QST

July 1975
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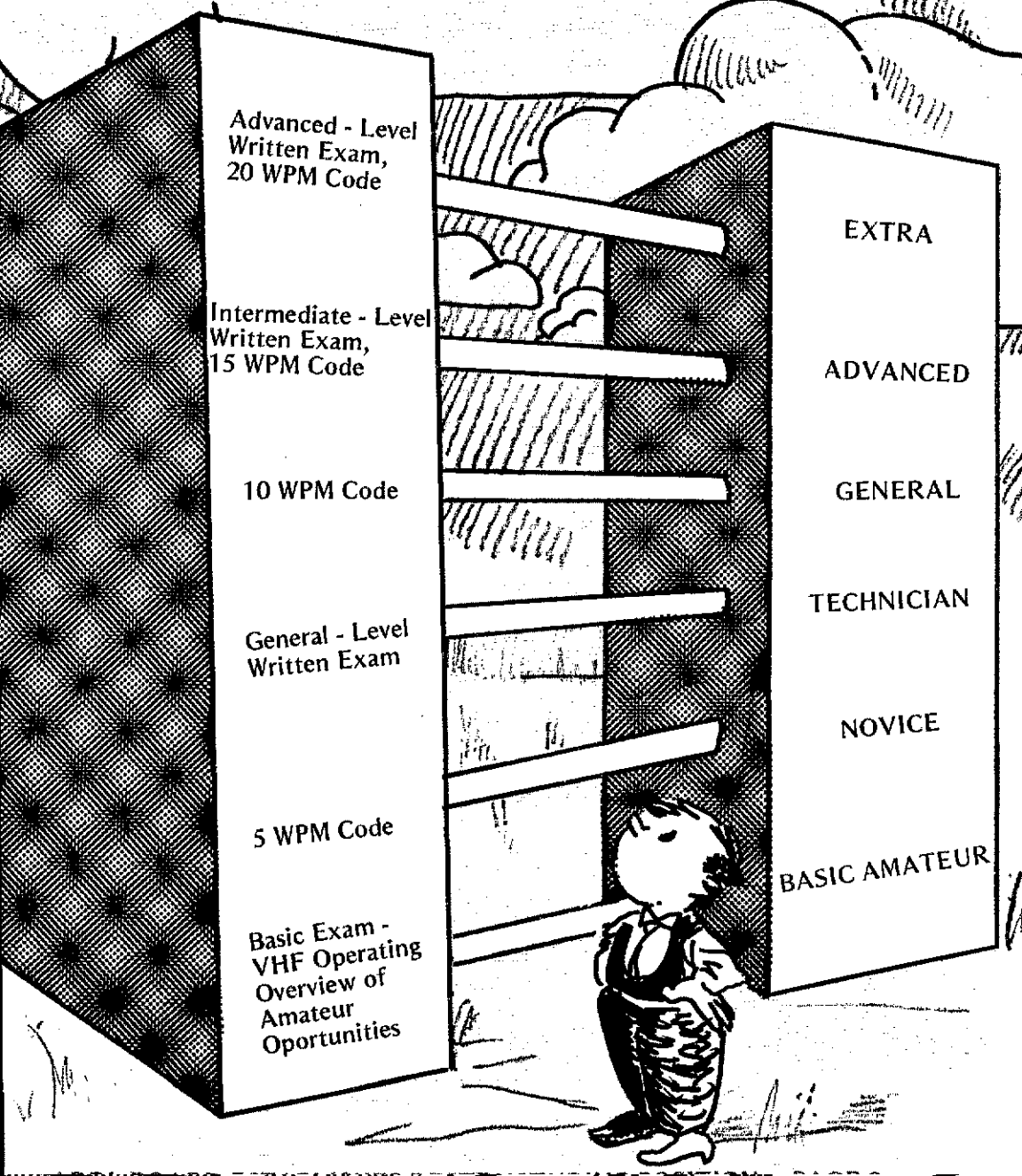
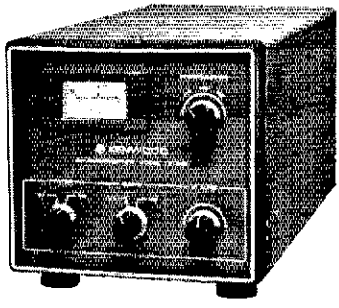
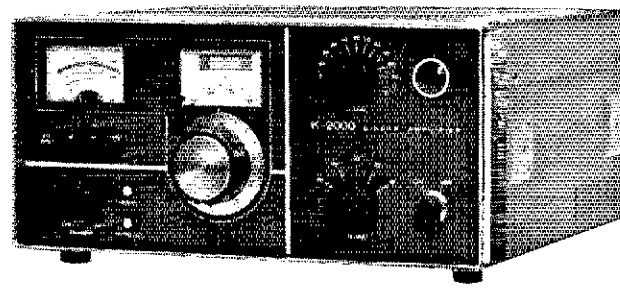


now...
Your Kenwood line does more

the new TV-502 2 meter transverter



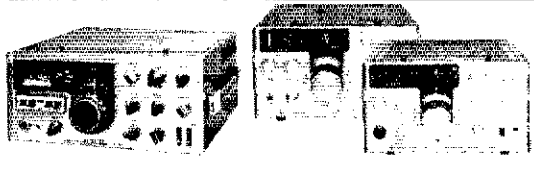
the new K-2000 full power linear amplifier

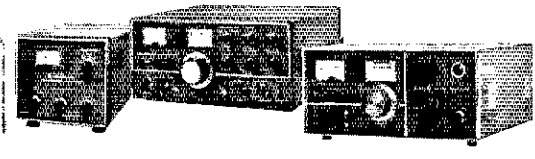


Kenwood engineering scores again. . . the TV-502 transverter now adapts any TS-520 transceiver or T-599/R-599 combination to transmit and receive SSB or CW on the two meter band.

- **All solid-state**
- **144 to 146 MHz**
- **SSB, CW**
- **Output impedance 50 ohms**
- **8 watts power output** (W/AC)
- **Frequency stability ± 200 Hz after warm-up**
- **Styled to match the TS-520**
- **Price $249.00**

The brand new K-2000 linear amplifier is the perfect companion for your TS-520 or T-599A. It is compact, reliable and priced right. Uses two Eimac 8873 grounded grid triodes cooled thru a large heat sink. The K-2000 offers a full 2 KW PEP input for SSB operation and provides amateur band coverage from 80-10 meters. Provides a built-in solid state power supply, built-in antenna relay, a relative RF power indicator, and built-in quality to match much more expensive amplifiers. The K-2000 comes completely wired and ready for operation.





Amateur Radio's New First Family

The TS-900, TS-520, R-599A, and T-599A in a few short years have established new levels of achievement in communications for amateur radio. Inspired engineering, careful attention to quality, beautiful styling. . . these have become the hallmark of the Kenwood family. Now your Kenwood line does more. The TS-520 or T-599A operated with the new K-2000 amplifier provides the full power capability you need. Combined with the TV-502 they provide the 2 meter performance on SSB or CW which gives you "Oscar" capability and introduces you to the exciting new experience of 2 meter DX.

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either way... you can save from $50 to $500 with a Henry Radio antenna package

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CDR Ham-II
RG-8 100'
Control Cable 100'
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Package Price: $889

Package No. 4
Swan TB-4HA
Tristao CZ-454 FS or Triex W-51
5' mast
CDR Ham-II
RG-8 100'
Control Cable 100'
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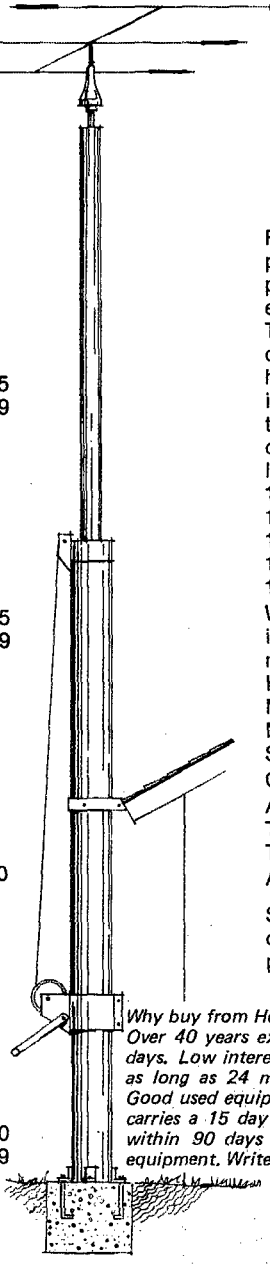

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For many years Henry Radio has been providing a beam-antenna package program for amateurs who wanted an efficient but economical package. Thousands have benefited from this offer in the past. In recent years we have offered the customer the versatility of designing their own system with the components that they want. Our only requirement is the purchase of at least:

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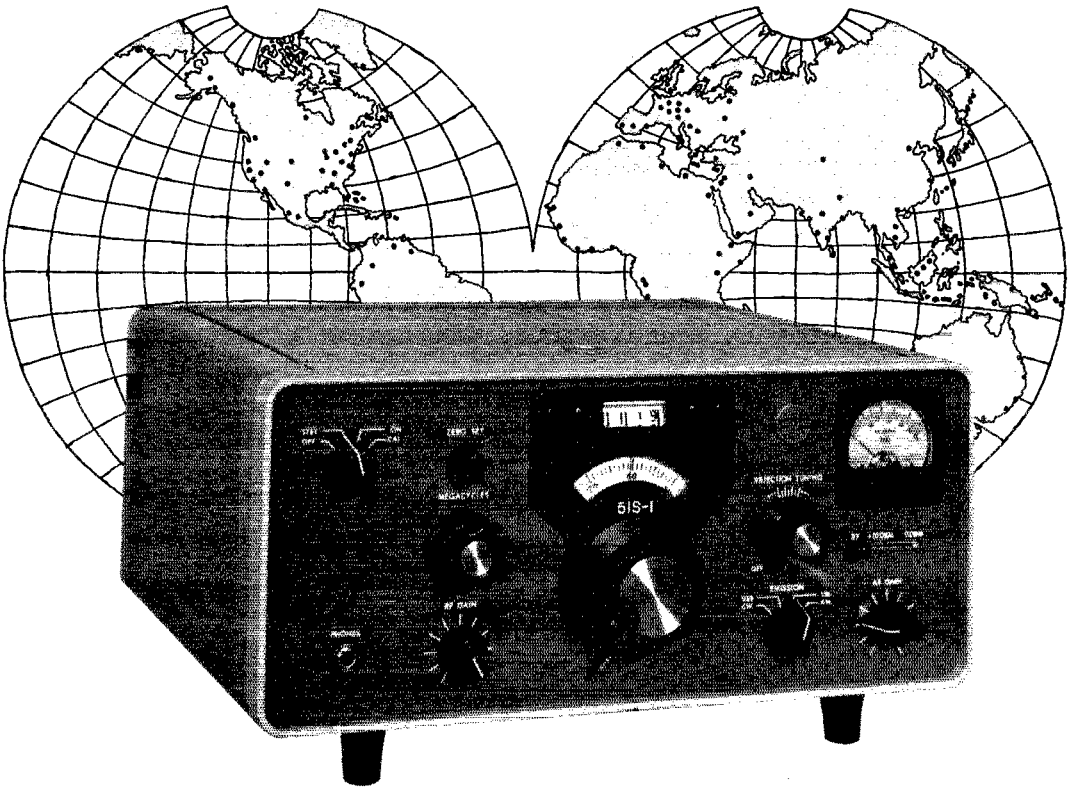
Prices subject to change without notice.

Stand by for the latest word on Collins' 51S-1 receiver.



The word for Collins' 51S-1 is the same today as it's been for every one of its 12 years: outstanding.

Amateurs say it's an ideal addition to their stations as a primary or backup receiver. It's stable, sensitive and extremely accurate, assuring optimum reception of USB, LSB, AM, CW, and RTTY signals in the 2.0- to 30.0-MHz frequency range. With an accessory available that permits operation between 200 kHz and 2.0 MHz.

There's a choice of either 800-Hz or 300-Hz CW filters and of either 2.4- or 2.75-kHz mechanical filters for SSB. For AM, there's a standard 5-kHz bandwidth or optional 6-kHz mechanical filter.

Commercial communicators and shortwave listeners alike appreciate the 51S-1 for its quality reception of signals from anywhere in the world. International news broadcasts, amateur and military nets, air-to-ground monitoring and ships at sea.

The 51S-1 is available now, at a price that makes it very appealing for this class of receiver. See your Collins distributor, or contact Amateur Radio Marketing, Collins Radio Group, Rockwell International, Cedar Rapids, Iowa 52406. Telephone 319/395-4507.

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QST

July 1975

Volume LIX Number 7

Published monthly as its official journal by the American Radio Relay League, Newington, Conn., U.S.A Official organ of the International Amateur Radio Union.

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Subscription rate $9.00 per year postpaid, U.S. funds, U.S. & Possessions; $10.00 in Canada; $10.50 elsewhere. Single copies $1.00. Foreign remittances should be by international postal or express money order or bank draft negotiable in the U.S. and for an equivalent amount in U.S. funds.

Second-class postage paid at Hartford, Conn. and at additional mailing offices.

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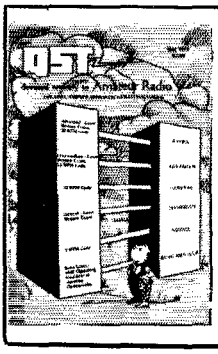
INDEXED BY Applied Science and Technology Index, Library of Congress Catalog Card No: 21-9421.



OUR COVER

It's a single ladder, synthesized from member comments on FCC's proposed "dual ladder" approach to licensing. Details on page 9.

— CONTENTS —

Amperex has what it takes to be Number One in RF Power Semiconductors...

The Line·The Book·The Boards

The line has been expanded with the addition of all the popular 2N types to the standard in-house types that have been available all along; there are new supplements to the book, available at no charge of course, to every recipient of the original edition . . . and our applications assistance has kept pace by the addition of many more prototype sample boards

Yes, we are still going all out to support our state-of-the-art line with a state-of-the-art program of applications engineering assistance.

Today, there's an Amperex RF power transistor for virtually every fixed or mobile transmitter application from 1.6 MHz to 2300 MHz, from ¼ watt to 150 watts, in 25 different packages and operating at any standard voltage from 6V to 50V.

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For more information . . . on the line, the book, the boards, contact Marty Burden, Group Product Manager, Amperex Electronic Corporation, Hicksville Division, Hicksville, N.Y. 11802. Tel. 516-931-6200.

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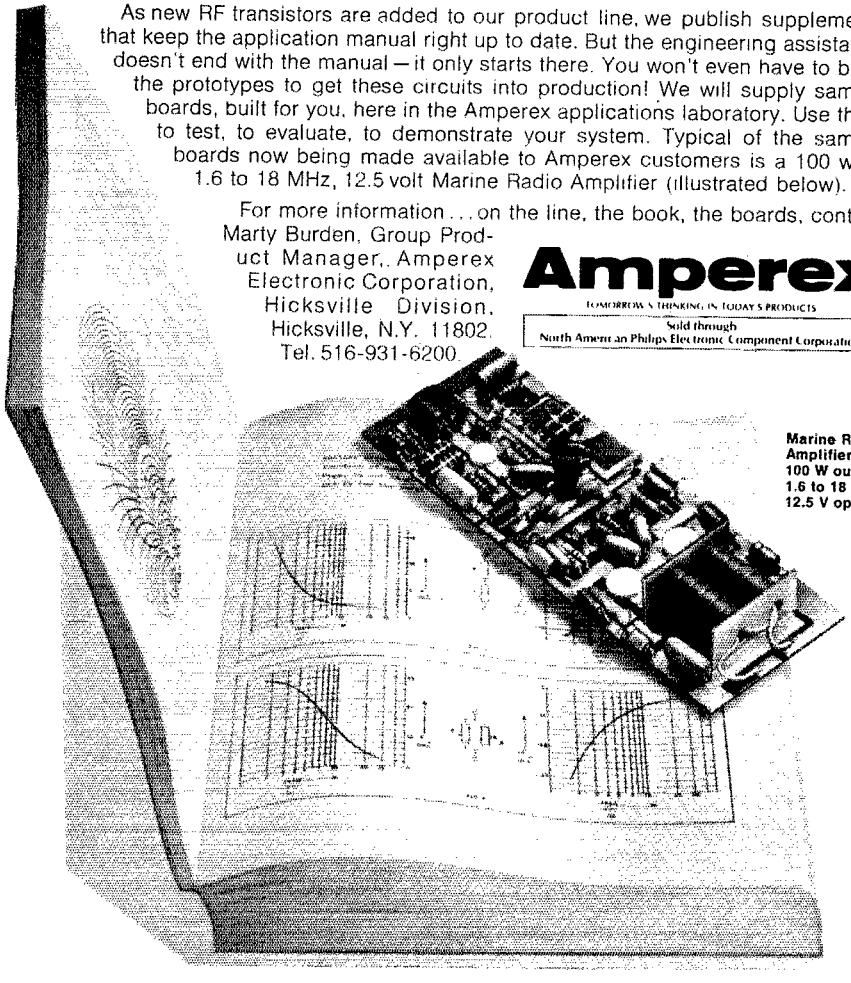
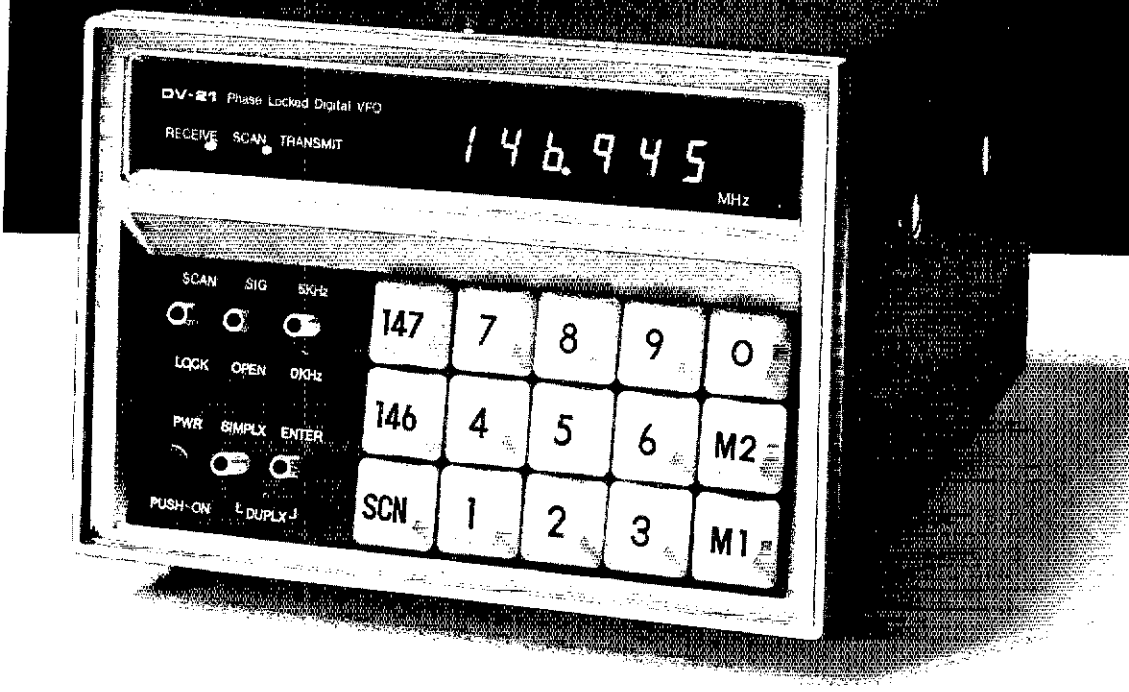


Marine Radio Amplifier 100 W output, 1.6 to 18 MHz, 12.5 V operation

DIGITAL!



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Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. ARRL Field Organization station appointments are available in areas shown to qualified League members. General or Conditional Class licensees or higher may be appointed ORS, OVS, OPS, OO and OBS. Technicians may be appointed OVS, OBS, or VHF PAM. SCMs desire application leadership posts of SEC, EC, RM and PAM where vacancies exist.

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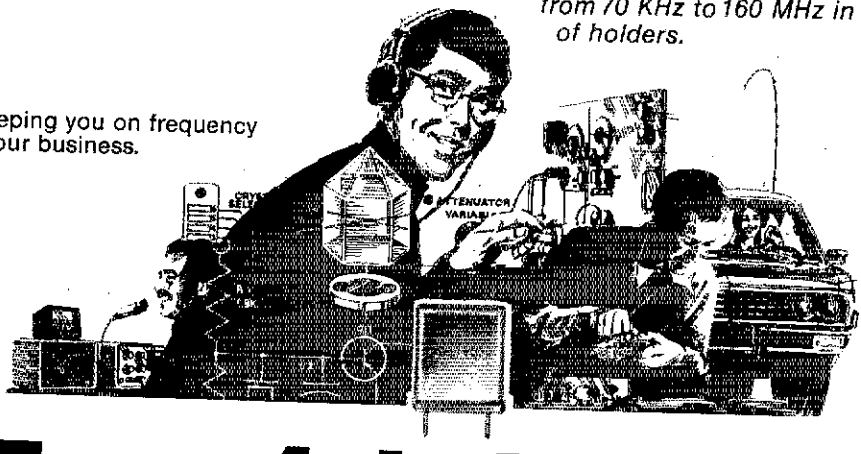

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors.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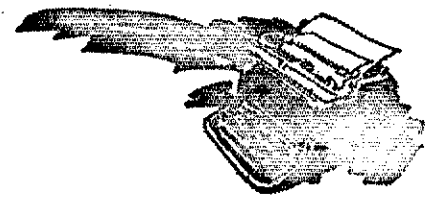
* Member Executive Committee

"It Seems to Us..."



ELSEWHERE in this issue you will find the minutes of the May 1975 Board meeting, a meeting which was scheduled specifically to permit timely response to FCC Docket 20282. The terse and formal language of the minutes completely fails to depict the drama of the occasion. It was a meeting in which the fifteen U.S. directors of the League discussed, almost continuously for three days, all of the ramifications of the FCC's restructing proposal, the reactions of ARRL members as revealed by the recent membership survey, and the many alternative responses that the League could make to the Commission proposal. This writer has sat through a good many ARRL Board meetings, and he does not recall another one which dealt with the problems in such an objective manner, or in which there was such a fine demonstration of democracy in action.

In mid-January, after the Board meeting that month, the headquarters staff got underway with the membership opinion survey, which had to be designed, printed, mailed, received back, processed, and analyzed by the early part of May. It was a difficult job, but it was done. The fact that over 55,000 members replied to that survey is testimony not only to the interest in the particular docket, but also to the high level of activity of ARRL members.

Also in January, the president appointed an ad hoc committee to study procedures for responding to Docket 20282, and furthermore to discuss alternatives to the FCC proposals. This committee did yeoman work and, by the time the May Board meeting rolled around, was able to present to the directors for their consideration an extensive list of questions which addressed the fundamental issues in the FCC docket and which were designed to assist the directors in developing the League's position.

During the course of the Board meeting the directors considered this long list of questions a number of times. Their consideration was tempered by constant reference to the membership opinion survey results which were before them, by reference to the individual comments which members had made both independently and in response to the membership opinion survey, by personal knowledge and belief in what was in the best interests of the amateur service, and by the knowledge that some compromise was necessary in many areas in order to achieve a final position which would be acceptable to all.

What the directors have done is to adopt a unified approach to amateur licensing – a single track, with every class of license encompassing all of the privileges of those before it. They have affirmed that the present structure is basically sound, and that, with minor revisions, amateur radio can continue to serve the public interest best within this structure. The difference between the FCC and the ARRL approaches is that the Commission has asked, in effect, "If we were to design an amateur radio service today, knowing what we have learned from our experience with past and present structures, what would we come up with?" The League has responded, "We already have an excellent amateur service in this country – one that needs revitalizing, perhaps, but one that is quite healthy, nonetheless. What can be done to improve it?"

The first thing we believe should be done is to enact the changes which the ARRL first proposed in 1969 to make the Technician license a part of the mainstream of amateur radio rather than a path leading off the main road from Novice to General and above. One fact gleaned from the membership survey is that nearly two-thirds of the Technician respondents had held a Novice license at one time. It is hardly likely that all of them discovered in their Novice days that their only interest in amateur radio was at vhf and above, so it appears that the step from Novice to General was simply too great for them to make at one time. Once the Technician license arrived and all hf privileges were lost, there was nothing to keep them interested in the pursuit of a higher class of license. The ARRL approach attacks this problem from several different directions.

The other major change we see as desirable is the creation of a class of amateur

(Continued on page 56)

League Lines . . .

QST will have a new look effective with the January 1976 issue, a new look that will make the magazine more useful to and readable for the members of the League. Long printed in a 6-1/2x9-1/2-inch page size, we are moving to an 8-1/4x11-inch page size in order to permit larger type size, larger diagrams, larger photographs, more artistic layouts and, not coincidentally, greater economy in printing. Along with change in page size there will be a number of internal changes in order to take fullest advantage of the increased size, but it'll still be clearly recognizable as QST and will be mailed to you in the same type of wrapper and at the same time of the month.

Thanks to the many, many members who, besides returning the membership opinion survey, sent along additional comments to the headquarters and/or their directors. Not all were individually acknowledged, but all were read, and formed a substantial basis for staff and director actions.

It's World Scout Jamboree time again. The 14th worldwide encampment will be held at Lillehammer, Norway from 29 July to 7 August, 1975. A heavy program of Radio Scouting has been set up for the boys. Fifty senior scouts and adults from the five host countries (LA, SM, OH, OZ, TF) will be supervising "Fox hunting", Scoutronics and ham radio, with the help of DU1RC, OE5FJL, HB9AOF, EI2CA, JA1JAM, G3BHK, ZL2APE, HB9ASM, K9ECE and Noel Lynch of Australia. Keep an ear out for LC1J on all h.f. bands.

Amsat-Oscar 7 has a 2304.1 MHz beacon aboard, but it won't be heard -- FCC has again turned down a request for its operation 14 minutes a week with a power of 30 to 50 milliwatts, because of the United States' international commitments.

W2JAO points out that the new one-minute interstate telephone rates make it very feasible for amateurs to set up schedules with other hams. A coast-to-coast call ranges from 56¢ weekdays down to 22¢ late at night and most of the weekend. One minute is plenty to pass along mode, frequency, and time.

Minute 41 of the January Board Meeting authorized an appropriate plaque to any amateur who has attained the Number 1 spot in the DXCC Honor Roll, to be paid for by the eligible recipient. Delivery expected at about the time you read this; complete cost $25 per. Interested? If so, please note the month/year of the QST issue showing your call in the top position and send with check to Hq.

We're committed to establishing an historical library here at Hq., supplementing our museum. Contributions gratefully received.

Two Technicians(C) at opposite ends of the country recently sent in applications for license renewal where the accompanying photocopy of the license showed only "Technician," apparently after being altered in anticipation of FCC's proposed rules making (C) licenses non-renewable. Now each must "Show Cause Why the Operator and Station Licenses Should be Renewed" at an FCC hearing if he wants to stay on the air. If loopholes previously existed in FCC procedures, they were plugged after a KØ "upgraded" himself to Extra a few years ago! This sort of thing doesn't help us much in convincing FCC that the amateur service is made up of responsible people who don't need tight regulation.

The DOC in Canada has increased the annual license fee for Canadian amateurs from ten dollars to thirteen dollars per year. The first indication of the increase for most Canadian amateurs was receipt of a fee renewal notice for thirteen dollars.

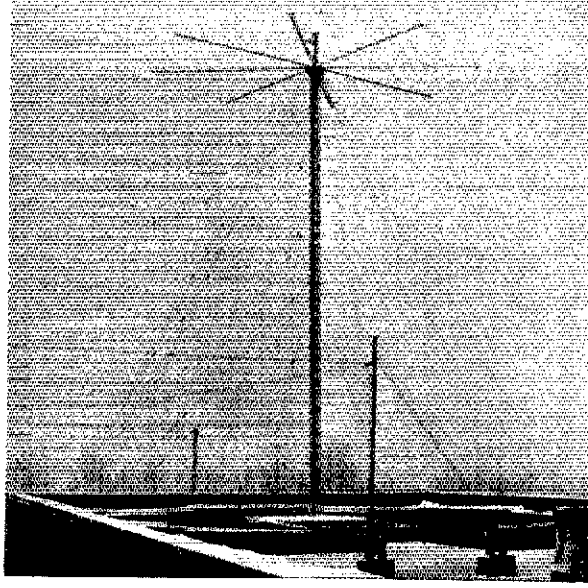
Quote of the month: "Amateur Radio doesn't measure its success by volume of traffic, gross revenue, or audience, but simply by how well it has served humanity." -- W3ASK. What part have you played in the success of amateur radio?

A new deal on multiple-year dues, to encourage memberships extending over a period up to five years. Now, $9 for the first year, $8 for the second, $7 per year thereafter, up to a maximum of five years. This new provision becomes effective July 15. Rates for VE $10, 9, and 8, for DX $10.50, 9.50 and 8.50, both with same 5-year maximum.

The HF Discone Antenna

A Frequency Independent Antenna For Vertical Polarization

BY JOHN S. BELROSE,* VE2CV/VE3DRC



The discone antenna has existed for years, but little information on this radiator has appeared in amateur publications. While the array looks like a guyed 36-foot tower having a large top hat, it offers the performance of an efficient vertical monopole but may be operated independently of any earth ground. It covers 40 through 10 meters without critical tuning, traps, or band switching, and provides an excellent match to 50-ohm coaxial line.

IN 1957 Victor Rumsey explained the basic requirements for frequency-independent antennas. The concept was that if the shape of the antenna could be specified entirely by angles, its performance would be independent of frequency. This is because the shape of the antenna, when expressed in wavelengths, would be the same at every frequency. The log-periodic antenna, which is the best known of this class of antennas, was devised by DuHamel and Isbell[1] in 1957. In 1959 Isbell[2] developed the dipole arrangement currently used. The discone antenna was developed by Kandoian[3] in 1945, and is a radiator having an impedance that can be *directly* matched to a 50-ohm coaxial transmission line over a wide frequency band. The discone also belongs to the log-periodic class of antennas.

The fact that the discone antenna does belong to the log-periodic class will be made clear below. The antenna comprises a vertical cone beneath a horizontal disk (see Fig. 1). For frequencies within the range of the antenna, the radiation is due to a resonance between the fields caused by current flow over the disk and over the surface of the cone, which is established by its flare angle. The apex of the cone, which is vertical, approaches and becomes common with the outer conductor of the coaxial feeder at its extremity. The center conductor of the coaxial feeder terminates at the center of the disk, which is perpendicular to the axis of the cone and the feeding transmission line. The discone can be thought of as an upside-down conical monopole, an antenna type that was devised much earlier.

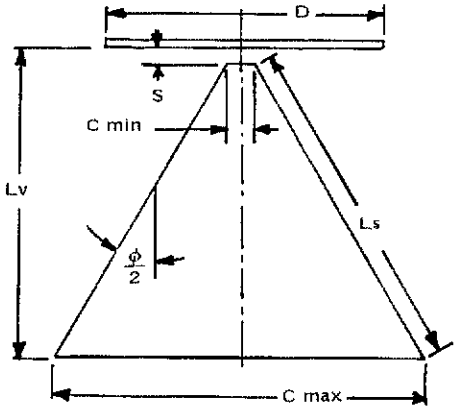


Fig. 1 — Cross-section sketch of the discone antenna. See text for definitions of terms.

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[1] For this and all subsequent references, see the listing at the end of this article.

The advantages of the discone are that it can be operated remote from and independent of ground. Furthermore, since the current maximum is at the top instead of at the bottom of the antenna, and since its structural configuration lends itself to mounting on a pole or on top of a building, the radiation characteristics of a practical discone antenna can approximate an *ideal* dipole antenna in free space. The change of impedance versus frequency is, however, very much less than for any ordinary dipole, even dipoles with rather small length/diameter ratios. The same is true for the radiation characteristics of the discone. The antenna exhibits good impedance characteristics over a ten-to-one frequency range and low-angle radiation with little change in the radiation pattern over a three- or four-to-one frequency range. At the high-frequency end the pattern begins to turn upward, with a resulting decrease in the radiation at low elevation angles. The discone antenna may be visualized as a radiator intermediate between a conventional dipole and a biconical horn. A biconical horn[5] is essentially a conical dipole operated at frequencies for which the physical dimensions of the antenna become large compared with a wavelength. At the lower frequencies the antenna behaves very much as a dipole; at much higher frequencies it becomes essentially a horn radiator.

Design Considerations

Refer to the sketch of the discone radiator in Fig. 1. The following nomenclature is used:

ϕ = cone flare angle (total)
L_s = slant height of cone
L_v = vertical distance from the disk to the base of the cone
C_{max} = maximum diameter of cone
C_{min} = minimum diameter of cone
D = diameter of disk
S = disk-to-cone spacing

From model studies Nail has determined the optimum parameters for discone antennas to be as follows:

$S = 0.3\ C_{min}$

$D = 0.7\ C_{max}$

and typically, for an optimum design

$$L_s/C_{min} > 22$$

$$\phi = 60^\circ$$

The performance of the antenna is not very critical in regard to the value of flare angle, ϕ, except that there is less irregularity in the SWR versus frequency if $\phi > 50^\circ$, although $\phi > 90^\circ$ was not investigated. Since the bandwidth is inversely proportional to C_{min}, that dimension must be small; for a frequency range of ten to one L_s/C_{min} should be greater than 22.

From the circuit standpoint the discone antenna behaves essentially like a high-pass filter. It has an effective cutoff frequency, f_c, below which it becomes very inefficient, causing severe standing waves on the feeding coaxial line. Above the cutoff

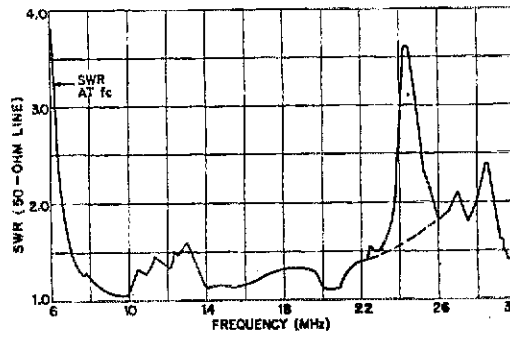


Fig. 2 — Standing-wave ratio vs. frequency for the discone antenna designed for operation on 7 MHz and above. The "spike" in the curve at approximately 24 MHz is believed to be caused by an adjacent metal structure, as explained in the text.

frequency little mismatch exists and the radiation pattern remains substantially the same over a wide range of frequencies (from some minimum frequency, f_{min}, to some maximum frequency, f_{max}). The slant height of the cone, L_s, is approximately equal to a quarter wavelength at the cutoff frequency, f_c, and the vertical height (or altitude) of the cone is approximately a quarter wavelength at the lowest operating frequency, f_{min}.

The radiation from the discone can be viewed in this perhaps somewhat-oversimplified way. A traveling wave, excited by the antenna input between the apex of the cone and the disk, travels over the surface of the cone toward the base until it reaches a distance along the slant surface of the cone where the vertical dimension between that point and the disk is a quarter wavelength. The wave field therefore sees a resonant situation and is almost entirely radiated.

For $f$min = 7.0 MHz and a velocity factor for propagation along the surface of the cone equal to 0.96, $L_v = \frac{2834}{f_{min}} = 405$ inches.

If $\phi = 60^\circ$, then $L_s = 456$ inches and $f_c = \frac{2834}{L_s} = 6.22$ MHz. The disk diameter is $D = 0.7\ C_{max} = 0.7\ (456) = 319.2$ inches, and for $C_{min} = 13.5$ inches (a practical dimension which we shall see later), $S = 0.3\ C_{min} = 0.3\ (13.5) = 4$ inches.

The ratio $L_s/C_{min} = \frac{456}{13.5} = 33.7$.

The frequency response of a discone antenna constructed with these dimensions is shown in Fig. 2. Here we see that the SWR is 3.25 at f_c and decreases rapidly with increasing frequency, being about 1.5 at f_{min}. The SWR is < 1.5 over the frequency range 7 to 23 MHz, and while this ratio

increases for frequencies > 23 MHz, the SWR, except for the irregularity for frequencies 23.5 to 25.5 MHz, is < 2.5 MHz over the frequency range 6.5 to 30 MHz. The SWR peak in the frequency range 23.5 to 25.5 MHz is thought to be due to a resonance in the metal structure of a nearby part of the building on which the discone antenna is mounted. It was mounted on a flat roof 70 feet from a penthouse which is 21.25 feet in height (including the grounded metal rail around the top). This height is a resonant half wave at 24.4 MHz.

Practical Construction

At hf the discone can be built using closely spaced wires to simulate the surface of the cone. The disk can be simulated by a structure consisting of eight spreaders with wires connected between them. It is important that a skirt wire connect the bottom ends of all slant wires simulating the cone, and another the outer ends of the spreaders which simulate the disk. These wires have the effect of increasing the effectiveness of the wire structures

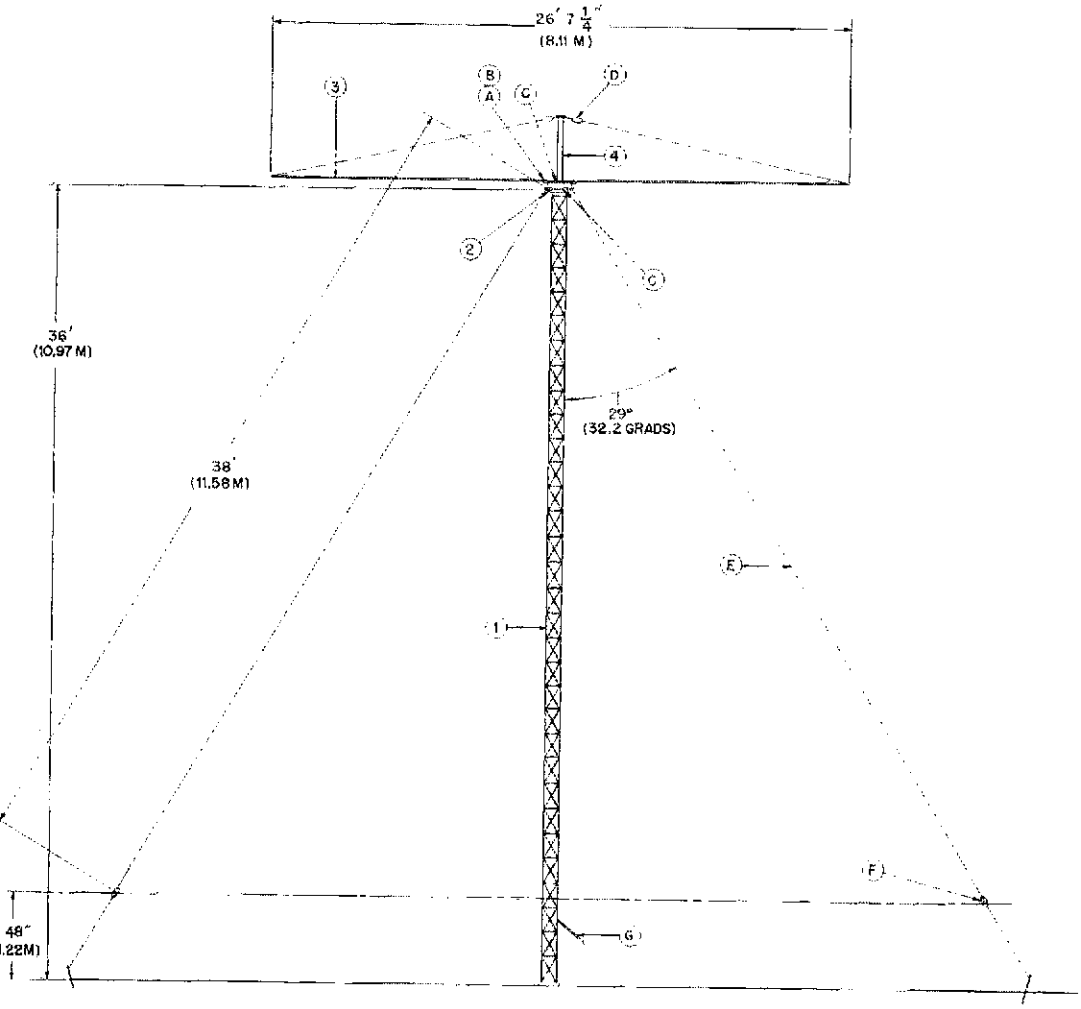


Fig. 3 — Construction details for the hf discone antenna.

A — Hex-head screw, 1/4-20 × 2-in. long, 16 req'd.
B — Hex nut, 1/4-20 thread, 16 req'd.
C — Hex-head screw, 3/8-16 × 1-in. long, 8 req'd.
D — 6-in. turnbuckle, 8 req'd.
E — No. 12 Copperweld wire, 1400 feet req'd.
F — Porcelain or ceramic insulators, 24 req'd.
G — 50-ohm coaxial feed line, length as required. Line is secured to mast and connected at feed point shown in Fig. 4.
1 — Antenna mast with cap.
2 — Insulator subassembly. See Fig. 4.
3 — Spreaders, made from 1-in. aluminum tubing, 8 req'd.
4 — Spreader support, 3-ft. length of steel or aluminum pipe or tubing, flange mounted.

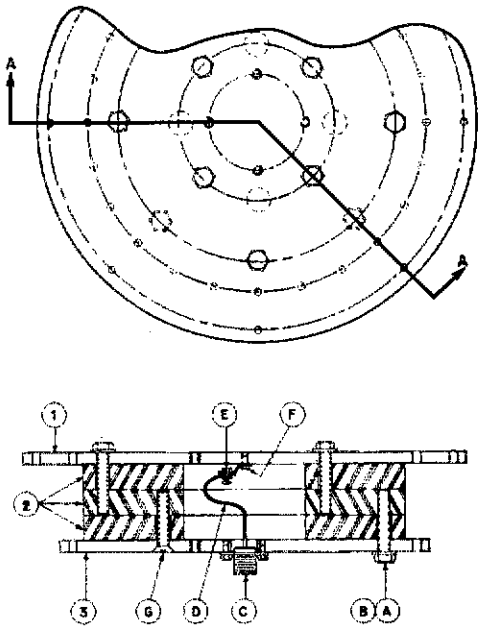


Fig. 4 — Construction details of insulator subassembly.
A — Hex-head screw, 1/2-13 × 2-1/2-in. long, 12 req'd.
B — Flat washers, 1/2-in. 12 req'd.
C — Rf connector, as required.
D — 6-in. length of copper wire.
E — Wire lug, Emco 14-6 or equiv.
F — Round-head screw, 10-32 × 3/8-in. long.
G — Flat-head screw, 1/2-13 × 2-1/2-in. long, 4 req'd.
1 — Aluminum mounting plate for disk spreaders.
2 — Phenolic insulator rings.
3 — Guy mounting plate.

to a considerable extent. An antenna constructed in this way closely approximates the performance of a solid disk and a cone over the frequency range of the antenna.

The discone assembly and construction details are given in Fig. 3. The antenna is supported by an eight-inch triangular aluminum mast (item 1) which is 36 feet high. The insulator separating the disk and the cone (item 2) is detailed in Fig. 4. Basically it is two metal plates separated by an insulating section. The lower plate has a coaxial feedthrough connector mounted at its center, and the outer edge is drilled with 24 equally spaced holes, 5/32-inch diameter, on a 13.5-inch diameter circle for the guy wires that simulate the cone. The end of each wire is soldered to a spade lug that is attached by a self-tapping machine screw to the plate. This plate is bolted to the top of the mast. Eight 1-inch diameter disk spreaders (item 3) are bolted to the top plate. A short 3-foot supporting rod (item 4) is flange mounted at the center of the upper plate to hold the cables for supporting the far ends of the spreaders. The center conductor of the coaxial feed line is attached to the center of the top plate, as shown in Fig. 4.

The antenna is mounted on the flat roof of a three-story building. The height of the lower edge of the cone is 4 feet above the roof. The 24 guy wires simulating the cone are broken by 12-inch porcelain insulators (item F) at their bottom ends, and, as previously mentioned, the ends of each wire are joined by a skirt wire, as shown in the figure.

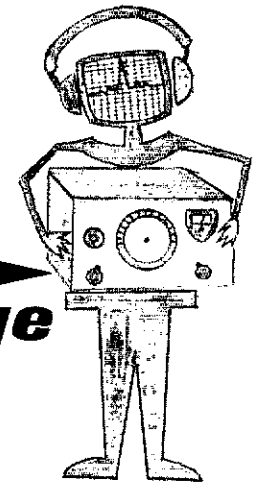
Performance

The discone antenna shown in the photograph was constructed in 1968, and it is still in use. It has survived more than one freezing-rain ice storm. The entire antenna and all supporting wires on at least one occasion were covered with 1/2-inch radial thickness of ice. A 3-element triband amateur beam covered with this thickness of ice also survived the ice storm but it was unusable; it was detuned too much by the ice sheath. The performance of the discone was unaffected by the ice. In fact at an operating frequency of about 14 MHz, paradoxically, the SWR was marginally lower when the antenna was covered with ice compared to normal. The antenna has no sharp corners or ends, and it is operated at dc ground (the cone is grounded and the disk is grounded through the input coil of the receiver). Because of this the antenna is essentially immune to precipitation static due to electrically charged rain, such as frequently falls in the Ottawa Valley during summer months. A log-periodic antenna is normally used for hf communications at the Communications Research Centre Amateur Radio Station, VE3DRC. Under conditions of precipitation static this antenna frequently builds up static-charge noise levels equal to a signal strength of S4 to S9 on a Drake R4C receiver, even though the antenna is operated at dc ground. By contrast, there is apparently no static buildup on the discone antenna. The noise levels are essentially that of the atmospheric noise intensity of the distant or nearby thunderstorm.

The antenna exhibits most of the usual characteristics of a vertical monopole. It is certainly and not surprisingly much superior in performance to the horizontal log-periodic antenna for communications over ground-wave ranges with a mobile station using a short vertical whip. The usual vertical monopole antennas have a characteristic overhead null in the radiation pattern, and for short-distance sky-wave communications a horizontal dipole is in general the best antenna. In our experience, however, communication was always possible with the discone, to distances beyond that over which the ground wave could be received, provided of course that the ionosphere would reflect a frequency of 7 MHz (the lowest frequency for which the antenna could be used). While there is certainly a null overhead, it is not a very deep one, and with a linear amplifier at the base station the mobile could always copy the base station if the base station could copy the mobile.

The antenna has been used for many hundreds of contacts on four amateur bands, 40, 20, 15 and

(Continued on page 56)



DEFINING AND MEASURING
Receiver Dynamic Range

BY WES HAYWARD,* W7ZOI

PRIOR TO THE late 1950s, the excellence of a communications receiver was thought to be commensurate with the number of signal conversions employed. A triple-conversion, 20-tube "super blooper" was the rage of the day. Then Goodman enlightened us with his paper, "What's Wrong with our Present Receivers?" His outlook contributed to the current popularity of single-conversion designs.[1]

The present trends in receiver design reflect an even more careful approach. Not only do we strive for suitable sensitivity, selectivity, stability, and frequency accuracy, but we also try to realize these ends without compromising receiver performance in the presence of a band filled with very strong signals. A number of superlatives are used to describe such a modern receiver, both by the amateur constructor and by the manufacturer. Phrases like "wide dynamic range," or "excellent immunity to cross modulation," are common. One manufacturer even claims in his receiver advertisement, "Adjacent-signal overload is non-existent!"

What do these terms mean? How wide is the dynamic range of a receiver? How immune is it to cross modulation, to blocking, to intermodulation-distortion effects? All of these parameters *can* be measured and specified. The purpose of this presentation is to review some of the basic measurement concepts which are used to define the performance of a receiver. Having an understanding of these measurements, we will be in a position to make a better selection in the purchase of a receiver, or to do a better job in the construction of our own homemade "machine."

The initial impression of some amateurs is that these measurements can be done *only* with expensive and sophisticated test equipment. This is partially true, for highly accurate measurements can be realized only with high-quality test gear. However, surprisingly accurate and meaningful measuring can be done with simple equipment which can be built easily and calibrated by the amateur experimenter in his basement workshop. Suitable circuits will be presented later in this article.

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Fundamental Considerations

Before we discuss the measurements for receiver evaluation some of the basic phenomena which limit the performance of an amplifier or mixer will be considered. These include intermodulation distortion, blocking (gain compression) and cross modulation. A typical test setup is shown in Fig. 1. The equipment includes a pair of signal generators, a hybrid combiner, the amplifier under test, and a spectrum analyzer. The reader should not be terrified by this collection because much less will be required for the more limited task of receiver evaluation. The function of each of these items will be outlined.

While most signal generators are calibrated in terms of output voltage, the real concern is not with the voltage from the generator but with the *power* available. The fundamental unit of power is the watt. However, the unit which is used for most low-level rf work is the milliwatt, and power is often specified in dB with respect to one milliwatt, or in dBm. Hence, 0 dBm would be one milliwatt. The output of a typical QRP transmitter might be +33 dBm, or 2 watts. A signal arriving from a 50-ohm antenna at the input terminal of a receiver might be 1 μV, or −107 dBm.

The convenience of a logarithmic power unit like the dBm becomes apparent when signals are amplified or attenuated. For example, a −107-dBm signal which is applied to an amplifier with a gain of 20 dB will result in an output of −107 dBm +20 dB, or −87 dBm.

The signal generators used in the test setup are, ideally, calibrated accurately in dBm. For receiver work they should be capable of producing output power from 0 dBm down to −140 dBm or even lower. The generators should have extremely low leakage. That is, when the output of the generator is disconnected, we should not be able to detect any signal in the most sensitive receiver tuned to the generator output frequency. Ideally, at least one of the signal generators should be capable of amplitude modulation. A suitable lab-quality piece would be the HP-8640B.

A hybrid combiner is essentially a unit with three ports (i.e., three spigots or coax connectors). The device is used to combine the signals from a

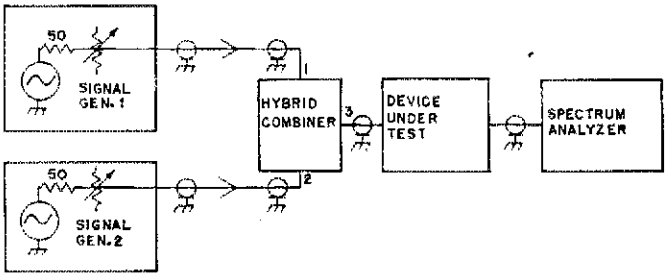

Fig. 1 — Block diagram of the test setup for evaluation of an amplifier or mixer.

pair of signal generators. Note the labeling on the hybrid combiner shown in Fig. 1; this box has the characteristic that signals applied at ports 1 or 2 appear at port 3, and are attenuated 6 dB. However, a signal from port 1 is attenuated 30 or 40 dB when sampled at port 2. Similarly, signals applied at port 2 are isolated from port 1 some 30 to 40 dB. The isolating properties of the box are needed in order to prevent one signal generator from being frequency- or phase-modulated by the other. A second feature of a hybrid coupler is that a 50-ohm impedance level is maintained throughout the system. A commercial example of a hybrid coupler of this kind is the HP-8721A.

The final piece of gear in our experimental arrangement is the spectrum analyzer. This box is essentially a receiver. However, it has a few features not usually found in an amateur receiver. First, the output information is not audio energy in a pair of headphones, but is a "blip" on the face of a CRT. Second, a spectrum analyzer is an electronically swept instrument, with the span of frequencies displayed being selectable by the operator. Finally, the spectrum analyzer is a calibrated instrument. That is, by examining the signals which are displayed on the screen, the operator can read directly the power amounts of the signals in dBm. Typical analyzers on the market also have selectable bandwidth or resolution. High quality examples for the lab are the Tektronix 7L13 or the HP-8553.

This equipment can now be used to study a simple test amplifier, or for that matter, any two-port device. This setup could also include a mixer if we assume the associated local oscillator to be included in the box labeled "device under test." For our example we will use a simple one-stage amplifier.

For the first experiment assume that one of the generators is turned off. Set the other generator to the frequency of interest, and adjust the output to a power of, say, -44 dBm. Remembering that the hybrid has an attenuation of 6 dB, the power available at the input to the amplifier is -50 dBm. We now tune the spectrum analyzer to the same frequency, and observe the output of the amplifier. With a signal of -30 dBm, the gain of the amplifier is determined to be 20 dB. Now we increase the generator output by 10 dB and notice an output of -20 dBm. The gain is still 20 dB. As this is continued, however, the gain decreases. For our hypothetical example, when the power available at the amplifier input is -10 dBm, we would expect an output 20 dB higher, or +10 dBm. Instead, only +9 dBm is observed. This is the point of 1 dB of gain compression and is the phenomenon which usually leads to desensitization, and ultimately, to blocking in a receiver.

It is interesting also to decrease the signal-generator output. For a time the output signal is observed in the analyzer at a level 20 dB above that of the generator. However, a point occurs eventually where the output energy is buried in the noise. This level will be determined by the noise figures of the amplifier and the spectrum analyzer and by the bandwidth of the system.[2]

Further Testing

The next experiment in the evaluation of the amplifier uses both signal generators to perform two-tone intermodulation tests. Two signals of equal level are injected into the input of the amplifier at slightly different frequencies, F_1 and F_2, and the output is studied. The so-called third-order, intermodulation-distortion products will appear at frequencies of $(2F_1\text{-}F_2)$ and $(2F_2\text{-}F_1)$.[3] Assume that the two input frequencies

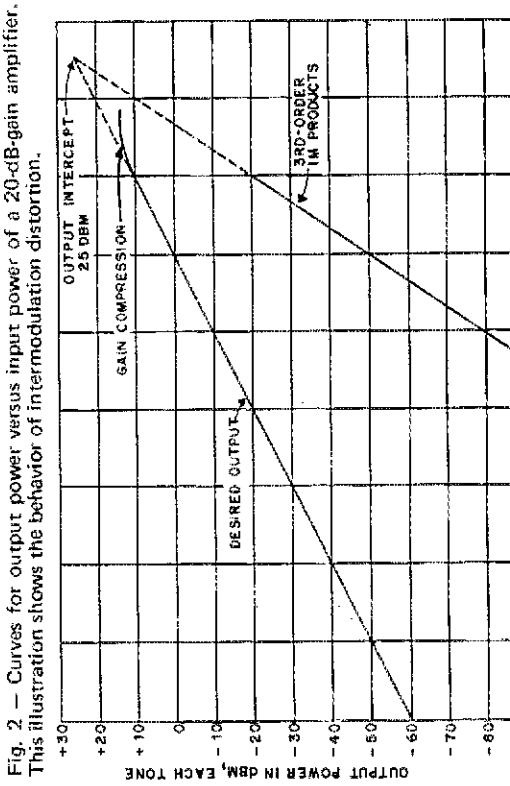

Fig. 2 — Curves for output power versus input power of a 20-dB-gain amplifier. This illustration shows the behavior of intermodulation distortion.

are 14,040 and 14,060 kHz. The third-order IM products will then appear at 14,020 and 14,080 kHz.

Assume that the input power to the amplifier is −20 dBm for each of the input "tones." If the spectrum analyzer is set to sweep from 14 to 14.1 MHz, the desired outputs of 0 dBm each are seen, indicating again that the amplifier has 20 dB of gain. The hypothetical amplifier also produces signals at '020 and '080 at a level of −50 dBm. In this case, the IM products are 50 dB down from each of the two tones. Since the peak envelope power (PEP) of the output is 6 dB above each of two equal tones in a two-tone test, the IM would be 56 dB below the PEP output. Although the latter definition is often used by manufacturers of amateur gear, the more conventional designation will be used in this article.

The really interesting property of intermodulation distortion is the way the distortion levels change as the drive power changes. If 10 dB of input power is subtracted from each signal-generator output, the two major outputs will decrease by 10 dB. However, the distortion products will decrease by 30 dB to −80 dBm each.[4] The IM is now 70 dB down from each of the desired output tones.

The output power may be plotted as a function of the input power of the tones in a graph of the kind shown in Fig. 2. In this curve, the abscissa shows the input power for each tone. The ordinate (vertical axis) represents output power. Two curves are shown. The upper one is merely the level of each of the desired outputs, while the steeper curve represents the power output of each of the distortion products. From the first experiment we found that our output ceased to be linear at an output of +9 dBm (1 dB gain-compression) point). Hence, it is not meaningful to extend the measurements to higher power levels. However, we can extrapolate each of the two curves beyond the powers where we actually do measurements. These portions of the curve are shown dotted in Fig. 2. The result of this extension of the curves is that the two plots eventually cross each other. The output power associated with this intersection is called the third-order, IM-output intercept, or the IM interept. This number is a very useful figure of merit for the designer, for it defines essentially the IM performance of the amplifier for all power levels. In the example the intercept point is +25 dBm. Knowing the intercept, output power "X" dB below the intercept will lead to IM products which are 2"X" dB down from each of two equal tones.[5]

In the first experiment gain compression was measured using only one signal generator. The same experiment can be performed with two tones. One generator is set for a medium-level output, such as −50 dBm. The other generator is moved 10 or 20 kHz away from the first, and its amplitude is increased until the first signal, as observed in the spectrum analyzer, decreases by 1 dB.

Cross Modulation

Cross modulation can be measured in a similar fashion. The first generator is set to deliver a cw output of −50 dBm. The second generator is set up for amplitude modulation at a 30% level. The output power of the second generator is increased until a 1% modulation appears on the first signal. The difficulty encountered with cross-modulation measurements arises from the fact that many signal generators create (unwanted) additional modulation sidebands. These can confuse the results seen on the spectrum analyzer. The best cure is to run the output of the second generator (the one with modulation) through a crystal filter which will pass the carrier and the desired modulation sidebands, but not the higher order sidebands.

The foregoing phenomena will limit the ability of the amplifier to handle strong signals. If this amplifier were, for example, the rf amplifier in a communications receiver, we would hear the IM-distortion products in the receiver during such an experiment. However, we have said nothing about dynamic range. This will depend not only upon the amplifier ability to handle strong signals, but also upon its capacity to work simultaneously with small signals, which have not been specified. This will depend, in this experiment, upon the noise figures of the amplifier and spectrum analyzer, and upon the system bandwidth. Blanket statements sometimes found in the "ham" literature claim that a given amplifier has, for example, a "140-dB dynamic range." Such comments are meaningless.

Receiver Measurements

The experiments presented in the foregoing discussion can be extended easily to the study of a receiver. The appropriate test setup is shown in Fig. 3, where the amplifier under test and the spectrum analyzer of Fig. 1 have been replaced by the receiver and an audio voltmeter.

The fundamental discussion used a hypothetical amplifier which was "designed" to yield numbers which were typical but consistent with simple arithmetic for ease of explanation. The example used to illustrate the receiver measurements, on the other hand, is quite real, being the writer's home-built, solid-state cw receiver.[6] The apparatus used

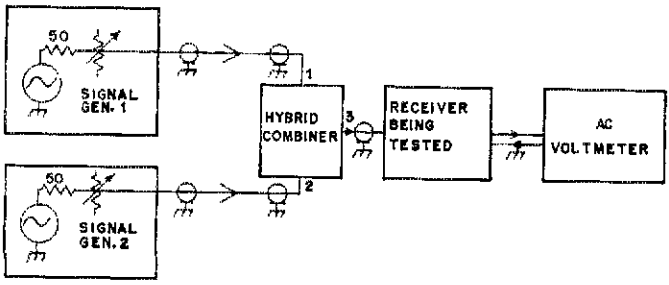

Fig. 3 — Block diagram of a test setup for receiver evaluation.

for evaluation was the collection of lab-quality gear mentioned earlier.

The first experiment is to measure the receiver equivalent noise floor. This is done by means of a single generator which is tuned to the same frequency as the receiver. Output from the generator is increased until the ac voltmeter at the audio-output jack of the receiver shows a 3-dB increase. In the writer's receiver, the input level available at the antenna terminal was −142 dBm. This measurement indicates the minimum signal which could be detected with the receiver. This level is defined as that which will produce the same audio-output power as the internally generated receiver noise. Hence the term noise "floor."

This measurement was cross-checked by using lab-quality equipment to determine the noise figure of the receiver. The two measurements corresponded within 1 dB. The noise figure was about 6 dB.

The noise floor of −142 dBm measured for the writer's receiver is typical of many of the receivers on the market with cw filters being used. With a "tangential sensitivity" of −142 dBm, these receivers will show a 10-dB signal-to-noise ratio with an input signal of approximately .06 microvolt. Rarely are commercial receivers specified so closely, even though they may be capable of this sensitivity. Much better sensitivity is possible. However, it is generally pointless in receivers for the hf bands. Noise figures as high as 20 dB are often suitable up to the 7-MHz band for use in locations plagued with high antenna-noise levels. Even on the ten-meter band, noise figures under 8 or 10 dB are rarely usable.

