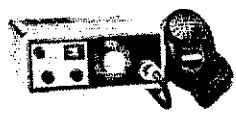
TR-72



TR-22C

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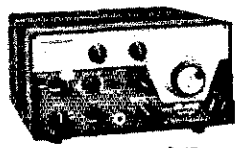
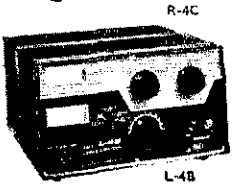


R-4C



L-4B

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TR-72 2m FM	$20 Bonus	TR-4C Xcvr	$50 Bonus
R-4C Receiver	$40 Bonus	C-4 Console	$40 Bonus
T-4XC Xmtr	$40 Bonus	L-4B Linear	$100 Bonus

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2. C.O.D. (20% DEPOSIT)
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Name:

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☐ Send used gear list

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21 Commonwealth Ave.; Orlando, Florida Phone (305) 894–3238

WA9DAY 39, W9KRO 31, W9IHW 30, WA9DXW 26, W9ESJ
K9IPS 24, W9AYK 20, WA9LRW 18, WB9JSW 17, WB9CVB
W9ZBD 10, WB9IEB 4, WB9HRP 2. (May) W9MMP/9 18.

DAKOTA DIVISION

NORTH DAKOTA – SCM, Harold L. Sheets, WØDM – SE
WAØAYL. OBS: KØPVG. RM: WAØMLE. OO: WØBF. FD messa
received from The Theodore Roosevelt ARC; The Three Rivers a
Bismarck Club on site, WAØLRE spent the day testing the n
repeater antennas from the 350-ft. level of tower out by Petersbu
Congrats to Ray Steiger, State C'D Dir. on his new call WBØNA
WAØREW's son received WBØJCS. They have been busy up Graft
way: WBØITE, WBØITD, WBØMCV. Prof reports WNØN
WNØNEK, WNØNEM and WNØNEL. WAØAUM recently becam
Life Member in ARRL. WØKXP vacationed back in Ill. WNØLKF
on with a home brew rig with 20 watts. WBØGFZ working a
draftsman this summer. KØTYY is getting in time for licer
renewal. WØZCM has a new van and WØRTK a new Nova. WØZ
has equipped his with a nice sounding mobile rig. WAØRE
planning more fossil hunting trips. WØNMV back from the hospit
WØOEL helped put up an anterina for him. KØPYZ/Ø announced t
Annual Corn Feed for Aug. 11. If not ready it will be on Aug.
Try and be there! The Mayville picnic had a nice turnout of the
timers. Thirty-five hams and families took part. Ex-batchel
WAØAYL has antennas up. WØGQC suffered loss of his home
fire.

Net	*kHz*	*CDT/Days*	*Sess.*	*QNI*	*QTC*	*Mg*
RACES	3996.5	1830 M-F	20	354	41	WBØA WAØSU
PON	3996.5	0900 S 1830 S-S	15	260	21	WBØBM WBØB

Traffic: WBØEHC 102, WAØMLE 96, WAØSUF 76, WØDM
WAØWLP 9, WBØBMG 7, WAØJPT 7, WBØBMH 4, WØMXF 4.

SOUTH DAKOTA – SCM, Ed Gray, WAØCPX – The Valentir
Nebr. repeater group have received the call WRØAFB. This repeat
will be available for parts of South Dak. on 25/85. All the amate
groups in the state were active for FD this year. There were mo
groups active this year than there has been for a long time.
presentation on Amateur Radio is scheduled for the state Ci
Defense meeting in Brookings during Sept. Net reports: Morni
Net – QNI 320 and format 24; NJO – QNI 388 and format 4
Early Evening – QNI 391 and format 20, Late Evening – QNI 8
and 53 formats; SDN – QNI 183 and QTC 141. PSHR: WAØRC
WAØTNM. WBØDGA. Traffic: WAØROK 241, WAØTNM 1
WBØDGA 93, WØHOJ 79, WAØVRE 67, WØIG 27, WAØKKR
WØMZI 22, WBØIJV 5.

DELTA DIVISION

ARKANSAS – Acting SCM, LeRoy Hymel, W5ENH – SE
W5RXU. Congratulations to WB5IGF on getting the Ark. Novi
Net off the ground. W5BED has a new TH6DXX on the 70-ft. tow
and is looking for new equipment for the fall activity. WB5H
reports that before too long the group in Mountain Home hopes
have *their 2-meter repeater on the air. Herb is ex-WA9EXZ.* T
Northwest Ark. Group reports a most successful Novice progr
with 16 having passed either Novice or Tech. W5TXA has don
good job of setting up liaison with the Northwest Ark. Red Cross
spite of a back problem which hospitalized him last June. Field D
activity was bigger and better than ever this year. Lets get th
reports in. The Mayor of West Memphis declared Aug. 5-9
Amateur Radio Week and much activity was planned by local Sc
groups as reported by W5POH. Pat is also helping considerably
sending Ark. Phone and Post Office net info. WA5VDH recen
received the first 5BDXCC in Ark., No. 314 in the world. Rick a
holds No. 156 5BWAS. Ham radio lost a fine representative that
will miss when W5OBD drowned in the White River while fishi
The Ark. WX Net has had a rest from the multitude of storms
May. A good job by all especially during the Forrest City Torna
WA5ZVW is now mobile with a new GTX-200 on 2 met
WB5GRU is pres. of the new Saline County ARC. Because of illn
in the family, W5ENH requests ALL reports, net or station be s
to W5RXU.

Nets	*Freq*	*Time/Days*	*QTC*	*QNI*	*Mg*
OZK	3765	0000 Dy	38	233	W5M
			51	210	W5M
RAZORBACK	3995	2330 Dy	–	–	WB5F
Teenage	3995	2230 Dy	22	204	WB5D
			40	197	WB5D
Novice	3715	2300 Dy	6	30	WB5I
Phone	3937	1100 M-S	19	648	W5PI
Post Office	3925	2130 M-F	–	–	W5O

WE'LL STACK OURS UP AGAINST ANY

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 and 1000 Hz center frequency available add $3.00

IMPROVED CWF-2BX, assembled and tested $22.95
CWF-2, PC board, includes 4 position selectivity switch $15.95
CWF-2, kit $13.95

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 $23.95
SBF-2, PC board, includes 4 position switch; wired and tested $17.95

FREQUENCY STANDARD

The MFJ-100 BX frequency standard provides strong, precise markers, every 100, 50, 25 KHz to beyond 60 MHz.

MFJ-100BX, assembled and tested $19.95

CMOS ELECTRONIC KEYER

● State of the art design uses digital CMOS electronics and NE 555 sidetone ● Built-in key with adjustable contact travel ● Sidetone and speaker, ● adjustable tone and volume ● Tune-operate switch ● Internally powered by 4 penlight cells ● Self-completing dots and dashes ● Jam proof spacing ● Instant start with keyed time base ● Perfect 3 to 1 dash to dot ratio ● 6 to 60 WPM ● Relay (30 VA to 250 VDC) or transistor (.5 amp to 40 VDC) output

CMOS-44ORS, Deluxe, includes sidetone, relay output $34.95
CMOS-440, less sidetone, transistor output $25.95
(perfect for QRP operation where sidetone is built into rig)

OTHER MODELS AVAILABLE

QRP TRANSMITTER

Work the world on 5 watts with the new MFJ-40T QRP transmitter.

● NO tuning required ● Clean output waveform with low harmonic content ● Pi network matches 50 ohm load ● Power amplifier transistor protected against no loads and dead shorts ● Switch select three crystals (two inside cabinet) OR VFO input ● 12VDC ● 5 watts input

Add a battery and crystal and you're on!

MFJ-40T, assembled and tested $19.95
MFJ-40T PC, transmitter electronics plus crystal switch only $15.95

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Companion MFJ-40V VFO plugs directly into the MFJ-40T.

Stable FET Seiler oscillator provides less than 100 Hz drift per hour after 10 minute.

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Power your 10 watt FM transceiver, CW and SSB audio filters, audio amplifiers, frequency standards, and electronic keyers.

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Write for our free catalogue and installation hints.
Test results available upon request.

Dealer Inquiries Invited

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Traffic: W5EIJ 46, W5MYZ 42, WB5IGF 31, WB5GWU 1
WB5AFR 2.

LOUISIANA – SCM, Robert P. Schmidt, W5GHP – Asst. SCM John Souvestre, WA5NYY. SEC: K5SVD. RM: WA5ZZA. PAM WB5EKU. VHF PAM: WA5KND. We regret to report the passing W5WT and W5IDD. K5AJK also joined Silent Keys after an inju in Africa. New Orleans Delta DX Assn. entertained Ahmed AP2A at their monthly meeting. GNOARC operated W5UK/5 from Mi during the VHF QSO party and made approximately 300 contac FD was a great success with all clubs reporting good scores. Ne officers for the New Orleans VHF club are WA5KND, pre K5UYP, vice-pres.; W5RNH and W5OWS, dir.; W5KO, secy.-trea K5SVD at the National Convention and meeting of the ECA Committee. Remember the New Orleans Hamfest Oct. 5 and Planning committee members WB5GFM, WB5EKU and WA5SB working hard to make it a success. All League appointees are ask to check in to On-the-Air meetings twice a month. Next meetin are Sept. 15 and 29. WA5TQA is acting net mgr. of LTN duri WB5EKU's vacation. Congratulations to all members who help make such a good SET score, with particular thanks to EC W5SK WB5IYH now active in Navy MARS. K5DZE/5 OBS North moving to Ft. Sill, Okla.

Net	kHz	Time(CDT)	QTC	QNI	Mg
LAN	3615	6:30&10:00 Dy	62	191	WA5ZZ
LTN	3910	6:45 Dy	47	186	WB5EK
LSN	3703	8:00 MT	16	42	WA5IQ
LRN	3587.5	8:00 Su	5	16	W5GE

Traffic: W5MI 119, W5GHP 113, WA5ZZA 104, WA5PRI 4 WA5TQA 34, WA5IQU 31, K5DZE/5 30, WB5IYH 24, WB5IKT 2 WB5JZQ 16, WA5QVN 15, WB5LBR 5.

MISSISSIPPI – SCM, W.L. Appleby, WB5DCY – SEC: WA5F WA5UEP now Extra; W5UCY worked Oscar during FD; JCARC h weekly Novice classes; WA5VPE and WB4OAA temp assign KAEB, Biloxi; W5SPX has new 75-meter Bazooka antenn WA4EGP/5 traveling; K5EVA, W5NOP, WA5VCF and W5UD operated VHF Contest from Waveland QTH. WA5FMF won HF at Mobile Hamfest; W5QER on 2 fm from Pass Christian Isl WN5IUS, Novice of the Month and also passed General; JCAR aired post FD show on Ch 13, Biloxi; W5BW, WA5ERS, K5QB WB4QCP/5 have new 2-meter antennas; WA5INV out of t hospital. Talk about a new Miss. VHF club; Who will have the fi 220 MHz repeater in Miss?; WR5ADW, Corinth, WR5AEK, McCon and WR5AEV, Keesler now on air; MSBN participation has boom under WB5BKM's guidance. FCHO participates in support Jackson Miss. Police Dept. Community Radio Watch; messag received indicate we had a record turnout for FD; Welcome to n Novices, WN5LPM, WN5MDP, WN5LXW, WN5LXL, WN5LX WN5MAD. K5YIN asst. EC Harrison Co.; W5PDG *K8YUW/KG6 report Life Membership ARRL confirmed.* Welcor also to MSBN participants WA5ZNV', WA5UBQ, WB5DZ WA5OKI, WB5FGC, WA5WRE, WB5FHA, WB5JFM. More pa cipation on MTN and MNN desired. They will QRS! W5OFE w HF rig at Atlanta Hamfest; W5NCB's XYL now out of hospit Your SCM thanks you for your many personal expressions support.

Net	Freq.	Time(Z)/Days	QNI	QTC	Mg
MNN	3733	2300 MWF	41	30	WB5KA
MSBN	3987.5	2315 Dy	783	108	WB5BK
CGCHN	3935	0100 Dy	1224	124	WB5D
GCSN	146.52	0100 Th	54	0	WB5D

Traffic: WB5JBW 57, W5EDT 45, WB5KAN 38, WN5IUS WB5DCY 26, WB5BKM 21, WB5HVY 18, K5YTA 13, W5SYA W5RW 6, K8YUW/KG6 3.

TENNESSEE – SCM, O.D. Keaton, WA4GLS – SEC: WB4D PAMs: WB4PRF, WA4NEC. RM: WB4NIR.

Net	Freq.	Time(Z)/Days	Sess.	QNI	QTC	Mg
TPN	3980	1140 M-F	69	3195	117	WA4EW
		1245 M-F				W4P
		2330 M-S				WB4Y
		1300 SSuH				
TPON	3980	1300 Su	5	157	12	WB4B
TN	3635	2300 Dy	26	663	145	WB4D
TNN	3707.5	2300 Dy	30	179	42	WA4GA
ETVHFN	50.4	0000 MWF	14	182	0	W4S
ETVHFN	145.2	0000 TTh	9	37	0	WB4D
ETTMN	28.7	0100 WF	9	59	0	WB4N
MTTMN	28.8	0100 TTh	9	38	0	W4E
ACARECN	145.28	0100 T	4	87	0	WB4Z
	145.88					
KCARECN	145.52	2230 F	5	42	0	WA4Z

Endorsements: PAM: WA4NEC; OPSs: WA4EWW, WB4M WB4ANX, WB4DYJ, W4TYV, WA4TWL, K4SJV, WA4J

The TRITON is a One-of-a-Kind HF transceiver, totally solid state including the final amplifier. The new generation that does more things better than ever before. One, you can change bands instantly. Just turn the band switch—and go! Two, there is less internal heat to prematurely age components and no high voltage to break down insulation or cause accidental shock. Three, it has ample reserve power to run at full rating even for RTTY or SSTV without limit. Great for contests or emergency service. Four, it is light and compact with a detachable AC power supply to work directly from 12 VDC—For mobile operation without tedious installation. Five, the TRITON is a delight to operate. SSB is clean, crisp and articulate. Amplified ALC puts all available speech power into the antenna without splatter. CW is wave-shaped to cut through QRM and pile-ups. Instant break-in (not "semi" which really isn't break-in) lets you monitor the frequency while transmitting. And six, a lot more goodies such as excellent dial illumination, plug-in circuit boards, offset tuning, built-in SWR bridge, speaker, crystal calibrator, snap-up anti-parallelax front feet, light indicators for offset and ALC, direct frequency readout, WWV, entire 10 meter band coverage—and a lot more. The TRITON brings together all that is new and exciting in Solid State for your greater enjoyment of Amateur Radio.

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Model 252 Supply for TRITON II	**119.00**

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WA4WVW; SEC: WB4DYJ. WB4PRF was appointed PAM of Tenn Phone Net effective July 1, 1974. John needs your help so let hin know what you can do in the traffic system. WB4SLJ has beer awarded a section net certificate for his participation in the MSSBN award was made upon the recommendation of Miss. SCM, W5NCB Commendations go to all amateurs who got out for Field Day and made it successful. Remember the Delta QSO Party on the 28th-30th, get in there and get the score up. Another reminder to contact K4PR if you are interested in the Quarter Centruy Wireles Assn. membership. Traffic: K4CNY 160, W4QGG 126, WB4NIE 109, K4KCK 91, WB4DCO 71, K4SXD 52, WB4ANX 40, W4CYE 36, WA4ZBC 31, WA4GLS 20, WB4MPJ 14, WB4PRF 13, W4SG 10, WB4YPO 10, W4PFP 9, W4RUW 8, WB4ZSZ 8, K4MOA 6.

GREAT LAKES DIVISION

KENTUCKY – SCM, Ted Huddle, W4CID – SEC: WA4GHQ.

Net	*QNI*	*QTC*	*Net*	*QNI*	*QTC*
KRN	228	28	KYN	322	26
MKPN	655	47	KNTN	136	9
KTN	1193	131			

Things can certainly happen fast and furiously! On June 21 the Ky Atty. General filed suit against issuance of our hard-won call-lette license plates and for a while it looked like we would be the last t get the plates and the first to lose them! A drive was organized money raised, attorney hired and on July 8, the Judge dismissed th case against the plates upon motion from our Attorney. Once agai Ky. amateurs bound together to meet a very serious challenge! A this writing, the privilege of call-letter license plates is safe unles our Atty. General decides to appeal. In other news, the No. Ky "Ham-O-Rama" was a big success and promises to be a yearly thing WB4WBP has a new antenna farm. New tickets: WB4FAT has h Advanced and WN4DWJ passed his General. The No. Ky. ARC has trailer as their new club house. Traffic: WB4ECB 153, K4UNW 116 W4BAZ 113, WB4ZML 81, WA4GRF 75, W4EJA 73, WB4WCM 71 W4CID 69, WN4IGT 67, WB4REN 53, WB4EOR 52, WB4EXQ 50 WB4VBG 45, WB4YQS 43, WA4GHO 42, WB4AUN 38, WA4FA 31, WB4ZMK 31, W4CDA 30, K4HOE 24, WA4VZZ 23, WB4FA 15, K4HFD 11, WN4IGS 8, W4OYI 8, WB4ZDU 8, WN4IKF K4AVX 1.

MICHIGAN – SCM, Ivory J. Olinghouse, W8ZBT – Asst. SCM A.L. Baker, W8TZZ. SEC: W8MPD. RMs: W8JYA, W8WVL W8RTN, K8KMQ, W8GLC, WB8IMI, WB8NII. PAMs: K8GBC W8NDL. VHF PAMs: K8AEM, WA8WVV.

Net	*Freq.*	*Time/Days*	*QNI*	*QTC*	*Sess.*	*Mgr*
QMN	3663	2300 Dy	539	242	55	W8JY
WSBN	3935	2300 Dy	727	69	30	K8GB
BR/MEN	3930	2130 Dy	783	101	30	W8ND
UPEN	3922	2130 Dy	470	50	35	WB8IF
GLETN	3922	0130 Dy	689	113	27	WB8MJ
PON	3955	1500 Dy	929	295	30	K8LN
PON/CW	3645	2300 M/S	97	26	26	VE3DP
MI-6M	50.7	2300 M/S	186	10	22	WA8VX
MNN	3720	2130 Dy	200	96	29	WB8IA

SW Mich. 2-Meter New QNI 53, QTC 2, sessions 4, W8CVQ, mg K8ZWR 6-Meter WX Net QNI 30, sessions 4. WA8WVV 2-Meter Ne QNI 70, QTC 1, sessions 5, W8DVD is reported as a Silent Key W8VOQ completed 5BWAS in June. WA8PII lost her transmitter b lightning. The June 15 bicycle race was a good test of waterproo equipment and operators. WA8MOA is home from military trainin at Ft. Benning and has a dish now for 1296 MHz. K8IKW has ne TA-33 and 50-ft. tower and with SB line and worked 15 countrie on 20 meters SSB 7 cw. CARC of Royal Oak made 500 contacts i Mich. Week as WM8ICH. WB8NCD is new editor of QMN Bulletin WA8VCI graduated from Western Mich. Univ. and is now workin for Motorola Communication Div. at Schaumburg, Ill. and lookin for contacts in Mich. Mich. Diabetes Assn. Bike-A-Thon June 2 wa covered by SRARS. Operators were WA8QCV, W8MWG, K8SGL WA8BKS, WA8WJX, K8BHL, WA8SSV, WB8FOK, WA8BVP an WA8BZB. 500 Bicycles were involved. Time was 10:00 A.M. t 5:00 P.M. 15 messages were received by SCM from Field Da stations. WB8EUN and XYL are proud parents of baby girl on Jun 26. From the reports and club bulletins I guess vacation time is her

Traffic: (June)WA8WZF 462, K8DYI 169, WB8ITT 167, WB8NCI 123, WB8NVH 110, W8UFS 84, K8LNE 76, W8OW 60, W8MO 55 W8TZZ 54, W8GLC 49, WB8IMI 44, K8LJS 44, W8NOH 44 WB8MJI 42, K8GXV 39, W8DBP 36, WB8NII 36, K8JED 32 WA8ENW 29, WB8DJS 28, WB8FBG 26, K8GBC 26, W8IUC 26 WB8JIX 26, WA8VBF 26, WA8WVV 24, W8VIZ 22, K8ZIU 16 WA8RXI 15, WB8BYB 14, WN8RTB 13, W8RTN 13, W8DCN 12 WB8HIB 12, W8BEZ 11, W8FZL 11, WB8QWQ 11, K8RNP 11 K8PYN 10, WA8SQC 10, K8AMU 9, WA8CUP 9, WB8EUN 9 K8WRJ 9, K8JHA 8, WB8APN 7, W8EU 7, WA8MDK 7, WA8OJI 7 W8RNQ 6, W8SDB 6, W8UOQ 6, WA8YVR 6, K8SDA 5, K8AEM

4, W8HKL 4. (May) WB8MJI 42, K8MJK 9, K8SWW 8, K8AEM 7 W8TBP 6, W8WVL 2.

OHIO – SCM, Henry R. Greeb, W8CHT – SEC: WA8CQA PAM: WA8YLW. RMs: WA8WAK, WB8KKL. VHF PAM: WA8ADU Net reports for June:

Net	*QNI*	*QTC*	*Sess.*	*Freq.*	*Time(Z)*	*Mgr.*
BN	434	206	59	3577	2245/0200	WA8WAE
OSSBN	2041	705	81	3972.5	1430/2000/2245	WA8YLW
OSN	216	72	29	3577	2210	WB8KKL
O6MtrN	528	94	–	50160	0100	WA8ADU

New OVS WB8RDY reports working 27 states and 3 provinces on meters. K8ONA has been appointed Public Relations Asst. OSI Amateur Radio Club, W8LT, renewed its OPS/ORS/OVS. WB8JGV is moving, and at least temporarily giving up the job of BN statistician. Twenty Field Day messages were received from portabl stations. W8QCU attended Rocky Mountain Division Convention WA8MGI is new Life Member. Apricot Net members helped direc communications for four parades in the Cleveland area during June with planning for several more in the upcoming months. K8NYT again submits a very good OO report. Listen for a special call sig from the Belmont County Fair Sept. 4 through 7. Hams i Massillon, Alliance and Canton coordinated for the Tri-City Bike-A Thon on June 9, using the Stark County Repeater, WR8ADE Cincinnati seems to be lacking on some section nets. Known to hav difficulty are the 1430Z session of OSSBN, the OSN, an occasionally the 0200Z session of BN. Traffic is reasonably heav into Cincinnati, especially during the first week of the month Volunteers, anyone? Traffic: WA8MCR 425, W8PMJ 261, W8QC 240, WA8HGH 224, W8MGA 224, WB8KKL 141, WB8JGW 13 W8IBX 114, WA8YLW 101, W8CUT 96, W8MOK 89, WA8DWH 7 W8QZK 73, WB8GGR 70, WA8YIB 68, W8WEM 59, K8MLO 5 WRJD 54, WB8PCM 46, WA8SED 44, WA8SSI 42, W8SUS 3 WB8BZX 37, WB8MKZ 37, WB8KXV 35, WB8MGW 35, WA8MA 33, K8BYR 30, WB8MED 28, W8EGD 25, WB8KWD 21, WA8FC 20, W8ARW 19, K8CKY 18, W8GOE 18, WB8AYC 17, W8LZE 1 W8LT 12, W8DPW 11, WA8DWL 10, WB8IBZ 10, W8BHL W8CXM 9, K8QYR 7, WA8IXM 5, WA8FSX 2, WA8MGI WB8RDY 2, WA8RUO 2, W8AYM 1, WB8FIC 1, WB8HUP 1.

HUDSON DIVISION

EASTERN NEW YORK – SCM, Graham G. Berry, K2SJN Asst. SCM/PAM: Kenneth Kroth, WB2VJB. SEC: W2KGC. RM WA2PJL, WB2IXW, WA2FBI and K2DM for RTTY. Nets – s previous columns for times, days etc. Attention all Novices a newcomers to CW traffic handling: W2RUF still looking for regul check-ins from ENY on Sat. training net sessions at 9:00 AM loc time on 3.728 MHz. Write Clara for copy of explanatory mem giving full details, and come aboard for traffic handling training a code speed buildup. New appointment: ORS to WB2VVS at ED Veterans Hospital, Montrose. Around the club circuit: Many clu now into summer hiatus making news scarce – but keep it comi when available. Most clubs June meetings were Field Day prepar tion, but some exceptions. Poughkeepsie ARC has new officers usual order: W2AXI, WB2YQU, WA2HSF and WN2TFA. Schene lady ARA officers, usual order are W2CPB, W2YB, WB2VPE a WB2ILC, and Dir. WB2OHQ, W2EWY and WB2VLF. Very bu re-dressing Broughton Memorial Station at Schenectady Museu now in an air-conditioned "fishbowl" in main traffic pattern whe 70K visitors pass by yearly. June guest night speaker H. Rozendael, MD on ocean crossing in 30 foot sail boat, rad equipped of course. Westchester ARA heard WA2BLX on the Han IA world recently visited. Harmonic Hills ARA held dinner May 2-meter transmitter hunt on .94 simplex June 9. Pearl River reports its club station WB2ABJ registered with County AREC a RACES. Is yours? Should be! Individual station activiti WA2HHO, new BSEE from U of Miami, Fla. summering in the a and planning fall move to New Hampshire, K2BK with 5BWAS a DXCC under his belt is now county hunting. Dutchess County E WB2NKN reports 200 fm stations available for AREC work! R WA2PJL back from three week business and pleasure trip England – goes back again before summer ends. W2ECV prov KL7 still exists by getting WAS. W2OOJ running Divisional PR 3,925 MHz 2nd and 4th Sun. at 2100Z. Westchester County WB2VUK started vacation at month-end – back Aug. WB2YQ 10 elements on six racking up more new contacts toward his state total. Your SCM received 5 FD messages – where were the r of 'em, or didn't you need points? Traffic: (June) WA2PJL 36 WB2NKN 271, WB2VVS 62, WB2IXW 57, WB2RKE 55, W2GE 35, WA2IQQ 35, K2SJN 26, WA2RFP 24, WA2BRV 19, WB2EI 14, WN2TGL 9, K2REV 5. (May) WA2PJL 362.