The next measurement concerns blocking. Both signal generators are used. One is set for a weak signal of roughly −110 dBm (S5 or so), and the receiver is tuned to this signal. The other generator is set about 20 kHz away from the desired frequency, and is increased in amplitude until the receiver output drops by 1 dB. This occurred at a level of - 21 dBm, or 121 dB above the noise floor in the author's receiver. This measurement is somewhat suspect with the writer's receiver, since the stop-band attenuation of the first crystal filter is not this good. A blocking measurement is indicative of the signal level which may be tolerated at the antenna terminal without rendering the receiver totally useless.

Two-Tone IM Tests

The more enlightening measurement is to evaluate the two-tone IM performance of the receiver. For this measurement it is often useful to place a step attenuator between the hybrid coupler and the receiver. This allows two equal tones to be varied at the same time. The two signal generators were adjusted for an output of −10 dBm each at 14,040 and 14,060 kHz. The receiver was tuned to 14,080. An IM product was noted immediately. The step attenuator was adjusted until the IM product produced an output which was 3 dB above the noise level. This is similar to the measurement of the noise floor, where the signal is tangential with the noise. This occurred for input signals of −57 dBm., or 85 dB above the noise floor. Hence, the two-tone *dynamic range* of the receiver is 85 dB. This figure is one of the most significant parameters which can be specified for a receiver: it is a measure of the range of signals that can be tolerated while producing essentially *no undesired spurious responses.* It is generally a conservative evaluation, for other effects such as "crossmod" or blocking will occur only for signals well outside the dynamic range of the receiver. Also, when a receiver is optimized for dynamic range, it is generally close to optimum for immunity from these other stronger and undesired responses.

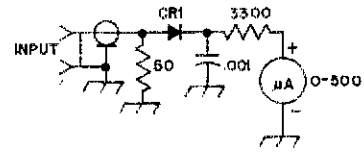

Fig. 4 — Circuit of a simple rf power meter. Full-scale sensitivity is approximately +17 dBm. See text for calibration details.

If the bandwidth of the receiver is changed, the dynamic range will change. For example, if the bandwidth of the receiver is increased by a factor of 10, the equivalent noise floor will increase by 10 dB. However, it will not be necessary to increase the two primary input tones by 10 dB in order to bring the IM response back up to a level tangential with the noise floor. (Note the curve in Fig. 2, where IM products climb three times as steeply as do the inputs.)[7] On the other hand, an attenuator ahead of the receiver will not change the dynamic range. Rather, it will shift it toward higher power.

Another useful measurement is the noise-modulation performance of the receiver.[8,9] This is done with a signal generator set 10 or 20 kHz away from the receiver frequency. The output level of the generator is brought up until a slight increase in

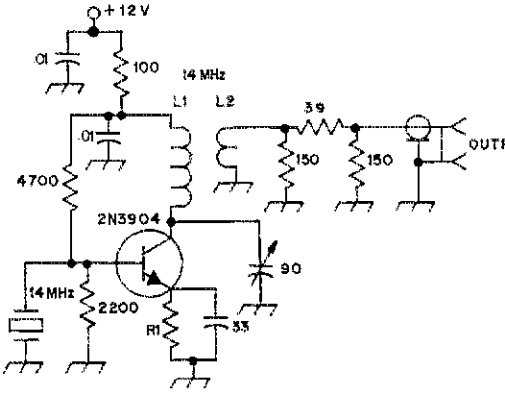

Fig. 5 — Diagram of a test oscillator which is suitable for making IMD measurements. L1 has 24 turns of No. 22 enam. wire on an Amidon T50-6 toroid core. L2 is 3 turns of No. 22 enam. wire over L1. R1 is selected to provide the desired output amount (220 ohms is a typical value).

the audio-noise output of the receiver is noted. This output is the result of noise from the receiver local oscillator, *or* from the signal-generator output mixing in the front-end mixer. In order to remove noise from the generator, the ideal measurement approach is to run the generator output through a very narrow crystal filter prior to application to the receiver.

Since a good crystal filter was not available at 14 MHz, only a qualitative noise-modulation experiment was done. A generator was set 100 dB above the receiver noise floor, and a slight increase in receiver output was noted 10 kHz away. The receiver was then tuned toward the generator frequency. When the two were within about 2 kHz of each other the noise output started to increase dramatically. At 1-kHz spacing, a beat note was first heard. While this measurement is not completely meaningful, because of the lack of a suitable crystal filter, it did show that the dynamic range of the receiver was not being compromised by local-oscillator noise. Noise-modulation effects are quite often the ultimate limitation in receivers, especially where very steep-skirted crystal filters are used in the i-f.

Home-Constructed Measurement Gear

The tests outlined earlier are performed easily if high quality lab test gear is at hand. However, meaningful tests can also be done in the home lab when using relatively simple equipment which an amateur can build. While the accuracy of such measurements will be compromised over the results obtainable with the higher quality apparatus, the results will be useful in receiver optimization. If care is used in the design, construction, and calibration of the equipment, the results may even be surprisingly accurate.

The intent of this section is to outline the kinds of measurement techniques which may be applied in the home lab. It is the purpose here to demonstrate feasability rather than to present projects for duplication. Hence, in the interest of brevity, many of the details will not be presented.

The basic requirement for performing a receiver evaluation is to provide stable signals to the receiver which have *well known power-output amounts*. Hence, the essential underlying problem is one of rf power measurements. Shown in Fig. 4 is a simple rf power meter which has a full-scale sensitivity of approximately 50 mW, or +17 dBm. This unit is the ultimate in simplicity, consisting of nothing more than a 50-ohm termination, a hot-carrier diode, one resistor, one capacitor, and a meter. Weiss[10] pointed out that power meters of this kind may be calibrated with dc. This is based upon the observation that the circuit is essentially a peak-reading voltmeter. For example, a power of 50 mW into a 50-ohm resistor would result from a peak voltage of 2.24 volts across the resistor. Hence, a dc voltage of 2.24 across the 50-ohm resistor would yield an equivalent meter reading. A dc calibration of the writer's power meter agreed within 0.5 dB of a more careful calibration with lab-quality equipment. Clearly, a gadget of this kind is a real workhorse in the amateur lab.

Shown in Fig. 5 is a simple crystal-controlled oscillator which is suitable for IM measurements. This circuit is virtually identical with that used in many QRP transmitters. The output is obtained through a 6-dB, 50-ohm attenuator. This serves the purpose of providing a little buffering, and ensuring that the output impedance is close to 50 ohms. A pair of these oscillators will be required for IM and blocking measurements.

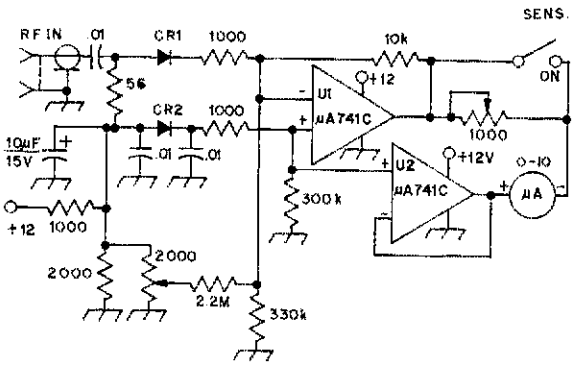

Fig. 6 — Circuit for a square-law detector. The sensitivity is below −26 dBm. See text for information on CR1 and CR2.

Once one of these oscillators is built, the emitter resistor may be adjusted for an output power of +7 to +10 dBm. Lower power levels are then obtained easily with a step attenuator. Such a device is constructed easily from inexpensive slide switches, half-watt 5% tolerance carbon resistors, and an enclosure fabricated from scrap pc board. Suitable units are described by Daughters and Alexander.[11] Although simple, these attenuators are surprisingly accurate, and are flat well into the vhf range. The unit used in the author's shack has eight sections with cumulative amounts of 1, 2, 3, 6, 10, 10, and 10 dB, yielding a maximum attenuation of 42 dB.

It is useful to measure much lower rf power directly. Shown in Fig. 6 is a relatively simple rf detector which is capable of detecting signals as low as −26 dBm. The basis of this "microwatt meter" is a diode, CR1, which is biased with a standing current of about 20 microamperes.[12] The key to achieving good sensitivity is to bias the diode from a low-impedance dc source. This is achieved by means of an operational amplifier, U1, with feedback. A second similar diode, CR2, is used for temperature compensation, although it has no rf applied to it. The other op amp, U2, merely provides a low-impedance reference for the meter. This instrument is calibrated easily while using one of the oscillators shown in Fig. 5 (and with the step attenuator). Although hot-carrier diodes were used ultimately, 1N914s gave similar sensitivity.

Note that a bootstrapping process is now being used for calibration. Initially a dc measurement was employed to calibrate a high-level power meter. This meter was then used to calibrate a high-level rf source This source is then attenuated and used to calibrate a more sensitive detector. The

process may be continued an arbitrary number of times, although the errors in the measurements will accumulate.

The low-level power meter of Fig. 6 can be extended to lower levels with suitable amplifiers of either broadband or narrow-band design. A broadband amplifier using three 2N5179s is included with the author's detector. It provides a sensitivity of under −60 dBm with a 3-dB ripple, and a bandwidth of 50 MHz. This combination has turned out to be an extremely useful general-purpose measurement tool. When used with a signal generator and a step attenuator, for example, filters may be evaluated over a 50-dB range. A small loop of wire at the end of a piece of coax will serve as a super-sensitive "rf sniffer." A suitable bank of filters could make the machine function as a rudimentary spectrum analyzer.

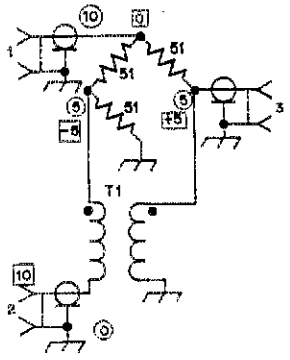

Fig. 7 — Illustration of a hybrid coupler. The isolation properties result from bridge action and the balun behavior of T1. The latter consists of 10 bifilar turns of light-gauge enamel wire on a 0.37-inch OD ferrite toroid core.

A workable hybrid combiner is shown in Fig. 7. This box is nothing more than a simple rf bridge. The three ports are labeled the same as was the hybrid unit used in Figs. 1 and 3. Shown in circles are the rf voltages at various points in the circuit, resulting from a 10-volt excitation at port 1. Similarly, in square boxes are the signals resulting from 10 volts of rf at port 2. The isolation transformer is wound on a ferrite toroid (Amidon FT-37-12-125) with a permeability of 125. A lower permeability powdered-iron core should not be used.

As might be expected, the hybrid device can be used also as an rf bridge. In this "return-loss bridge" mode, rf excitation is applied to port 1, the load to be adjusted to 50 ohms is connected to port 3, and the detector is tied to port 2. The virtue of such a bridge is that measurements can be made at very low power levels.

The most difficult and critical item to build and calibrate is an rf source which can be used to measure the noise floor of the receiver under test. A circuit suitable for this purpose is shown in Fig. 8. Again, a simple crystal-controlled oscillator is used as the rf source. However, in this case the oscillator must be extremely well shielded and decoupled from the battery. The latter should always be used for a power supply. Significant attenuation is provided by the enclosure which houses the oscillator. The unit is built in a box made from scraps of double-clad pc board. After the attenuator resistors are adjusted to provide something close to an S7 signal in a receiver, the box is soldered shut, crystal included. Several partitions are used in the attenuator portion of the circuit.

While this low-level source could, in principle, be calibrated with an extension of the bootstrap process used to calibrate the rest of the equipment, the errors would probably be excessive. A better method would be to borrow a calibrated signal generator from a local amateur. Many such units have appeared on the surplus market, or through the MARS program, and should not be hard to locate. Then, the low-level source of Fig. 8 can be compared with the signal generator in a receiver.

The crystal-controlled source, once calibrated, will be every bit as good as all but the best signal generators, for the leakage will be quite low. No output should be detectable in a fairly well-shielded receiver when the two units are grounded together. Attaching only the receiver antenna post to the homemade generator output terminal should yield a detectable signal. This source can then be used with the step attenuator for tangential-sensitivity measurements, or directly without attenuation as the "desired" signal in blocking measurements. Even if it is not possible to calibrate this source, it will be quite useful for comparative measurements.

The author's low-level source has an output of −112 dBm at 14 MHz. Used in conjunction with the home-constructed step attenuator, the measurement results agree with those obtained with lab-quality instrumentation, within one dB.

The final item needed for receiver evaluation is an ac voltmeter. A simple unit is shown in Fig. 9.

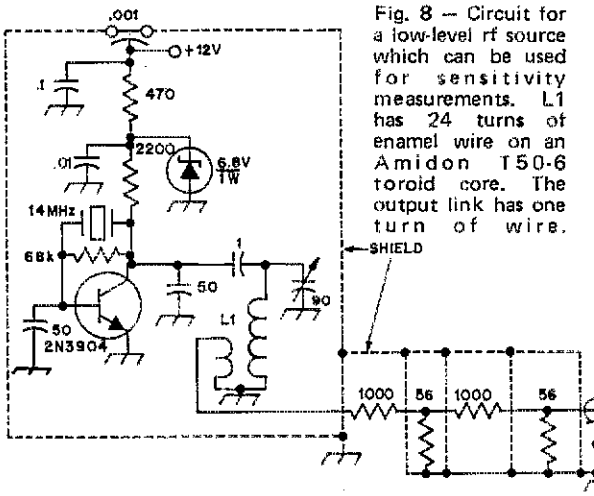

Fig. 8 — Circuit for a low-level rf source which can be used for sensitivity measurements. L1 has 24 turns of enamel wire on an Amidon T50-6 toroid core. The output link has one turn of wire.

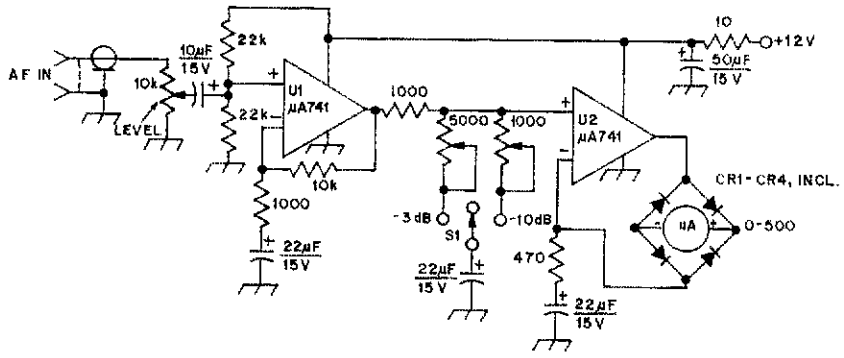

Fig. 9 — Simple audio voltmeter. CR1-CR4, incl., are 1N914s. M1 is a 500-µA meter. S1 is a spdt toggle switch (center off).

This equipment is not calibrated on an absolute basis. However, 3 dB and 10 dB of attenuation can be switched in for measurement purposes. The internal adjustments are made easily by temporarily tacking a 51-ohm resistor across the input terminal, then driving the input with the step attenuator. Audio power is applied to the step attenuator from an audio generator with a −10-dB 50-ohm pad in the output.

Conclusions

With the inexpensive modern semiconductors available to the radio amateur, high performance receivers can now be built. However, the "ultimate" receivers will come only from those builders who are willing to perform careful measurements during their design efforts. Ideally, these measurements are performed best with the high quality lab instruments presently available. However, a suitable job can also be done with rather simple homemade equipment if it is calibrated carefully.

Using readily available components, and care in measurement, it should be possible for the experimentally inclined amateur to build a receiver with a dynamic range of 100 dB or more. Using more exotic components, the current state of the art is probably somewhere around 140 dB. Receivers of this caliber, however, are not available on the amateur market.

Considering the fact that the measurements needed to specify blocking and dynamic range can be performed by the amateur who uses simple equipment he has built, it does not seem unreasonable that we, as consumers, demand more realistic and complete specifications from the receiver manufacturers. In a similar vein, it is this writer's opinion that similar data should be included in ARRL evaluations of Recent Equipment. This would not only be useful to the potential customer, but also to the builder who needs a goal for his own work.

References

[1] Goodman, *QST* for Jan., 1957.

[2] The noise figure of an amplifier, a mixer, or a receiver, is the input signal-to-noise ratio divided by the output signal-to-noise ratio. The input noise is usually assumed as originating in a resistor at a temperature of 290 degrees Kelvin. The reader unfamiliar with the definition and the subtleties of the noise-figure concept should review Nelson's, "A Little Bit About Noise," *73 Magazine* for January, 1967.

[3] The transfer characteristics of most real amplifiers can be expressed as a power series:

$$V_{out} = K_0 + K_1 V_{in} + K_2 V_{in}^2 + K_3 V_{in}^3 + \ldots$$

The term of normal interest is the linear term $K_1 V_{in}$. The other terms describe the distortions in the amplifier. If two input signals of equal amplitude, A at frequencies f_1 and f_2 are considered, the input signal is

$$V_{in} = A[\cos \omega_1 t + \cos \omega_2 t]$$

where $\omega_N = 2\pi f_n$

If this input signal is substituted into the cubic term of the power series, $K_3 V_{in}^3$, a number of terms result, including some of the form

$$V_{out} \propto A^3 \quad \cos(2f_1 - f_2)\, 2\pi t + \cos(2f_2 - f_1)\, 2\pi t$$

These are the so-called third-order intermodulation distortion products. A more complete outline of this analysis is found in *Electronic and Radio Engineering*, Chapter 10, McGraw-Hill, 1955.

[4] It follows directly from the analysis of footnote 3 that $P_{IM} = KP_{out}^3$. Taking the log of this expression, P_{IM} (in dBm.) = 3 P_{out}(dBm) + 10 log K. P_{IM} is the power of the IM product and P_{out} is the desired amplifier output power.

[5] Measuring the output intercept allows the constant of footnote 4 to be evaluated. The numbers presented in the example used in the text are typical of a quality bipolar transistor amplifier biased for a collector current of 20 mA, with a collector load resistance of 50 ohms.

[6] Hayward, "A Competition-Grade CW Receiver," *QST* for March and April, 1974.

(Continued on page 43)

A Crystal-Controlled SSTV Sync System

Beats QRM

BY ROBERT F. TSCHANNEN,* W9LUO

THOSE EXPERIENCED with SSTV operation in crowded ham bands are aware of the many interference problems caused by sideband splatter, heterodynes, cochannel habitation, and other forms of QRM. The purpose of the SSTV synchronization system described here is to provide a completely independent sync system, which, when utilized by two stations with similar sync generators, permits continuous SSTV synchronization without interruption due to any type of "on the air" interference. Then, even though some video portions of the picture may still be obliterated by interference, the relative positions of remaining picture elements are precise and the resultant video continuity is far superior to that obtained with "hold off" circuits, APC loops, or driven sync. As will be explained later, this condition will hold true for substantial time intervals, permitting greatly improved picture exchanges to be made in the presence of interference.

Principle of Operation

This sync system is independent of the power-line frequency and takes advantage of the comparatively low timing accuracy demanded by the amateur SSTV system. By using crystal-controlled sync generators and maintaining a modest frequency accuracy between the two stations in SSTV contact, excellent results may be obtained.

To elaborate a little more on the system, assume that two SSTV stations desire to use the crystal-controlled sync system. For convenience, each has chosen to use 1.966080-MHz crystals as outlined for the sync generators in this article. Then, even though the crystals used as the master oscillators may be operated in different environments, it is simple for the operators to adjust these oscillators, at least momentarily, to be within ±10 Hz of each other as contact is initially established. Once this is achieved, the only other requirement is to provide correct horizontal and vertical phasing. This is handled by a horizontal phasing control plus a momentary-action switch in the vertical sync circuit. After simple frequency and phase adjustments are made — bring on the QRM, it *will not* disturb the synchronizing performance of the SSTV at either station using the system.

Some may question how adequate timing accuracy is obtained when the master oscillators are not locked together. This is explained as follows: To produce sync pulses corresponding to the amateur SSTV standards from a 1.966-MHz crystal, a frequency division of 2^{17} or 131,072 times is required for the horizontal frequency of 15 Hz and a total of 2^{24} or 16,777,216 times for the vertical frequency of 0.117 Hz. (Such frequency divisions sound formidable, but are an easy task for some of the new counter ICs.) Because of the very large divisions involved, the initial good stability of the crystal-controlled master oscillator is translated to the very low frequencies, providing good timing accuracy for the SSTV sync. Master-oscillator frequency differences of 10 or 20 Hz show up as such miniscule differences in sync-pulse timing that they are almost imperceptible. Table 1 lists several possible MO frequencies and the divisions and/or multiplications required to produce usable SSTV horizontal frequencies. The field-rate frequencies shown are based on additional divisions of 128 times. Some of the line and field rates shown differ slightly from each other, but all are usable.

Several other frequencies, in addition to the 1.966080-MHz frequency mentioned earlier, are tabulated, since an extension of this system concept would be to phase lock to a standard frequency such as is available from WWV. Alternatively, one might lock to the 3.579545-MHz color reference oscillator of a color TV receiver. If the color receiver is in sync, the reference subcarrier would then be maintained at close tolerance by the broadcaster (in some cases by means of a rubidium

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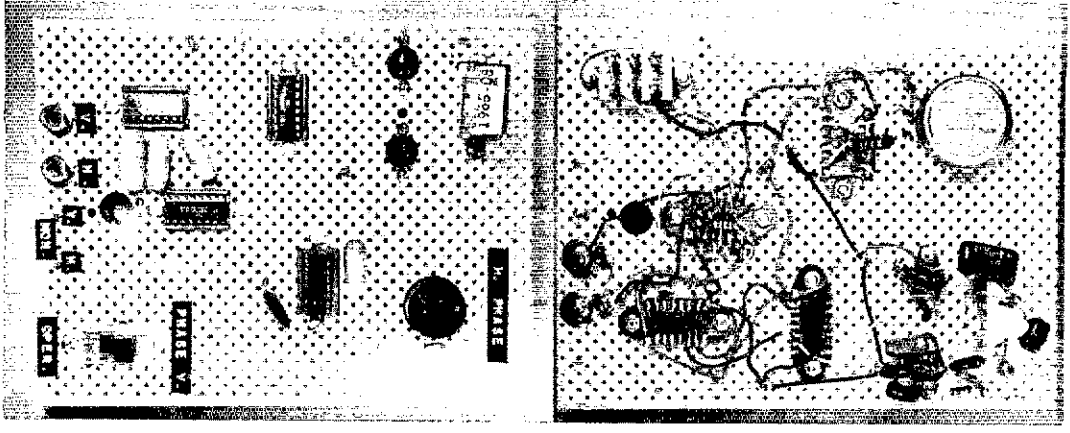


Top and bottom views of the sync generator with COS/MOS IC dividers. Perforated board, IC sockets, and point-to-point wiring were used in the construction. The crystal oscillator is positioned at the right on the board, with the vertical and horizontal sync outputs available at the left.

standard). Note that in all cases the calculated horizontal picture shift per minute is so small as to be imperceptible.

One might ask if the use of a 60-Hz reference frequency from the power line might not serve as well as the crystal-controlled source. If all stations involved in the SSTV exchanges were on a common phase-locked system, the answer would be yes. It is well known, however, that while the average timing accuracy of the public utilities service is very good, the nominal frequency increases or decreases by modest amounts over given time intervals. A horizontal shift of 10% of the picture width could be experienced if a 0.1-Hz shift of line frequency occurs during a one-minute time period. It is, therefore, considered more practical to utilize a stable local source such as a crystal oscillator, especially since a controllable amount of frequency shift can be obtained at will if it is required. A block diagram of the basic sync system using COS/MOS dividers is shown in Fig. 1.

It may be seen that the system is simple and straightforward. The dividers provide the frequency countdown. Wave-shaping circuits provide driving pulses of desired duration. A pair of monostable multivibrators is used to make up the horizontal phase shifter. Vertical phasing is produced manually with a momentary-action switch, S1. When the switch is depressed, the dividers are reset to zero.

Circuit Description

Two versions of the sync generator were developed. One version uses two COS/MOS 14-stage ripple counters, and the other version uses TTL dividers. The COS/MOS version is much more compact and easier to build. However, if the COS/MOS counters are difficult to purchase, some

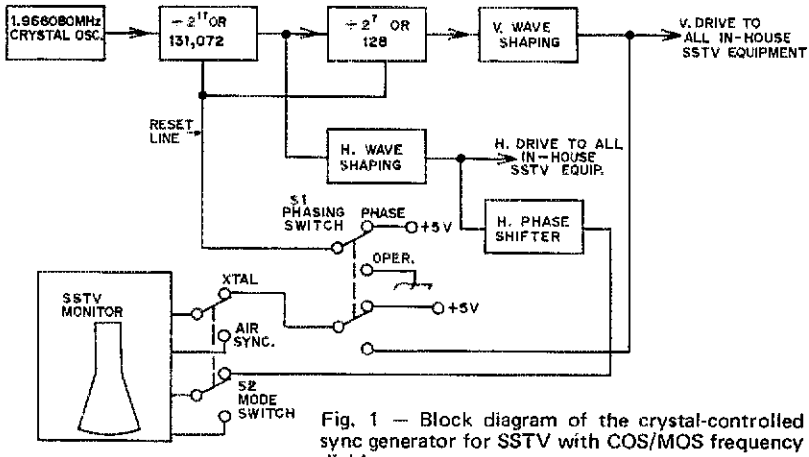


Fig. 1 — Block diagram of the crystal-controlled sync generator for SSTV with COS/MOS frequency dividers.

TABLE I

MO Freq.,	**Mult.*	**Division*	*Nominal Hor. Freq., Hz*	***Max. Hor. Pic. Shift/Minute*	****Field Rate,Hz*
1.000,000	—	2^{16} or 65,536	15.259	0.12%	0.11921
1.966,080	—	2^{17} or 131,072	15.000	0.06%	0.11719
3.579,545	4	955,500	14.985	0.034%	0.11707
5.000,000	9	3,000,000	15.000	0.024%	0.11719

*Total multiplication and/or division required to obtain nominal hor. frequency.
**Based on 20-Hz MO frequency difference between stations.
***Based on 2^7 division of specified horizontal frequency.

of the more readily available TTL ICs can be used. It ends up that the comparative cost between the two versions is not greatly different. Fig. 2 is the schematic diagram for the COS/MOS unit; Fig. 3 is that of the TTL unit. The CA3096 transistor array used in the COS/MOS version could also be used with the TTL unit, or individual discrete transistors substituted for the output system of the COS/MOS unit. Physical comparisons of the two units are seen in the photographs.

Connecting the System into a Station

Some elementary knowledge of the operation of the SSTV monitor, camera, and/or flying-spot scanner systems is desired if the system is to be

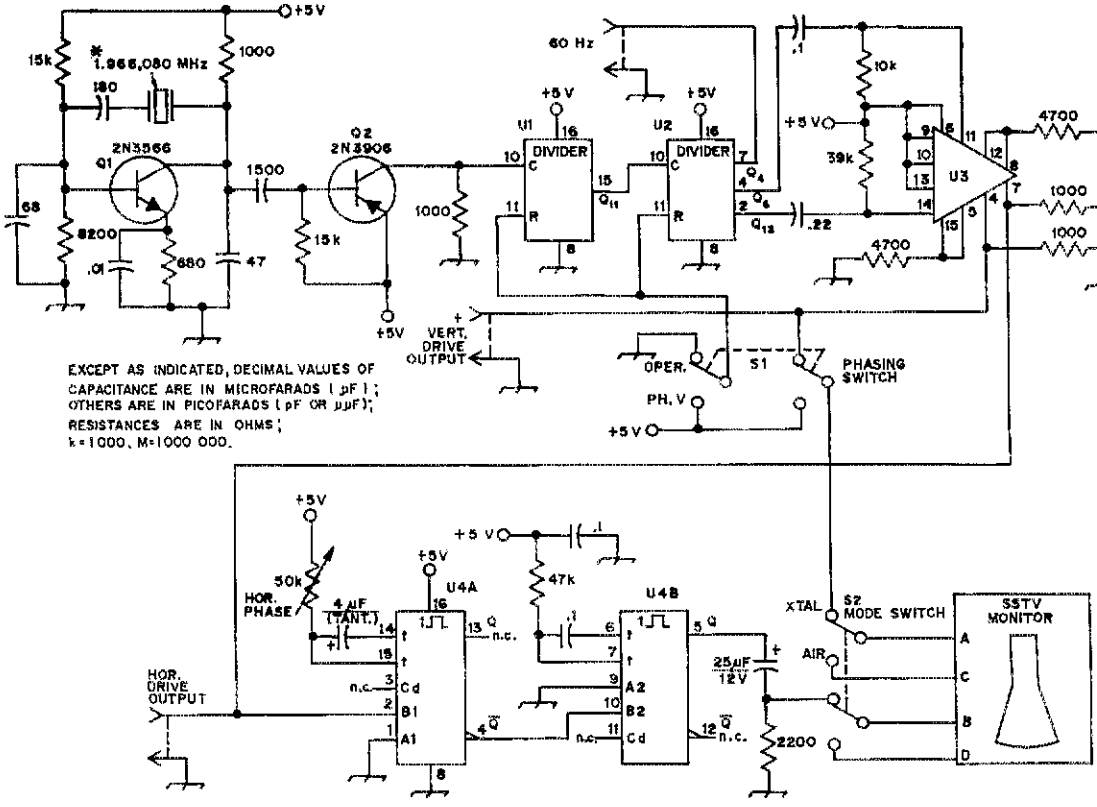


Fig. 2 — Circuit diagram of sync generator with COS/MOS IC dividers. A 7-45 pF trimmer connected in shunt with the crystal will provide for about 100 Hz of frequency-adjustment range, if desired.
U1, U2 — RCA CD4020 or Motorola MM5620 or equiv.
U3 — Transistor array, RCA CA3096 or equiv.
U4 — TTL monostable multivibrator, type 74123.

properly implemented. Horizontal and vertical drive signals from the sync generator are used to drive all cameras or flying-spot scanners in the station. The SSTV monitor is driven by the horizontal and vertical drive signals supplied via the horizontal phase shifter and the vertical phasing switch.

Representative connections to several different monitors and a typical camera are as follows:

W9LUO, Mark I Monitor

1) Open base leads to Q10 and Q16.

2) Connect terminal A of mode switch to base of Q10. Connect terminal B of mode switch to base of Q16.

3) Connect pin 6 of vert. monostable MV to terminal C of the mode switch. Connect pin 6 of hor. monostable MV to terminal D of the mode switch.

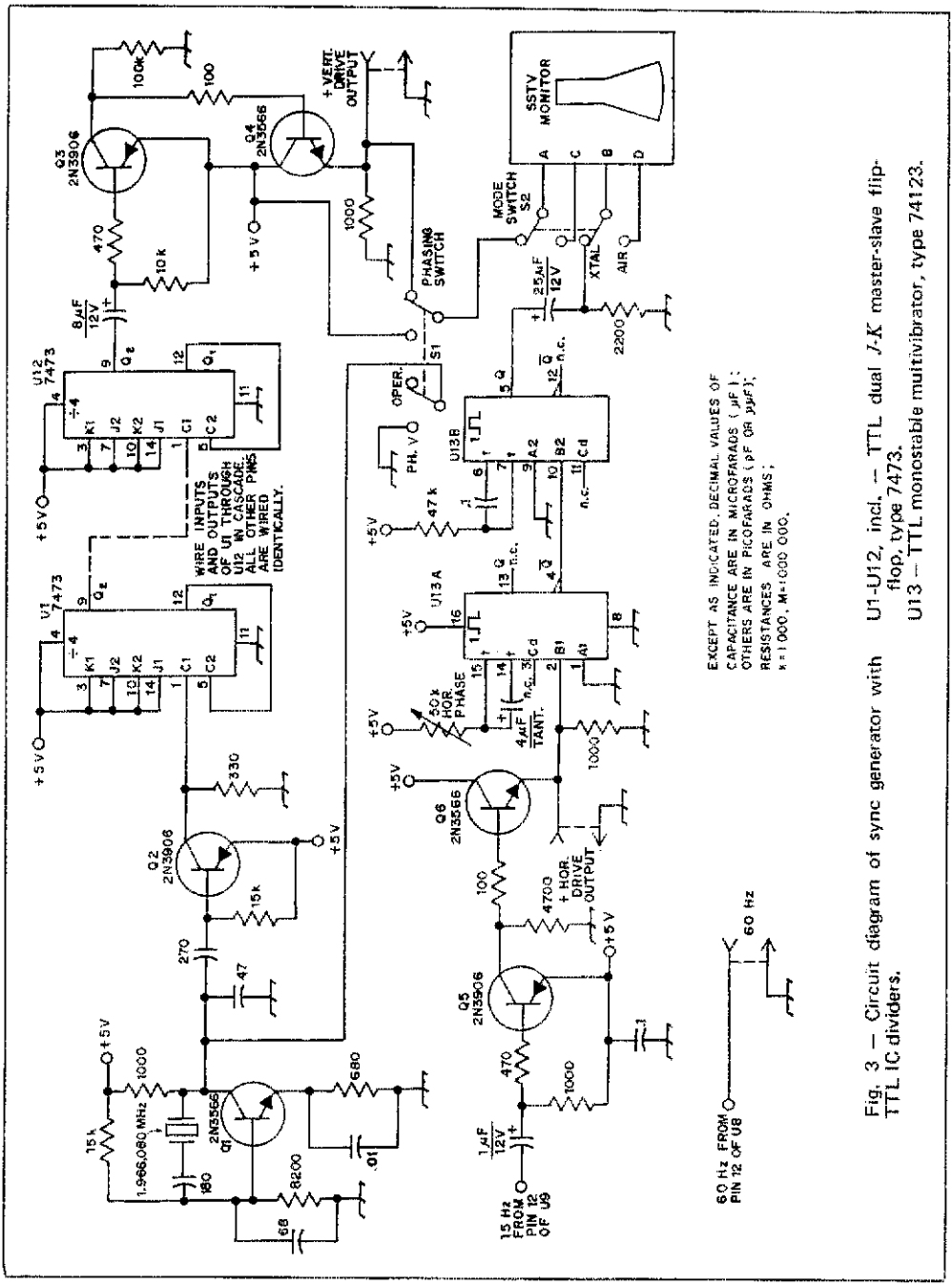
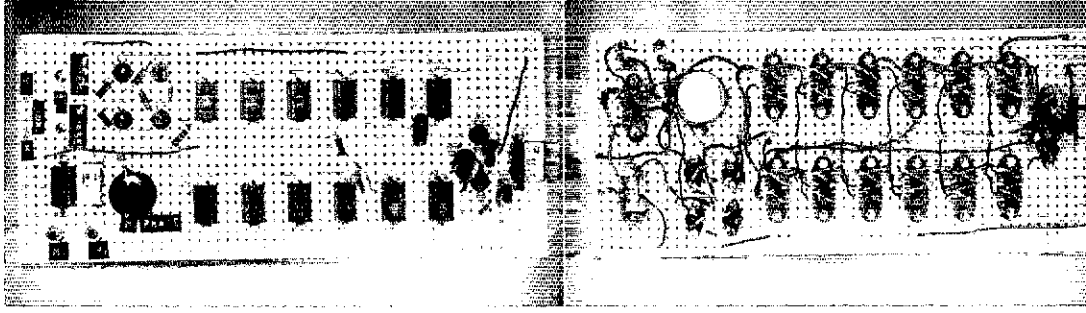


Fig. 3 — Circuit diagram of sync generator with TTL IC dividers. U1-U12, incl. — TTL dual *J-K* master-slave flip-flop, type 7473. U13 — TTL monostable multivibrator, type 74123.



Top and bottom views of the sync generator with TTL IC dividers. With 7473 dividers, twelve are required to obtain division by 2^{24}. With necessary wiring changes, the same division may be obtained with six 4-bit binary counter ICs, TTL type 7493. The dividers occupy the central section of the board, with the oscillator at the right and the outputs at the left.

W9LUO, Mark II Monitor

1) Open base leads of Q2 and Q5. (Do not disconnect 2200-Ω resistor at Q2.)

2) Connect terminal A of mode switch to base of Q5. Connect terminal B of mode switch to base of Q2.

3) Connect output from pin 8 of U5 to terminal C of the mode switch. Connect output from pin 14 of U2 through 0.1-μF capacitor to terminal D of mode switch.

Robot Model 70 Monitor

1) Open base lead to Q28. Connect this base to pin A of the mode switch.

2) Connect collector of Q15 to terminal C of mode switch.

3) Use negative hor. drive output from horizontal phase shifter of the sync gen. (This is obtained by moving the 25-μF output coupling capacitor from pin 5 to pin 12 of the 74123.)

4) Lift the end of C28 going to the sync source in the Model 70 and connect this lead to terminal B of the mode switch.

5) Connect the collector of Q2 in the Model 70 to terminal D of the mode switch.

Robot Model 80 Camera

1) Disconnect 60-Hz source end of R110.

2) Connect this lead to the 60-Hz output terminal of the crystal sync generator.

General Information on Connections

In cases where conventional discharge transistors are used to supply sawtooth driving waveforms to deflection output circuits, such stages may be driven from the 15-Hz and 1/8-Hz outputs of the sync generator. If the camera or flying-spot scanner contains a sync generator that is normally driven by a 60-Hz source, the 60-Hz output from the crystal sync generator can be used to drive at this point.

Operating the System

While full advantage of interference-free performance is achieved only between stations using similar crystal-control systems, either one of the two generators described is an excellent sync source for any ham SSTV station. When operating with crystal-controlled sync, it is necessary to establish correct vertical and horizontal phasing. A couple of frames are transmitted by one station as the other station closes his vertical phase switch and waits until he hears the vertical sync pulse, at which time he releases the switch or push button. The horizontal phase is then adjusted to properly position the picture with respect to retrace. The second station then sets the horizontal phase on his monitor. After this, operation may be carried on for extended periods without further adjustment.

If, during operation, a blanking bar were to appear near the left of the received picture and show a slow drift to the right, this is an indication that the local master oscillator frequency is substantially greater than that of the transmitting station; conversely, if a blanking bar appears near the right and shows a slow drift to the left, the local master oscillator frequency is lower than that of the transmitting station. (If the two master oscillators are within 100 Hz of each other, it will be difficult to see any shift during a several minute transmission.)

Conclusion

The independent crystal-controlled SSTV sync system described above offers synchronizing performance to the SSTV enthusiast that is totally immune to "on the air" interference. It is reasonable to visualize an extension of this concept to ham SSTV networks phase locked to precision standards, thereby offering a new dimension in SSTV synchronizing performance. QST

Strays

Join the fun on Straight Key Night, a six-hour stretch starting at 0100Z July 4. Remember this is the evening of July 3, local time. Check page 95, June *QST*, for details.

The 1975-1976 ARRL Repeater Directory is now available for distribution. The 56-page booklet sells for $1.00 postpaid — with a special price to members of 50c.

Monolithic Crystal Filter Application in Amateur VHF Repeaters

BY JOSEPH M. HOOD,* K2YAH

RECEIVER FRONT END intermodulation-distortion products (IMD) in vhf repeater service can be a difficult problem to resolve. Even with the best commercial-quality receiver using field-effect transistors, a repeater located in a metropolitan area with a high density of 150- to 160 MHz business-band signals has a high probability of experiencing problems from receiver front-end IMD. Furthermore, unless the repeater receiver is located some distance from population centers, front-end overload problems from strong adjacent-channel amateur signals can also be severe.

Solutions — Band-pass Cavity

A band-pass cavity network can be quite effective in eliminating the IMD problem from signals which are several MHz removed from the repeater input frequency. However, if we refer to Fig. 1, which shows the typical attenuation versus frequency characteristics of a band-pass cavity, it is apparent that the cavity offers very little attenuation of adjacent-channel amateur signals. Even if two cavities are used, the selectivity is not sufficiently improved for adjacent-channel problems. Furthermore, the band-pass network does little to attenuate the repeater transmitter noise sometimes experienced with 600-kHz input-to-output frequency spacing.

Cost is another consideration; a typical price for a single band-pass cavity at 146 MHz is in the $100 region. The selectivity-per-dollar quotient for a band-pass cavity network is 1.8 (a Q of 180 per $100 cost). As will be shown, this is poor when compared to the monolithic crystal filter.

Solution — The Monolithic Crystal Band-pass Filter

The crystal-filter approach to reducing or eliminating IMD and overload offers several significant advantages. Obviously, the selectivity of a monolithic crystal filter is superior to that of a band-pass-cavity network as can be seen in Fig. 2. Response is down 3 dB at ±19 kHz (the approximate bandwidth of a 6 kHz, fm signal) which means the filter Q is approximately 7300. Response is down 40 dB at ±38 kHz and goes to an attenuation exceeding 50 dB at frequencies greater than 60 kHz from the filter center frequency.

* 67 Mountain Ash Drive, Rochester, NY 14615.

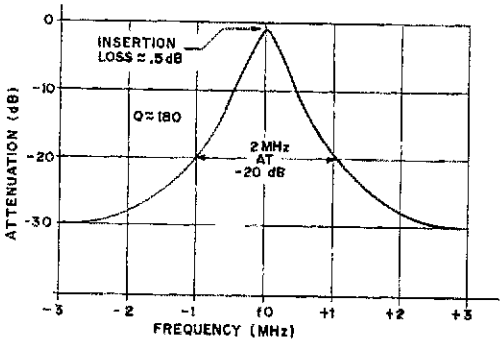


Fig. 1 — A typical response curve of a single cavity shows a bandwidth of 2 MHz at the −20 dB points.

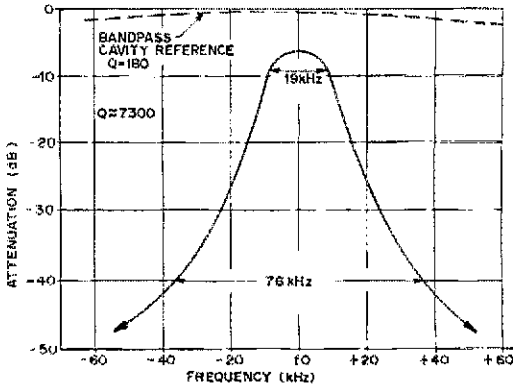


Fig. 2 – The response curve for the Piezo Technology TM-4133VBP crystal filter shows a more narrow characteristic. At the −3 dB points the bandwidth is 19 kHz, and at −40 dB it is 76 kHz. The improved selectivity is an aid in rejecting adjacent-channel energy as well as signals from strong out-of-band transmitters in the commercial or entertainment services.

Physical size is also an advantage. The band-pass cavity will require a volume of 1.5 cubic feet. The monolithic filter and associated components can be packaged in one-third cubic feet of space with the filter itself requiring a volume of approximately 1 × 1-1/2 × 3 inches.

The crystal filter also has some disadvantages and characteristics which one should be well aware of before proceeding on this approach. The most obvious disadvantage is that, unlike a cavity network, the filter cannot be tuned. Once a filter is purchased for a given input frequency, that frequency is the only one it is good for. However, since the input and output frequencies of amateur repeaters should be selected by first consulting the area repeater council (to reduce the chance that the selection will result in an interference problem within the area) and since frequencies so chosen become unchangeable for obvious reasons, this disadvantage is small.

The crystal filter has an insertion loss which can be considerable. The particular model in use in Rochester on the WR2AEI repeater is a model TM-4133 VBP manufactured by Piezo Technology Incorporated of Orlando, Florida. This model is specified to have an insertion loss less than 6.0 dB. The insertion loss of our particular filter was 5.5 dB as measured with a Hewlett Packard model 3200B vhf oscillator, KAY model 431C step attenuator and Tektronics 7L12 spectrum analyzer. This magnitude of insertion loss in the receiver input is, of course, intolerable in the repeater system. However, the problem can be overcome with a properly designed preamplifier inserted between the filter and the receiver input. The preamplifier design details will be discussed later.

The crystal filter is designed for operation in a 50-ohm system. This means that, in order to meet its frequency-response and insertion-loss requirements, the filter must see a 50-ohm source and load impedance. If these impedances are not tightly controlled, the filter may not perform as specified. Since many receiver inputs do not present a true 50-ohm VSWR load, the preamplifier used to make up the insertion loss also serves as a controlled termination for the filter, thus eliminating receiver input-impedance variations as a source of trouble.

The crystal filter is also an extremely delicate device. It cannot absorb large amounts of power and survive the experience. The TM-4133 VBP filter specification states that the filter will not

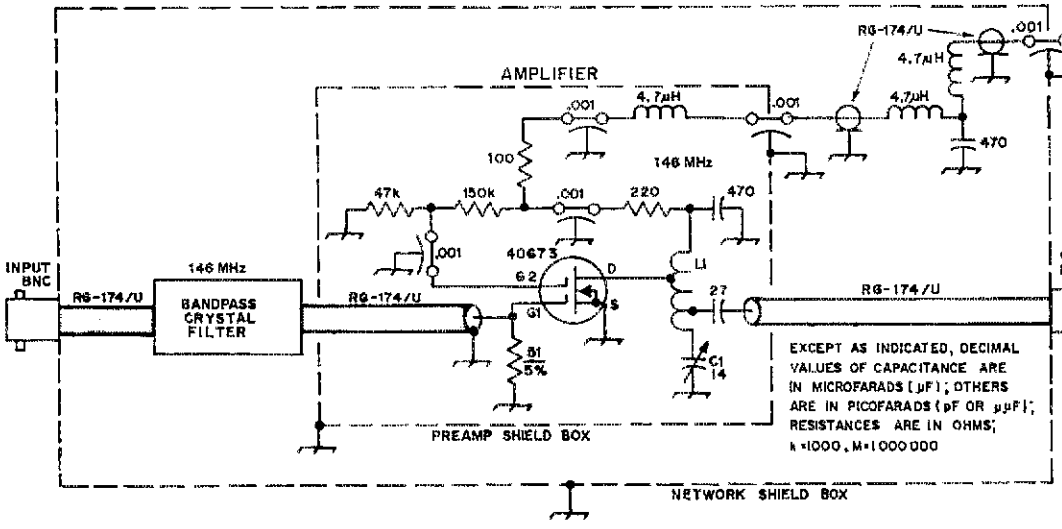


Fig. 3 – Schematic diagram of the preamplifier used in conjuction with the filter. The amplifier makes up for the insertion loss of the filter as well as providing a proper termination.

Fig. 4 — The crystal filter and the preamplifier are housed in individual shielded boxes, and the whole assembly is placed in a larger metal enclosure. Good shielding and filtering are essential to proper operation of the filter/preamplifier combination ahead of a repeater receiver.

withstand power in excess of 10 milliwatts at its design center frequency. This should be no problem in repeater applications where great care is taken to maximize the transmitter to receiver isolation. In fact, unless the power level at the receiver input is several orders of magnitude less than 10 milliwatts, the repeater will experience terminal desensitization. Seriously, though, if a shared tower is used for the repeater and other services have antennae in close proximity to the receiving antenna or feed line, a measurement of the transmitter power coupled into a 50-ohm termination at the receiver end of the feed line is in order. If power in excess of 10 mW at any frequency is encountered, a band-reject or suck-out cavity tuned to the power-source operating frequency and placed in the receiver-input feed system is in order.

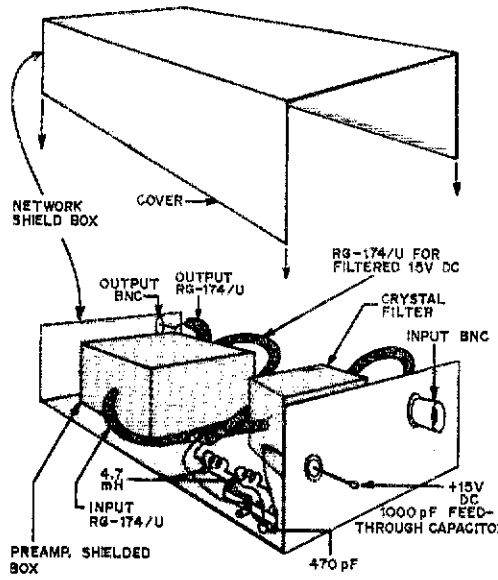
Preamplifier

The insertion loss encountered and the need to provide a known 50-ohm termination for the crystal filter make the use of a preamplifier between the filter and the repeater receiver input mandatory. The preamplifier should have the following characteristics:

1) Gain of 6 dB minimum, 8 dB maximum.
2) Input impedance of 50 ohms.
3) High linearity – (low cross modulation/intermodulation susceptibility).
4) Noise figure less than 4 dB.
5) No neutralization – unconditionally stable.
6) Operation from +15 V dc supply.
7) Output network compatible with most receiver inputs.

A 40673 dual-gate MOSFET was selected for the task. This device has cross-modulation performance characteristics superior to most bipolar and junction field-effect transistors and has a low noise figure. The preamplifier circuit details are shown in Fig. 3.

The preamplifier was constructed on an etched circuit board and mounted inside a small 1-1/2 × 2-1/2 × 2 inch aluminum Minibox. A length of RG-174/U coaxial cable was brought out through the enclosure for input and output connections. The +15 V supply feedthrough capacitor was mounted in the enclosure wall. Constructional technique is very important. Use good quality, low inductance feedthrough capacitors where called for and keep all leads short and direct. To minimize lead length the gate 2 bypass capacitor body was soldered directly to the ground foil of the circuit board with one of its ungrounded terminals touching the gate 2 pad for later soldering to the 40673.



A terminated input configuration was selected to minimize the inductive and capacitive coupling effects between input and output circuits. Also, a tuned circuit at the input would add no additional selectivity to the system since the crystal-filter Q is much greater than any tuned LC network.

Network Packaging

When completed and tested, the preamp and crystal filter are mounted in a larger 2 × 4 × 6 inch aluminum enclosure as shown in Fig. 4. Additional rf filtering is added to the +15 V line as shown in Figs. 3 and 4. This filtering is important since any rf leakage into the package degrades the performance of the system. Shielding the +15 V line back to the supply should be considered.

Network Performance

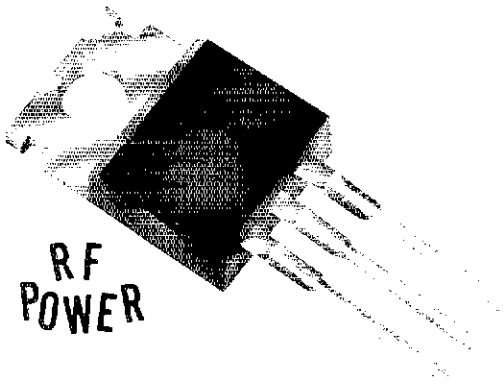
The performance of the amplifier and crystal filter network in the WR2AEI repeater has been excellent. The preamplifier gain was equal to the filter insertion loss resulting in a net insertion loss of zero for the system. Our receiver IMD problems have been greatly reduced and susceptibility of the repeater receiver to strong adjacent-channel signals has been eliminated.

A check of the filter frequency response with the vhf oscillator and 7L12 spectrum analyzer showed that the response, when properly terminated, was identical to the response when terminated by the preamplifier. The only difference in the two curves was in the insertion loss, which increased to 5.5 dB with the preamplifier removed from the circuit.

Cost

As for cost, the crystal-filter network cost compares very favorably with that of a single

(Continued on page 48)



Learning to Work with SEMICONDUCTORS

BY DOUG DeMAW,* W1CER AND
JAY RUSGROVE,** WA1LNQ

Part III

Part II of this series covered the unsteady ground on which impedance-matching techniques for rf power stages are based. Recommendations were made for selecting suitable transistors in rf power work, and examples of resonant matching networks were given. This installment will deal with additional design considerations and will provide a workshop exercise relating to the assembly and testing of a buffer and amplifier section which can be connected to the crystal-controlled oscillator discussed in Part I. The resultant circuit will be suitable for 80-meter QRP cw work.

WHILE TREATING the matter of resonant matching networks in Part II we slanted the discussion toward input circuits for rf power amplifiers. Although we alluded to a 50-ohm driving-source impedance as being somewhat typical at the amplifier input "port," there is more likelihood of finding 50 ohms a "standard" terminal impedance at the *output* port of a solid-state power amplifier (antenna side of tuned circuit). A 50-ohm input impedance is more common with amplifiers that are excited by a remote rf assembly, where some length of coaxial cable is employed between modules. However, when the driver stage is on the same pc board or chassis as the power amplifier, other source impedances are likely to be common — 50 ohms, 150 ohms, 30 ohms, or whatever.

Let us look now at the opposite side, or port (collector), of the amplifying transistor. There are significant complexities to deal with in terms of inductive and capacitive reactance, as was the situation at the input side (base) of an amplifier. However, the magnitude of the problem is not as great at the output of the circuit, primarily because the collector capacitance of the transistor is seldom as great as the capacitance on the input (base) side of the device. Furthermore, a formula exists for calculating the collector impedance. It can be used to approach a viable network design. The two known terms for the equation are the operating voltage, Vcc (dc supply voltage), and the desired large-signal power output, POE. Assuming we wanted to design a 10-watt-output amplifier, and were using a 12.5-volt dc supply, we would use: $Z = Vcc^2 \div 2 \times POE$. Thus, $Z = 12.5^2 \div 20$, which equals $156.25 \div 20$. The answer is 7.8 ohms. Assuming a ball-park efficiency figure of 50 percent for a Class B cw amplifier, our dc input power for the stage will be 20 watts, and the collector current will be 1.6 A: where $I = W \div E$. In keeping

* *QST* Technical Editor.
** *QST* Technical Assistant.

with our recommendation in Part I, the PT rating of the transistor should be approximately 40 watts or greater.

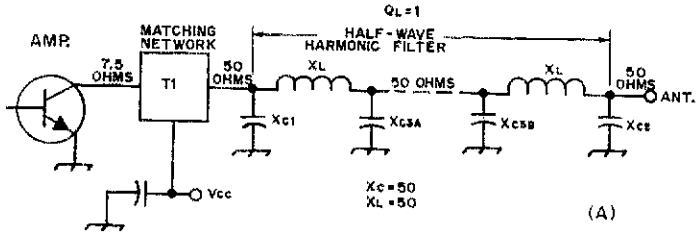
Broadband or Narrow-Band Networks?

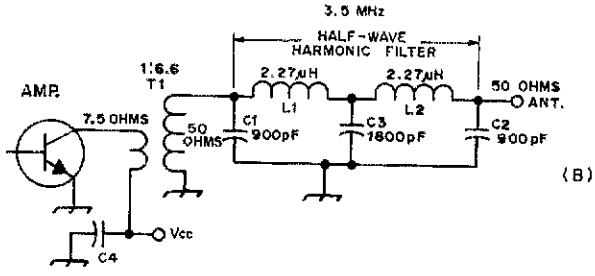
There are two popular approaches to network design. The one taken will depend on the application for which the amplifier is intended. A single-band transmitter is designed typically for narrow-band use. That is, the tuned circuits need only cover a frequency range from, say, 3.5 to 4.0 MHz, 7.0 to 7.3 MHz, or whatever the designer prefers. If narrow-band networks are used, and if the transmitter must cover more than one hf band, it will be necessary to design a collection of tuned circuits which can be band-switched. That method is a familiar one, of course, since the technique is commonplace in tube-type transmitters.

A broadband amplifier is one that has low-Q *untuned* impedance-matching networks or transformers in place of narrow-band *tuned* circuits. A properly designed amplifier of that kind can cover a frequency spread of 1.5 to 30 MHz without band-switching the matching networks. Because of the variation in transistor gain versus frequency (discussed in Part II) a compensating network of R, L and C components is required at the input port of the amplifier to assure uniform gain from 1.5 to 30 MHz. The broadband concept is applicable to all classes of amplification – A, AB, B, and C. Information on toroidal broadband-transformer design is contained in the chapter on transmitting, *The Radio Amateur's Handbook*.

The major drawback common to broadband amplifiers is the lack of frequency discrimination which results from such a design. Harmonic currents generated in the collector circuit of the amplifier can pass unattenuated to the antenna system, and if single-ended amplifiers are used in preference to push-pull ones, the harmonic situation can be very bad. A push-pull amplifier will discriminate against even-order harmonics (second, fourth, and so on), whereas a single-ended amplifier will discriminate against none of the harmonics present. Regardless of the configuration used, some type of harmonic filter should be used at the amplifier output. Without one, the second, third, and fourth harmonics at the antenna-connection point of the amplifier can be less than 20 dB down from the desired-signal amplitude. It is common to find the second and third harmonics down only 10 or 12 dB from the fundamental-signal amount! Class C amplifiers are the worst of the lot in this

Fig. 1 — Progression for designing a broadband half-wave harmonic filter. The illustration at A shows that two pi networks are joined to provide a single capacitance value in place of $Xc3A$ and $Xc3B$. The two become C3 in the example at B. T1 in these illustrations is a broad band matching transformer with a 1:6.6 impedance ratio (turns ratio = 2.56:1). T1 is typically a unit which contains a toroid core.





$X_{C1}, X_{C2} = 50$ $\quad X_{C3} = 25$ $\quad C = \frac{1}{2\mu f x_c}$ and $L = \frac{X_L}{2\mu f}$ where

$X_{C4} = 5$ $\quad X_{L1}, X_{L2} = 50$ $\quad C = \mu F$, f = MHz,

$Q_L = 1$ $\quad Z = 50\Omega$ $\quad L = \mu H$, X = Reactance (ohms)

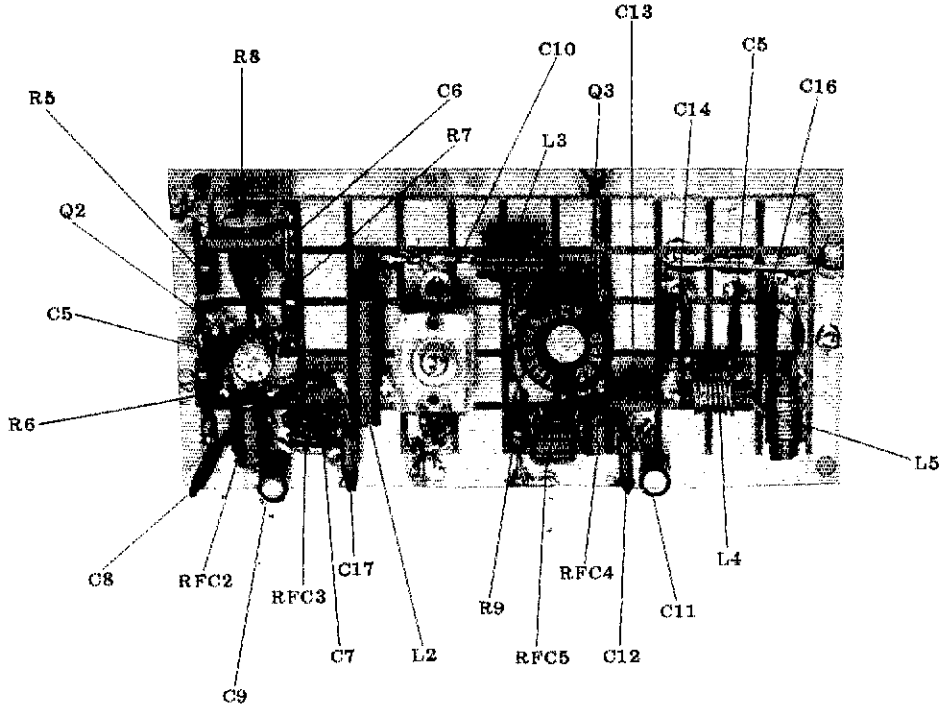
respect, with Class B types running a close second. The harmonic currents flowing in the collector circuit of the B and C amplifier types are often as great in magnitude as the desired-signal current. It is easy to understand, therefore, why it is essential to include in the amplifier output an effective harmonic filter, as shown in Fig. 1. One of the more popular filters is the half-wave low-pass type. It is easy to build and consists essentially of two low-Q pi networks in cascade. A typical design calls for a 50-ohm characteristic impedance at each end of the filter, and a QL (loaded Q) of 1. The design is based on capacitive and inductive reactances of 50 (X_L and X_C each = 50). Capacitance and inductance values for the filter of Fig. 1 can be obtained from a reactance chart, or: $C = 1 \div 2\pi f X_C$, and $L = X_L \div 2\pi f$.

Generally speaking, a broadband amplifier costs more to build than does a narrow-band type. Increased cost is brought on by the necessity to use numerous ferrite pieces (toroid cores or beads) when building the transformers. Conversely, narrow-band amplifiers can be made with air-wound inductors and mica trimmers in the tuned-circuit networks . . . the less expensive route.

Toward Good Stability

Perhaps the most prevalent "bug" encountered by amateurs who build solid-state gear is the problem of instability. If a circuit is designed and laid out with care, neutralization should not be necessary. That axiom is valid only when using transistors designed specifically for the frequency of operation, when a single power level is maintained, and when a very narrow frequency range is covered (e.g., a part of a single hf amateur band). The narrow-band amplifier is more prone to instability than its broadband brother is, chiefly because low-Q networks are used in the latter.

Instability can become manifest anywhere in the spectrum, regardless of the design frequency. Vhf or uhf parasitic oscillations can occur, oscillations near the operating frequency can pop up, or the instability may occur in the af, vlf, or lf region. Low-frequency oscillations (below the hf band) are the most prevalent because of the increasing gain of the transistor per octave lower. It is not the least bit unusual to have a transmitter that is unconditionally stable at hf, vhf, and uhf (no TVI, no unwanted signals in the hf spectrum), but that same unit may be spewing out all manner of "crud" in the broadcast band or lower. Such low-frequency oscillations are most often caused by inadequate bypassing, poor decoupling of dc leads between stages, and high-Q rf chokes that resonate with stray circuit capacitances and set up a tuned-base/tuned-collector oscillator condition in one or more of the transmitter stages. That energy can mix with the desired signal in one or more of the amplifying stages and produce additional spurious energy by way of sum and difference frequencies. Effective preventive measures include the following: (1) Use low-Q rf chokes in the base



Photograph of the assembled driver/PA board showing component placement. The output transistor and heat sink are near the center of the board. A suitable heat sink could be constructed from a thin piece of aluminum by wrapping it around a drill bit of approximately the same size as the transistor case. The heat sink should fit snugly on the transistor body.

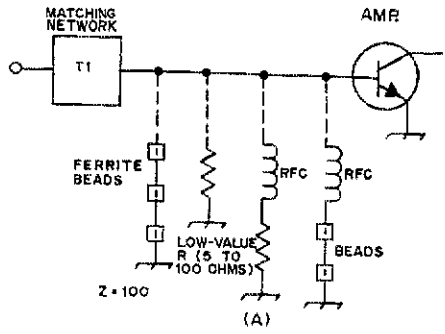
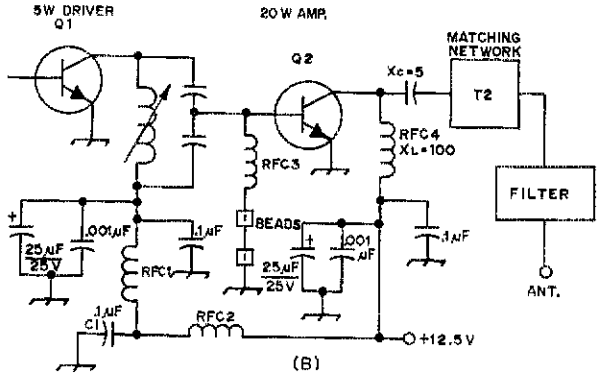


Fig. 2 — Four choices of base-return circuit are shown at A. The use of ferrite beads (far right) is preferred for Class B amplifiers. Where some reverse bias is desired in Class C applications, either of the impedances at the center are suitable. Illustration B shows the use of rf chokes and bypass capacitors in the 12.5-volt line. Those components help isolate the stages from one another to prevent instability caused by feedback. Bypassing, for low frequency through uhf, is made possible by three values of capacitance at Q1 and Q2.



returns of the stages requiring them. (2) Use low-*Q* rf chokes in the dc-circuit decoupling networks. (3) Use the least amount of inductance possible in the rf chokes. (4) Bypass the critical circuit points for audio, lf, hf, and vhf. (5) Include lf compensating networks (gain killers) in the rf circuits if necessary. Fig. 2 illustrates these techniques clearly.

When pc-board construction is employed for an amplifier design, use double-sided board material (copper on both sides of the insulating material). The unetched side of the board will serve as a ground plane for the etched side, thereby aiding stability a great deal. The ground-plane side should be connected electrically at several points to the ground foil of the etched side of the board. The various "hot" etched foils then become small-value capacitors (10 to 30 pF, typically, depending on length and width) through their proximity to the ground plane. The low-inductance capacitors thus formed are effective in aiding vhf and uhf stability. Pigtails on resistors and capacitors should be kept as short as possible to minimize unwanted inductance effects . . . a further aid to stability.

A completed transmitter or amplifier should be checked carefully for spurious output before it is placed in service. It should be checked at all power levels it will be called upon to provide, and the entire spectrum should be checked for unwanted output frequencies. A "hashy" signal usually indicates oscillation at vlf or audio frequency. TVI (other than fundamental overloading) is a good indication that there is high harmonic output, or that vhf/uhf parasitics are present. Spurs that aren't harmonically related to the operating frequency, but appear in the hf range, are sure signs of hf-band instability. Oscillations may occur at only one power-output level, so vary the drive to check that possibility. *Remember this fact:* Spurious oscillations can cause serious problems — burned out transistors, TVI, or a violation notice from the FCC!

Some tube-oriented amateurs have come to the mistaken conclusion that a newly built Class B or C solid-state amplifier stage was unconditionally stable. After all, with full operating voltage present, and without excitation applied, the stage or stages drew no measurable current, and no rf energy could be found in the circuit. *Beware of the sleeping dragon!* Instability is most likely to occur when the stages are *driven* — the time when they are *conducting*. The same is not quite so true of Class A and AB amplifiers, for they are forward biased and conducting even though no signal voltage is applied.

Component Considerations

Fig. 2A shows four possible base-return elements. Each is a low-*Q* component. Ferrite beads are shown as the first possibility. They can be used provided the total number assures ample impedance at the operating frequency. Permeability of

the beads should be 900 or greater. Amidon Assoc. miniature beads are suitable for the applications suggested in Fig. 2. In terms of μH, each bead slipped over a piece of wire will add approximately one μH to the choke. Since most power amplifiers have a base impedance of less than 10 ohms, X_L should be 100 or greater (10 times the highest base impedance). Thus, if the operating frequency is 3.5 MHz, and X_L = 100, the choke should have an inductance (low Q) of 4.5 μH or more. Five ferrite beads on a piece of wire should be ample. A ferrite-bead choke will be extremely low in Q, and that is desirable respective to good stability.

For Class C amplifiers, where it is necessary to develop some reverse bias across a base resistor, the Q can be kept low by using a single resistor in the base return, or an rf choke (coil type) can be used in series with a resistor. The resistor, in the latter case, will spoil the choke Q and serve as a bias resistor. For Class B work it is best to have minimum dc resistance in the base-return lead. Therefore, an rf choke connected in series with one or two ferrite beads, as shown, will provide a low-Q inductor of known value.

Fig. 2B illustrates some recommended practices attendant to effective bypassing and stage decoupling. On the supply line end of each collector-load impedance are three bypass capacitors. The 25-μF value is for af and vlf bypassing. A 0.1-μF capacitor is used at each stage for lf, mf and hf effectiveness, and the .001-μF capacitors provide bypassing for the upper end of the hf spectrum, vhf, and uhf. RFC1 and RFC2, in addition to C1, form an effective decoupling network to help isolate the stages in the dc part of the circuit. RFC1, RFC2, and RFC4 must be capable of carrying the collector current taken by the stage to which they relate. In practice they can be made by winding large-diameter enameled wire on small ferrite rods or toroid cores. The ferrite should have a high permeability factor to assure ample inductance with the least amount of wire possible. Low-Q chokes are desirable in the decoupling circuits. Capacitor pigtails should be kept as short as possible.

A Practical Circuit

Simple formulas are listed in Appendix I to enable the amateur designer to select workable component values for a small-signal Class A amplifier. Our design frequency is 3.5 MHz. R1 in a stage of this power class can be 470 ohms. R2 is typically five times the ohmic value of R1. R3 can be a value between 50 and 150 ohms for most applications at this power level. L1, L2, and C1 form a classic T network, and formulas are given for obtaining the values of reactance, capacitance, and inductance for a Q_L of 4. A loaded Q of 4 is a reasonable compromise over the higher values possible. It should be known that the higher the Q the greater the likelihood of instability, and the more restricted the bandwidth. A Q of 4 will eliminate the need to retune the network when operating between 3.5 and 3.8 MHz.

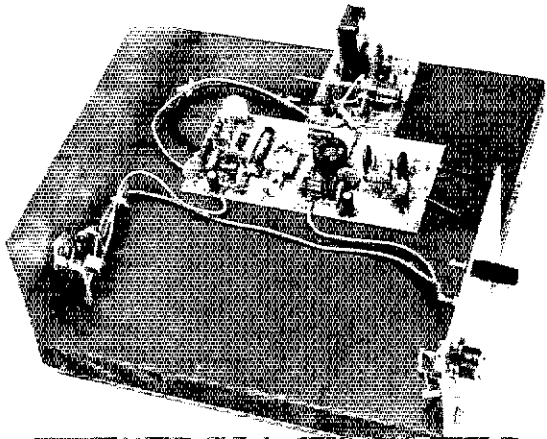
Fig. 3 shows the two-stage circuit which will be connected to the oscillator described in Part I of this series. Q1, the oscillator, is keyed simultaneously with Q2 of Fig. 3 by breaking the 12.5-volt collector supply at J1. Operating voltage is applied to Q3 at all times during the transmit mode, since for the most part it does not conduct until excited by Q2.

Q3 serves as the PA in this installment of the course. It will deliver approximately 2 watts of rf power to a 50-ohm load. Later in this series we will build a 10-watt amplifier stage, and Q3 will function as a driver for that addition.

A half-wave filter network (C14, C15, C16, L4, and L5) is used as the PA tank. It consists of two pi networks in series (Appendix II), and is a low-pass type of filter. The first section is designed to match the collector impedance of Q3 to 50 ohms, and the second section matches 50 ohms to 50 ohms. When working with large-signal amplifiers the collector impedance is found by using: $Z = Vcc^2 \div 2Poe$, where Poe is the large-signal power output. Thus, for 2 watts of output, and with a 12.5-volt Vcc, $Z = 12.5^2 \div 4 = 39$ ohms. A loaded Q of 1 is used for the output-network design, thereby assuring adequate bandwidth consistent with good harmonic rejection. Formulas for obtaining the network values are listed in Appendix II. A T network could have been used at the output of Q3 (Fig. 3), but would not offer as much harmonic rejection as the circuit shown.

Construction

The isolated-pad circuit-board technique (used in the construction of the oscillator in Part I of this series) is employed in building the driver and PA stages in this installment. The board measures 2 × 5 inches, and is mounted on a slightly larger piece



Photograph of the 2 watt transmitter. The insulated key jack is located at the left; the antenna and power terminals are mounted on the rear apron as seen at the right.

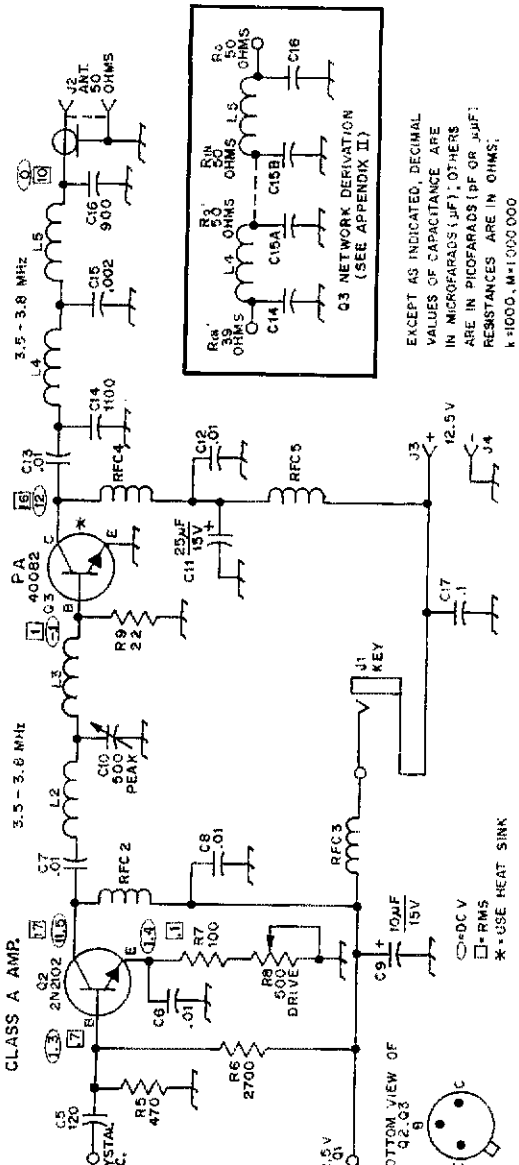


Fig. 3 — Schematic diagram of the amplifier strip which is connected to the oscillator from Part I of the series. Fixed-value capacitors are disk ceramic unless otherwise noted. Polarized capacitors are electrolytic. Fixed-value resistors are 1/2-watt composition types. The inset drawing shows how the collector tank of Q3 is derived. Numbered components not appearing in the parts list are so identified for chassis-layout purposes.

C5 — 120 pF.
C6, C7, C8, C12, C13 — .01 µF.
C9 — 10-µF electrolytic, 15 volts.
C10 — 170 to 780-pF. mica compression trimmer (Elmenco 469 or equiv.).
C11 — 25-µF electrolytic, 15 volts.
C14 — Disk-ceramic capacitors (750 pF in parallel with 100 pF).
C15 — .0018 µF.
C16 — Disk-ceramic capacitors (500 pF in parallel with 400 pF).
C17 — 0.1 µF.
J1 — Phone jack (Radio Shack 274-280 or equiv.).
J2 — Coaxial connector, type SO-239.
J3, J4 — Binding posts (Radio Shack 274-661 or equiv.).
L2 — 28 turns No. 24 enam. wire on a complete Radio Shack loop-antenna core (Radio Shack 270-1430) see text.
L3 — 15 turns No. 24 enam. wire on half a loop-antenna core (see text).
L4 — 9 turns No. 20 enam. wire on half a loop-antenna core (see text).
L5 — 10 turns No. 20 enam. wire on half a loop-antenna core (see text).
Q2 — RCA 2N2102 or equiv.
Q3 — RCA 40082.
R8 — 500-ohm control (Radio Shack 271-226 or equiv.).
RFC2 — 60 turns No. 30 enam. wire, layer wound on half a loop-antenna core.
RFC3 — 7 turns No. 24 enam. wire on an Amidon husky bead.
RFC4, RFC5 — 6 turns No. 24 enam. wire on an Amidon husky bead.

of copper-clad circuit board. The larger board serves as the ground bus, and is used also for mounting purposes.

Most of the rf chokes used in the transmitter are constructed by winding the appropriate number of turns of wire on Amidon 7.5-mm husky ferrite beads. The turns of wire fit tightly within the core, so care must be taken to ensure that the insulation on the wire remains intact to prevent the turns from shorting. The matching-network coils are wound on core material obtained from Radio Shack loop-antenna coils. The threaded shafts must be removed, and two cores must be cut in half. L2 is wound on a complete core. All others are wound on half lengths of rod.

Q3 is an RCA 40082. Several so-called substitutes were tried, but they did not deliver 2 watts of output power, as did the 40082. Two watts of power will be necessary to drive the 10-watt amplifier that will appear in a subsequent part of this series. The calculated values of C14 and C16 are nonstandard. Therefore C14 is a 100-pF unit in parallel with a 750-pF capacitor. C16 is a 500-pF capacitor in parallel with a 400-pF unit.

The completed driver/PA board and the oscillator assembly are mounted on a wood chassis that measures 4-1/2 × 8-1/2 inches. The front and rear panels are made of sheet aluminum. Mounted on

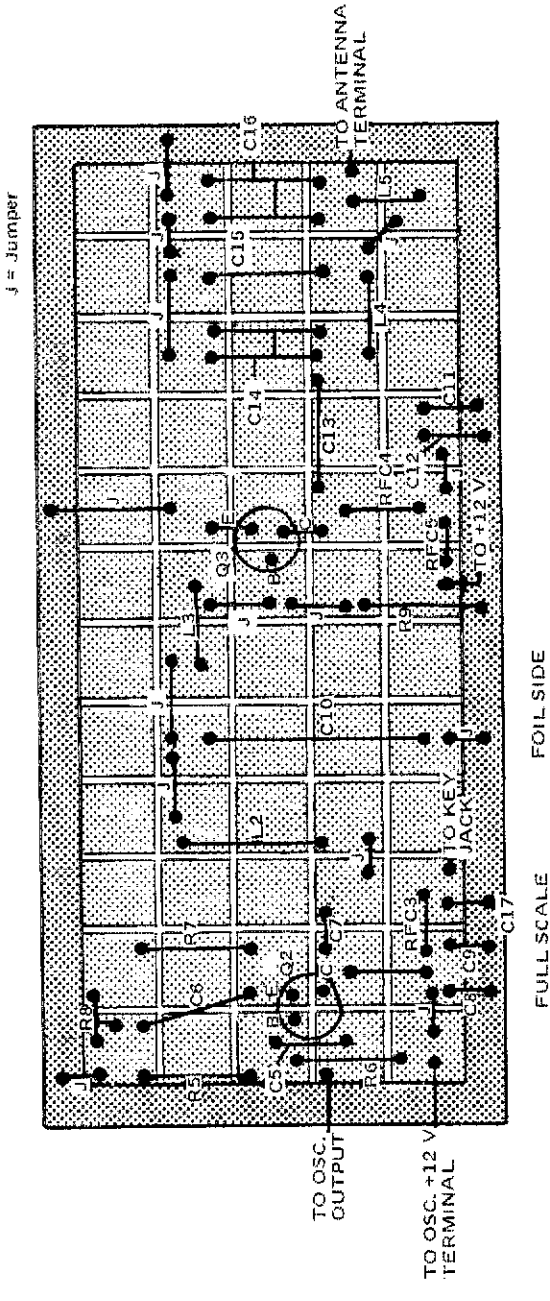


Fig. 4 — Scale layout of the circuit board for the two-stage power strip. The board with the isolated pads is glued to a slightly larger piece of copper-clad board. The latter serves as a ground plane for the composite circuit. The jumper wires from the corner squares to the ground bus are used to help secure the two boards together.

the rear apron are the ground and B+ terminals, J3 and J4, along with the antenna connector J2. Keying is accomplished by breaking the 12.5-volt line. Therefore, the key jack must be *insulated* from the front panel. Two composition washers, one on each side of the panel, will work fine. An alternative method would be to cut out a larger hole and fasten a piece of insulating material to the panel, then drill the insulating material to accommodate the key jack. A short length of coaxial cable connects the oscillator board to the driver/PA board.

Adjustments

After the wiring has been checked against the schematic diagram for errors, connect a 12.5-volt source to the terminals on the rear apron. The power supply should be capable of delivering at least 500 milliamperes of current. Suitable power supplies would include nine size-D cells in series, two 6-volt lantern batteries in series, or a regulated ac-operated dc supply. A version of the latter that will satisfy the voltage and current requirements of the transmitter appeared in an earlier *QST* article.[1]

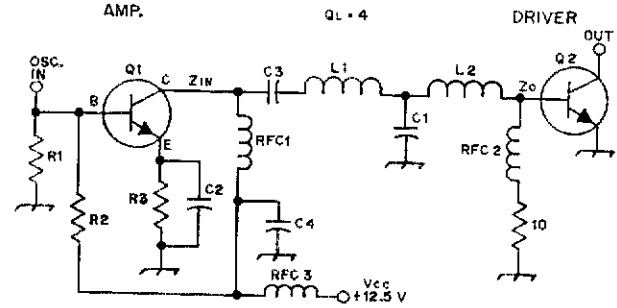
Connect a 50-ohm, 2-watt resistor to the antenna terminal and plug a key into J1. Insert an 80-meter crystal in the crystal socket, and preset R8 to a 3/4-closed portion – about 125 ohms. A VTVM or FET voltmeter should be connected across the load resistor. Close the key and adjust C10 for maximum output while monitoring the crystal frequency with a receiver. Tune L1, the oscillator coil, for maximum output. Adjust R8 for an rms reading of 10 volts (2 watts output). Remove the meter, probe, and resistor. Bear in mind that this transmitter is designed to work into 50 ohms. Radical departures from that value can destroy the output transistor in short order.

Operation

The completed transmitter was operated at the two-watt output level into an 80-meter dipole, fifty feet high. During an hour of operation contacts were made with stations from Maine to Georgia, and west to Illinois. Signal reports ranged from 549 to 599, with no reports of chirps or clicks. Most all stations commented, "Can't believe you are running only two watts!" QST

Part IV of this series will appear in a subsequent issue.

[1] Kalin, "A No Junkbox Regulated Power Supply," *QST* for January, 1975.



Appendix I

Q1 Poe = 0.2W

EFF. ≅ 50%

Pie = Ic × Vcc

Poe ≅ 0.5 X Pie

$Ic = \frac{2\,Poe}{Vcc} = \frac{0.4}{12.5} = .032A = 32\text{ mA}$

$iC = Ic \times 1.7 = .055\text{ A} = 55\text{ mA}$

$Eo = \frac{2\,Poe}{iC} = 7.27\text{ V}$

$Zin = \frac{2\,Poe}{iC^2} = \frac{0.4}{.003} = 132\ \Omega$

$XRFC1 = 10 \times Zo = 1320$

$RFC1 = \frac{XRFC1}{2\pi f} = \frac{1320}{6.28 \times 3.5} = 60\ \mu H$ min.

$RFC2 = \frac{XRFC^2}{2\pi f} = \frac{50}{6.28 \times 3.5} = 2.27\ \mu H$ min.

$XL1 = ZIN\ Q = 132 \times 4 = 528$

$L1 = \frac{XL1}{2\pi f} = \frac{528}{6.28 \times 3.5} = 24\ \mu H$

$XL2 = Zo\ B$, where $B = \sqrt{\frac{A}{Zo}} - 1$

and $A = ZIN\ (1 + Q^2)$

$\therefore A = 132 \times 17 = 2244$

and $B = \sqrt{\frac{2224}{5}} - 1 = 21.16$

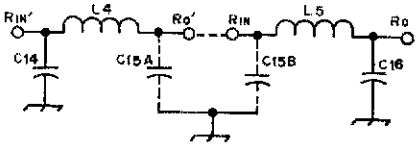
$XL2 = 5 \times 21.16 = 105.8$

$L2 = \frac{XL2}{2\pi f} = \frac{105.8}{6.28 \times 3.5} = 4.8\ \mu H$

$C1 = \frac{1}{2\pi X_{C1}} = \frac{1}{1956} = .0005\ \mu F$ or 500 pF

$XC2, C3, C4 = 5$

$\therefore C2, C3, C4 = \frac{1}{2\pi fX} = .009\ \mu F$ min.



PA – NETWORK

Appendix II

QL = 1

RIN' = 39 ohms

Ro', RIN, RO = 50 ohms

$XC15A = \frac{RO'}{Q} = \frac{50}{1} = 50$

$XC14 = RIN' \sqrt{\frac{RO'/RIN'}{(Q^2 + 1) - (RO'/RIN')}}$

$= 39\sqrt{\frac{1.282}{.718}} = 52.1$

$XL4 = \frac{QRO' + (RIN'\ RO'/XC2)}{Q^2 + 1} = \frac{50 + \frac{1950}{52.1}}{2}$

$= 43.7$

$XC15B = \frac{RO}{Q} = \frac{50}{1} = 50$

$XC16 = RIN \sqrt{\frac{RO/RIN}{(Q^2 + 1) - (RO/RIN)}}$

$= 50\sqrt{\frac{50/50}{2-1}} = 50$

$XL5 = \frac{QRO + (RIN\ RO/XC2)}{Q^2 + 1}$

$= \frac{50 + (2500/50)}{1 + 1} = 50$

$L4, L5 = \frac{XL}{2\pi f}$ $\therefore L4 = 2.0\ \mu H$, $L5 = 2.27\ \mu H$

C14, C15A, C15B, C16 incl. $= \frac{1}{2\pi fXc}$

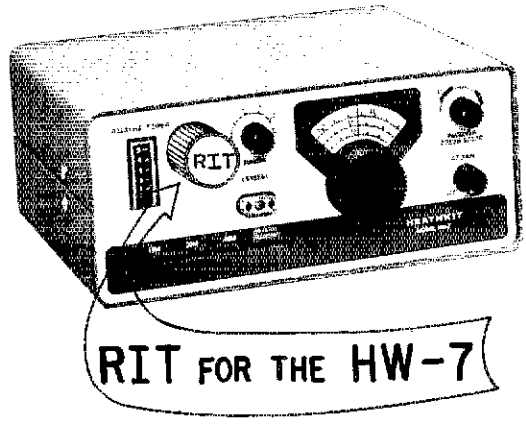
$\therefore C14 = 873$ pF.

C15A = 910 pF.

C15B = 910 pF.

C16 = 910 pF.

$C15 = C15A + C15B = 1820$ pF.



RIT FOR THE HW-7

BY JOHN GREBENKEMPER,* WA6BVA

PREVIOUS ARTICLES in *QST* have covered modifications to the Heath HW-7 which can improve greatly the performance of that QRP transceiver. Several of these articles dealt with improving the receiver sensitivity and audio selectivity, and with eliminating the ac hum and microphonic problems.[1,2] One described method to decrease variably the receiver frequency from that of the transmitter.[3] This article describes a receiver incremental-tuning circuit (RIT) that can be incorporated in the HW-7 for only a few dollars. It will allow the receiver to be tuned independently several kHz either side of the transmitter frequency.

The original design of the HW-7 included no circuit to offset the transmitting and receiving frequencies from each other. Instead, Heath depended on the change in loading of the subsequent stages to pull the VFO frequency between key-up and key-down conditions. In the author's transceiver, which uses a regulated power supply, the offsets were measured as 20 Hz on 40 meters, 600 Hz on 20, and 400 Hz on 15. An offset of 400 to 1000 Hz provides suitable copy with the HW-7.

The Circuit

The HW-7 VFO uses a JFET in a Colpitts oscillator circuit, Q2 of Fig. 1. The frequency of the oscillator can be shifted by varying the bias voltage across the gate junction of the JFET. As the bias is decreased, the capacitance of the junction increases, thereby lowering the frequency of the oscillator. A bias change of 1 volt will produce a frequency shift of 1.5 kHz on 40 meters, and more on the higher bands. To obtain the bias, a resistor is inserted in the source lead of the JFET oscillator, Q2. During key-down periods a fixed-value 120-ohm resistor is used, and during the key-up condition a 250-ohm potentiometer serves the purpose. These resistors are switched in and out by means of transistors Q101 and Q102. Both transistors are saturated and have a voltage drop across them of less than 0.1 volt. Transistor switch Q101 is driven directly from the keyed 13-volt line. Q103 inverts the signal of the keyed line to drive switch Q102. As a consequence, either Q101 or Q102 is always conducting. (An earlier version of this circuit used a second relay in parallel with the transmit/receive one to do the switching, but it was discarded because of its higher current drain.)

On 40 meters the potentiometer cannot provide a sufficiently wide frequency swing. To increase the bias available on this band, additional current is fed through the potentiometer by connecting a 3900-ohm resistor from the positive supply to the cold side of RFC1. Since these modifications make the VFO more sensitive to supply voltage changes, the drain of the oscillator, Q2, is regulated at 10 volts by using Q104 and VR101 in an emitter-follower voltage regulator. This circuit was chosen because its current drain is lower than when using a Zener diode alone. The regulated voltage at the emitter of Q104 will be 0.6 volt less than the Zener-diode voltage because of the base-emitter voltage drop.

The switching circuit is built on a small piece of Vectorbord and mounted on the side of the chassis. The transistors used are not critical of specifications, but they should be npn silicon types with beta greater than 100, and a breakdown voltage greater than 15. When lifting the ground end of RFC1, drill a small hole in the circuit board just beyond the ground pad and run the wire from RFC1 through it. Connect bypass capacitor C101 directly to ground at this point. The rest of the circuit operates at dc and can be wired in whatever

* Radio Astronomy Institute, Stanford, CA 94305.

[1] DeMaw, "HW-7 QRP Transceiver Modifications," *QST*, January, 1973.

[2] Wine, "New Front-End for Heath HW-7," *QST*, December, 1973.

[3] Carlson, "Receiver Offset Tuning for the HW-7," Hints & Kinks, *QST*, June, 1973.

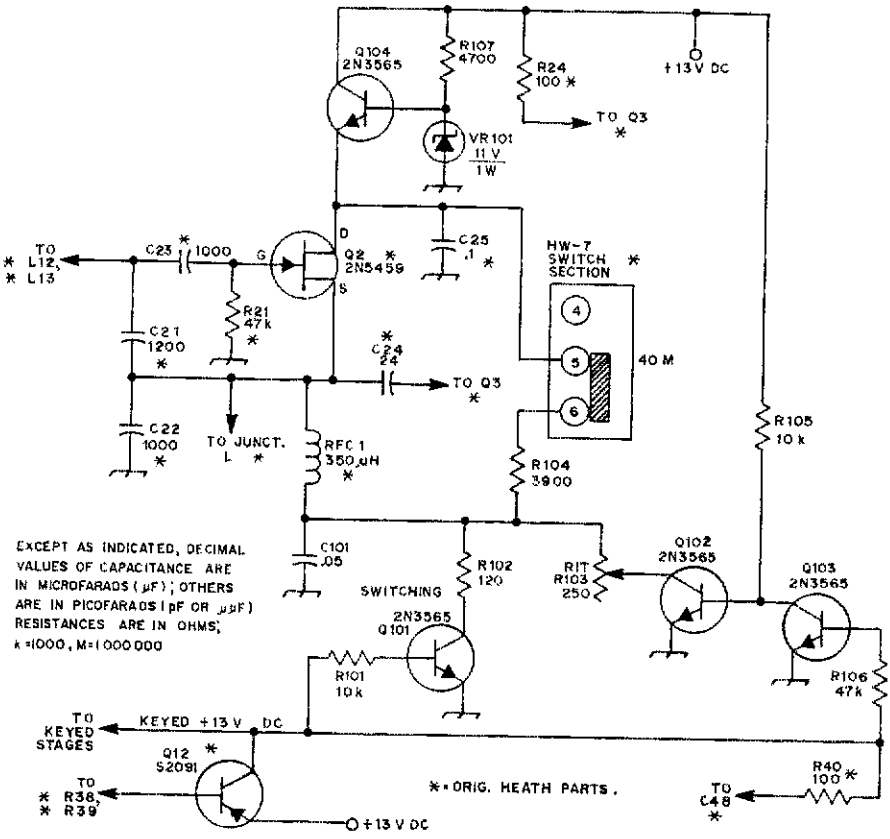


Fig. 1 — Schematic diagram of the modified section of the HW-7 where incremental tuning has been added. Numbered components not appearing in this caption are so identified for text discussion purposes only. New fixed-value resistors are 1/4-W composition or larger. R103 is a 250-ohm, linear-taper miniature control Allen Bradley No. WA2G056S251UA used by author. C101 is a disk ceramic. Components not bearing an asterisk are new parts required for the modification.

neat manner the user desires. The 250-ohm potentiometer is mounted in the screw hole that originally held the left side of the front panel in place. The emitter-follower voltage regulator is constructed on the main circuit board in the space formerly occupied by R25.

Operation

By listening to the HW-7 VFO output with an additional receiver, the RIT control can be adjusted so that zero beat is obtained under both key-up and key-down conditions. This position can be marked on the front panel for each band. When receiving a signal, adjust the HW-7 main tuning for a zero beat while the RIT control is set at its marked position for that band. Then, turn the RIT control for best copy. Answering a CQ on the same frequency can do wonders for increasing the number of stations responding to you, especially while operating QRP!

This circuit provides a maximum frequency shift of 1.4 kHz on 40 meters, 2.4 kHz on 20, and 3.4 kHz on 15. Tuning with the RIT is easier than with the main tuning dial. On-the-air tests indicate that this circuit doesn't cause any chirp on the HW-7 signal.

The modification described here, along with some of those of previous articles, make the HW-7 into a more versatile performer. The author's unit has operated admirably under extreme conditions, from the top of 14,000-foot peaks in the Sierra Nevadas, and in the depths of the Grand Canyon. If anyone can modify the HW-7 for operation on 80 meters, I'd sure like to hear about it. QST

Strays

I would like to get in touch with . . .

. . . hams who are also gun collectors. W9FSK.

. . . hams who are interested in T-Series MG automobiles. WB6TCA.

. . . amateurs in the vicinity of any city served by a Jewish Community Center. K8PBQ.

. . . U.S. amateurs who are members of the Knights of Columbus. GM4DNM, St. Niniah's, Cardenden, Fife, KY5 0JG, Scotland.

MAYTI-40

Part II

BY D. K. SIEMER,* KØJYD

The Driver Stage

IN PART I of the article, we described the receiver and VFO sections of the 40-meter transceiver. With the information provided in this section, the builder can complete the station.

The driver board is a small transmitter that is an adaptation of the Milligallon by W7ZOI, as described on page 336 of the *Radio Amateurs Handbook*, 1972 edition.

To minimize VFO loading, Q5, a JFET was used as the driver transistor. Q5 drives the base of Q6, an amplifier, via L9 which is a 3-turn link wound over L8. Q6 has a typical output of 700 mW when Vcc is 13.6 volts. The output drops to a little over 500 mW when Vcc is reduced to 12 volts making it a usable transmitter when flashlight or lantern batteries are the only available source of power. Q6 is about 65% efficient in this circuit.

The low-pass filter consisting of C25, C26, and L13 removes most of the harmonic energy present in the output from Q6. It is wired between the antenna terminal and the rest of the circuitry, and is effective on both high- and low-power transmitting as well as the receive mode.

Q7 is a UJT that is used as a sidetone oscillator. Whenever the driver is keyed, Q7 turns on and its output is coupled to the headphone jack via C27. The value given for C27 provides a comfortable level of sidetone, but it may be changed to suit individual preference. C28 and R17 determine the sidetone frequency, which is typically 1 kHz. With C22 and C24 peaked at midband, 7075 kHz, the output amplitude is constant from one end of the cw band to the other.

The number of turns for the inductors on the driver board is somewhat critical and should be counted carefully. To make counting and hookup easier, different size wire was used for each of the windings. The wire size is not critical. However, it is best if the turns are spaced equally along the circumference of the core. Be sure that L9 is wound over the middle of L8 and not in the gap between the ends. This can be a cause of low rf output.

Depending on the position of S3, the rf output from the driver board is either coupled to the antenna via the T-R switch, S2, and the low-pass filter, or to the input network opposite the power-amplifier board.

The Power Amplifier

The power-amplifier board was designed using the procedure given by W7ZOI in the May, 1972, issue of *QST*. Excitation from the driver board is

* Mankato Area Vocational-Technical Inst., 1920 Lee Boulevard, North Mankato, MN 56001.

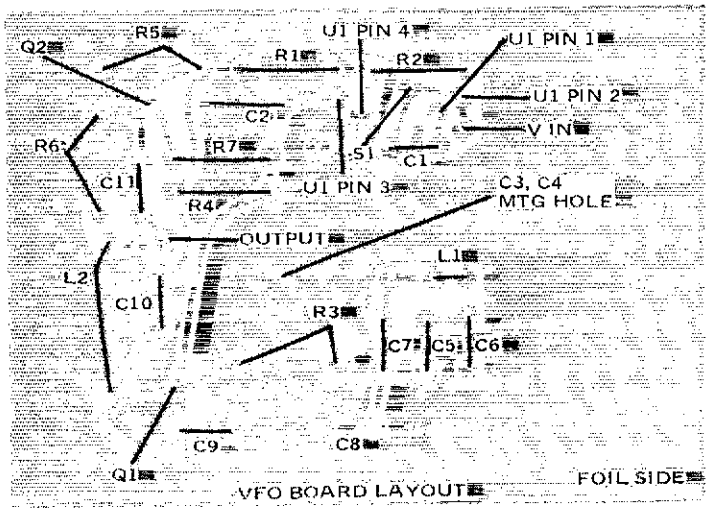


Fig. 4. — Full size template for the VFO board.

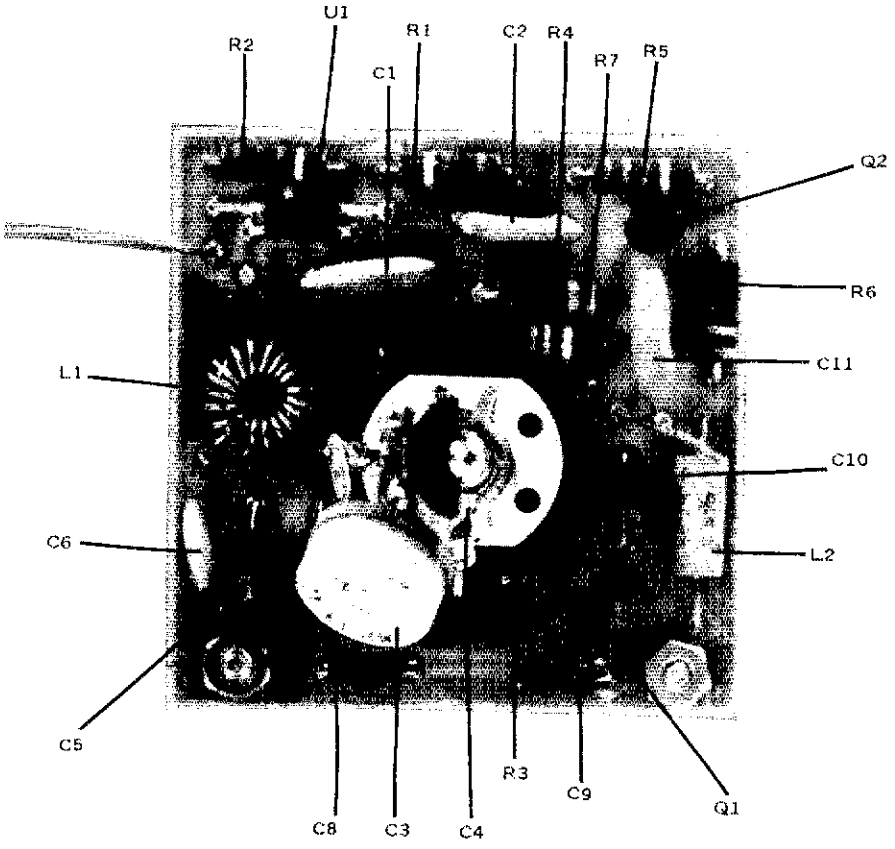


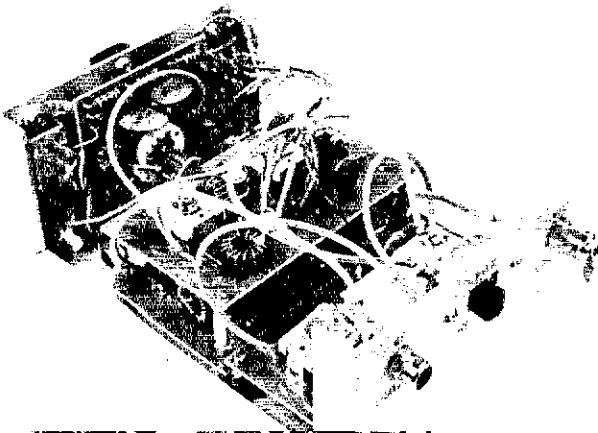
Fig. 5 — Parts placement for the VFO board.

coupled to the base of Q8 via the input T network consisting of C29, C30, and L14. The base swamping resistor, R19, was selected to provide adequate drive and reasonable efficiency in the amplifier.

Rf chokes L15 and L16 should be glued to the pc board by means of silicone rubber adhesive. The other inductors are wound with heavier wire and are supported adequately by their leads.

Q8 is the only transistor in the unit that requires a heat sink. It is shown with the sink removed in Fig. 7 for clarity. The heat sink in the author's units is a Thermalloy type 1101A with two 1-inch square pieces of aluminum bolted to it. It can be observed in photographs. The sink is conservatively rated and the key must be depressed for a good while before the assembly becomes very warm. Almost any of the finned clip-on sinks that are readily available should work well.

The power amplifier is keyed on by applying rf excitation to the input rather than by keying Vcc. When the first prototype was being built, it was found that trying to key several stages caused chirping, particularly when the current through



This shows the inside of the transceiver as viewed from the rear.

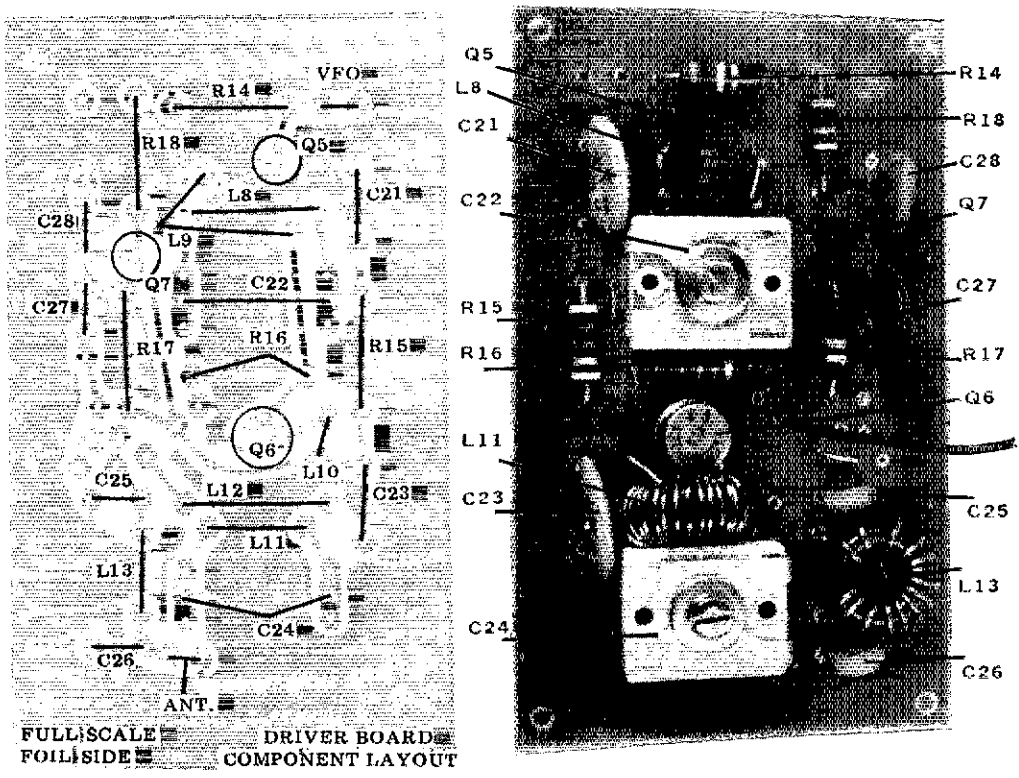


Fig. 6 — Full-size template and parts placement for the driver board.

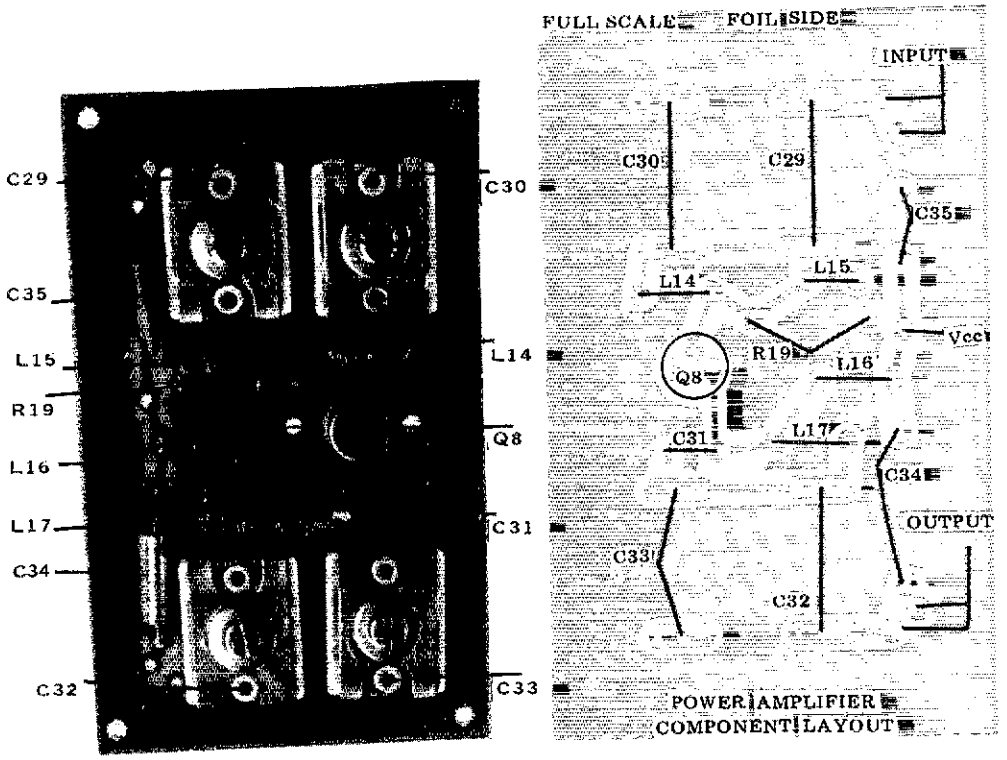


Fig. 7 — Full-size template and parts placement for the power-amplifier board.

them exceeded 200 mA. Only by keying the driver was this problem eliminated.

There is no danger of thermal runaway with this arrangement because the base of Q8 is tied to the emitter through L15. Also, the leakage current consumed by Q8 when it is not in use is negligible. It is in the order of a few microamperes.

As a matter of interest, the transmitter was operationally checked at 10°F increments between -40°F and +140°F. The output was stable and no amplitude change could be observed. Rf power output is typically 5 watts for 8 watts input.

Construction

The receiver, driver, and power amplifier boards all measure 3-1/2 × 2-1/8 inches and the VFO board is 2-1/8 inches square. Layout of the boards is not critical and most any convenient packaging arrangement may be used. All rf wiring is done with RG-174/U. Extra solder lands for interconnection between the VFO, driver, and receiver boards are provided on the receiver board.

The unit is housed in a homemade aluminum box measuring 2-3/8 inches high by 4 inches wide, and 6-3/4 inches deep including the 5/8-inch front overhang of the top cover. The chassis is finished in Golden Harvest Shadow epoxy appliance enamel and the top cover is painted with a dark brown wrinkle finish. Amidon lettering is protected with a coat of clear acrylic spray. Stick-on rubber furniture bumpers are used as feet to complete the cabinet.

The VFO output was brought out to a jack on the back panel so that a frequency counter could be used for a digital-frequency readout when operating at home. The whole station, including the key, earphones, NiCad battery pack, and a 40-meter dipole can be carried in an ordinary lunch bucket.

Alignment

Alignment of the VFO is accomplished by monitoring its output frequency with a frequency counter or calibrated receiver. Tuning the output frequency to 7.0 MHz by adjusting C3 with C4 while they are fully meshed is also done. The receiver is aligned by tuning in a station near 7.075 MHz and adjusting C13 for maximum headphone volume. For transmitting alignment, a dummy load with an rf detector as shown in Fig. 8 should be used.

Turn the adjusting screws of C22, C24, C29, C30, C32, and C33 to maximum clockwise positions. With the load connected to the antenna terminals, S3 set to low power, and Vcc set at 10 V dc, depress the key and adjust C22 and C24 for maximum output. Then increase Vcc to 12 V dc and repeat the adjustment. The tuning should be smooth and regular. Next set Vcc back to 10 V dc, S3 to high power, and adjust C29, C30, C32 and C33 for maximum output. They interact so you will find it necessary to go back over them a few times until no further increase in output can be obtained. Increase Vcc to 12 V dc and repeat the procedure; the capacitors should require very little retuning and should cause the output to vary smoothly with no sudden variations.

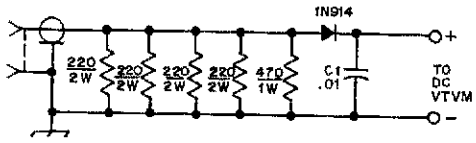


Fig. 8 — Dummy load and rf detector.

After tune-up, a battery current-drain check should yield the following values with Vcc at 13.6 V dc:

Receive mode	20 mA
Transmit mode (low)	100 mA
Transmit mode (high)	750 mA

The author wishes to thank the staff, faculty, and students at the Mankato Area Vocational-Technical Instutute who provided assistance on this project.

QST

Dynamic Range *(Continued from page 21)*

[7] It may be shown that if the bandwidth is changed from B to B' the dynamic range, D will go to D' where:

$$(D'/D) = (B/B')^{2\ 3}$$

Here, the dynamic ranges are expressed as algebraic ratios rather than in dB.

[8] A good discussion of noise in oscillators is given by Priestley, "Oscillator Noise and Its Effect on Receiver Performance," *Radio Communication* for July, 1970.

[9] The on-the-air effects of noise modulation are outlined in Part I of footnote 6.

[10] Weiss, *Ham Radio Magazine* for Oct., 1973.

[11] Daughters and Alexander, *73 Magazine* for January, 1967.

[12] This detector works essentially in the square-law region. If the series of footnote 3 is considered with a sine-wave input at a single frequency, it may be shown that a dc term results in the output from the quadradic term, $K_2V_{in}^2$.

†[EDITOR'S NOTE: Concerning the intercept-point method, agreement between experiment and theory will be satisfactory with the devices normally encountered in receiver applications. Diode balanced mixers and Class A amplifiers would be typical examples. However, the method should not be considered a suitable one for *all* circuits where nonlinearities exist. For example, class AB or B linear power amplifiers often exhibit IMD products (with a two-tone test signal) that may increase with additional input-signal level, then drop, then increase again. From a mathematical outlook, this means that the amplitude of the third-order distortion products are not directly proportional to the cube of the signal voltage, but behave in a more complex manner. Therefore, it should not be assumed that the third-order products will *always* increase by 30 dB for every 10 dB of signal-power increase.]

QST

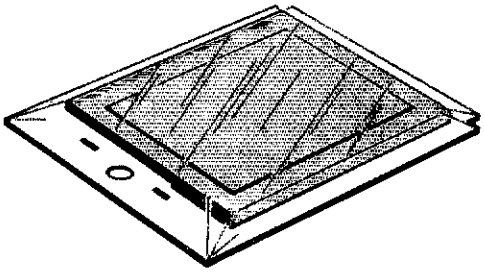
Hints and Kinks For the Experimenter

SOLID-STATE HANG AGC

Recently, I converted Goodman's hang age circuit[1] from a tube to a solid-state system. It works as a hang-age system should – very fast attack time with no age "pop". Q1 and Q2 function as audio amplifiers. CR1 is the age diode, with C7 and R9 serving as the charging network. Q2 output is stepped up through the 2 to 10 KΩ audio transformer. CR2 charges R10/C8 to a higher voltage than that across R9/C7, which keeps the FET (Q3) cut off. A 2N5716 was used because of its low pinch-off voltage. When the voltage across R10/C8 decays to a lower voltage than that across R9/C7, Q3 conducts and clamps the age bus to ground. CR3 is the charging diode for the .01 μF age capacitor. Age threshold is determined by the value of R_T. The value should be between 100 KΩ and 470 KΩ depending on the age threshold desired.

Like the original tube version, the age line must be of very high impedance. This would be the case with an FET i-f system. If this circuit is to be used with an integrated-circuit or bipolar i-f amplifier system, a low-impedance driver would be necessary. – *Dick Stevens, W1QWJ*

[1] Goodman, "Better A.V.C. for S.S.B. and Code Reception," *QST* for Jan. 1957, p.16.



RECYCLED BATTERIES

Used film packs from Polaroid SX-70 cameras contain a flat-plate, Ray-O-Vac, 6-volt battery that is still good even after taking ten pictures with the camera. The battery is enclosed in a cardboard and plastic envelope which measures 3-1/2 × 4-1/2 × 1/8 inches. These batteries can be connected in series, parallel or series-parallel to provide a variety of voltages and ampere-hour ratings, and thus are ideal for powering portable, low-power ham equipment. Removal of the battery is easy. Simply break off the plastic end of the container and slip the battery out of the case. Individuals should pay attention to the warning stamped on the battery: *Do not cut, take apart or burn the battery.* So don't throw those SX-70 film-pack batteries away – recycle them! – *R.W. Johnson, W6MUR*

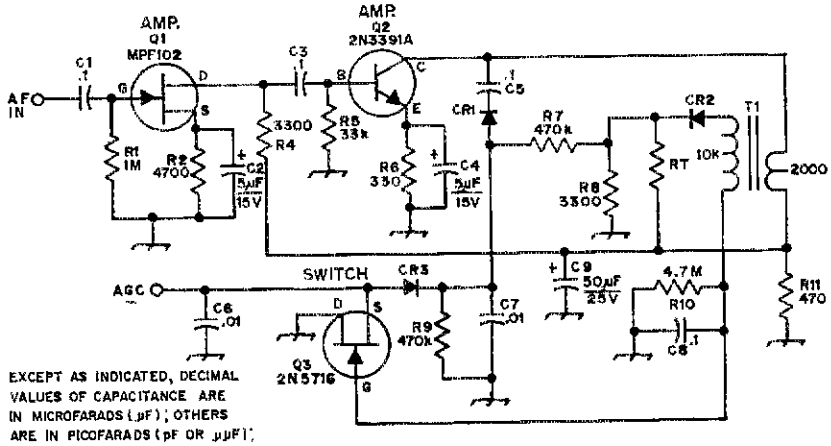


Fig. 1 – Schematic diagram of the hang-age system. Resistors are 1/2-watt composition.
C2, C4 – 5μF electrolytic, 15 volts.
C9 – 50 μF electrolytic, 25 volts.
CR1-CR3, incl. – Silicon diode, 1N914.
Q1 – MPF102 FET.
Q2 – 2N3391A transistor.
Q3 – 2N5716 FET.
R_T – See text.
T1 – Audio transformer, 10,000-ohm primary to 2000-ohm secondary (Radio Shack 273-1378 or equiv.).

ZENER + DIODE

Frequently, while experimenting, the need arises for a Zener diode of a slightly higher voltage than is on hand. An easy way to achieve this higher voltage is to add silicon diodes in series with the Zener diode. Each diode will add approximately 0.5 to 0.7 volts to the regulated voltage amount (see diagram). It is considerably cheaper to stock a couple of Zener diodes and a handful of silicon diodes than to stock a Zener diode for every voltage that might be required in the course of an experiment. – *Robert A. Sullivan, WØYVA/4*

A BETTER GAMMA CAPACITOR

The gamma rod is fairly easy to make and fasten to the driven element of an antenna, but the gamma capacitor can present some difficult mechanical problems. While this capacitor need not have a very high voltage rating (the gamma-match feed point is usually at a high-current/low-voltage point), it must withstand the outdoor environment.

Common methods for weatherproofing include sealed metal, glass, or plastic cans for air-variable capacitors, and the use of coaxial capacitors, with the gamma rod itself acting as one plate with an air or polystyrene tubing dielectric. Both of these methods require fairly sophisticated and painstaking design and construction techniques.

At my location, a gamma-matched wire dipole has been in service for 18 months, exposed to the Southern California seashore environment. This antenna uses a fixed-value mica gamma capacitor that is fully exposed to the weather. There have been no observable adverse effects caused by temperature, moisture, salt or smog, and the mechanical installation is sturdy.

The mica capacitor used in this application was made by Elmenco, and has a hard-glazed, brown ceramic coating, with the wire leads brought out at right angles to the body of the capacitor. The required capacitance value is determined by temporarily clipping an air-variable capacitor to the terminals of the antenna and adjusting this capacitor and shorting bar location until the desired match is obtained. When a satisfactory match has been achieved, the variable capacitor can be removed and the value determined visually (for example, if a 100-pF variable capacitor is used and the plates are about 60% meshed at the matched condition, 60 pF is a good starting point with the fixed-value capacitors).

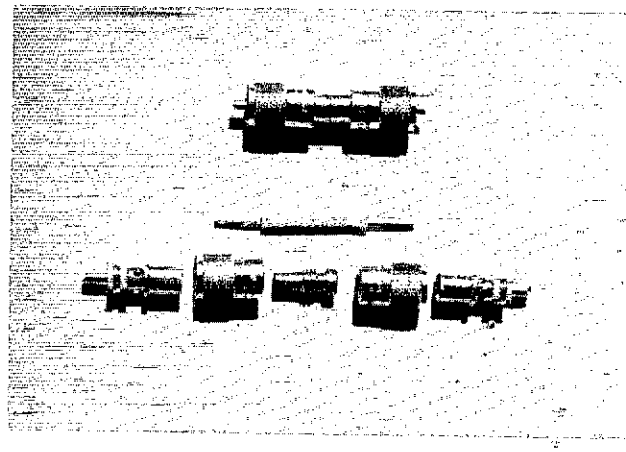
Mica capacitors are stocked in MIL values and are rated at 1500-V dc for low values of capacitance, and 1000-V dc for intermediate values. At about 15 cents per unit, a dollar will buy an assortment that will certainly include the required value (and help replenish the junk box). A brief cut-and-try session should show which capacitor brings the desired match. The selected capacitor, which is light, compact, and inherently weatherproof, can then be mounted permanently on solder lugs or screw terminals and coated with silicone grease or acrylic lacquer to protect leads and solder joints from corrosion.

The same type of capacitor has been used in the trap circuits of a two-band trap dipole, at 500-watts input. In this application, high rf voltages were present across the traps, so it was necessary to connect three 1500-V units in series across the inductor. Adjustment can be accomplished most easily by using a dip oscillator to find the resonant frequency of the trap (as constructed from calculated values) and by compressing or expanding the inductor to achieve the desired setting. A heavy coat (or coats) of lacquer is recommended for corrosion protection for the inductor. – *Paul H. Weisz, K6YQ*

ANOTHER HOMEMADE ADAPTER

Many times the need arises to connect the output of a transmitter to a low-pass filter or coaxial relay. An adapter will enable you to connect two SO-239 female connectors together as shown in the accompanying photograph. All that is needed is two PL-259 connectors, a UG-175 reducing adapter and a short length of insulated wire.

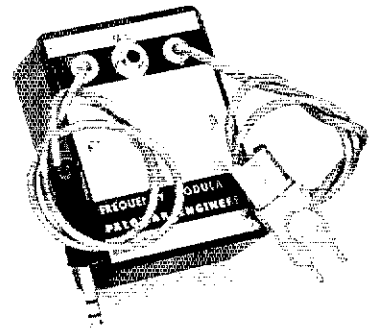
Saw off the "shoulder" on the UG-175 reducing adapter. Thread the wire through the UG-175 and then through the outer shell of the PL-259 into the center pin. Solder the wire to the center pin. Screw a few threads of the adapter into the PL-259. Next, place the outer shell of the second PL-259 over the wire and insert the free end of the wire into the center pin of second connector. Screw the second PL-259 onto the adapter snug against the first PL-259. Solder the two connectors together; then solder the remaining center pin. Snip off any excess wire protruding from the center pin. – *Mac Bruington, W4NJE*



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.

• New Apparatus

PALOMER ENGINEERS FREQUENCY MODULATOR



FM may have been the first kind of modulation used in radio communication. It is still the simplest, at least at the transmitting end. This small package provides plug-in conversion to fm for many a-m and cw transmitters for 144 MHz and higher. It is not intended for use with Pierce oscillators, or with circuits using overtone crystals. The modulator shown is for the Gonset Communicator III. It will work with the I and II types, though these earlier models do not have push-to-talk circuitry, and so do not require provision for it. Minor variations are available for various transmitters, as listed herein.

The adaptation places a variable-capacitance diode in the oscillator circuit to swing the frequency at an audio rate. A microphone amplifier, speech clipper-filter, and a driver-amplifier, all designed for fm service, are included in the adapter unit. Power can be external, or from a transistor-radio 9-volt battery inside the case. The crystal (desired operating frequency divided by 18) plugs into a small adapter, which includes a trimmer for zeroing the frequency. This assembly plugs into the transmitter crystal socket. The microphone plugs into the adapter, and a cable, fitted with the proper kind of plug for the unit in question, goes into the transmitter microphone jack.

Most FT-243 crystals used with 2-meter a-m rigs may not give sufficient deviation. If yours don't, special crystals are available for this modulator, on order, from International Crystal Mfg. Co., 10 North Lee, Oklahoma City, OK 73102. Specify that the Palomar unit is to be used.

Anyone not familiar with the nature of fm should be warned that this conversion applies to the transmitter only. The receiver used in a-m transceivers will not work well on fm. Slope detection is usable on strong signals, but the receiver qualities that make fm the effective mode it is for mobile work will be lacking in any a-m transceiver. A local repeater will come in well enough in a home station, but the a-m detector will not "have it" for mobile work with fm signals. The narrower the receiver bandwidth, the better it will slope-detect the fm deviations now being used, but none of the commercially built a-m transceivers is selective enough to do a good job under high noise levels, both electrical and mechanical, that characterize mobile vhf communication.

Palomar Frequency Modulators are available for Gonset 2-meter Communicators and for the Clegg 22-er (except Mark II) and Zeus, Hallicrafters SR-34, Poly-Comm 2 and PC-62, Johnson 6N2, Aerotron 500, Ameco TX-62, and Heath Seneca. They are not available for other models by Heath, Hallicrafters, Clegg, Lafayette, and Knight. They are sold direct by the maker, Palomar Engineers, Box 455, Escondido, CA 92025. The price is $34.50 except for the two Poly-Comm models, which are $36.50. The modulators are not for 6-meter operation. Higher bands may be used by backing off on the built-in deviation control, which is set for about 8.5 kHz at 146 MHz. – *W1HDQ*

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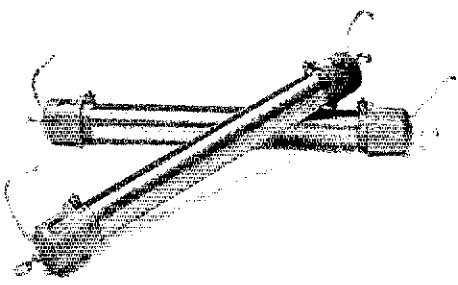
RUSH MULTIBAND-ANTENNA LOADING COILS



In their search for a simple but effective multiband antenna system, many amateurs overlook the fact that a multiband dipole can be constructed *without traps*; loading coils are used alone. These are strategically placed, and are of an inductance value to make the antenna electrically equivalent to an odd number of half wavelengths overall for each band of operation. Thus, the antenna feed-point impedance provides a tolerably low SWR with 50- or 75-ohm transmission line near the optimum frequency in each band. This technique was touched upon briefly in the closing paragraphs of a recent *QST* article,[1] and has been given more extensive treatment in earlier papers.[2,3]

Louis Rush, K6QXN, has come up with a unique method of constructing those loading coils He uses PVC pipe and fittings, screw eyes with machine threads, and other materials available at most hardware stores. He suggests that anyone may follow his construction technique, but for those

(Continued on page 69)

[1] Hall, "Off-Center-Loaded Dipole Antennas," *QST*, September, 1974.