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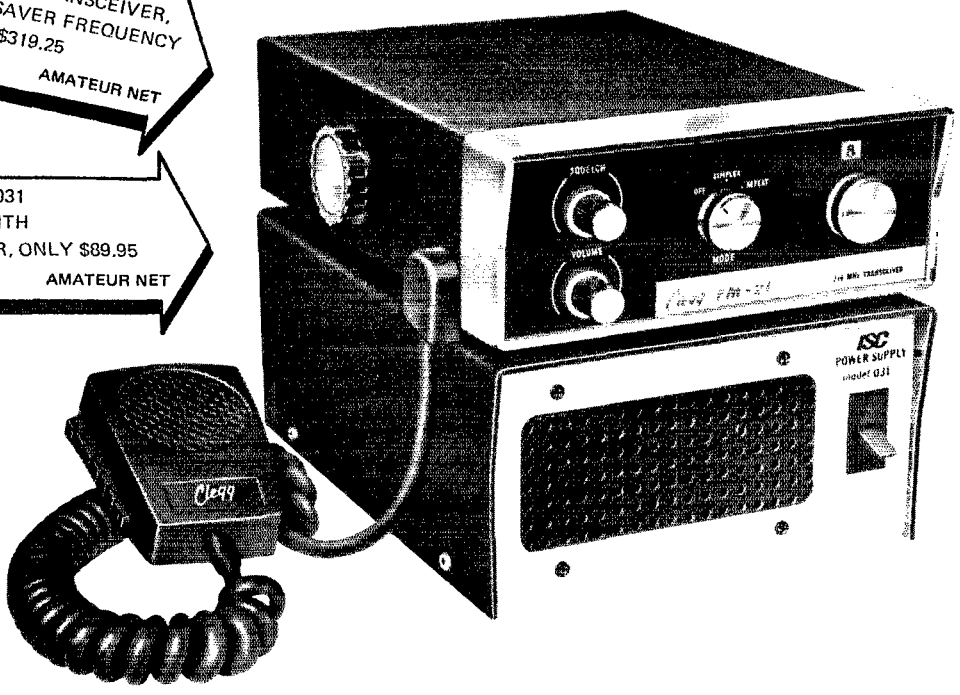

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NEW YORK CITY-LONG ISLAND – SCM, John H. Sma WB2CHY – SEC: K2HTX. RM: WB2LZN. PAM: WA2UWA. VE PAM: WB2RQF. The following are major AREC/RACES nets, jo one.

Bronx	28.64 MHz	50.35 MHz	146.88 fm
Kings	28.64 MHz	50.35 MHz	146.88 fm
Richmond			146.88 fm
New York	29.5 MHz	50.48 MHz	146.88 fm
Queens	29.5 MHz	50.20 MHz	146.88 fm
Nassau	28.72 MHz		145.68 am
Suffolk(West)	28.73 MHz(Hunt.)		145.59 MHz
	28.65 MHz(Smith.)		147.21 MHz
	28.610 MHz(Babylon)		
Suffolk(East)			146.82 fm

Note: Net times between 2000 and 2100 local, Mon. I hope th everyone enjoyed themselves at the NLI Picnic and congratulatio to the winners of the Directors trophy. W2PF is using his n Kenwood TR520 while his Signal One is being worked on, Dave a did an FB job as master of ceremony for the ROWH initiation tea at the convention. New officers for the LIDXA: WA2BVU, pre W2GKZ, vice-pres.; WB2HXD, secy.; WA2RJZ, treas. WB2ED took over as mgr. of NLS; he is looking for Novices to act as NC or anyone else interested in traffic. New appointments: W2HXT a WA2KVH ORSs; WA2DHF OVS and OBS. WB2LZN reports t 2-meter fm net is doing fine, with a lot of familiar faces from N showing up. W2OCZ bought a new car and naturally the 2-meter rig went in right away. Congratulations to WA2DGZ on upgradi to Advanced. Tim also completed school in VT, and a n transmatch. I hope that everyone has had a chance to read t Docket 20092, keeping a log is something every station operat should do. All are invited to join in on the LIMARC Public Servi Net, every Mon. night on WR2ADM, also, WA2APJ is trying to up more bunny hunts for the club. WB2LZN reports more statio are needed to handle traffic for Nassau County, the same goes f the phone net. W2QOD now a TV personality, Frank does t fishing report for CH 67, WSNL which also did a special on ha radio, sorry that we couldn't have announced earlier, but I ho that everyone managed to catch it. The following have al upgraded, WB2ROF and WB2SGT to General, WB2TBC to A vanced. Some of the ideas used for "natural" power for operating Field Day were really interesting. Perhaps the League will print small booklet with the best of these ideas. Hope everybody had enjoyable summer. Traffic: (June) WA2UWA 519, WB2LZN 19 W2EC 161, WB2PYM 159, WB2FLF 135, WB2EDW 94, W2MI 63, WB2OYV 53, WA2KVH 42, K2JFE 33, WA2THV 33, WB2CE 30, WB2UFG 26, W2EW 10, WA2DGZ 8, WA2JZX 8, WB2FIG W2PF 6, WA2PLI 6, W2DBQ 5, WA2KXE 4, K2FV 4.

NORTHERN NEW JERSEY – SCM, William S. Keller, WB2RKK – SEC: K2KDQ. PAM: WA2SHT. RMs: WA2DI WB2RJJ, W2ZEP.

Net	*Freq.*	*Time(PM)/Days*	*Sess.*	*QNI*	*QTC*	*A*
NJN/E	3695	7:00 Dy	30	486	124	WB2F
NJN/L	3695	10:00 Dy	30	226	60	WB2F
NJSN	3730	8:15 Dy	30	245	69	WA2D
NJPN	3950	6:00 M-S	30	416	219	WA2F
NJPON	3930	6:00 Su	4	79	14	WB2F
NJPON/VHF	146.52	10:00 SuTh				WA2E
PVETN	145.71	8:00 Dy	29	120	9	K2KI

New appointments: WB2GPU as EC for Ridgefield Park a vicinity; K2EK OO, Classes I-IV; WB2GPU OPS; WB2GA WB2GPU, WA2PCF, WA2SLF as ORSs. FD messages were recei from W2AOF/2, K2DR/2, W2GLQ/2, W2GSA/2, W2RJ WA2UOO/2, K2YNT/2. OO reports received from WB2CS WA2DNY, W2DYS, K2EK, W2TPJ, WA2GEZ has a new sev element beam for 2 meters and a Gonset II; WB2KNS has a n collinear antenna for his 2-meter fm mobile rig, and WB2HSD ha new 80-meter dipole. NNJ congratulates the following amateu K2EK on measuring WIAW to within 1 Hz during the May FM WA2SHT on becoming the acting NJPN mgr.; WA2OPY on be asst. mgr. of the Passaic Valley Emergency & Traffic Net (PVET and WA2EUX on graduating from RPI with a BSEE degr Congrats also to the Ramapo High School ARC (WN2HPY pres.) their recent ARRL affiliation. VHF has been looking up recent WA2GEZ reports working as far as Utah on FD with a 100-watt a four-element beam on six, while K2KDQ reports working much the West Coast during the recent VHF contest (also 6 meter WB2IWH wishes W2BAI a full and speedy recovery from rece hospitalization. WB2ELF has been operating from summer camp NY State with his HW12 and TR22C. WA2EUX is moving to T where he will be working. WA2GSP recently operated /VP9. K2Z spent July in Mich. WB2ELF, K2EFM, K2VAC, K2MZJ and oth amateurs recently participated in a lost child search. WA2VI reported a brush fire to K2GVC via 2-meter mobile, who relayed t into to the Fire Dept. of Bloomfield. WB2PBO has appoint

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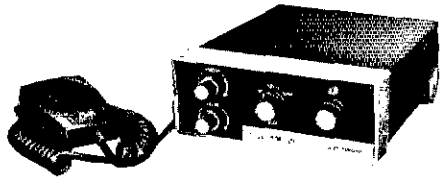

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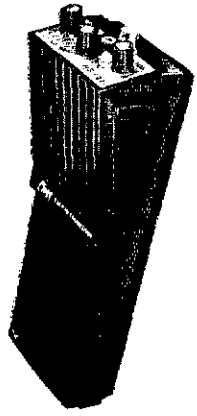

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W2DED, WA2OBJ, W2OPE as asst. ECs for the Cranford & vicin AREC. That group is also coordinating their efforts with the lo RACES/CD group. K2BHL represents NJ on the 20-meter Interst Sideband Net. It is with deep regret that we record the passing WB2VEJ of Cape May one of our most reliable stations on NJN the past several years. Bill had recently been commended on activity on NJN. He is missed by all. Traffic: (June) WA2DSA 5 WB2RJJ 126, WA2SHT 115, WB2RKK 103, WB2ELF 94, WA2B 88, WB2GAV 71, K2BHL 67, WB2NOM 64, WB2AEH 59, WA2S 54, WB2GPU 41, WA2PCF 35, WA2DIW 34, W2CVW 26, WA2Q 22, W2ZEP 22, W2CU 21, K2ZFI 20, WA2OVE 18, W2BLM WA2OPY 13, WA2KFE 11, WB2VFT 10, WN2QHN 8, W2SWE WA2UOO 8, W2WOJ 7, WA2CCF 6, WA2QJU 6, W2ABL 5, K2E 5, WA2EUO 4, WA2EUX 4, W2NKD 4. (May) WB2ELF 74, K2B 65, WB2KNS 17, W2CVW 10, WB2HSD 3.

MIDWEST DIVISION

IOWA – SCM, Al Culbert, KØYVU – Effective July WAØV will become the acting SCM of Iowa until an election can be h for selection of a permanent SCM. Good news for all you folks have wanted to QNI the Iowa Talleorn CW net, but could not m the 6:30 PM time, KØAZJ has started a second session at 10:00 local nightly and welcomes QNIs with or without traffic. Congr *lations to WBØHPH who has been promoted to Production Force* of Amateur Products at Collins Radio. Some guys will do anyth for a few extra points during FD, it seems as though the Ce Rapids group were using bicycle powered alternator. I wonder h many 807s it takes to produce a KWH on one of those thi WA7TZO was visiting in the Mason City area this month. WAØ has sold his home at Charles City and moved to W5-Land in Ark. Mason City group has acquired a 2-meter repeater and hop have same operational this summer.

Nets	*QNI*	*Q*
Ia 75 Fone (noon)	1455	
Ia 75 Fone (eve)	849	
TLCN	75	

Traffic: (June) WAØAUX 337, KØAZJ 130, WAØTAO 72, WAØV 42, WØLCX 16, WØBW 14, KØYVU 9, (May)WAØAUX 270, KØ 146, WAØVZH 49, WØLCX 48, WØMOQ 36, WBØDBG 17, WØ 10, KØYVU 9, WØBQT 2, WAØTAQ 1.

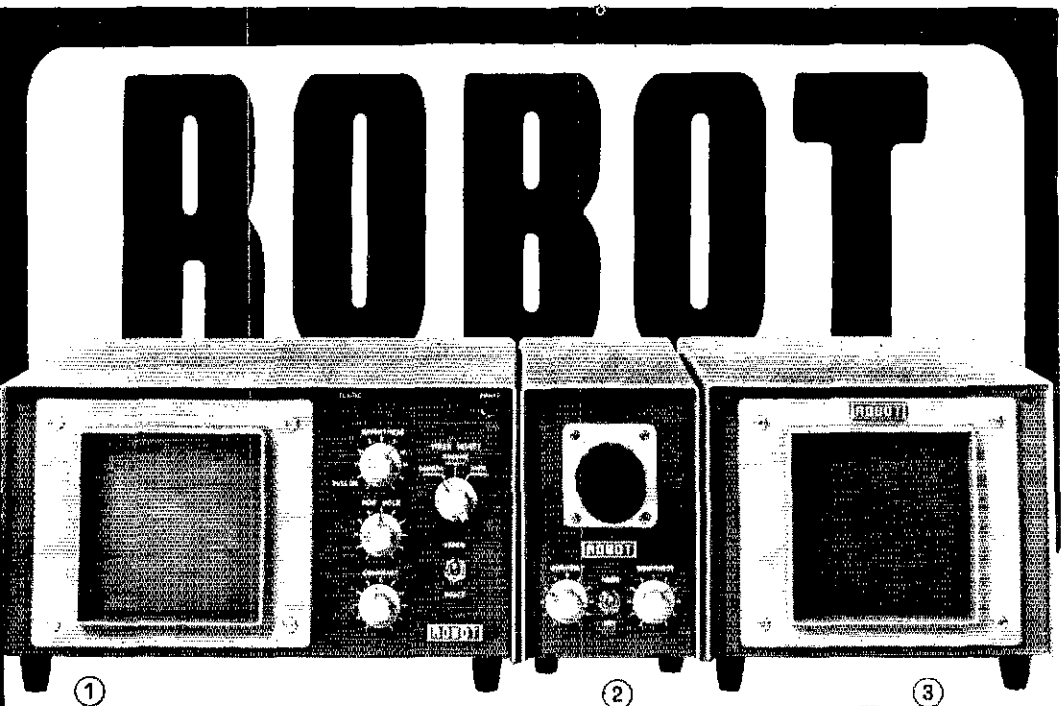
KANSAS – SCM, Robert M. Summers, KØBXF – SEC: KØJ RM: KØMRI. PAMs: WØGCJ, WBØBCL. VHF PAM: WAØTRO. reports of the Emporia tornado have been drifting in, and a other noteworthy reports of emergency type activity inclu amateur activity in the Johnson County area, helping wit kidnapping. Perhaps we should say they helped the authorities w a kidnapping happened in the area; wouldn't want the wr interpretation to get out. WØPB says the GWASH Certificate N has been issued to WØOYH. GWASH is a plan to encourage Nov especially, and others to handle message traffic on cw, participa will be on the OKS-SS net. One message will be sent each w Sorry this information did not appear sooner, but it appears SCM was by-passed in the decision to start such a program and info just did not appear in this column. If activity warrents continued efforts of WØPB to continue the traffic sending, I am *that more certificates will be issued.* Contact either WØPB WØOYH for more details. Field Day reports received from W WØOKU, WØAWB, WØERH and WØLB. July Net reports shoul about a duplicate of these for June 1974. HBN: QNI 205, QT KWN: QNI 351, QTC 132; KSBN: QNI 650, QTC 70; KPN: 158, QTC 19; KFC: QNI 23, QTC 1; QKS: QNI 409, QTC 168; States Mobile Monitor Service QNI 731, QTC 74 serving 34 mob Effective July 12 the new net mgr. for QKS-SS will be WØO Traffic: WØHI 226, WØOYH 94, WØFIR 82, WBØHIR 81, KØI 79, WØCHJ 67, WBØGVR 53, KØMRI 52, WØPB 45, KØJME WØMA 39, WØGCJ 38, WBØCZR 36, WAØGNC 24, WØNYG WAØOWH 4, WØFCL 2, WBØCUY 1.

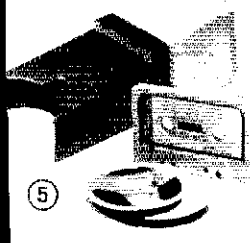
MISSOURI – SCM, B.H. Moschenross, WAØFMD – Asst. S Clifford E. Chamney, KØBIX. New appointments: KØGSO WØSIV as ECs; KØPCK as OPS and WBØFND as PAM. Endo ments: WAØFLL as OO, OPS, ORS, OVS; KØSGJ and WØTD OBSs; WAØKUH as PAM and KØSGJ as OPS.

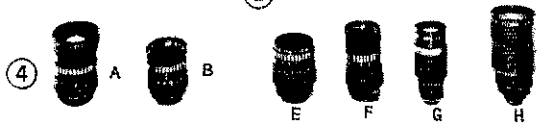
Net	*QNI*	*QTC*	*Net*	*QNI*	*Q*
MOSSB	948	58	SCEN	42	
MON	236	128	JC2AN	41	
MEN	168	10	BCE	34	
MON 2	146	47	MOAREC	22	
PHD	69	11	WEN	6	
MSN	64	23	ACE	6	

Thanks to the MOSSB net members for a fine picnic. Tri-Lakes hopes to have a repeater at Silver Dollar City on .34/.94 by

ROBOT







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"Nice" wallpaper is available from WØRK for checking into their n
10 consecutive times on Mon. nights, 2000 local, 28.6 MH
WRØABF has a new Hustler antenna up which is doing a fine jo
St. Louis ARC members made over 1000 QSOs as KDØITU, WØHB
applied for his WAZ award. Congrats. Lets help KØLIR make th
Mo. QSO party on Oct. 5,6 a big success. Congrats to new Novic
WNØMWZ, WNØMXA, WNØMXB, WNØMXC. Help Mo. have a goo
showing at the Midwest Convention in Sioux City on Oct. 4-6. Fie
Day messages received from KØHMN/Ø KØETY/Ø KØRWL,
KØDEQ/Ø WØBRN/Ø WØCBL/Ø KØBIX/Ø WBØHSI/Ø and WØNZY/
PHD ARA Novice classes have resulted in 18 new amateurs so far
1974. Congrats to KØONK for six months consistent representatio
on DIRN. Also WBØLRX for May and June. Traffic: (Jun
KØONK 1213, WØBV 124, WØEPI 100, KØBIX 71, WAØFMD 6,
WBØHSP 57, WAØYNC 54, WØOTF 53, WØOUD 47, WBØCKI 2
WNØLMW 23, WBØLRX 18, KØRWL 18, WØGRI 14, WØOAU 1
KØPCK 12, WØBVL 7, WØRTO 7, WØZLN 6, WØCBL 1, WAØJOG
(May) WBØEKY 20.

NEBRASKA – SCM, Claire Dyas, WØJCP – Asst. SCM: Velm
Sayer, WAØGHZ. SEC: WAØASM. My thanks to all who supporte
me in the election. If you have any suggestions, send them to me fo
careful consideration. WØGYM and WAØRKU, a Life Member, a
Silent Keys. There are indications there was a record participation
all Field Day sites. AK-SAR-BEN and North Platte RCs hosted Le
McCoy, W1ICP, ARRL at early June meetings, which were ver
informative and well attended. The Midwest Dir. accompanied Le
on the trip. The Lincoln ARC will operate during the State Fai
Club has applied for a special call. The Lincoln started a YL clas
On July 1, WAØLVW, KØUDW and WØSGA provided vital commun
cations during the move of the McCook hospital to new quarter
during which an actual emergency occurred and was ably handle
by the amateur radio network. New repeaters: Lincoln, WRØAEV
.25-.85 and Valentine, WRØAFB, .25-.85. NEB 1 & II, ONI 11
QTC 18; NSNI ONI 770, QTC 18; NMN ONI 1214, QTC 35; WN
ONI 471, QTC 7; AREC, ONI 211, QTC 3; CHN ONI 1050, QT
71; SHN ONI 183; NAN ONI 204, QTC 10; NSN II ONI 1882, QT
27; 160, ONI 33. Traffic: WØVEA 26, WØEQB 24, WØVYX 1
WØSGA 18, WØJCP 15, WØJDJ 13, WØMW 13, WAØPCC 12, WØNI
11, WØPGF 11, WAØGHZ 10, WBØFRG 8, WAØDXY 7, WØDMY
WAØOOX 6, WBØGMQ 5, WAØHQQ 5, WØDJO 4, KØODF
WØOOX 4, WAØEFI 2, KØHNT 2, WØLWN 2, WØRJA 2, WØUDW
WØAFG 1.

NEW ENGLAND DIVISION

CONNECTICUT – SCM, John McNassor, W1GVT – SE
W1HHR. RM: K1EIR. PAM: K1YGS. VHF PAM: K1SXF.

Net	*Freq.*	*Time/Days*	*Sess.*	*QNI*	*QT*
CN	3640	1900 Dy 2200	60	505	3
CPN	3965	1800 M-S 1000 Sn	30	487	2
VHF 2	28/88	2130 Dy	28	211	

High QNI: CN – W1KV and W1CTI, CPN – WA1LIR, WINQ
K1PAD, WA1RFR and K1SRF. SEC W1HHR appreciates the Fie
Day messages sent to him. During an emergency, conditions cou
be even more crowded – message handling ability is a mus
Director W1QV is pleased that many clubs arranged for Delega
Representation at the National Convention in New York this ye
WA1SHO has fine Net Bulletin for Conn. Slo Net members – plea
spread the welcome word to all. 5:30 PM on 3720. New Englan
Novice Net is on 3720 at 6:30 PM and K1PNB extends a welcon
to all. Shoreline ARC members had an Emergency Communicatio
program presented by W1NFG and his XYL W1UK1. Tri-City AR
members visited Channel 13. 28/88 meeting at the "Wee On
preparing for fall elections. Congratulations to: WA1LIR a
WA1RYL for June BPL; and to K1GUD and WA1JZC for OO listi
activity! Official Observers get the OO Bulletin and know t
importance of this service to amateurs. Capable and active membe
are needed – but you must qualify to make it! Sincere thanks to t
many clubs and members who participated in Field Day
problems, work, frustration and FUN! For some, "never again", f
others, "wait til next year" and for all, "What a Week End
Traffic: WA1LIR 318, WA1RYL 307, WA1SHO 247, WA1GI
176, WA1PHI 159, WA1FCM 144, W1CTI 116, WA1RFR 11
W1EOW 100, WA1STN 93, W1KV 79, WA1PXM 71, K1YGS 5
WB2SEZ/1 54, W1GVT 45, WA1RUA 40, WA1RXA 34, WA1PI
33, W1DHT 21, K1SRF 21, WA1JCN 20, WA1NLD 17, WA1RU
17, WA1ROT/1 12, WA3JSU/1 10, W1CUH 7, WA1OPB
WA1HYN 6, W1QV 6, WA1IKN 5, W1BDI 4.

EASTERN MASSACHUSETTS – SCM, Frank Baker, W1ALF
SEC W1AOG received reports from ECs W1s EQH, BAB; K1s DZ
NEW, UAQ, CCW; WA1DXL, W1HQC, W1TJP are Silent Ke

W1SE home after a visit to the hospital. W4KT/1 back in Chatha for summer. W6BJR/1 on the Cape. W6PIN is ex-K1DXY. K4WW. WØPD are mobile in NE. W1JJD has his Extra. W1CLS has his c back and in Amherst, NH. Sorry to report W1LAV had a very b attack. WA1SSI, ex-W3 in Marblehead. WA1DPX moved back Marlboro. K1OJQ is on 1296 and 2304, getting ready for Oscar W1IYD has Galaxy 550. WA1SCI visiting WP4DSO. W1NF got tape recorder on his 81st birthday. WN1RFD new mgr. Eastern Ar Slow Net 3726 daily, 7:30 PM. WA1ROG has 200 mW on 40 and 10. WA1PGY handled WS1UTU traffic. K1REW has 55-ft. pole dipole. WA1DFL worked Utah, Idaho on 6, now has 47. WA1IF worked lots of DX on 6. W4LUV up for a visit. WA1PQY active ECARS. Very sorry to hear that W1PEX has to give up operating CW due to ear trouble and glad that W1QV gave him a "Me Award" for his traffic handling for many years, he will be 2-meter fm. New officers of Quannapowitt RA: W6JQE/1, pre W1GAO, vice-pres.; WA1HTP, secy.; K1ZTA, treas.; W1s PI., FED: K1s NKA, ZQL, NFW, dir. Capeway RC met at W1GPI QTH. W1ANB took a trip to VE1-Land. W1ASI so busy at wo W1AOG reports a "Disaster Drill" a plane crash with CD Directo of Medford, Malden & Everett present; AREC units were activat and WR1AAA repeater was used. W1CUY now retired, Massas ARA held a meeting and W1AAI had slides on VHF UHF above MHz. WA1RIW has a new son. W1ECK went to Lithuania to see folks. W1MV went on a trip across the pond. W1WLZ out on sailboat. K1JMR Club station now on 2-meter fm, thanks W1LUG. WA1TLX is ex-WN1PUI. W1LUG. WA1PGY has TR-22 WA1EOT has a CX7. K1AAP won European style Foxhunt held Norwood ARC. WA1JUY. Univ. of Lowell Wireless Soc., ne officers are WN2UMS, pres.; WA1JYY/WA1RBR, vice-pre WA1RCY, treas.; WA1TFH, secy. Endorsements: K1EPL as OB OO, EC; WA1JYY/WA1RBR ORS, OBS; K1UMP, W1RM EC W1AEC ORS, OPS; K1BJZ OBS. WB2QEI visited W1UX. WA1RG very active in Wellesley ARS on nets and classes. MMRA office W1EFH, pres.; WA1OQK, vice-pres.; WA1QWG, secy.; WA1LU treas.; WA1NWQ, clerk; W1DXQ, WA1RUJ, W1WSN, WA1EO WA1MSK, dir. New England Novice Net, K1PNB says two week sessions have been added Tue/Thur nites 6:30 to 7 PM, 13 wpm 30 wpm. W1TPB has his WAC. W1TWG is a Silent Key. W6FZJ has tower and antenna up, sixty-four-element for 432. WA1OA worked DX South on 2 and 6. K1UIW trying out 189 kHz. W1R moved to Nashville, Tenn.

Net	*Freq.*	*Time/Days*	*QNI*	*QTC*	*Mg*
NEEPN	3945	0830 Su	127	13	K1E
EM2MN	145.8	2000 M-F	83	34	W1AI
EMRI	3660	1900/2200 Dy	352	238	WA1MS
MPON	50.63	2000 Dy	216	67	WA1E
HHTN	146.64	2230 Dy	328	126	WA1MY

Traffic: (June) WA1MSK 179, K1PNB 146, WA1GL 1 WA1MXV 133, W1EIH 116, WN1RFD 60, W1PL 56, WA1ROG 5 W1CF 51, WA1PAZ 50, W1UX 37, WA1PGY 36, WA1OAM 3 WA1OWQ 30, W1EMG 20, W1PEX 19, WA1IFE 13, K1FFX W1AEC 1. (May) W1EMG 71, WA1QKD 49, WA1PGY 46, W1U 28, WS1ITU 1.