[2] Lattin, "Multiband Antennas Using Loading Coils," *QST*, April, 1961.

[3] Buchanan, "An Inexpensive 40- and 80-Meter Antenna," Hints and Kinks, *QST*, September, 1962

Technical Correspondence

HOMEMADE CAPACITORS

Technical Editor, *QST*:

May I first congratulate you on your approach to "Transmitting Variables" in Feb. '75 *QST*.[1] I, for one, can very much appreciate the wisdom of getting a job done and publishing the results as an example. If we could just get guys to appreciate such efforts, we might once again get hams to build!

Anyway, the article mentioned that the homemade capacitor has far less than its calculated value due to the air spaces between the plates (p. 43). Here is a suggestion that works well for me. Simply coat the plate and Teflon with silicone oil. The oil, while not having as high a dielectric constant as the Teflon, does have one higher than air. Further, I note that Krylon now puts out silicone oil in a spray can. I don't know if it is as good as the grease put out by Dow Corning, but it is worth a try. Furthermore, the capacitor is now thoroughly moistureproofed. – *Cliff Buttschardt, W6HDO, Rt. 1, Box 420, Ord Bend (Glenn), CA 95943.*

MORE ON THE 432-MHZ KW STRIP-LINE AMPLIFIER

Technical Editor, *QST*:

The K2RIW 432-MHz amplifier[2] has been a real breakthrough for generating high power at 432 MHz using reasonably priced tubes. However, many builders have experienced problems such as instability and lower output than expected. I have not built one of these amplifiers myself, but I have discussed these problems with the author and have worked with many other builders. In the process I have compiled a list of recommendations which, if followed, will cure many of the problems incurred.

1) The grid-tank mechanical dimensions have often been misinterpreted (see *QST*, July 1972, p. 47). The 4-3/4 and 2-1/4 inch dimensions are from the left edge, not the centerline of the screw hole.

2) The input capacitors, C2 and C3, may in some cases be too low a value. Furthermore, some have not been able to obtain a good input VSWR into the amplifier. If this is experienced, it is recommended that you experiment with the capacitors and the point where they tap to the grid tank, L2.

3) The plate line, L1, should be as shown in the photos. Failure to round off the corners may make it difficult to resonate the output circuit. Some builders have reduced the length of the plate line by 1/8 to 1/4 inch and claim more tuning range.

4) Lower than expected output power (with sufficient drive) may be due to the output loading capacitor value (C4). Tune the final for maximum power output (input power fixed) with the loading at maximum. Then tune the same way with minimum loading. If the output is the same or greater at minimum, reduce the width of C4 by 1/8 inch and repeat until the correct combination is obtained.

5) This amplifier may be slightly regenerative if Eimac SK-610 tube sockets are used. One cure is to use Eimac SK-620 or -630 type sockets. The latter are preferred. If SK-610s are used and instability is experienced, it may be possible to obtain stability by bending the screen-grid contacts from the socket either in or out to change the screen inductance on the return. One method is to slide a 1-5/8 ID nylon ring over the contacts (a household sink-drain bushing available in most hardware stores). This will lower the inductance. If this fails it may be advantageous to raise the inductance by decoupling one or more of the contacts. This can be done easily by bending the contacts one at a time away from the tube and/or putting a small Teflon insulator between the fingers and the tube.

6) The high-voltage feedthrough capacitor, C7, may not be available since it is a company part number. A substitute homemade capacitor is described in Part II of the article. A suitable one is also available from W2GN (see below).

7) The control-grid supply has been a major source of problems such as instability and runaway plate current. First off, the supply itself should be heavily loaded such as with a 1000-ohm power resistor. Also the 10,000-ohm, 2-W resistor between the supply and the shunt regulator (if this circuit is used) should be lowered. A 3000-ohm, 5- to 10-watt value is recommended. A better solution would be to build a supply with a 1000-ohm variable output load resistor which would be used to adjust the control-grid voltage.

8) At least one builder reduced regeneration by moving the point where the control-grid rf choke, RFC3, connects to the grid line, L2. See Fig. 1 for the recommended contact point.

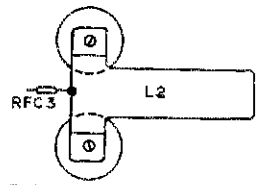


Fig. 1 – Point for repositioning RFC3 in the K2RIW 432-MHz amplifier. L2 is in the grid tank circuit, as shown in detail in Fig. 9, p. 62 of *QST* for May, 1972.

9) Plate-tuning and output drift have sometimes been experienced. There are several possible reasons. The main one is insufficient air (cooling) due to obstructions or too small a blower. Another reason could be low output efficiency (see item 4 above) which would in turn increase plate dissipation and hence raise the tube temperature. It goes without saying that the mechanical strength, etc., must be carefully evaluated in your own model.

As a final note, W2GN can supply most of the parts and/or assemblies including the metal work for this amplifier. A note to him will bring a price list, etc.[3] Any notes on your experiences would be greatly appreciated. – *Joe Reisert, W1JAA/W6FZJ, 17 Mansfield Dr., Chelmsford, MA 01824.*

[1] DeMaw and Dorbuck, "Transmitting Variables – Who Needs 'Em," *QST*, February, 1975, p. 37.

[2] Knadle, "A Strip-Line Kilowatt Amplifier for 432 MHz," *QST*, Parts I and II, April and May, 1972.

[3] W2GN, Amateur Radio Component Service, Box 546, E. Greenbush, NY 12061.

CONTROL CABLE FOR ANTENNA ROTATORS

Technical Editor, *QST*:

I am writing to bring an item of information to the attention of those readers who are planning to install antenna rotators in the near future. A number of companies are selling a flat cable with polyethylene insulation for use as antenna rotator control cables and are claiming it is appropriate for both indoor and outdoor use. However, the insulation becomes extremely brittle from exposure to an outdoor environment. I have recently replaced a seven-year-old piece of cable and found it to be so brittle that it would crumble to powder in my bare hands. As the insulation breaks down adjacent wires can touch, and damage can result to the rotator (rendering it inoperative in my case). The breakdown first appears as a series of hairline cracks transverse to the direction of the wires.

I have talked to another ham who had the same problem and we both agree that the best types of insulation for cables are vinyl plastic and certain types of rubber, especially neoprene rubber. In addition, the round cables are preferable to the flat cable in many cases because the round cables have each wire separately insulated as well as having a separate layer of insulation for the entire cable, whereas many of the flat cables are merely a piece of plastic with imbedded wires.

The cable I am switching to is a vinyl-insulated cable by Belden which is carried by many stores as well as by Lafayette Radio Electronics. The series includes five-wire cables in both eighteen (8465) and twenty-two (8445) gauge wire, an eight conductor cable (8448) which is excellently suited for Cornell-Dublier Ham-M and CD-44 rotors, as well as a variety of other configurations to suit virtually all types of rotors. However, these are not listed or displayed as rotator cables in most places, but as communications cable or simply as multiconductor cable. The three cables mentioned specifically above are all available from Lafayette Radio Electronics. Use of these cables or similar cables by other manufacturers will result in much longer life for the control cables, probably as long as the antenna feed line itself. — *Bradley A. Ross, WA3FCY, 122 Maple Ave., Bala-Cynwyd, PA 19004.*

BALL-POINT-PEN TEST PRODS

Technical Editor, *QST*:

Using ball-point pens for test prods, as suggested earlier in *QST*,[4] occurred to me a few years ago. My first trial was also my last because in its first use it produced a shock as well as a meter reading. The reason is that, while most plastics have good bulk insulating properties, some of them are capable of absorbing considerable surface moisture. The sweat from my fingers was sufficient to provide the leakage current that convinced me to use commercial prods in the future. — *William Nighman, W4ZSH, 8806 Overhill Rd., Richmond, VA 23229.*

[4] Socci, "Ball-Point Pen Test Prods," *QST*, September, 1974, p. 50.

FEEDBACK

James H. Fox, WA9BLK, writes that because of precise timing relationships, dirty key contacts may cause a dash to be produced when a dot is keyed in the Integrated Keyer/T-R Switch (*QST* for January, 1975). The possibility of this happening can be eliminated by changing four components. Change R2 from 270 Ω to 1500 Ω. Replace CR3 with a 1000-Ω resistor, and CR4 with a 470-Ω resistor. Replace R3 with a silicon diode (1N914 or equiv.); connect the anode to the dot side of the key, and the cathode to pin 6 of U3B.

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In Part I of "The Mavti-'40," *QST* for June 1975, the value of R19 (base of Q8 in Fig. 1) should be shown as 6.8 ohms.

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The following were erroneously listed in Silent Keys for May, 1975: Harvey L. Williams, W6KUP, Joseph W. Bell, W6BJO and Floyd E. Cummings, Jr., W6OSX.

Monolithic Crystal

(Continued from page 29)

cavity. The device we purchased from Piezo Technology Inc. had a price of about $140, including shipping charges. The "preamp" can be built for almost nothing, so a total cost for the network is in the $150 area. This provides a considerably higher selectivity per dollar quotient of 48 (a *Q* of 7300 per $150 cost) than compared to the 1.8 figure attainable with the band-pass cavity.

Installation Tests

A final word about installation and adjustment. The preamplifier should be tuned in the installed configuration in the repeater system. Normal receiver sensitivity measurements and receiver desensitization tests should be made on the system before and after installation to confirm proper operation. The repeater should not cycle when in its operating configuration with its squelch set at threshold, and a weak, *radiated* signal from a nearby source is slowly decreased in amplitude until the receiver squelch just closes, causing the repeater transmitter to go off. If the system cycles it means there is probably some receiver desensitization indicating inadequate receiver to transmitter isolation. Resolution of this problem is discussed in the ARRL *FM and Repeater Handbook*, chapter on Repeater Technical Problems and Cures.

Conclusion

The cost/performance comparison between a cavity system and the crystal-filter network for use in amateur repeater service indicates that, since costs are comparable, the crystal-filter approach should be considered even if a repeater system may only require a cavity network. If care is taken in the design, layout and construction of a crystal-filter/preamplifier network, the result will provide the optimum in receiver front-end selectivity in a smaller package and for about the same expenditure as for a cavity network. QST

The ARRL Membership Opinion Survey

THERE MUST BE at least 56,000 members of the League who are interested in the results of the membership opinion survey, because that's the number that returned the questionnaires to us. Fifty-six percent return is remarkable by any standards, phenomenal by some, and to us it indicates the keen interest of ARRL members in the recent FCC restructuring proposals. In the paragraphs and pages that follow, we'll comment briefly on the results of the survey, and list the raw data. The directors of the League were furnished a 38-page report by the hq. staff, and a copy of that report is available to anyone who'll send us a 9 × 12-inch envelope with 70c postage affixed for return by first-class mail. Because we have no way of knowing how many members may be interested in a copy of the report, we'll not print up a supply until the mail gives us some indication of that interest. So, once having requested a copy of the report, please be patient – it won't necessarily be on its way to you by return mail.

Scope of the Survey

The purpose of the survey was to determine the attitudes and opinions of each League member in such a way that these opinions could be related to the opinions expressed by other members. Such a goal necessitated the use of a standardized response form which could be tabulated by machine.

It was obvious that an attempt to sample member reaction to every minute detail of the FCC proposals would obscure the major issues involved; therefore, the survey form was designed to cover the broad issues in depth and to deal only with certain specifics which were anticipated to be controversial.

Additionally, the survey statements were made final about two months after the release of the docket, during which period spontaneous expressions from amateurs were reaching the hq. in quantity. By this time there was a clear consensus on a few issues such as power levels, so these needed only minimum attention in the survey.

Design of the Survey

The design of this survey involved a combination of questionnaire wording and computer analysis of the responses. In addition to a series of statements each tabulated separately, a number of statements were made, and possible responses posed in different ways for each topic or subject. For example, the measurement of opinion generally in favor of the FCC proposal was based on the responses to 15 statements. A separate analysis produced a measurement of intensity of opinion – i.e., the proportion that was strong, mild or neutral. A total of 12 indices for each questionnaire was computed in this manner – for the FCC proposal, against the proposal, for easier entry into amateur radio, against easier entry, for a no-code license, against a no-code license, the degree of intensity for each of the first four topics, general "knowledgeability" based on answers to 5 questions, and consistency based on the pattern of response to all the questions on each topic. The analysis was then based on tabulating those indices for each questionnaire in addition to individual responses. In this way a much more accurate reflection of the opinions held was produced in the resulting data.

Whenever a task is turned over to a machine, it is wise to have a way of checking to see that it is performed accurately. This was part of the reason for a feature of the survey which saw two statements address a single issue from diametrically opposing positions. There were five such pairs of statements in the survey. For each questionnaire, the responses to these pairs of statements were tested for consistency and a consistency index was tabulated. This index was on a range from −1 (totally inconsistent) through zero (no correlation between responses) to +1 (totally consistent). When the individual responses were fed to the computer for the first time, a graph showing the distribution of consistency over this range was produced. A significant number of surveys with low or negative consistency indices would have been an indication of one of the following problems:

1. A mechanical or electrical problem in the data processing equipment, causing a random distribution of errors in the raw data.

2. A "language gap" between the designers of the survey and the League membership, resulting in interpretation of statements in ways not intended by the designers.

3. A number of members not understanding how to fill out the form properly.

Conducting the survey ultimately involved about two dozen people at Headquarters. Day-to-day mail is machine-opened, but the survey envelopes had to be opened by hand to avoid damaging the special forms. Here is part of the envelope-opening crew which was at work during late March and much of April. Other pictures of the processing operation appeared on page 94, May *QST*.

The original design of the survey called for the elimination of survey returns showing negative or extremely low consistency from the sample before doing the final tabulation. However, the number of returns falling in this category was so low (about 4%) that this step was eliminated as being unnecessary. The consistency index can be regarded as an "insurance policy" upon which it was not necessary to register a claim; it was comforting to have, but it is even better not to have needed to use it.

The final index which was included in the survey design was an index of knowledgeability on matters related to a no-code license. Five statements were made relating to FCC regulations, the experiences of other countries with no-code licenses, and international radio regulations. Because these statements dealt with facts, not opinions, all of the statements were worded so that a response of "agree" was correct; it was not desired to have an ARRL survey propagate untrue statements.

There were several reasons for wanting to have an index of knowledgeability. First, it provided a good indication of the factual foundation on which members' attitudes toward a no-code license were based. Second, it permitted a comparison of groups at opposite poles on issues, on an additional dimension. Whether or not the comparison would turn up significant differences between groups was unknown when the survey was constructed, but as long as the vehicle for testing such differences existed, it seemed worthwhile to investigate the question. In a minor way, this index reflects on the job the League has done in informing its members on these matters.

Some negative reaction to the statements dealing with knowledgeability was anticipated and, in fact, some negative reaction did occur – more on this than on any other feature of the survey. However, it is important to note that 97.8% of the knowledge statements were responded to, compared with an average of 98.3% for the other statements from 1 to 37. The number of members objecting to the concept of the knowledgeability index may be estimated by comparing these two figures.

The inclusion of demographic information rounded out the design of the survey. License class and area of activity were included so that cross-tabulations based on these variables could be conducted to uncover differences of opinion between the different sub-groups of League members who stand to be affected in different ways by restructuring. ARRL Division was included so that each Director could examine the attitudes of members in his division separate from the membership as a whole. Other demographic information was requested for statistical purposes.

The method of survey construction which was adopted for the ARRL membership survey permitted the handling of tremendous amounts of data quickly and accurately, provided an in-depth look at members' opinions on the major issues, permitted cross-tabulations based on license class and other significant factors, and provided the dimension of intensity on each issue. The comment sheet to the Division Director which was included in each survey package provided the element that could not be included on the standardized form: an open-ended opportunity for the member to express his opinion to his representative on the Board. The success of this approach can be measured in terms of response: 50,186 forms that could be machine-read were received before the computer run was undertaken, and a total of about 56,000 forms were received by the date this report was prepared. These figures represent 50% and 56% of the U.S. membership, respectively.

An additional advantage of the survey method used was that all of the tabulation, much of the statistical analysis, and a great deal of preliminary report preparation was programmed into the computer in advance, making it possible to produce a full report in the limited time available. This process would have taken far longer had conventional methods been used, and would have produced far less useful and accurate information.

What the Membership Said

The survey contains a wealth of information about membership opinion not only when tabulated simply by response to each question on a nation-wide basis but also when broken down by division, by cross-tabulation with respect to license class, and so on, as already noted. In preparation for the May Board meeting it was not possible, or even necessary, to perform every possible type of cross-analysis of the results of the survey. Nevertheless, certain basic opinions of the membership came through loud and clear. In summary form, here's what the membership told us:

a) There was a concern over retention of present prerogatives and privileges.

b) There were significant differences in opinion among the different license classes.

c) There was no rigid commitment to the status quo.

d) There was no overwhelming mandate either for or against the general concepts contained in Docket 20282.

e) There was a recognition of the need to attract more people to amateur radio.

f) There was a willingness to accept the concept of a new entry class of license.

g) There was a resistance to the complete abandonment of a code requirement.

h) There was strong support of a licensing system which encourages upgrading.

We are including as part of this *QST* summary the two appendices to the full report, the appendices which contain the detailed breakdown by geographical area and by license class. These two breakdowns were of major interest to the staff and to the Board. Included in the full report, however, is an even more detailed analysis based on the responses of those who were generally in favor of the FCC proposals and those who were generally opposed. Further analysis treats the reaction to easier-entry and no-code in greater detail than we are carrying in the pages of *QST*. For those who have a greater interest in the survey results than we have satisfied here, the complete report is available upon receipt of that self-addressed 9 × 12 envelope bearing 70c in postage.

Abbreviations used in the tables: SA - strongly agree; A - agree; N - neutral; DN - don't know; D - disagree; SD - strongly disagree; MTL - much too low; TL - too low; AR - about right; TH - too high; MTH - much too high. Columns do not total to 100% because of rounding error and non-responses.

Table I. Survey responses categorized by ARRL division. Figures represent percentages of the total response in each category.

	All Areas	Atlantic	Central	Dakota	Delta	Great Lakes	Hudson	Midwest	New England	Northwestern	Pacific	Roanoke	Rocky Mountain	Southeastern	Southwestern	West Gulf
1. The present U.S. amateur licensing structure needs to be changed.																
sa	14	13	13	11	13	14	15	12	13	13	15	14	13	14	17	13
a	40	40	39	39	40	40	41	41	40	41	41	41	41	38	41	41
n	19	19	20	22	18	19	17	19	19	19	19	19	18	19	18	18
d	17	18	18	17	18	17	17	18	18	18	17	17	18	19	15	18
sd	9	9	9	10	9	9	9	9	9	8	8	8	9	9	8	9
2. In general, something like the FCC's proposed new structure will be a good change.																
sa	8	8	8	7	8	7	8	8	8	8	9	9	10	8	10	7
a	40	39	40	40	38	40	39	39	39	41	43	41	39	38	42	40
n	14	14	14	17	14	13	13	14	14	14	13	14	14	13	13	13
d	21	22	21	21	23	22	22	23	21	22	19	21	21	23	18	22
sd	15	15	16	13	16	16	15	15	15	14	13	14	15	16	14	16
3. Under the FCC proposal, present licensees would lose too many of the privileges they now have.																
sa	17	18	17	16	17	21	18	18	17	15	15	16	15	17	17	18
a	26	25	26	26	26	28	27	28	26	25	24	24	25	25	22	26
n	13	14	14	13	12	12	13	14	13	13	13	14	12	13	13	12
d	34	34	33	36	36	31	32	31	34	37	37	36	36	33	37	34
sd	8	8	8	8	8	7	8	8	8	9	10	9	10	9	10	7
4. Present procedures for conducting mail examinations by volunteers need to be tightened.																
sa	26	24	23	20	27	26	27	26	23	25	26	26	23	29	30	30
a	37	36	38	35	38	35	38	38	38	38	37	37	38	35	38	37
n	18	21	20	23	16	19	17	16	19	18	20	19	20	18	16	16
d	13	14	14	16	13	15	12	14	14	14	11	13	15	12	11	12
sd	4	4	4	5	4	5	4	4	4	4	4	4	4	4	3	3
5. A no-code license is a good way to bring in more amateurs.																
sa	10	10	10	8	9	10	13	10	9	9	10	10	10	10	11	10
a	29	28	28	28	29	27	33	29	28	27	29	31	28	27	33	28
n	9	9	8	11	8	9	8	9	8	10	9	7	9	7	9	8
d	22	22	22	21	21	21	20	23	23	23	22	21	23	23	20	23
sd	29	31	31	30	33	32	25	29	30	30	29	29	29	32	25	29
6. Having more amateurs will help protect our frequencies.																
sa	20	19	20	17	19	19	25	19	20	18	20	21	17	19	24	20
a	42	42	42	41	44	42	42	43	42	44	43	43	43	42	43	43
n	12	12	12	14	10	13	11	13	12	13	13	12	13	12	11	10
d	16	17	17	18	17	17	14	17	17	17	16	16	17	16	14	18
sd	6	7	7	6	7	7	6	6	7	6	6	6	7	8	5	7
7. An examination without code, with Novice-level technical requirements and conveying some vhf privileges, would bring in more undesirable than worthwhile new amateurs.																
sa	33	35	35	28	37	36	29	33	30	34	31	33	32	36	30	33
a	27	27	27	29	26	27	26	27	30	28	28	26	27	26	25	27
n	13	13	12	15	11	13	14	14	12	13	14	12	13	12	14	13
d	20	19	19	21	19	18	24	20	21	20	20	22	20	18	24	20
sd	6	5	5	5	5	6	6	5	6	5	6	6	6	5	6	5
8. The exclusive Extra Class phone band from 3775 to 3800 kHz should be opened to the Advanced Class, as proposed.																
sa	20	19	20	17	20	20	20	20	21	19	21	19	18	22	23	19
a	29	28	28	31	28	29	28	30	31	31	30	28	29	30	29	28
n	22	22	24	22	21	23	22	22	21	21	20	21	22	21	21	21
d	16	16	16	17	18	16	16	16	16	16	16	16	16	14	15	18
sd	12	13	11	12	12	10	13	10	11	12	12	14	14	12	12	13
9. The exclusive Extra Class phone band from 21,250 to 21,270 MHz should be opened to the Advanced Class, as proposed.																
sa	20	19	19	17	19	20	20	19	20	19	21	18	19	22	23	19
a	30	29	29	31	29	30	29	32	32	31	31	28	30	31	29	29
n	22	23	24	23	21	24	22	22	20	21	20	22	21	20	20	21
d	15	16	15	17	17	15	15	15	15	16	15	16	16	14	15	17
sd	11	12	11	11	12	10	12	10	10	12	11	13	13	11	11	12
10. Knowledge of code is not a basic international requirement for all amateur licenses.																
a	28	26	28	29	29	25	36	27	26	27	28	27	29	26	30	28
dn	37	39	36	34	37	37	33	38	37	36	36	38	37	39	36	37
d	33	33	34	34	32	35	29	33	35	35	34	33	33	33	32	33
11. The FCC licensing system should be designed to encourage amateurs to work toward a higher grade of license.																
sa	36	37	36	34	37	35	38	34	34	36	37	38	37	37	39	37
a	45	44	45	46	46	46	42	46	46	48	45	45	46	44	44	47
n	8	7	8	9	6	8	8	9	9	6	8	7	7	7	6	6
d	7	7	6	7	7	7	7	7	7	5	5	6	7	7	6	6
sd	3	3	3	3	3	3	3	3	3	3	3	4	3	3	3	3
12. Knowledge of Morse code for an amateur license is not as important as it once was.																
sa	9	9	9	8	9	8	12	10	8	9	10	10	9	10	11	9
a	34	31	32	33	35	30	40	33	33	33	34	33	37	33	35	35
n	7	7	7	7	5	7	7	7	7	6	7	7	7	6	6	7
d	29	30	29	31	29	30	24	30	30	29	28	29	29	28	28	28
sd	20	22	22	19	21	24	16	19	20	22	20	20	19	22	18	18
13. Simplifying entrance-level requirements for a vhf license would not lower standards for the rest of amateur radio.																
sa	6	6	5	4	5	6	7	6	6	5	6	6	6	6	6	5
a	31	31	31	31	31	28	34	30	32	31	33	31	30	30	33	30
n	12	12	12	15	11	12	12	14	12	12	13	12	13	12	13	12
d	31	31	32	32	32	32	28	31	31	31	29	31	31	30	30	32
sd	18	18	18	15	20	19	16	17	16	17	17	17	19	19	15	18

	All Areas	Atlantic	Central	Dakota	Delta	Great Lakes	Hudson	Midwest	New England	Northwestern	Pacific	Roanoke	Rocky Mountain	Southeastern	Southwestern	West Gulf
14. FCC requires a knowlege of code for all present U.S. amateur licensees.																
a	85	85	86	85	88	89	85	85	84	85	82	85	84	83	83	85
dn	5	5	5	7	5	4	5	6	6	5	6	5	5	7	6	6
d	8	8	7	7	5	6	8	7	8	8	9	8	9	8	10	7
15. All amateur licenses should be renewable, including entrance-level licenses.																
sa	17	17	17	17	16	18	18	16	17	16	16	17	16	17	16	16
a	38	38	39	37	38	37	39	39	36	37	40	38	37	38	38	37
n	9	9	9	10	10	8	8	9	9	9	9	8	8	9	10	8
d	25	24	24	26	25	24	23	25	26	27	23	25	28	23	25	27
sd	10	10	10	8	10	10	10	9	10	10	9	10	10	10	10	10
16. Even if others are not permitted to renew a basic entrance-level license, senior citizens should be permitted to.																
sa	17	18	18	19	14	18	18	17	18	17	15	17	16	16	15	14
a	31	33	31	33	33	32	33	32	32	31	31	31	29	28	29	29
n	16	16	16	16	16	16	15	16	15	15	18	15	16	16	15	17
d	24	22	23	21	25	23	22	25	24	27	25	25	28	26	26	28
sd	10	9	10	10	11	11	11	9	9	9	10	10	10	12	13	11
17. Even if others are not permitted to renew a basic entrance-level license, the handicapped should be permitted to.																
sa	20	21	21	22	19	20	21	21	21	20	18	21	19	20	20	19
a	40	40	39	41	40	40	41	40	40	41	40	41	39	40	39	39
n	14	15	15	15	14	14	14	14	14	14	15	14	16	14	14	14
d	16	16	16	13	18	17	14	17	16	17	17	16	18	17	17	19
sd	7	6	7	7	6	7	7	6	6	5	7	6	6	7	8	7
18. If a no-code vhf license (with basic technical requirements) is created, its holders should be assigned some frequer that are widely used by other amateurs to allow the newcomers to learn from the experienced amateurs.																
sa	10	10	10	10	10	10	12	10	10	8	10	10	9	9	12	10
a	31	31	30	31	29	29	33	29	32	29	31	33	32	30	35	31
n	12	12	12	14	10	11	11	12	12	13	13	11	12	11	10	11
d	22	22	22	23	22	22	21	23	23	23	22	20	22	23	20	22
sd	24	24	25	20	28	26	21	24	22	26	22	24	25	26	23	25
19. Under international radio regulations, the FCC cannot create a class of amateur license with no requirement of te knowledge.																
a	35	34	36	32	32	35	37	35	36	35	36	34	33	34	36	35
dn	51	52	50	55	52	51	48	52	51	51	50	52	54	51	50	51
d	12	12	12	11	13	11	12	12	11	12	11	12	12	13	12	11
20. Technician and Conditional licenses obtained by volunteer exam before the effective date of new rules should b renewable.																
sa	18	16	19	21	19	21	18	19	18	16	15	18	19	17	14	20
a	39	41	40	40	39	40	40	39	40	38	37	39	37	37	35	36
n	16	17	16	16	14	14	16	14	15	15	16	16	16	15	17	14
d	18	17	17	15	19	16	16	18	18	20	20	18	20	19	22	19
sd	9	8	8	6	8	8	8	9	7	10	10	9	7	11	11	9
21. Higher power levels for the highest classes of license (Extra, Advanced, and Experimenter) and lower levels for th intermediate classes (Technician and General) are a good idea.																
sa	15	15	15	15	14	14	16	14	14	15	18	15	17	16	17	15
a	30	29	29	29	29	28	30	30	30	32	31	29	33	29	33	30
n	9	9	9	10	10	10	9	9	9	10	9	10	8	9	9	10
d	20	20	21	19	22	21	21	21	20	20	19	20	19	20	19	20
sd	24	26	26	26	24	26	24	25	25	22	22	25	22	24	22	24
22. Only those amateurs interested in vhf/uhf experimenting might need power greater than the present limits.																
sa	8	9	8	9	7	8	8	7	8	7	9	8	9	8	7	8
a	21	22	21	21	23	21	21	20	22	18	20	24	20	22	19	21
n	19	19	18	22	19	19	20	20	19	20	19	19	21	19	19	19
d	31	30	31	29	32	31	30	32	31	33	31	30	32	31	32	31
sd	19	19	20	17	18	20	20	19	17	20	19	18	17	19	21	20
23. FCC's proposal for separate hf and vhf licensing would serve to limit the scope of an amateur's activities.																
sa	20	20	21	18	21	21	22	19	21	20	19	19	20	19	20	22
a	37	37	37	38	37	38	36	38	38	38	34	37	35	38	36	36
n	11	11	12	14	11	12	11	12	11	11	12	12	11	12	11	11
d	23	23	23	23	24	22	23	23	23	24	27	24	25	23	24	23
sd	7	7	6	6	6	6	7	6	6	6	7	6	9	7	8	6
24. There should be some frequencies in common on which both hf and vhf licensees can communicate.																
sa	23	24	24	22	23	26	24	23	25	21	21	23	22	21	23	24
a	50	50	51	51	48	51	50	51	50	51	50	51	51	50	49	51
n	13	13	14	14	13	12	12	13	13	15	14	13	14	13	15	12
d	8	8	7	8	10	7	8	9	8	9	9	9	9	9	8	8
sd	3	3	2	3	4	3	3	3	2	3	3	3	3	3	3	3
25. Special modes (such as radioteletype, slow-scan television, and facsimile) should not be available for Technician a General licensees.																
sa	9	8	8	8	8	8	8	9	8	9	9	8	10	10	10	10
a	19	18	18	19	19	16	18	21	19	22	20	19	20	20	21	20
n	12	12	12	14	14	12	11	12	12	14	13	12	15	14	12	13
d	30	30	30	30	29	29	31	31	31	28	31	32	29	29	29	28
sd	29	30	31	28	28	34	31	26	29	26	26	27	26	27	27	27
26. Other countries have issued no-code licenses.																
a	26	22	27	26	27	23	38	24	23	22	25	25	24	25	29	27
dn	64	68	63	65	64	66	53	66	68	68	65	66	66	65	61	63
d	7	9	7	7	6	8	7	7	8	8	7	7	8	7	7	7
27. The FCC proposal would not have much harmful effect on the privileges of present licensees.																
sa	6	6	6	5	6	5	7	6	5	6	7	6	6	7	8	6
a	33	32	33	34	33	30	31	32	34	35	37	34	38	33	37	33
n	10	10	10	11	9	10	11	10	10	10	10	10	8	10	10	9
d	26	26	26	26	25	27	26	28	26	26	24	26	24	25	23	26
sd	23	24	24	22	25	26	23	23	22	22	20	22	23	23	21	22
28. If a no-code vhf license as proposed does bring in more new amateurs, it would be a good thing for amateur radio																
sa	9	9	9	8	9	9	13	8	9	8	9	10	8	8	11	8
a	28	27	27	26	26	25	31	28	28	26	29	29	27	26	32	27
n	18	19	19	23	15	19	17	18	18	21	18	17	18	16	17	18
d	25	25	24	24	28	26	22	26	26	27	25	26	27	25	23	26
sd	18	19	20	16	20	20	16	18	18	19	17	18	19	22	16	19
29. The code is such an important part of amateur radio that a license should not be granted to a person with no kno of it.																
sa	29	30	31	26	33	32	25	29	29	31	29	30	28	33	26	28
a	29	30	29	31	29	30	26	30	30	29	28	28	30	28	27	31
n	12	11	12	13	10	11	12	12	12	12	12	11	12	11	12	11
d	21	21	20	22	19	19	25	21	22	20	23	22	21	18	24	21
sd	8	8	8	7	7	7	11	8	7	7	8	9	9	9	9	7

	All Areas	Atlantic	Central	Dakota	Delta	Great Lakes	Hudson	Midwest	New England	Northwestern	Pacific	Roanoke	Rocky Mountain	Southeastern	Southwestern	West Gulf
30. Amateurs holding a no-code vhf license (with basic technical requirements) should be limited to band segments not widely used by other amateurs.																
sa	26	26	26	21	30	28	22	27	23	27	24	26	26	28	23	27
a	33	33	33	34	34	33	33	35	35	35	33	32	34	33	33	35
n	13	13	12	16	12	13	13	14	13	13	14	13	12	13	13	11
d	21	21	21	21	19	20	22	17	22	19	21	22	21	18	23	20
sd	6	6	7	6	5	6	8	6	7	5	6	6	5	6	7	5
31. If the Communicator license is created, provision should be made in the ARRL organization for participation by these licensees.																
sa	21	21	21	19	19	20	25	20	20	21	21	23	22	20	22	22
a	51	52	49	54	53	50	50	49	51	52	62	52	51	50	53	52
n	16	16	17	17	15	17	14	18	16	16	16	14	15	17	14	14
d	5	4	5	4	5	5	5	6	5	5	4	5	5	6	4	5
sd	5	5	5	4	7	6	5	5	5	5	4	5	6	5	5	5
32. The Experimenter license as proposed would serve no useful purpose in the licensing structure.																
sa	11	11	11	8	12	12	11	10	9	10	9	10	10	11	11	11
a	20	20	21	19	24	21	19	22	20	19	19	19	20	21	19	21
n	25	25	25	29	23	25	24	26	25	25	24	24	25	26	23	25
d	33	33	32	34	31	32	34	33	34	35	36	35	33	31	34	33
sd	9	10	9	8	8	9	10	8	9	9	10	9	10	8	11	7
33. "Special" station licenses such as club station, repeater station, auxillary link station, etc. should continue to be available to Generals and Technicians.																
sa	23	24	23	20	23	26	26	24	24	21	21	24	20	22	20	23
a	44	44	45	49	46	44	44	44	45	44	44	45	43	42	41	43
n	14	13	15	14	14	14	12	14	13	15	15	13	15	15	15	13
d	14	14	13	13	12	12	12	14	14	15	14	13	16	14	17	15
sd	4	4	4	3	5	4	5	4	4	5	4	4	5	5	6	5
34. Communicators should be permitted to operate on cw if they want to.																
sa	16	16	16	17	16	17	18	14	17	14	17	17	15	16	16	17
a	40	40	40	40	39	40	38	40	40	41	40	40	41	40	41	40
n	13	12	14	15	13	12	12	14	12	12	13	11	13	14	13	12
d	15	16	15	13	15	15	15	16	15	17	15	15	15	14	15	16
sd	13	14	13	12	15	14	14	14	13	14	12	15	14	13	12	13
35. Under international radio regulations, the FCC cannot do away with the code requirement for six-meter operation.																
a	19	19	20	18	20	19	18	18	20	19	19	19	17	18	19	21
dn	67	67	66	68	67	67	65	68	67	68	67	67	69	68	66	66
d	12	12	12	12	11	11	15	11	10	11	11	12	12	11	13	11
36. If the FCC is going to make some classes of license non-renewable, out of fairness they should require re-examination of all amateurs at renewal time.																
sa	7	6	7	7	8	8	7	7	7	7	7	6	8	7	7	8
a	7	7	7	9	7	8	8	7	8	8	8	7	7	7	6	8
n	8	8	9	10	7	8	7	7	7	8	10	7	8	7	7	7
d	30	30	30	29	29	28	29	31	31	31	30	30	31	28	31	29
sd	47	48	46	44	48	47	48	46	45	46	43	48	46	49	48	47
37. There is no real reason to change the present U.S. amateur licensing structure.																
sa	16	16	17	17	16	17	17	17	17	16	15	14	16	18	15	18
a	20	20	20	18	22	20	19	21	20	19	18	20	20	20	18	19
n	17	18	18	20	17	17	16	17	16	17	17	17	15	17	16	16
d	34	34	33	35	33	34	34	33	34	36	35	37	35	33	37	35
sd	10	10	9	8	9	10	11	9	10	10	11	10	11	9	12	9
38. The proposed power level for Communicators (250 watts input) is																
mtl	1	1	1	0	1	1	1	1	1	1	1	2	1	1	1	1
tl	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2
ar	30	28	30	33	31	28	28	32	29	30	32	32	29	31	31	30
th	30	31	29	33	30	29	31	31	32	32	30	30	31	29	31	28
mth	34	35	36	29	32	37	35	32	32	33	33	31	36	33	32	36
39. The proposed power level for Novices (250 watts input) is																
mtl	0	1	0	0	0	0	1	0	0	0	0	1	0	1	0	0
tl	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ar	32	30	31	32	35	30	31	34	29	32	33	36	32	33	34	33
th	37	37	36	38	37	36	36	37	39	39	36	35	38	35	36	36
mtn	27	28	28	25	23	29	29	25	27	26	26	25	26	26	25	26
41. Membership category:																
lm (full)	8	8	7	9	9	6	8	8	8	8	7	11	8	7	8	6
full	82	83	83	81	83	83	81	81	82	81	82	79	83	82	82	84
lm (assoc)	0	0	0	0	1	0	1	1	0	1	1	1	1	1	1	0
assoc	6	6	7	6	5	6	7	6	6	6	6	7	6	6	5	6
42. License Class:																
extra	12	14	10	14	13	9	14	10	13	14	13	14	14	13	13	13
advanced	36	35	36	35	38	33	33	37	34	37	38	35	37	37	43	38
general	24	27	26	22	24	27	25	24	26	21	21	24	19	23	21	19
conditional	6	3	5	14	8	4	9	7	9	7	8	12	7	4	9	
technician	9	9	10	4	8	13	12	7	9	6	7	7	6	8	9	8
novice	7	7	7	7	7	8	7	8	7	7	7	6	6	7	6	6
43. Age:																
under 15	1	1	1	1	1	1	2	1	1	1	1	0	1	1	1	1
15-19	4	5	5	6	4	4	7	4	5	3	4	3	3	3	3	4
20-25	6	7	7	9	8	6	7	6	6	5	4	6	6	4	4	6
26-35	20	20	22	23	22	20	21	21	20	19	19	23	21	18	16	22
36-50	23	23	23	24	26	25	21	25	20	23	23	28	26	22	23	24
51-65	31	31	30	26	29	30	30	30	31	32	33	28	31	30	35	29
over 65	13	11	11	9	9	11	11	12	14	14	14	9	11	20	16	12
44. Year you were first licensed:																
before 1930	6	5	5	4	4	5	6	5	7	6	8	5	5	9	8	5
1930-39	12	13	12	10	8	11	13	9	13	15	15	10	12	13	16	10
1940-49	8	8	7	6	7	7	8	8	9	8	9	7	9	8	10	9
1950-59	25	25	25	26	25	25	23	25	27	25	26	28	28	25	25	28
1960-69	25	25	27	28	31	28	25	28	23	24	20	27	24	22	19	23
1970-present	19	19	20	22	22	21	20	22	17	19	17	19	18	18	18	19
never licensed	3	3	3	2	2	3	4	3	3	3	3	3	4	3	3	3
45. Did you ever hold a Novice license?																
yes	54	55	58	61	58	59	51	58	52	53	48	57	53	49	47	55
no	40	40	37	34	36	35	43	36	43	41	46	37	42	45	48	40
46. I am currently active on:																
hf only	39	39	37	46	37	35	38	37	39	40	42	38	38	38	42	37
vhf only	13	14	15	9	13	17	16	12	14	10	11	13	10	13	12	11
both	36	36	36	36	41	36	32	39	35	39	33	37	40	37	34	40
inactive	10	10	10	8	7	10	12	10	10	9	11	10	10	9	9	9

Table II. Survey responses categorized by class of license held. Figures represent percentages of the total response in each category.

	All Classes	Extra	Advanced	General	Conditional	Technician	Novice
1. The present U.S. amateur licensing structure needs to be changed.							
sa	14	14	18	10	8	21	18
a	40	39	44	31	27	37	41
n	19	17	16	16	13	12	17
d	17	20	15	26	28	18	17
sd	9	10	7	17	22	11	7
2. In general, something like the FCC's proposed new structure will be a good change.							
sa	8	9	13	4	3	10	11
a	40	40	47	26	22	36	40
n	14	13	12	12	10	9	13
d	21	21	17	29	32	24	23
sd	15	17	10	28	33	20	13
3. Under the FCC proposal, present licensees would lose too many of the privileges they now have.							
sa	17	15	7	33	40	31	17
a	26	24	17	34	35	30	28
n	13	12	12	9	8	11	17
d	34	38	48	20	13	20	30
sd	8	11	15	3	2	4	6
4. Present procedures for conducting mail examinations by volunteers need to be tightened							
sa	26	36	32	25	11	15	15
a	37	38	40	39	35	33	28
n	18	16	16	19	21	20	24
d	13	8	9	13	24	23	26
sd	4	2	2	4	8	8	7
5. A no-code license is a good way to bring in more amateurs.							
sa	10	10	10	7	10	18	13
a	29	30	32	21	27	32	24
n	9	9	8	6	6	8	8
d	22	20	19	23	22	16	19
sd	29	31	30	43	34	24	37
6. Having more amateurs will help protect our frequencies.							
sa	20	20	22	16	16	28	20
a	42	43	44	38	40	42	37
n	12	12	11	13	13	10	15
d	16	17	16	21	21	13	17
sd	6	7	6	10	8	5	9
7. An examination without code, with Novice-level technical requirements and conveying some vhf privileges, would bring in more undesirable than worthwhile new amateurs.							
sa	33	32	32	45	37	31	43
a	27	23	22	27	27	19	21
n	13	12	13	9	11	12	11
d	20	27	27	15	19	27	17
sd	6	6	6	4	6	11	7
8. The exclusive Extra Class phone band from 3775 to 3800 kHz should be opened to the Advanced Class, as proposed.							
sa	20	3	31	18	19	14	10
a	29	13	30	33	38	27	22
n	22	10	17	22	22	42	36
d	16	24	14	17	15	11	21
sd	12	49	7	9	6	5	10
9. The exclusive Extra Class phone band from 21,250 to 21,270 MHz should be opened to the Advanced Class, as proposed.							
sa	20	3	31	18	19	14	9
a	30	16	31	34	36	27	23
n	22	11	17	22	23	42	36
d	15	24	14	16	14	11	20
sd	11	45	7	9	6	5	10
10. Knowledge of code is not a basic international requirement for all amateur licenses.							
a	28	35	30	22	30	38	21
dn	37	30	37	39	36	32	38
d	33	34	32	38	32	28	39
11. The FCC licensing system should be designed to encourage amateurs to work toward a higher grade of license.							
sa	36	63	42	24	16	23	44
a	45	32	47	47	43	45	44
n	8	2	5	11	14	13	5
d	7	1	3	11	18	14	5
sd	3	1	1	6	9	6	2
12. Knowledge of Morse code for an amateur license is not as important as it once was.							
sa	9	5	9	5	16	27	10
a	34	30	31	21	31	35	21
n	7	6	7	6	4	5	7
d	29	32	31	35	28	20	33
sd	20	28	22	33	20	12	29
13. Simplifying entrance-level requirements for a vhf license would not lower standards for the rest of amateur radio.							
sa	6	6	6	4	6	13	6
a	31	33	34	22	31	34	25
n	12	11	10	11	13	9	15
d	31	29	29	35	30	25	32
sd	18	20	19	26	19	19	20

	All Classes	Extra	Advanced	General	Conditional	Technician	Novice
14. FCC requires a knowledge of code for all present U. amateur licensees.							
a	85	87	85	87	86	92	91
dn	5	4	5	5	5	3	4
d	8	8	9	7	8	4	5
15. All amateur licenses should be renewable, including entrance-level licenses.							
sa	17	10	12	13	36	37	28
a	38	34	37	38	40	40	37
n	9	10	10	9	4	5	7
d	25	30	29	28	14	12	18
sd	10	15	12	12	5	4	9
16. Even if others are not permitted to renew a basic entrance-level license, senior citizens should be perm to.							
sa	17	11	14	15	30	25	19
a	31	28	31	31	30	28	28
n	16	17	16	15	13	16	18
d	24	30	27	27	18	20	24
sd	10	14	11	11	9	10	13
17. Even if others are not permitted to renew a basic entrance-level license, the handicapped should be permitted to.							
sa	20	15	18	18	35	28	22
a	40	40	41	40	37	34	33
n	14	15	15	15	10	14	18
d	16	19	18	19	11	15	18
sd	7	9	7	7	5	8	9
18. If a no-code vhf license (with basic technical requirements) is created, its holders should be assigned sor frequencies that are widely used by other amateurs allow the newcomers to learn from the experienced amateurs.							
sd	10	10	9	7	10	19	10
a	31	29	27	22	27	31	24
n	12	13	11	10	11	10	11
d	27	21	24	26	24	16	22
sd	24	29	29	36	28	24	33
19. Under international radio regulations, the FCC can create a class of amateur license with no requireme of technical knowledge.							
a	35	39	33	37	35	38	37
dn	51	48	53	52	52	48	52
d	12	12	13	10	12	13	9
20. Technician and Conditional licenses obtained by vo unteer exam before the effective date of new rules should be renewable.							
sa	18	7	9	12	65	58	17
a	39	32	38	45	27	28	45
n	16	17	18	17	5	9	19
d	18	27	23	17	3	6	14
sd	9	16	12	8	1	2	5
21. Higher power levels for the highest classes of licens (Extra, Advanced, and Experimenter) and lower le for the intermediate classes (Technician and Gener are a good idea.							
sa	15	21	22	7	9	12	13
a	30	33	36	19	20	27	31
n	9	8	9	6	8	14	14
d	20	18	17	24	24	24	21
sd	24	21	16	44	38	23	19
22. Only those amateurs interested in vhf/uhf experim might need power greater than the present limits.							
sa	8	10	8	7	8	12	
a	21	20	19	19	21	26	22
n	19	14	17	19	20	20	20
d	31	30	35	31	29	28	29
sd	19	25	21	24	20	13	11
23. FCC's proposal for separate hf and vhf licensing w serve to limit the scope of an amateur's activities.							
sa	20	14	15	29	33	29	29
a	37	37	34	41	41	33	33
n	11	11	10	10	9	10	11
d	23	29	31	16	13	20	17
sd	7	8	9	4	4	7	
24. There should be some frequencies in common on which both vhf and hf licensees can communicate.							
sa	23	16	18	26	35	47	29
a	50	48	50	49	47	43	51
n	13	18	16	14	11	5	11
d	8	12	12	8	6	3	
sd	3	5	4	3	2	1	
25. Special modes (such as radioteletype, slow-scan te vision, and facsimile) should not be available for Technician and General licensees.							
sa	9	12	12	5	5	4	
a	19	25	26	13	11	6	11
n	12	14	14	9	8	7	11
d	30	32	32	28	29	23	33
sd	29	16	16	44	46	59	33
26. Other countries have issued no-code licenses.							
a	26	40	29	21	24	31	23
dn	64	52	63	68	68	61	70
d	7	6	7	9	6	7	

	All Classes	Extra	Advanced	General	Conditional	Technician	Novice
27. The FCC proposal would not have much harmful effect on the privileges of present licensees.							
sa	6	6	11	2	1	4	5
a	33	39	48	20	13	19	30
n	10	8	9	6	5	8	11
d	26	25	18	30	27	28	20
sd	23	21	13	41	53	41	24
28. If a no-code vhf license as proposed does bring in more new amateurs, it would be a good thing for amateur radio.							
sa	9	11	11	6	8	17	9
a	28	27	28	17	21	29	19
n	18	15	15	14	17	15	16
d	25	26	25	32	28	20	31
sd	18	21	20	32	27	19	24
29. The code is such an important part of amateur radio that a license should not be granted to a person with no knowledge of it.							
sa	29	33	29	43	30	21	41
a	29	25	25	29	28	19	26
n	12	10	11	7	8	10	8
d	21	26	26	15	20	25	16
sd	8	6	9	5	14	25	9
30. Amateurs holding a no-code vhf license (with basic technical requirements) should be limited to band segments not widely used by other amateurs.							
sa	26	26	27	33	25	23	32
a	33	29	31	33	31	22	30
n	13	12	12	12	14	10	12
d	21	25	24	17	21	29	19
sd	6	7	6	5	9	16	7
31. If the Communicator license is created, provision should be made in the ARRL organization for participation by these licensees.							
sa	21	26	23	16	20	29	22
a	51	49	53	47	46	47	48
n	16	13	14	20	20	14	18
d	5	5	5	7	7	4	5
sd	5	6	5	9	7	5	6
32. The Experimenter license as proposed would serve no useful purpose in the licensing structure.							
sa	11	11	9	17	16	14	9
a	20	18	18	27	27	22	19
n	25	21	22	26	25	17	30
d	33	38	39	24	24	28	31
sd	9	11	11	5	7	17	10
33. "Special" station licenses such as club station, repeater station, auxiliary link station, etc. should continue to be available to Generals and Technicians.							
sa	23	9	11	36	39	48	33
a	44	41	42	44	47	38	46
n	14	17	17	10	8	8	13
d	14	24	21	7	5	5	7
sd	4	9	7	2	1	1	1
34. Communicators should be permitted to operate on cw if they want to.							
sa	16	17	15	15	18	26	14
a	40	39	41	37	42	38	33
n	13	9	11	15	15	11	14
d	15	16	17	15	13	11	18
sd	13	16	14	17	10	12	19
35. Under international radio regulations, the FCC cannot do away with the code requirement for six-meter operation.							
a	19	27	19	18	16	23	16
dn	67	56	66	71	69	60	76
d	12	15	13	10	13	15	8

	All Classes	Extra	Advanced	General	Conditional	Technician	Novice
36. If the FCC is going to make some classes of license non-renewable, out of fairness they should require re-examination of all amateurs at renewal time.							
sa	7	2	2	3	32	27	8
a	7	4	3	5	19	16	14
n	8	7	5	7	8	10	13
d	30	31	31	30	20	23	32
sd	47	56	58	55	20	24	32
37. There is no real reason to change the present U.S. amateur licensing structure.							
sa	16	16	11	28	34	20	16
a	20	19	16	23	25	15	15
n	17	15	15	14	11	12	15
d	34	39	43	28	23	36	37
sd	10	11	14	7	6	17	16
38. The proposed power level for Communicators (250 watts input) is:							
mtl	1	0	0	1	3	2	1
tl	2	0	1	2	4	5	2
ar	30	22	29	24	34	32	31
th	30	31	32	29	27	28	30
mth	34	44	36	41	30	32	34
39. The proposed power level for Novices (250 watts input) is:							
mtl	0	0	0	0	1	1	1
tl	1	0	0	0	1	3	2
ar	32	23	30	23	34	51	45
th	37	41	39	37	36	29	31
mth	27	34	28	37	26	15	20
41. Membership category:							
lm (full)	8	18	9	5	6	6	2
full	82	79	87	90	89	86	80
lm (assoc)	0	1	0	0	0	0	0
assoc	6	1	1	2	2	4	14
42. License Class:							
extra	12	100					
advanced	36		100				
general	24			100			
conditional	6				100		
technician	9					100	
novice	7						100
43. Age:							
under 15	1	0	0	0	0	0	8
15-19	4	2	2	5	0	2	19
20-25	6	5	6	6	2	7	10
26-35	20	23	19	20	27	30	22
36-50	23	24	24	25	31	28	20
51-65	31	33	34	31	29	25	15
over 65	13	12	14	11	9	7	4
44. Year you were first licensed:							
before 1930	6	11	7	4	1	1	0
1930-39	12	23	18	7	3	1	0
1940-49	8	12	13	5	4	1	0
1950-59	25	30	23	34	49	25	2
1960-69	25	20	26	29	34	42	5
1970-present	19	4	13	21	9	29	90
never	3	0	0	0	0	0	2
45. Did you ever hold a Novice license?							
yes	54	42	47	69	64	61	86
no	40	55	49	26	32	33	5
46. I am currently active on:							
hf only	39	42	40	45	38	3	76
vhf only	13	4	6	8	10	84	1
both	36	50	49	40	45	3	1
inactive	10	3	4	7	6	9	20

INDICES	All Classes	Extra	Advanced	General	Conditional	Technician	Novice
PRO-FCC	48.46	52.33	54.27	39.33	42.73	50.20	43.40
CON-FCC	35.89	42.33	33.20	47.80	44.13	34.27	40.13
PRO-EASIER	45.12	44.67	48.17	33.00	40.17	55.50	40.33
CON-EASIER	39.98	43.50	39.83	55.50	47.83	33.67	45.83
PRO-NO CODE	32.75	35.75	37.25	22.50	31.25	46.00	28.25
CON-NO CODE	52.50	55.00	51.50	69.00	56.25	40.25	62.00
KNOWLEDGE	38.6	44.8	39.2	37.0	38.2	44.4	37.2

It Seems ...

(Continued from page 9)

license at the entry level which would be more attractive to prospective amateurs. The main objection to the FCC-proposed Communicator is that it is a "something-for-nothing" license; it grants so many desirable privileges that few people will want to upgrade. Also, because it requires no familiarity at all with the Morse code, Communicator licensees might not be encouraged to upgrade. The League's proposed alternative, called the Basic Amateur license, provides reasonable privileges as compared with requirements for the license. A novel feature of the Basic Amateur exam is the inclusion of basic questions on the broad range of opportunities available to amateurs with higher classes of license, to ensure that new amateurs are aware of the desirability of upgrading. We feel that this approach will attract large numbers of the kind of new amateurs who will be encouraged to seek the more fertile fields of the higher grades of amateur license.

Although the FCC proposal has been promoted as one having little negative impact on present licensees, in fact the present holders of all classes of license (except Advanced and Novice) stand to lose privileges if it is enacted without change. The League is firmly opposed to further erosion of privileges already earned, including the renewability of the licenses.

Further details on the League's response to Docket 20282 will be found elsewhere in this issue, including the cover. The important fact to note here is that the position adopted by the Board was worked out on the basis of detailed reference to the membership opinion survey. A strong spirit of cooperation enabled individual members of the Board to adjust their positions and response so that the overall position taken by the Board was unanimous. We feel it is truly representative of the majority opinion of League membership. We believe that amateur radio has spoken so clearly in this matter that there can be little reason for a delay in its conclusion along the lines proposed by the League.

And when the final report and order is announced, the League is ready to proceed with strong support of this unified approach to licensing and amateur privileges. We are committed to the adoption of League programs which will encourage the revitalization and growth of the amateur radio service.

— *W1RU*

Discone Antenna

(Continued from page 14)

10 meters, as well as on a number of frequencies outside amateur bands. The performance of the antenna is difficult to assess quantitatively. Compared to a log-periodic antenna, which has a theoretical gain of 13.5 dB above isotropic (dBi), we should anticipate a change of two to three S units when switching from one antenna to the other. This is assuming that the gain of the discone is not going to be greater than 2.14 dBi (the gain of a dipole antenna) and that an S unit is equal to 5 dB of signal change. At frequencies near the low end of the range, 7 MHz, the signal change is usually greater, being 3 to 4 S units. This seems reasonable. At 7 MHz the angle of maximum radiation for the log-periodic antenna occurs at 32° above the horizon, whereas low-angle radiation from the discone is optimum at this frequency. At 14 MHz the angle of maximum radiation for the log periodic decreases to 10° above the horizon, whereas the discone radiates somewhat less efficiently at low angles. The relative gain between the two antennas is therefore a function of frequency and distance and more particularly the elevation angle of the downcoming sky wave and the relative response of the antenna at that angle.

In an article in a recent issue of *QST*, Wintzer[7] discusses experiments with simplified wire discones. While none of the experimental arrangements utilized a sufficient number of wires to simulate a discone very well, nevertheless a reasonable performance was achieved on spot frequencies in some amateur bands. The advantages of a true discone antenna can be obtained without constructing the "unwieldy monster" that Wintzer suggests it must be, and one can certainly claim that the discone is a sensible alternative for a monopole. The 4-band broadband frequency range with low standing-wave ratio and no critical tuning of traps and inter-trap spacing should appeal to many. In the eyes of the antenna man, the discone is a beauty to behold; birds also love it as rows of them are usually seen sitting of the disk spreaders.

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QST

Retrospection: Simulated Emergency Test-1975

BY BILL MANN,* WA1FCM

MORE AMATEURS participated than in previous years. More reports than ever were received. A total of 64 ARRL sections were reportedly active. Traffic nudged up. The number of nets participating continues to rise. More stations are equipped for emergency power operation. A greater number of amateurs assumed net control and liaison functions. Red Cross activity took an upswing. Pointwise, too, it was a record-breaking year. Oh yes, we're talking about the 1975 Simulated Emergency Test held on January 26-27.

In January, Emergency Coordinators plot devastation for their local areas. Clandestine plans are devised incorporating realistic problems to confront the local Amateur Radio Emergency Corps group. Meetings are held to give the AREC members a hint – but only a hint – of what lies ahead to challenge their emergency preparedness capabilities. Net managers conjure up some potential snags, such as an emergency-power-only net session, to hurl at unsuspecting net stations. Then comes the last weekend in January: Hurricanes, blizzards, tornadoes, earthquakes, ice storms, et-cetera invade various communities throughout the U.S. and Canada. Local activity commences. The National Traffic System holds extended net sessions, and indeed some extra sessions, to provide an organized communications link between the numerous local hubs of simulated-emergency activity. Many Radio Amateur Civil Emergency Service groups join the SET operations. Messages and other communications are handled on behalf of public service agencies. The SET is in full swing.

With the remote likelihood of a major disaster affecting the entire U.S. and Canada, it might seem unrealistic to sponsor a nationwide emergency exercise. However, consider the following objectives of the SET: (1) to test the capability of the local amateur communications organizations (primarily AREC and RACES) under emergency conditions; (2) to test the ability of nets (primarily NTS) to function under overload conditions; (3) to demonstrate to served agencies (Red Cross, c.d., etc.) and the public, amateur radio's value as an emergency communications service; and (4) to provide operator training and experience in emergency communications practices. In view of these objectives, it appears desirable to have all local areas simulate emergency conditions rather than limiting "stricken areas" to certain parts of the U.S. and Canada, while other parts assume only supportive roles.

In an effort to make "comparable comparisons" with past performances, most features of this year's event were kept the same as in recent years. One change, however, was the NTS schedule. Immediately preceding the advent of the daytime segment of NTS, the net schedule called for two complete cycles of NTS, the usual evening cycle and an identical one, five hours earlier. Enter DNTS. In 1974 we tried running DNTS nets intermingled with the early cycle of the evening nets, but this proved self-defeating and confusing. This year, DNTS was handed a complete daytime cycle, while ENTS manned the usual evening cycle. Poor band conditions dealt both the daytime and evening cycles non-winning hands; later-evening nets were washed out while many higher-level daytimers were plagued by long skip. Conditions seemed to dictate a need for more net sessions in both cycles.

Repeaters continue to play a feature role in the SET. Undoubtedly, the greatest number of emergency-powered stations are on vhf, specifically two-meter fm. Yet, with over 1500 repeaters listed in the 1975-1976 ARRL *Repeater Directory*, it is evident that only a fraction of the number of repeaters are employed in the annual SET. Let's get more in '76.

* Assistant Communications Manager, ARRL.

The North Carolina State University ARC participated throughout the SET from a tent pitched on the school grounds. Shown operating W4ATC are club president WB4RYB left, and WB4BHJ right.

The remainder of this report has been compiled by Bob Poirier, WA1QME. The tabulations are based on reports submitted by Emergency Coordinators, net managers and RACES radio officers (i.e. what you see is what we got). The method of numerical scoring was not chosen to afford a contest flavor for the SET. Rather, it allows for a statistical comparison to data recorded in past years. Since it is impossible to represent many aspects of the SET empirically, the figures don't tell the complete story. However, we can make some generalizations on the trends in our public service capabilities when confronted with non-routine communications needs . . . in an effort to make us all better prepared when a real emergency calls.

– *WA1FCM*

Local Activity

Local SET activity has been somewhat erratic throughout the first half of this decade. Small increases were noted up to 1973 when the all-time record was set, surpassing the old one set in 1971 by 6000 points. The 1974 test saw a decline of 232 points from '73. Then in 1975 another all-time record, 63,218 points, was rung up, surpassing the '73 record by over 12,000 points. It makes one curious as to what the 1976 affair holds in store for point totals.

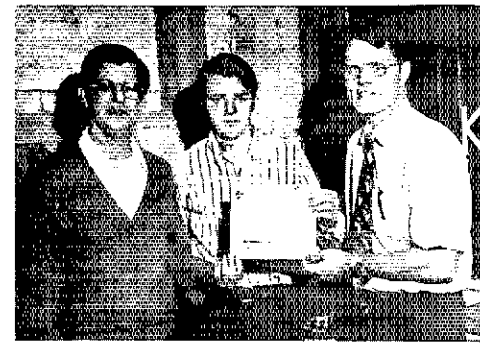
Results are summarized in the following table:

	1975	*1974*
EC/ROs submitting mail reports or mail and radio reports	293	253
EC/ROs submitting only radio or informal reports	8	9
Number of sections reportedly active	56	55
Total AREC/RACES membership of participating groups	8915	8655
Total reported participation	4613	4363
AREC/RACES messages to SEC/State RO	2725	2480
Self-powered portable/ mobile/fixed stations	2673	2558
Total number of points	*63,218*	*50,538*

For comparison purposes, the "average" local group has 30 registered AREC/RACES members with 16 participating in the local test. This is slightly less than last year, but more reports were received accounting for the wide point spread. In addition, an average of nine messages were sent to the Section Emergency Coordinator or State Radio Officer. The local test included nine stations using emergency power, either fixed, mobile or portable. The average point total was 215.

The following sections managed more than 2000 total points: Indiana, Kentucky, North Carolina, Northern Florida, Ohio, Saskatchewan, Southern Florida, Tennessee and Western Pennsylvania.

Total scores of participating groups are listed below with scores based on the sum of the following: 1 point for each AREC registrant or RACES operator; 2 points for each amateur participating in the local test; 1 point for each message from an AREC/RACES member to the SEC or State RO (limit one per amateur); 1 point for each message sent by participants to friends (limit two per amateur); 5 points for each mobile, self-powered portable or fixed station using emergency power; 5 points for each agency for whom messages were originated; 10 points for each community in which agencies were contacted; 10 points for a release to the news media; 10 points for submitting an emergency plan; and a quality point ranking from 1-10 based on how the local group performed overall. Last year's points are listed in parentheses.



A special presentation was given to those amateurs whose participation during the SET was "above and beyond the call of duty." Pictured at the affair are left to right: K9MKM, Emergency Coordinator Vigo Co. Indiana; WN9OGV, Asst. EC; and WB9NIW, Trustee of the Terre Haute North Vigo High School Station K9TNV. Others receiving awards were K9CDE and WA9OJU.

Area of Jurisdiction . . . . Reported By Total Points

ATLANTIC DIVISION

Eastern Pennsylvania . . . . . (655) 1579
Bucks Co. WA3IWX 793
Chester Co. K3WAC 421
Cumberland Co. K3WEB 94
Lackawanna Co. W3VAP 164
Schuylkill Co. W3CMA/3 107
† York Co. . . . . K3FOB –

Maryland, DC . . . . . (1055) 519
Calvert Co. W3ZNW 63
Carroll Co. K3ORW 72
Hartford Co. K3EGG/3 86
Prince George's Co. WA3RSG 163
St. Mary's Co. W3HJH 97
Worcester Co. WA3UUM 38

Southern New Jersey . . . . . (152) 472
Atlantic Co. WB2EYF 89
Burlington Co. K2VKS 225
Gloucester Co. WA2SEA 158
†Mercer Co. . . . . (WA2TRK) –

Western New York . . . . . (2127) 1365
Chemung Co. K2DNN 252
Genesee, Orleans, Wyoming Cos. . . . WA2AIV, W2FEY
Onondaga Co. W2EOS
Niagara Frontier WB2YEM
Oswego Co. K2DUR
Tioga Co. W2EWO

Western Pennsylvania . . . . . (860)
Armstrong Co. WA3WGV
Centre Co. WA3LJW
McKean Co. W3OOR
Mercer Co. WA3SSU, K3SMB

CENTRAL DIVISION

Illinois . . . . . (1207)
Calhoun, Greene, Jersey Cos. W9ITA
Cook Co. W9HPG
De Kalb Co. WB9IPX
Wabash Co. W9EIP

Indiana . . . . . (429)
Cass Co. K9EOT
Clark Co. WA9TJS
Fountain, Tippecanoe, Warren Cos. K3VWJ/9

Gibson Co.	K9PNP	83
Howard Co.	WA9QEQ	140
Jay Co.	WA9KWH	70
Lake Co.	WB9HCH	149
La Porte Co.	K9HYV	200
Madison Co.	WA9OKK	63
Monroe Co.	WA2VKU/9	247
Ohio Co.	WB9JKU	40
Ripley Co.	WA9JNC	13
Vanderburgh Co.	WA9QCF	268
Vigo Co.	K9MKM	509
Wayne Co.	K9FZS	118
Wisconsin	(226)	342
Dane Co.	K9QXY	342

DAKOTA DIVISION

Minnesota	(63)	283
Bloomington	WØPAN	151
Blue Earth Co.	WBØMHL	132

DELTA DIVISION

Arkansas	(0)	143
Area 8	WA5OVN	143
Louisiana	(2509)	2510
Caddo Parish	K5RNM	268
East Feliciana Parish	K5BLV	29
Ouachita Parish	WB5DVS	192
Southeast Louisiana	WB5FKU	338
Southwest Louisiana	WB5EPE	1683
Mississippi	(0)	653
District B	WA5JTB	77
District L	WN5LFG	243
Gulf Coast Cos.	WB5GOI	242
Northwest Mississippi	WA5MPQ	91
Tennessee	(2568)	2810
Anderson Co.	WB4ZSZ	296
Bedford Co.	WA4AXH	44
Benton & Humphrey's Cos.	WB4PRF	49
Blount Co.	WB4GJR	137
Bradley Co.	WB4BKF	118
Chester Co.	WB4EAH	100
Cumberland Co.	WB4PHW	14
Davidson Co.	WA4BCS	388
Hamblen Co.	WA4FQA	69
Knox Co.	WA4ZBC	245
Volusia Co.	WB4NJI	310
Southern Florida	(2224)	2611
Dade Co.	W4IYT	1054
Hendry Co.	WB4BMR	30
Hillsborough Co.	WB4ALH	543
Indian River Co.	W4LEP	135
Lee Co.	W4SMK	108
Okeechobee Co.	WA4ESS	53
Palm Beach Co.	WB4RLU	371
Polk Co.	WB4ZZB	235
St. Lucie Co.	W4NTE	82

SOUTHWESTERN DIVISION

Arizona	(0)	647
Maricopa Co.	K7JWB	363
Pima Co.	K7NTG	284
Orange	(1319)	1839
Desert Valley	W6TJ/7	283
Southwest Orange Section	K6LJA	389
Riverside Co.	K6CTD	673
San Bernardino Co.	K6GGS	494
San Diego	(1341)	1367
Imperial Valley	WB6RMG	69
Northern San Diego Co.	K6HAV	351
San Diego (City)	W6INI	780
Southern San Diego Co.	WA6HLA	167
Santa Barbara	(942)	1282
Santa Barbara Co. – North	WB6WWY	440
San Luis Obispo Co. – North	W6CDN	347
Ventura Co. (Coastal)	WB6TNL	413
Ventura Co. (Inland)	WA6OBT	82
Madison Co.	WA4VVX	139
Obion Co.	WB4TPS	110
Sevier Co.	W4SGT	53
Shelby Co.	W4OQG	356
Sullivan Co.	K4LRL	513
Unicoi Co.	W4AHN	73
Weakley Co.	WA4ZQX	105

GREAT LAKES DIVISION

Kentucky	(2588)	2379
District 1	WA4IGS	372
District 4	K4UDZ	1078
District 6	WA4AGH	148
District 8	K4ISI	558
District 11	W4NVE	86
District 12	WB4HRK	46
†District 14	WB4FDK	—
District 18	K4AVX	61
District 19	WB4IBO	30
Michigan	(2085)	1126
Calhoun Co.	WA8VXE	160
Menominee Co.	WB8PFB	212
Monroe Co.	WA8EFK	142
Wayne Co.	WB8IFD, K8JTT	612
Ohio	(4585)	5986
Adams & Brown Cos.	WA8CFX	117
Allen & Auglaize Cos.	WA8MIH	284
Belmont & Monroe Cos.	WA8KPN	174
Clark Co.	W8VZE	108
Clermont Co.	WA8TSX	192
Clinton, Fayette, Highland Cos.	K8CKY	98
Cuyahoga & Lorain Cos.	WB8MJB	317
Franklin Co.	W8ERD, W8IJE	1109
Gallia, Jackson, Meigs Cos.	W8TRI, W8FPA	57
Greene, Montgomery Cos.	W8ILC	1816
Hamilton Co.	WA8DFD	373
Hardin, Marion, Wyandot Cos.	WB8EDO	187
Harrison, Jefferson Cos.	W8ERR	160
Knox Co.	WB8AYM	109
Licking Co.	W8EOG	187
Mercer, Van Wert Cos.	K8PBE	96
Ottawa Co.	WA8HGH	82
Richland Co.	WB8GGR	432
Warren Co.	WB8AMI	88

HUDSON DIVISION

Eastern New York	(1483)	1390
Columbia Co.	W2KHQ	271
Rockland Co.	K2CXO	166
Saratoga, Warren, Washington Cos.	K2AYQ	216
Schenectady Co.	W2PKY	262
Westchester Co.	WB2VUK	475
NYC-LI	(1537)	1674
Babylon Town	WA2JZX	48
Huntington	W2GLE	184
Nassau City	W2ELK	1442
Smithtown	WB2GUB	—
Northern New Jersey	(559)	473
†Bayonne	WA2FUI	—
†Clifton & Vicinity	WA2BSU	—
Englewood & Vicinity	WA2CCF	167
Mendham	WB2VUF	112
Ridgewood	WB2ELF	194

MIDWEST DIVISION

Iowa	(531)	229
Buena Vista Co.	KØEVC	34
Story Co.	WAØEYG	195
Kansas	(1074)	1787
Northwest Kansas	WØWOB	181
Zone 1	WAØSRR	59
Zone 2	WBØMRX	147
Zone 4	WBØCZR	179
Zone 6B	WØKL	195
Zone 7	WAØGSG	118
Zone 9	WAØUTT	459
Zone 10A	WAØRFF	46
Zone 10B	WBØHOM	158
Zone 14	WAØYXK	245
Missouri	(881)	953
Adair Co.	WØOTF	86
Audrain Co.	KØAHL	43
†Callaway Co.	WBØATD	—
Clay-Platt	WAØKUH	157
Cole, Moniteau Cos.	WBØLTD	53
East Jackson City	WØQBX	174
Laclede & Pulaski Cos.	KØDEW	132
Saline Co.	WØVZK	65
Springfield Area	WØSIV	486
Vernon Co.	WAØFKD	57
Nebraska	(48)	305
Buffalo, Franklin, Kearney Cos.	WØRGF	149
Dodge Co.	WAØHAL	41
Scottsbluff Co.	WØVQR	69
Seward Co.	WØZOF	46

NEW ENGLAND DIVISION

Connecticut	(362)	1325
Bristol	WA1LRO	236
Darien, New Cannan, Norwalk, Westport, Wilton	WA1RXA	340
Southwestern Connecticut	WA1JYP	174
Greater Hartford	WA1LMV	218
Meriden	WA1QME	113
Northeastern Connecticut	WA1HYN	54
Southeastern Connecticut	WA1IKN	190
Eastern Massachusetts	(485)	605
Bellingham	W1EQH	159
Greater New Bedford	W1LE	91
Newton	W1HI	64
Norwood	WA1OLV	69
Sharon	WA1PGY	74
Wellesley	WA1QLI	105
Winthrop	W1BB	43
Maine	(0)	218
Presque Isle	K1CLF	218
New Hampshire	(0)	194
Rockingham Co.	K1RSC	194
Rhode Island	(168)	97
Middletown, Newport, Portsmouth	W1JFF	97
Western Massachusetts	(162)	153
Berkshire Co.	W1KZS	153

NORTHWESTERN DIVISION

Alaska	(106)	287
Anchorage	KL7HMN	130
Delta Junction	KL7HNQ	—
Kodiak	KL7IAS	157
Idaho	(476)	331
Ada Co.	W7DOH	331
Montana	(123)	87
Missoula Co.	K7IMZ	87
Oregon	(333)	578
Clatsop Co.	WA7RQS	84
Jackson Co.	WA7SNY, W7HLF	103
Lake Co.	WA7OYL	73
Washington Co.	WA7EUQ	318
Washington	(1213)	1782
Adams Co.	W7CTS	27
Cowlitz, Wahkiakum Cos.	WA7RCR	88
Island Co.	W7HHU	95
King Co.	WA7EBH	525
Lewis Co.	W7PWP	99
Pierce Co.	WA7WMB	305
Whatcom Co.	K7VNI	398
Yakima Co.	K7VAS	245

PACIFIC DIVISION

East Bay	(187)	132
Dixon, Fairfield, Vacaville	WB6DSI	132
Hawaii/Pacific	(0)	153
Honolulu Co.	KH6IKB	153
Sacramento Valley	(0)	—
†Sacramento Co.	K6QIF	—
San Joaquin Valley	(378)	419
Eastern Kern Co.	WA6KZV	96
Tuolumme	WB6RZI	192
West Kern Co.	WA6RXI	131
Santa Clara Valley	(825)	1596
Carmel, Ft. Ord, Marina, Monterey	WB6YAM	99
Los Altos, Mt. View, Palo Alto	W6ASH	349
Los Gatos, Saratoga	K6LU, WB6OOP	298
Menlo Park, Redwood City	W6DEF	474
San Jose, Santa Clara, Sunnyvale	WA6JQC	114
Santa Clara	WA6JHI	142
Santa Cruz Co.	WA6UPE	120

ROANOKE DIVISION

North Carolina	(1631)	2333
Alamance Co.	WA4FFW	160
Avery, Burke, Caldwell, Watauga Cos.	K4AI	88
Buncombe Co.	WA4VNV	340
Carteret, Onslow Cos.	W4OFO	111
Cherokee Co.	K4AIH	64
Craven Co.	WB4CCU	42
Cumberland Co.	W4FHF	375
Forsyth Co.	W4IRE	96
Lenoir Co.	WB4UOU	25
Mecklenburg Co.	WB4CES	238
Onslow Co.	WA4MLV	115
Pamlico Co.	K4BGD	37
Pitt Co.	WB4HGT	125
Rowan Co.	W4NZJ	157
Wake Co.	W4FMN	360
Virginia	(1023)	1183
Allegheny Co.	WB4RZW	17
Alexandria	W4HE	70
Augusta Co.	WB4KIT	108
Hampton	WB4ODZ	216
Lynchburg Co.	W4GCE	106
Virginia Beach, Norfolk	WB4WOZ	258

Richmond	WA4HUB	170
Washington Co.	W4VTU	63
Winchester Co.	W4AUC	175
West Virginia	**(666)**	**391**
Hancock Co.	KØOEW	66
Ohio Co.	WA8ZNC	288
Pocahontas Co.	WA8LFW	37

ROCKY MOUNTAIN DIVISION

Colorado	**(1094)**	**1125**
Boulder Co.	KØCZG	62
District 2	WAØYED	46
District 13A	WØHEP	444
District 13B	WØPXF	256
District 18	WØYCD	10
Meeker	WBØNOV	8
Pueblo	KØPHF	299
Utah	**(116)**	**242**
Box Elder Co.	W7QDY	8
Weber Co.	WA7TEH	234

SOUTHEASTERN DIVISION

Alabama	**(864)**	**1818**
Colbert & Lauderdale Cos.	K4CUU	176
DeKalb Co.	WA4SNU	55
Jefferson Co.	WA4BDW	737
Marshall Co.	K4WSS	238
Morgan Co.	W4PKA/4	330
Tuscaloosa Co.	WB4SVH	282
Georgia	**(118)**	**260**
Hall Co.	K4CRO	260
Northern Florida	**(2033)**	**2222**
Bradford Co.	WB4OMG	25
Citrus Co.	K4CVO	93
Duval Co.	WA4VZF	274
Escambia Co.	WB4JCV	131
Lafayette Co.	WB4PAV	15
Orange Co.	W4UJL	1221
Pasco Co.	WA4WBM	153

WEST GULF DIVISION

Northern Texas	**(177)**	**201**
Cherokee Co.	W5SHN	98
Collin Co.	K5MWC	103
Oklahoma	**(540)**	**608**
Comanche Co.	K5RYF	169
Ottawa Co.	WA5FLV	71
Payne Co.	W5QIV	116
Pottawatomie Co.	K5LQI	66
Stephens Co.	WB5FQR	186
Southern Texas	**(1483)**	
Bexar Co.	W5QMH	
Calhoun Co.	W5ZPJ	
Jefferson Co.	W5LTW	
Orange Co.	W5ICL	
San Patricio Co.	W5FQP	
Travis Co.	W5UIJ	
Williamson Co.	WB5FMA	

CANADIAN DIVISION

Maritime	**(113)**
Cape Breton	VE1BG
Halifax	VE1BBK
Moncton	VE1AUT
Prince Edward Island	VE1AIC
Sackville	VE1YX
Ontario	**(762)**
Brantford	VE3LU
Toronto	VE3GFN
Quebec	**(0)**
†Montreal South Shore	VE2AIH
Saskatchewan	**(1176)**
Moose Jaw & Southwest Saskatchewan	VE5IL
Prince Albert	VE5HO
Regina	VE5QO
Saskatoon	VE5RJ

Even Oscar was utilized during the SET. Shown here is WA8YFW sending a message via the orbiting "repeater."

Net Activity

Record breaking years are not uncommon and this year was no exception. Except for the total number of different sections reporting net activity, new records were set in virtually every category. Although total traffic for all nets reporting edged out the '74 total, the NTS traffic slipped somewhat. Since the overall number of minutes in directed net session continued to climb, our rate dropped a bit. The largest percent increase was in the number of stations reporting into emergency-power-only sessions; the increase was in the order of 85%!

Net results are tabulated as follows:

			Total	*NTS*
	1975	*1974*	*1975*	*1974*
Nets reporting	195	183	162	156
States/Provinces reported	41	45	40	43
Number of messages handled	15,471	15,341	14,016	14,893
Minutes in useful directed session		54,100	46,094	47,621
Different stations participating	5581	4408	5006	4211
Stations reporting into emergency-power-only sessions	1,119	610	962	503
Number of different NCS	770	721	682	666
Number of different liaisons to higher level of NTS	729	696	729	696
Total number of points	81585	79176	81590	75043

The "average" section or local net handled 79 messages in 277 minutes with 29 participants (six stations on emergency-power0only sessions), four net control stations and four liaison stations to higher level NTS nets.

Net totals in the following states surpassed 2000 points: Alabama, California, Connecticut, Florida, Georgia, Indiana, Kansas, Kentucky, Louisiana, Massachusetts, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, and Washington.

Total points for nets are based on the following: 1 point for each message handled; 1 point for each minute the net was in useful directed session; 2 points for each different station participating by handling traffic; 3 points for each different station reporting into emergency-powered-only sessions; 5 points for each different net control station; and 5 points for each different station performing liaison to a higher level NTS net.

A – Messages handled
B – Minutes in directed session
C – Stations participating
D – Stations in emergency-power-only sessions
E – Net control stations
F – Liaison stations

Net Name	A	B	C	D	E	F
AREA/REGION NETS						
Eastern Area	300	185	57	13	3	9	698
Central Area	299	130	70	–	2	4	599
Pacific Area	245	173	39	–	2	9	551
First Region	172	209	28	5	6	12	542
Second Region	61	130	14	–	3	6	264
Third Region	45	110	21	1	2	6	240
Third Region Daytime	181	322	34	2	4	7	632
Fourth Region	123	148	22	–	2	5	350
Fifth Region	287	279	41	–	5	14	713
Fifth Region Daytime	188	367	20	–	5	7	655
Sixth Region Daytime	62	339	26	–	4	5	498
Seventh Region	77	193	26	–	4	5	367
Eighth Region	74	85	14	–	3	4	222
Eighth Region Daytime	97	126	23	5	5	8	349
Ninth Region	84	139	17	1	3	4	295
Ninth Region Daytime	30	91	14	–	4	2	179
Tenth Region Daytime	12	48	5	–	3	2	95
Eastern Canada	169	321	25	–	4	9	605
SECTION/LOCAL NETS							
ALABAMA							
Ala. Emerg. Net B	37	98	10	–	3	6	200
Ala. Emerg. Net D	56	398	11	4	4	7	543
Ala. Emerg. Net J	25	120	15	12	2	2	231
Ala. Emerg. Net M	423	1075	79	20	6	14	1816
DeKalb Co.	20	60	7	2	2	1	115
ALASKA							
Ak. Sniper's	113	240	8	8	1	2	408
ARKANSAS							
Ark. Teenage	30	4	37	–	6	1	143
CALIFORNIA							
Indian Wells Valley Emerg.	6	240	4	4	2	2	256
Northern California	277	455	25	–	6	2	772
Novice Emerg.	25	180	13	–	4	3	266
San Gabriel Valley*	35	60	17	34	2	–	241
San Joaquin Valley Sect. AREC	15	60	10	10	1	2	140
Santa Barbara Sect. AREC	85	607	34	3	5	2	804
Santa Barbara SET*	17	840	20	6	3	–	930
Southern California	132	446	22	6	5	9	710
Ventura Coastal AREC	54	80	24	32	2	1	293
West Kern VHF AREC	8	51	2	8	2	2	107
COLORADO							
Boulder SET	12	1	5	–	1	5	53
WR0ADR Repeater	147	285	29	20	3	7	570
CONNECTICUT							
Bristol Emerg.	50	375	28	4	4	5	538
Conn. CW	107	195	27	–	4	5	401
Conn. Phone	249	367	55	10	7	5	816
Conn. Slow	41	131	15	–	2	3	227
Eastern Conn. Ham Ops.	5	30	7	3	2	2	78
Meriden Emerg.	29	108	18	–	2	3	198
Nutmeg VHF	100	312	64	19	2	10	657
DELAWARE							
†Del. Emerg. Phone	–	–	–	–	–	–	–
FLORIDA							
All Fla. CW Tfc.	202	225	39	6	3	12	598
Fla. Phone TFC.*	32	144	44	–	2	–	274
Fla. Midday Tfc.	82	393	102	–	4	3	714
Gator	120	699	22	7	6	16	994
Northern Fla. Phone	202	248	30	16	4	5	623
Polk Co. Six Meter	20	35	5	2	1	2	86
GEORGIA							
Georgia Single Sideband	454	988	481	16	16	9	2574
Northeast Ga. Emerg.*	330	720	24	2	9	–	1149
ILLINOIS							
Cass, Morgan, Scott Cos.*	6	30	3	12	1	–	83
Illinois Sect.	33	125	2	1	2	1	180
Wabash Co.*	5	60	6	4	1	–	94
INDIANA							
Gibson Co.	15	57	5	3	3	2	116
Indiana Tfc.	418	1190	82	–	12	2	1842
Jay Co. AREC*	6	65	4	–	2	–	89
Monroe Co. AREC II	94	300	15	15	1	–	474
Ohio Co. AREC	4	1	3	1	1	2	29
RACES AREC	13	–	4	33	2	2	74
Tippecanoe Co. ARPSC	11	195	26	6	4	4	316
Vigo Co. AREC*	105	300	32	11	3	–	517
Wayne Co. AREC*	23	370	10	5	2	–	438
KANSAS							
Zone 2*	10	180	10	3	3	–	234
Zone 14	15	90	15	15	3	1	200
Zone 15A*	14	75	25	1	4	–	162
Kansas CW	44	145	22	–	5	7	293
Kansas Phone	293	1095	136	–	4	9	1725
Kansas Slow Speed	39	125	7	1	4	6	231
KENTUCKY							
Kentucky CW Tfc.	163	1140	26	–	8	6	1425
Ky. Tfc.*	58	120	18	–	1	–	219
Morning Ky. Phone	283	600	98	25	5	5	1204
Sixth Dist. AREC 2 Mtr.	78	90	9	2	2	2	212
LOUISIANA							
La. Amateur	89	172	57	–	3	9	435
La. RTTY	9	55	3	–	2	3	95
La. Slow Speed	37	259	15	–	7	9	406
La. Tfc.†	236	310	36	–	5	10	693
New Orleans AREC	87	110	33	18	6	8	387
MAINE							
Sea Gull	113	418	37	–	6	3	650
MARYLAND							
Carroll Co. AREC	15	90	6	–	1	1	127
Md.-Del.-DC Tfc.	44	283	17	3	5	5	420
Md. Emerg. Phone and Tfc.	191	708	48	7	11	8	1111
Md. 2 Meter Emerg.	4	45	6	13	1	2	115
MASSACHUSETTS							
Bellingham AREC	26	210	9	1	4	2	282
Berkshire Co. AREC	17	180	5	19	2	3	289
Eastern Mass. RI. Phone	78	159	19	2	5	8	346
Greater New Bedford Emerg.*	11	330	10	4	1	–	378
Norwood ARC	4	60	4	4	2	1	99
Western Mass. CW	28	191	10	–	2	2	259
Western Mass. Emerg.*	9	70	5	8	1	–	118
Western Mass. Phone	105	365	34	15	5	5	633
MICHIGAN							
Mich. Sect.	52	191	37	–	5	4	362
Wayne Co. 2 Mtr. AREC	50	490	30	20	5	4	705
MINNESOTA							
Piconet All day Watch	76	970	43	–	13	4	1217
Rochester 2 Meter*	36	480	20	1	3	–	574
MISSISSIPPI							
Miss. Sideband	242	1215	39	7	10	6	1636
Miss. Slow	38	280	7	–	3	2	357
MISSOURI							
Adair Co. Emerg.	6	50	3	–	2	2	82
Indian Foothills AREC*	4	30	6	2	2	–	62
Mo. CW	15	145	10	–	4	5	225
Pulaski, Laclede Cos. AREC	7	90	10	10	2	2	167
Mo. Single Sideband	71	227	40	–	4	5	423
†Mo. Slow	–	–	–	–	–	–	–
Springfield Area	13	120	11	19	3	4	247
Vernon Co. AREC	6	205	6	–	2	2	243
MONTANA							
Missoula Area Emerg.	16	8	4	–	1	2	47
NEBRASKA							
Tri-City AREC	8	125	5	5	3	3	188
NEW HAMPSHIRE							
N.H. Emerg. Phone	60	930	33	10	8	1	1131
NEW JERSEY							
Coastal Emerg.	8	25	8	3	2	2	78
N.J. CW	63	117	40	–	3	2	2
N.J. Phone	301	471	61	8	7	7	988
Ridgewood AREC	187	113	10	8	2	3	369
NEW MEXICO							
Southwest CW Tfc.	15	65	17	–	2	3	139
NEW YORK							
Cayuga Co. 2 Meter AREC	78	480	14	8	2	2	630
Columbia Co. AREC	57	335	10	10	2	4	472
Huntington AREC*	155	270	17	–	8	–	499
NYC-LI Phone	109	188	37	–	5	5	412
NY Region RTTY	21	234	9	–	2	2	293
NY State CW	281	650	86	10	9	18	1268
Tioga Co. Public Service*	10	120	9	–	1	–	153
Tri-County FM	34	240	9	6	3	1	330
Westchester Co. AREC	69	314	34	24	3	5	563
Western 2 Meter	15	210	9	6	2	1	276
NORTH CAROLINA							
Alamance Co. AREC	57	186	22	18	3	3	371
Cape Fear ARS*	119	390	35	25	3	–	669
Forsyth Co. RACES/AREC	61	600	4	–	2	2	689
Mecklenburg Co. AREC Emerg.	56	600	7	–	1	1	680
NC Central Piedmont	32	185	15	16	4	4	356
Pitt Co.	8	340	4	12	1	3	412
Farheel Emerg.	216	949	109	–	5	4	1428
OHIO							
Adams & Brown Cos. AREC	30	95	3	3	2	1	155
Belmont & Monroe Cos. Emerg.	27	480	22	6	7	2	614
Buckeye	93	369	27	7	7	8	612
Clark Co. Emerg.	23	120	15	4	2	2	205
Gallia, Jackson, Meigs Cos. Emerg.	11	22	9	1	2	1	69
MASER	83	254	24	16	3	3	443
Oh. Single Sideband	484	1062	325	33	15	18	2360
Oh. Six Meter	49	160	15	–	7	1	279
Oh. Slow	15	65	10	4	2	2	132
Ottawa Co. Emerg.	14	140	6	6	2	1	199
WARTS*	26	126	9	9	4	–	217
OKLAHOMA							
Ottawa Co. AREC*	3	30	4	4	1	–	58
Stephens Co. AREC Emerg.	26	84	12	9	4	1	186
OREGON							
Ore. Sect. AREC	50	90	19	2	3	2	209
Portland Area AREC*	54	253	31	–	4	–	389
PENNSYLVANIA							
Eastern Pa. CW	40	125	14	2	4	9	264
Central Cos. AREC/RACES	45	200	16	–	6	4	327
Cumberland Co. AREC*	2	30	2	–	1	–	41
Eastern Pa. Emerg. Phone & Tfc.	139	335	34	5	7	9	637

WMAL AREC, Foothills Radio Emerg.	179	2400	120	121	22	4	3312
Mercer Co. Emerg.	12	73	5	12	4	1	156
Montgomery Co. AREC	9	2	3	1	–	1	25
Pa. Training Tfc.	30	58	25	–	2	2	158
Western Pa. CW Tfc.	27	82	15	–	3	4	174
RHODE ISLAND							
Aquidneck Island Communications*	10	125	10	2	2	–	171
TENNESSEE							
Anderson Co. CD/AREC	129	660	45	10	6	5	664
Bedford Co. Emerg.	10	30	2	1	2	2	67
Bristol 2 Meter	14	45	6	5	1	1	96
Cleveland ARC	28	720	16	3	4	2	819
Davidson Co./Tenn. Emerg.	288	1292	22	12	20	11	1815
Memphis/Shelby Co. AREC	26	240	12		3	4	325
Obion Co. Emerg.	20	40	8	5	3	2	116
Tenn. SET	312	780	225	3	9	3	1611
West Tenn. VHF Emerg.*	40	210	21	14	4	–	384
TEXAS							
Southern Tex. Emerg.	9	105	4		3	1	142
Tex. Tfc.	159	600	143		7	5	1205
UTAH							
Beehive Utah Net	10	52	18	3	3	1	137
Weber Co. ARES	63	256	26	17	3	6	467
VIRGINIA							
Alexandria RACES	9	1	4		3	1	38
Area 2 AREC	54	178	16	10	7	8	549
Va. Beach/Norfolk AREC	8	300	8		6	5	379
Va. Novice Tfc.	57	132	8	–	3	7	225
Va. Sideband	202	852	93	16	9	8	1193
WASHINGTON							
Island Co. ARES*	6	15	2		2		35
Kelso-Longview ARC	21	180	7	2	1	1	251
Pierce Co. AREC*	82	90	23	9	6		471
Wash. Sect. AREC	201	938	47	14	11	4	1460
Wash Sect.	51	690	20	–	6	5	536
WEST VIRGINIA							
Three State AREC 2 meter*	40	44	11	3	1	–	120
W. Va. CW Tfc.	18	45	9		2	4	103
Wheeling Emerg.	84	285	7	10	6	6	443
WISCONSIN							
Badger Emerg.	63	151	49		2	3	337
Wisc. Interstate/Late	45	97	26	–	2	3	210
Wisc. Interstate/Late	12	38	12	–	4	5	134
Wisc. Sideband	70	151	26	–	2	2	293
MANITOBA							
Man. Tfc.	52	87	7		3	2	178
MARITIME							
Atlantic Provinces	58	180	11		3	5	280
ONTARIO							
Brantford ARC	22	35	14	5	0	3	145
Ontario Phone	46	248	22	–	4	3	383
Ont./Que. CW	123	216	23	0	8	2	478
SASKATCHEWAN							
Sask. Amateur Tfc.	41	145	5	2	4	4	348
INDEPENDENTS							
Hit & Bounce Slow	90	353	31		7		540
Medicare	8	25	4	1	2	–	54
7290 Tfc.	109	524	104	2	7	–	857

Sacramento Valley, Santa Clara Valley, and the East Bay sections combined to make the 1975 SET a regional affair. At the sacramento Valley command post are (standing, l to r): W6TEE, WB6KZN, K6QIF (EC, Sacramento Co.), W6FRE, WA6CXB, W6SMU (SEC SV), WN6HJA, WA6HGH, K6GUC. Kneeling are: K6PWA, W6KKE, W6SI, WA6WOX, and K6FO.

SOAPBOX SET 1975

The SET showed the importance of Daytime NTS. The unfortunate thing being, not enough evening NTS people were available in the daytime, and conditions in the evening were unreliable. (WA1QJU, PAM EMass.) We actually had a snowstorm! It was a good SET though with our "simulated snowstorm" providing much in the way of activity. – (W1JB, EC Merrimack Co., NH) I continue to suggest that at the NTS level there be a specific emergency declared by ARRL for some prearranged spot in the country and then have NTS pass traffic into and out of that area. That is more realistic than the mish-mash of traffic now passed. I also believe those social messages to the SEC/SCM be sent during the week immediately following the SET, rather than during such operations. – (W8IBX, Hit & Bounce Slow Net Mgr.) Poor conditions on 80 meters caused lack of QNI and subsequent lack of QTC. – (VE4PG, Man, Tfc. Net Mgr.) By 0030Z 80 meters folded. You had to know that things were not right for short skip when 9Y4BC calls in with a S99 signal and asks for QRK and QRG! (W8HZA, RM W.Va.) Had problems on D9RN, all NCS stations were virtually QNP. – (W9MFG, RM Wisc.) Band conditions were rotten and we lacked thru traffic. Just you wait! – (K9LGU, RM Wisc.) Most emphasis in this section was on local nets rather than national or section-wide. – (W7OCX, Beehive Utah Net Mgr.) Things went smoothly in Virginia; hope for the same next year. – (WA4DHY, RM Va.) Much of our Red Cross and other traffic could not be moved due to lack of activity on the region level. Doesn't the SET require full time operation of area/region nets? (WA9NEW/4, PAM Va.) Judging from the experience gained from this activity, I'd have to say it pays for me to be active at least once a week. – (W1JFF, EC Newport, R.I.) Having NTS(D) was a great help. Our net doesn't usually meet during the SET, but this year we didn't have to worry about interfering with EPA. Good idea. – (WA3QLG, RM E.Pa.) Two-meter fm proved to be advantageous when outlets for traffic could be found. – (W3ID, EC Montgomery Co. Pa.) More liaisons needed between local and section nets. – (WA3PZO, PAM E.Pa.) Run daytime sessions both days for NTS(E). – (K3DZB, RM E.Pa.) We have ways to persuade our sheriff and police about the things we can do that the CBers can't. – (WB5EQR, EC Stephens Co., Okla.) If you think 58 points looks bad, it was all zero last year! – (WA5FLV, EC Ottawa Co., Okla.) During SET, as during emergencies, the increasing number of stations that operate *only* ssb has made it pointless to activate a cw net at the section level. If this trend continues, the Ohio Slow Net will merely take a vacation during next year's affair. Picking up traffic that has no outlet certainly doesn't give anyone any practice. – (WB8KKI, RM Ohio) This was our first year using a repeater for a large volume of traffic and it worked out great. This is the answer to solid coverage of an entire county. – (W4EHF, EC Cumberland Co., N.C.) It would help if the ARRL would supply EC's a list of members

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How I Got My Novice and Found True Love

BY WENDY CLAY,* WN7WEO

THAT WAS the funny thing about Bill. The night we met, the only mention of radio was whether I wanted to listen to AM Top 40 or FM Instrumental. When we finally settled on a Hi-Fi Easy Listening, the subject was dropped.

The next date wasn't much different. We played all the usual games of getting to know one another. I spent half the night trying to impress him with my theatrical sense of humor, and he spent half the night trying to impress me by laughing at all of my stupid jokes. But, finally, I asked the lethal question. "Bill, do you have any hobbies?" He gave me the old well-this-is-gonna'-blow-it look and said, "I'm a ham."

A ham? I just couldn't picture this fella' hamming anything up! It was surely beneath him to wave at TV cameras or to be the perpetual clown in the seventh grade who always crossed his eyes in the class picture. No, Bill was definitely not the ham type! Sensing my confusion, Bill explained that a ham is a slang term for someone who is interested in amateur radio, and he added, "No, I don't know Barry Goldwater."

End of second date. However, by our third meeting, my curiosity had been whetted. I had heard about hams before, but I had never met a real live one! I suppose Bill realized my interest, because he asked me if I would like to come over to his place and "see his rig." I wondered if that was anything like etchings. It wasn't.

First, I was ushered into his "ham shack" which, contrary to popular opinion, is not a shack at all. It was just an extra bedroom filled with complicated machines, wires plugged into overloaded outlets, and a couple of ashtrays that hadn't been emptied in about a year. Yet, despite the unbelievable clutter, I was very impressed by the idea that through all this electronic maze, Bill could actually talk to someone in California, Hawaii, or even Japan! How?? That question was the key to the opening of a whole new world for me.

Learning the Code . . . and Hating Samuel Morse

"I'm a reasonably intelligent human being. My memory is above average, I've got a good ear and furthermore, I was completely potty-trained before I was two and a half! I should be able to do anything that I set my mind on. So why can't I hear the difference between a dit and a dah?" But time passed and so did my frustration. Soon I was perspiring at five words a minute, and Bill announced that I was ready for the Novice code test. I didn't have the heart to tell him that I would flunk, so I let him go on with his wild ideas. There was a catch, though. Bill said that he would rather not give it to me. Instead, he would have his ham friend Bob do it so there would be no talk of cheating. I reacted the way any normal, rational, confident Novice-to-be would. I panicked. "But what if he sends differently than you do? What if he laughs at me?? And God forbid! What if he sends me a lot of Xs?" "Don't worry," my sadistic friend assured me. "We'll go over to Bob's house one night this week just so you can get used to him." Grudgingly, I consented.

So, Sunday night we drove over to Bob's house. He was very nice, and I had no trouble copying what he sent. I even had the nerve to send him some characters on the hand key. "Easy as pie!" I thought, so I bravely announced, "Ya' know, I think I can pass the code test!" to which Bob answered, "YOU JUST DID!"

Moonlight, Roses, and Electronic Theory

At my house, Bill was now known as the "Current Boyfriend." Now, Current Boyfriends are always under careful scrutiny by my over-

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* 1147 E. Hatcher, Phoenix, AZ 85020.

Results: 1975 VHF Sweepstakes

REPORTED BY JIM CAIN,* WA1STN

THIS WAS PROBABLY a typical winter weekend for vhf propagation; one when little or nothing would have happened without a contest. With a contest, everything happened – but not enough to flush out the casual participants whose activity is so important if any impressive statistics are to come out of the weekend. There was pretty fair winter tropo at intervals, with 144 and higher getting the best of this, of course. The 6-meter round-the-clockers caught enough sporadic *E* and morning scatter to make for some impressive section totals. But all things considered, one would have to say that it was a relatively quiet contest weekend.

Having set aside the weekend for contesting, not a few ops were taking it easy and engaging in the almost lost art of rag chewing on the vhf bands. Many find this one of the appeals of a contest weekend. One runs across people he hasn't talked to in a year, and a few, at least, are familiar names and calls from the earliest days of vhf communications. In this respect, the year-first-licensed check turns up some interesting reminders of the durability of amateurs in general, and those on the vhf bands in particular. Several checks in the "20s" were heard on the bands.

Although some will say this was a dull contest, and others will read into it signs of deteriorating vhf interest, if there had been just a little more of the various forms of DX propagation instead of just brief flashes of them, the log pile would probably have been much higher though it was pretty high to begin with! – *W1HDQ*

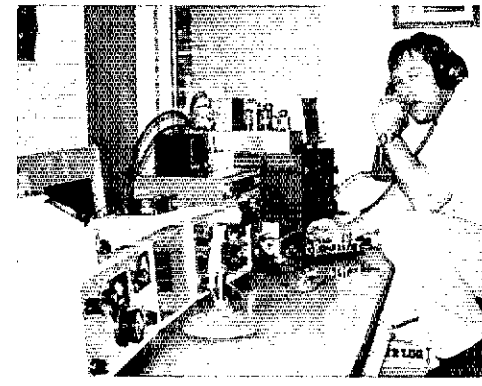
Perhaps the above doesn't sum up the contest in *your* vicinity, or in *your* opinion, but that's the danger of drawing conclusions in general about an activity that takes different forms in different locales. Perhaps the biggest reason for only two division records being set in 1975 was the lack of reliable 6-meter, long-distance propagation. In the write-up of the 1974 VHF Sweepstakes, the all time division leader box showed the year each record was set, and they were, for the most part, sunspot years. Even our vhf bands' ups and downs are dictated by Old Sol.

* Asst. Communications Manager, ARRL.

The 573 entries this year were only slightly fewer than last year's 580. The average top-ten score this year for single ops was about the same as in 1974 and the top multi-op scores were down a little. Two interesting highlights of the 1975 VHF Sweepstakes were a "mini-VHF Sweepstakes," run by the York Radio Club (Illinois) in conjunction with the ARRL Sweepstakes (won by WB9NXB) and an expedition in the dead of winter to Pack Monadnock, New Hampshire, by K1HIC and a non-ham friend. Certificates for this year's Sweepstakes are scheduled for mailing mid-July.

Soapbox

Couldn't find instructions for performing a rain dance for an "E" cloud. – (K9UBF). Would like to see satellite QSOs counted in the SS, on a permanent basis; took time out during the 1975 event to work KL7MF on Oscar 6 for state number 49. – (W3BWU). Murphy bit me on 220 MHz when my receiver converter died the night before the contest. – (WA1QQV). Invested about $500 in my new 2-meter fm station and made only 24 contacts with it during the contest! – (WB4JGG). We ran multi-op due to the channel 2 TVI problems in this area. – (K9TZZ/9). My first contest; 40-meter inverted "vee" worked fairly well on 6 meters. Thanks to the ssb boys who switched to am for a while. – (WA2WLH). Two-meter fm is alive in Detroit, had 41 contacts. – (WA8EUU). Running only ten watts keeps me out of channel 2. – (WA6JYU). Suggest instead of sending the "check" that stations be required to exchange jokes. – (WA3SXX). Suggest an additional point be made by each station if *one-half* of the contact is on cw; this would at least encourage some to copy the code, even if they are rusty and hesitate to send it. – (WA3TGR). Since activity on 220 and 432 are down in January, as compared to June and September, I suggest additional points or credit of some kind be given for activity on those bands in the January SS. –(WA2FZW). Suggest some rule changes to promote this contest among non-contesters; over 90% of my contacts didn't know a contest was in progress. – (K2YRZ/4). Since 1971,



WA6JUD, shown here, is the proud holder of the new Pacific Division record. Carl, a Northern Cal. Contest Club member, used 8 elements on 6, 11 elements each on 144 and 220, and a gain vertical on 450 and four-bay helicoil on 1296, in addition to the inside apparatus visible here.

I have worked 50 stations in the St. Louis area, but during the contest worked only one. Local activity in general not nearly as good as during the June QSO Party. – (WB4VLH). I suggest credit for contacts on 2 fm continue, but that greater point credit be given for more difficult "DX" work on 2, even when the contact is within the same section. – (K7ZCB).

TOP TEN

Single		*Multi*	
K3IPM	40,622	WB2WIK	41,220
K8LEE	33,626	WA8NJR	40,850
W3HQT	30,030	WA8TTS/8	38,052
W3HMU	26,460	W3KKN	31,062
W3ZD	25,420	WA2SNA	27,270
WA3AXV	24,720	WA8PLZ	26,340
WB2ZVS	24,430	WA2KHL/2	21,866
K3MWV	22,591	W4BFB	18,444
WA1NGR	22,144	K2CBA	16,608
K3ZSG	21,450	K1MNS	13,064

Winter Mountain-Topping
By Myrle H. Morgan Jr., K1HJC

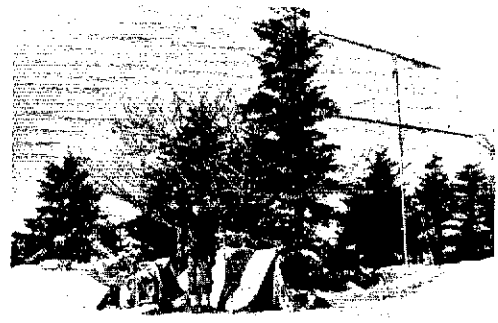
The idea to operate from Pack Monadnock, NH, for the January VHF Sweepstakes originated in early fall of 1974. Frank Holt and I, both avid backpackers and winter hiking enthusiasts, thought that the "expedition" would be enjoyable, interesting and perhaps even unique, since not too many portable stations are heard during January VHF Sweepstakes, especially from the tops of snow-covered mountains. Initial plans called for the design and construction of compact, lightweight transceivers and antennas for six and two meters. Due to unforseen circumstances (procrastination), we found ourselves one week away from contest time with little more preparation than a few pen scratches on paper.

The next few days were spent gathering available gear. My old Heathkit Twoer and vibrator supply were retrieved from a dark corner of the ham shack. W1CMV generously offered us the use of his 9-1/2-element yagi with one element broken during a previous outing on Pack Monadnock. My car battery, mounted in a styrofoam cooler, completed the two-meter station. K1HDO offered us the use of his HA-460 and collapsible four-element yagi for six meters. Our original intention was to power all equipment with a 12-volt car battery, to eliminate that infernal generator noise and preserve the peace and tranquility of the mountain. But because of the excessive power consumption required by the HA-460, I decided to bring my Tiny Tiger generator out of retirement for use in recharging the battery.

The last two days were spent checking equipment operation at temperatures expected to be encountered on the Pack. The transceivers functioned flawlessly and the generator started on the first pull. (Murphy was waiting for a more opportune time to inflict his infamous law upon us.) Everything was loaded into or onto the cars and we were ready for our assault on the Pack.

Last minute errands delayed our departure until early Saturday afternoon. We arrived at the parking lot at 1:00 PM and began transferring gear from the cars to the sleds, much to the amusement of curious on-lookers out for an afternoon hike. The last thing to be loaded was the 12-volt battery from my car. With everything lashed securely to the sleds, Frank and I shouldered our packs, attached the sled tow lines to our improvised waist harnesses and began the one and one-half mile hike to the summit. The snow on the road was well packed by the many hikers who enjoyed hiking in the winter-time. After two or three premature stops (the sleds had a tendency to tip over at the slightest provocation, such as moving forward), we lashed the sleds together, side by side, to improve stability. With this problem solved, we proceeded, arriving at the summit at about 3:00 PM, somewhat winded and with very sore legs.

After recording our arrival on film (thanks to camera, tripod and ten-second timer), we unpacked and set up the tent and antennas. An eight-inch piece of plywood was our kitchen table, providing also a flat surface for our stove and transceivers, and accessibility from inside the tent. The generator and auxiliary gasoline container (2-1/2 gal.) were placed fifty feet away, and power lines run to the operating position. I had failed to locate the 12-volt power plug for the HA-460 so the six-meter rig would have to operate from 117 Vc supplied by the generator. So much for peace and tranquility. The sun was setting in the west as we declared ourselves ready for a record-breaking contest week-



end. It was at this very moment, I'm sure, that Murphy decided to make his presence known.

In order to start the generator, the manual priming button on the fuel pump is depressed several times until fuel is observed to be flowing to the carburetor. As you have probably guessed by now, depressing the manual priming button had no effect whatsoever on the gas in the tank. After several futile attempts at getting gas to flow, Frank applied mouth-to-gas-tank resuscitation while I pumped the primer. Eureka! We had gas flow. With choke on full, I firmly pulled the starter cord and the engine came to life – for about ten seconds. Further attempts at starting resulted only in coarse grinding sounds emitted from the recoil starter housing. It was time for major surgery. By the light of the Coleman lantern, we disassembled the starter and made what we hoped would be adequate repairs. Next, the fuel pump was disassembled to check for air leaks. After about one hour, the engine was back together. With two firm pulls, the engine came to life and settled into its noisy but steady beat. We were finally on the air. Time – 7:00 PM.

Our first contact was with W1FMF in Bedford, NH, on six meters. We had ten more QSOs on six before switching to two meters; generator hash and ignition noise made six-meter reception somewhat less than ideal. I shut down the generator at about 8:15 PM. (Ah! Peace and tranquility again.)

Our first contact on two meters was with W1BXM, who had been looking for us on the band since early afternoon. He ran phone patches for us so we could let friends know that we had arrived and were still in one piece. After signing with Guy, five more contacts were made before breaking for supper at 9:45 PM (our stomachs were protesting – we hadn't eaten a full meal since breakfast). We were severely limited on two meters because of the superregen receiver. Our apologies to the many stations that were calling. Two meters was really hopping.

Up to this time, we were operating outside the tent, squatting by the rig in a somewhat less than comfortable position. The temperature was dropping toward twenty degrees. After preparing the kitchen area for cooking, we retired to the tent and warm sleeping bags. After an enjoyable meal, the Twoer was brought inside, and three more QSOs were made on two meters. We shut down for the night at 11:30 PM. It had been a long day.

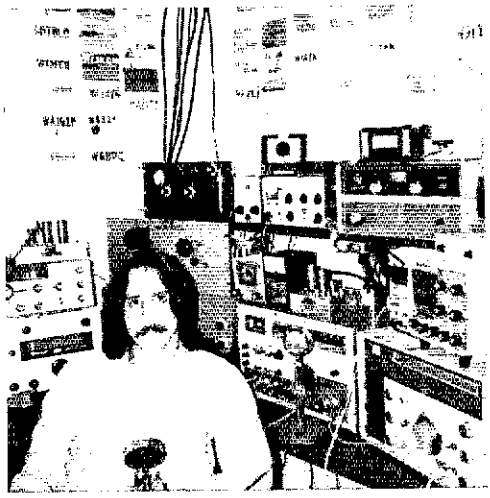
We awoke Sunday morning to a bright sunrise and an outside temperature of ten degrees with a moderate wind. The Twoer, which had spent the night outside the tent was completely covered with frost, but came to life at once after a light tap on the vibrator. Activity was sparse on two meters this early in the morning, but we made one contact before crawling out of the tent into the crisp morning air. I decided to start the generator and check six-meter activity. At the same time, the battery would be charging. Unfortunately, Murphy beat me to the generator. The manual priming button was gone; I found it about three feet away. It had broken loose from the pressure diaphragm and the coil spring beneath the button had launched it to its resting place in the snow. Oh well! There was already fuel in the line from the previous night's operation, so maybe it would start anyhow. Guess again! That ominous but familiar coarse grinding sound from the starter housing signaled the end to six-meter operation. The battery still had plenty of energy remaining, so two-meter operation could continue.

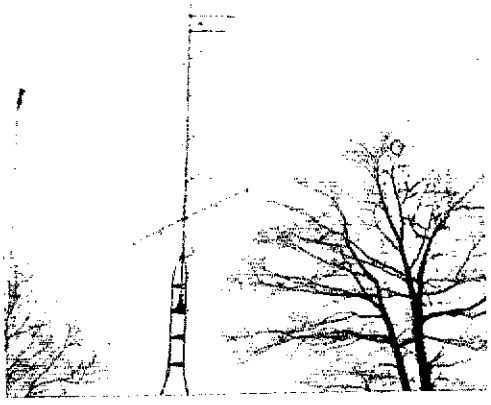
By 10:30 AM, two meters was hopping again. Unfortunately, the lack of receiver selectivity made it nearly impossible to work any but the strongest

stations and their calls were already in our log. By 11:00 AM, we had accumulated a grand total of twenty-one contacts in three sections. We had to work at least one more section. Hearing that WB2GLQ/1 would be on around noon from Hogback Mountain in Vermont, we left the Twoer in service while disassembling and packing the rest of the gear for the trek down the mountain. At 11:58 AM, we worked WB2GLQ/1 and we had our fourth section. After one more QSO, we shut down for good. By 2:00 PM, the sleds were packed and lashed together. We were ready for the hike down to the parking lot at the base of the mountain. We were assisted during the descent by friends who had hiked up to visit. They arrived just as we were departing. Their assistance was greatly appreciated, as they walked along side the sleds supplying greatly needed stability. We reached the bottom with no further interference from Murphy's law.

Despite our low score, the weekend was a resounding success. A few eyebrows were raised whenever we gave our QTH. "You're where? On the Pack? In January?" We gained valuable experience that can be applied to future winter vhf operations. Frank and I are looking forward to the 29th VHF Sweepstakes with an eye towards compact multi-mode transceivers, easily transportable antennas and, most of all, a more reliable power source.

Again, our thanks to all who contributed equipment, time, advice and moral support.





The antennas and station owner himself, Steve, WB2WIK, at this year's top multi-op.

DIVISION LEADERS

Single Op.	*Division*	*Multiop*
K3IPM	Atlantic	W3KKN
K9UVJ	Central	K9HMB
WØPAN	Dakota	WØOHU
WB4JGG	Delta	WB4KMK
K8LEE	Great Lakes	WA8NJR
WB2ZVS	Hudson	WB2WIK
KØTLM	Midwest	WØJYJ
WA1NGR	New England	K1MNS
K7ZCB	Northwestern	WA7PVE
WA6JUD/6*	Pacific	WA6WSW
W4UCH	Roanoke	W4BFB*
WA8GUB/Ø	Rocky Mt.	. . . .
K2YRZ/4	Southeastern	. . . .
K6YNB/6	Southwestern	. . . .
W5UOJ	West Gulf	. . . .
VE2ADE	Canadian	. . . .

*New record.

AFFILIATED CLUB SCORES

Club-Score-Entries-Winner			
Mt. Airy VHF RC (Pa.)	564,565	166	K3IPM
Rochester VHF Group (N.Y.)	344,386	127	K2YCO
South Jersey Radio Assoc.	183,882	28	W2BV
Mobile Sixers RC (Pa.)	115,573	41	K3ATL
Suburban ARC (Pa.)	47,200	10	WA3NVO
Potomac Area VHF Society (Va.)	37,002	8	K3DUA
Hampden County RC (Mass.)	35,394	11	W1MTV
York Radio Club (Ill.)	24,704	11	WB9NXB
Dutchess County VHF Society (N.Y.)	17,153	4	W2AWX
Six Meter Club of Chicago	15,168	13	W9RVG
			WA9FIH
Gloucester County ARC (N.J.)	13,344	4	WB2BZY
Northern Calif. Contest Club	13,229	3	WA6JUD/6
Scioto Valley ARC (Ohio)	12,738	6	K8SUB
Southern Calif. VHF RC	12,242	5	K6YNB/6
West Jersey Radio Amateurs	11,708	3	. . . .
Greater Pittsburgh VHF Soc. (Pa.)	8625	5	W3BWU
Rancocas Valley ARA (N.J.)	6934	3	WB2PZF
Dayton ARA (Ohio)	6770	4	WA8BOB
Warren ARA (Ohio)	5254	4	WA8KUR
Dept. of State ARC (D.C.)	3144	4	W4HU
Lake Success RC (N.Y.)	2312	4	K2IJL

VE

Quebec

VE2ADE 768- 24- 6-B
VE2DQE 144- 6- 2-B
VE2AKF 66- 3- 1-B

Ontario

VE3AQJ 22- 1- 1-A

1

Connecticut

WA1NGR 22,144-346-22-ABCD
WA1IQJ/1 (K1IFP WA1s HYN MDQ QBD) 18,000-302-20-ABC
WA1IOX (K1ZND, opr.)* 5060-115-12-AB 4326-103-11-ABC
W1HDQ* 3036- 67-13-AB
WA1FFO 1518- 33-13-B
K1TZD 1024- 32- 6-ABC
WA1LOU 930- 31- 5-AB
W1WEE 700- 25- 4-B
WA1PVV 576- 18- 6-AB
WA1GTP (+K1VYU) 8500-171-15-AB

Eastern Massachusetts

WA1MSK 7350-175-11-AB
WA1KIR 6960-146-14-AB
WA1MJD 6200-125-15-B
WA5IOD/1 3492- 97- 8-ABCD
WA1MKE 3287- 87- 9-A
W1MX (W2QHQ, opr.) 2840- 71-10-AB
K1CHY 2698- 71- 9-ABCD
WA1HON 2520- 70- 8-ABC
WA1QQV 2480- 78- 6-AB
K9AQP/1 1548- 43- 8-ABCD
WA1LXP 1232- 44- 4-AB
W1IOO 962- 37- 3-AB
WA1FCD 840- 28- 5-A
WA1RGA 696- 29- 2-AB
K1VUT 650- 25- 3-AB
W1AAR 313- 12- 3-B
W1LMU 312- 12- 2-B
W1JAA 225- 8- 5-D
W1GXT 168- 7- 2-CD

New Hampshire

WA1QUB 7992-150-17-ABD
W1EUJ 7410-144-16-ABCD
W1FMF 4313-114- 9-ABCD
W1BDC 2622- 69- 9-A
WA1FSZ 2356- 63- 9-ABD
W1JSM 2136- 45-14-B
K1MNS (+K1s HZN PLX W8GIM) 13,064-284-13-ABD
W1JJO (K1s CYP VOF WPM W1KGZ WA1TOB) 8702-229- 9-ABC
K1HJC/1 (+F. Holt) 686- 25- 4-AB

Rhode Island

W1CPC 1600- 40-10-B

Vermont

WB2GLQ/1 3230- 85- 9-AB
K1GYT 448- 14- 6-AB

Western Massachusetts

WA1HHN 10,868-209-16-AB
W1MTV 10,608-204-16-AB
WA1OLK 1886- 41-13-A
K1NJC 896- 28- 6-AB
WA1SOF/1 546- 21- 3-AB
W1ALL 456- 19- 2-AB
K1EPI 288- 12- 2-B
WA1CYK 288- 12- 2-B
W1UWX 144- 6- 2-B
W1UWX/1 130- 5- 3-B
WA1SOF 120- 5- 2-B
W1KK/1 (+W1UWX WA1s ECR LPJ RWU) 11,050-213-16-AB

2

Eastern New York

WB2OTK 12,512-186-24-AB
W2AWX 7124-137-16-AB
W2CXC/2 5405-118-13-AB
K2BGU 5150-103-15-AB
WB2YQU 3652- 83-22-AB
W2KBH 972- 27- 8-B
WA2TQO 448- 14- 6-A
W2IP 300- 10- 5-B
K2CBA (+WA2VQB WB2s BYP DNE) 16,608-261-22-
WA2BLM (+WA1PDK K2s IOM OYG WA2s LOA ZPD WB2s FZF OZA SGN) 13,000-250-16-ABC
W2AIR (WA2s IQP THT WA7VYQ) 1395- 47- 5-B

N.Y.C.-L.I.