MAINE – SCM, Peter E. Sterling, K1TEV · SEC: K1CL PAM: K1GUP. RM: W1BJG. The Loring Air Force RC participat in Field Day making about 430 contacts, 52 sections. New ham Loring AFB, WB4IKP/1, with complete Collins Line. Two n Generals in Fort Fairfield, WA1RWX, WA1RWY, teenaged brothe The new repeater, VE1KMT at Kentore Mountain is on the 146.46-147.06, and really giving good coverage around Aroosto and adjacent New Brunswick. The Streaked Mountain Repea 28/88 WA1KGZ now is WR1ADS. K1RQE worked XU1DX country No. 321. New hams in Maine are WA1TLW (ex-K1CXV WA1TLV, WA1TNJ, WN1TNX, WN1TOJ, WN1TOK, WN1TO WN1TPH, WN1TOQ. Congrats, fellows. WA1QCS dropped the from his call. I am sorry to report the passing of W1ECM; he w very active on vhf as well as the dc bands. W1BJG still looking people who are willing to NCS the Pine Tree Net at least once week, contact W1BJG. Traffic: WA1RDX 7, K1TEV 2.

NEW HAMPSHIRE – SCM, Robert C. Mitchell, W1SWX – SE K1RSC. PAM: K1YSD. RM: W1UBG. Endorsements: W1UBG ORS and K1YSD as OPS. Last month's report was missing becau yours truly has a broken elbow. K1PQV and K1LMS are now L Members of ARRL. K1BCS keeps the BPL for the state acti NHEPN reports 97 check-ins and 14 traffic. WA1QNK graduat from the Novice ranks with totals of 42 states and 9 countri K1PQV's HW-7 with 3 watts on a mountain made 30 FD QS W1UBG's NHVTN report shows 107 check-ins, 129 traffic. reports received from K1WKS and WA1JSD. Welcome new ha WN1TIQ, WN1TIZ, WN1TIS, WA1TIA, WA1TGQ, WN1TH WN1THQ, WN1TIR, WA1TGO, WA1TGN, WN1THM, WN1TG

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WA1TGP and WA1TLY. The new Granite State Traffic mgr. K1WKS. For OO work WA1JSD has a new SB610 monitor sco K1LMS moved here from Conn., station is all home brew w transmitter of 200 watts. Officers of The Derry ARC are WA1LN pres.; WA1PSI, treas.; WA1JSD, secy. The Crotched Mountain Al new call is WA1TOD. In the upcoming VE/W Contest, WA1JSD a WA1LNH plan to operate from Prince Edward Island, Cana W1BYS/K1TXC back from Fla. The GSPN report shows 4 check-ins, 117 traffic, thanks to PAM, K1YSD. K1WKS received ARRL Code Proficiency for 25 wpm. Traffic: (June) K1BCS 5 WA1MXT 107, W1UBG 89, K1LMS 31, WA1JSD 1. (May) K1B 638, W1UBG 183, WA1MXT 94, K1PQV 38, K1YSD 28, K1W 11, W1BYS 1.

RHODE ISLAND – SCM, John E. Johnson, K1AAV – messages were received from K1NQG and W1AQ Clubs reporti their activities. New Novices in R.I. are WN1s TMZ, TMP, TN TOS, TFC and TFW. New Techs: WA1TOE and WA1TD Congratulations to all the new hams and hope that you will ta part in ARRL activities. RM WA1POJ reports that the RISN w again start in Sept. when vacations are over. WA1RFT is bu building some new antennas. With activity decreasing we all kn that vacations are here so the SCM wishes you a good summer l of outdoor projects and when fall returns activity on the ham ban will begin anew. Traffic: (June) WA1POJ 251, WA1RFT 22. (Ma WA1POJ 248, WA1RFT 15, WO1ITU 6, W1OP 4.

VERMONT – SCM, James H. Viele, W1BRG – SEC: W1VSA

Net	Freq.	Time(Z)/Days	QNI	QTC	Mg
VTSB	3909	2200 M-S 1130 Su	657	200	WA1C
VTPO	3909	2200 Su			K1BC
Currier	3935	1300 M-S	335	10	W2DS
Green Mt.	3932	2130 M-S	382	34	W1I
Vt. Phone	3932	1230 Su	72	9	W1KK

Welcome new amateur WN1TQA, son of K1NXC and grandson *W1BRG, a rare three generation amateur family.* Amateurs needi Bennington County contact WN1TBV, 2 Woodward Drive, Benni ton, 05201. Burlington ARC provided communications for t Olympic Development Bicycle Races in Burlington June 23. Mc detail in Public Service section this issue. Traffic: W1LMO 16.

WESTERN MASSACHUSETTS – SCM, Percy C. Noble, W1B – SEC: WA1DNB. CW RM: W1DVW. 75-Meter PAM: WA1J UHF/VHF PAM: W1KZS. Sun. morning WMEN (8:30 AM 39 held 4 sessions with QNI 30 and QTC 17 liaison from repeat K1FFK and WA1KHC. WM AREC Repeater held 20 sessions w QNI 123. K1RGQ/W1BBI is the new EC for Franklin County. WM (daily 7:00 PM 3562) held 30 sessions with QNI 126 and traf 100. WMPN (Mon.-Fri. 4:30 PM 3935) held 20 sessions with Q 237 and traffic 23. *Attendance on the above organized nets is pre* good, but with about 660 ARRL members in Western Mass believe we should do better. In case of emergency, the organiz nets will be in operation, and it might be advantageous to familiar with their procedure. ARRL membership is not a requi ment for taking part in these nets, but is required for su appointments as OPS or ORS as well as for EC. K1RQF is a n OO. Two club bulletins received this month. MARC reports speal of the month – W1BHR, New England Vice-Director of ARE Annual banquet will be held Sept. 13. Western Mass. stations w very active during Field Day. Full reports on that will be ir forthcoming issue of QST in a separate section. Traffic: W1TM W1BVR 82, W1DVW 65, WA1LNF 59, W1KK 34, WA1MJE W1BBI 17, WA1DNB 16, WN1RSY 16, WA1LPJ 14, W1ZPB 2.

NORTHWESTERN DIVISION

ALASKA – SCM, Roy Davie, KL7CUK – The Kodiak C SPARK reports they had 207 QSOs with two stations operating emergency generator during Field Day. They are also trying establish communications with the Anchorage Repeater on 2-m fm. The above courtesy of KL7JDO. The Moose Horn Amat Club at Kenai reports they also had a good Field Day exercise w 1242 contacts. The club has also procured and converted high-band transceivers to 146 MHz fm use. Much research bc conducted by club members on vhf paths for a proposed repea for the Kenai Peninsula. A worth while project was a comp amateur radio electronics course through the Univ. of Alaska, w teachers provided by the club. Good work and congratulation KL7HQD and VE6NH/KL7. KL7GCK and KL7EWQ finally ceived their new repeater license WR7AEB on 146.22/82 M located in the mountains above Anchorage covering both North South. KL7DG still working many stations on QRP (4.82 watts)

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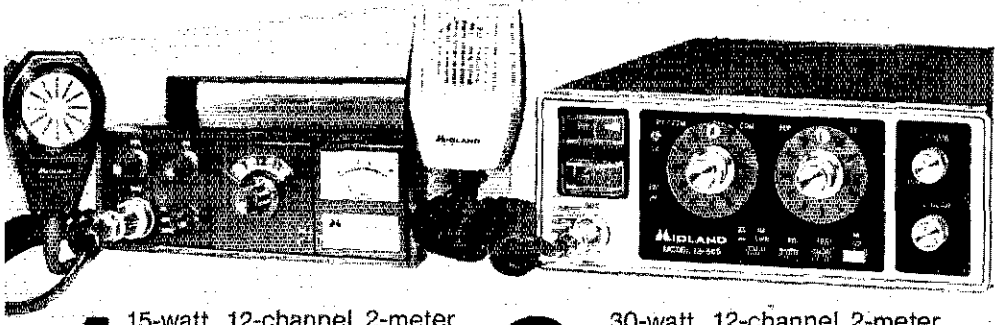

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14070, 7070 kHz. KL7AG visited Anchorage and advised [illegible] Fairbanks club provided communications as usual for the boat ra[illegible] on the Yukon River. Keep an ear out for code practice on 3905 k[illegible] three nights a week. KL7HMJ and his XYL KL7IMH very active [illegible] the new repeater frequency. Traffic: KL7GCH 15, KL7JDO [illegible] KL7DG 1.

IDAHO – SCM, Dale A. Brock, WA7EWV – SEC: W7JMH.

Net	Freq.	Time	Sess.	QNI	QTC	Mg
FARM	3.935	0200 Dy				WA7R[illegible]
IMN	3.582	0300 M-F	19	79	32	W7GI[illegible]
RACES	3.990	1415 M-F	19	492	50	K7U[illegible]
IPO	3.93	0130 MWF	13	147	6	W7[illegible]

W7JMH, Boise, is our new SEC. If we give him our support, I'm s[illegible] he'll do a fine job. WA7CTS reported their club, W7VJD, ma[illegible] better than 200 contacts on Field Day; but no satellite. New OC[illegible] *W7KDB, Caldwell, Idaho needs many ECs; if your county does n*[illegible] have one, would you consider the appointment? Also needed [illegible] OBS and OVS, any takers? Hope you didn't forget WIMU at Ma[illegible] Inn this past Aug. 2-4. Traffic: W7GHT 222, W7IY 4.

MONTANA – SCM, Harry A. Roylance, W7RZY – Asst. SC[illegible] Bertha A. Roylance, K7CHA. SEC: WA7IZR. PAM: WA7PZ[illegible] From reports looks like we *had a fair turn out in the Field D*[illegible] There also was much activity on the VHF Field Day with ma[illegible] contacts made on 2 meters. K7MNZ now has to share the ham sha[illegible] with number one son who is now WN7XYL. They are sporting a c[illegible] FB four-element 3 band quad at 60 feet. Hear it reaches Singapo[illegible] real good. Another repeater licensed is for Billings with the c[illegible] WR7ADY. WR7ADN back up on Bridger Mountain in late Ju[illegible] W7CGG received a promotion and was transferred to W6-Lar[illegible] Congratulations Woody, we will miss you on 3915. Mont. traffic n[illegible] had 733 check-ins, 42 pieces of traffic and 20 sessions. I hear th[illegible] some of you never see your call in this report! Drop me a note a[illegible] let me know of your activities and you will be seeing your call. OK[illegible] WA7PZO has been appointed as PAM for the Mont. section. Than[illegible] to WA7IZR for a job well done. Finally, I am saddened with the lo[illegible] of an old friend and a real fine ham, Rex Roberts W7CPY who w[illegible] *our Northwest Dir. for many years.*

OREGON – SCM, L.R. Perkins, WA7KJU – SEC: W7HL[illegible] PAM: K7RQZ. RM: K7GGQ.

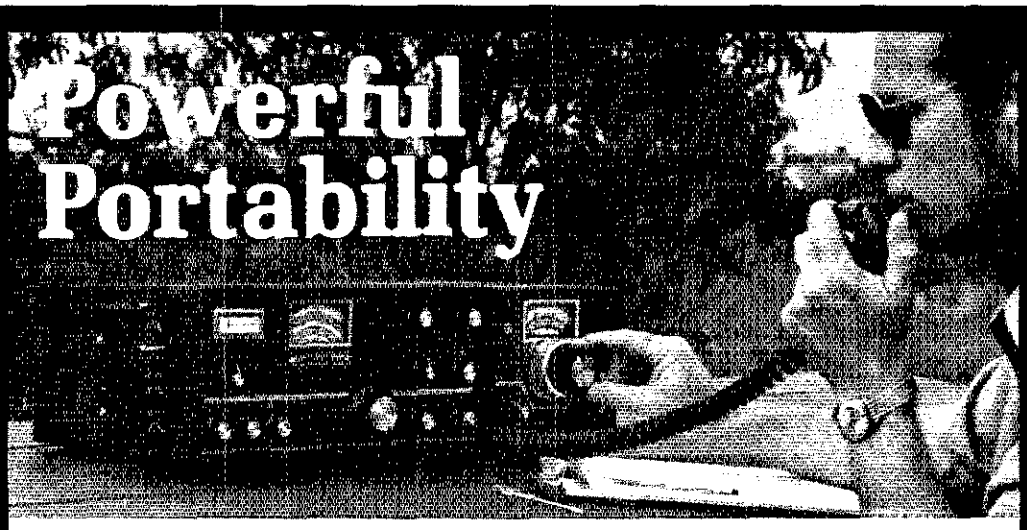
Net	Freq.	Time	QNI	QTC	Sess.	Mg
OSN	3.585	0145	129	93	30	K7OU[illegible]
BSN	3.908	0030	808	103	60	WA7SS[illegible]
AREC	3.993	0200	355	9	30	WA7RW[illegible]
Nuclear	50.250	1630 Su	21		5	W7FI[illegible]

Congratulations to: WA7JUH for 1st Phone with radar, and to BS[illegible] members for electing WA7SSO. WA7IHO is recovering quite w[illegible] from electric burns received when his antenna got mixed up wi[illegible] 1200 volt power lines. Doug will swear it doens't always "happen[illegible] the other guy." K7OUF suggests you prime the filter capacitors [illegible] that old rig with low voltage before you plug it in. A blo[illegible] electrolytic is very, very messy. W7FFE reports high reading [illegible] June was 0.2 Milliroentgens, hardly enough to get a good sunta[illegible] Now that Labor Day '74 is history and Autumn is upon us [illegible] *activity should be picking up along with other operating activiti*[illegible] Which club is going to be the first to report plans are being made [illegible] a Section Meeting for 1975. I think its a great idea, how about yo[illegible] Traffic: K7NTS 154, K7IFG 133, W7ZB 115, K7OUF 101, K7QI[illegible] 98, WA7JUH 68, WA7NWV 49, WA7KIU 27, W7UT 16, K7IWD [illegible] WA7OPZ 12, WA7ODC 12.

WASHINGTON – SCM, Mary E. Lewis, W7QGP –

Net	Freq.	Time	QNI	QTC	Sess.	Mg
NTN	3970	1130	1279	82	30	W7P[illegible]
NWSSB	3945	1830	815	105	30	K7O[illegible]
NSN	3700	1900	338	73	30	WA7N[illegible]
WSN	3590	1545	263	134	30	K7O[illegible]
WARTS	3970	1800	1784	141	30	W7O[illegible]

It is with regret that I list the following Silent Keys. W7FW[illegible] former QSL Bureau Mgr.; K7UFY, co-founder NW Country Cousi[illegible] K7KXN, long time member of Skagit Club; W7DTK member of [illegible] Walla Walla Club; W7OWI, also of Walla Walla, Wash. Set aside Se[illegible] 21-22 for the *28th Annual Walla Walla Hamfest to be held in* [illegible] community building of Milton-Freewater. Also on Sept. 28 [illegible] executive committee of the ARRL will be in Seattle for a meet[illegible] and dinner. In attendance will be some 20 ARRL officials includ[illegible] the IARU president, VE3CJ, Noel Eaton. After dinner speaker [illegible] be ARRL pres. Harry Dannals, W2TUK. For reservations cont[illegible] Dick Hendrickson, K7CVL, 5608 37th Ave., S.W. Seattle, [illegible] 98126, or your representative to the Pudget Sound Council



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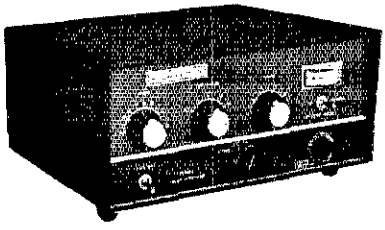

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Amateur Radio Clubs. Winding up a summer of camp-outs will b the Salmon Barbecue of the Skagit Radio Club on Whidby Island o Sept. 7. Don't forget that new repeater on Mt. Constitution nea Bellingham, Input 146.13 and output 146.73. The West Tacom repeater with output on 146.76 should shift above 147 sometim early this fall. W7JWJ tuning tests on fast scan TV with output o 439.2 MHz looking for contacts in the Seattle area. Traffic: (June WA7OCV 151, W7PI 147, W7HHU 71, W7APS 59, WA7BDD 59 W7OGP 59, W7PWP 47, K7CTP 44, WA7WMD 44, WA7GVB 42 WA7RCR 42, W7UWT 39, W7BQ 29, W7KET 18, W7AXT 16 W7IEU 16, W7JWJ 15, K7ZYA 10, W7AIB 5, K7OXL 3, K7VNI 3 (May) K7ZVA 6.

PACIFIC DIVISION

EAST BAY – SCM, Charles R. Breeding, K6UWR – Asst. SCM Ronald G. Martin, W6ZF. SEC: WB6RPK. Asst. SEC: WB6DSI RMs: WA6DIL, W6IPW. VHF PAM: WA6JUD. It is my sad duty t report W6OHU has become a Silent Key. There are a number o Novice classes in the making. Most are planned to start in Sept. Fo those interested or know of someone interested drop your SCM note for the latest information. On June 29, the Pacific Division Du W6ZRJ, held a League Officials meeting in San Jose. Those presen from the East Bay Section were K6AN, WB6DHH, W6GI WB6RPK, W6ZF and K6UWR. From all indications Field Day was success, it was my pleasure to visit the combined field sight of th Silverado AR Society and North Bay AR Assn. and later the fiel sight of the Hayward RC. We are soon to lose the services o WB6NMZ as EC for Alameda Co. He is returning to his home i Washington State. Our thanks to him for his hard and successfu work with the Alameda Co. AREC/RACES. Taking over the EC jo is a very capable man, W6CSL. We wish both of them the very bes Congratulations to W6JXK on making PSHR this month. Fro CCRC the following were listed as newly licensed in the sectio WA6DRT, WB6DTJ, WN6DSD, WN6DXG, WN6DXH, WN6DV WN6DWJ, WN6DQJ and WN6DUQ. For their work in the Norther Calif. Net, Section Net Certificates were issued to W6JXK, K6JZ K6PMG and WB6VEW. Remember the Pacific Division Conventio on Oct. 26 and 27 in San Mateo. See you there. Traffic: W6IP 343, W6JXK 110.

HAWAII – SCM, J.P. Corrigan, KH6GQW – Congrats to KH6 IGJ and DVT on obtaining their Extra Class. KH6AN report KH6BYO left for Ore. permanently and Ed was hosted/honored at farewell dinner on June 15 by KH6s AKE, ALV, EN, AN. All th best to Ed. Many of the KH6 boys in Field Day and much fu reported by all. WA8GCW/KH6 is on from Hickam. Al is e HS1AJJ. KH6IAC now has daily sked with W6RSY for traffic. you have message traffic to get into NTS, pass it to him. Woody also new OPS. Kingman Reef DXpedition a great success despit problems. They made 5000 plus QSOs including about 30 Europeans. KH6GMP, KH6GOW and KH6IGJ met the operators o July 9 on their way back to W6. Hon. DX Club soon hopes to hav slides and tapes of the trip. Kudos to KH6BB on 315 DXC KG6JCP has developed a beautiful AREC Emergency Plan for Guar Island. Ben has good participation with drills, etc. We need more o Oahu and we may get action from new SEC to be appointed shortl Also EC's needed for Neighbor Islands. The HARC meeting in Jun was a great success with inroads made into tower applications wit Hon. City Building Dept. Also, Mayor Frank Fasi personall presented Am. Rad. Week Proclamation. Traffic: KH6GQW 2 KH6IAC 24, KH6GMP 2.

NEVADA – SCM, Harold P. Leary, K7ZOK – Welcome K6MQX/7 who has new Linear amplifier working FB. Glad to s W7FJN recovering from heart surgery. W7ILX had more rig troub but still passed traffic via Kingman repeater from W7GAA. W7RM and K7OHX active in NCN net. W7OK and K7JRW chasing DX o all bands and using local repeater for liaison. WB5IQI/7 has returne from vacation. WA7HXO has new 10 db antenna and duplexe WR7ADZ is new call for 28-88 autopatch repeater. W7ZT h returned after 2 weeks in the cool country. WA7BEU still in th cool country vacationing. K7YKN also had a short vacation. Che into the RACES Net on Mon. at 7 PM on 3996.5 kHz. Send yo reports by the first of the month. WA7MRS enjoying his ne rhombic. Heard ragchewing on 10 locally – WA7PWG, W7KA WA7PVU. Traffic: W7ILX 44, W7WLV 40, K6MQX 8.

SACRAMENTO VALLEY – SCM, Norman A. Wilson, WA6JV – SEC: W6SMU. Through the efforts of W6NJU and others, th State Assembly proclaimed Amateur Radio Week to coincide wi Field Day operations. The semi-annual league officials meeting San Jose was attended by WB6AUH, WB6CQF, WA6JVD, W6NJ and W6SMU. At this meeting W6ZRJ selected WB6AUH to be t first Division Public Relations appointee. Congratulations also WB6CQF, the new EC in the Chico area; and to W6NKR, the Sta

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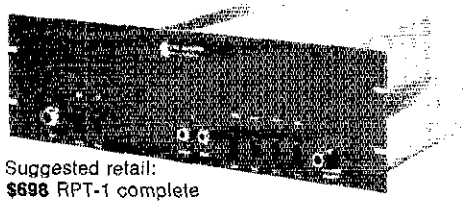

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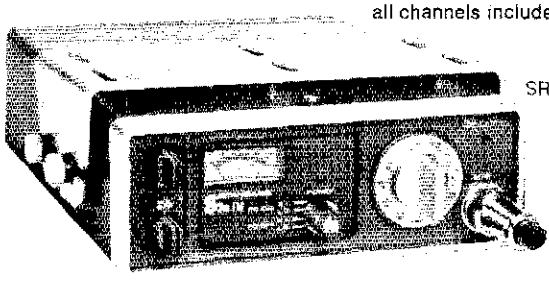

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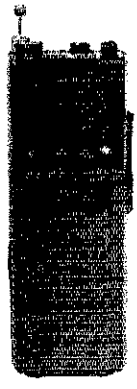

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RACES officer, who became an AREC/RACES liaison EC. The Sacramento ARC and the North Hills RC couldn't seem to get along without each other and both groups went to Somerset for Field Day. Even with the local QRM, a very successful operation took place. WB6BYU reports summer portable operation in Plumas Co while surveying for the USFS. WA6GHH has a new four-element yagi radiating from Davis. Section Net certificates were issued to K6KWN, W6PU and K6YZU for their continued participation in the Northern Calif. Net (3630 kHz at 7 PM local time). NCN needs SV check-ins as badly as the SCM needs activities reports.

SAN JOAQUIN VALLEY – SCM, Ralph Saroyan, W6IPU – The Turlock Amateur Radio Club held their Field Day at Do Pedro, with 6 transmitters and 18 operators. The Fresno Amateu Radio Club held their FD at Shaver Lake. WB6GJG now W6HKV W6CUA heard on 2 meters fm. The new officers of FARC ar K6UFC, pres.; K6CZO, vice-pres.; WB6OSH, secy.; W6WME, trea The Stockton EXPO was held on June 1 and 2, 1974 and th following furnished communications: WA6HIN, WB6SP WA6FBL, K6AXV, K6OZI, WA6YNH, WB6OSF, WB6ZOC WA6IRR, WN6WRM, WB6OPQ and WA6FBY. WA6SHO no located in Denver. W6OHT has a HAL keyer WB6KPH attendin FSII. WB6DKR has a Standard 146AU. W6MUV teaching code an theory. WB6ITP is the editor of Grid Leak. K6OZL passed h Extra Class exam. WB6HQU now WAS on 6 meters. W6DPD worke 49 and W6JUK worked 48 states on 6 meters. The Kern Count Radio Club held their FD on Greenhorn Mountain with 34 attendance. WN6RXH and WN6RXF passed their General Cla exams. W6TRP and W6ZJQ are motorcycle mobile on 2 meter WA6BUH has a 301.1 amplifier. W6YKS, K6OZI and WA6CH received public service awards. The Lincoln High School in Stockto conducts code and theory classes open to public. WA6SOI is hea on 20 ssb. K6JR still working DX. Traffic: WA6RXI 82, WA6JD 2.

SANTA CLARA VALLEY – SCM, Jim Maxwell, W6CUF/K6A WA6WEI reports the West Valley ARA is negotiating for a site the Santa Clara County Fair this fall. Foothill ARS's FD effort wi K6YA/6 included two QSOs through Oscar 6, with the Oscar effo spearheaded by W6OCP. W6RSY and W6RFF made BPL. The ir man of NCN for the months of Mar., Apr. and May was W6RF with 134 check-ins. Close on his heels were WB6TYA, W6YBV a W6DEF, with 124, 105 and 102, respectively. WA6IUF hea himself through Oscar 6 and will be QRV for QSOs shortly. N officers of NCDXC are W6ISQ, pres.; K6CQF, vice-pres.; W6S secy.; K6RXZ, treas. WB6IJO heads the No. Calif. 220 Net, QR each Sun. at 8 PM local time on 222.0 MHz. Meanwhile, elsewhe on 220, WR6ABH has opened up repeater activity for the first tir on this band in the Bay area, due to the efforts of WB6OOO a others. Input 223.34 FM, output 224.94. OPS WA6SCY ma PSHR for the second time. Also on PSHR are W6RFF and W6AU NCN mgr. W6BVB in the British Isles on vacation. W6NW celebra his 62nd year as a ham. VE3DXV/W6 is readying the station for t winter DX season. W6OII recently received his 17th endorseme running for OPS. KP6KR, the NCDXC contribution to DXi found its way into the logs of many SCVers, including W6MM W6NLG and K6DC. WB6UBG and WA6SCY jointly run the W Coast CW net, meeting nightly at 0400Z, 3690 kHz. New membe of PAARA are W6NIR, W6GNX, and an OM-YL team, WB6LV and WB6NAT. This monthly column is for all SCV hams. A newsworthy items should be in my hands no later than the 6th each month. Don't forget the Greater Bay Area Hamfest/Pac Division Convention on Oct. 26 and 27, at San Mateo. A symposi on Space Communications, ham style, follows on the 28th Foothill College. NCN traffic for May: QNI 772, QTC 346 in sessions. It was the best month ever on NCN2. Traffic: W6RSY 5 W6RFF 296, W6YBV 260, W6NW 142, W6AUC 59, W6DEF W6BVB 47, W6QNB 31, W6KZJ 20, WA6SCY 17, WA6HAD W6NLG 8, W6OII 8, K6AQ 2, W6ZRJ 2.