WA2VFA 7888-136-19-B
K2OVS 5346- 99-17-ABD
WA2EUS 896- 28- 6-BD
K2IJL 810- 27- 5-BD
K2RIW 680- 20- 7-D
WA2SRH 640- 20- 6-B
W2TNI 572- 22- 3-B
W2NBI 510- 18- 5-B
W2MI 420- 15- 4-B
WA2TLM 286- 11- 3-B
WA2EXP 156- 6- 3-B

Northern New Jersey

WB2ZVS 24,430-349-25-AB
WA2FZW 10,920-210-16-ABD
WB2CUT 5500-126-12-B
WA2CWA 4224- 96-12-A
WA2GEZ 4032- 96-11-B
WA2VYA 3276- 91- 8-AB
WA2WSR 2628- 73- 8-B
WA2FCW 2380- 70- 7-AB
W2CVW 2220- 56-10-ABD
WA2YGR 2091- 63- 7-B
K2RLW 1316- 48- 4-B
W2ODV (WA2FUI, opr.) 1292- 38- 7-B
WA2GFN/2 1092- 39- 4-B
WB2TMD 1003- 30- 7-AB
WA2NTI 840- 30- 4-B
WA2ALD 540- 18- 5-B
WB2VLC 234- 9- 1-B
WA2FAX 182- 7- 3-AB
WB2WIK (+K2OWR WB2s CST UIJ) 41,220-576-26-AB
WA2SNA (K2BJG WA2s AJS NPK SLR WB2s BEA LPX QEA QOQ RIU) 27,270-505-17-ABCD
WA2KHL/2 (WA2UDT WB2s LDE LYP VPO) 21,866-377-19-ABD

Southern New Jersey

W2EIF 21,431-370-19-ABCDE
W2BV 18,000-300-20-AB
WB2MTU 17,458-301-19-AB
WA2EMB 17,361-322-17-ABCD
W2PAU 15,903-294-17-ABC
W2REB 11,700-234-15-AB
W2EA 11,484-261-12-AB
WB2BNE 10,764-207-16-AB
W2FYS 10,660-205-16-AB
WA2KOK 8418-183-13-AB
W2EPA 7938-189-11-AB
WB2BZY 6660-222- 5-AB
W2OSD 6510-155-11-AB
WB2NPY 6080-190- 6-AB
W2ORA 6000-200- 5-AB
W2EKB 5760-180- 6-AB
W2GIA 5460-130-11-B
WA2YSW 4902-129- 9-AB
WA2PBZ 4312-154- 4-AB
WB2OSQ 4200-150- 4-AB
W2TQ 4160-130- 6-AB
WB2SPJ 3600-100- 8-AB
WA2FFV 3444-123- 4-A
WB2PZF 2800-100- 4-A
W2FGY 2688- 96- 4-B
WA2QZQ 2626-101- 3-AB
WB2EFL 2528- 79- 6-AB
WB2WRP 2496- 78- 6-AB
K2EVW 2464- 56-12-B
W2ITG 2304- 96- 2-AB
W2BAY 2002- 77- 3-ABC
WB2WXK 1950- 75- 3-B
W2FDJ 1800- 75- 2-A
WA2SEA 1716- 66- 3-AB
WB2JIN 1508- 58- 3-A
WB2VLD 1368- 57- 2-AB
W2HX 1300- 50- 3-AB
W2FBF 768- 32- 2-A
WA2HJF 650- 25- 3-B
K2JOC 630- 21- 5-B
W2HBE 360- 15- 2-AB
W2AXU 252- 9- 4-ABC
W2SDB 216- 9- 2-B
WB2NPY/2 44- 2- 1-B
W2JUG/2 (K2s QIJ QPN SQS W2EWQ WA2s HJF IVO LUR WMK WB2s ANJ EXQ IOE LBT LCC LLF) 9108-253- 8-ABD

Western New York

K2YCO 14,508-279-16-AB
WA2TEY 9476-206-13-AB
K2CEH 8944-172-16-B
WA2ZNC 7378-217- 7-AB
W2CNS 6760-169-10-AB
WB2JFL 6256-184- 7-AB
WA2THS 5724-159- 8-AB
K2LDU 5700-150- 9-AB
W2OWF 5576-164- 7-AB
WB2ZFS 5550-185- 5-AB
K2RZI 5400-180- 5-AB
WA2KND 5160-172- 5-AB
WB2YHD 4794-141- 7-AB
W2RIS 4320-144- 5-AB
WB2RJB 4147-160- 3-AB
WA2AIW 4074-146- 4-AB
W2EQW 3960-180- 1-AB
W2MPM 3888-162- 2-AB
K2RHS 3864-138- 4-AB
WA2YEK 3864-138- 4-AB
WB2JRX 3744-144- 3-AB
WB2SNA 3674-167- 1-AB
WB2VPK 3432-143- 2-B
W2ECH 3416-122- 4-AB
W2DUC 3384-141- 2-AB
K2WW 3360-140- 2-AB.
WB2SLM 3318- 79-11-B
K2OFQ 3264-136- 2-AB
WA2YTK 3240-135- 2-AB
WB2VSE 3168-132- 2-B
WA2QAU 3144-131- 2-AB
W2SNI 3120-130- 2-AB
W2VVG 3120-104- 4-AB
WA2CER 3102-141- 1-AB
K2YAH 3048-127- 2-B
W2QY 3024-126- 2-AB
WB2YJH 3016-116- 3-AB
WB2GGM 3014-137- 1-AB
WA2TJS 2860-130- 1-AB
WB2WPA 2860-130- 1-AB
WA2EKN 2844-119- 2-B
WA2JFM 2816-128- 1-AB
K2JJT 2772-126- 1-AB
K2YMM 2760-115- 2-AB
W2EMY 2750-125- 1-AB
WB2EDT 2712-113- 2-AB
WB2KWZ 2664-111- 2-AB
WB2QVH 2664-111- 2-AB
WB2NFY 2624- 82- 6-A
W2DBU 2592-108- 2-B
WB2NOJ 2552-116- 1-AB
WB2HDK 2508-114- 1-B
W2ECM 2496-104- 2-AB
K2UXF 2448-102- 2-AB
W2ZZS 2431-111- 1-B
W2FDI 2398-109- 1-AB
WB2LAD 2354-107-11-AB
W2SFA 2352- 98- 2-AB
K2GMZ 2332-106- 1-AB
W7JRL/2 2332-106- 1-B
K2JA 2288-104- 1-AB
WA2NGH 2288-104- 1-B
WA2SRY/2 2288-104- 1-B
K2OIU 2266-103- 1-B
WA2YPT 2222-101- 1-AB
WB2MDB 2200-100- 1-B

K2SQI 2186- 98- 1-AB
WB2IMX 2134- 97- 1-B
WB2WQJ 2106- 81- 3-B
K2RUE/2 2068- 94- 1-B
WB2HTH 1958- 89- 1-B
W2RBT 1920- 80- 2-A
WB2AMC 1826- 84- 1-AB
W2SRP 1824- 76- 2-B
WB2MCP 1800- 75- 2-AB
WA2OVQ/2 1740- 73- 2-B
WA2YSG 1694- 77- 1-AB
W2BLU 1680- 70- 2-B
LU7ABU/W2
1628- 74- 1-B
WA2SDK/2 1606- 73- 1-B
WA2SSU 1584- 72- 1-B
W2YBK 1562- 71- 1-AB
WB2KLD 1480- 37-10-AB
WA2BQA 1474- 67- 1-AB
WB2FZB 1452- 66- 1-B
K2ZCU 1430- 65- 1-B
W2GUY 1430- 65- 1-B
WA2BEH 1392- 58- 2-AB
WB2JGV 1344- 48- 4-AB
WA2RYT 1342- 61- 1-AB
WB2DPT 1342- 61- 1-B
WB2EEU 1342- 61- 1-B
WA2GCX 1320- 60- 1-B
WB2NSE 1320- 60- 1-B
WA2MBW 1298- 59- 1-B
WB2HJN 1298- 59- 1-A
K2UCI 1276- 58- 1-B
W2ZHB 1254- 57- 1-B
WA2YYZ 1254- 57- 1-B
W2CJQ 1176- 49- 2-AB
K2LCS 1144- 52- 1-AB
W2EBF 1144- 52- 1-B
WA2DRC 1144- 52- 1-A
K2EAW 1122- 51- 1-B
WA2HUR/2 1078- 49- 1-B
WA2NFY 1056- 48- 1-B
WA2IJC 946- 43- 1-AB
WA2GBQ 902- 41- 1-B
W2UAD 858- 39- 1-B
WB2ZJY 836- 38- 1-A
WB2LYH 792- 36- 1-B
WA2DBK/2 768- 32- 2-B
WA2MKX 726- 33- 1-B
WA2WLH 720- 30- 2-AB
WA2YRH 704- 32- 1-AB
W2ICE 660- 30- 1-AB
WB2DNW 660- 30- 1-AB
W2FOJ 624- 26- 2-A
WB2PSA 594- 27-11-B
WA2EKD 374- 17- 1-A
WA2AQW 352- 16- 1-A
WB2LIN 330- 15- 1-B
W2WGL 224- 7- 6-B
WA2DEF 132- 6- 1-B
W2UTH (+K2ZEV WA2RHW)
8694-207-11-AB
W2OW (WA2s (KO MSQ RBJ WB2s LNX RBA WN2s SGS YCW) 7450-149-15-AB
K2MPE (+WB2TGU)
6930-165-11-AB
WA2MQX (+WA2AGE WB2EEU)
4536-162- 4-B
WA2EKR (multiop)
4248-177- 2-AB
WA2EJY (WA2EKR WN2UTM C. Holdsworth G. Holdsworth)
4224-176- 2-AB
WB2KUR (+WA2NZO)
3432-143- 2-AB
WA2ROC (+K2RKW WA TO) WB2FBP)
1872- 52- 8-AB
K2JD/2 (WA2EKR C Holdsworth) 1672- 76- 1-AB
K2JIQ (+WB2FJH)
(178- 31- 9-AB

3

Delaware

WA3QPX 8684-167-16-ABCD
W3UGV 2584- 68- 9-ABC
WA3MGR 1118- 43- 3-AB
K3URP 504- 18- 4-A

Eastern Pennsylvania

K3IPM 40,622-535-28-ABCD
W3HQI 30,030-455-23-ABCD
W3HMU 26,460-441-20-ABCD
W3JD 25,420-410-21-ABCD
WA3AXV 24,720-412-20-ABCD
K3MWV 22,591-390-19-ABD
K3ZSG 21,450-359-20-ABCD
W4HBY 18,044-347-16-ABCD
K3AEL 17,580-293-20-AB
K3IUV 16,536-319-16-ABCD
WA3UNG 15,360-320-14-AB
WA3NGK 14,490-315-13-ABCD
K3BPP 13,568-307-12-ABCD
W3CF 13,440-320-11-ABC
WA3NVO 13,068-297-12-ABCD
WA3IUF 12,650-253-15-ABCD
K3JJZ 12,200-305-10-ABCD
K3ACR 12,120-303-10-ABC
WA3PUL 10,780-245-12-ABD
W3IZD 10,258-223-13-ABC
W3LUW (WA3PUL opr.)
9760-244-10-AB
W3ELX 9280-232-10-AB
W3AJF 8694-207-11-ABC
K3GAN 8424-234- 8-ABCD
W3HK 7848-218- 8-AB
K3DMA 7360-245- 5-ABC
K3KTY 7120-190- 9-ABC
WA3OVH 6838-263- 4-AB
W3BBC 6720-160-11-AB
W3FTB 6660-222- 5-ABC
W3CXU 6657-159-11-ABC
K3MXM 6592-206- 6-ABC
WA1HM 6426-154-11-AB
K3EPB 6422-169- 9-ABC
K3GEW 6210-207- 5-ABC
K3UGX 6188-221- 4-ABC
W3CJU 6176-193- 6-ABCD
WA3KPS 5792-193- 6-B
W3CCX 5520-184- 5-ABC
WA3IMM 5516-197- 4-AB
W3YXF 5490-145- 9-ABC
WA3GGY 5440-160- 7-AB
W3AWA (WA3JMM, opr.)
5320-190- 4-AB
WA3AQA 5278-203- 3-AB
W3BRU 5270-155- 7-AB
WA3NUG 5206-127- 9-AB
WA3DJF 5200-200- 3-AB
K3GOZ 5096-196- 3-AB
K3EOD 4950-165- 5-ABC
WA3BDQ 4144-148- 4-ABC
K3MUA/3 4125-138- 5-AB
W3JQD 4064-127- 6-ABC
K3YFD 4020-134- 5-AB
K3HIN 3808-136- 4-ABC
K3NMN 3724-133- 4-AB
WA3HLS 3562-140- 3-AB
W3CTT 3400-100- 7-AC
K3VYG 3380-110- 3-A
WA3EPS 3360-120- 4-AB
W3NSI 3354-129- 3-BC
WA3RJM 3300- 75-12-A
W6AB/6 3154- 86-19-AB
WA3PNW 2922- 83- 7-A
W3NHX 2808-108- 3-AB
WA3ISR 2808-108- 4-AB
WA3LGC 2808-108- 3-AB
WA3MKV (K3AIL, opr.)
2700- 90- 5-AB
W3QXV 2604- 93- 4-A
WA3NFV 2568-107- 2-ABD
WA3INF 2520- 90- 4-AB
WA3NQY 2212- 79- 4-A
K3BOY 2002- 77- 3-AB
W3ZOR 1872- 78- 2-A
WA3DUC 1776- 74- 2-A
WA3MRU 1736- 62- 4-A
WA4UOC 1680- 60- 4-AB
K3GZT 1586- 61- 3-AB
K3DLS/3 1560- 60- 3-AC
WA3TUL 1512- 63- 2-A
WA3WAK 1368- 57- 2-A
WA3NAQ 1326- 51- 3-AB
WA3NBQ 1326- 51- 3-AB
WA3TDR/3 1300- 50- 4-A
K3UDM 1274- 50- 3-A
W2GGB 1272- 53- 2-B
K3VEQ 1248- 48- 3-BC
WA3JTC 1176- 42- 4-A
WA3DZT 1170- 45- 3-AB
WA3QYE 1120- 40- 4-AB
K3KEL 969- 26- 9-AB
W3KXH 960- 40- 2-A
WA3KOL 884- 34- 3-A
W3HKZ 840- 35- 2-AB
WA3BTE 832- 32- 3-AB
WA3VJJ (WA2BCY, opr.)
832- 32- 3-B
WA3KEF 806- 31- 3-AB
W3KM 768- 32- 2-B
WA3TEM 768- 32- 2-ABC
WA3PSA 744- 31- 2-A
WA3IEL 484- 22- 1-AB
W3QIs 456- 19- 2-BC
WA3EPS/3 264- 11- 2-B
WA3QZI 264- 11- 2-A
WA3RTC 264- 11- 2-A
WA3QZE/3 198- 9- 1-A
K3ZKO 192- 8- 2-B
K3OBY 154- 7- 1-AC
W3OR 132- 6- 1-A
W3PSI 132- 6- 1-B
W3LRH 110- 5- 1-A
K3MUA 66- 3- 1-A
WA3KOL/3 66- 3- 1-A
WA3TEM/3 66- 3- 1-B
WA3QZF (K3ATL, opr.)
44- 2- 1-AB
W3KKN (+K3KMN)
31,062-501-21-ABCD
WA3FOP (+K3DLS WN3YLZ)
9320-233-10-AB
WA3MPO (+WA3s IEL OIB OJI)
8184-186-12-AB
W3SD? (+WA3s WID WLU)
7986-121-23-AB
WA3KFI (+WA3IDR)
7974-222- 8-AB
K3MTK (WA3s PUL TVZ)
4956-134- 7-AB
W3LP (W3s GFN JUZ)
4312-154- 4-AB
WA3SPR (+K3DLS)
3528-126- 4-ABC
WA3HVE (+K3DES)
2886-111- 3-AB

Maryland-D.C.

K3DQA 11,550-231-15-ABC
W3KMV 8164-158-10-AB
WA3NZL 6604-127-16-AB
W3LUL 4056- 79-16-B
K3AAF 3950- 79-15-ABCD
K3MWO 3542- 77-13-AB
WA3LNU 2442- 86-12-B
W3HVM 1584- 66- 2-B
WA3NNZ 1580- 41-10-B
WA3EOQ 1216- 32- 9-B
WA3ISZ 1080- 45- 2-B
WA3OYW 910- 35- 3-AB
K3ENN 864- 36- 2-ABC
WO3C 812- 29- 4-AB
W3HB 720- 24- 5-B
W3FYT/3 648- 27- 2-B
K3AKR 600- 25- 2-AB
WM3SN 546- 21- 3-ABC
W3DOS (K3KWI, opr.)
408- 18- 2-B
W3CJK/3 (+K3ARN WA3s AMH CGU K. Corbin M. Staley)
9175-184-15-ABCD
WA3SXX/3 (+WA3s QED SFF D. Astrab) 1700- 50- 7-AB

Western Pennsylvania

W3BWU 3276- 78-11-AB
W3ANX 2667- 64-11-B
W3OMY 2354- 54-12-BD
WA3ANO 1944- 55- 8-AB
W3JOH 1890- 45-11-AB
W3IIM 644- 23- 4-A
WA3SDK 264- 11- 2-B
W3FYV (+WA3s SZX WIK WA8s PDG SRB)
4120-103-10-AB
WA3TGR (+WA3UAT)
871- 35- 3-AB

4

Georgia

WB4RUA 240- 10- 2-AB

Kentucky

WB4VLH (+WB9VFT)
224- 8- 4-B

North Carolina

K4LWZ 5050-103-15-AB
WA4MVI 4065-136- 5-AB
WB4MXC 812- 29- 4-AB
WB4LDO 728- 26- 4-B
WA8FFB (K4s BWS COF GHR IZE LVV ROM WA4s JCM IPQ VCC WB4s BZS CCW IZP YFC YFD)
18,444-318-19-AB
W4ZZ (+K4s MIJ MOU)
3944-116- 7-AB
WA4WZQ (+WA4WZP)
1836- 51- 8-AB

Northern Florida

WB4BSZ 728- 26- 4-AB
W4CSS 140- 5- 4-A

South Carolina

K4GMJ 780- 26- 5-AB
WB4NBK 150- 5- 3-AB

Southern Florida

K2YRZ/4 2916- 81- 8-AB

Tennessee

WB4IGG 3975- 81-15-AB
WB4KMK (WA4DFV WB4s CXC LSK) 6120-170- 8-AB

Virginia

W4UCH 7176-138-16-ABCD
W4IFK 5400-108-15-B
WB4YET 3060- 85- 8-ABC
WA4SIQ 2926- 77- 9-AB
K4LHB 2888- 76- 9-ABC
K4LFO 1680- 42-10-B
W4HD 1416- 59- 2-B
K4MSG 864- 31- 4-AB
K4PIV/4 744- 31- 2-AB
K4LSD 240- 10- 2-B
WA4EPI 48- 2- 2-A
WB2EAI/4 (+WB2PRI WA4s DOX GPM)
4978-131- 9-AB
K4ZKU (+WB4RDT)
3000- 75-10-AB

5

Louisiana

WA5IUD 425- 13- 7-A
WA5QBX 308- 11- 4-AB

Northern Texas

WA5IUD 2262- 87- 5-A
WB5FCR 176- 8- 1-A

Southern Texas

WA5ZNY 900- 30- 5-A
K5PFL 66- 3- 1-A

6

East Bay

WA6VFI 4004-154- 5-B
K6IE 240- 10- 2-A
W6RGG 22- 1- 1-B

Los Angeles

WB6IMV 864- 27- 6-AB
WB6YVP 650- 25- 3-AB
K6BPC (WB6IMV, opr.)
448- 16- 4-A
WB6JCD/6 (+W6PJM WB6W P. Jenzen) 2055- 69- 5-A

Orange

K6YNB/6 8930-235- 9-A
WB6IDK/6 1350- 45- 5-A
WB6IMV 864- 27- 6-A
WB6YVP 650- 25- 3-A
K6BPC (WB6IMV, opr.)
448- 16- 4-A

Santa Clara Valley

WA6JUD/6
12,255-323- 9-A
WB6KBZ 8379-221- 9-A
K6GSS 8136-226- 8-A
WA6UAM 3600-100- 8-A
WB6KAP 3420-114- 5-A
WB6FFC 3400-100- 7-A
W6OCP 2432- 76- 6-A
WA6HAN 1440- 48- 5-B
WB6INN/6 650- 25- 3-B
W6PKI 408- 17- 2-B
K6GI 22- 1- 1-B
WA6WSW/6 (WB6s HWO WLE) 4448-139- 6-A

San Diego

WB6NMT 1840- 58- 6-A

San Francisco

WB6QVW/6 3490-113- 5-A
W6OAT/6 952- 34- 4-B
WA6JYU 810- 27- 5-A
WA6AW 266- 10- 4-A
W6KHI/6 72- 3- 2-B

San Joaquin Valley

WA6OSX/6 5066-149- 7-A
W6YKS 2546- 67- 9-A
K6ZMW 1614- 44- 9-A
K6QHC 1060- 27-10-A

Sacramento Valley

WB6NKO 1904- 56- 7-A
WA6UOS 1092- 39- 4-B

7

Oregon

K7ZCB 1008- 42- 2-A

Washington

WA7PVE (+J. Baskett)
1056- 44- 2-B

8

Michigan

WB8BKC 4862-143- 7-A
WB8IVA 3876-102- 9-A
WA8LUU 2624- 82- 6-A
WB8TGV 1248- 39- 6-A
WB8EIY 990- 33- 5-A
WA8HTL 986- 29- 7-B
WB8QXB/8 689- 27- 3-B
WK9DK/8 (WA8s TMP WOO WB8s LCN OTA)
4500-125- 8-A

Ohio

K8LEE 31,626-391-33-A
WB8AMI 7272-202- 8-A
K8SUB 5664-118-14-A
WA8STX 5304-156- 7-A
WA8HPY 4968-108-13-A
WA8BOB 3510- 98- 8-A
WB8UZI 3400-100- 7-A
WA8MLV 2560- 81- 6-A
WB8GFY 2278- 67- 7-A
WB8PAT 2040- 60- 7-A
WB2OIF 1984- 62- 6-A
W8NKW 1976- 77- 4-B
K8BPB 1651- 64- 4-A
K8CKY 1170- 39- 5-A
WA8RCN 1120- 35- 6-A
WB8NFY 1056- 48- 1-B
WA8TYF 900- 60- 5-A
WB8PLP 840- 28- 5-A
WA8KUR 744- 31- 3-B
WB8BBP 650- 25- 3-A
WA8LXI 648- 27- 2-A
WA8KAQ 504- 21- 2-A
K8RXD 352- 11- 6-B
WB8GZM 242- 11- 1-A

W8IRN 220- 10- 1-B
K8WYY 198- 9- 1-B
K8BXT 192- 8- 2-B
WA8NJR (+WB8IGY Barb Rose)
40,850-475-33-AB
WA8TTS/8 (+K8s ETI MMM WB8s JNS KRY)
38,052-456-32-AB
WA8PLZ (K8s DCM TQK W8s DJY KPV WA8s DZU LTA MSF SVV WB8s MVR ONY QQC QUC YAB K9DZK G3PAC)
26,340-439-20-AB

West Virginia

WA8UUY/8 240- 10- 2-B
WA8DQR/8 (+W8JJG)
5040 120-11-AB

9

Illinois

WA9LEF 4420-130- 7-AB
WB9NXB 4394-169- 3-AB
W9RVG 3750-125- 5-AB
WA9FIH 3750-125- 5-ABD
WA9RIJ 3660-122- 5-AB
WA9NRI 3600-120- 5-AB
K9DTB 3296-103- 6-AB
W9DJZ 3104- 97- 6-B
WB9IPH 2716- 97- 4-AB
W9MLU 2280- 76- 5-AB
K9JFN/9 1992- 83- 2-AB
W9IVI 1650- 55- 5-B
W9DBJ 1482- 57- 3-AB
K9KQR 1360- 40- 7-B
WA9KAN 1232- 56- 1-B
K9ZWU 1210- 55- 1-ABD
K9ZWV 1210- 55- 1-ABD
WA9OHU 1104- 46- 2-B
WB9KHR 1100- 50- 1-A
WB9LWI 696- 29- 2-B
WA9UQO 574- 21- 4-B
W9KDR 546- 21- 3-AB
W9WIC 462- 21- 1-B
K9EFD 336- 14- 2-AB
W9KBU 308- 14-14-B
W9WIC/9 264- 12- 1-B
W9DSJ 242- 11- 1-B
K9DKI 198- 9- 1-AB
W9ZYI 198- 9- 1-B
K9ZWU/9 154- 7- 1-B
WA9FIH/9 110- 5- 1-B
K9UNW 66- 3- 1-B
WA9ZER 44- 2- 1-B
K9HMB (+WB9CAS)
11,960-230-16-ABCD
W9BGX (WA9s KJO ULO)
7191-212- 7-AB
K9UZZ/9 (WA9s NFO PQY WB9s GEN IWN IWO JRA JSK KLW KXI Curt)
6826-191- 8-ABCD
K9ONA/9 (K9s ZWU ZWV)
726- 33- 1-AB

Indiana

K9UVJ 6840-171-10-ABCD
K9UBF 4862-143- 7-ABD
WA9MEM 2340- 78- 5-A
WB9GMC 1950- 65- 5-A
WB9CFP 1596- 57- 4-B
K9EFX 1440- 48- 5-B
W9CGI 1200- 40- 5-A
K9UNM 240- 8- 5-B
WB9IDL 108- 5- 2-B
WB8HUC/9 (WB8s GEU GEX GEY GFA)
2516- 74- 7-AB

Wisconsin

WB9OQD 78- 3- 3-B
W9KNH 72- 3- 2-A

Ø

Colorado

WA8GTB/Ø 22- 1- 1-A
KØSQG 22- 1- 1-C

Kansas

WBØBHC 448- 32- 4-AB
WØJYJ (+WBØEYS)
336- 14- 2-AB

Nebraska

WAØMRH 480- 16- 5-A
WØEKB 300- 10- 5-A

Minnesota

WØPAN 44- 2- 1-B
WØOHU (+WAØQWY)
300- 10- 5-BC

Missouri

KØTLM 1904- 60- 6-AB

Check Logs

W2HF K4EJQ QST

Rush Loading Coils

(Continued from page 46)

who don't want to bother with all the work of gathering the materials, preparing the forms, and counting and winding the turns by hand, Rush offers ready-made coils (see photograph). These are 13 inches in length, and 1-3/8 inches in diameter at the largest point. The inductance of each was measured as 126 μH in the ARRL lab, with a *Q* u of 135 at 790 kHz, and 180 at 2.5 MHz. From a number of amateur installations, Rush has determined that this inductance value is optimum for 75, 40, and 15 meters for an inverted-V antenna.

The coils are available from Louis D. Rush, 10071 Casa de Oro Blvd., Spring Valley, CA 92077. Price class is $7.00 a pair plus postage. Included with the coils is an instruction sheet of dimensions and installation data. Also available from Rush are complete antenna systems, ready for installation. Write to him for more details. — *K1PLP* QST

Simulated Emergency Test

(Continued from page 62)

in their jurisdiction for more AREC participation. — (WB2ELF, EC N. Bergen Co., N.J.) Would like to see extra SET sessions for the regular NTS cw nets, more emphasis on emergency power but with mixed rather than emergency power only sessions, and more of a SET/Field Day and Field Day/SET. Why not combine them both and have at least two SET/Field Days each year? — (K5KPS, RM N.M.) Suggest ARRL sponsor an organization of a long haul RTTY net. — (K2DN, N.Y. Region RTTY Net Mgr.) Am suggesting a change of SET date to later in the year because year after year the evening band conditions on 80/75 meters are unreliable due to the long mid-winter skip. — (WA1QME, EC Meriden, Conn.) Would like to see the SET cut to just one day. — (WB5EKU, EC New Orleans, La.) WB4HRK ran one session on emergency power with over 25 checking in. — (WB4AVN, PAM Ky.) Thanks to the ARRL gang for the fine work on behalf of amateur radio and radio amateurs. — (WØOYH, Kans. Slow Speed Net Mgr.) The ability to pass net control from station to station was demonstrated and should prove highly helpful in the event of a real disaster. — (K3YWJ/9, EC Tippecanoe Co. Ind.) Conditions being as they were, the point totals were low, but the training incurred was excellent. — (W4SDR, PAM N.Fla.) I would like to see more emphasis on traffic handling for the SET rather than waiting to handle traffic! — (WA4GBC, RM S.Fla.) Stations should be encouraged to use "HXB" on SET traffic. A good deal of traffic without "HXB" was handled and since it was obviously SET traffic, containing "test message," etc., we were forced to handle it after the SET. There is enough work afterwards without all this junk floating around after the SET. — (WA1SHO, Conn. Slow Net Mgr.) General unhappiness with this year's schedule. Let's have more expanded activity on cw next year, particularly. Perhaps one whole emergency-powered cycle thrown in. — (K2KIR, EAN Mgr.) QST

Stolen Equipment

Drake TR-4, serial number 23003, stolen April 6 in Buttonwillow, California (near Bakersfield, CA), from Marcus P. Schwaegerle, WA6QEW, Alameda County R.A.C.E.S. Supply Sgt.

The following equipment was stolen on May 2: Regency HR-2B two meter FM transceiver including 70 dB crystal filter, Data Signal DS 2182 receiver preamplifier and crystals for 34-94, 94-94, 52-52, 25-85, 16-76, 31-91, 37-97 and 28-88 (146 MC frequencies). HR-2B serial number is 49-04926. John A. Kenyon, 623 Norfolk Dr., Kirkwood, MO 63122.

Stolen April 8, Swan 350c, number C1051396, Swan 117X, number 014054, Swan 14XP number 122 converted to 14X; Webster kW-80 loading coil and whip; Turner 350C mike and Misco speaker. Contact Robert B. McNorton, W6FEM, 144 Elder Ave., Chula Vista, CA 92010.

SB-144, serial number 620035, stolen from Irving Smith, W7DZR. Contact Officer Ken Leithead, Colville P.D., Colville, WA 99114.

Yaesu 200R 2 meter transceiver stolen April 15, Serial No. 4L 008022. Taken from car owned by E. Freeman Leverett, W4SKO, 25 Thomas Street, Elberton, GA 30635.

Stolen at Dayton Hamfest 75: Ultracom 25 2 meter FM, serial number 090511. Contact Montgomery County Sheriff's Office, 333 W. Second St., Dayton, OH.

Clegg FM-27B, serial number 27023-1274, with Touch-Tone pad attached and Operation Identification number TX2992554 engraved on back was stolen May 1 in Dallas. Contact WA5ZNA at (214) 388-3535 or Dallas Police Dept. at (214) 748-9711, ext. 561. Refer to offense number 140765G.

1975 ARRL INTERNATIONAL DX COMPETITION — High-Claimed Scores

The following are high *claimed* scores of entries received by May 15. Read (left to right): total score, multiplier, contacts. Please don't ask for DXCC credit based on log confirmation until the adjusted scores make the scene. — *WA1STN*

DX – CW

Single Op. – All Band

KH6RS (K2SIL, opr.) 2,724,276-262-5466
KH6IJ 2,599,575-253-3425
HC1CW 2,237,301-243-3069
KV4IO 1,854,900-225-2748
TI2BFV (K4VW, opr.) 1,710,330-235-2426*
PY7AK (K3BSY, opr.) 1,693,089-219-2577*
KH6CF 1,487,244-209-2372
KH6GPQ (K2KIR, opr.) 1,376,892-209-2196
CT2BN 1,284,120-174-2460
LU6EF 1,159,536-196-1972
KP4EAJ 1,149,642-221-1734
ST5CJ 1,106,160-176-2095
LU8ADK 1,047,411-193-1809
KV4CK 986,616-193-1704
YV4AKI 982,800-200-1638
VP2E (K2EJ, opr.) 916,965-213-1435*
HR1AT 887,409-207-1429
YV1OB 749,916-222-1130
I6BQL 675,135-135-1667
JA2JW 656,850-145-1510
PI8AS (W6IPU, opr.) 653,625-178-1245*
OX3DL 573,480-120-1593
ZL1AFW 505,248-152-1108
VP2LAW 460,167-157- 977

Single Op. – High Band

LU3EX 988,014-153-2146
KH6IGC 659,244-137-1604
KH6IEG 303,408- 98-1032
PY4ALC 301,350- 98-1025

Single Op. – Low Band

KP4EAS 253,890- 93- 910

Multi-Single

OA4O 3,340,500-262-4250
LU8DQ 2,853,906-242-3931
YU1BCD 499,824-117-1424
HG5A 492,636-122-1389

W/VE – CW

Single Op. – All Band

W3WJD 1,477,440-320-1539
W6OGH 1,285,488-226-1896
W6MAR 1,277,073-243-1817
W3LPI 1,238,880-290-1424
W6OUN (WB6OLD, opr.) 1,108,917-201-1839
WB4VLG 1,100,328-254-1444
W7IR 1,063,755-231-1535
K4GSU 1,039,581-277-1251
K3YUA 973,269-261-1243
K5PEL 949,806-246-1287
K4VX (WB4SGV, opr.) 915,732-244-1251
W6RR 877,044-197-1484
W3QOR 825,363-231-1191
W4YWX 825,210-265-1038
K3GJD 815,517-237-1147
WB4HGY 699,930-231-1010
W2DXL 666,666-222-1001
W4KFC 649,371-233- 929
W9IRH/7 598,128-136-1466
WA6EPQ 593,370-190-1041
WA1STN 568,941-199- 953
W3VT 567,672-248- 763
WA1ABW 544,434-226- 803
W1DAL 544,416-214- 848
WB2FIT 537,624-228- 786
W6MUR 532,116-156-1137
W9LT 527,775-227- 775
K2BMI 510,450-205- 830

Single Op. – High Band

W2GXD 582,912-176-1104
K6SDR 541,920-160-1129
W1FBY 529,851-166-1097
W6PLH 399,360-130-1024
K2TQC 346,458-146- 791
W4WSF 319,422-139- 766
WB9LHI 297,321-139- 713
K1DPB 276,120-118- 780
K1JHX 268,149-113- 791
W3ZSR 255,564-124- 687
WB9BPG 253,524-148- 571
K8IDE 243,432-126- 644
WA1NKK 214,926-113- 634
WB7ABK 200,700-100- 669

Single Op. – Low Band

K6OVJ 232,023- 79- 979
K5ABV 178,770-118- 505
K1NOL 173,940-130- 446
W1MX (WA0UCU, opr.) 116,532-117- 332
WA6IQM 106,488- 58- 612
K8HLR 84,420-105- 268
K6OZL 70,800- 59- 400
WA5VDH 58,590- 93- 210

Multi-Single

W2YD 1,390,032-294-1576
WA5LES 1,212,354-286-1413
WA1NRV 1,196,826-302-1321
K6AQ 1,089,816-182-1996
W3BWZ 872,772-257-1142
W3BGN 869,934-247-1174
W5MYA 745,038-243-1022
WA8TBQ 700,839-257- 909
W3FZT 666,324-249- 892
W6OKK 645,072-151-1424
K3BHJ 599,064-218- 916
W6BIP 520,047-153-1133
W6DOD 514,896-140-1210

Multi-Multi

W3AU 3,185,604-428-2481
W4BVV 2,844,560-404-2380
W3PV 2,126,100-373-1900
W1ZM 2,045,175-339-2045
W3GPE 1,866,308-337-1846
W3GM 1,862,748-354-1754
W7SPA 1,714,920-248-2305
WA2BLV 1,680,825-307-1825
WB6DTX 1,592,748-302-1758
W5BRY 1,472,481-322-1501
W5KFL 1,298,088-298-1452
W6NUT 1,174,041-201-1947
W6ANN 1,171,248-208-1877
K6RR 1,170,792-202-1932
K1VTM 876,078-238-1227
WA4LZR 852,250-250-1163
W3TV 525,000-200- 875
K2CW/2 523,422-243- 718
WA6ENP 515,040-232- 740

DX – PHONE

Single Op. – All Band

KZ5BC 4,157,484-268-5171
6F8J 3,368,189-251-4473
YV4YC 3,110,508-249-4164
XF1LLS 3,056,634-238-4281
KH6IJ 2,473,428-218-3782
TI2WX 2,313,036-242-3186
HI8XAW 2,299,209-209-3667
KH6BZF 2,193,900-206-3550
ZF1AK 2,026,080-224-3015
6W8EP 2,015,181-203-3309
KH6IGJ 1,666,692-201-2764
TI2BEV 1,656,936-216-2587*
LU2A 1,638,000-210-2600
CR6GA 1,520,064-174-2912
ZS6DW 1,224,300-175-2332
VP9GD 900,000-160-1875
LU4AU 803,142-149-1926
VP2DX 787,950-150-1751*
LU8A 757,680-168-1505
PZ5EB 629,100-180-1165*
8P6AA 575,586-171-1122
C6ABN 474,180-140-1129
JA2JW 473,250-125-1262
PY4KL 447,120-135-1104
KH6HML 429,660-155- 924
ST5CI 416,568-136-1021

Single Op. – High Band

CE6EZ 1,804,392-152-3957
KP4EAS 1,399,464-132-3534
KH6GQW 1,090,704-114-2312
KH4MU/KP4 664,416- 96-2307
9J2EP 442,902- 97-1522
WB8ABN/HC8 368,532-116-1059
KH6IGC 364,206-101-1202
PY7VNY 296,346-106- 847
I6FLD 252,858- 67-1258
ZS6FN 230,400- 96- 800
EL4D 214,851- 91- 787
PY3CHP 200,887- 97- 667
DJ9BA 184,860- 60-1029
PY1CHP 181,578-106- 571
3B8CV 171,984- 82- 699
OA4CU 147,120- 80- 613
JA6BAX 115,911- 53- 729

Single Op. – Low Band

EA4LH 104,400- 60- 580
IV9AMU 41,454- 47- 294
JA1EFY 28,476- 28- 339

Multi-Single

KH6GKD 2,379,276-212-3741
KP4AXM 2,099,052-199-3516
PT2ZBS 1,885,884-182-3454
ZF1AU 1,419,588-188-2517*
VP2EEE 1,179,198-174-2259*
G3UJW 1,115,940-140-2657
W3BRB/CB4 819,180-148-1845*
ZF1CW 818,496-168-1624*
G3UBR 739,332-132-1867
G3UJE 560,472-121-1545

Multi-Multi

VP2A 5,253,147-261-6709*

W/VE – PHONE

Single Op. – All Band

W3WJD (WA3LRO, opr.) 2,281,125-385-1935
W6RR 1,676,700-270-2070
W6HX (WB6OLD, opr.) 1,119,297-289-1291
K4VX 1,119,297-289-1291
W4QCW (WA8ZDT, opr.) 1,063,382-313-1133
W3LPL 1,057,866-314-1123
W3BGN 1,012,557-283-1193
WA1KID 925,380-265-1164
W2MB 835,725-275-1013
W2HMH 826,950-298- 925
K1CSI 790,836-236-1117
WA1NRV 732,564-238-1026
W4YWX 715,293-267- 893
(WA0CVS (WB0DIY, opr.) 650,589-229- 947
WA9BWY 646,914-274- 787
VE3KZ 646,272-272- 793
WA8TBQ 641,160-260- 822
W9LT 619,164-252- 819
W3VT 610,236-276- 737
W1CMH 598,247-233- 853
WA6EPQ 592,272-216- 914
WB4UZT 577,368-264- 729
K1RQE 571,500-254- 750
WB4VUP 569,664-276- 688
WA1STN 520,144-219- 792
W5NMA 518,076-246- 702
W7TML 517,962-173- 998
W3QOR 508,688-232- 728

Single Op. – High Band

K6SVL 960,492-188-1703
W6CCP 940,281-179-1751
K6JAN 640,370-163-1330
W2GXD 577,418-177-1078
W6PLH 467,229-133-1171
K8IDE 391,680-170- 768
VE3BBH 377,307-159- 816
WA4SVO 352,674-189- 622
WB9LHI 325,692-166- 654
W1FBY 324,096-166- 652
WB7ABK 281,802-134- 701
WA5ZNY 248,985-165- 503
K1JHX 240,702-154- 521
K4JWD 214,368-154- 464
K2BQO 202,395-131- 515

Single Op. – Low Band

WA8ZDF 168,750-150- 375
W1MX 128,503-171- 354
W1FBC 125,001-129- 323
K6OVJ (W6DSQ, opr.) 109,746- 78- 469
WA5VDH 84,816-114- 248
K8HLR 81,900-105- 260
W6ITY 63,726- 88- 247

Multi-Single

W6ONV 1,515,024-252-2004
WB4BGY 1,196,715-323-1235
W6YRA 1,010,070-215-1566
WA4LZR 883,877-288-1023
W2HPF 714,492-267- 892
K8GID 700,500-250- 934
W5BJA 682,227-273- 833
W6DOD 621,511-189-1150
W6QAT 619,515-195-1059
W6OKK 603,432-174-1156
K3BHJ 561,408-256- 731
W9MYN 548,775-225- 813
VE7SV 536,328-191- 936

Multi-Multi

W2PV 3,965,364-458-2886
W3AU 3,757,320-441-2840
W1ZM 3,203,589-401-2663
W4BVV 3,068,568-408-2507
W3GPE 2,678,526-402-2221
W3GM 2,360,358-393-2002
W1FRY 1,987,167-377-1757
WB5DTX 1,817,487-357-1697
W3DHM 1,518,900-332-1525
K1VTM 1,080,000-288-1250
WA3ATX 805,350-295- 910
K2CW/2 726,264-267- 924

* One-weekend DXpedition Class

Strays

Here's a new twist for energy conservation: W6ATC put ten batteries from discarded Polaroid film packs together and came up with enough to power a two-meter portable rig.

QST for

AMATEUR RADIO PUBLIC SERVICE

NTS RACES AREC

In the Public Interest, Convenience, Necessity HRH

CONDUCTED BY BILL MANN,* WA1FCM

NTS Grows With Proper Routes

THINK how great it would be if it were only necessary to have one traffic net that you could report into and pass traffic directly to delivery stations in your state, in your part of the country, anywhere in the U.S. or Canada or anywhere in the world. No relays – just point-to-point handling of your traffic. There would be fewer chances for mistakes . . . less time between origination and delivery . . . not so many . . . But wait. With the potential number of messages in any given day, this would be absolutely impossible!

Okay. Then let's have all kinds of nets: some that cover local areas, some national, some covering states, some international, etc. When you have a message, simply consult the Net Directory or hunt around to find a net that might be able to handle it. Well, that may be fine if you only handle an occasional message and operate a super station. (Imagine a California station with a message for Springfield, Mass., joining the Western Massachusetts Phone Net on 75 meters at 1330 Pacific time!)

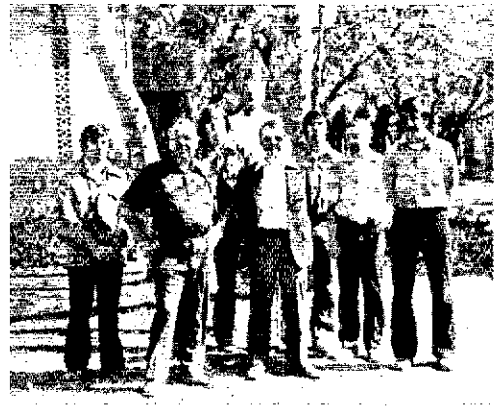
How about having each ARRL section having a section net and all section nets tied together in an organized manner which allows for the systematic handling of traffic? This, of course, is the mission of the National Traffic System. Sections are linked together by region and area nets. In the evening, areas are tied together by the Transcontinental Corps and this function is served by the Continental Traffic Net in the daytime.

A main function of a section net is *coverage*. That is, to have participants in as many towns and cities *within that section* as possible to receive and deliver traffic to their localities. Thus, the net control station should know who in the section can handle what traffic. Traffic going outside the section is routed to one (or more, if traffic load warrants) station who will take the traffic to the region net. It is not, therefore, necessary for the NCS to know that W9WWW can take traffic for Wisconsin and Indiana, but not for Illinois, and that W8XXX handles all northeastern traffic except New York which is handled by W8YYY in a later sked with W2ZZZ, etc.

As far as knowing who handles what traffic, it is even easier for the region net NCS: Each section representative identifies his section when reporting in and the station to handle "thru" traffic (going outside the region) also identifies as such. Note that at region level and above, the key is *representation* rather than coverage. There is little advantage – indeed, it is usually a hindrance – to have several "representatives" from each section reporting into a region net without traffic.

When out-of-section stations report into a section net and handle traffic, the systematic flow of traffic is interrupted. It gets back to an extended who-can-handle-what game. This has not been a problem on the evening cw nets inasmuch as most all meet at the same time; if a station from Georgia checks into the Virginia CW Net, then he's missed part of his own Georgia State Net. However, the evening section phone nets have much more varied meeting times, and it's quite possible for stations to hop from net to net to clear traffic. True, in many cases the traffic gets through a little faster (though usually only a matter of a few hours), but we now start to lose the systematic flow of traffic which is one of the purposes of NTS. And we have a hodge-podge of traffic handlers. Some amateurs will route traffic via NTS only if it's going to a state whose section net is not

* Assistant Communications Manager, ARRL.



The Southern California Net held its annual picnic at the California Institute of Technology in Pasadena. Some of those attending were: l. to r., WB6DJP, K6UYK, WB6ZVC, WB6ZKK, WA6IDN, WA6OTU, WB6OYN and WB6OYD. Photograph courtesy of K6UYK.

Coordinating emergency operations during the Rockford, Illinois, flooding recently were K9QYY EC (seated) and C.D. Deputy Director Hampton. Story in Public Service Diary.

one they usually make in their "rounds" each evening. Isn't this saying "I'll route traffic via NTS if it is not more convenient for me to bypass the System"?

Another advantage in having traffic follow the standard NTS routing is that liaison stations are afforded more experience in traffic handling and this, too, is a main objective of NTS: training of amateur operators in handling of written traffic and participating in directed nets. Generally, the more traffic there is to handle, the more interest there is in traffic handling.

Members of the Transcontinental Corps handle traffic between NTS areas. Generally speaking, west to east traffic must buck the time zones (i.e. the Central Area Net meets after the Eastern Area Net and the Pacific Area Net meets after the Central Area Net). Thus, a TCC station receiving traffic from his counterpart station in a time zone further west is authorized to clear that traffic in any appropriate section or region nets in his area. Other instances when reporting into section or region nets other than one's own is authorized are when a station holds emergency traffic or when a regular representative doesn't show and the NCS assigns another station to take the traffic directly to the non-represented region or section net. Otherwise, traffic should follow standard NTS routing.

NTS is designed to be a team effort to handle traffic efficiently on a daily basis throughout the year. Also, when disaster situations occur, NTS operations can be stepped up to accomodate greater loads of traffic. Details on NTS operation are contained in *Public Service Communications* manual available free from ARRL for an s.a.s.e. with 20 cents U.S. postage. Let's follow established NTS procedures and routings in daily operations. In so doing, we'll also be better organized to handle emergency-related traffic when the need arises.

– *WA1FCM*

Accolade Dept. We've often cited the excellent public service record being established by repeater operation. Each month the Public Service Diary accounts many instances of emergency use of repeaters for reporting accidents, fires, disabled vehicles, etc. Excerpts from a couple of letters received at Hq. recently are good examples of the appreciation officials have for repeater users.

"Over 500 public-service-minded amateurs have performed a great service to their state, community and the National Weather Service in spotting and reporting severe weather when it occurs across the tri-state [Ohio, Michigan and Indiana] area. The repeaters, WR8ADC and WR8ACT in the Toledo area serving the northwest Ohio and southeast Michigan communities, perform like professionals when it comes to storms such as the tornadoes that occur this time each year. Also, there are many other fine repeaters doing the same job. Our hats come off to you men and women. Keep up the fine job you are doing in reporting severe weather to us at the National Weather Service so we can warn the public of any future severe weather in the years to come." (Signed) Merle G. Kachenmeister, National Weather Service, Toledo, Ohio.

"Monroe County [N.Y.] Manager Lucien A. Morin has considerable respect for the amateur radio fraternity and most especially for the 1600 hams within the County of Monroe who have, more than once, offered themselves and services in several natural emergencies." (Signed) Gene Molter, Director, Office of Public Information and Communications. The letter goes on to announce the direct touch-tone link between WR2AEI and the Cobbs Hill Communications Center which automatically triggers an alarm to gain dispatcher attention. Morin was later quoted: "They [amateurs] are probably one of the few groups who never seek acclaim, but when an emergency does arise they are always there to do an outstanding job. We want to certainly express our gratitude to them for the service they render our community."

Traffic Talk

It seems there are some who do not fully understand this new handling instruction, "HXG", which has been officially adopted to mean "Delivery by mail or landline toll call not required. If toll or other expense required for delivery, cancel message and service the originating station." Only messages bearing HXG instructions may be cancelled by the delivering station if expense is involved. All messages without HXG should be delivered by any means necessary. This means that messages without HXG should be delivered even if it requires a quarter for the phone call or ten cents for a stamp. Too often, one will be quick to pickup a piece of traffic and will not be able to relay it because of a lack of amateur radio outlets in the area. This is not necessarily the receiving station's fault, but instead of incorporating a "prefabricated" HXG himself and servicing the originating station telling him there were not outlets, he should make the delivery. It's worth the effort to spend a few pennies on a piece of traffic that could bring much more in happiness to the addressee!

■ Remember this is the month when the new traffic counting and categories take effect. Summertime is a good time of the year to generate third-party traffic for that new "originated" column. How about setting up a station at a summer camp or a large gathering and originate messages for vacationing visitors to relatives back home? Complete details of the new traffic

counting appear in the February and June Public Service columns. – *WA1QME*

National Traffic System

■ DRN7 will continue with a morning and afternoon session throughout the summer months regardless of propagation since half of their traffic is received on the early session. 2RN manager W2MTA writes that most of his members are bracing themselves for the summer QRN that will be upon us, especially on early evening nets. D3RN certificates were awarded to K3IQG, WA3PHQ and WA3UYB. D4RN is in desperate need of help writes WA4AVN net manager. Net controls, liaisons and section reps are especially needed. WØHXB, manager of TWN is getting ready to help generate more interest in NTS in the Twelfth Region. CAN certificates went to: W5QU, W4OGG, W9DND and WØZHN, 5th annuals; KØAZJ, 4th annual; WB5FDP, W5GHP and W5UJJ, 3rd annuals; WB4DXN and WAØTNM, 2nd annuals; and WA5ZZA, WB5JBW, WA5IQU, WB4HQW, WB9KPX, WB9NOZ, KØCVD, WØQMY and W5EDT.

April Reports

Net ..... *Sessions*	*Traffic*	*Avg.*	*Rate*	*%Rep.*
EAN 30	1599	53.3	1.364	98.3
DEAN 30	263	8.7	.424	87.2
CAN 30	1091	36.4	.871	99.4
PAN 30	938	31.3	.867	96.7
1RN 59	503	8.5	.449	92.0
D1RN 29	86	3.0	.269	80.4
2RN 60	622	10.4	.838	99.0
3RN 60	510	8.5	.455	95.3
D3RN 30	230	7.7	.436	95.0
4RN 54	477	8.8	.334	95.4
D4RN 28	19	1.5	.110	47.8
RN5 58	572	9.9	.375	78.2
DRN5 30	86	2.9	.155	52.1
RN6 60	638	10.6	.435	99.4
DRN6 60	250	4.2	.096	60.0
RN7 59	289	4.9	.364	82.8
DRN7 55	68	1.2	.126	32.2
8RN 53	299	5.6	.327	97.5
D8RN 30	76	2.5	.256	70.0
9RN 57	511	9.0	.393	92.5
D9RN 30	55	1.8	.199	87.5
DTRN 43	116	2.7	.160	77.0
ECN 61	281	4.6	.422	93.4
TWN 58	297	5.1	.243	75.9
DTWN 21	48	2.3	.093	70.5
TCC Eastern ....112[1]	654			
TCC Central .....88[1]	549			
TCC Pacific .....116[1]	721			
Sections[2] 3650	14902			
Summary *4765*	*26,750*	*5.6*		
Record *6256*	*36367*	*19.1*		

[1] TCC functions not counted as net sessions

[2] Section and local nets reporting (103): APSN (AB), MEPN MTN (MB), APN (Mar.), CMN, GBN, ODN, OGN, OPN, WOEN (ON), W-QV/UHF (PQ), AENB AEND AENJ AENM AENW AENX (AL), OZK (AR), ATEN HARC (AZ), NCN SCN (CA), CCN (CO), CN CPN CSN NHVFTN (CT), DEPN DTN (DE), FAST FMTN FPTN GN NFPN QFN QFTN VEN (FL), TLCN (IA), IMN (ID), ILN (IL), KPN KSBN KWX QKS QKS-SS (KS), KNTN KSN KTN KYN (KY), LAN LRN LSN LTN (LA), EMRI EMRIPN WMN WMNPN (MA), MDCTN MDD (MD), MACS MNN QMN WSBN (MI), MSN MSPN PAW (MN), MSN MSBN MTN (MS), MTN (MT), NCSSBN CN VHFTN THEN (NC,SC), TCAREC (NE), NHVTN (NH), NJN NJPN NJSN (NJ), NMN (NM), NLI (NY), OSSBN (OH), OPEN OTWN STN (OK), BSN (OR), EPA EPAEP&TN PTTN WPA (PA), TNN (TN), HAEN TEX TTN (TX), BUN UCN (UT), VSN VSBN (VA), NSN WSN (WA), WSSN (WI), WEN (WV).

Transcontinental Corps

EAN to PAN TCC skeds doing well on 14 MHz as evening conditions have improved reports TCC Eastern Dir. W2FR. TCC Central Dir. KØAEM writes that his crew is doing a great job despite a slack in traffic. Certificates were issued to WB5IQU and WB9KPX.

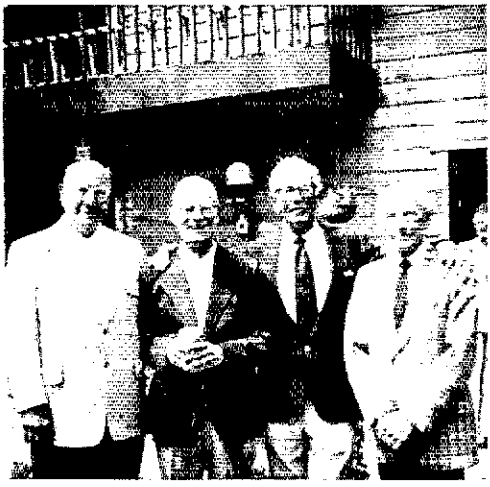
Area	*Function%Successful*		*Out-of-Net Traffic*	*Traffic*
Eastern 120		93.3	1771	654
Central 90		97.7	1116	549
Pacific 120		96.7	1459	721
Summary *330*		*95.8*	*4346*	*1924*

The TCC roster (April): Eastern Area (W2FR Dir.) – W1s NJM QYY K1GMW WA1s MSK POJ, W2s FR GKZ KAT/3, WA2s DSA ICB PJL UWA, WB2s PYM RKK, W3EML, K3s CB DZB MVO, W4UQ, K4KNP, WB4SGV, W8PMJ, K8KMQ, WA8HGH, WB8ITT, VE3SB. Central Area (KØAEM Dir.) – W4OGG, WB4DXN, W5s MI GJP QU UGE UIJ, WB5IQU, W9s CXY DND NXG, WA9EED, WB9KPX, WØs HI INH LCX QMY ZHN, WAØTNM. Pacific Area (K5MAT Dir.) – W5RE, K5MAT, W6s BGF BVB EOT MLF QAE RSY UE VZT, K6HW, WA6DEI, WB6s AKR DJP OYN, W7s GHT KZ BQ, K7s IWD NHL NHV QFG, WØs LQ LRN, KØDRL, WBØs AKW HCK.

Independent Net Reports (April)

Net ..... *Sessions*	*Traffic*	*Checkins*
Central Gulf Coast		
Hurricane 31	219	1933
Early Eighty Free 30	173	268
Hit & Bounce 30	910	315
Hit & Bounce Slow 16	76	181
IMRA 26	1116	544
Mission Trail 30	196	1515
North American Traffic 26	187	337
Northeast Traffic 22	91	194
7290 Traffic 44	471	1455
75 Meter ISSB 30	372	1319
20 Meter ISSB 22	642	243
Washington Region PON 12	42	179

The Miami Valley FM Association provided communications for a Walk-a-thon on April 19. Standing in the communications van is the chairman of the MVFMA, WA8BUW. Outside, discussing the operation are l. to right: WA8SED, W8JUK, Asst. EC, WA8PQI, and WB8QXA.



At a recent get-together at Hilton Head Island, S.C., are l. to r. W2EC, K4GSJ (ex-W1HUM), K4ZB (ex-W1OA) and W2OE who collectively total about 225 years devoted to amateur radio including many years of traffic handling dating back to the ARRL Trunk Line operations.

Public Service Diary

■ Larsen Bay, AK — Feb. 3. When a vessel loaded with shrimp ran aground, KL7APH contacted the Coast Guard via relay of W7IUY, K7TWD and W7UNI as band conditions were poor. Soon after, contact was made and a helicopter arrived on the scene. — (KL7APH)

■ North Bend, OR — Feb. 13. A light plane carrying three passengers crashed and Civil Air Patrol and amateurs responded by conducting a ground search. The WR7AFA repeater was used to recruit more help while the operations were taking place. WR7ADD was utilized for most of the traffic passed between rescue teams. — (WA7KIU)

■ Ft. Valley, GA — Feb. 18. A tornado all but demolished this sparsely populated town and several amateurs from surrounding communities converged on the area to supply communications. K4JNL activated an emergency session of the Georgia SSB Net and several pieces of health and welfare traffic were passed. — (WB4MUR)

■ Camp Gruber, OK — Feb. 23. When heavy snow fell on the Muskogee area, several motorcycle riders who were participating in a special event became lost as the visibility decreased. A search was conducted by five amateurs using 2-meter fm. The riders were located before the weather worsened. — (WB5HLR, EC Muskogee Co.)

■ Morgan Co., AL — Mar. 12-13. The AREC was activated when severe weather hit the area. Mobile units were dispatched in various areas of the county to monitor flooding along several streams. Thirty-one amateurs participated. — (W6LJU/4, EC Morgan Co.)

■ Rockford, IL — Mar. 17. A total of 1378 hours were logged by amateurs when flooding became severe. WR9AES was set up to handle emergency traffic as well as provide constant communication with local agencies. — (K9VJJ)

■ Atlanta, GA — Mar. 24. A tornado cut all communications to the central portion of Atlanta and local amateurs supplied the necessary links. Telephone service was maintained through the WR4AGV auto patch until the usual commercial means were restored. — (K4LPQ)

■ Gadsden, AL — Mar. 27. When two men fell into a gorge at Noccalulu Falls, the Etowah RACES Unit was called to provide communications during the rescue attempt. Liaison was set between rescue squads in the area via 2 and 75 meters. — (K4VMV, RO Etowah Co.)

■ Lincoln, IA — Mar. 27. When power was interrupted during an ice storm, the Blackhawk Co. c.d. was asked to supply communications. An amateur link was set up via the WRØAFA repeater. Operation was later moved to simplex before being terminated after 30 hours. — (WAØINC, EC Zone 2)

■ Warren, AR — Mar. 28. When a tornado hit the area, c.d. and Red Cross liaison was maintained via amateur radio. Volunteers with mobile gear were dispatched to Warren to handle messages for a hospital. Assistance was provided by amateurs for 18 straight hours. — (W5RXU, SEC)

■ Waynesville, OH — Apr. 2. On the first anniversary of the Xenia disaster, a tornado roared through Montgomery Co. Local amateurs set up around the clock communications for the stricken area. Several pieces of health and welfare traffic were passed on the Ohio SSB Net. — (W8ILC, EC Montgomery & Greene Cos.)

Public Service Honor Roll April 1975

This listing is available to amateurs whose public service performance during the month indicated qualifies for 40 or more total points in the following nine categories (as reported to their SCM). Please note maximum points for each category: (1) Checking into cw nets, 1 point each, max. 10; (2) Checking into phone/RTTY nets, 1 point each, max. 10; (3) NCS cw nets, 3 points each, max. 12; (4) NCS phone/RTTY nets, 3 points each, max. 12; (5) Performing assigned liaison, 3 points each, max. 12; (6) Phone patches, 1 point each, max. 20; (7) Making BPL, 3 points regardless of traffic total; (8) Handling emergency traffic directly with a disaster area, 1 point each message; (9) Serving as net manager for entire month, 5 points.

WA1MHJ	73	WA1QME	50	K3KAJ	44
WA2DSA	64	WA2VPA	50	WA3VBM	44
WA1TGF	63	W5IUS	50	WB4DXN	44
W5KLV	63	WB6BDL	50	WB4SKI	44
WBØHOX	63	WB4FDT	50	K4VND	44
WØOYH	63	K5MAT	49	WB4WYX	44
VE3FRG	62	W5MYZ	49	WBØHCK	44
WA1MSK	61	W5UGE	49	WB5EMA	44
WA1SHO	61	WB6OYN	49	WB5JZQ	44
WB2PYM	61	W7GHT	49	WB5KEA	44
WA3DUM	61	WA7MEL	49	WR6AKR	44
W5GHP	61	WB9ICH	49	WA6DEI	44
WA5IQU	61	WB9MDS	49	W6JXK	44
WA5ZZA	61	K9ZTV	49	WB9KRR	44
W7OCX	61	KØMRI	49	WB9NMF	44
W8IBX	61	WØOTF	49	WAØKKR	44
WB8PAV	61	VE4PG	49	VE3DVF	44
WBØCZR	61	WA9KRF	48	VE3GOL	44
WBØHBM	61	WB5LBR	47	VE3GT	44
VE3GFN	61	K5TTC	47	VE3SB	44
WB5AMN	59	WB6PVH	47	WA1RWU	43
WA1QJU	58	W6RFF	47	WA3EOP	43
WA8ZNC	58	WA9QVT	47	WB4FKJ	43
WA1FCM	56	WB4GHU	46	K4IAF	43
WA1QKD	56	WB5MTG	46	WA61VA	43
WA1QZX	56	WB9KPX	46	WAØFMD	43
WB2JRX	56	WA3WRN	45	KL7JDO	43
WA4FBI	56	WB5DXR	45	WA2PIL	42
WB5EHA	56	W5GSN	46	WB4YKM	42
WB5IGF	56	WA1MJF	45	WA5VBM	42
W5RB	56	WB5MEU	45	WØMFG	42
WA8HGH	56	W5UJJ	45	WB2RMK	41
K8LGA	56	W1BVR	44	W7LG	41
VE3FQZ	56	K1PAD	44	KØCVD	41
K6GMJ	55	WA2BSU	44	WØOF	41
WB8JGW	53	WA2DIW	44	W1EIH	40
VE3GJG	53	W2MLC	44	WA1PAZ	40
WB4FZQ	52	WA2PCF	44	W2OE	40
WB5MJN	52	WB2RKK	44	WB5ASD	40

■ Prince Georges Co., MD – Apr. 3. During a windstorm the Green Mountain repeater was utilized to provide communications for the c.d. headquarters. Two amateurs manned the station Emergency services provided residents with shelters at churches and schools as well as transportation. – (W3FA, SCM MDC)

■ High Bridge, NJ – Apr. 3. A train carrying toxic gas derailed in a residential area. Communications were set up between the county emergency operations center and local authorities. The emergency was cancelled after a few hours and residents were allowed to return home. – (WB2GGE)

■ Patagonia, AZ – Apr. 7. While enroute home, K7MTZ hit a piece of metal that punctured his gas tank. A call for assistance on WestCARS was answered by K6REF who summoned help. – (K7MTZ)

■ Okaloosa Co., FL – Apr. 11-13. Several amateurs provided communications after heavy flooding hit the area. Operators in adjacent counties manned the emergency operations center radios in case they were needed while WR4ABZ was used for emergency traffic. – (W4RKH, SCM NFla)

■ Dayton, OH – Apr. 17. A three alarm fire was enough to cause the Red Cross to request that amateurs supply communications The Miami Valley Repeater Association repeater, WR8ACV, was utilized until operations were secured. – (W8ILC, EC Montgomery & Greene Cos.)