ROANOKE DIVISION

NORTH CAROLINA – SCM, Chuck Brydges, W4WXZ – S K4FBG. PAM: WB4JMG. VHF PAM: K4GHR. RM: WB4FTF, F Day '74 activity was high with traffic received from Cary A Mecklenburg ARS, Alamance ARC, Onslow County ARC, Rale ARS, Buncombe Cty ARC, Rowan ARS, Charlotte ARC K4TP/4. W4EHF is getting tower up. K4LVV now PR man for Mecklenburg ARS. WB4OXT has TA33 on tower and after DX. N net in Durham area is Triangle Radio Alert Network (TRAN) m daily 2030Z and 0030Z on 34/94. In Winston-Salem new grou Forsyth County Amateur Radio Emergency Service, (CARES) us autopatch through WR4ACA on 04/64. In Buncombe Cou WN4EMF passed General and WB4AAK made Advanced. Congr K4JO and W4IRE set up an Amateur Radio display at

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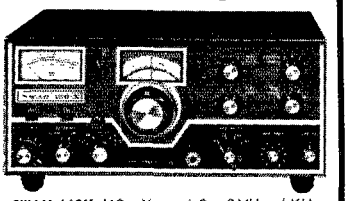

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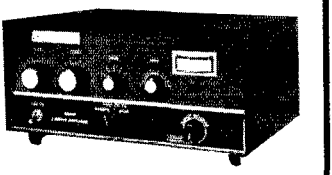

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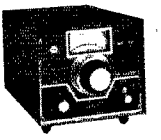

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Telephone Pioneers of America regional meeting in Winston-Sa using material sent by ARRL. WB4NUL needs two more states 6-meter WAS. WB4LDO active on 6 and 2 primarily Western V Tfc Net on 16/76 each Tue., 8:30 PM through WR4AEV. If want to have some fun try working and confirming all 100 counties and get award from Alamance ARC, PO Box 503, Grah NC 27253. This award is in four classes: D-30 counties, C-50, B & A-100. If you have not had call-letter license tags within the year you must obtain a registration card from Raleigh and tile plates by Nov. 1. Remember, we fought for and received a new pl level, and, we are separate from CB in the law books once again proudly display your call. Traffic: (June) K4GCN 287, W4O 204, WA4EFZ 183, WAØYDJ/4 122, K4MC 80, WB4OXT W4WXZ 52, K4FTB 44, WB4KHZ 40, W4ACY 30, WB4JMG WA4KWC 16, K4VBG 14, W4WCG 10, WB4CES 6, W4EHF (May) WA4EFZ 81.

SOUTH CAROLINA – SCM, Richard H. Miller, WA4ECJ Asst. SCM: Charles N. Wright, W4PFD. PAM: K4GOG. R K4LND. New OPSs: WA4UZA, WB4UDK, W4MTK, WB4MJ WB4OWK, WA4EFP, W4WQM, K4LNJ, K4FRX, WB4B WB4VZN, WB4KNB, WB4TGK; OVSs: K4GL, K4FRX; O WA4EFP. These appointments, and all future ones, are made on basis of a service being performed or about to be performed monthly report is one of the requirements. To those who aspire an Official appointment, we pledge to go all out in the effort to f adequate justification. Currently needed are several OBS for spe assignment to include collecting and disseminating announceme of interest to hams from sources throughout the State. So don't bashful about volunteering for an appointment. If your offer can justified, it will be eagerly accepted, for a large staff of appoint working together with a right good will augurs well for the integ and prestige of amateur radio. A series of Section meetings planned, to be held as frequently as urgency demands and circumstances permit, with due care to avoiding conflicting da with other ham activities. Perhaps every six weeks or so. Traf W4NTO 44, WA4ECJ 28, K4FRX 12, WB4UDK 8, WA4UZA 5.

VIRGINIA – SCM, Robert J. Slagle, K4GR – Asst. SCM: A Martin, Jr., W4THV. SEC: WA4PBG. RMs: W4SQO, K4E WA4SMR, WA4AVN, WN4DHY. PAM: W4HIR. Field Day w well – Sterling Park ARC won an extra hundred points by operat a Ten-Tec on solar power; Alexandria ARC sent me an excell drawing of their site by K4DHB; amongst FD messages received one from WB4DRB/FDT regarding a participating bear. O WB2LAU/4, K4MSG reports full of openings on VHF this mon Excellent turnout at VFN/VSBN picnic – new VFN offic W4BAD, mgr.; WA4JUT, asst. mgr.; K4CGY, treas. Note new R our many thanks to retiring W4SHJ and WN4GHY. Over members in PVRC On-The-Air Reunion. WA4EPH on 2 fm. W4 NCSing on Heart Bank Net. W4KX still not breaking acti records. W4UQ visiting Mich. for a month. K4GTS at ITU Marit Frequency conference for three months! WB4WIS going mobile is WA4YIU. W4SOO moving – off the air till Aug. WN4DHY d FB DX on 15. Garden of W4WWQ competing with humming. pleased with Central Virginia 2-Meter 6M Net; it is really boom for a new net. VSBN Sun. Magazine Net suspended until S WB4DRB will be married this month. I believe we have the Repeater appointment – certainly for Va. – WR4ACN now W4TZC is eyeing a TV antenna for 01/61 beam. Look for new VNFN (Va. Novice Forty Meter Net) on 7145 kHz at 1800 FD WN4HMZ net mgr.; QNI 10, QTC 0 for June. Others: CV2FM 379, QTC 35; VSN QNI 202, QTC 80; VFN QNI 790, QTC 34. of space again – see Apr. report for net listings. Traffic: WA4A 370, W4SOQ 290, K4KNP 170, WB4ZKG 160, W4UQ 104, K4 101, W8VDA/4 96, W4QDY 94, WB4SGV 94, W4SUS WA4SMR 57, K4GR 54, K4MLC 53, WB4KIT 49, K4KA WA9NEW/4 36, WB4WIS 36, W4TF 34, K4JM 29, WB4PNY WA4EQW 19, WB2VYK/4 18, WN4DHY 17, WB4DRB 14, W4T 11, W4KFC 10, W2TPV/4 9, W4MK 7, K4MLD 6, WB4RZV W4DM 4, W4SIG 4, K4VIG 4, WA4WQG 4, WA4YIU 4, K4GT W4KX 2, W4WWQ 2.

WEST VIRGINIA – SCM, Donald B. Morris, W8IM – S WA8NDY. RMs: W8HZA, W8JWX. PAMs: W8DUW, W8IYD. Ph Net Mgr.: WB8DQX. CW Net Mgr.: W8IZA. Gen. Mgr. J Huntoon W1RW, Tom McMullen W1SL, Vic Clark W4KFC, Booth W3PS, Phil Wicker W4ACY, John Johnston K3BNS and Grenfell W4GF were among the 600 amateurs attending the State ARRL Convention at Jackson's Mill. Dates for the Convention will be July 5 and 6, so mark your calendar Division Dir. Wicker, W4ACY presented the Roanoke Public Ser Award for 1974 to William (Bill) Grenfell, W4GF. John Freel W8GSN of Romney won the 1974 West Virginia Outstan

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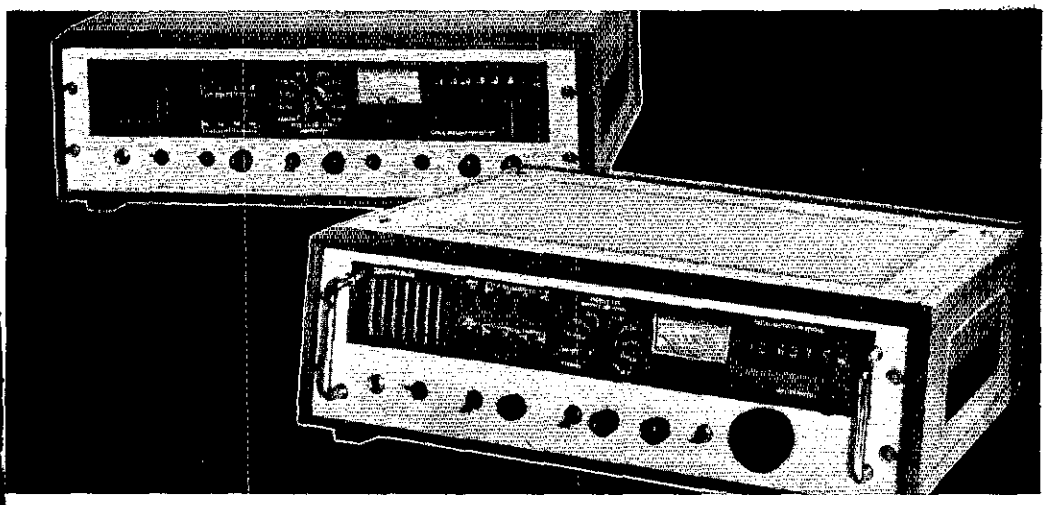

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Amateur Award and the Logan County ARC won the Field D Trophy presented by the State Radio Council. WB8DOX w reelected Phone Net Mgr. and John Davies was chosen for the C Net. Phone Net meets daily at 6:00 PM on 3990 and the CW r runs daily at 7:00 PM on 3570. State Radio Council meeting set f Parkersburg on Oct. 12. WB8DQX received WACWV No. 53, t first WB to win this award. Phone Net with 29 sessions, 614 statio passed 146 messages and the CW Net in 28 sessions with 1 stations had 50 messages. Traffic: W8HZA 55, WB8DOX 3 W8DUV 15, WA8NDY 12, WA8ZNH 11, W8JM 9, W8AEC WB8BMV 7, WB8MAV 7, WA8FLW 6, W8LGT 6, WB8MZI W8CZT 5, K8QEW 5, W8GDP 4, WB8MKL 4, W8CNF 4, WB8N 3, WA8ROB 3, WA8UWU 3, W8ETF 3, WB8SCG 2, WB8BJI WB8BSN 1, K8CMW 1, WA8OKG 1, K8TCM 1, WB8FOC WA8YCD 1, K8ZDY 1.

ROCKY MOUNTAIN DIVISION

COLORADO – SCM, Clyde O. Penney, WAØHLQ – SF KØHLQ. RM: KØOTH. PAMs: KØCNV, WAØYGQ, KØDCW, KØS has been serving as NCS on Wed. during all of June, on 12th Regi DNTS, which meets Mon. through Sat. at 1630 MDST (2230Z) frequencies 7232 and 3932 kHz. WAØYNQ reports having work 28 states since Jan. 1, 1974, on 10 meters, which continues to op up in the evenings. WBØGEX reports having worked 29 spec stations during his participation in the ITU anniversary. It is w deep regret that we add to the list of Silent Keys, the call KØMVT, who will be sorely missed by his fellow amateu especially in the Colo. section. Congratulations to all the amate who contributed so unsparingly of their time and talents providing communications in Rangely, Colo. for four days whe June snow storm downed the telephone lines and initiated telephone blackout in the area. Net traffic for June: Columbine C 986, QTC 87, informals 199, 26 sessions. Late net traffic for M SSN QNI 138, QTC 120, informals 13, 31 sessions, 530 minu Traffic: (June) WØWYX 1390, KØOTH 129, WØLAL 57, KØSPR KØPVI 31, WØSIN 31, WØMYB 12, WØKFH 10, WØGAQ 9, WØN 9, WØBY 8, WAØYNQ 7, WBØLGC 5, WAØYED 4, WAØHLQ (May) WBØHSZ 162, WAØTMA 29.

NEW MEXICO – SCM, Edward Hart, Jr., W5RE – SE W5ALR. RMs: K5KPS, W5UH. PAMs: W5DMG, W5PNY, W5M is now mgr. and NCS for ISSB net. W5TLK spent half of June at Cape in Fla., but made it back in time to handle some traf K5MAT was away for the month. With those two away our tra total suffered. K5YRY now has touchtone for the repea Congrats to WB5CSO who passed his second class phone commer ticket. W5WFP will take Advanced Class exam in Oct. Our N mgr., K5KPS retired from CS June 30. Now he will really be bu NMN, 3585 daily at 1930 MDT held 30 sessions, QTC 54, QNI 1 NMRRN, 3940 daily at 1800 MDT had QNI 497, QTC 49. The Alamos club has been evicted from their club house. Seems the A has declared it surplus. On June 26 we lost one of our better kn and well liked hams, K5DAA. He will be missed. Condolence XYL K5DAB. Traffic: W5MYM 252, W5RE 81, W5ENI 47, W5I 43, K5KPS 33, W5PDY 27, W5YQ 27, W5QNQ 10, WA5MI W5WFP 4, WA5OHI 2.

UTAH – SCM, John H. Sampson, Jr., W7OCX – SEC: W7G RM: W7UTM. BUN meets daily at 1830 CUT on 7272 kHz, check-ins, 31 messages. UCN meets daily at 0130 CUT on 3575 190 check-ins, 46 messages. K1TMK/7 is now UCN mgr, repla W7UTM who has done an outstanding job, but gave the job because of ill health. WA7BSG reports 10 IW reports filed. DXers have participated in pileups in band openings. K7CLO WA7MEL are about even in getting 5BWAS with only about 3 st to go. W7BE is enjoying traffic and DX with his repaired yagi. W he says is an enemy of ham radio. W7RCZ is a Silent Key. took 2 of the top 3 prizes at the Rocky Mountain Div convention in Pueblo. The XYL of W7GPN garnered the top of an Atlas 180. Rudy likes it fine. W7GIM, XYL of W7EU wa away with the 2nd top prize. W7DKB having antenna problen his summer cabin. Band conditions have been poor in all area this section. There is increased activity on 2 meters. This has especially useful in passing local traffic. Warm weather and fishing is responsible for increased mobile and portable opera Traffic: (June) W7UTM 79, WA7MEL 36, W7OCX 25, WA7TSE W7DKB 12, WA7HCQ 10, W7LLH 6, WA7VNQ 6. (May) WA7 26.

WYOMING – SCM, Joe Ernst, W7VB – SEC: K7NQX, PA W7SDA, WA7NHP, K7YUG. OBSs: K7NQX, W7SDA, WA7E K7YUG. Nets: Pony Express Sun. at 0800 on 3920; YO dail 1830 on 3597; Jackalope Mon. through Sat. at 1215 on 7260

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3,920); Wx Net Mon. through Sat. at 6:30 on 3920; PO Net 184 Mon. through Fri. on 3950. Sunspot activity during late June an July made traffic handling very difficult on most bands. A bi increase in two meter activity was noted this summer on the state repeaters at Laramie and Boysen Peak, near Thermopolis. Th Repeater license for Grizzly Peak, near Billings in Mont, has bee granted and it is hoped to be in operation before winter sets in W7ILL, W7VB, WA7LUY and W7CGK from Wyo. attended th ARRL Convention in Pueblo in June. Traffic: W7SDA 263, K7VW 72, W7ILL 8, W7SQT 6.

SOUTHEASTERN DIVISION

ALABAMA – SCM, James A. Brashear, Jr., WB4EKJ – SEC W4DGH, RM: W4HFU, PAM: W4ROS. W4LNN completed th $30.00 Counter in Jan. QST, says it works fine. WB4RCF busy NCS on 1 phone net and checks in on 3 others. WA4AJA no checking in AENM with a Yaesu 401B. WB4UNY appointed pul chmn. for the Mobile ARC. K4IAY is recovering from an operation K4LXU and WB4UNY assisted the Pensacola amateurs in providin communications for their "action 76" program. K4LXU appeare on WALA TV to promote the Mobile hamfest. ED activities an amateur radio. The Mobile ARC had another good hamfes WB4KDI reports the Ala. PON in operation for over 5 years. W4IC is NM. The Huntsville ARC provided communications June 15 fo the Sports Car Club of America during their Johnny Reb Nationa Rally. K4HJM anxious to get going on 2 meters. W4ROS helping o AENB. K4UMD says ED was a blast! K4ROR has a pipe-line t Birmingham on 2 meters. K4VF has his 2-meter beam up to 70-f and having good results. K4AOZ now reading bulletins on Mo nights on 10/70. Congrats also on his appointment as Asst. Dir. Th Tuscaloosa ARC went all out to win the Section ED award this yea The Huntsville and Limestone ARCs had a tornado watch and ha to shut down for a while. Please correct the following in pric Station Activities: July '74 – W4ZWF should be W4ZWE. May '7 – RM W4WHU should be W4HFU. Endorsements: W4DGH as SE WB4SVH ORS: WB4JMH and WB4SVH OBSs. Traffic: †June K4AOZ 128, WB4SVH 89, WB4EKJ 87, W4LNN 73, WB4RCF 45 WN4EZQ 40, W4ROS 40, WB4KDI 34, WB4TVY 23, WA4AJA 1 WB4KSL 17, K4VF 12, K4UMD 4, WB4EJP 1, WB4NLU 1. (May W4LNN 131, WN4EVY 123, WB4KSL 37, WB4PDO/4 2, WA4AJA 3, WB4EJP 3, K4HJM 2.

GEORGIA – SCM, Ray LaRue, W4BYG – Asst. SCM: Jof Boston, WB4RUA. SEC: K4WC. PAM: K4JNL. RM: WA4BAA.

Net	*Freq.*	*Time(Z)*	*QNI*	*QTC*	*Manag*
GSN	3,595	2300/0200	258	91	WA4B
GSBN	3,975	0000	867	31	K4JI
GFN	3,718	2200	–	–	WB4T
GVEN 2	146.940	0130	344	42	K4Y

To help minimize confusion on VHF and HF bands on call si techniques, remember: when beginning a transmission (with an one), it is only necessary to give YOUR call sign ALONE. Then yo are only required to I.D. your call once every ten minutes during QSO, (not on every xmission). At the end of a QSO, you need on to give the call sign of ONE of the stations you talked too, (n every station in a roundtable). Note: other stations need not sign or out with you to make it legal. Also, "funny" phonetics are n recognized by the FCC for I.D. purposes. You must state your c sign clearly or use one of the accepted phonetic alphabets. Excessi signing and listing of all the stations in your roundtable only ser to create "on-the-air pollution" and waste other operators valuab time. Re-evalute your personal habits and techniques and make su you are functioning efficiently and properly. Traffic with indicating PSHR: K4JJO* 140, W4AAYU 57, WA4LLI 26, WB4Y 15, W4JM 8, K4JNL 8, WB4RUA 7, K4BAI 7.

NORTHERN FLORIDA – SCM, Frank M. Butler, Jr., W4RK SEC: W4LKB. RM: WB4DXN/WA4WIW. PAMs: WA4IZM/7 W4SDR/40; WA4CAD/VHF. ED reports received from Jax, O lando, N.Pt. Richey, Inverness and Pensacola this year. New NMs a WA4GBC for QFN, WN4HOL QFTN, WB4AIK EAST Net, N Certificates issued to W7EM/4, W2GVH/4, W4KIX, W4LDN WB4SKI, K4VND and WB4DXN for QFN; and to WN4DA WN4DRZ and WN4GHU for QFTN. Appointment: WB4DXN RM; WB4WHK renewed OPS. WB4VMP setting up 2-meter fm net Seminole Co. WN4GHU upgraded to General, and active on 5 F traffic nets! Daytona Beach Red Cross station has new 150-f tower, thanks to WA4JCP and many assistants. WB4NJI a W3MR/4 improved their 2-meter antennas. K4WKY and WB4NC moved to Jax from Miami. W4ORT reports N. Fla. DX Assn. to high club score and WB4EYX high phone score in Fla. QSO Part KP6PA and KP6KR were worked by many N. Fla. DXers. W4TKE on 220 MHz fm. WA4FBI new QNI to NFPN from Tallahasse WN4BAX up to 34 states worked; has ARRL 20 wpm CP. W4CDE

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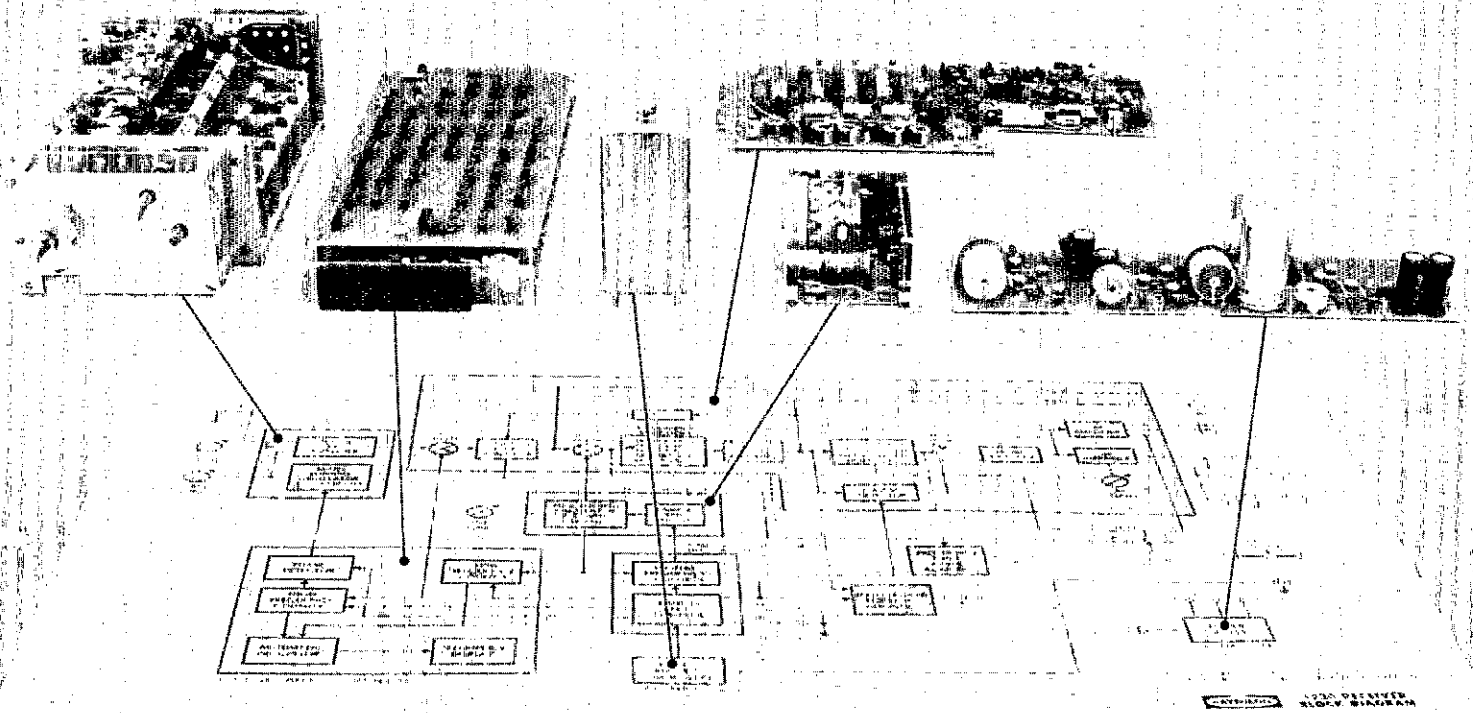

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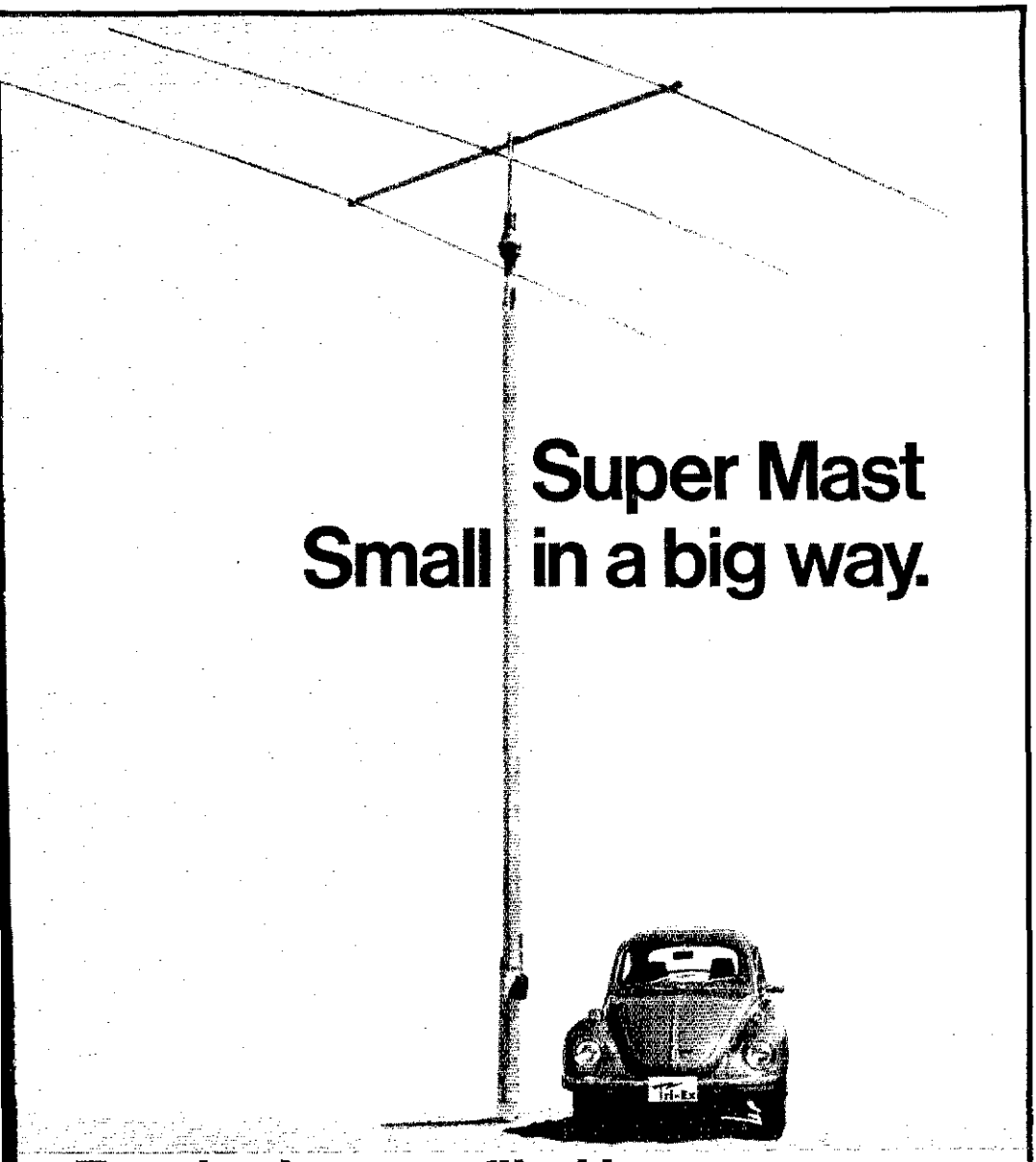
Silent Key. New hams in Playground area: WB4BKR, WB4CM WN4FMZ, WN4HXT. The PARC presented a complete set of ARR publications to the EWB library. FFARA operated FD fro shopping plaza this year, received publicity. The WR4ACZ repeat has a new solid-state receiver and auxiliary link transmitter thank to WB4JCV and WA4CAD. WA4JNA had lead article in July QS WA4CAD attempting meteor scatter QSOs with W5TVB on 146.- MHz. K4HKK has 26 states on 6 meters. Traffic: (June) K4VN 185, WB4DXN 170, W4WNY 165, WB4GHU 156, W4SDR 10 W4LDM 77, WN4HOL 76, WB4OMG 69, WB4SKI 58, K4CVO 3 W4RKH 38, WB4DAD 37, WB4FJY 35, WA4IZM 34, K4IZT 3 WA4EYU 29, WB4WHK 26, WB4NJI 24, WB4VYU 20, W4LSR 1 WA4FJA 15, WB4VDM 15, W4BKC/4 8, W4IA 8, WA4VZF W4AFT 7, WB4VMP 6, K4RNS 5, WN4BAX 2, WB4NHH 1. (Ma WA4BGW 17.