■ Ellettsville, IN – Apr. 18. The SKYWARN system was activated as severe thunderstorms plummeted the area. When a funnel cloud touched down, K9BBZ alerted authorities. WA2VKU/9 assumed NCS of the SKYWARN Net and local AREC members were called into action. – (WA2VKU/9, EC Madison Co.)

■ Miami, OK – Apr. 27. K5BKA spotted several funnel clouds approaching the town from the southwest and quickly alerted surrounding areas via 146.52 MHz simplex. Shortly afterwards, a twister hit Neosho, Mo. Amateurs remained on 2 meters but local communications were not hindered seriously and operations were secured. – (WA5FLV EC, Ottawa Co.)

■ Livingston Co., MI – Apr. 26. The AREC was activated when flooding hit the area. Communications was provided for the local authorities and mobiles were deployed to monitor flooding in lower elevations. Thirteen amateurs participated. – (K8SWW, EC Milford Township)

■ Colfax, CA – Apr. 27. While W6RXF, WØNOF and WB6OEK were having a roundtable, WA6AOY broke in and said the ship he was on was disabled off the coast of Calif. WØONF contacted the L.A. Coast Guard as band conditions between the vessel and the coast were unreliable. Help was soon rendered. – (W6RXF)

■ Central MT – Apr. 27. A severe snow storm closed roads and cut power and telephone communications. Amateurs were called in to assist local authorities and the hospital. Twenty amateurs utilized 2 and 75 meters throughout the affair. – (W7RZY, SCM MT)

■ Minot, ND – Apr. 27. Heavy rains threatened to flood the Minot area and assistance was requested from the Ward Co. c.d. and local amateurs to dispatch sand bag trucks and to maintain a 24-hour watch on conditions along the swollen Souris and Red Rivers. – (WBØFUO)

■ Butler Co., OH – Apr. 28. Amateurs assisted local authorities when flooding was reported in low lying areas. The WR8AFX repeater was used as the main communications link. – (WB8CLF, EC Butler Co.)

■ Owensboro, KY – May 4. Two men capsized in a small boat making it necessary for a local rescue squad and amateurs to help them. W4OYI, K4UDZ, WA4DZJ and WB4ANL went to the rescue site while WA4FMY and WB4ZSA stayed at a base station and acted as relay between the field units. – (W4OYI)

■ Topeka, KS – Apr. 27. The local AREC's telephone tree was activated when the National Weather Service issued a severe weather warning. Twenty-two amateurs participated by means of a 2-meter net or by being deployed as mobile tornado spotters at various locations. Operations were halted after the weather system had passed without incident. – (WBØCZR, EC Zone 4)

■ *Repeater Log.* According to reports received, repeaters were used to report 41 traffic accidents, 39 disabled vehicles, 10 fires, 19 dangerous situations and provided individual(s) with six miscellaneous types of special services. The following repeaters were involved: WR1s AAC ABM ABV ACB WR2s ABA ABS ADD ADM ADZ WR3ADG WR4ABR WR6AIT WR8ABE and VE1PD'.

Special Activities. February. The weekend of Feb 8-9 saw 100 amateurs across southern Ontario involved in operating the communication system for the 23rd Annual Canadian Winter Rally. – (VE3GFN, EC) *March.* The San Diego (CA) Humane Society sponsored a five day hunter-jumper horse show at Rancho Bernados and the amateur fraternity supplied the necessary communications. – (K6BWT) On Mar. 9, members of the Huntington (NY) AREC supplied communications during the St. Patrick's Day Parade. (W2GLE, EC) *April.* At the Torrey Pines (CA) Glider Meet on Apr. 4-5, several hams provided information and handled all communications throughout the affair on 146.52 MHz simplex, 145.500 MHz a-m and 3950 kHz ssb. – (W6GBF, SCM SDgo). On Apr. 9 a group of Lancaster Co., PA, Boy Scouts were treated to an exhibition on amateur radio at a jamboree. Local amateurs operated on 2 and 75 meters for the occasion. – (WA3QNK, EC) Members of the Worcester Polytechnical Institute in Worcester, MA, set up a program to originate messages for the student body back home to friends and relatives. All messages were transmitted from WPI radio club station, W1YK. – (WA1NNC) Several amateurs provided communications via 2-meters during the Dubuque Co., IA, March-of-Dimes Walk-a-thon. Communications were provided at several check points and with local agencies. – (WØOM).

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for April Traffic

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W3CUL/4	207	1150	1096	37	2490
WØWYX	31	860	178	682	1751
W6RSY	25	549	506	5	1085
K9CPM	27	358	63	625	1073
W1PEX	50	501	345	15	911
KØZSQ	0	416	2	410	828
KØONK	117	294	263	12	686
KH6IAC	110	277	168	45	600
WBØHOX	107	247	224	3	581
W3VR/4	226	193	151	10	580
WA2DSA	24	277	218	7	526
WA1POJ(Mar.)	45	261	228	13	547

BPL for 100 or more originations-plus-deliveries

K4KDJ	216	W6RFF	149	WN1UAX	108
WA3EOP	187	W9MVF	120	W1AEL	106
WA1QME	153	K5TTC	114	WN4JWN	107
WØFIR	150	K1PNB	113	WA2VPA	102

BPL Medallions (see December, 1973 *QST* p. 59) have been awarded to the following amateurs since last month's listings: WA1QME, WN1UAX.

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.

Hamfest Calendar

JULY

Arizona – The 25th annual Fort Tuthill hamfest will be held July 25-27, at Coconino County Fairgrounds six miles south of Flagstaff. Tech sessions, demonstrations, flea market, transmitter hunts, contests and, on Sunday, a covered dish potluck. On Saturday, QCWA will hold a meeting and another potluck. Talk in freqs for the hamfest are 3992 kHz and 146.22/.82 via W7IO and WR7ABR. Registration $2. For further information, contact Don French, W7IWL, 9509 Rolling Hills Drive, Sun City, Arizona 85351.

British Columbia – The Maple Ridge Amateur Radio Club's second annual hamfest is July 11-13, at the Maple Ridge Fairgrounds. Technical seminars and displays, contests for the women, children and OMs, a hidden-transmitter hunt, mobile judging, technical IQ quiz, homebrew antenna contest and a Saturday evening meal. Registration at the door $3. with dinner $7 (advance $6 up to June 30). Overnight parking for trailers, campers, tents, for $2 without hookups. VE7MRC monitors 146.94, .76, .79, 147.33, 3970, 3755 for talk-in beginning 1600 July 11. Maple Ridge is about 30 miles east of Vancouver on the north side of the Fraser River. Hwy 7 runs right past the fairgrounds entrance; also, access from the Trans-Canada Hwy 1 via Fort Langley. Airport is at Pitt Meadows, a few miles west; call for a ride. Shopping nearby. Visit the largest zoo in Western Canada in Stanley Park, Vancouver; enjoy the whole area, Mt. Seymour or Grouse Mt.

British Columbia – The 25th anniversary of the Okanagan Inter. Hamfest Assoc. is July 26-27. Located at Gallagher Lake Koa Campsite (8 miles north of Oliver, B.C.) Entertainment for hams, XYLs, YLs, harmonics and visitors. Call-in frequencies: 3800, 34/94 OKN repeater, 146.76 simplex. Registration 9 AM PDT, Saturday; 2 PM PDT, Sunday. Write: Kirk Carter, VE7DV, 450 Vista Rd., Kelowna, BC.

Hawaii – SAROC Hawaiian Convention Holiday new dates, July 17-24. Deluxe rooms Sheraton-Waikiki, Honolulu. Exhibits, technical sessions, cocktail party and banquet. Limited number reservations on Western Airlines from Los Angeles and Oakland. Reservations available from mid-west and east coast principal cities. Travel arrangements by Del Webb World Travel Co., SAROC, PO Box 945, Boulder City, NV 89005.

Idaho – The 43rd annual W1MU hamfest is August 1-3 at Macks Inn, Idaho.

Illinois – The Quad-Co. Amateur Radio Club, Inc. 18th annual hamfest of the "Breakfast Club" on July 19-20 (at Terry Park, 3/4 mile east of Palmyra). Other groups are invited to meet by giving prior notice to the hamfest committee. Saturday night dancing and movies. Bring your own basket lunch. Sandwiches and soft drinks available. Talk-in on 3973 kHz from noon Saturday to 11 AM Sunday. Games, contests, golfing and fishing. Bring your swap gear. Camping facilities open Fri. afternoon until Mon. morning. Pre-registration until July 7 is $1; $1.50 at the gate. Write: "Hamfest," c/o Quad-Co. ARC, Box 81, Chatham, IL 62629.

Indiana – The Indianapolis hamfest is Sunday, July 13, (at Marion Country Fairgrounds, south and east of the jct of I-74 and the I-465 outer loop on the east side of Indy. Roads will be marked with bright QSY signs). Talk-in frequencies: 16/76, 10/70, 28/88 and 146.94 and .52 simplex and 3910. Admission $2, children under 12 years free. If a vehicle is involved flea market is $2, otherwise free. Also, an outside flea market area. One entire building for commercial vendors and special interest groups, booth space $25. The Indianapolis Lions Club provides good food at reasonable cost. Free coffee, tea and donuts from 6 AM until 10 AM. Forums, technical and general interest, 9 AM until 3:30 PM. Subjects included: SSTV, uhf-vhf, ARRL, Oscar, moonbounce, DX. Of special interest is a ladies activities program – movies, magic show and bingo. Meeting space for MARS, home-brew contest. Write: The Indianapolis Hamfest Assoc., Inc., PO Box 1002, Indianapolis, IN 46206.

Indiana – The 28th annual Turkey Run Hamfest and VHF Picnic is sponsored by the Wabash Valley ARA, Inc., Sunday, July 27 at Turkey Run State Park near Rockville. Flea market, XYL bingo, refreshments, camping facilities and park recreation for the kids. Also this year, banquet July 26, 7:30 PM featuring quest speaker W9NTP, in the park dining hall by reservation only, $6.50, deadline July 1. Activities begin 9 AM Sunday; talk-in, 146.94, W9UUU/9. For details, tickets, banquet reservations: s.a.s.e. WVARA Hamfest, Box 81, Terre Haute, IN 47808.

Michigan – The Cherryland Amateur Radio Club's annual family picnic and trunk swap n' shop welcomes all Northern Michigan hams to their picnic July 27 at Whitewater Township Park in Williamsburg (just outside of Traverse City). Bring your family, food and drinks for a good ol' fashioned picnic with boating, fishing, swimming, swings and play areas for children. It's a freebee – no charges – for details write: W8GI, Box 176, Kingsley, MI 49649.

Minnesota – The Mankato Area Radio Club hosts its annual picnic on Sunday, July 27 at Spring Lake Park, North Mankato from 10 AM to 4 PM. Pot luck, ham bingo. Talk-in: 146.95 and 25/85; 3925. Open to all. Contact WBØJYT.

Missouri – The Zero-Beaters ARC annual hamfest is Sunday, August 3 at the Washington-Missouri City Park. Free parking, auction, and bingo for the XYLs. No fee, admission or parking in the traders' row. For info or tickets contact: Kevin Weiskopf, WAØMNP, or the Zero-Beaters ARC, WAØFYA, Box 24, Dutzow, MO 63342.

Nevada – The Nevada Amateur Radio Assoc.'s annual shindig is August 9. Admission at the gate on August 2nd, $11. Children under 6 free; 7 through 16 will pay $3.50. For info contact: Al Westall, WA7GLK, Hamfest Chairman, 211 Galleron Way, Sparks, NV 89431.

North Carolina – The Antique Wireless Assn's meet is July 11–12. Registration Friday evening and Saturday morning at the Holiday Inn North, 3050 N. Cherry St., Winston-Salem, NC. Talk-in on 04/64. Saturday morning antique radio's display; afternoon flea market – antique radios, components, magazines, etc.; evening social hour, banquet, guest speaker, Wayne Nelson, W4AA; for the ladies, a tour of old Salem. For details contact: L. W. Elias, W4DBT, 3919 Poindexter Dr., Winston-Salem, NC 27106.

North Carolina – The Cary ARC's third annual mid-summer swapfest is Saturday, July 19, 9 AM to 3 PM. A la carte cookout, 11:30 AM. Auction 12:30 PM. No commission charged. Talk-in: 04/64, 22/82, 28/88, and 222.34/223.94. At Lions Club Shelter, Cary NC (near Raleigh). For info s.a.s.e.: K4FBG, 1022 Medlin Dr., Cary, NC 27511.

North Dakota, Manitoba – The 12th annual International hamfest is July 12-13 at the International Peace Gardens between Dunseith, ND and Boissevain in the American Lodge. Camping excellent, party, contests, free pancake breakfast and meetings. For info contact: John McCann, 1234 Valley View Dr., Minot, ND 58701 or Dave Syndal, 25 Queens Crescent, Brandon, Manitoba, R7B1G1.

Ohio – The Van Wert Amateur Radio Club, Inc., annual picnic is Sunday, July 27 at Jubilee Park, Van Wert at the north end of Market St. Swap table, auction, flea market. Potluck lunch (bring table service and covered dish); coffee and cold drinks furnished. Lunch at 12:30.

Ohio – The Hall of Fame hamfest and auction rain or shine is August 3 in Canton. Sunday, hamfest and auction at Stark County fairgrounds. Motel and camping space available. Talk in: 19/79 or 52/52. For further info write: WA8SHP, Max R. Lebold, Box 3, 73 Nimishillan St., Sandyville, OH 44671 or call W8SWB (216) 455-4449.

Pennsylvania – The Two Rivers Amateur Radio Club's eleventh annual hamfest is Sunday, July 20 at the Green Valley Fire Department grounds off the East Pittsburgh-McKeesport Blvd. near U.S. 30. Mobile check-in on 146.52 and 22/82. Registration required for flea market. For info write: John S. Roberts, WA3SOZ, 2823 Bowman Ave., McKeesport, PA 15132.

Pennsylvania – The 38th annual hamfest of the South Hills Brass Pounders and Modulators is August 3, from noon till dusk, at St. Clair Beach, Upper St. Clair Township, 5 miles south of Mt. Lebanon on Rte. 19. Swap n' Shop, picnic space and swimming for the family. Mobile check-in on popular 2 meter frequencies. Info and pre-registration – $1.50 per ticket; $2 at door. Write: Fred Schreiber, 181 County Line Rd., Bridgeville PA 15017.

South Carolina – Charles Towne hamfest located in Charleston, July 12-13. Info: PO Box 12502, Charleston, SC 29412.

Tennessee – The Oak Ridge Amateur Radio Club, Inc. annual Crossville hamfest is July 19-20. July 19 highlights technical forums and a banquet. July 20 features a picnic, flea market. Events also, at the local Holiday Inn and at nearby Cumberland Mountain State Park.

Texas – The Texas VHF-FM Society's 1975 Summer Convention is August 1-3 at the Ponderosa Inn, 2625 South 31st St., Temple. The best ever with the featured speaker A. Prose Walker, Chief of the Amateur and Citizen Division of the FCC. Equipment displays, technical sessions, a swapfest, ladies activities. Contact: the Temple VHF Repeater Assoc., PO Box 23, Temple, TX 76501.

Texas – The 10th annual Northwest Texas Emergency Net swapfest and picnic is in the City Park at Levelland on Sunday, August 3. Bring your own picnic basket. Free registration begins at 0900. Lunch at 1300. Swapping all day. This event is for the entire family. Mobile talk-in 3950 kHz and on 28/88.

Washington – The Washington Amateur Radio Club hamfest is July 11-13 at the Toutle River Park. Contact J. J. Dewaele, W7PWP, Star Rte. 4, Box 19B, Morton, WA 98356.

Washington – The Spokane Amateur Radio Council's hamfest is July 19-20 at Eastern Washington State College Campus. For info write: Spokane Amateur Radio Council, c/o Larry Rasmussen, W7FYU, W. 4132 Kathleen, Spokane, WA 99208.

Wisconsin – South Milwaukee Amateur Radio Club 5th annual Southeastern Wisconsin swapfest is Saturday, July 12 at Shepard Park (American Legion Post 434), 9327 South Shepard Ave., Oak Creek. Activities 7 AM to 5 PM or later. Parking, picnic area, hot or cold sandwiches and liquid refreshments available. Overnite camping available. Admission is $1 and includes a "Happy Hour" with free beverages. Talk-in on 146.94 MHz. Write: South Milwaukee Amateur Radio Club, S. F. Schreiter, W9AKF, Sec., 104 Brookdale Dr., South Milwaukee, WI 53172. QST

CANADIAN DIVISION CONVENTION

Calgary, Alberta **August 1-3**

The Calgary Amateur Radio Association will host its first convention with ARRL President Harry J. Dannals, W2TUK, heading the list of speakers. The Canadian Amateur Radio Federation executive will also be present. The convention will be held in the Calgary Inn, August 1-3, 1975. Program highlights will include forums of the two organizations as well as technical talks by Scientist Astronaut Dr. Owen Garriott, W5LFL, NASA; Martin Laine, OH2BH (DX); Larry Kayser, VE3QB, (Oscar 7); Lewis McCoy, W1ICP (ARRL); Dr. J. S. Belrose, VE2CV, (DOC, antennas); and several others.

Among the commercial and educational exhibits will be one sent by NASA showing a Lunar Communication Module, which is basically a repeater for relaying audio, video and telemetry from the moon-walkers back to earth. A space suit will also be on display. A flea-market will operate Friday afternoon, and there will be a get-acquainted wine and cheese party in the evening. Technical sessions are scheduled for Saturday, with a dinner-dance in the evening, followed by a Wouff Hong ceremony at midnight.

Dr. Garriott, W5LFL, will be the featured dinner speaker and his topic "Living and Working in Space."

Sunday will feature additional technical sessions. There will be a ladies program and for children from 6 to 18 years of age a program of special activities will include an overnight stay at a dude ranch. Day care will be provided for the little ones.

Special convention rates of $20 single and $25 double are available at the Calgary Inn, 320 Fourth Avenue S.W., Calgary. Telephone (403) 266-1611.

Registration is $5 through June 30, and $7.50 later. Friday evening wine and cheese party $4.75 and Saturday dinner/dance $14. For information and registration write: Registration, Box 592, Calgary, Alberta T2P 2J2, or contact Convention Committee on air daily at 0130 UTC on 3,770 kHz (Alberta Public Service Net). QST

COMING ARRL CONVENTIONS

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

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

Happenings of the Month

BOARD MEETING HIGHLIGHTS

The Federal Communications Commission's proposal to restructure the amateur radio service, Docket 20282, was both the primary topic for the Board of Directors' meeting May 15-16 and the reason for its being held then rather than in July. The way for decision-making was paved at the previous meeting in January when the directors authorized a nationwide survey of the members. More than fifty thousand forms went through the optical scanner: the report to the directors took thirty pages in a loose-leaf notebook. An ad hoc committee studied ways of tackling the many serious questions posed by the docket and came up with a "decision tree" containing 67 branches. Two evenings and a morning were spent by the full Board talking about the docket, exchanging views and constructing compromises. A drafting committee spent an entire afternoon refining the language to describe the decisions made. Finally, in 17 motions, the Board assembled its "Unified Licensing Structure" as a counterproposal to Docket 20282's dual ladder. A key feature is no loss of privileges or renewability for any presently-licensed person. More details can be found in minutes 12, 19, and 46 through 62. Incidentally, minute 64 directed publication of the survey – and the story can be found on page 49. On a related matter, the Board authorized a petition to FCC for a return of privileges in the 21,250-21,270, kHz phone band for Advanced Class licensees, and for a new phone subband, 14,175 to 14,200 kHz, for Extra Class licensees (Minute 27).

In membership matters, the By-laws were changed to permit lower membership dues rates for those signing up for multiple years in advance, up to a maximum of five (Minute 9). As a first step toward fulfilling a fifty-year dream, By-law 25 has been amended to add the words, "Alternatively known as the Canadian Radio Relay League" after "Canadian Division" (Minute 14). There will be a special certificate for those clubs which have been affiliated with ARRL for fifty years (22) and a new category, "ARRL Hamfest," is being added to the rules on national, state and division conventions (40). Speaking of conventions, the San Diego National in 1978 will take on international flavor as a result of minute 26. Further help for volunteer instructors should come from minute 34, which calls for separate lesson plans for each license class, to be available from hq. Minute 65 establishes a new award for the best technical article in *QST* each year, to be chosen by the Membership Affairs Committee with Board concurrence.

Sister Cities and the Town Affiliations Association continue to attract League attention through an ad hoc committee continuing at least until next January (minute 13). Regional Emergency Coordinators have been established for plans where emergency work has to cross section lines – notably in California (minute 8). The Board thanked NASA for its educational program (minute 66) and viewed a new tool for that purpose, a videotape called "Oscar and the Ham," as reported at minute 6. A traveling exhibit for the promotion of amateur radio, to be displayed in shopping malls and at hobby shows, was authorized on a pilot basis by minute 7. Fees for additional operating awards were established and are announced elsewhere in this issue (minute 29). Max Arnold, W4WHN, director from the Delta Division, was elected as a director of the ARRL Foundation, replacing Director Harry Shima, WØPAN, who resigned as a director of both the League (see separate item, below) and the Foundation, of which he remains Treasurer.

Studies were ordered for an IARU travel information packet; guidelines for ARRL QSL bureaus, a chapter-type organization for the League; cassette training aids for traffic handling and nets; public-relations handout material and long range needs for electronic data processing at hq.

The full text of the Board minutes appears at the end of this department.

The Sun City (Arizona) Amateur Radio Club, through its president, John Allen, W7YR, presents a set of ARRL publications to Mrs. Howard Wood, librarian of the Sun City library. Actually, Mrs. Wood may have seen one or two of them before: her husband is WA7SDS. Affiliated clubs – only – may acquire a set of books for presentation to a school or public library – only – at the very special rate of $17.50. (The library must agree in writing to make the books available to the public.) (A *News-Sun* Photo)

RFI-PROOFING BILL, HR-7052

A bill aimed at radio frequency interference susceptibility in entertainment devices has been introduced into Congress. The Hon. Charles A. Vanik of Ohio filed the bill, HR-7052, on May 15. It would give FCC the power to regulate the manufacture of audio and video devices so that susceptibility to signals from nearby radio transmitters would be reduced. The bill is an improvement upon the Teague Bill of the last Congress; like it, the Vanik bill has been referred to the House Committee on Interstate and Foreign Commerce, whose chairman is the Hon. Harley Staggers of West Virginia, and to its Subcommittee on Communications and Power, which is headed by the Hon. Torbert H. Macdonald of Massachusetts.

Much background work for the new legislation has been done by Theodore Cohen, W4UMF, of the ARRL RFI Task Group. He is compiling a comparative text, showing the present and the proposed wording of Section 302 of the Communications Act of 1934. Ted will also have a list of congressmen who may be contacted by amateurs wishing to support the measure. He points out "if we are to get a hearing on this bill, amateurs are going to have to voice their support." At press time, this material was still in preparation; check this department of *QST* next month for further info, or write to Hq. for the dope – an s.a.s.e. will help.

The Hon. Gilbert Gude, of Maryland, also showed interest in cosponsorship of the RFI bill. Walt Schroeder, WB2EXK, is associated with Congressman Gude, and assisted behind the scenes. More info on this very important legislation will be presented as we get it.

SHIMA RESIGNS; KULAS NEW DIRECTOR

Larry J. Shima, WØPAN, director from the Dakota Division of ARRL since May 2, 1970, has resigned because of a promotion at his job which will greatly reduce the time he has available for League affairs. In accordance with the Articles of Association, Thomas M. Kulas, WAØIAW, of Minneapolis, vice director since January 1, 1974, is the director for the remainder of the term, until January 1, 1976. Tom is 29 and works as a distribution engineer for the Northern States Power Company. Tom's organizational background goes like this: assistant director, 1969-1973, ARRL Dakota Division; director, Minneapolis Radio Club and trustee of WØCKF; past vice president Badger Amateur Radio Society (W9YT); ORS, AREC, A-1 Operator Club; Dakota Division Certificate of Merit, 1970; Life Member, ARRL; licensed since 1963.

WØKE NEW VICE DIRECTOR

Garfield A. Anderson, WØKE, of Edina, Minnesota, has been appointed vice director from the Dakota Division for the remainder of the term ending January 1, 1976. Gar is 63, holds the Amateur Extra Class ticket and earns his living as assistant secretary and assistant treasurer of the Northwest Bell Telephone Company. WØKF was appointed earlier this year as an assistant director of the Dakota Division, and is a past president of the Radio Amateur Teletype Society of Minneapolis. For a decade he served as State Radio Officer for Minnesota, and was author of the State RACES Plan. He's a member of the Handi-Ham System, 3900 Club, PicoNet, Minnesota phone and cw nets, the QCWA and the A-1 Operator Club. He holds the ARRL 40-year pin, and has been licensed since 1926.

Roy W. McCarty, W4RM, of Fort Lauderdale (at right) receives his Fifty-Year Member plaque from ARRL Southeastern Division Director Larry Price, W4DQD, while South Florida SCM Woodrow Huddleston, K4SCL (center) beams approval.

ARRL FILES FOR "RTTY LIB"

Following up on a motion at the January 1975 Board meeting, ARRL has filed a petition with FCC seeking to eliminate restrictions on code speeds, and to allow the use of additional RTTY codes beyond the five-unit, start-stop code now permitted. Though a primary purpose is to permit amateurs to use the ASCII 8-level code which is compatible with automatic data processing equipment, the League felt it wise to request authorization for the use of other codes at the same time, so that amateurs coming across surplus equipment of other types would have the right to experiment with it.

The text follows:

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of

Amendment of Section 97.69
In part to allow use of
Additional Radioteleprinter
Codes and to remove speed
Restrictions

To: The Commission

PETITION FOR RULEMAKING

The American Radio Relay League, Incorporated, the national non-profit organization of amateur radio operators and enthusiasts, respectfully requests amendment of Section 97.69 (a) to permit amateur radioteleprinters to use standard alphabets additional to the one presently specified and to delete Section 97.69 (b) which specifies speeds for radioteleprinters in the Amateur Service.

In support whereof, the following is respectfully submitted.

1) The most recent official consideration of this matter by the Commission was in Docket 19110, concluded by a Report and Order adopted November 24, 1971 (FCC 71-1180-72742). This order added the speeds of 67, 75 and 100 words per minute to the then-authorized speed of 60 words per minute.

2) The League, in its comments on that docket, had proposed a greater broadening of privilege:

". . . the Commission is urged to reexamine its proposed amendment . . . so as to eliminate all references to keying speeds. The Commission also is requested to eliminate the specification of any particular codes in subsection (a) of Section 97.69 . . ."

3) Comments by other parties in the Docket specifically requested the amendment of Section 97.69 (a) additionally to permit use of the eight-level American Standard Code for Information Interchange (ASCII).

4) In its Report and Order, the Commission said in part:

" . . . The Commission has no requirement at this time to supply its monitoring stations with eight-level equipment for the purpose of determining compliance with the Commission's Rules and international treaties by stations in [other] radio services. It is not economically feasible to spend public funds for the purchase of eight-level equipment to be used solely for the purpose of determining compliance by stations in the Amateur Radio Service. These proposals are therefore denied. . . ."

5) The Commission on its own motion in February of this year proposed, in Docket 20351, to use the ASCII code in automatic transmitter identification systems under rules proposed for Parts 81, 83, 87, 89, 91, 93 and 95. Presumably, therefore, the Commission now has, or proposes soon to have, monitoring equipment capable of interpreting the ASCII code. Thus, its former objection to this code is moot.

6) The rules and regulations of the Commission for the amateur service have traditionally avoided rigid specifications for the characteristics of amateur equipment in order to provide for

". . . (b) Continuation and extension of the amateur's proven ability to contribute to the advancement of the radio art." (Section 97.1 of the rules.) This policy has provided the greatest freedom to experiment and develop new techniques, equipment and practices. One significant exception to this policy is Section 97.69 relating to radio teleprinter transmissions – even after its modification in Docket 19110.

7) The amateur service has a deserved reputation as a disciplined service, uniquely so among those services with widespread use by the general public (Citizens, Maritime Mobile, Radio Common Carrier, taxi-cab and other land mobile, etc.). Continuous or frequent monitoring of amateur transmissions for content has not been necessary. Indeed, the Commission has permitted amateurs to use languages other than English for radiocommunication despite the lack of multilingual personnel at FCC monitoring stations; only the identification has been required to be in English. Since identification of a radioteleprinter station is also given by voice in English or by International Morse code (Section 97.87 (h)), the same "freedom of language" can be given to radioteleprinter operators as is given to radiotelephone operators. That is, availability of eight-level monitoring equipment should be no more necessary than availability of e.g., French-speaking monitoring personnel.

8) Amateurs are presently limited by Section 97.69 (a) to using a code which contains only 32 characters. This perhaps poses no severe handicap for casual conversation via the radioteleprinter mode, but neither does it provide for innovative work by amateurs. Four times as many functions are immediately available with the ASCII, and the potential is there for another 128 characters. For instance, it should be feasible to use an ASCII device directly with either slow-scan or regular television to add written messages in real time to a visual presentation. An amateur equipped with ASCII (which is compatible with computers) could transmit amateur satellite predictions directly from his computer to another amateur so equipped. Other amateurs could exchange network design parameters, computer to computer. Telemetry for future amateur satellites could profitably be designed around ASCII, if action were taken now to encourage amateur use and familiarity with this code and its associated equipment. In short, the potential for amateur experimentation is almost limitless if the rigid specifications are lifted.

9) Many amateurs have had to rely on the availability of surplus commercial and military equipment in order to operate by radioteleprinter. The supply of such equipment which uses the five-level code now authorized is dwindling; the supply of surplus or second-hand equipment using other codes is on the increase.

10) Under the amended rule which we propose, most of the additional equipment which amateurs would then utilize likely would be programmed for ASCII. However, to extend the greatest possible flexibility to the amateur service we are proposing that any of the standard codes in military or commercial usage be permitted. *Reference Data for Radio Engineers*, 5th Edition (1968), ITT, pages 30-37 through 30-44, lists these:

- Five-Unit Teleprinter Code (International Alphabet No. 2, along with U.S. Alphabets for Military Standard, Weather, FWX, and Telex, these latter codes differing from the International Alphabet No. 2 code only in that variances occur in printed symbols or machine functions in the "Figures" case of the teleprinter carriage)
- Moore ARQ Code (7-unit code)
- Bell System Information Interchange Code (7-unit code)
- IBM Data-Transceiver Code (8-unit code)
- U.S. Department of Defense 8-unit code
- USA Standard Code for Information Interchange USASCII (8-unit code)

11) Similarly, while the present speeds up to 100 words per minute would be adequate for much amateur work, we believe freedom of choice should exist for teleprinter enthusiasts as it is for amateurs using International Morse Code.

12) Just as most amateurs continue to use English in their amateur transmissions despite the right to choose other languages, many radioteleprinter enthusiasts will continue to use the five-unit code and their present equipment for some time to come. Most casual and contest work will remain centered on those techniques presently available for months or years. But the principle should be freedom of choice, freedom to experiment, latitude to "Contribute to the advancement of the radio art."

13) This is an age where technology is advancing at a more rapid rate than it ever has in the history of mankind. If an amateur is required to use only emission speeds, and codes in particular, which are rapidly approaching obsolescence, he could well be inhibited from becoming stimulated toward technical advancement. More importantly, advancement in the state of the art, as it applies to teleprinter, is more than inhibited – it is prohibited by the present language of Section 97.69 (a) and (b) – in conflict with the aims of Section 97.1 (b).

14) These premises considered, the League requests amendment of the rules as set forth in the appendix.

Respectfully submitted,

THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED

By Robert M. Booth, Jr.,
Its General Counsel

April 29, 1975

APPENDIX

1) Section 97.69 is proposed to be amended to read:

97.69 Radio teleprinter transmissions. The following special conditions shall be observed during the transmission of radioteleprinter signals on authorized frequencies by amateur stations:

(a) One of the standard codes in current or recent military or commercial use will be utilized, including but not limited to the 5-unit start-stop International Alphabet No. 2, Moore ARQ Code, Bell System Information Interchange Code, IBM Data-Transceiver Code, U.S. Department of Defense 8-Unit Code and USA Standard Code for Information Interchange (USASCII).

(b) Reserved

(c) (No change from present language)

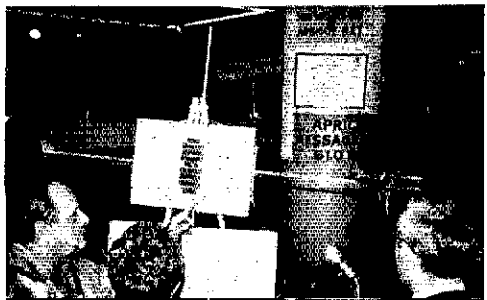
(d) (No change from present language)

AMATEUR RADIO WEEK

The Hon. Hugh L. Carey, Governor, has proclaimed the week of June 23-29 as Amateur Radio Week in New York State. The paper specifically recognized the training aspects of Field Day June 28-29 as well as the general public service communications of amateurs.

Englewood, N.J., by its Mayor, Walter S. Taylor, also declared Amateur Radio Week, June 22-28 – by now a firm tradition for that city! It, too, primarily recognizes Field Day, with words of praise for the exploits of the Englewood Amateur Radio Association.

In another continuing tradition, Amateur Radio Week in Ohio came the last full week in April, partially in recognition of the Dayton Hamvention. Cleveland, Ohio, celebrated its Amateur Radio Week March 31-April 5, particularly honoring the Apricot Net.



Oscar was on display in Cleveland at the American-Canadian Sportsmens Show. Apricot Net chairman Bill Zahuranec, WA8LIP, points out features to the crowd. *(Photo tnx to K8ONA)*

MINUTES, EXECUTIVE COMMITTEE MEETING
No. 353 May 14, 1975

Pursuant to due notice, the Executive Committee of The American Radio Relay League, Inc., met at the headquarters offices of the League at 2:30 P.M., May 14, 1975. Present: President Harry J. Dannals, W2TUK, in the Chair; First Vice President Victor C. Clark, W4KFC; Directors Roy L. Albright, W5EYB, Max Arnold, W4WHN, John R. Griggs, W6KW, and Robert B. Thurston, W7PGY; and General Manager Richard L. Baldwin, W1RU. General Counsel Booth and a number of other directors and vice directors of the League were also present.

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

Broken Arrow Amateur Radio Club, Broken Arrow, Okla.; Brooklyn Technical H.S. Amateur Radio Club & Society, Brooklyn, N.Y.; The Brown University Radio Club, Providence, R.I.; Calaveras Amateur Radio Society, San Andreas, Calif.; Cedar Shoals H.S. Amateur Radio Club, Athens, Ga.; Central Ohio DX Association, Groveport, Ohio; Charles River Wireless Society, Walpole, Mass.; Cherryville Repeater Association, Quakertown, N.J.; Cincinnati Area Ten Tuners, Cincinnati, Ohio; Cincinnati Chapter - O.M.I.K. Electronics Association, Cincinnati, Ohio; Dam Site Amateur Radio Club, Warsaw, Mo.; Duquesne University Amateur Radio Club, Pittsburgh, Pa.; Eastern Mennonite College Amateur Radio Club, Harrisonburg, Va.; Edward H. White Sr. H.S. Amateur Radio Club, Jacksonville, Fla.; Fargo Repeater Association, Fargo, N.D.; Great South Bay Amateur Radio Club, Lindenhurst, N.Y.; Jay Amateur Radio Society, Portland, Ind.; Kelso-Longview Amateur Radio Club (KLARC), Longview, Wash.; Kentucky Amateur Radio Association, Louisville, Ky.; Lake County Amateur Radio Society, Lucerne, Calif.; Madison Area Repeater Association, Madison, Wis.; Maple Hill H.S. Amateur Radio Club, Castleton, N.Y.; Marshall H.S. Amateur Radio Club, Marshall, Mich.; Menomonee Falls Amateur Radio Club, Menomonee Falls, Wisc.; Metro Amateur Radio Club, Chicago, Ill.; Miami Valley F.M. Association of Amateur Radio Operators, Inc., Dayton, Ohio; Museum of Art, Science and Industry Amateur Radio Club(M.A.S.I.), Bridgeport, CT; The New Brunswick Amateur Radio Association, Inc, Rothesay, N.B., Canada; North Florida DX Association (NFDXA), Jacksonville, Fla.; Northwest Ohio Amateur Radio Club, Lima, Ohio; Nova Scotia Amateur Radio Association, Sydney, N.S., Canada; Oak Ridge Youth Amateur Radio Club, Oak Ridge, Tenn.; Orange County Amateur Radio Club, Cornwall, N.Y.; Port City Amateur Radio Club, Inc., Portsmouth, N.H.; Prescott Amateur Radio Association, Prescott, Ariz.; Radio East Texas State University, Commerce, Tex.; Rag Chewer's Radio Club, Cedar Rapids, Ia.; Shawnee Amateur Radio Club, Bloomfield, Ind.; Slemon Park Amateur Radio Club, Sackville, N.B., Canada; South Orange Amateur Radio Association, Laguna Niguel, Calif.; Southern New England DX Association, Bellingham, Mass.; The "807" Club, Kokomo, Ind.; The Thomas A. Edison Amateur Radio Association, Edison, N.J.; The University Amateur Radio Club,

Johnson City, Tenn.; Trenton State College Radio Club, Akron, Ohio; University of Akron Amateur Radio Club, Akron, Ohio; University of Lowell Wireless Society, Lowell, Mass.; WELI Amateur Radio Club, Hamden, Conn.; Westchester Emergency Communications Association, Rye, N.Y.; Western Mass. AREC Repeater Assn., Springfield, Mass.; White Water Valley Amateur Radio Club, Richmond, Ind.; Wisconsin Lutheran H.S. Electronics Club, Milwaukee, Wisc.

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

On motion of Mr. Thurston, unanimously VOTED to grant approval for the holding of a West Virginia State Convention in Jackson's Mill on July 5-6, 1975; an Oklahoma State Convention in Oklahoma City on August 2-3, 1975; a Southwestern Division Convention in Tucson, Arizona, on April 9-11, 1976; a Central Division Convention in Milwaukee, Wisconsin, on July 9-10, 1976; a Northwestern Division Convention in Seattle, Washington, on July 29-31, 1977; a Midwest Division Convention in Wichita, Kansas, on October 14-16, 1977; and, in confirmation of an earlier mail vote, approval for the holding of a New England Division Convention in Boston, Massachusetts, on September 10-12, 1976.

On motion of Mr. Albright, unanimously VOTED to authorize Barbara Camp to sign checks on League depositories on behalf of the Treasurer.

During the course of the meeting the Committee discussed, without formal action, use of the AC prefix for W1AW during the bicentennial, non-refundability of Life Membership dues payments, closing dates for receipt of SCM nomination petitions, announcement of winners of *QST* Cover Plaques, and distribution of guidelines for approval of club affiliation applications.

There being no further business, the Committee adjourned, at 4:18 P.M.

Respectfully submitted,
JOHN HUNTOON, W1RW
Secretary

MINUTES OF THE 1975 MEETING OF THE BOARD OF DIRECTORS THE AMERICAN RADIO RELAY LEAGUE, INC. May 15-16, 1975

1) Pursuant to due notice, and to the action in Minute 19 of the Annual Meeting, the second meeting of the Board of Directors of The American Radio Relay League, Inc., convened at the Holiday Inn, Hartford, Connecticut, on May 15, 1975. The meeting was called to order at 9:31 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
Charles M. Cotterell, WØSIN, Rocky Mountain Division
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
John C. Sullivan, W1HHR, New England Division
Robert B. Thurston, W7PGY, Northwestern Division
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 and Carl L. Smith, WØBWJ, Vice Presidents; and Richard L. Baldwin, W1RU, 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; Edmond A. Metzger, W9PRN, Central; John H. Sanders, WB4ANX, Delta; George A. Diehl, W2IHA, Hudson; Richard W. Pitner, WØFZO, Midwest; John F. Lindholm, W1DGL, New England; Donald B. Morris, W8JM, Roanoke; Ted R. Wayne, WB4CBP, Southeastern; Jay A. Holladay, W6EJJ, Southwestern; and Jack D. Gant, W5GM, West Gulf. There were also present Honorary Vice Presidents R. O. Best, W5QKF, Robert Y. Chapman, W1QV, and F. E. Handy, W1BDI; Secretary John Huntoon, W1RW; Treasurer David H. Houghton; General Counsel Robert M. Booth, Jr., W3PS; Canadian Counsel B. Robert Benson, VE2VW; Communications Manager George Hart, W1NJM; Senior Assistant Secretary Perry F. Williams, W1UED; *QST* Technical Editor Doug DeMaw, W1CER; Assistant Secretary David Sumner, K1ZND, and Public Relations Consultant Don Waters.

2) On motion of Mr. Price, seconded by Mr. Shima, unanimously VOTED that Item 5 of the Agenda will be, "Receive reports and consider recommendations of committees," and that Item 6 is deleted.

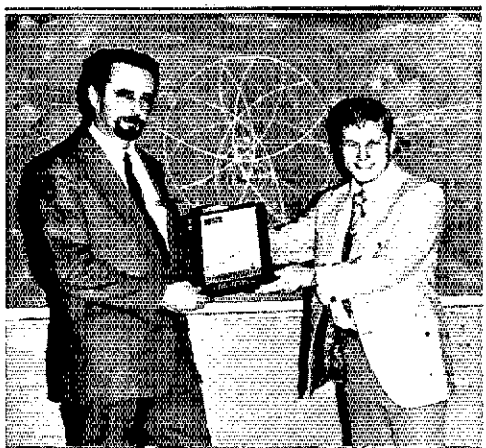
3) On motion of Mr. Thurston, seconded by Mr. Gmelin, unanimously VOTED that the minutes of the 1975 Annual Meeting of the Board of Directors are approved in the form in which they were issued by the Secretary.

4) At this point oral reports were offered by the officers, general manager and counsel of the League, during the course of which the Board was in recess from 10:00 to 10:18 A.M.

5) Mr. Albright, as Chairman, presented the report of the International Affairs Committee. Mr. Thurston, as Chairman, presented the report of the Plans and Programs Committee.

6) The Board was in recess for luncheon from 12:36 P.M. to 1:49 P.M., during which period those in attendance were provided a preview of a new half-hour color videotape on the subject of the classroom training using the Oscar satellite, being produced for loan to schools for space educational purposes.

(Continued on page 152)



Allan A. Simpson, VE4AS, earned the November 1974 Cover Plaque Award for his *QST* article, "A Two-Band Delta-Loop Array for Oscar." Making the presentation (at right) is Manitoba SCM Steve Fink, VE4FQ.

NEW LIFE MEMBERS OF THE LEAGUE

David A. Abell, KP4EBR; Michael Abitz, WBØDMK; Lee Abrams, WB2CUW; Jack J. Ammann, Jr., WA5NAD; Ken Anderson, K7LDZ; Robert B. Annas; Joseph Arnone, Jr., K2MZE; Robert E. Ashburn, WB2LZN; Charles W. Atchison, WA5TKU; Dean Bailey, WAØUHW; Thomas W. Barker, W7MTB; John L. Bass, W6ATF; Dennis R. Baumgarte, WB2NKN; George R. Bell, WB4GHZ; J. Wallace Bell, K4IOQ; J. D. Bennight, K4GKJ; Gordon B. Bergum, W7ADM; Daniel J. Black, WB9DCV; Jeffrey D. Blair, WB5DYB; David R. Blaschke, W5WZQ; Fred W. Bopp, Jr., WA1DTN; William E. Bordy, WA8VVI; John H. Bott, K7SUJ; Philip P. Brankin, K9UAA; Kenneth Bratz, WA5JUM; John W. Brogden, W3VDL; Edwin R. Brookman; Dwight M. Brown, W5ABA; Hiram F. Brown, W2YSM; Jere D. Bruning, WAØUQA; Joseph P. Bruno, WB2VVS; Warren W. Buchanan, WAØLEM; William G. Buchholz, K8SYH; Patrick L. Burt, W4OFO; Hugh Cabeen, WØOGN; Lloyd J. Cabral, WB6TRR; Duane A. Calvin, WB2HDS; Stephen M. Carson, W7EOT/KH6; John B. Caulfield, KØFUZ; Arnold L. Chase, WA1RYZ; Timothy N. Colbert, WA8MLV; Jeffrey C. Collins, WB5FIO; Clarence E. Conn, K7DUE; Willard O. Conrad, K4BE; Theodore J. Conway, W4EII; Harry L. Cook, WB8ORE; Paul A. Cooper, K6LTJ; Robert G. Copeland, W1HDA; Robert F. Creswell, K8KHL; Alan R. Crumley, KP4BJU; Charles E. Curle, Jr., W4TDZ; John Blair Curtis, WB8AHH; Thomas R. Custer, W7ZBS; John F. Davis, WA8YXM; Austin P. Davitt, K1MHD; Franklin M. Davy, WA2EXU; Richard A. Decker, WA2AJS; Louis V. Derby, WBØIAR; Miles W. Detling, WA8ZWO; Lorin L. Dobson, WAØRIQ; Robert N. Douglas, W5GEL; Kelly J. Drake, WA6GHH; Daniel G. Drath, W6QNB; Glen J. Drellishak, WB8NAT; Carl I. W. Durban, K8LMK; Lester Dwyer, W4ZJX; Warren D. Dyckman, WA2CAC; Fred C. Easton, W9JQH; Raymond C. Eberly, WB4ECL; William E. Ege, WB9PPE; Lyman B. Ellis, WB6PLZ; John Ely, WØEMA; Charles L. Fair, W7ZMH; Edward A. Finzi; James H. Fisher, Jr., WB4AMU; Vernon H. Fix, W4THN; James N. Fong, WB9FID; Gilbert C. Ford, W7OXD; Charles J. Forsyth, WB4CGX; Eric Foster, WA3TXV; Bruce Fried, K5YXN/5; Elmer P. Frohardt, Jr., W9DY/W9GFF; Barry S. Fromm, W8FYP; Arthur Fugate, W8GFH; Paul J. Furman, WB4ECE; Michael Gallagher, WA5FJV; Ramon F. Gandia, KL7GDO; Philip G. Garrahan, W6LQC; Rudolph M. Gibbs, W4HX; Terrence J. Gilles; Osamu S. Goda, WA6JRA; John H. Gold, WB2AFS; J. Richard Goldstein, WN6AYA; Frank L. Gore, K6RTZ; Mike Grambsch, WB9BPO; Jonathan D. Griswold, WA7RXU; William H. Hammer, WB6NAF; Shozo Hara, JA1AN; David R. Hardman, WA6BQF/6; H. Alan Harp, WA4SVH; Paul T. Harrenstein, WA7OKQ; William E. Hart, W7DJM/W6QAT; James M. Hartley, Jr., W2CXC; John Hauner, WAØYPY; Hank H. Hay, W5TF; Lawrence A. Heintzman, WA9ZDT/DA1LH; Ivan P. Hersh, K2KNL; W. F. Herzog; George R. Hicks, Jr., W1HUB; James A. Hildreth, VE3BZQ; Melvin R. Howarth, VE3DEE; Douglas J. Huggard, WB6AJX; William E. Huntenburg, Jr., WA2LQA/ZL2BGI; Charles T. Huth, WB8NLM; Ronald Hutsel, WBØJAE; Liberato A. Iannone, WA3VHB; Charles W. Irwin, DJØHZ; J. Stephen Jarrett, K4CFB; David L. Jensen, WA6HXF; Paul Kanniainen, WB2PYU; Richard D. Kaplan, WB2CUT; Audie Kaufman, WB2TLD; Charles L. Lum Kee, KH6HLU; Laurence R. Kinney, WA6HOB; Kay W. Klages, WB4GIO; David A. Kolb, K8IKD; Edward P. Kuklinski, WA2GPF; John Kurschner, W2OBN; Arthur S. Lake, W1YOL; Dennis M. Lampe, WA8KIY; Hardy K. Landskov, W7KAR; Craig Larsen, WA7HTN; William H. Launer, WBØCLD; Victor Leroi, VE5VL; Arthur E. Lewis, W3TV; Gerald W. Loban, W7BPE; Mark A. LoBosco, W2YTR; James K. Lucas, WA6UZP; Cornelius A. Lucey, W2TFS; John A. Magan, WAØZPP; Charles R. Marlow, WB8CNN; John Marrin, WA2IEU; Donald V. Mason, WN6FUS; Sherwood W. Mathis, WNØNXI; William B. Mayes, WA7PQU; David J. McElhinney, WA7AKR; Terrence J. McGraw, WA2UDG; E. J. McHale, WA1SLE; James P. McHale, WA1QOS; A. L. McIntosh, K7AL; John D. McMillen, Jr., KL7HSA; Glenn P. Menzie, W3GTB; James R. Meyer, WAØDSG/WB9DUI; Richard E. Miller, WBØNSE; E. Clifford Milliken, Jr., K1ADC; Luther C. Mitchell, WA4MER; Kiyoshi Mizoguchi, JA1BK; George T. Moore; H. P. Mogensen; Stephen J. Momot, K3HBP; Hugh W. Morgan, W4VAB; Wilfred C. Morin; G. Staten Morris, WA9YKM; Howard O. Morse, Jr., WA3LVA; Andrew G. Nelson, Jr., K3JNF; Philip A. Nevels, WBØGTX; David Novoa, KP4BDL; Barclay G. Nutter, VE3HAH; George K. Ono, K6FNS; E. A. Osberg, VE7AXJ; Ray G. Overman, Jr., WB6STL; David H. Packard, W7MNS; B. J. Perkins, W5URH; Dwight E. Perkins, WA1EPK; Robert L. Peterson, W6PXT; Arthur F. Petzold, WA2PEY; Steven D. Pfander, WA3RHX; Robert L. Pierce, WBØCGJ; Walter N. Pike; Don Pippin, VE3DOP; Robert A. Prahin, W8DIL; Thomas Pusateri, W9NBG; Jacob L. Ritzen, Sr., WØJHY; Robert E. Roberts, K6VK; Catherine B. Rochlitzer, W7OBH; William N. Rohrer, W7ZFY; Ray A. Rosenberry, K8EBF; Clayton E. Ruth, WB9IWO; Fred Ryan, K4YEH; Linda J. Saunders, WA4HKP; Jerry Scapperotti, WA2LTZ; Robert W. Schenck, WB2RJJ; Harold Schmidt, K2JYK; L. Dennis Shapiro, W1UF; Jesse D. Sheinwald, WB2CAN; Howard I. Shieber, W7JQL; Robert B. Showalter, WA8ZXF; Gerald G. Skeen, K8AON; Larry R. Smith, WA4YYU; Merrill S. Smith, WØEIA; Randall S. Smith, VE2BYG; Eric L. Smitt, K3YWJ; Richard A. Spohn, WB2GXM; Lawrence Staats, WB9HOB; W. R. Staples, W4SME; David M. Stephens, WAØQMT; James M. Stitt, WA8ONQ; Melvyn S. Stoller, K2AOQ; Stephen F. Sturgis, WA1MFB; Henry Suydam, WA2TQO; Edmund Tagliamonte, WB2OKS; Edward T. Tanton, WA4BAA; Frank L. Taylor, WB6SAE; John J. Thilmany; Robert W. Thompson, K6SSJ; Morris B. Tillotson, W4OKN; John Van Lear, YB7AAA/VE7IR; Gary F. E. Vrooman, W8ARH; Donald S. Walch, WBØHHC; Cleo Wallace, WB4DLJ; W. Stanley Wartenberg, W2ET; Thomas H. Way, K4EIA; Robert G. Wheaton, W5PKK; Bert M. White, VE3DUS; Douglas C. Widmann, WB2YXY; Lawrence C. Widmann, W2WRS; Donald R. Wilson, K2DSV; Gregory J. Wilson, K4FJC; Jack Wineberg, WA9YAQ; Abram L. Winters, WB8SOC; Barry L. Wollman, WA1KVI; Johnny Wood, K4JEY; Tom Wrensch, WB9DRH; Joseph J. Yafchak, W3GRU; Charles Young, WA5VNV; Joseph Zink, WA2ZTV;

Correspondence From Members-

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

NOT MONEY MAKERS

● In his letter in "Correspondence" (May, 1975) my friend Joe Price, W4RHZ, unfortunately and unnecessarily questioned the integrity and amateur nature of repeater operators and repeaters in the greater Cincinnati area. While it may be proper for Joe to suggest that we reconsider the form employed by repeater club members in paying for the costs of repeater facilities (such as autopatch), as a repeater and hf operator I feel it necessary to correct the misinformation his letter contained.

Is it unique for repeater club members to pay for the cost and operation of their repeaters? The autopatch and other services that may be added to their repeaters? No more so than it is unique for any club to include in its dues a fee for a hf or non-repeater vhf station. And, no more unique than for Joe . . . or me . . . to pay for the installation and operation of our own stations.

Is it unique for repeater club members to pay total dues that exceed the actual cost of paying for equipment and services charged by the telephone company, for example, to the club? No more so than it would be unique for a non-repeater club to receive total dues in excess of the amount needed to pay for the administrative costs of the club, and the equipment and upkeep of a non-repeater hf or vhf station. After all, who is to say that as one of its goals, the non-repeater club, or the repeater club, is preparing to buy and install additional equipment or new or better equipment to replace existing equipment when it is no longer operational.

In Joe's letter it was clearly stated that "commercial two-way radio service companies own so many amateur radio repeaters." Having experience in operating repeaters in only some 100 cities throughout the U.S., I admit that I cannot speak for repeaters outside of greater Cincinnati. I can categorically state, however, that none of the repeaters in this area are owned by commercial enterprises — radio or otherwise. It is true that the founders of three local repeater groups included radio amateurs who happen also to be in the two-way communications business. However, to accuse them merely on the evidence of being interested in furthering the state of 2-meter fm repeater communications of having commercial interest in the repeaters is totally unfounded. Actually, it is quite naturally through such amateurs that much of the technical information on repeater operation was gained so quickly. And, because considerable technical information was so readily available, Cincinnati area repeaters enjoy state-of-the-art status second to none.

As to his claim that the "commercial two-way radio service companies" sell so much gear to amateurs, that simply is not so — at least in greater Cincinnati. Of the three two-way businesses whose amateur-owners are associated with repeaters, two have never been in the amateur market. The third makes limited equipment available to amateurs solely for their convenience.

As a final comment, I am aware of no repeater in greater Cincinnati which is not "open" to all amateurs. Habitual users of any repeater probably will be invited to join the club, but if they choose not to join, they will not be "kicked off" the machine. Use of special features, such as autopatch, usually is limited to members, or to non-member with the assistance of members. Even this "restriction" is not unique to repeater clubs. The non-repeater clubs of which I am aware limit use of their hf and vhf stations to members, as well.

Greater Cincinnati repeaters money making schemes? You can bet Samuel F. B. Morse's memory they are not!

W4RHZ has done much to foster amateur radio and is dedicated to amateur radio. It is unfortunate that he chose to expound on the operation of greater Cincinnati area repeaters when because of his choices of operating modes he has little, if any, familiarity with them. It is, therefore, understandable that he is so highly uninformed of the facts concerning their operations. — *Jim Weaver, WA8COA/WA9FEW, Forest Park, OH*

WORTH PONDERING

● Suggest all ponder — ham bands for hams and new hams (ex-CBers), or ex-ham bands for CBers. — *R. Beck, K2GS, Parlin, NJ*

WHAT HAS HAPPENED?

● What has happened to the classic ham radio operator? What is going on? Twenty years ago as a teenager I could find a ham just by walking into a crowd and asking if there were any around.

I have turned up two in this community of 4,000 and there is one ham at church (from Brian, Ohio). None of them are enthusiastic about bringing some new Novice into the fold. In fact, all I have heard is the great cost of equipment (not under $75 for the cheapest receiver kit).

I am still trying to figure how to come up with the $30 to $40 for the 80-40-15 meter receiver I would like to build after I have learned what I will need to know so I can build something.

I don't need a Swan or National all-wave, all-functional, fully chromium plated megawatt station. I just want someone I can go to for help and guidance because I have a lot to learn, and that means the math and all of its related symbols too. Sometimes I feel like I am in the wrong age.

Where is the pride in building with your own hands?

Where is the enthusiasm — the comradery that I know once permeated the realm of the radio amateur? — *Thomas H. Aungst., Albion, IN*

BICENTENNIAL PREFIXES

● Ref the "Centennial Call signs," in "Happenings of the Month," *QST* May 1975, page 89.

Won't this confuse the deuce out of the DX chasers! W3PT becomes AC3PT, and is this Sikkim, Zone 22 – and W4YN now becomes AC4YN, shades of 25 years ago from Lhasa, Tibet, Zone 23! Gotta run now, cause I gotta practice up on AC7YF! Di-dah Dah-de-dah-dit Dah-dah-de-de-dit. . . ! – *Jack Wichels, W7YF, Lynnwood, WA*

● Is there any way to stop this Bicentennial "Alternate" prefixes before it starts in 1976?

Why should I exchange a perfectly good single letter prefix for "AC4"? I not only PREFER the single "W", but I'll be darned if I see any sense in putting me over in Lhasa, Tibet, which I always supposed was rare DX. Who is going to buy new callbooks (if such are even issued?) especially now that we have to float a VA loan to buy a current copy? What knucklehead figured out that it would advertise the Bicentennial, or add luster to the 200th anniversary?

Have fun – join Navy MARS and learn to stutter with the latest call sign change from N0 to NNN0 – with phonetics required!! We use call signs like names. Let's quit monkeying with changes – at least not until there is a real need for change. – W. H. Kibbe, W4CCD, Clearwater, FL

[EDITOR'S NOTE: The alternate prefixes authorized by FCC for use by U.S. amateurs during 1976 are just that, available for use at the option of the individual amateur. Those preferring to use their regular calls may do so.]

A BAD FEELING

● I am a teenage Novice Class operator and I think of the fact that even when I gain my General – which I hope to do in June – with all the new and broader privileges I will be given, I still won't have gained one no matter what class I am in until I am at the age of 21. I'm sure you can guess that I am speaking of the right to administer Novice and Technician exams taken by mail. Speaking on behalf of all the teenage hams who will be in the upper class slots in the future and those up there now, this really makes us feel *bad*! Evidently we are not old, mature, and/or honest enough to oversee an exam taken by mail. Right? Wrong! I say we *are!* – *Jim Spikes, WN5NJZ, Ridgeland, MS*

BOLD IDEA

● The bold black type on the edge binding of *Specialized Communications Techniques* is great. Very legible. I'd like to see this carried over to your other books as they are revised. – *David D. Holtz, WB2HTH, Rochester, NY*

PRESERVING OUR PAST

● A ghost has come into my shack tonight. I have politely asked it to leave, but it remains. It is a real ghost. I know it is real, for even now I hold it in my hands. It looks like a crumbled, tattered slip of paper, but closer examination shows it to be a relic of days long past. My ghost is an original program from the very first ARRL National Convention, which was held in Chicago, in the late summer of 1921.

Why has this ghost come to haunt me tonight? Why does this ghost bother me? What do I care about the past it represents? It belongs in the hands of some old-timer, some senile old geezer who is forever boring others with talk about the "good old days" of amateur radio, of "200 meters," of "King Spark." This ghost does not belong here, in my 23-year-old hands, in this solid-state, prepackaged shack. But it remains, and I have no choice but to turn its pages.

Maxim! Schnell! Deloy! I am suddenly surrounded by the spirits of men long gone, by those 1200 radio amateurs attending this convention which for the first time, found amateurs from each of the then nine radio districts together.

Yet, as these amateurs were symbolically united for the first time, the world of amateur radio in which they had matured, that of 200 meter spark, was in its twilight. Already, amateurs were turning away from spark, to the narrow-band "Continuous Wave." Amateurs were experimenting with the "shorter" waves. Within a year American amateurs were heard in Europe. Within two, the first European-American QSO took place. At this first ARRL National Convention amateurs stood on the very eve of their greatest achievements! Truly a glorious time!