SOUTHERN FLORIDA – SCM, Woodrow Huddleston, K4SC – SEC: W4IYT. Asst. SEC: W4SMK. RMs: K4EBE, W4EI WA4GBC. PAMs: WA4NBE, W4OGX. New appointments th month: WA4GBC RM-80; WA4NBE PAM-40 and EC Breva County; WA4ALH OVS and EC Hillsborough County; K4RCP E Hardee County. We regretfully accept the resignation of WB4NC as RM-80 and WB4TUP as EC Hillsborough. Endorsements: K4K ORS. QFN Net Certificates issued to K4SCL, W3AIZ/4, K4WK WA4HDH, W4DQS, WA4SCK and WA4GBC. The best news th month is that W4IYT has decided to remain in Fla. contrary to o previous report he was moving with his job. Many Southern Fl hams journeyed "across the border" into Northern Fla. for th Orlando Hamfest June 15-16, which turned out to be FB as usua Heavy rains June 24-26, over 20 inches in places, caused loc flooding in low areas but no wide spread requirement for emergenc communications. However, on June 27, Red Cross Miami requeste K4WKY to "establish backup communications with flooded area near North Port and Fort Myers. K4WKY ran the show, acting NC for both TPTN and FAST nets, which turned out satisfactori However, in retrospect, we feel that Florida Sideband Emergenc Net should have been activated. This operation was characterized b unwillingness of most operators to believe there was an emergenc and dogged insistence of K4WKY that he had a mission to establi backup communications. At any rate, it turned out to be a excellent drill. W4YW reports he is now retired and "Intrud Watching." WA4ATF reports he and W4WYR were "Portable 4" Fort Myers Beach throughout July. K4QG reports 120 countri confirmed. Traffic: WA4SCK 441, K4SCL 406, WA4IJH 25 WB4AIW 212, W3AIZ/4 171, WA4GBC 162, W4EH 106, WA4NE 93, WA4ATF 91, W4WYR 86, WA4NBT 85, W4BM 82, W4DVO 7 WA4BPE 70, K4SJH 53, WB4KSG/4 50, W4IYT 43, WA4EIC 3 W4SMK 37, K4QG 36, WA4HDH 34, K4NE 28, W4OGX 2 K4BLM 23, K4IWT 23, WB4AID 16, W4BCZ 16, W4NTE 1 W4FPC 12, WB4TRI 12, W4TJM 11, W4IRA 10, WB4ZKJ K4DRH 5, K4EBE 1.

WEST INDIES – SCM, Juan Sepulveda, KP4OM – Salud Amigos! The RCPR is sponsoring a 14 session theory and telegrapl course for Novice and General license. KP4QM appointed Asst. D SE Division traveled to Atlanta for Director meeting. Amateu from Arecibo area sponsored a Mini-Hamfest last May. KP4BI elected pres. of first RCPR Chapter in Arecibo. KP4AHQ worki SSTV with K5CFM and WA1NNW on 6 meters and with KP4GN v WR4AEC on 2 meters. Also worked about 50 Ws and Ks on 6-met ssb opening. KP4DPN via Oscar 6 contacted CN8BO and K2BZ orbit 7116. KP4CO again activating MARS. Weekly nets: Sun., 14(GMT, 7250 kHz; Wed. 23.30 GMT, 3897 kHz. Bulletins fro ARRL by OBS KP4QM and RCPR by pres. KP4AOL. New statio heard on 2 meters are KP4s BJM, RK, VS, DMI, BDL, DFH. Has Luego.

SOUTHWESTERN DIVISION

ARIZONA – SCM, Gary M. Hamman, W7CAF – The Presco ARC participated in Field Day from the Prescott Airport. Also, ne officers were recently elected: WA7WZE, pres.; W7IPN, vice-pre W7JSZ, secy.-treas.; WA7WMO, asst. secy.-treas. A station at Can Geronimo, a Boy Scout camp near Pine, is being operated b members of Explorer Post 710 to provide communications t scouts and staff to their families in the Phoenix area. W7JS K7JWB, K7NMO, W7UXZ and K7UYW used two meter FM provide communications for the Explorer Olympics for the Phoen area on June 1. WA7CNP was recently appointed OO and w primarily monitor two meters for signals generating spuno emissions. Although attendance at club meetings has been go through the summer, be sure not to miss out on the fun a planning that will be done at the fall meetings. There are act clubs at Apache Junction, Bisbee, Kingman, Morenci, Phoen Prescott, Scottsdale, Sun City, Tucson and Yuma. Section r awards were earned by K7GLA, W7RQ, WA7KQF and K7NM



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LOS ANGELES – SCM, Eugene H. Violino, W6INH – SEC: WA6DUC, RMs: K6UYK, WB6OYN. Congrats to RM WB6OYN on taking over the difficult task of writing Zero-Beat for the SCN group. His first copy was very well done and it seems that now we will finally have a news bulletin for the more serious traffic handlers and ew advocates. Kevin and his father have put in a lot of hours in this effort and anyone with news items or noteworthy information should contact Kevin. Thanks to WB6MKV and K6UYK for their originating so much traffic to help us over the slow summer slump. WA6DUC back on his feet after a short period of illness and is back organizing AREC, which is really picking up. The San Fernando RC's WB6IPY made a suggestion that the members and the club donate to the W2OVC fund to help him fight his suit against his neighbor's million dollar suit, thanks to Smith, W6KMC finally made arrangements with neighbor to put up a good antenna and you should hear the improvement. W6PZY home after a stay at the hospital; Charlie will be missed very much by the SOWP group, which by the way had a very successful dinner meeting in Pasadena. Some of the locals are glad that Field Day is over, it turned out very hot and there was a lot of sunburn lotion used. I am sorry to report the passing of W6BHG, he will be missed very much by the SCN gang. Many of the younger members owe their code speed to his multiweekly OBS sent by machine at 18 wpm. He has done much for the Los Angeles Section hams. K6CL has been checking into the Wed. night AREC liaison net offering good pointers. The SGVRC, AREC group assisted the local police in the Eighth West Covina July 4th parade. W6HPN recently passed his Advanced Class exam. The TWR RC is planning a summer Novice and Tech. training class, those interested contact W6KQI. I would like to thank the Telco RC for enclosing the "FCC public notice" in their bulletin, its good information. The JPL RC/W6VIO operating 1 watt via Solar power made 391 contacts and worked 23 states. The Santa Clarita RC's W6KZL gave a good presentation of Slo-Scan TV. Glen gave everyone a lot of food for tinkering. W6OHS and W6OAW have built a brand new type antenna for 40 meters, for the San Pedro RC Field Day operation. Ramona RC's WA6CTB, EC; working on a drill in the near future, wants to test local message handling ability. A total of nine RCs reported to me with Field Day messag WA6BCO reports the Marina ARC will start Novice class in Aug. a upgrade class around the same time. WA6IDN reports FD v curtailed by unwanted visitors. WA6TCH mobiling 20, 40, and meters on trip to Sacramento. W6OAW has finished solid st frequency counter. W6RTT experimenting with directional meter antennas with some success. WA6TQA participated in VHF QSO party and worked four states. WB6VZI is helping the QSL Bureau for the West Valley RC. WA6OTU has had to sl down on SCN due to heavy school sked, but will soon be act again. W6DFM now has a new IC 230 for 2 meters, also n member of URAC Inc. Traffic: K6UYK 291, W6INH 20 WB6OYN 204, WA6TLV 96, WB6MKV 66, WA6BCO 38, WA6I 37, W6NKE 14, W6USY 14, K6EA 11, W6IVC 10, WA6TCH WA6ZKI 8, W6HUJ 6, K6CL 4, W6OAW 4, W6RTT 4, W6DGH

ORANGE – SCM, William L. Weise, W6CPB – Asst. SCM: D Burbeck, K6CID. SEC: WA6TVA. PAM: K6YCI. RM: WB6AK DRN6 Mgr.: K6GMI. The summer doldrums has hit the secti temperatures were exceedingly high causing some unusual s conditions. If you have missed DRN6 on 7265 kHz try 3950 k This is the alternate frequency when 40 meters is not propagati WA6DBX back on the air with new HW101 and 16 ant/wb verti On June 23 WA6TVA, K6CID and W6CPB were on standby alert assist in providing help in locating four lost persons in the upper S Juan Camp Grounds. Many thanks to WA6TVA for filling in for while on vacation. K6YNB scored 46,494 points in June V contest. This breaks the all-time national record. Congrats Way Wayne also had 1800 QSOs, with one transmitter, in the Field D operation. Excellent operating, no? W6BUK attended the Miss Trails Roundup at Buelton meeting many old friends. Some cl will be electing new officers for the coming year. Please s complete changes of officers to your SCM. Many changes are tak place in the regulations which may affect your operations. Be keep tuned to the Official Bulletin Stations to keep up with changes. Many are on vacation. Hope all have a great time. D safely and let us hear from you when you return. W6LHY, WB6J and others held FD in the White Mountains. Good newspa coverage. WA6TVA and WB6AKR received their Life Members plaque this month and WB6AKR received A1 Operator Certific Congrats to both. Traffic: K6GMI 426, WB6AKR 110, WA6T 52, W6WRJ 51, K6GGS 22, W6CPB 20, W6QBD 8.

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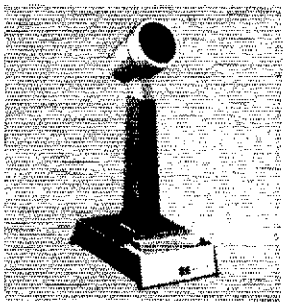

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SAN DIEGO – SCM, Cy Huvar, W6GBF – Asst. SCM: Art Smith, W6INI. Do all of you know who our Asst. Division Directors are? They are appointed by our Director to assist him in promulgating league affairs. W6DLN, W6INI, W6KGC, W6LRU, W6SE, W6SRS, K6SQ. Feedback from members is a vitally important business for our Director. Well done to SANDRA and Palomar repeater members for providing communications on June 1 and 2. Some 40 amateurs id an outstanding job. WA6HJW was net control. WB6OJP recently completed a 9600 mile trip around the U.S. and Canada keeping continuous schedules with daughter WA7JDO. W6OLR moving to Tehachapi, thanks Bill for AREC work. Guess all worked at least one ITU station. KO6ITU operated by K6SDR. WB6HGJ and WB6OLR logged over 2500 QSOs in 10 days. Nice going fellows. New Novices are WN6DSW and his dad WN6DZT, WN6EOT and WB6YBY. On June 8 we had a very profitable meeting with W6KW and other League Officials in Riverside. W6CPB SCM Orange was host. My thanks to W6INI, W6SRS, W6SE, W6KGC, K6HAV and W6PZU for their participation. Imperial Valley ARA has suspended formal meetings until Sept. On June 27 W6INI traveled to San Francisco to visit with FDAA, GSA, Red Cross. The purpose: ideas on what amateurs can do in an emergency situation throughout Calif. Thanks Art and WB6RPK SEC E. Bay section. W6DEY attended a farewell dinner for the closing of Santa Ana Monitor station. Roy started the station in 1941. PSHR: WA6DMB. Traffic: (June) WA6DMB 132, WB6PVH 90, W6DEY 29, WB6ERP 9, W6PZU 6. (May) W6VNQ 120.

SANTA BARBARA – SCM, D. Paul Gagnon, WA6DEJ – SEC: WB6HJW. RM: K6QPH. PAM: K6EVQ. This report is coming to you from 30K feet on the way to Rome. I hope visit some Italian hams on this trip. Field Day has just passed with activity heavy within the section. W6DM, W6AB, WA6VBU, W6HF, K6MN were the big guns. Explorer Post 2955 had 16 scouts on FD in Ventura led by W6PNM and K6VIE. WB6PGK leads the traffic again this month, and has obtained a mill to up his rate. K6QPH has a new four-element Quad at 70-ft. and is the letter "Q" for Calif. DX QSL Bureau. WB6VGC and XYL WA6HHH attended Fresno Hamfest. Herb won an award for his homebrew "J" antenna. WA6JVM heading up bi-monthly "T" hunts in Santa Maria; and Conejo Club has monthly hunt in L.O. WR6AEP AREC Net had 129 QNI in June (28/88-Tue. 1930). New SMRA chmn. is W6PNM; WA6OBT, vice-chmn. WA6CKK passed General. W6OAZ spoke at VCARC June. Dave received ARRL trophy for WAS via satellite and he h fully automated his Oscar command station. WB6HJW is breaking new keyer. MTN roundup was held in Buellton with K6EVQ, hos WB6MHU, MC; WB6PGK Tfc. award winner; WB6DXY door pri winner SB-300; WA6PEF, antique show. Other attendee WA6LBO, K6YX, WB6DHW, WA6DEJ. WA6WYD won journalist award as editor of K6MEP Keyer. W6HL made Oscar QSOs on F and made another big score with 15 transmissions. MAKRAC assisting CAP in Camarillo. Please report any interference to EI and have them clean up their equipment. W6QKI spoke on R design at SBARC. WB6FZU and WB6IYW are owners of new 31/9 repeater in S.B. W6TYP experimenting on 1750 meters. Traffi (June) WB6PGK 95, WA6DEJ 57, WB6LND 25, WA6OBT 1 W6PNM 6, WB6KOW 4. (May) WA6WMD 19, WB6HJW 4.

WEST GULF DIVISION

NORTHERN TEXAS – SCM, L.E. Harrison, W5LR – As SCM: Frank Sewell, W5IZU. SEC: K5KOM. RM: W5QU. WB5B writes a nice report covering the cw group. FB Bill. W5Q interested in OO job. Tyler QCWA chapter meeting attended by people June 29. WB5BFX/5 formerly Ft. Worth on the air fr Richardson. WA5BYH of Wichita Falls expresses interest in Leagu Abilene (Key-City) ARC scored on FD work but no message SCM. NoEasTexEmergency Net meeting June 30 at Hogg State Pa attendance. 35. SEC and SCM XYL there. W5LGY reports co merce/Greenville repeater call WR5ADV operating 19/79. Wich Falls AR Society circulates a swapsheet with club news. PAR treasury report very favorable per WA5FDK with $399.03 in ban Jack says '75 dues payable now. Much conversation comes from t 2-meter group these days and rightly so, but, when we bring up t subject of OVS we receive the silent treatment. W5HWN is the n Tex. State MARS Dir. Congrats Bob. Richardson WK has members in Novice class age 8 to 65. FB K5ZJP. K5STI received 25 points for FD message delivery to SCM. Regular meeting T Bldg. 8 PM 2nd Mon. of each month. Traffic: W5TI 250, WB5B 157, W5QU 149, WB5OGE 132, WA5NEJ 109, WB5EEE 1 W5GSN 55, K5QKM 45, W5SHN 36, W5IZU 26, WB5BFX/5 WB5BFZ 16, W5LR 14, WA5ING 12, WA5BXH 11, W5YK

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☐ SN7407	.49
☐ SN7408	.27
☐ SN7410	.24
☐ SN7411	.31
☐ SN7413	.89
☐ SN7416	.46
☐ SN7420	.24
☐ SN7421	.55
☐ SN7422	.31
☐ SN7425	.50
☐ SN7426	.33
☐ SN7430	.24
☐ SN7432	.35
☐ SN7437	.49
☐ SN7438	.52
☐ SN7440	.24
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☐ SN7442	1.12
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☐ SN7478	.85
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☐ SN7483	1.15
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☐ SN74156	1.45
☐ SN74157	1.45
☐ SN74158	1.45
☐ SN74160	1.85
☐ SN74161	1.59
☐ SN74162	1.75
☐ SN74164	2.10
☐ SN74165	2.10
☐ SN74166	1.85
☐ SN74173	1.85
☐ SN74175	2.60
☐ SN74176	1.85
☐ SN74177	1.85
☐ SN74180	1.10
☐ SN74181	4.10
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☐ LM-309H	5V Volt-Regulator TO-5	1.19
☐ LM-309K	5V Volt.-Reg. 1 Amp TO-3	1.85
☐ LM-310	Voltage-Follower TO-5	1.25
☐ LM-311	Hi-perf. Volt. Comp.*(A)	1.19
☐ LM-319	Hi-speed Dual Comp. DIP	1.50
☐ LM-320	MINUS 5, 12 or 24V V.R. TO-3	1.50
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OKLAHOMA – SCM, Cecil C. Cash, W5PML – Asst. SCM/SEC: Leonard R. Hollar, WA5FSN. RM: WB5GWB. Asst. RMs: WB5EEY and WN5KHC. PAMs: WB5AZS and WA5OUV. Was glad to hear from quite a few of the Field Day sites but there were many I didn't get a message from. Remember next year you should send your SCM a FD message. I visited two radio clubs and three FD sites in one swing around the state. Thur. night at Ponca City, Fri. night at club organizational meeting in Durant, then Sat. and Sun. made FDs with Ardmore and Ada then on Sun. back to close out FD with the Lawton Ft. Sill ARC. I received a real nice news release and FD report from the Black Mesa in the Okla. panhandle from K5HWO. Why not put your SCM on your club mailing list, I get club bulletins from several real active clubs. Vacations are over for some of us. I (foolishly) went south, but heard from W5JJ also W5EW and his YL. W5PWN who went to Colo. K5OCX was hit by the Okla. City tornado, lost his antennas and some damage to his house. Congrats to ARRL Life Members WA5OPV and WA5TXG of Altus. Congrats to new General Class WB5KCU and to new Novices WN5LUU, WN5LUV, WN5LUW, WN5LUY and WN5LUZ, all of Enid. How about your club, do you have a training program going? Happy vacation to all of you. Traffic: WB5GWB 143, WA5ZOO 130, W5RB 117, WB5EAY 53, WN5KNK 34, W5EW 30, WB5AZS 29, W5FKT 28, WA5FSN 25, W5SUG 23, WB5LYG 22, WB5ELG 15, W5PML 12, WB5EQR 2, WA5TWM 2, WA5OUV 1.

SOUTHERN TEXAS – SCM, Arthur R. Ross, W5KR – SEC: WA5YXS. PAM: W5HWY. RM: W5UGE. OOs reporting this month: W5RBB, WA5MIN, WA5LES, W5NGW. W5ZD became Silent Key May 30; retired from FCC at Kingsville, he was widely respected for his contributions to amateur radio; we will miss him. WB5FIC has new 60-ft. tower; WA5YSC and WA5WQF installed antenna. W7WAH/5 has new antenna farm courtesy K5EJL and WA5ZBJ. WA5TMT going to DA-Land for 3 years. WB5GZG has new bug-catcher but not old enough to drive! VHF openings fantastic according to OVSs K5UZJ, WA5OCP, K5CWS, WB5GYF. K5RVT operated portable SM6 first week of June. K5IZJ's son, age 10, is WN5LVL,5has 2 countries and 18 states on 40, OM K5LZT has 46 states on 6 ssb. WA5IQV reports good openings on 6, had 2 pages of contacts on Field Day. WB5HOD has new WAS certificate with cw endorsement. WB5DQF has joined 2 meter crowd with new handi-talky. W5KLV must be busiest OBS ever; averages 45 readings each bulletin! W5RBB, WB5AMN, WB5DBQ, WB5GZG activated Houston CD Hq. station, W5PMQ for FD. W5TFW had great time FD and meeting with W. Gulf Director W5EYB. WB5GNP is new outlet for Laredo and is first EC for Webb County. WB5HJV and others operated W5RRR (NASA ARC) for FD. W5UGE and W7WAH/5 have new homes. K5CWS working on new .22/.82 repeater in El Paso; tests show reliable range of 85 miles, but awaiting license. WB5CIT active on HF with school out; has new HT-220 for 2 meters and U44-BBT for 450 MHz. Corpus Christi ARC big success with North American Sailing Races, thanks to W5GEL, W5KNZ, WA5YKK, W5DYV, W5INN, W5YAO, W5JOK, W5GZ, WA5PZV. WA5AUB awaiting EP call; will be there several years. Traffic: (June) WB5CUR 356, W5TQP 280, WB5FMA 200, W5UGE 198, WA5VBM 160, WA5ZBN 118, W5KLV 116, WA5YEA 102, WB5GZG 90, K5ROZ 64, W5RBB 56, K5HZR 51, WB5DBK 51, W5BGE 48, WB5AMN 47, W5TST 44, WB5BWV 42, W5HWY 30, WA5LNV 25, WA5FOE 24, W5TFW 22, W5QO 21, WB5GNP 20, WB5HJV 18, W7WAH/5 15, WA5YXS 14, WB5IJR 12, W5EZY 8, K5RVF 5, WB5DQE 3, WB5GVO 3, WB5IOG 2. (May) WB5GVO 7. (Apr.) WB5GVO 24.

CANADIAN DIVISION

ALBERTA – SCM, Don Sutherland, VE6FK – Asst. SCM: Mrs Doncz Booth, VE6YL. SEC: VE6XC. PAM: VE6ALQ. As you all know after years at the same QTH, I have moved. This month due to my enforced inactivity I have little to report. A few more reports via mail would have been helpful. I enjoyed a visit with ZL2KG & XYL and was pleased to sked his brother ZL2LH for him. My time on FD was very limited and received reports from two Calgary entries. The CNIB white caners ham radio classes are progressing well. VE6RH doing a wonderful job with the code classes. How many of us realize how much amateur radio owes to VE6IO. Although antennas and towers are his business – Vic still places time and material in the background when he can be of use in amateur projects. Thanks VE6IO. VE6AW is recovering from surgery and should soon be home. OVS VE6MX has been doing an FB job organizing the Calgary BEBA campaigns during the illness of VE6AW. Traffic: VE6FS 52, VE6XC 23, VE6CAS 16, VE6FK 6, VE6WN 5, VE6AFJ 2, VE6AGU 1, VE6HF 1.

BRITISH COLUMBIA – SCM, H.E. Savage, VE7FB – VE8AS, Clinton Creek, Yukon, new transceiver, VE8RCS and VE8CFS

Wilson seven-element 20-meter beam in action for July. VE7BLO back in hospital with broken leg. Jim is a quadraplegic and it seems this has become an annual event. VE7APF in intensive care for heart attack. July has come so the news drops to the low level. But BCEN 3650 kHz is looking forward to an active summer net. VE2QC now VE7KX. Traffic: VE7CDF 70, VE7CCJ 26, VE7TT 7.

MANITOBA – SCM, Steve Fink, VE4FQ – We welcome VE4OW as our new RM and head of the CW Net, MTN. Thanks to VE4LG for an FB job the past year. Field Day reports were received from the Winnipeg DX Club, VE4AA/4, WARC, VE4BB/4, BARC, VE4QD/4, and VE4KE/4 along with VE4GM. Congratulations to VE4LX on a new junior op. Brandon Repeater VE4BDN has changed to 34/94 from 46/94 this past summer. OBS VE4MG spent the summer at home in Winnipeg but has now returned to Kelwood for another season of teaching school. You have less than one month till WARC's Hamfest '74 at the International Inn in Winnipeg on Oct. 5-6, so make your plans now. Registrations in advance and/or reservations to WARC at Box 352, Winnipeg. The Manitoba QSO Party goes Oct. 19-21 so let's get those VE4 calls on the air! Traffic: VE4OW 47, VE4PG 38, VE4RO 21, VE4JP 18, VE4FQ 12, VE4CR 9, VE4IA 8, VE4LU 5, VE4FK 4, VE4HE 4, VE4LN 4, VE4OP 4, VE4NF 2, VE4RL 2, VE4RW 2, VE4TY 2.

MARITIME – SCM, W.D. Jones, VE1AMR – SEC: VE1SH. RM: VE1ARB. Field Day messages were received from VE1CD/1, VE1LC/1, VE1WN/1 and VE1PEI/1. VE1CL, VE1LX, VE1ER and VE1KX made their annual trek to the Rochester Hamfest. VE1KX was recently married. The Kintore Mt. N.B. Repeater (VE1KMT, 46-06) is now on the air; also the Bridgetown N.S. repeater (VE1BO, 46-06) is operating. Other new hams from the Summerside, PEI area include VE1AOK, VE1AOY, VE1AEP, VE1APU, VE1APJ and VE1ANZ. Welcome aboard to you all and congrats to the instructor VE1AMA. Congratulations to VO1KE on running up some nice scores in the CD parties. Its nice to see VE1AKB coming along well after a nasty accident. We are all looking forward to seeing you at the Fredericton Hamfest, Bill. Anyone going to Charlottetown should drop in to see VE1ARB's collection of slides taken while in ZS-Land this summer, don't tell Janet I sent you though. Traffic: VE1AMR 100, VE1ARB 37, VE1AWP 22, VE1SH 5, VE1AYJ 1.

ONTARIO – SCM, Holland H. Shepherd, VE3DV – VE3DV has been nominated for a third term as SCM Ont. and wishes to take this opportunity to express his deep appreciation to all the members of the field organization, particularly the Leader Group, for their untiring efforts in developing and maintaining the Ont. field activities. Congratulations to a very active XYL, VE3CGO, on earning the coveted Guide award "The Golden Lamp of Learning" on qualifying as a trainer of Brownie and Girl Guide leaders. VE3VI recovering from a painful foot injury. VE3DV had a short but pleasing eyeball QSO with HB9AQZ during a stop over of a Swiss DC8 on which Hans is a Flight Engineer. EC VE3GFN already organizing the Ont. amateurs for the 1975 Winter Car Rally. VE3CGD and a Rallyman himself will organize the Ottawa leg while VE3RL will probably look after the southern leg as he did last year. Keep this special event on your calendars please. VE3FCJ having lots of fun with his new 5w QRP 5 band SSB/CW transceiver and even took it to the OARC where it was well received. CARF, Inc., held their annual Directors' meeting in Ottawa on June 22! Next month will be the annual RSO Convention at Hamilton and you are urged to make your reservations right away. The Ont. AREC has been noticeably strengthened by two recent additions. VE3CRX has taken over as EC Ottawa from VE3VP and VE3LU is newly appointed as EC Brantford. Congratulations to VE3EHN on getting his Advanced. Do you have a number of sases on hand at the QSL Bureau? Now is the time. Traffic: VE3SB 209, VE3GJG 126, VE3EHF 117, VE3FRG 89, VE3FOZ 84, VE3DV 76, VE3AWE 74, VE3DPO 72, VE3GFN 72, VE3DVE 67, VE3ASZ 53, VE3EWD 31, VE3CYR 28, VE3GOL 24, VE3FGV 20, VE3GRR 19, VE3ATR 10, VE3FZG 7, VE3VD 2.

QUEBEC – SCM, Larry Dobbey, VE2YU – We regret to report that lightning has damaged the station of VE2AOX. Hope she returns to the air soon to continue her skeds with South America. VE2-Land was well represented during Field Day but not too many Field Day messages were received by the SCM. A glance at the results of the CD parties indicate poor participation from appointees in VE2-Land. One of the requirements of your appointment is participation in CD operating events. Take a little time out and enjoy some good operating. A large aurora occurred on July 5 and was used to good advantage by VE2DFO and VE2RYG on 6 and 2 meters. VE2DFO worked over 100 stations during the early hours. VE2RM has acquired several FM rigs and will have them available in the near future. Plans are moving ahead for the erection of a new

tower at VE2RM site to expand the existing facilities. Many West Island Club members are building SSTV monitors under VE2AEG. The West Island Club meets on the 2nd Tue. of each month at Stewart Hall in Pte. Claire. New members are welcome. Traffic: VE2ALH 103, VE2DR 30, VE2BP 56, VE2EC 30, VE2OJ 21, VE2APT 9.

SASKATCHEWAN – SEM, Percy Crosthwaite, VE5RP – The Hamfest held at Melfort was a great success. A two meter experiment took place on the roof of the civic centre. The experiment was to see if we could hit Saskatoon repeater with a 35-ft. tower and a 12 DB gain antenna. Unfortunately it didn't work. VE6AEA flew from San Francisco Fri. night June 28 and arrived at Cold Lake, Alta. at 4 AM, then proceeded to drive to the Melfort Hamfest. Norm is a dedicated amateur and should be congratulated. As we are now into the fall of '74 I would like to ask you fellow amateurs to try and involve an amateur you know who is not an ARRL to become an ARRL member. Our next Geneva conference is not so far off and we need all the support we can get in order to keep the frequencies we now have. Support the amateur by supporting ARRL. Traffic: VE5OS 42, VE5DN 20, VE5WM 15, VE5NJ 13, VE5PD 12, VE5TC 12, VE5HF 6, VE5UZ 6, VE5SM 5.

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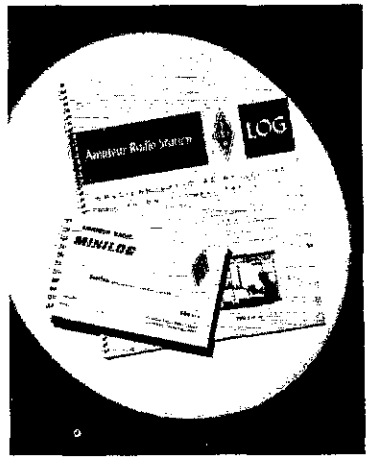

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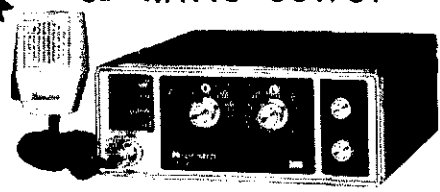

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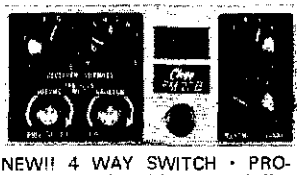

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Op Events

(Continued from page 100

cup awards. Non-members will receive certificates. Only YLRL members are eligible for the Corcoran Award. Contacts with OM will not count. Call CQ YL. All bands may be used, crossband not permitted. Only one contact with each station may be counted. Exchange QSO no., RS(T) and ARRL section or country. Entries in the log must show date, time, transmitter and power. Logs must be signed. Note that cw and phone are separate contests. Submit separate logs for each (phone takes place Nov. 7-8). To score: All YLs within an ARRL section score 1 point for each QSO with another station in an ARRL section. Score 2 points for each contact with a station not within an ARRL section (i.e. DX). Definition of DX: All stations not located within an ARRL section. DX YLs score 2 points for each contact with a station in an ARRL section and 1 point for a contact with another DX station (note that section lists are available from the YLRL v.p. upon receipt of an s.a.s.e.). Multiply no. of contact points by the total no. of ARRL sections and/or countries worked. Contestants running 150 watts or less dc input (at all times) may multiply result by 1.25. Ssb contestants running 350 watts p.e.p. or less at all times use the low power multiplier (1.25). High cw score gets gold cup (YLRL member only, anywhere in the world), high phone ditto. Additional certificate awards. Corcoran Award for high combined cw and phone from YLRL member only within an ARRL section. For DX, high combined cw and phone from No. and Central America (included the Greater and Lesser Antilles) will receive the YL/AP Hagen Plaque (YLRL members only). Highest combined score from any other part of the world will receive a duplicate award. Copies of logs must show claimed score, contain a signature and be postmarked no later than Nov. 22, 1974, to be received no later than December 19, 1974 or they will be disqualified. No logs will be returned. Mail to Chris Haycock, WB2YBA, 361 Roseville Ave., Newark, NJ 07107.

19-20 CD Party cw. Boy Scouts Jamboree-on-the-Air. RSGB 7 MHz DX Contest cw single operator, from 1800Z Oct. 19 to 1800Z Oct. 20 (phone Nov. 2-3). Work only G GC GD GI GM GW and contacts with stations using GB prefixes will not score bonus points. Exchange report plus serial starting with 001. Each contact between a British Isles station and a station in No. America counts 15 points. British Isles and EI 5 points. British Isles and S.A., Asia or Africa 25 points and British Isles with Oceania 50 points. A bonus of 20 points for the first contact with each country for British Isles entrants. Overseas stations may claim a bonus of 50 points for the first contact with each British Isles country numerical prefix (i.e. first G2, G3, etc.). Entries must be addressed to the HF Contests Committee, c/o J. Bazley, G3HCT, Brooklands, Ullenhall, Solihull, Warwickshire, England. Overseas logs must be posted in time to arrive by Dec. 16 for the cw contest and Dec. 30 for the phone contest. Include check list showing bonus points. Awards. *Manitoba QSO Party*, first annual, sponsored by the Amateur Radio Clubs of Manitoba, starts 0001Z Oct. 19 and ends 0400Z Oct. 21. The same station may be worked on each band/mode. Manitoba to Manitoba contacts are permitted. Exchange name, QTH, RS(T) and QSO no. Each QSO counts 1 point. Manitoba stations multiply no. of QSOs by the no. of U.S. states, VE provinces and countries. Out-of-province stations multiply no. of QSOs by the no. of Manitoba cities and towns worked. Suggested freqs.: ssb, 3770 3900 7145 7230 14190 14280 21240 21355 28600; cw, 3750 7150 14090 21200 28200. Awards. Mail a copy of the log, signed, to Doug. Bowles, VE4QZ, 1104 First St., Brandon, Manitoba, Canada R7A 2Y4. Mailing deadline is Nov. 8, 1974.

26-27 CQ WW phone.

28 W1AW Special Evening Qualifying Run.

NOVEMBER

2-3 Sweepstakes, cw, *RSGB 7 MHz phone* (see Oct. 19-20 listing).

6 West Coast Qualifying Run.

7-8 YL/AP, phone.

9 Frequency Measuring Test.

9-10 Rocky Mountain QSO Party, North Carolina QSO Party.

10 OK DX Test.

15 W1AW Qualifying Run.

16-17 Sweepstakes, phone.

23-24 CQ WW, cw.

Dec. 7-8, 160-Meter Contest.

Dec. 14-15, 10-Meter Contest.

Dec. 31, Straight-Key Night.

Happenings of the Month

(Continued from page 85)

pursuant to Congressional enabling legislation earlier approved by such residents by referendum, and

WHEREAS, the history, tradition and culture of the Commonwealth of Puerto Rico owes many of its unique features to its Spanish origin, and

WHEREAS, the residents of Puerto Rico have adopted Spanish as their principal business, professional and official language, and

WHEREAS, numerous United States government agencies make available their publications, forms and materials in Spanish, and

WHEREAS, written examinations for amateur operator privileges are now given by the Federal Communications Commission in Puerto Rico only in the English language,

Now, therefore, BE IT RESOLVED, by the Board of Directors of the American Radio Relay League, Inc., that the Federal Communications Commission be petitioned to make examinations for written elements of the amateur examination available at examining points located in the Commonwealth of Puerto Rico in the Spanish language.

19) Moved, by Mr. Gmelin, seconded by Mr. Chapman, that the General Manager is directed to prepare for filing by the General Counsel comments in the matter of Docket 20092 urging the adoption of the Commission's proposed method of alloting call signs to amateur extra class licensees. At the same time, the Board reaffirms its opposition to any call sign system which results in the mandatory change of call signs for existing amateur stations. But, after extended discussion, on motion of Mr. Cotterell, seconded by Mr. Albright, unanimously VOTED that the matter is laid on the table.

20) On motion of Mr. Chapman, seconded by Mr. Price, unanimously VOTED that the General Manager is directed to perform an in-depth study of establishing at League Headquarters the additional staff position of "Assistant Secretary for Legal Services." The report to be submitted to the Board at the 1975 annual meeting.

21) The Board recessed at 10:45 P.M., reconvening at the same place at 9:01 A.M. on July 18, 1974, with all persons hereinbefore mentioned in attendance.

22) On motion of Mr. Chapman, seconded by Mr. Thurston, after discussion, unanimously VOTED that the Communications Department continue the issuance of the DXCC Phone Award.

23) At this point, 9:12 A.M., at the request of Mr. Cotterell, members of the headquarters staff departed from the meeting. Mr. Clark assumed the recording of the minutes. On motion of Mr. Cotterell, seconded by Mr. Price, unanimously VOTED that the Board now resolves itself into a Committee of the Whole to discuss the questions of staff salary and retiree benefits. The Committee rose at 9:23 A.M., and reported to the Board, where upon, on motion of Mr. Thurston, seconded by Mr. Gmelin, the report was unanimously ADOPTED.

24) Moved, by Mr. Price, seconded by Mr. Zak, to adopt new Rules and Regulations concerning American Radio Relay League Conventions and Hamfests, as follows:

1. There shall be four types of ARRL authorized and approved meetings of members and other

persons interested in amateur radio:

a. National ARRL Conventions
b. Divisional ARRL Conventions
c. State ARRL Conventions
d. ARRL Approved Hamfests

2. Neither the name of the American Radio Relay League, nor the initial letters thereof, nor its *emblem, shall be used in connection with any* meeting, hamfest or convention, or in the advertising thereof, save such as defined above.

3. *Application* for approval of an ARRL Convention or Hamfest shall be submitted in writing, on appropriate forms, to the Division Director. The application shall include: date and place of proposed meeting, territory to be embraced, the particular purpose to be served thereby, the clubs, associations or groups who propose to sponsor it, and the names and addresses of the officers chosen to conduct it.

4. In all cases, the approval of the Division Director in the area in which the meeting is proposed to be held will be required. In addition, in the case of National ARRL Conventions the approval of the Board of Directors is required. In the case of Divisional and State ARRL Conventions the approval of the Executive Committee of the Board is required.

After discussion, moved by Mr. Albright, to amend the motion to add to Paragraph 4, "The management, program and financial plans of every such convention or hamfest shall be subject to the joint approval of the director concerned and the Executive Committee." But there was no second, so the motion to amend was lost. After further discussion, moved by Mr. Gmelin, seconded by Mr. Cotterell, to refer the question to the Membership *Affairs Committee for study. But, after further* discussion, on motion of Mr. Chapman, seconded by Mr. Albright, unanimously VOTED that the *matter is laid on the table.*

25) Moved, by Mr. Griggs, seconded by Mr. Albright, that the Board directs the League General Counsel to negotiate with the Federal Communications Commission for such changes in the rules governing amateur radio as may be necessary to permit multiplexed control and audio signals on the control link channel with a remotely controlled station, and to permit the control station in such instances to be operated from a fixed, portable or mobile location. After discussion, on motion of *Mr. Gmelin, seconded by Mr. Chapman, VOTED to* amend the motion to provide that counsel will proceed in cooperation with the VHF Repeater *Advisory Committee and the Legal and Regulatory* Committee. Mr. Spencer abstained; Mr. Griggs requested to be recorded as voting opposed. The question then being on the motion as amended, the same was ADOPTED.(Mr. Spencer abstained.)

26) On motion of Mr. McConaghy, seconded by Mr. Thurston, after discussion, the following *resolution* was unanimously ADOPTED: *RESO*LVED, that the Board of Directors, recognizing the need for increased public understanding of the nature of radio frequency interference and for improvement in the design of home electronic devices to render them less susceptible to RFI, endorses the program of the RFI Task Group and encourages the Task Group's continued efforts to establish corrective measures in this vital area.

27) On motion of Mr. Haller, seconded by Mr. Shima, unanimously VOTED to take from the *table the motion concerning SCM and SEC travel.* On further motion of Mr. Haller, seconded by Mr.

McConaghy, unanimously VOTED to amend the motion by striking the text and substituting therefor the following: "that the Communications Manager revise travel reimbursement rules for SCMs and SECs of Alaska, Canal Zone, Hawaii, and West Indies to provide for one trip each year to a convention or director called meeting in their own division without director prior approval." The question then being on the motion as amended, the same was unanimously ADOPTED.

28) The Board was in recess from 10:14 A.M. to 10:37 A.M.

29) Moved, by Mr. Grauer, seconded by Mr. Shima, that candidates for director and vice director be prohibited from using the ARRL non-profit postage rate for campaign purposes. But, after extended discussion, on motion of Mr. Thurston, seconded by Mr. Chapman, VOTED that the matter is laid on the table. Mr. Griggs requested to be recorded as opposed to tabling.

30) On motion of Mr. Chapman, seconded by Mr. Shima, unanimously VOTED that the president is directed to appoint annually an Official Availability Committee with the task of preparing for review by the Board a list of suitable persons to be considered for appointment to the Board of Directors of The ARRL Foundation, Inc. as vacancies on that Board occur in the future.

31) On motion of Mr. Gmelin, seconded by Mr. Shima, unanimously VOTED that the Board now engage in informal discussion of legal and regulatory matters. Whereupon the Board discussed such matters at length, during the course of which the Board was in recess for luncheon from 11:45 A.M. to 1:08 P.M. On motion of Mr. Gmelin, seconded by Mr. Arnold, unanimously VOTED that the informal discussion is terminated.

32) On motion of Mr. Gmelin, seconded by Mr. Arnold, unanimously VOTED to take from the table the motion concerning Docket 20092. On further motion of Mr. Gmelin, seconded by Mr. Price, unanimously VOTED that the matter is referred to the Executive Committee, for action after later canvassing of information from directors.

33) On motion of Mr. Wicker, seconded by Mr. Zak, after discussion, unanimously VOTED that the ARRL Public Relations Consultant in cooperation with the Plans and Programs Committee, develop a plan for preparing and distributing recorded public service announcements regarding amateur radio for use on commercial radio stations.

34) On motion of Mr. Price, seconded by Mr. Shima, after discussion, unanimously VOTED that the post of Past-Director is created in the League organization. Each director of the League, shall upon leaving office, be designated as Past-Director. As such he shall be eligible to take part in Communications Department QSO parties, to receive Directors' Letters as issued by the Secretary, to wear the Director's pin as his badge of office, to be considered as a League "official," and to perform such duties as the Board may from time to time determine.

35) On motion of Mr. Albright, seconded by Mr. Shima, after discussion, unanimously VOTED that the Plans and Programs Committee review and prepare any necessary recommendations for further streamlining Board operating procedures.

36) On motion of Mr. McConaghy, seconded by Mr. Wicker, after extended discussion, VOTED

that the Board of Directors approves the application of the Northern Virginia Amateur Radio Council to sponsor an ARRL National Convention in the Washington, D.C. area on September 12-14, 1975. Mr. Griggs requested to be recorded as voting opposed. The Board was in recess from 2:50 P.M. until 3:06 P.M.

37) On motion of Mr. Spencer, seconded by Mr. Eaton, unanimously VOTED to grant approval for the holding of an ARRL National Convention in Toronto, Ontario, on June 4-6, 1977, under the sponsorship of the Scarborough Ama. Radio Club.

38) Moved, by Mr. Zak, seconded by Mr. Arnold, that Life Membership be conferred on those ARRL members who have held a continuing 50-year membership in the ARRL and have reached a minimum of 60 years of age. After discussion, Mr. Gmelin called for the question, seconded by Mr. Price, which call was VOTED, 9 in favor, to 7 opposed. Whereupon, the question being on Mr. Zak's motion, same was rejected.

39) On motion of Mr. Gmelin, seconded by Mr. Griggs, after discussion, unanimously VOTED that the Membership Affairs Committee in cooperation with the Communications Manager, study the advisability of establishing a special Emergency Coordinator appointment for areas larger than an ARRL section when it is found that such large area coordination is necessary for special reasons.

40) Moved by Mr. Wicker, seconded by Mr. Griggs, that the Management and Finance Committee develop expanded guidelines regarding suggested duties, the selection and termination of assistant director appointments for inclusion in the Director Workbook. But, after extended discussion, on motion of Mr. Price, seconded by Mr. Chapman, unanimously VOTED that the matter is laid on the table.

41) On motion of Mr. Cotterell, seconded by Mr. Shima, VOTED, 9 in favor to 6 opposed, that the Board now engage in informal discussion of various types of insurance for amateurs. Whereupon the Board engaged in such discussion. On motion of Mr. Cotterell, seconded by Mr. McConaghy, unanimously VOTED to terminate the discussion.

42) On motion of Mr. Price, seconded by Mr. Chapman, after discussion, unanimously VOTED that there shall be added to the Rules and Regulations Concerning ARRL Conventions a provision authorizing the category "ARRL Approved Hamfests." Appropriate rules and regulations for ARRL Approved Hamfests to be developed by the Membership Affairs Committee, in cooperation with the General Manager, for adoption by the Executive Committee.

43) On motion of Mr. Griggs, seconded by Mr. Haller, unanimously VOTED that the Board approves the holding of a Southwestern Division ARRL Convention in Ventura, California October 24-26, 1975.

44) On motion of Mr. Albright, seconded by Mr. Griggs, after discussion, unanimously VOTED that the Plans and Programs Committee, in coordination with the Membership Affairs Committee, develop more definitive guidelines for the planning and conduct of National ARRL Conventions.

45) Moved by Mr. McConaghy, seconded by Mr. Zak, to amend By-Law 25 by adding to the territory of the Hudson Division, in the listing of

counties of the State of New York, the names "Saratoga, Warren and Washington." On a roll call vote, the question was decided in the affirmative, 16 votes in favor to 0 opposed. All the directors voted in favor. So the By-Law was amended.

46) On motion of Mr. Haller, seconded by Mr. Griggs, after discussion, unanimously voted that the General Manager is requested to investigate ways and means of facilitating earlier delivery of *QST* to those members residing in such areas as Alaska, Hawaii, the Canal Zone, and West Indies section.

47) On motion of Mr. Arnold, seconded by Mr. McConaghy, unanimously VOTED that the American Radio Relay League extends its sincere congratulations and best wishes to the Federal Communications Commission on the occasion of its 40th anniversary.

48) At this point Mr. Clark assumed the Chair. On motion of Mr. Egbert, seconded by Mr. Cotterell, unanimously VOTED that the Board congratulate the Hudson Division on its 50th anniversary of the foundation of the division.

49) On motion of Mr. Zak, seconded by Mr. Arnold, after discussion, unanimously VOTED that the Membership Affairs Committee study the feasibility of providing, at charge, an ARRL newsletter for disseminating timely information.

50) Moved, by Mr. Chapman, seconded by Mr. McConaghy, that the ARRL petition the FCC to award and authorize any amateur radio operator, who has held a General Class or higher license for 50 years, honorary Extra Class operator's privileges. The proof of 50 years of amateur service would be with the applicant. After discussion, on motion of Mr. Price, seconded by Mr. Cotterell, unanimously VOTED that the matter is referred to the Legal and Regulatory Committee for study.

51) On motion of Mr. Gmelin, seconded by Mr. Zak, after discussion, VOTED, 9 in favor to 6 opposed, that the Membership Affairs Committee study the possibility of establishing a patron, endowment and/or sustaining membership in addition to the present Associate, Full and Life Membership. Messrs. Albright, Price and Thurston requested to be recorded as voting opposed.

52) On motion of Mr. Wicker, seconded by Mr. McConaghy, unanimously VOTED that the Membership Affairs Committee review the desirability of establishing a plan whereby a complete set of ARRL publications can be purchased annually as a package by members desiring this service.

53) Moved, by Mr. Price, seconded by Mr. Shima, that By-Laws 32, 33, 34, 35, and 36 are amended by the deletion of the words "as directed" in the first sentence of each By-Law. After extended discussion, on motion of Mr. Albright, seconded by Mr. Haller, unanimously VOTED that the matter is laid on the table.

54) Moved, by Mr. Griggs, seconded by Mr. Albright, that the eligibility requirements for any elected official of the League include a provision for a statement by candidates for such offices affirming that they have, and will continue to have, a telephone number listed publicly so that they will be accessible to their constituents during their terms of office. After discussion, moved by Mr. Gmelin, seconded by Mr. Chapman, to amend the motion to provide that the telephone bill will be paid by the League. After further discussion, on motion of Mr. Shima, seconded by Mr. Zak, VOTED, 13 in favor to 2 opposed, that the matter

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is laid on the table. Messrs. Gmelin and Price requested to be recorded as voting opposed to tabling.

55) At this point Mr. Dannals resumed the Chair. The Board was in recess for dinner from 5:30 P.M. until 8:05 P.M.

56) On motion of Mr. Haller, seconded by Mr. McConaghy, unanimously VOTED that the General Manager provide for a League representative and/or booth at the annual convention of the National Red Cross in Boston in 1975.

57) On motion of Mr. Grauer, seconded by Mr. Shima, unanimously VOTED to take from the table the motion concerning the election questionnaire format, together with its pending amendments. After discussion, moved, by Mr. Gmelin, seconded by Mr. Chapman, to lay the matter on the table; but the motion to table was rejected, 6 in favor to 10 opposed. After further discussion, the question being on the second amendment (Mr. Albright's) the same was ADOPTED. The question then being on Mr. Gmelin's amendment (as just amended) the same was unanimously ADOPTED. Finally, the question being on the main motion, the same was unanimously ADOPTED

58) Moved, by Mr. Gmelin, seconded by Mr. Thurston, that the Legal and Regulatory Committee study the desirability of petitioning FCC for the issuance of special call signs for United States amateurs during the coming U.S. Bi-centennial celebration or supporting such petitions already submitted for special call signs. After discussion, on motion of Mr. Arnold, seconded by Mr. Griggs, VOTED that the matter is laid on the table. Mr. Gmelin requested to be recorded as opposed to tabling.

59) Moved by Mr. Wicker, seconded by Mr. Albright, that the Membership and Affairs Committee in cooperation with the General Manager investigate the feasibility of preparing for membership distribution on cassette tapes, copies of W1AW code practice sessions, such service to be self supporting. After extended discussion, on motion of Mr. Shima, seconded by Mr. Egbert, unanimously VOTED to amend the motion by striking the text and substituting therefor the following: "that the Communications Manager continue to investigate, and if feasible, implement a program of offering to the membership cassette tapes of code practice. Such program to be self supporting." The question then being on the motion as amended, the same was unanimously ADOPTED.

60) Moved, by Mr. Price, seconded by Mr. Shima, to take from the table the motion concerning an amendment of By-Laws 32 through 36; but the motion was rejected, 2 in favor to 14 opposed.

61) Moved, by Mr. Griggs, seconded by Mr. Grauer, that the Board of Directors does hereby instruct the president, general manager and other officers of the League to initiate a strong program of cooperation with the FCC looking towards the elimination of malicious interference with nets and other amateur operations on the amateur bands. After discussion, on motion of Mr. Spencer, seconded by Mr. Albright, unanimously VOTED to amend the motion to provide that the president shall appoint a committee to study a program of cooperation with the FCC looking toward the elimination of malicious interference with nets and other operation in the amateur bands, and make

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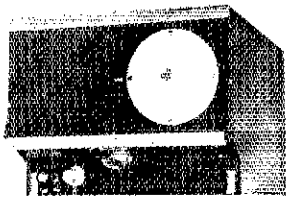

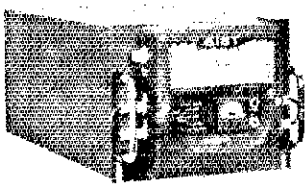

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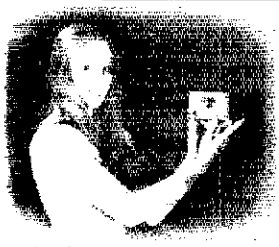

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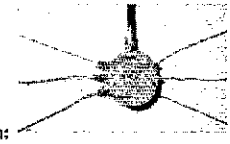

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recommendations on procedures to be established to solve the problem by ARRL working in cooperation with government agencies. The question then being on the motion as amended, the same was unanimously ADOPTED.

62) Moved, by Mr. Smith, seconded by Mr. McConaghy, that, at the request of the VHF Repeater Advisory Committee, the General Counsel request the FCC to amend its rules with respect to repeater operation in the 50 MHz amateur band to permit (1) expansion of the repeater band from 52-54 MHz to 51-54 MHz, and (2) to increase the effective radiated power to a maximum of 300 watts at 1,000 feet above average terrain and to a maximum of 500 watts at lower heights. Extended discussion followed. The Board recessed at 9:25 P.M., reconvening at 8:32 A.M. on July 19, 1974. Moved, by Mr. Price, seconded by Mr. McConaghy, to amend the motion to place the lower repeater subband limit at 51.5 instead of 51.0 MHz. After further discussion, moved, by Mr. Albright, seconded by Mr. Chapman, to further amend the motion to provide that ARRL headquarters study the frequency segment requirements for the various modes of operation in the 50-54 MHz band and make appropriate recommendations to the Board. On the second amendment, a roll call was requested, and the motion was rejected, 4 in favor to 11 opposed; Messrs. Albright, Chapman, Shima and Wicker voted in favor; all other directors voted opposed, except Mr. Spencer, who abstained. The question then being on the first amendment, and a roll call also being requested, the same was VOTED, 11 in favor to 4 opposed; all the directors voted in favor except Messrs. Albright, Chapman, Shima and Wicker, who voted opposed, and Mr. Spencer, who abstained. The question then being on the amended motion, the same was ADOPTED. Mr. Albright requested to be recorded as voting in opposition. Mr. Spencer abstained.

63) On motion of Mr. Smith (at the request of the VHF Repeater Advisory Committee), seconded by Mr. McConaghy, after discussion, unanimously VOTED that the General Counsel petition the FCC to amend its rules to permit portable operation of remotely controlled repeaters with effective radiated powers not exceeding 100 watts.

64) Moved, by Mr. Smith (at the request of the VHF Repeater Advisory Committee), seconded by Mr. Zak, that the General Counsel petition the FCC to amend the rules to permit slow scan television operation on repeaters operating in VHF bands. After discussion, on motion of Mr. Gmelin, seconded by Mr. Zak, unanimously VOTED (Mr. Spencer abstaining) to amend the motion to provide the addition of fm facsimile(F4 emission) no wider than an F3 signal allowed in the same band. Whereupon, the question being on the motion as amended, the same was unanimously ADOPTED (Mr. Spencer abstaining).

65) On motion of Mr. Price, seconded by Mr. Gmelin, VOTED that the Editor of *QST* is instructed to establish a periodic propagation column to include both articles on the theory of hf propagation and predictions of long-range and medium-term radio conditions in the amateur frequency bands.

66) On motion of Mr. Price, seconded by Mr. Cotterell, after discussion, unanimously VOTED that the Plans and Program Committee is directed to undertake, in conjunction with the staff, the design of a suitable standard QSL card for use by the Board family.

67) On motion of Mr. Price, seconded by Mr. Albright, after discussion, unanimously VOTED that the Membership Affairs Committee study the minimum license class qualification that is desirable in the rules for candidates for SCM.

68) The Board was in recess from 9:50 A.M. until 10:10 A.M.

69) On motion of Mr. Griggs, seconded by Mr. Thurston, after discussion, unanimously VOTED that the Board of Directors instructs the General Manager to reserve the right to reject any advertising claims for antennas or equipments indicating such items are FCC Type Accepted or FCC Type Approved so that there shall be no misunderstanding leading to an abrogation of the amateur's right to experiment and to operate experimental equipment without hindrance.

70) There being no further formal business, the Board engaged in an extensive discussion, lasting more than an hour, on the general subject of possible FCC proposals to restructure amateur radio licensing and with particular attention to a no-code license.

71) The president announced the appointment of an ad hoc committee to study the structure of ARRL standing committees of the Board, with Mr. Clark as Chairman and each standing committee chairman a member.

72) Whereupon, on motion of Mr. Chapman, seconded by Mr. Haller, unanimously VOTED at 12:20 P.M., that the Board now adjourn, *sine die.*

73) (Total time in session as a Board, 19 hours, 13 minutes; as a Committee of the Whole, 11 mins.)

Respectfully submitted
JOHN HUNTOON, W1RW
Secretary

Frequency Standard

(Continued from page 21)

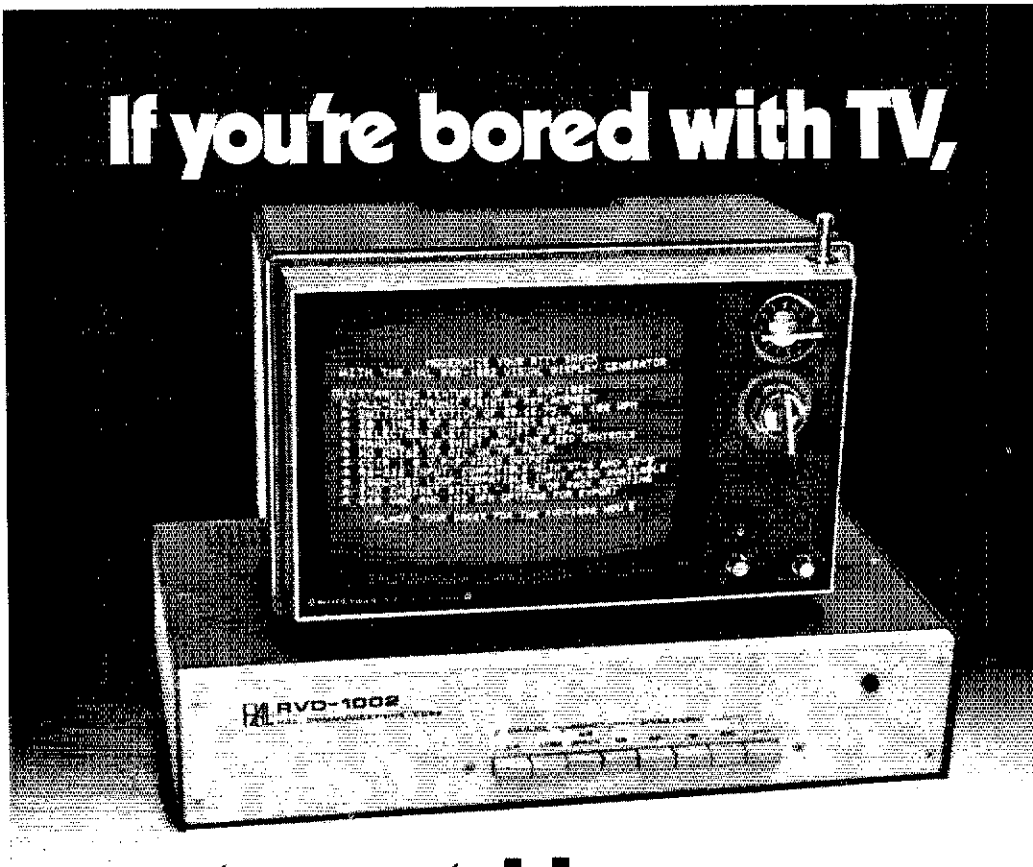
In the present advanced state of the art, excellent compact standards are available, representing the culmination of many years of research by experts. Thus a long development program may not be economical for an individual, where time is important. On the other hand, the mere purchase of a standard is not educational. The author hopes that the considerable number of amateurs who are interested in high-accuracy frequency measurement will find useful ideas herein, and perhaps be able to build more accurate equipment, at moderate cost. Perhaps some readers who may never build a frequency standard will have gained a better idea of the factors involved in the design and construction of better-than-average gear.

Acknowledgements

The author is grateful for suggestions from Don Hilliard, WØEYE, Gerry Reeve WØEI, and Jack Quinn, KØEH, who built equipment using many of the principles described herein. Discussions with Don Halford, WØJVD, with George Kamas, and with Richard Davis, were also very helpful. QST

[EDITOR'S NOTE: A complete list of references used by the author in preparation of this article is available from ARRL Headquarters. Please send s.a.s.e. for copy.]

If you're bored with TV,



try watching ours.

We've put RTTY in its place. On television. And watching TV was never more exciting. The HAL RVD-1002 takes the output of any TU and converts the signal to one that's compatible with any TV receiver (with slight modification). Or the signal can be fed directly to a video monitor.

The RVD-1002 is compatible with signals from any TU at 60, 66, 75 or 100 WPM. The RVD-1002 means an end to the headaches of electromechanical printers — and the beginning of silent, reliable, low-power-consuming, trouble-free RTTY reception.

Whether you're into amateur RTTY, or thinking about it, or just interested in "seeing" what all those RTTY signals you hear are saying, the RVD-1002 is the perfect answer. HAL also offers the RVD-2110 (a complete, all-channel TV set, plus RTTY readout). And if you're looking for one of the best TU's around, HAL has the answer — in the ST-6. The ST-6 is practically immune from interference, is all-solid state, has features like autostart and anti-space, shift selection and much more. For transmitting, there's the HAL RKB-1 TTY keyboard, with features like auto letter/number shift at all four RTTY speeds. And all HAL products are built with care, based on sound, proven engineering and use only the finest state-of-the-art components available.

If you're looking for better television programming, get into the exciting world of video-displayed RTTY from HAL. Whether you want to ham it up or catch the latest news, or just explore the very wide world of RTTY entertainment, HAL has it. And it's a really big show!

RVD-1002 video unit: $575.
RVD-2110 monitor/TV: $140.
ST-6 RTTY terminal unit: $310.
RKB-1 TTY keyboard: $250.
RKB-1 TTY keyboard: $250.

HAL Communications Corp.
Box 365, Urbana, Ill. 61801
Telephone: (217) 359-7373

☐ Enclosed is
$_____ (RVD-1002 video unit)
$_____ (RVD-2110 Monitor/TV)
$_____ (ST-6 RTTY TU)
$_____ (RKB-1 TTY keyboard)
☐ Charge Master Charge #_____
☐ Charge BankAmericard #_____
☐ M/C Interbank #_____
Card exp. date_____
☐ Please send me the HAL catalog.

Name

Address

City/State/Zip

All prices include USA shipping.
Add $10 each for air shipment.
Illinois residents add 5% sales tax.

For the best RTTY, you need all the help you can get.

It's all right here.

The HAL ST-6 terminal unit has been hailed by experienced RTTY amateurs. Its immunity to interference and noise is the talk of the RTTY world as the best in the business. In fact, we built it to highest standards — but kept the price in a range that you can afford.

The features of this unit tell the story of why it's so popular: Auto-start operation, separate input filters for each shift, an antispace feature, and switch selection of 60 and 170 Hz shifts are standard. An extra discriminator for a 425 Hz shift is available as an option. A space-saving special power transformer is part of the package; it includes windings for low voltage and loop supplies, and a 115/230 VAC primary. Dual-in-line IC's are mounted in sockets for ease of testing and replacement. Seven G10 epoxy glass boards with reliable wiping contacts hold all circuitry. Tuning is read from a 1 ma. panel meter which, at the flick of a switch, serves as a loop current readout. Other visual indicators display AC power on, Mark, and Space conditions. Two other lamps indicate whether the ST-6 is in the receive or standby mode. For maximum safety, a three-wire grounding cord and grounding outlet for the printer are included. The power supply cord contains easy-to-replace clip-in fuses. The ST-6 is available factory assembled and aligned, or in kit form. The PC boards and cabinet only are also available.

A popular option designed to plug right in to the ST-6 is HAL's AK-1 AFSK oscillator. Available assembled or in kit form, the AK-1 is an AFSK oscillator that demonstrates stability and reliability. It provides switch selection of 170 Hz and 850 Hz shift using standard AFSK tones. The AK-1 may also be mounted in its own cabinet for use as an independent unit. Frequencies are set by 15-turn trimmers for ease of accurate tone adjustment. The AK-1 operates on 12 VDC, or directly from the ST-6 power supply.

If you're ready for the very best RTTY at an attractive price, look into the HAL ST-6 TU, the 425 Hz discriminator, and the AK-1 AFSK oscillator. They'll give you all the help you need. Order yours today!

Prices:

Assembled:
$310 — ST-6 Terminal Unit
$350 — ST-6/425 Hz Disc.
$350 — ST-6/AK-1
$390 — ST-6/425 Hz Disc/AK-1

Kit Form:
$147.50 — ST-6 Terminal Unit
$ 35.00 — ST-6 Table or Rack Cabinet
$ 29.00 — 425 Hz Discriminator
$ 29.00 — AK-1 AFSK Unit

All prices postpaid, USA. For air shipment add $4 for the ST-6 kit or cabinet, $1 each for the 425 Hz kit or the AK-1 kit, $10 for the assembled ST-6 with any options.

HAL Communications Corp.
Box 365, Urbana, Ill. 61801
Telephone: (217) 359-7373

☐ Enclosed is $_____ for the following items: ☐ ST-6 Assembled. ☐ With all options; ☐ ST-6/425 Hz Disc; ☐ ST-6/AK-1; ☐ ST-6 kit; ☐ ST-6 Cabinet; ☐ 425 Hz Disc kit; ☐ AK-1 kit.

☐ Charge to my Master Charge #_____

BankAmericard #_____

Master Charge/Interbank # and Exp. date_____

☐ Please send me the HAL catalog.

Name_____

Address_____

City/State/Zip_____

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 50 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 15 cents per word will apply to advertising which, in our judgement, is obviously non-commercial in nature. Thus, advertising of bona fide *surplus equipment owned, used and for sale by an* individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 15-cent rate. Address and signatures are charged for, except there is no charge for zipcode, which is essential you furnish. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 50-cent rate. Provisions of paragraphs (1), (2) and (5) apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions. No checking copies can be supplied.

(8) No advertiser may use more than 100 words in any one advertisement, nor more than one ad in one issue.

(9) Due to the tightness of production schedules, cancellation of a Ham-Ad already accepted cannot be guaranteed beyond the deadline noted in paragraph (5) above.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST *are unable to vouch for their integrity or for the grade or character of the products or services advertised.*

QCWA Quarter Century Wireless Association is an international non-profit organization founded 1947. Any Amateur Radio Operator licensed 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., Box 394, 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 580, 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, West Coram NY 11727.

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.

BLUEFIELD, W. Va. Hamfest, August 24-25th, bigger this year. Big flea market, free space for information contact K4CGF, Ralph, Rocky Gap VA 24366.

MIX pleasure with pleasure at the Hamburg International Hamfest near Niagara Falls on September 21. For information contact Lin Brownell, WB2HCL, 210 Buffalo, Hamburg NY 14075.

INDIANA'S fastest growing fall hamfest. Grant County ARC's annual hamfest, Sept. 29, 1974, 4-H Fairgrounds. Admission still $1 for advance tickets, $1.50 at gate. Large flea market, *technical sessions, bingo for XYLs, large inside pavilion, plenty* of parking. For more information or advance tickets, write W9EBN, P.O. Box 815, Marion IN 46952.

FOUNDATION for amateur radio annual hamfest Sunday 20 October, 1974 at Gaithersburg Maryland Fairgrounds.

CINCINNATI Hamfest: 37th annual — Sunday September 15, 1974 at the New Stricker's Grove on State Rt. 128, one mile west of Ross (Venice), Ohio. Flea market, contests, model aircraft flying, food and beverages all day. $7 covers everything. For further information: Ray Clark, WB8BUF, Box 1521, Cincinnati OH 45201.

MEMPHIS area Hamfest and Tennessee ARRL Convention, Sunday October 6 at State Technical Institute, conveniently located at Interstate 40 and Macon Road (Exit 11). Demonstrations, Displays, FM forum, MARS meetings, flea market, XYL entertainment. Informal dinners Saturday night. Dealers and Distributors welcome. Talk-ins on 3980, 34-94 and MARS. Contact Harry Simpson, Box 27015, Memphis TN 38127, Phone (901) 358-5707.

THE New York Radio Club invites hams to club meetings, 2nd Monday of each month, 8:00 P.M. at the Williams Club, 24 E. 39th St., NYC.

QSLs??? Made-to-order!!! Samples 35c. DeLuxe 50c. Relig 35c. (Deductable). Sakkers, W8DED, Box 218, Holland 49423.

PICTURE QSL cards of your shack, etc. from your photog or art work. 500 — $13.50, 1000 — $18.25. Also un non-picture designs. Generous sample pack 35c. Half pour samples 65c. Raum's, 4154 Fifth Street, Philadelphia PA 19

3-D QSLs — Increased returns assure users' satisfaction. San 25c (refundable). 3-D QSL Co., Monson 2, MA 01057.

TRAVEL-PAK QSL Kit — Send call and 25c; receive you *sample kit in return. Sameo, Box 203, Wynantskill NY 1219*

FREE QSL samples, Samcards, 48 Monte Carlo Dr., Pittsb PA 15239.

QSLs, samples 10c. Fred Levden, W1NZJ, 454 Proctor Revere MA 02151.

QSLs 300 for $4.65, samples dime, W9SKR, Ingleside IL 60

QSLs "Browne" W3CJI, 3035A Lehigh, Allentown PA 18 Samples with catalog 35c.

DELUXE QSLs, Samples 20c. Petty, W2HAZ, P.O. Box 5 Trenton NJ 08638.

DON'T buy QSL cards until you see my free samples, service, economical prices. Little Print Shop, Box 9848, A TX 78757.

QSLs, 300 for $4.95. Others equally low priced. Samples Colourcard, Box 326, Topanga CA 90290.

FRAME Display, and protect your QSLs with 20 pocket p holders, 2 for $1, 7 for $3, prepaid and guaranteed. Tep Box 198T, Gallatin TN 37066.

QSLs. Second to none. Same day service. Samples airmailed Ray, K7HLR, Box 331, Clearfield, UT 84015.

QSLs — Variety, value, quality, custom. Samples and ca 20c, Alkanprint, Box 3494, Scottsdale AZ 85257.

RUBBER stamps $2 includes postage. NJ residents add Clints Radio, W2UDO, 32 Cumberland Ave., Verona NJ 07

QSLs 3 color glossy $4.50, samples 10c. Rutgers Vari-T *Service, Thomas St., Milford NJ 08848.*

QSLs, samples 20c. John Hull Printing, Rte 6, Box 41, D MN 55804.

QSLs from "Bullett," creative designs, fast service, econon Send 20c for samples to Bullet Printing Co., Box 3033, Wac 76707.

QSLs catalog. Samples 35c. Ritz Print Shop, 5810 Detroit Cleveland OH 44102.

CREATIVE QSL cards. Personal attention. Imaginative designs. Send 25c. Receive catalog, samples. Wilkins Prin Box 787-1, Atascadero CA 93422.

CANADIAN Surplus Catalog and flyers $1. Etcox Electro Box 741, Montreal Canada H3C 2V2.

CANADIANS — We carry a broad line of electronic including most solidstate LEDs, ICs, etc. Send for free fly Ken, VE1AOJ, Dartek Electronics, Dept. Q, Box Dartmouth, Nova Scotia B2W 4A5.

TOP band kits Yaesu FT-401/570. $23 air mail. Details, M Leeming, 21 Beresford Road, Blackburn, BB1 8BG England

CASH paid for your unused tubes and good ham and comm equipment. Send list to Barry, W2LN1, Barry Electronics Broadway, NY NY 10012.

CALL Toll-free: (800) 327-7799. Ask for Bob Hoffman Electronics Corp.) We buy all types of tubes. Top prices pa Varian, Eimac, Amperex. Address: 412, 27th Street, Orlan 32806. In Florida call collect (305) 843-9551.

THE El Paso Texas Hamfest and Swapmeet will be Saturda Sunday, October 12-13. Seminars, hospitality and fleam For info; WB5CMB, 7772 Gran Quivira, El Paso TX 79904.

GRAND Rapids Swapfest. September 21, 8AM, Hudso fairgrounds, M-21 at 40th, three blocks West of Hudso traffic light. $1.75 admission, no charge for tables and sales.

A.W.A. National Historical Radio Conference, Canadaigua, York, Oct. 4th and 5th. Programming for old time oper radio historians and collectors. Write W2QY for details.

SPIDERS for boomless quads. Heliarc welded aluminum Antennas, 1339 So. Washington St., Kennewick WA 99336

VERY in-ter-est-ing! Next 5 big issues $1. "The Ham Tr Sycamore IL 60178.

TRANSFORMERS rewound, Jess Price, W4CLJ, 507 E Orlando FL 32806.

NOVICES: Need help for General ticket? Complete rec audio-visual theory instruction. Easy, no electronic backg necessary. Write for free information. Amateur License, P 6015, Norfolk VA 23508.

WANTED: tubes, transistors, equipment, what have Bernard Goldstein, W2MNP, Box 257, Canal Station, New NY 10013.

MANUALS for ham gear before 1967. S.a.s.e. for specific W0JJK, Hobby Industry, Box 4864, Council Bluffs IA 5

WE BUY electron tubes, diodes, transistors, integrated ci semiconductors, Astral Electronics, 150 Miller St., Elizabe 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.

P.C.'s. Send large s.a.s.e. for list. Semtronics, Rt. 3, Box 1, Fellaire OH 43906.

TELETYPEWRITER parts, manuals, supplies, equipment. Toroids. S.a.s.e. for list. Typetronics, Box 8873, Ft. Lauderdale FL 33310. W4NYF. Buy parts, late machines.

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.

STUDYING for FCC ham exams? Try Posi-Check. 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. Each classification complete for its own class only. New General, including section on new Rules and Regulations $5.10, new Novice $3.35; Advanced Class $4.65; Extra Class $4.90. First class mailing included. Air mail 25c extra per copy. Send check or money order to Posi-Check. P.O. Box 3564, Urbandale, Des Moines IA 50322.

WANTED: Squires-Sanders SS-1R, also if available SS-1S. R. A. Kumada, 1902 W. Victory Blvd., Burbank CA 91506.

PAYING 5% over best offer for any 618T, 490T, ARC51, GRC106. Any Collins item or Eimac tube. The Ted Dames Company, W2KUW, 308 Hickory Street, Arlington NJ 07032 (201) 998-4246, or 998-6475 nites.

CLEGG FM-27Bs at prices I dare not publish. WØNGS, Bob Smith Electronics, 1226 9th Ave. North, Fort Dodge IA 50501. (515) 576-3886.

LEARN design techniques. Electronics Monthly Newsletter. Digital, linear construction projects, design theory and procedures. Sample copy $1. Valley West, Box 2119-D, Sunnyvale CA 94087.

DXers DC-100 preamplifier: MOSFET, 20 dB gain, 5 dB, n.f., 10-30-MHz — $39.95. DC-200 logarithmic speech processor, 8 dB increase in average power, with level meter — $49.95, in cabinets. Dynacomm, 1183 Wall Road, Webster NY 14580.

FOR SALE: NCX-2 transceiver. Recently overhauled at factory — $140. Rich Mandelbaum, WA2IYF, 72 Quinn Road, Scarborough NY 10510.

NOVICES: Complete station HW-16, HG-10B, factory aligned, recently re-tubed. Also HD-20 SWR meter, key, speaker, dipoles for 80, 40/15, each with 50 feet coax. All interconnecting cables. Very good condition. Package deal only — $150. Write WA1QPJ, P.O. Box 234, Dennis MA 02638.

SELL: HQ-1 with AR-22 rotor — $75; NCX-3 with ACPS — $150. WB5HBO, 4033 Dublin, Corpus Christi TX 78413.

FOR SALE: Hallicrafters SX-111 receiver, excellent condx — $100. You ship. WB2VND, Corbettsville NY. (607) 775-3639.

WANTED: HQ180AC Swan 600T 600R CE200V Bird 43 TV test equipment fm generator. Waskowitz, W2KPF, 35-30 73 st., Jackson Heights NY 11372.

CONFIDENTIAL Frequency list! Thousands of classified frequencies: spies, aircraft, ships, government, teletype, emergency, many more! $4 postpaid. Bob Grove, WA4PYQ, 6601 S.W. 56th Street, Davie FL 33314.

WANTED: Pilot Super Wasp and National SW-3 receivers. C. Byrnes, 210 Calderon Ave., Mt. View CA 94040.

OLD radios wanted, prior to 1931. Also want radio memorabilia such as signs, catalogs, tubes, magazines, and microphones. Quote price frist letter. W2GHF, 45 Allen Dr., Woodstock NY 12498.

DRAKE 2A with crystals for full 10 meter coverage — $160; Heath DX60, — $50; HG10 VFO — $15. Richard Matzner K5HAY, 2601 Rich Creek, Austin TX 78757. (512) 453-1753.

MUFFIN Mark 4 fans. New. $10 each. Guaranteed. Post paid. P.R. Electronic Supply, Box 203, Rochester NY 14580.

WANTED: Electronic keyer; new 3-500Z's; high dissipation water cooled tube; 500pF vacuum variable; BW-850A. K6HER, 585 Grand Ave., Colton CA 92324. (714) 825-6141.

COAXIAL Connectors, 1/2" alumafoam cable connector, Prodelin mfg'r, $3 each postpaid. Limited quantity. AMITY, 331 Canal Street, New York NY 10013.

SACRIFICE: Each guaranteed mint condition. FTDx401B — $499 (like new); SP401 — $13; NCX3 — $60; National 200 — $165; Galaxy V II — $185; AC35 — $60. W9HF, 505 Roxbury, Ft. Wayne IN 46087.

SELL: 2NT — $85; R4A — $225. Both recently factory checked. HA5 VFO — A1 condition, $40. You pay shipping. K4IPO, Box 128 Dyersburg TN 38024. (901) 285-0906.

YAESU transceiver owners — present and prospective. Join the international Fox-Tango Club. Send business-size s.a.s.e. or two IRCs for complete information and sample of monthly FT Newsletter. Milton Lowens, waтAOQ, 3977-F Sedgwick Ave., Bronx NY 10463.

HOMEBREWERS: Stamp brings list of high quality components. CPO Surplus, Box 189, Braintree MA 02184.

CLEANING out: excess parts, antennas, equipment, accessories, magazines. Bargains. No junk. Write: Marc Felt, W2GYQ, 669 Summit, Englewood Cliffs NJ 07632.

TOROIDS, 88, 44 Mh, 8/$3.25 pp. Telecom., Box 4117, Alexandria VA 22303.

DESPERATE for: Keyer paddles — Autronic and/or W8FYO models. Top price paid. All letters answered. Fred Caposella, c/o BBDO, 5670 Wilshire Blvd., Los Angeles CA 90036. (213) 938-3188, Ext. 234.

SELL Test Gear: SG-1A/ARN FM generator, 88-110 MHz — $35; Measurements Corp. 78B 14-82 and 114-168 MHz — $20; Variac — $5; Others. S.a.s.e. list. WN5KWX, 41 Easley, Huntsville TX 77340.

MOBILE Ops — Summit Enterprises will be operating for the summer months from 20 Eider Street, Yarmouth Port MA 02675. Send SASE for information on Shielded Ignition Systems and noise suppression components.

F.C.C. Licensing and Electronics Courses Offered: Beginning September 7, 1974 the Hall of Science of the City of New York will offer 12 week courses on consecutive Saturday mornings for Novice, Technician, General and Advanced Class F.C.C. Licenses. Beginning September 12, 1974 a 12 week course on Basic Solid State Electronics will be offered on consecutive Thursday evenings and will instruct in basic components and circuits in solid state devices used in radio, television, stereo and other audio and radio frequency equipment. Licensing course fee $8. Electronics course fee, $15. Write P.O. Box 1032, Flushing NY 11352 or phone (212) 699-9400 for information.

CHRISTIAN Ham fellowship is now organized for Christian fellowship and witness among licensed amateurs. Free gospel tract sample and details on the organization on request. Christian Ham Callbooks, listing members, $1 on donation. Christian Ham Fellowship, 5857 Lakeshore Dr., Holland MI 49423.

DRAKE, TR-6, NB, a-m filter, AC4, MS4, mint — $615; Clegg 22'er, fm, complete station, tuneable 143.4 to 148.3, with Vanguard ST-140 synthesizer (need no crystals) and Dycomm 35-0 linear, 100 watts, A-1 — $425. Russell, 19680 Mountville Dr., Maple Hts OH 44137.

FOR SALE: Completely rebuilt NCX3 by factory representative also. T2 Nalt power supply, rebuilt, complete with cables, microphone and Heathkit HM15 reflected power meter. All in perfect condition. Sidney Tritsch, RD 1, Box 64, Lockwood New York 14859.

WANTED R390A cabinet. Craig Church, 604 S. 29th Road, Arlington VA 22202.

WANTED: Collins 30S-1 Linear with manual; 180S-1 antenna tuner, 522-0651; CP-1 crystal packet, 597-0404. William Snyder, 8416 Culver Place, Alexandria VA 22308. Tel. (703) 360-4808.

FOR SALE: 30S-1 11732, needs ps door. Works excellent — $1050; KWS-1 700+ — $375; 75A-4 5297, spkr 2.1, 3.1, 4.0 — $550; SR-C826M, ACPS — $250; Tcom TC2-F, ACPS — $200; HT-200, nicads, charger — $225; KWM-2, 516F-2, (late) — $950; H-P 5532-A counter — $200; Telrex rotator, 100'+ Telrex cable — $275; Telrex TM-30 — $175. James Craig, W1FBG, 29 Sherburne Ave, Portsmouth NH 03801. (603) 436-9062.

WANTED: Vibroplex "Presentation" or "Original" model key. For Sale: Heathkit monitor scope model HO-10 never used. Factory checked — $50. H. Frandsen, R 1, Box 614, Port Byron IL 61275.

FREQUENCY Standard, proportional oven 1 MHz crystal oscillator, CTS Knights JKTO-47. Aging 2 x 10^{-9}/day. Octal plug-in. Cost — $250, new $36.50; Collins mechanical filter F500Y-315, 3.1 kHz BW at 500 kHz, new — $15; also 455 kHz. S.a.s.e. for filter and surplus equip list. C. Isham, WB6ORT, 6275 Arnold Way, Buena Park CA 90620.

HEATH SB101, speaker/power supply, SB200. Good condition — $450. James Lamberton, 224 Sneden Pl. West Spring Valley NY 10977. (914) 352-2397.

SELL $25 each — modified TA33jr, 18AVQ, 4-1000 and large blower, RV-1 remote VFO; Micromatch wattmeter ($20); B&W T-R switch, not working, ($5); ARC-5 modified w/ps for 80 m ($10). W2HNO, 18 Hanover Lane, Willingboro NJ 08046. (609) 871-6088.

SELL-Trade, Bell & Howell Electronics Home Study Course, 162 lessons, labs, answers. HT-220 on 16-76, Drake TR4, NB, RV4, AC4. Mike, manuals. All mint. Pohorence, 2334 Regal Court, Lawrenceville GA 30245.

SELL 2 Galaxy five transceivers, one 12 v DC supply, one 117v AC supply. One rig in car, one in house. $265 each with a supply. Jerry Smiley W9DKR, 505 W. Broadway St, Kokomo IN 46901.

BIRD Thruline wattmeter elements and line sections Wanted. Tony Gold, PO Box 614, NYC NY 10028. (212) 427-6451.

WANTED For Cash — 4-1000A, 4CX1000A, 4-400A, 4-250A, 4-125, 3-1000Z, 3-400Z, 3-500Z, 813s, 811As. All must be brand new and good. Also, sockets and chimneys for above. All tubes subject to my test and approval. Will buy one, or one thousand of the above. Also, want vacuum variables, new, what have you. All letters and phone calls answered. Michael D. Harrison, 431 Windsor Pl, Oceanside L.I. NY 11572. (516) 536-5320.

HAL MKB-1 keyboard — $170; Robot SSTV model 70 monitor and 80 camera — $350; Mor-Gain 80-40-20 antenna — $25. K3TML, 27 Shedon St, Wilkes Barre PA 18703. (717) 824-5310. FOR SALE: Drake 2B, 2BQ, 2AC. All ten meter crystals, plus 5 extra crystals and manual. Excellent condition — $185. Call Jim, W1VYB (617) 922-3850.

HEATH SB-110; SB-620; Gonset Communicators III, 2 meter & 6 meter, VHF-P.A., TTL/2. Reasonable. Charles P. Ausberger, K8ILR, 907 West Houghton, West Branch MI 48661.

FOR SALE: Clegg 99'er — $60; Knight VFO V-107 — $15; Lysco Transmaster exciter — $50. Frank Hockett, KØOIJ, 2924 Elmcrest Dr., St. Charles MO 63301.

COVER-UPS. Vinyl plastic equipment dust covers, personalized with your name or call. Adds professional look to your shack. Prices start at $2.95. Information, write Cover-Craft, P.O. Box 10, Roselle Park NJ 07204.

INSTRUCTOGRAPH 110VAC, 10 tapes, manual, FB Condx — $30 shipped. WB9MYR, 240 So. Waiola Ave., Lagrange IL 60525.

WANTED: Hallicrafters Model T54 7" television in metal cabinet. Made 1948-1949. Need not be working, but must be complete. Wayne Letourneau WB0CTE, 2338 E. South Ave., No. St. Paul MN 55109.

ENGRAVED redwood plaques (call sign or house numbers, black) — $5; walnut finish, gold engraving — $6. Postpaid, 5 3/4 X 16. Tony Vitolo, 2756 Tanglewood Dr., Snellville GA 30278.

SB-10 Wanted, sell 5BDQ 10 to 80 trap dipole, Lynmar KW 50 to 75 ohm 1.5-40 MHz xformer, offers? Wanted, 2M transverter. Arthur Eckman, WA2ECI, 11 Ft. George Hill NYC 10040.

NEW JERSEY Hams 80 ft. free standing tower. Original cost — $1,000. You pay to dismantle and move, and it's yours for $100. Call 201/383-4109, or write: Bill Pattison, Box 822, R.D. 1, Newton NJ 07860.

YAESU FT-101, fan, RP speech compressor, very clean. $465 or best offer, FOB. WA4SCA/5, 116 Harrold Street, Jacksonville AR 72076.

BUY-Sell-Trade Write for monthly mailer. Give name, address, call letters. Complete stock of major brands. New and reconditioned equipment. Call us for best deals. We buy Collins, Drake, Swan, etc. SSB & FM. Associated Radio, 8012 Couser, Overland Park KS 66204. (913)381-5901.

BUILD digital multimeter using standard parts: Four digits display AC/DC volts, amps, ohms, 27 ranges very accurately! Plans — $2.98, Green Bank Scientific, Box 100N, Green Bank WV 24944.

CHEAP various panel meters, 250 asstd. mags, QST, CQ, 73, Ham Radio — $25 & PP. SASE for listings. Samkolsky 4803 Brenda Drive, Orlando FL 32806.

EICO mod. 221 VTVM — $20; LaFayett tube & trans checker — $15; Leader mod. LSG-11 sig. gen. — $30; Waterman Mark I scope — $35; Swan 10-40 mtr. trap vertical — $35; K W Electronics ant. match (250 wts) — $30. All like new, with manuals. George, WA2OVS, 139 Kings Drive, Riverhead NY 11901.

HEATH VTVM 1M-28 Hi volts/RF probe — $59.95. W6RQZ, 1330 Curtis, Berkeley CA 94702. (415) 526-7345.

VIKING II VFO — $80; HQ-145-X — $110 plus shipping. Both in good condition. Ed Smith, 2635 Acadia St., East Point GA 30344. (404) 767-2566.

SELL: mint Drake T4XB and R4B with power/speaker — $700 cashiers check. Cliff Brown, WA3GBT, 15 South Park, Kane PA 16735. (814) 837-9683.

CODAX 361 keyer — $25. 1 ship. W7QWD, Trailer Estates 10, Winnemucca NV 89445.

SELL: Heath 1B-28 bridge — $65; 1T-27 transistor checker — $4; 1G-62 color bar generator — 40; CDR control AR-22 — $15. W2WHK, 210 Utica St., Tonawanda NY 14150.

18 HT — $65; 14AVQ — $25. Both excellent. You pick up. Frodey, 409 Cherokee, Fremont MI 49412.

WANTED: Hammarlund Super-pro power supply. WB6GCE, 5140 Diablo Dr., Sacramento CA 95842.

FOR SALE: Heath SB303 with CW filter and SB600 speaker — $280; Heath SB401 with crystal pack — $220; Heath HD10 keyer - $25. Trade Miranda Sensomat RE, 35 mm camera for General Coverage receiver. All equipment in good condition, with manuals and cables. WA7DJN, PO Box 822, Thompson Falls MT 59873.

SELL: Globe Scout XMTR and Lafayette HA-800 RCVR, both *with manuals and excellent cond. Both* — $130. *Will ship.* WB4SDH, Mike McKay, 774 Erwin St., Jesup GA 31545. (912) 427-3817.

HEATH HW 101, crystal filter, and HP23A. Clean and unmodified — $285. Tom Eagan, 14019 Stewart, Apt 1E, Riverdale IL 60627.

FOR SALE: Viking II — $65; Heath HG-10B — $35; DX-60 — $45; Eico 720 — $25; SX-101 Mark III — $125. Phil Wood, WA3VQF, 54 Powderhorn Dr., Phoenixville PA 19460.

DISCOUNT prices plus full warranty. Call or write for fast quote and delivery. All items new, guaranteed. Midland 13520 W-T 200.95; New-Cusheraft 4EL Tribeand beam ATB34 179.50-Write Quote; New CDE Ham-2 109; Belden 8Wire Rotor Cable 8448 1½c/ft; 20% off list; Hygain TH6DXX, 204BA, DB24B; Mosley Classic 33; Belden, consolidated 8214 RG8FOAM Coax 18c/ft; 15% discount Trlex Tower W, MW series FOB Calif.; New Brandes headphones (J) 5.50; Sorensen ACR2000VA AC regulator 150; Vibroplex; Callbooks; Quote Swan, Drake, Kenwood, Atlas, Curtis, Prices FOB Houston, Free Flyer. Madison Electronics, 1508 McKinney, Houston TX 77002. (713) 224-2668. Nite/weekend (713) 497-5683.

SELL: H.W.-32, H.P.-23 AC supply. Millen Kilowatt Transmatch. All $150. DeFazio, 14 Stevens St., Danbury CT 06810. After 5: (203) 743-2481.

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SELL: Heath HW-101 w/AC ps — $225. WB5JLI, 2810 Col Drive, Dickinson TX 77539.

NOVICE station: Knight T-60 CW/AM XMTR. — $30; H HR-10 rcvr w/calibrator — $40. sase appreciated. You shipping. Stephen Nahm, 9200 Chenoak Ct., Baltimore 21234.

DRAKE R-4A+MS-4. Good cnd. Also 60 ft. tower & 50 RG-8/U coax. WB0DHP. Mark Starkebaum, Box 297, Gunn CO 81230. (303) 641-0460.

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HAMMARLUND HX-50A, 200W SSB/CW. Late m Absolutely mint. Factory carton, manual — $225; homebrew linear, PR 6146, self- contained. Prof wiring. Pic for sase. I'll ship cert, checks or mo — $110. K4JJW, 106 P Goldsboro NC 27530. (919) 736-1741.

SELL: Yaesu FT101, FAN, car mount. All mint conditio $550. W3MBO, North 61st, Philadelphia PA 19151.

MUST SELL: Hallicrafters SR-400 Cyclone II transceiver, matching ps. Paid $1,024 1 yr ago. Best offer over $550. condition; Pearce-Simpson Gladding 25 2 meter transceiver touch-tone pad, loaded with crystals, Hustler mobile ant Used 1 1/2 years, $336 package for — $200. WB5EDV, Dutton, Waco TX 76706.

DRAKE TR4 and RV4 and mobile power supply, plus l mike, all in excellent condition. First $500, cashier check o will ship collect. John Tomasiewicz, W1QAJ, 15 Stonybrook Waterbury CT 06705. (203) 754-8470 after 6PM.

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HW-100 with CW filter, HP-23A power supply, SB-600 spe — $275. K6FI, Byron Looney, 10234 Nevada Ave., Chatsw CA 91311. (213) 998-1323.

WANTED: Hallicrafters HT-9; Collins 310A3, 310B1 or 31 exciter; Stanacor ST-203A; RCA velocity microphone; select-O-ject and NBFM adaptor for HRO-50; tri- beam/rotor; old TFs from 30s-40s, 7" or smaller. Describe and state lowest price. Sam Thompson, 1133 Polk, Francisco CA 94109.

NOVICE rig, Heath receiver HR-10B with calibrator, transm DX-60R, VFO HG-10B — $140. Excellent condition, rec realligned, Weinberg, 36 Calumet Ave., Hastings on Hudso 10706 (914) 478-3244.

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WANT: any repairable equipment. Urgent need. New WB4JNT, Boys' Club, PO 596, Pinellas Park FL 33565.

FOR SALE Ameco 6J2 transmitter — $75, mike included modulator to put in it on 2MT fm — $20. P. Laspina, 33 C Ann Smith Dr, Bricktown NJ 08723.

FOR SALE: Drake 2B-Q mint — $160; AR77 — $60; RBA-B-C series (3 units) with power supply and spkr. 15 18 MHz coverage — $150. W2JB, 586 Mountain Ave Caldwell NJ 07006. (201) 226-2747.

WANTED: Heathkit SB-640 external LMO, with manual, fo with SB-101 for separate transmit & receive frequencies. W Al Palmer, 111 Wilfred St., West Hartford CT, 06110.

FOR SALE: Hammarlund HQ-170, new tubes, alignme $125; Drake 2NT/Heath HG-10B VFO — $125; SBE-33 80 SSB transceiver, built-in ac — $150; cw filter — $1 excellent, with manuals. D. Ross, W6KHI, 2079 15th Ave Francisco CA 94116. (415) 564-9883.

WANTED: manual schematic Sylvania tube tester model Will buy copy and return. Edward Wilcox, WB9JXV, Ni 62358.

WANTED: Good general coverage receiver. R390A? SP600? Prefer local. Bob, K1YKB, 4 Paul Revere Rd, Lexi MA 02173. (617) 861-1071.

GALAXY 550 ac/spk crystal calibrator, spare finals, low hc $350; Vibroplex Champion $7. W8JAY, 2981 Greenridge Barberton OH 44203.

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WANTED: R4B, T4XA or B, ps, spkr, complete station. R. J. Doherty, W1GDB, 14 Pine St., Sandwich MA 02563.

SB-110 Heath 6 meter SSB with HP-23/SB-600; Collins 75S3 with 200 Hz, 32S3, 75S1 with 500 Hz and Waters; NCX-5 with NCXA. All in good physical and operating condition with manuals. K4YYL, Art Balz, Route 4, Greer SC 29651.

SELL: Drake 2NT transmitter and Gonset communicator IV, 6 meter transceiver, both for $180. Will sell separately. Peter Trinche, WB2SET, 20 Salem Way, Glen Head, Long Island NY 11545.

HEATHKIT HR-10B with xtal calib; DX-60B with three xtals; HD-10 electronic keyer; HS-24 speaker; PTT mike; Hy-Gain 14-AVQ vertical with 100 ft. coax; much more. All in excellent condition. Complete: $150. L. Kaplan, 225 Country Club Rd., Newton MA 02159. (617) 244-5117.

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FOR SALE Galaxy R-530 communications receiver, late model, bought in Dec. 1973, It is in mint condition. Serial number 817-1039, for $575, or as a package deal with all these other items all for — $675. Omega-T Ant Noise Bridge; unique wire all band tuner; Ameco all band preamplifier model PCL-P; Galaxy R-530 speaker; Q Box by Autek Research; Superex APS headset 600 or 4-16 ohms, and manuals. Believe me, all these items are like new, in mint condition. Stanley F. Cabral, 2254-62 Ave., Oakland CA 94605. (415) 568-2486.

SELL: Drake 2-C, 2-NT, 2-CS. Manuals and assorted crystals. Local sale preferred — $240. M. Grotell, 10 Yates Lane, Jericho NY 11753. (516) 822-1092.

SELL: Hallicrafters HT-18 VFO/FM 80-10 — $39; a-m-1180/GRC 6M amplifier 4X150A — $20; ac regulated power supply for mobile fm — $19; shack cleanup list, similar, sase. Trade: Maxon 1141A 200-2500MC 40W signal source for VHF Linear. W4API, Box 4095, Arlington VA 22204.

MUST sell college: Yaesu Fldx400 xmtr, Frdx400 rcvr — $600; Ham-M rotor, 50' Rohn tower, Mosley Classic 33, 100' cable — $250; Ten-Tec KR6 keyer — $25; Heath Dx60 xmtr, HG-10 VFO — $60. Or best offer. J. Sacksen, WA1NHZ, 59 Main St., Lunenburg MA 01462. Tel. 582-6861.

SELL: AR-1500 stereo — $425; HW-7 with ps — $75; HQ-129X — $55. WB8HWF, 546 Oakwood Ave, Newark OH 43055.

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WANTED Heath VF-1 VFO with or without power supply. Mint condition WN6DXM 640 Vista De Loma, Hemet CA 92343.

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SB sideband 100 watt transceiver, 15 through 80 meters — $250; just updated and calibrated at factory. Will ship at buyers expense in still sealed factory carton with book, upon receiving payment. William Trelease, Yaupon Lane, Atlantic NC 28511. Telephone (919) 225-4341.

INOUE IC-20, fully crystalled, $270; GLB synthesizer for prog. line — $160; VHF engineering portable, with NI-CAP & .52 xtals — $135; Motorola Pageboy II, standard squelch — $100. J.M. Hagedon, K8YQH, 1340 Brainard Woods Dr., Dayton OH 45459. (513) 433-6406.

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WANTED: HRO, any model, with coils A,B,C,D. Also want broadcast and low frequency coils for same. Wanted, DX100B; Valiant II. E. Engebretsen, W2RAA, Box 200, West Monroe NY 13167. (315) 668-2040.

FOR SALE: Collins 75 A-4 (serial 4850) with 0.5 & 2.1 Kc mechanical filters, speaker — $350; Ameco PT pre-amplifier — $25; HD10 keyer — $25; Drake Wattmeter W-4 — $30; Johnson Valient 2 XMTR — $75; Douglas Randall scrubber — $50; All with manuals and in excellent working condition; Also, have H-D 11 Q mult; RG- 8U cable, coax selector, Baluns, 40M crystals, 24 hour tymeter. Write WN1SBY or phone (413) 536-5982 at 26 Woodland Street, Holyoke MA 01040.

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HRO5T manual wanted to purchase or copy. Dick Dillman, 32 States Street, San Francisco CA 94114.

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HEATH HW-101, ps, Shure 444 microphone, cw filter, SWR meter, $275 or trade 2 meters. Phil Fielding, WA7QWF, 1396 S. 200 E. 4, Salt Lake City UT 84115.

SELL: Drake 2C and spkr — $180; Heath TX-1 — $75; Johnson Tr switch — $15. Bob Gorman, 64 Summer St., Andover MA 01810.

HY-GAIN Long John 4-element 20-meter Yagi. Original cost about $600. Antenna has never been assembled. Super rugged! Write for details. Robert M. Myers, W1FBY, 221 Long Swamp Road, Wolcott CT 06716.

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WANTED: Gousett 903A amplifier for 2 meters. E. Huffman, Rt 9, Box 1079, Hickory NC 28601.

WANTED: Money, trade Heath HW-7. Ed Kalin, WA1JZC. (203), 666-1541 (days); (203) 233-9915 (evenings).

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WANTED: 1945 and 1946 issues of CQ magazine. Nagle, 12330 Lawyers, Herndon VA 22070.

HEATH HW-16 and HG10B VFO. Absolute mint condition — $120 or best offer. Perfect novice rig. Tom Leathley, WN8PNJ, 8531 Kimblewick, Warren OH 44484. (216) 856SELL: Realistic

HALLICRAFTERS S102-S106 2-6 meter, CR4X to 50 MHz receivers, clean $25 each. United States Army Signal Corp GSC TI Morse Code Training Unit with 10 keys — unused $125. Signal Corps Flashing Morse Code signal lamp, new $22.50; 4 X 5 Speed Graphic, enlarger, contact printer, trays, etc. Write. Want Leica M Series camera, accessories, Focomat enlarger 4 X 5 or 5 X 7 view camera. Simpson 260 VOM, Heath oscilloscope 10-21, 10-17. Ben Fisher, 235 Adams Street, Brooklyn NY 11201.

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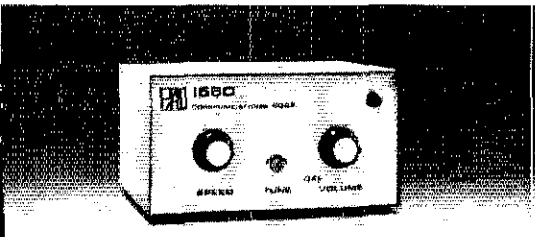

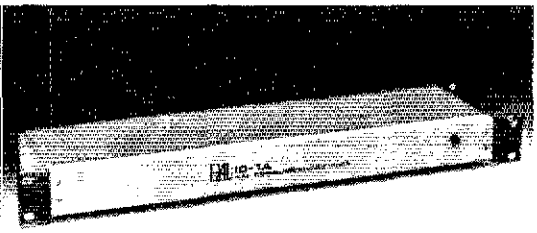

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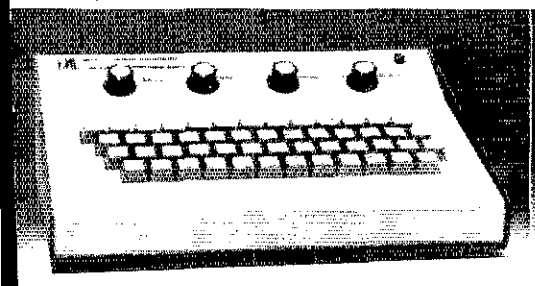

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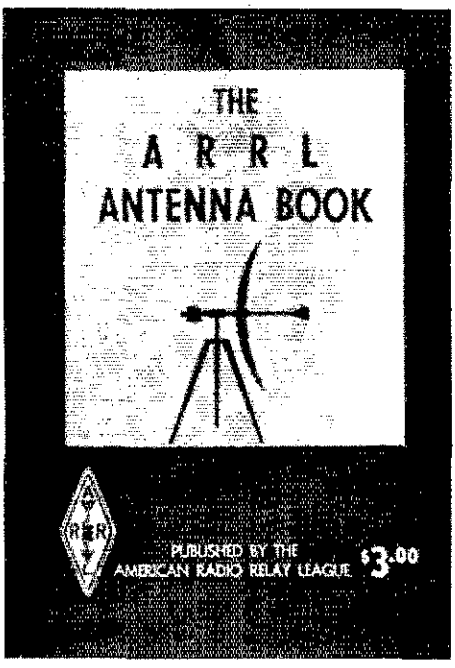

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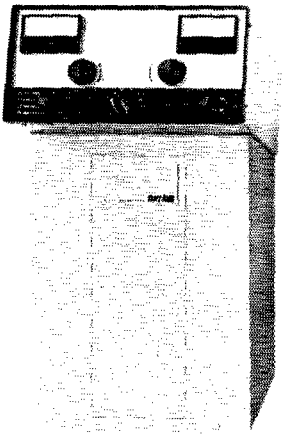

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EIMAC started with the 150T triode, the first reliable high frequency power tube. A whole family of triodes followed.

1940

EIMAC produces the 304TL multiple triode, the heart of World War II pulsed radar equipment.

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1948

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1955

EIMAC produces the first ceramic-metal tetrode, the 4CX5000A, for broadcast and FM service.

1957

EIMAC introduces the 4CX1000A high gain, external anode tetrode for single sideband HF linear amplifier service.

1961

EIMAC produces the 3-400Z and 3-1000Z high-mu triodes for cathode driven linear amplifier service.

1962

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1966

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1970

EIMAC produces the 8877 external anode VHF triode for cathode driven service.

1973

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