And then I feel as if I had lived through this age! I find myself there at this first convention where West and Stone had their famous debate! I am there watching as an amateur discards his spark and turns to a 5-watt UV-202 cw rig. I am there listening to the Transatlantic tests, and I am there listening to the greatest achievement of all, the first QSO between European and American amateurs. Then I find myself in the present, holding this remnant of days long past.

Why has this ghost come to haunt me tonight? What do I care about the past it represents? The answer is clear. That first convention was held 54 years ago. 54 years! Certainly, the youngest participant there would today be in his late 60s. I suddenly realize that my generation of amateurs will be the last generation to have direct contact with these first pioneers of radio. How can I make my generation, and future generations, feel the thoughts that I have felt tonight? How do I tell them about these first pioneers who not only built their own equipment, but often built their own components as well. When that first generation is gone, will my generation be able to communicate this spirit of amateur radio to succeeding generations without the guidance of our original group?

The time has come for the ARRL to build an historical library. This library would not only contain a museum of radio equipment, but would also include historical documents, all types of amateur and radio publications, even early club bulletins, logs and QSLs of this first generation of amateurs. In brief, a place where historical research could be done.

The time is rapidly growing short. As each day passes, these original pioneers grow fewer. Each day, historical material is thrown out of attics after "granpa" has gone to greater rewards. Let us try to save what is left. Future generations will surely thank us.

The ARRL Board of Directors is already studying the feasibility of building a library on the grounds of its Newington headquarters. Let us all, young and old, encourage it at our radio clubs, in our nets, and in our letters to our ARRL officials. Above all, let us finance it when asked. Perhaps it seems strange that this plea should come not from some old-timer, but from one relatively young. But until this first ARRL National Convention Program lies within the library walls, I will forever be haunted by its ghost. – *Phillip M. Sager, WB4FDT, Arlington, VA*

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

REGION III ASSOCIATION HOLDS CONFERENCE, ADOPTS WARC PLANS

The third Conference of the IARU Region III Association was held March 4-8 at the Lee Gardens Hotel, Hong Kong, by invitation of the host society, the *Hong Kong Amateur Radio Transmitting Society*. Region III comprises Asia (except the USSR) and Oceania (except Hawaii). Participants in the Conference included the representatives of nine member-societies, the president of the IARU (VE3CJ), three directors of the Region III Association (JA1BK, VK3KI, and ZL2AZ), and the secretary (VK3QV/9V1RH).

The most important item on the agenda was the forthcoming ITU World Administrative Radio Conference, and most of the subjects discussed had some relation to this topic. The policy adopted by the Region III Association essentially mirrors the position discussed on page 9 of *QST* for December 1974. Anticipated growth of the amateur service to one million stations worldwide by 1982 and the increasing use of telephony are seen as justifications for additional allocations to the amateur service in all Regions. The merging of the amateur and the amateur-satellite service is seen as desirable, as is the seeking of amateur allocations in all parts of the spectrum up to at least 275 GHz. The possibility of a worldwide amateur allocation at 220 MHz, now allocated to amateurs only in Region II, will be investigated.

There was recognition of the need for international coordination of the use of some portions of the vhf and uhf bands to avoid conflict in space operations. With this exception, band plans for these frequencies may be national in scope.

The Conference urged societies to participate in a regionally-coordinated Intruder Watch system similar to the ones which have proven successful in Europe, Australia, and the U.S. The *Wireless Institute of Australia* will nominate a regional coordinator.

When it became apparent that increased Association activities in the years before the 1979 WARC would result in a budget deficit, the *Japan Amateur Radio League* generously offered to meet the anticipated deficit. The *JARL* has also offered to publish a "Region III News" periodically in order to improve communication between societies.

New officers of the Region III Association are: directors, ZL2AZ, VK3KI, 9V1OD, and JH3PJE; secretary, VK3QV/9V1RH. The next conference is scheduled for Bangkok about October, 1978.

REGION I DIVISION TRIENNIAL CONFERENCE MAPS WARC STRATEGY

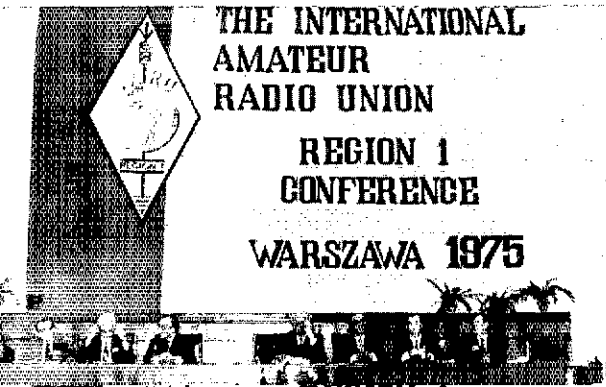
The Region I Division, representing amateur radio in Europe, Africa, and the USSR, held its triennial Conference in Warsaw on April 14-18. Thirty-five societies in the Region were represented, 27 in person and eight by proxy, and observers from Regions II and III were both present, including IARU President VE3CJ.

The Conference covered a broad range of subjects through a series of formal and well-disciplined meetings. Much of the work was purely Regional in scope dealing with operating practices, contests, the Intruder Watch, the beacon program, etc., and included the presentation of several scientific papers describing work done by amateurs in the area of propagation study. In preparation for the 1979 WARC, there were several notable accomplishments including the adoption of a position very similar to that adopted by Region III. There are some differences in the medium-frequency and lower hf range, as summarized below. The Region I Division seeks:

1. An exclusive amateur segment in the band 1800-2000 kHz.

2. An exclusive amateur segment in the band 3500-3800 kHz.

3. An exclusive amateur band from 7000 to



The opening plenary session of the IARU Region I Division triennial conference, Warsaw, April 14, 1975.

The new Executive Committee for the IARU Region I Division: (left photo, seated) Secretary G2BVN, Chairman PAØLOU, and Vice-Chairman SP5FM; (standing) members YU3AA, EL2BA, and DJ3KR. Treasurer SM6CPI is missing from the photo. In right photo, ITU Secretary-General M. Mili signs the *PZK* guestbook as outgoing Region I Division Chairman SM5ZD (back to camera) looks on.

7200 kHz.

4. Elimination of sharing with fixed service stations in the USSR in the 14,250-14,350 kHz band.

5. New amateur bands in the 10, 18, and 24 MHz regions, each one to be 500 kHz wide.

Upon the adoption of this position by the Conference, the vice president (N. Kazansky) of the Radio Sports Federation of the U.S.S.R., announced that he had already discussed this proposal with his government, and that his government has agreed that it will support the proposal. His announcement met with an enthusiastic response from the other delegates.

The Conference agreed that an amateur allocation will be sought from 220 to 225 MHz. Desired frequencies in the shf region were also agreed upon.

A new Executive Committee was elected which will serve until the 1979 WARC in order to maintain continuity of leadership. The Executive Committee was authorized to raise the dues for membership in the Division in order to finance the WARC preparatory work. (There are no dues for a society's membership in the IARU, but Regional Organizations may set dues at their option, and may waive them in cases of hardship.)

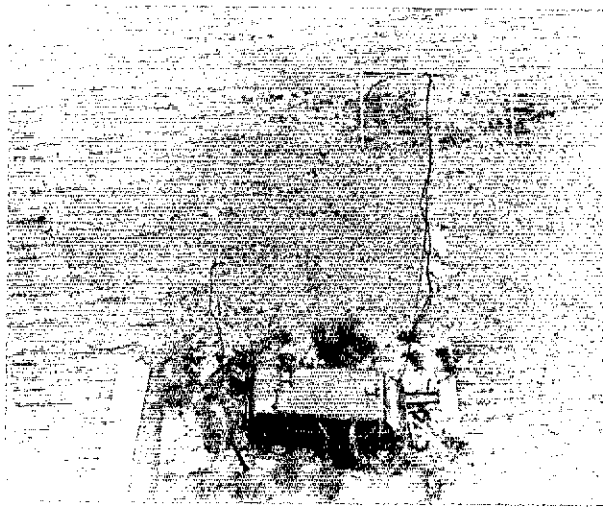
The *Polski Zwiazek Krotkofalowcow* hosted the Conference. The importance of this gathering of amateurs may be assessed by the following: the Polish government issued a special postage stamp and used a special postmark in honor of the Conference, and Mr. M. Mili, secretary-general of the ITU, accepted an invitation to come to Warsaw to open the Conference.

REGION II SCHEDULES CONFERENCE

The Executive Committee of the *Union Interamericana de Radioaficionados*/IARU Region II met in Miami on April 5-6 to plan its triennial Conference scheduled there for 1976. The Conference will be hosted by the *ARRL* with assistance from the Dade Radio Club and will take place in mid-April next year. Representatives from the other Regional Organizations will be invited to attend. QST

Strays

WA6MHZ took Field Day to the public, instead of the usual other-way-around. His one-twentieth scale model won first place at the Southern California Exposition in Delmar recently.



True Love

(Continued from page 63)

protective parents, who tend to view them as prospective sons-in-law. However, with Bill, I guess I was a bit secretive, and my mother's subtle questioning proved futile. "How well do you like this one?" "A lot." "What do you talk about?" "Things." "Does he like you?" "Seems to." "Hasn't he said anything about future plans?" "Okay Mom. You might as well know. Very soon, we're going away together to a cold-water flat in the absolute worst district in San Francisco to live in sin. Maybe we'll have some illegitimate kids and teach them how to smoke pot and panhandle before they're six years old!" Of course, she didn't believe all this, but she wouldn't have believed the truth either – that we discussed electronics and tried to work DX on forty meters until the wee hours of the morning.

I remember the first theory lesson Bill gave me. "I think you ought to start learning about vacuum tubes," Bill said. "I'd rather neck," I said. "The test will be here in two weeks," Bill said. "Now a simple tube has two parts which current flows through; the cathode and the plate. . . ." "Fine," I said, "but what's current?"

Thus began my daily lessons on radio electronics. Poor Bill – with his dog-eared copy of the *License Manual* clutched frantically in his hot little hands, inadvertently saving it from being flushed down the toilet by a frustrated YL. Yet, despite my nightly hysterics, I learned a lot. I learned about half-wave antennas, QSL cards, repeaters, and block diagrams of receivers. I also learned how to spell schematic, that a microamp is less than an amp, that there is no good explanation of radio waves, and that the term "carrier" has nothing to do with tuberculosis or pigeons. As a matter of fact, I was beginning to feel like I knew everything! But then Bill had to spring it on me: the all-important Ohm's Law.

Be It Ever So Humble . . . There's No Place Like Ohm

There are two ways of learning Ohm's Law: the hard way and the traumatic way. The hard way involves the equation at it's barest: E=IxR or I=E/R or R=E/I. It doesn't look too bad if you were a trig major at Cal. Tech. So, being a math flunkie from Camelback High, I was forced to learn the traumatic way, which involves tears, fights and logical assumptions which I was not willing to assume.

The multiplying part didn't rattle me a bit, but when it got into dividing, I got into trouble. Bill tried to simplify it with little mathematical tricks, but I am not mathematically inclined. Okay, so you have five ohms and four amps. What's the voltage? Easy! 20! But what if you have 100 volts and three amps and you want to find the ohms? Well, let's see. . . that would be 100/3. Or is it 3/100 – and oh I hope not, because that means decimal points! "How can I explain anything if you keep crying?" Bill would yell. "But even if you explained, I still wouldn't understand!" I'd sob back, "because I never learned how to divide!"

Silence. Would he finally give up and stop tormenting me? Would he make me write "Ohm's Law is fun" five hundred times? Or would he teach me how to divide? He would, and he did, and I finally learned to apply Ohm's Law. "All right, if Dick has four milliamps and Jane has sixteen volts, how many ohms does Baby Sally have?"

I've Been a Ham All My Life . . . and Never Had a License

After all the concentrated effort and dedicated studying, the actual written test was a bit anticlimatic. The real test was waiting to hear the results from the FCC. There was no way I could have passed, but Bill seemed totally undaunted! He even staged a dress rehearsal! "OK Wendy, I say 'CQ CQ CQ de K7UOP K7UOP K7UOP CQ CQ de K7UOP K7UOP K' – now, what do you say?" "I say you're being repetitious!" "No! You say K7UOP K7UOP K7UOP whatever-your-call-is WN7 whatever-your-call-is WN7 whatever-your-call-is. . ." "Wait a minute. Why are we doing this? I flunked, Bill! And I'm never gonna' be on the air, and I'm never gonna' talk to Japan, and I'm never gonna' make you proud of me!" But stubborn Bill would keep at it; "You're not thinking positive. Now, let's try it again. CQ CQ CQ. . . ."

Weeks kept passing, and so did the mailman. Finally, after realizing that the FCC had looked upon my test as a joke, which, after a good laugh, they threw away, I got my license – that little white piece of paper that you have to fold funny to make it fit into your wallet and signed by a dear Mr. Ben F. Waple. Had it been signed by God himself it wouldn't have been more important, for it means that I did it! I did something I never thought I could do. I became a Novice!

And that's the funny thing about Bill. I no sooner get the Novice, than he starts talking about a General Class License! But things will be better this time because of three things in my favor: I've got the confidence, I've got an interest, and I've got a wedding ring from Bill.

The End (and the beginning) QST

Strays

QST Contratulates . . .

Lt. Craig M. Nicholson, K7VEW, recipient of the Armed Forces Communication and Electronic Association Honor Award, in honor of attaining the highest class average in a Telecommunications class at the U.S. Naval Postgraduate School, Monterey, California.

Ernest E. Sullivan, III, WB6HDJ, who has been an active ham since age 13 and was recently named an appointee to the United States Military Academy at West Point.

Neal V. Latorraca, I0OUL/ON8UN, recipient of the Academy of Motion Picture Arts & Sciences' Elemack Company Class III award for his Spyder camera dolly.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

Your ARRL DX and Contest Advisory Committees in their studied wisdom have taken bold action to encourage use of radiotelegraphy among the faithful. Cw specialists were surprised to find themselves suddenly in Field Day demand last month, and now we anticipate an inpouring of applications for the League's new code-only DX Century Club certification.

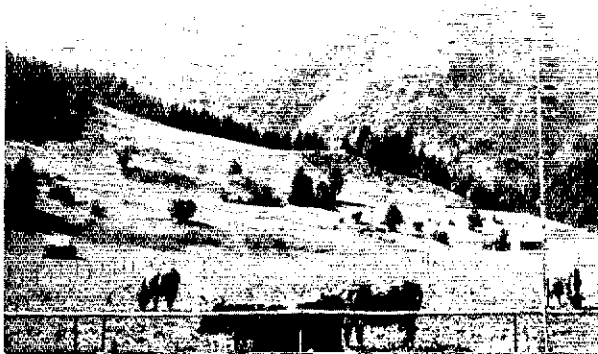
Cw equipments can be so inexpensively simple that manufacturers are hardly to be blamed for a current market preponderance of more complex voice-oriented communications apparatus. This radiotelephone accentuation naturally compounded cw's gradual QSB. Copying code in the barnwide speech passband of too many "modern" ssb transceivers is about as pleasurable as auditing birdsongs at Niagara Falls. Outboard peaked audio helps but is a 1920s-style compromise. Now maybe the factories will answer increased demand with more state-of-the-art radiotelegraph gear.

Oh, there are those who will say that cw isn't very state-of-the-art anymore to begin with, but most of 'em will be knocking something they haven't really tried. And becoming proficient with the key isn't easy for everyone. Rising population and rf pollution of our best high-frequency DX bands, however, points up radiotelegraphy's vital role in amateur radio's booming future. Cw is still by far the best weak-signal crowded-band communications tool in our entire emission arsenal. Good thing to keep it oiled and shining. Commercials, too, seem unready to forgo cw's obvious efficacy and dependability. Just tune marine and aircraft ranges near 6, 8, 12, 16, etc., MHz. and check the cw-help-wanted advertisement on page 134 of April '75 *QST*.

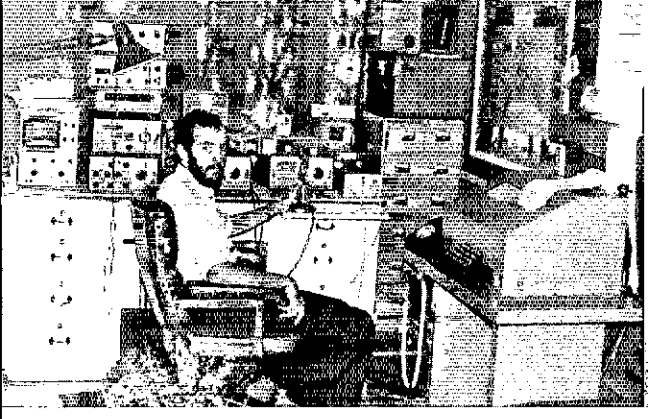
Where:

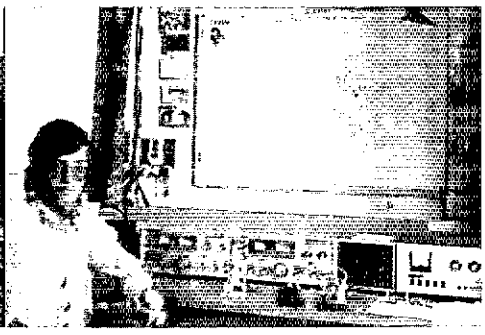
NORTH AMERICA – "QSLers of the Month" this month, each commended for swift card comebacks in "How's" mail from correspondents Ws 1CDC 1OPJ 8UUM/4, WA2HHO, WBs 2UFN 8FOS, WNs 2TAS 5NSR and ØONN, include CP1EU, CTs 1LN 2BN, FP8DH, FYØBHI, GC4CHY, GM3GJB, GW4BIQ,HBØAHA, HH2WF, HI8LC, HKSDER, IØAVC, JA1HHK, LB3P, LU8AKK, LX1BJ, OZ1LO, PJ9JR, TI2WX, UK2GKW, VPs 2KK 2LAW 5WW, VQ9M, WA8TFJ/YV6, XE2GU, YN1FWN, ZB2CJ, ZE1JV, ZF1AK, 4X4JV, 5TTs CJ FP and 6W8DY, plus QSL agents K9OTB, WAs 3HUP 9PZU and VE4SK. Any creditworthy candidates among your recent receipts? . . . Almost three years of DXing have given me some picture of QSL reliability at my end. I must vote the Bulgarian gang as the world's worst QSLers closely followed by Cubans. Most South American countries also show poor results. On the other hand DLs, OKs and YUs are the greatest. Best of all is the Azores, six cards from six CT2s worked! (VO1KE) . . . Cuba is no problem here with fresh QSLs from CM2GB, COs 5CN 7CC and 8CA, most on 7 MHz. (WN4JIA) . . . WB4EYX, QSLing for VP5WW, was good enough to take the trouble to find my logged contact even though I misdated my card. Bill sent his and asked for my corrected QSL, me a lowly WB2! (WB2UFN) . . . Glad to receive seventy QSLs in my last packet from the ARRL Bureau even though most were routine Europeans. (W1OPJ) . . . I handle the W/K/VE portion of FM7AQ's QSLing. I2YAE does the rest for Alick. I also have all my KG6SX logs. (K4KQB) . . . An eyeball QSO with WA2FQG at the IEEE meeting brought forth an envelope from the ARRL Bureau. He and his XYL do the "2H" portion. Very satisfying returns thanks to the foreign mint postage emporium of W2AZX. (WA2HHO) . . . I'm now handling QSLs for CR7BC, DM3OML, OK1ADM, TI8s PE PE/9, VP5NB, YN1s GLB JBL, 9Y4s SF and TR. (WA5GFS) . . . I formerly did QSL chores for KG4DS but the station has been reactivated with a new operator. I understand that WB8LUI handles his cards. (VE3BYN) . . . We offer our clerical services as QSL managers for any DX stations so in need. (WA3SZI, WB4QWM) . . . With persistence and patience I've managed 200 countries confirmed out of 212 worked. Not too bad a batting average compared to some I've heard about. (W1KLY) . . . I am not, repeat, not managing QSLs for 8P6AE despite ostensibly authoritative declarations to the contrary. (K9KLR) . . . 'Alp! Parenthesized brethren breathe breathlessly for tips toward QSL success with holdouts mentioned: (W1CDC) IT9RAN, VP7BA, YS1GWE, 8P6BU, 9J2XZ, 9Y4VU; (W1KLY) MP4BJP, TY1UF, UK2s FAM PAF, UP2BAW; (W1OPJ) 9G1AK; (W8LY) "ITU" managers WAs 1PID 2UWA; (WA2HHO) KS4CJ of '71; (WB2UFN) CP5AO '72, HR5JDC '73, OH2BX '72, UK2FAA

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



DA1GS contributes your QTH of the Month, a southern Bavaria location of restful rusticity. Greg, who signs K5EAT back home, has no trouble working the world with his one-sprout antenna farm, the simple vertical at right.





CR6GA (left) has an elaborate collection of DX gadgetry in Luanda. Jim also does extensive shortwave listening on a trusty HQ145. Nova Lisboa neighbor CR6OZ, licensed in '71, is nearing the 200-country mark and prefers 28 and 21 MHz when skip is in. *(Photos via WA3HUP, K1RQF)*

'72, YN1JAB '73; (WB4SXX) EI1AA, FY7AA, TF3IRA, UL7GI, 3A2CN, 5Z4MO, 6G1AA; (WB0KFY) KS6FA; (WN2TAS) EA4DX, G4CUN, FI2WX, VS6EK, XE1AV, YV6AVT; and (VO1KE) VP8NT. Any aid?

EUROPE – Worked 55 Russian stations in the past thirteen months with just one QSL to show for it. (W1CDC) . . . That's just about minimum transit time for two-way QSL exchange via the U.S.A.-U.S.S.R. bureau route, Alex. They should soon be showing up in quantity. (W9BRD) . . . Permit me to join in defense of the Box 88, Moscow, QSL bureau. It may be "a heck of a way to run a railroad" and to say it's slow gives it credit for being faster than it ever was, but the eventual return rate of the U.S.S.R. QSLs is one of the best in the world, certainly better than our own. (W8UUM/4) . . . To save myself much paperwork and increase on-the-air time I send copies of my log to OE3NH who responds with my QSLs via bureau. If self-addressed envelopes and appropriate International Reply Coupons are supplied, response goes back direct. (SV0WZ) . . . Use of the DA prefix in West Germany may be confusing to some. DA1 is shared by British, French and American forces, yet of the hundreds listed only a handful seem to be exceptions to the all-American rule. DA2s A through Q appear American, R through V French, W American and X through Z British. DA4s are conglomerate. We DAs could sure use a bureau. (DA1PK) . . . As of April 1, 1975, I am the new QSL manager for Marconi memorial station II4FGM. (I4BFY) . . . The *Callbook* can fool you on Corsican calls. Not its fault, but FC9UC may be listed as F9UC, etc. (WCDXB) . . . Continental tidbits via *DX News-Sheet*: DM3ø stations were D.D.R. commemoratives in April and may be QSLd via the East German bureau. . . . YUs will become YZs commemoratively through November, suffixes unchanged.. . . . The SSA bureau address is now Oestmarksgatan 43, S-123 42 Farsta, Sweden. . . . TK was a French commemorative prefix in May, numericals and suffixes the same. This included overseas regions, TK7MAQ being FM7AQ, TK7GAA-FG7AA, etc. . . . ON4QX vows 100-percent QSLing for his ON8ITU QSOs in May. . . . QSLs from 4K1C bear stamps commemorating the 20th U.S.S.R. Antarctic Expedition. . . . UA3ø, UB3ø, ad inf., were fresh Russian commemorative prefixes in April and May. . . . From April through June Swedish amateurs tried their commemorative 7S-8S prefix tacked on ahead of regular calls such as 7SM1AA. . . . UR2AR, Enn Lokht, Box 137, Tallinn, Estonian S.S.R., U.S.S.R. 200090, still welcomes inquiries about QSLs for the UK1ZF1 Franz-Josefland fling in 1972.

OCEANIA – I'm happy to try to confirm contacts made by other Johnston Island operators but it always takes some time. As Chief of Communications, Holmes & Narver and the AEC Pacific Area Test Division, I see many cards for contacts made by operators who were on the various islands for brief periods. Logs are not always in the best of condition. Also, I visit the islands only as need arises. I'm very sorry about the way most of the multioperator club stations are run, but it's impossible to deny so many short-time operators the privilege of hamming from KJ6-land and it's equally impossible to see that they properly sign their logs, etc. Cards arrive at KJ6CF in such quantities that we cannot bother about QSLs unaccompanied by self-addressed stamped envelopes or s.a.e. plus International Reply Coupons. With hundreds pouring in on each mail flight you can appreciate the mountain of work required just to handle those with appropriate enclosures. (KW6HF) . . . VR4DX, a philatelist, likes U.S. commemoratives with his QSLs but says they have a much better chance of getting through unscathed if under envelope cover. (DXNS) . . . From my new Australian address I'm still managing QSLs for K6CAA, FW8DY, KX6BK, VR3DY and my own KH6GLU activity. Still have logs for old VS5AA, ZK1s AJ and MA, too. Note, however, that I do not handle QSLs for FW8DA. (VK4ABA)

SOUTH AMERICA – Being unable to afford QSLing direct by sea or air I must use bureau routes which are admittedly slow. I've answered some cards that were dated two years back, so some poor guys may receive their OA6CV QSLs three or four years after QSO. But on receipt of just one IRC I reply airmail direct with one-day turnaround when possible. Those who want fast cards should send theirs with IRC direct to my Arequipa address. (OA6CV) . . . I continue to act as QSL manager for operators at Antarctica's Byrd, McMurdo, Palmer stations and Williams Field. (K2BPP) . . . My QSL service in behalf of YV5s BZX and ESN is on an s.a.s.e.-only basis. (WB2SFF) . . . HK5DER just has to be accorded super QSLer status. Rich came through with his card twelve days after QSO and returned my IRCs. (WN5NSR)

AFRICA – All cards sent direct to me are answered 100 percent for the calls 3Hs 6DA 7DA 8DA and 9DA. Please include customary s.a.e. plus IRCs. (3B8DA) . . . ZD8NC QSLing, only for contacts made in February-March last year, is done by K4KH. (SCDXC) . . . Been waiting several months now for 7X2BK's logs. Tell the gang to be patient until I can answer their QSL

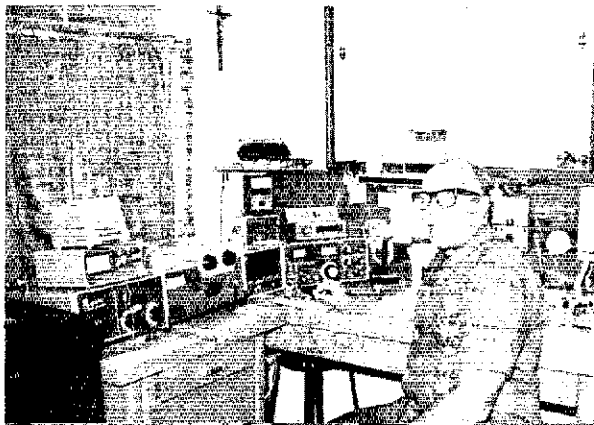
OA6CV's big DX thing these days is 75 phone but he says most W/K/VEs are too busy yakking with locals to heed weak breakers. This may change when George replaces his horizontal half-wave in Arequipa with a vertical. "Almost as much fun as firing up on old 160 as W9IAI some forty years ago!" George is KØWTM when up our way.

requests. (WA3HUP) . . . G3SS indicates that the Uganda bureau is not cleared very often, a considerable backlog on hand especially for former 5X5s. (WCDXB)

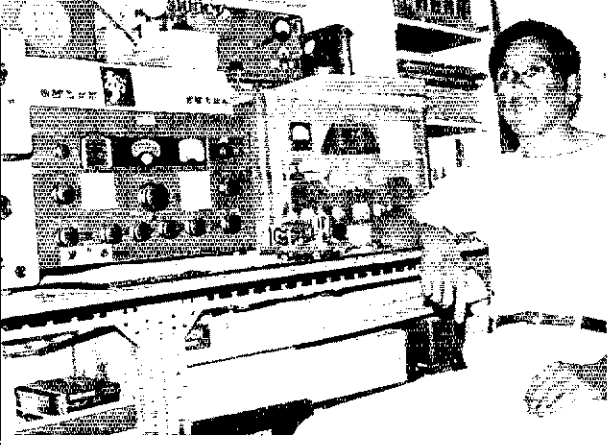
ASIA – AP2KS reminds us that International Reply Coupons are usually not redeemable unless they are properly stamped by the issuing post office. (WCDXB) . . . Bangladesh authorities, naively suspicious of amateur radio activities, cause PAØIWH/S2 to request no further mail be sent direct to his Dacca address. QSL instead to his Netherlands QTH. (VERON) . . . XU1DX logs were spirited out of Phnom Penh in the nick of time and are now in the able hands of manager W1YRC. Vong of XU1AA is reported under detention. (WCDXB) . . . HZ1AB QSOs made by guest operator DJ9ZB may be QSLd via the latter's address but be advised that DJ9ZB is not QSL manager for other HZ1AB contacts. (VERON) . . . Here we go with the month's bag of individual specifications but be aware that all suggestions are not necessarily either accurate, complete or official:

AP2AC, Box 65, Lahore, Pakistan
C5AG, Box 165, Banjul, Gambia
CR8AB, P.O. Box 177, Dili, Portugese Timor
DA1EG, T. Casey (W1EII), 6653 Blieskastel/Saar, Neunkircherstr. 57, W. Germany
DA1PK, R. Dunn, Box 5249, APO, New York, New York 09057
FMØBQQ/FG (to W6HJP)
GC5s AVR BLE BLF BLG BLH (via DJ5UA)
GD3ENK, T. Moore, Glynmoor, St. John's, Isle of Man, U.K.
HR3JJR, P.O. Box 207, La Ceiba, Atlantida, Honduras
IA5s BFY DJD OAK (via I4BFY)
IVØWXK, P.O. Box 361, Rome, Italy
JY6BM, P.O. Box 7698, Amman, Jordan
JY9s CS MS, c/o U.S. Embassy, Amman, Jordan
KC6JW, J. Walsh, P.O. Box "A", Yap, W. Carolines 96943
KG4BE, Box 13, USNavSta, FPO, New York, New York 09593
KH6EVM/KP6, 1427 Dillingham Blvd., Suite 209, Honolulu, Hawaii 96817
KM6EB, S. Kibler (K4DNU), USNavSta, P.O. Box 43, FPO, San Francisco, California
ex-PA9AGM, J. Hudelson, P.O. Box 121, Sterling, Kansas 67579
SV1FT, N. Zamenes, P.O. Box 15, Chania, Crete
ex-SVØWEE, F. Spencer, K8APP/5, 6219 Indian Valley, San Antonio, Texas 78242
SVØWKK, Box 658, APO, New York, New York 09593
TL8AA, via E. Alberici, via Farnesiana 100, I-29100, Piacenza, Italy
TR8RS, Box 2038, Libreville, Gabon
TR8WR, R. Wegsheider, P.O. Box 101, Moanda, Gabon
VP2AYL, Box 550, Antigua, W.I.
VP2LAN, Box 262, Castries, St. Lucia, W.I.
VP5SL/VP2S (to VP5SL)
WA1RFM/VP9, W. Birtcher, Tudor Hill Lab., FPO, New York, New York 09560
WB5APF/KL7 (via KL7HLC)
WB9s MYR/6Y NMN/6Y (to WB9s MYR NMN)
YK1UN, P.O. Box 35, Damascus, Syria
YN1s GLB JBL (via WA5GFS)
YV5s BZX ESN (via WB2SFF)
YV5CET, Dr. J. Diaz, P.O. Box 16251, Caracas, Venezuela
ZD8LN, Box 4608, Ascension Island, c/o Patrick AFB, Florida 32925
ZF1MD, Dr. A. Hyde, 418 Princess St., Alexandria, Virginia 22314
ZL3NR/c, B. Donaldson, c/o Radio Station, Chatham Islands, New Zealand
ZP9s AR CA (via DK6KA)
4X4TI, Z. Gideon, 18 Jeremiah St., Tel-Aviv, Israel
5B4PP, Box 375, Larnaca, Cyprus
9G1RQ, Box 10129, Accra, Ghana
9K2DI, Box 5595, Kuwait, Arabia
9X5AN, P.O. Box 449, Kigali, Rwanda

A4XVE (via G4AAJ)
A6XN (via DJ9ZB)
C21KM (via NZ4RT)
C31IL (to WA9INK)
CR7BC (via WA5GFS)
DL7RT/HBØ (to DL7RT)
FØBAK (to PAØTO)
FC9RY (via HB9TL)
FM7AQ (see text)
FW8DY (via VK4ABA)
FY7VU (via WB2TSL)
G3VGU (via WA9MZS)
GB2IARU (via G3GVV)
GB3IARU (via G2BVN)
HBØAZD (to HB9AZD)
HC1MM/5 (via WA8TDY)
HC1WW (via K1ALP)
HC5EE (via WA8TDY)
HL9KT (via WAØNNX)
KG4DS (see text)
ex-KH6GLU (to VK4ABA)
KX6BB (via K3NEZ)
KX6BK (via VK4ABA)
ON8ITU (to ON4QX)
PAØIWH/S2 (see text)
PJ9CDC (to W1CDC)
SQ8EDQ (to SP8EDQ)
SVØWAA (via W7PHO)
SVØWZ (via OE3NH)
TI9DX (via TI2CF)
TI9FAG (to HB9AQM)
TI9WC (via TI2YL)
TK7YAA (via F2QQ)
TKØBLG (to I1RBJ)
UK1ZF1 (see text)
VC1HH (to VE1HH)
VE3CUD/SU (via VE1AL)
VE3HEY/SU (to VE3PET)
VP1FF (via WBØAOM)
VP1PKW (via WB9LTY)
VP1MT (via G4RS)
VP2ABA (via W3HNK)
VP2MEO (via VE3CQV)
VP5AH (via WA4DRU)
VP8HZ (via G3NMH)
VP8NP (via G3BNH)
VP8OB (via G4DIF)
ex-VQ8CC (to GM3MBS)
VR3AJ (via KH6CIY)
VR3DY (via VK4ABA)
VS5AA (via VK4ABA)
VS9MB (via G3KDB)
WB9BZL/mm (via WA9MZS)
XJ3ITU (via VE3ODX)



WP4EBQ sails over to Virgin Gorda now and then for DX sport as VP2VCN. Aboard his motor yacht *Joyce*, Hans has an FT101B, linear and vertical, going on several bands.



9M2FK hopes to complete his WAS from Penang with the early addition of some central United States, especially in the Zero region. Eshee lurks on or near 14,025 kHz around 1600 UTC. *(Photo via WIDAL)*

YBØABV (to WA7OBV)	5B4CA (to G4AWJ)
ZC4DI (via RSGB)	5W1AB (via W6DAB)
ZD8NC (see text)	7X2BK (see text)
ZD8PH (via WB4RVX)	9L1AP (via I3SCO)
ZK1AJ (via VK4ABA)	9M2AX (via JA6RIL)
ZK1MA (via VK4ABA)	9M8HG (via GW3OJB)
ZW4AKL (to PY4AKL)	9N1MM (via W2KV)
ZZØJO (via PY2JO)	9V1SN (via G3VAO)
3D2RM (via WB5MXO)	9X5SP (via DL8AO)
3V8CA (to F6CPU)	9Y4SF (via WA5GFS)

These specs are yours thanks to the efforts of Ws 1EII 1OPJ 2HAE 4UMF 6YKS 7TE, WAs 2HHO 2JZX 6VNR, WB4SXX, VE3EZU, VO1KE, Columbus Amateur Radio Association *CARAscope* (W8ZCQ), *DX News-Sheet* (G. Watts, 62 Belmore Rd., Norwich,NR7 OPU, England), International Short Wave League *Monitor* (E. Chilvers, 1 Grove Rd., Lydney, Glos., GL15 5JE, England), Japan DX Radio Club *Bulletin* (JA3KWJ), Long Island DX Association *DX Bulletin* (K2KGB), Newark News Radio Club *Bulletin* (M. Witkowski, Rte. 5, Box 167, Stevens Point, Wisconsin 54481), Northern California DX Club *DXer* (Box 608, Menlo Park, California 94025), North Florida DX Association *News* (WA4UFW), Southern California DX Club *Bulletin* (WA6KZI), VERON's *DXpress* (PAØTO), West Coast *DX Bulletin* (WA6AUD) and Western Washington DX Club *Totem Tubloid* (WA7JCB). Got one or two for the stew?

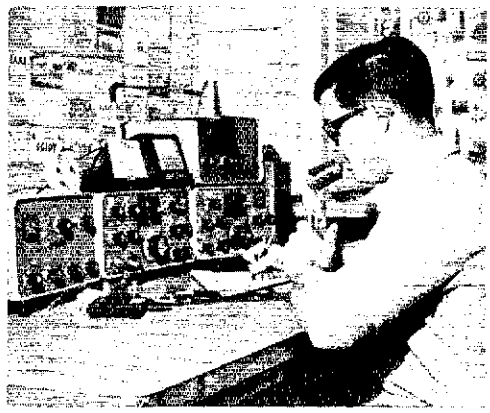
† † †

W h e n c e :

EUROPE — SP-DX Contest single-op results for the 1974 session find K2KUR, WAs ØKDI 2ZWH 3ENM, W9OHH, WA5ZWC, WB4NRI, WS 4KO 4IUK and 3CGS pacing our pack in that order. VO1AW represented Canada. Continental leaders are KX6LA, LU5HFI, UAs 3QO 9JH and K2KUR. Other kingpins per country: DL1OY, DM3YBF, EA2IA, G3ESF, GI3OLJ, GM3KHH, GW3INW, HA5FA, HB9QA, I3AXD, JA3EA, LZ2DC, OE4WPB, OH2BAD, OK3YL, OZ4HW, PY1DBU, SM6BZE, UB5WK, UC2LAO, UF6DD, UH8BO, UI8AAE, UJ8JAS, UKs 6DAU 6GAD 6QAA 9AAA, UO5OWN, UP2BBH, UQ2GW, UR2QD, YO2BBT and YU1OCV. Victors on the home front in sequence are SPs 9DTI 9CTW 5EXA 6TQ 9BPF 7BEW 9AJT 9BCH 9ZD and 2BKF with SP5PWK the multioperated biggie. (PXK) . . . Much fun operating 4U1ITU while in Europe on business recently. (WA3NHG) . . . VERON's *DXpress* is a one-man show that keeps me very busy as editor. Still I manage to work upward in the 200-country group, mostly on cw but with sideband available for new ones that come along. (PAØTO) . . . Enjoyed PAØSOL's four-day stop over at my place and Bob got a kick out of being PAØSOL/W3. (W3YAF) . . . All continents and 35 countries have come back to the potent 10 watter of OK1FCW on 160-meter cw. Vlad radiates with a half-wave dipole about thirty feet above his roof. (W1CER) . . . Good sport logging several hundred contacts in the first March weekend of this year's ARRL Test with an FT101 and rooftop dipole from the Montarik Hotel in downtown Gibraltar. (AB2CS-USA, W9JVF) . . . I was fortunate to work the Belgian raft ON4AXA/mm, pictured in your May pages, three times in January with the help of ON5KL and 9Y4NP. (W2JGR) . . . Enjoyed my sabbatical in Vienna as OE1ZHW, also visiting near-by countries. Every time I spotted a tribander on somebody's roof I'd start knocking on doors. I signed VEs 2AAS and 3DNZ before getting my Illinois call. (W9CJW) . . . Operators interested in entering the 2nd DX Oldtimers Club Marathon to run from September 1, 1975, through August 31, 1976, are invited to inquire with s.a.s.e. to my address. (IT9SEZ) . . . I'll be looking for DX friends as FØBPZ from southern France this month. (W6FKF) . . . Young OE3EVA is on the DXCC move, jumping from 102 to 183 countries in a few short months. (W1CW) . . . Friends of DX pioneer GM6RV will regret to hear that Bill suffered serious injuries in an April auto accident. He's on the slow mend, according to his XYL, and doubtless would appreciate mail from the gang. (K9KLR) . . . I intend to be operating from Peru next month, then from Curaco in September during the WAEDC test. Met many DX friends at the Warsaw IARU meeting. By the way, WA3KWD now is an official checkpoint for DARC certifications and welcomes correspondence from W/K/VEs on the subject. (DJ3KR) . . . About hamming in Andorra, my activity has been the only nonresident low-bands operation from September to early April. Resident father and son, C31s AH and CS, are on 2 meters almost exclusively. Licensees in the C31L series are apparently authorized by the Spanish government, most active being C31s LF LI. Andorra, no longer much of a rarity because of frequent summer DXpeditions, still is loads of fun to activate. I've been there three times and will continue to visit the place until all of my C31 QSLs are used up. (WA9INK-C31IL-VQZR) . . . I'm closing down in the Hague after an interesting six months of 40-meter DX work. (PA9AGM) . . . Worthy diplomas for QSOing Spain and its possessions are available

VS5MC is quite rare enough at home in Brunei but he's still intent on activating scarce adjacent areas. Here Maurice catches his breath after an abortive dash toward Spratly. *(Photo via WIDAL)*

CT2BG closed this Lajes Field layout recently but his QSLs are still going up on shack walls. Any DX slack in Gary's wake was quickly taken up by CT2BH (K7YHA) who volunteers this photo.



to all DXers. Inquiry through our QSL bureau address is welcomed. (URE) . . . International Amateur Radio Club, founded in 1961 and sponsor of famed 4U1ITU, invites inquiry concerning your possible IARC membership. Correspondence may be directed to my address. (K4ZA) . . . I find an open-wire center-fed wire still a very effective DX antenna for all bands. (YO7NA) . . . There was no Rhodes activity after SVØWU's departure two years ago but now I'm available from Trianta with a V/MK3 and TH33. Polite breakers around 14,300 kHz are welcomed but QSO-killers will be blacklisted. Watch for my southern (Bavarian) drawl. (SVØWZ-WB4IRD) . . . G4DFB, recently worked on 160 cw, was running all of two watts. (VO1KE) . . . Friends and I operated IA5s BFY DJD and OAK from the isle of Giglio over a recent weekend, each using 21, 14 and 28 MHz respectively. (I4BFY) . . . Very glad to place in the '73 DX test offered by Spain's URE. The diploma goes well beside one won in the Czech CAV test 25 years ago. (W1OPJ) . . . DJØIP and Berlin buddies intend a rerun of the Liechtenstein DXpedition that was foiled by a sudden ionospheric disturbance last summer. Rick also lays groundwork for an early Andorra effort. (LIDXA) . . . GB3RN was a spring DX spree by RNARS members aboard London-based HMS *Belfast*. (DXNS) . . . SVØWKK expects to keep Crete available with an SB230 and fresh beam through the rest of the year. Tony skeds K6HTM at 1700 or 1800 UTC each Monday on 14,210 kHz. (WCDXB)

NORTH AMERICA — My friend WB5APF, formerly ZL3AAM, operates in a prefab at an ice-dynamics research station on the Beaufort Sea ice pack, about 76 degrees north, 142 west. The base is about thirteen feet thick in his area. Mel works mostly 20 sideband around 14,280 kHz at 0400-0700 UTC, usually beamed toward New Zealand. To raise him fast, call with speedy cw. (KL7HLC) . . . Gobs of goodies worked on 75 sideband this spring include GCs 4DAA 5BLE, HG5A, HR6SWA, KM6EA, OD5IO and ZL3NR of the Chathams. UQ2GCO and 4Z4HF were my best on 80 cw. Whew! Only about a dozen more countries on the band and I'll have that elusive ARRL Five-Band DXCC membership. (WB8FOS) . . . I'll take cw on 20 and 40 where I caught all continents but Asia in April. (WA2JZX) . . . Made about 200 contacts on 7- and 14-MHz ssb from Grand Cayman in late spring. (ZF1MD) . . . WB8APH gained the first ssb-endorsed 160-meter WAC on March 19, 1975. Other 1.8-MHz WAC diplomas were awarded in this order since the first of the year: 5Z4KL, W2DEO, JAs 2UEO 3AA 3ONB 7NI, OK1FCW, JA2CQO, GM4AGG, G3SZA, DK3BJ, 9L1JT, JAs 6WGE 3PNP 5DQH and GW3UCB. (W4WFL of ARRL) . . . So much DX fun running QRP as ZF1JH last fall I'm already planning another Caymans thing. (WA6VNR) . . . Elmers? I vote for WB4DRB, my radio pal classmate since early grade school. (WB4FDT) . . . A grateful letter from KH6IKL makes me proud to have been his Elmer in a modest way. (KH6BZF) . . . Conditions have been so sour lately I have to peek outside occasionally to make sure my antenna is still up. (W6YKS) . . . We enjoyed our 6Y5 DXpeditionary vacation and must thank the Jamaican government for prompt operating permits. (WB9s MYR/6Y5 NMN/6Y5) . . . Fifteen gets worse and worse but I scrounged up recent contacts with LU6DJX, OA4AOB, PYs 2FVT 3CLJ 5CKL, ZP5s AN EC and NP. (WNØONN) . . . On the 17th-25th of next month I'll fire up PJ9CDC in Curaco, mostly on cw near 7035 or 14,035 kHz. (W1CDC) . . . I'm managing a few DX QSOs from my new North Carolina QTH despite high line noise thanks to the old reliable HX50A, HQ180A and 50-foot-high TH3 jr. (WB4SXX) . . . Still fighting the sunspot shortage on 15 with an HW16, HG10B and 18AVT/WB. (WN5NSR) . . . Our members made a great showing in this year's ARRL DX Test. No whopping scores, perhaps, but at least sixty percent of the club filed substantial entries despite horrible conditions. (NFDXA) . . . More localisms courtesy aforementioned literature of clubs and groups: ARRL Test conditions may have been rough but SCDXC's high scorers turned in totals quite comparable with those of last year. . . . Back in the 1960s power-input exchange numbers in the ARRL International included plenty of 030, 040 and the like. This year it was a 200-500-kW landslide. (W8ZCQ) . . . Old reliable KV4AA can still be found taking on all comers at 2130-2230 UTC on 14,081 kHz. . . . TI9DX was 160-meter country No. 100 for KV4FZ, the second top-band century after W1BB's. Herb has been setting 1.8-MHz DX records since leaving WØVXO in '69. . . . Those wanting to help promote more DX on 160 are invited to write W4BRB. To start with, Gene would like to arrange some early Easter Island radiations. . . . Arkansas DX Net holds court near 3815 kHz each Monday and Friday at 0100 UTC and after. . . . The vast two-element Yagi of KP4AST makes huge noises on 75 sideband. . . . HH2WF terminated a prolific Haiti DX sojourn in April. . . . W6ABA points out that Danny Weil did last Clipperton honors as FO8AN with 600 QSOs back in 1960. . . . Venerable DXpeditioner DXtraordinary W4BPD threatens to hit the boondocks again around March. . . . W9MR/CEØ reports a productive spring DX visit to Easter but heard nil on 160. Wayne left a 12AVQ with resident CEØAE who may give 1.8 MHz a whirl ere long. . . . Issue No. 366 marked the seventh year of West Coast *DX Bulletin* publication, a solo endeavor by WA6AUD of the Marin County DX Group. . . . While cruising the Caribbean aboard steamer *Fairsea*, W6AM operated from five countries and visited some sixty amateurs. . . . The Northwest DX Convention erupts on the 2nd-3rd of next month at the Doubletree Inn near Seattle. Rush attendance inquiries to K7CVL. . . . After 31,000 QSOs K7ABV is surprised at so many continuing "first Montana!" comments. . . . W6JAY doggedly hung in with high offer amid frenzied bidding for the small chunk of Kingman Reef auctioned off by WA9UCE/6 at a recent southern California DX meeting. . . . Our DX world and all of amateur radio mourns the passing of Fred Schnell, W4CF. The Commander's transatlantic first with French 8AB on 110 meters in 1923 is but one of the many highlights of his varied contributions to the art. QST

YL news and views

CONDUCTED BY LOUISE RAMSEY MOREAU,* W3WRE

YLs of the "Green Keys"

FOR A NUMBER of women, RTTY is not only a part of their station equipment, it is, in their opinion, "the only way to fly" in amateur radio. Here in this country this interest for many YLs developed through affiliation with the three MARS services where they found that it wasn't necessary to be a crack high speed typist to handle amateur radio teletype. With just familiarity of the keyboard, they were off on a brand new form of emission.

The YL interest in RTTY has spread until it is now possible to work for that WAC-YL certificate using this form of operation through contacts with gals in England, Canada, U.S., Italy, Canal Zone, Australia, Korea, and Venezuela.

In Canada, VE6YL, Donez Booth, became interested through eavesdropping on news service transmissions in 1962. The following year when she received her license, she found the printer was so close to her in the shack that it became her pet form of operation. Donez feels this is the best way for her to handle traffic.

Gwen Burnett, VE3YL, has been working with RTTY since 1965 when she tried it as a "change of pace" in amateur operating after being active since she was first licensed in 1930. Gwen was the first VE to qualify for the QCA award for two-way communication with 25 countries given by the British Amateur Radio Teleprinter group in 1966. Also she held first place in Canada in the Alexander Volta DX RTTY contest sponsored by the ssb RTTY Club of Italy in 1967. Gwen is secretary for the Canadian Amateur Radio Teletype Group which has seven YL members.

I1PXC, Rosa Maria Colombino, found that it was difficult to operate on ssb due to a language problem, but on RTTY she was able to write at a convenient speed, and with more confidence when working DX countries. For the past two years she has been an eager contestant in the various RTTY activities.

For the handicapped, for people with a speech or hearing problem, RTTY has been the answer to their operating needs. As in the case with I1PXC, it is a good way to be able to communicate with people in other countries when our own language deficiencies keep us from more than a short contest contact with a YL in another country. The YLs who enjoy this operation at the green keyboards say with the familiar advertisement "Try it, you'll like it!"

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

Sandy Harjala, WN8TTL, has been enjoying operation on both 80 and 40 meters. A member of YLRL and the Copper County Radio Amateurs Assn., she is looking forward to Field Day.

Annual CLARA Day Contest

CLARA, Canada's national YL club, has announced its annual AC-DC Contest to be held September 13-14, 1975, UTC. Club members will be looking for contacts in this first of their 1975-76 contest calendar. Here is a good chance to make enough contacts with member stations and with the designated "bonus stations" to qualify for the CLARA certificate. Looking for both OM and YL participants, members will be active on all bands as well as on suggested frequencies.

Contest custodian Myrtle Cunningham, WA6ISY, YLRL vice president comments that a number of contacts had to be disqualified due to no QSO number, or section, or county. Also any logs that were mailed after the mailing deadline of March 25, 1975, were not included.

It has been suggested that in future contests the rules as formulated by the current custodian will always be found in the "Operating News" section of *QST*. These rules should be used as a guideline for contest participation in order that the logs qualify.

Please send the logs to the chairman of the contest Marjorie Karl, VE6IC, Box 191, Formost, Alberta, Canada, T0K 0X0.

Complete rules may be found in the "Operating News" column of *QST*.

1975 YLRL Directory

The 1975 edition of the YLRL annual Directory Issue of *YL Harmonics* will be a large form that will take the place of issues 4 and 5 of the club publication.

This large directory will contain a brief biographical sketch of each member, a list of all YL Nets, and updated rules for the YLRL contests.

The biographical information has been compiled from data gathered by *YL Harmonics* editor, Carrie Lynch, WA4BVD.

First 2-way RTTY via Oscar 7

When Robin Addie, G8LT, worked W2LEL using RTTY via Oscar 7 on February 10, 1975, to

score a "first" with this type operation, it was the result of careful planning to utilize the 1093rd revolution of the satellite.

Robin writes, "Equatorial crossing 23.896 degrees W, sked time 2228 UTC. Mode "A" was used with the uplink frequency of 145.890 MHz and downlink on 29.440 MHz. The "window" was scheduled to open at that time and last for about ten minutes. In fact after Oscar 7 had passed beyond usable range, we picked the QSO up again on Oscar 6 which was on almost the same course, but behind 7. This gave us almost 17 minutes in all. Signals varied considerably from a good S7 down to 4 or 5. I had the junior op Robert with a list of bearings versus times, and had him control the beam bearings to it.

"The receiving antenna was a triband beam mounted up 60', and my 50 watts were running into a 10-element, 2 meter Yagi mounted 8' above the tribander. For transatlantic use elevation is not needed, and you shoot at the horizon. Funnily enough it turns out my ERP is just about marginal to get into Oscar, and other attempts have failed on this count; 50 watts and 165 feet of coax into the top tower does not leave much to be radiated!

"Despite ssb QRM from both European and U.S. sources over the channel we were using, it was proved that it can be done if you are prepared, do your homework, and get the numbers right.

"Almost no printers in G-land have "unshift on space" and furthermore the lineshift is 69 characters. There is no inexpensive way of making my 444 go to 75 so please everyone remember these facts when engaged in RTTY across the pond."

Canadian YL History

Cathy Hrischenko, VE3GJH, is assembling material in preparation for a history of Canadian YLs and their part in amateur radio. This work will be the first formal history of women amateur radio operators in Canada.

Cathy who has prepared, and updated the *Canadian YL Directory*, sponsored by CLARA, has requested any information regarding early YL operators in Canada. She would also like to have documentation of the "firsts" of Canadian YLs – the youngest and oldest women who have been licensed, women who were operators aboard ships, military operators, and those in commercial radio work. Anyone having information, pictures, early QSLs or publicity that concerns Canadian YLs is requested to contact Cathy Hrischenko, VE3GJH, 30 Lisburn Crescent, Willowdale, Ontario, Canada, M2J 2Z5.

At present the only formal history of YL operators is, of course, *CQ-YL*, of Louisa Sando, W5RJZ.

1975 YL-OM Contest Results

The Winners

YL Phone		*OM Phone*	
WA3UTA	98,382	W4CHK	1,856.25*
HC2YL	72,576	VE3GCO/CG3	360*
W7JYX	55,712	W9LNQ	866.25*

YL cw		*OM cw*	
WA3UTA	43,228	W4CHK	1,050*
K8ONV	13,406	W9LNQ	735
HC2YL	12,921	VE3EMA	585*

YL Phone

WA3UTA	98,382.00
HC2YL	72,576.00
W7JYK	55,712
WA6QFO	53,136.00
LU8YYL/W*	31,635.00
DJØEK	21,038.00
W2GLB	19,200.00
DJ1TE	18,225.00
K8ONV	13,230.00*
WA8FSX	12,600.00*
K8NGR	8,436.00
WB8GMU/KH6	67,645.00
WB8DQX	6,708.00
YU2CBV	4,655.00*
OK3ØKKF	3,421.25*
DK8LQ	2,997.50*
W1ZEN	2,887.50*
DF7UAC	2,650.00*
K4RHU	2,625.00*
SP3HDB	2,210.00
OK3ØCIH	1,395.00
VK3KS	1,240.00
K2RUE	1,196.00
DK7CB	822.50*
K1QFD	740.00*
VE5FK	487.50*
DJØYL	192.00
WA7TLL	66.00
WA2NFY	25.00
F5RC	4.00

OM Phone

W4CHK	1,856.25*
VE3CGO/CG	3960.00*
W9LNQ	866.25*
WA2BXK	650.00*
KØETA	496.00*
K5LXZ	495.00*
W4OZF	472.50*
W3ETB	323.00*
WØKSG	315.00*
W4JUJ	280.00*
W7AHZ	280.00*
WBØCGJ	243.75*
DL9XN	202.50*
K9KKX	192.00
WA3EXX	165.00*
W1PEG	100.00*
VP2D/K2FJ	90.00*
K4LRO	90.00
K9RKP	90.00
DM2CON	81.25*
DL7SU	78.00
K4BAI	64.00
OH2LU	60.00
K4FCN	52.50*
K5DEC	42.00
G2NFV	35.00
SP3KX	26.25
LA2MT	11.25
WAØKXJ	5.00
OZ8KU	2.50

YL cw

WA3UTA	43,228.00
K8ONV	13,406.00
HC2YL	12,921.00
K2RUE	11,968.00
K1QFD	11,850.00
DK5TT	11,387.00
WA8FSX	8,763.75*
WAØYNC	8,427.00
WA2DMK	7,680.00
YU2CBU	6,200.00*
WA8USU	5,688.75
K4RHU	4,410.00
WA6OZS	4,250.00*
VE8NN	4,150.00
WA1KMP	3,870.00
WB8MFD	3,710.00
WB8MEC	2,720.00
K8MXO	8,325.00
SP5YL	2,184.00
W5QWI	1,406.00
W2HFR	1,248.00
W3SLS	1,225.00
WA2FNY	336.00
WN7ZYU	297.50*

OM cw

W4CHK	1,050.00*
W9LNQ	735.00*
VE3EMA	585.00*
W2AAU	540.00*
W4KFB	531.25
WA3EXX	517.50
W4LIN	495.00
VE3DXO	488.50
VE2CO	488.50
WAØFND	480.00*
W6ZP	437.00
WB4RVA	412.50*
WB2EZG	393.75*
W3IN	391.00*
W4KMS	367.50*
W4JUJ	330.50*
WA1TWN	308.00
WB6OYJ	276.25*
WØQNP	276.25*
WA1CDO	221.00
WA2BXK	210.00*
W4ZRJ	206.25*
W9TCU	206.25
WØLUG	200.00*
W1PEG	195.00*
OH2LU	140.00
WB8FUO	132.00
W4FCN	112.50
SP8AIS	112.00
K5LXZ	110.00*
W6IC	101.25*
SP7KKa/SP7FZC	97.50*
WA2EJZ	77.00
OK3ØPCW	75.00*
OK2QX	66.00
OK2SMO	52.00
W4BAI	52.00
DM2CON	50.00*
WA6ORJ	45.00
SP1FMG	45.00

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CONDUCTED BY BILL TYNAN,* W3KMV

ALL TOO MUCH of the mail received since assuming the stewardship of this column speaks of low activity on this vhf band or that. Believe it or not, activity on the vhf/uhf amateur bands has actually increased over the last few years. True, the so-called "traditional" forms of operation have suffered some drop-off but overall use of our bands has increased. The reduction in the traditional forms of operation can be attributed to a number of factors including the emergence of large scale fm operation and, more recently, the advent of long lived amateur satellites. It is, nevertheless, these two developments which have increased overall utilization of our vhf/uhf bands. Thus they have been good with respect to making a case for retention of our segments of the spectrum above 50 MHz. The situation with respect to occupation of our vhf and higher bands would be even better, however, if all of the various forms of operation could be employed to complement one another, rather than being segregated and competitive. What steps can we, who consider ourselves the "traditional" vhf operators, take to help accomplish this? First, make a little more noise on the particular portions of the bands which we normally inhabit. An oft repeated complaint heard from prospective vhf/uhf operators who have been doing some listening with a view to acquiring transmitting capability is that activity is too low to bother. To remedy this situation, all of us should get on the air as much as we can. We should establish schedules, take part in nets, *and call CQ*. Then, send word of these activities to this column so the rest of the gang, and potential gang, will be aware that there is someone to talk to in *the world above 50 MHz*. To submit material, use the address at the bottom of this page or, if you don't have time to write, use your telephone. Just call the number listed any time and record your message. This method should prove particularly useful in providing the word on any particularly good band openings which occur near deadline time for this column, which is the 15th of the month.

In addition to becoming more active at "doing our own thing," how about doing the other guy's thing? In this way we can tell the rest of the vhf world that there are interesting things going on in other parts of the band. For example, get on fm and use the local repeater to talk up exploits of the previous night when working stations on that big tropo opening at distances of up to perhaps 800 miles while the fm gang were repeater dxing maybe 300 miles. At the same time don't sell fm short. While it is not as efficient as a-m, ssb, or cw for weak signal work, it does have activity. It can, therefore, often be used as an indicator of band openings. Also, the local repeater can be used to

WILLIAM LEO SMITH, K4RJ (ex W3GKP)

Vhf/uhf, and amateur radio in general, lost one of its great men with the passing on May 2 of Bill Smith, K4RJ, recently of Franklin, NC. Most of us will remember Smitty as W3GKP of Spencerville, MD, near Washington, DC. His contributions to vhf and uhf were many, but most certainly he will go down in the history of our hobby for his pioneering of amateur EME. On January 27, 1953, working in conjunction with Ross Bateman, W4AO, he proved that 2-meter amateur signals could be sent to the moon and be received back upon earth. Experiments conducted by Smitty and Ross 23 years ago laid the groundwork for the first successful two-way moonbounce contact 6 years later, between Sam Harris operating W1BU and the Eimac club station, W6HB, as well as for the present high level of EME activity on several bands.

W3GKP later went on to construct an elaborate EME station on 2304 MHz with which he succeeded in working W4HHK. Although it took place five years ago, this work has yet to be equaled.

Smitty will long be remembered for the great things he accomplished in our hobby, but only a few know of the many less spectacular, yet nevertheless important, contributions he made to amateur radio. He always went out of his way to help newcomers and was particularly adept at presenting complex concepts in simple terms that could be understood by those who lacked the technical expertise which he possessed. When a local radio club wanted a speaker to present a talk, particularly on the subject of techniques for the higher frequencies, they could always count on Smitty to present an interesting and informative program. It is impossible to estimate the number of people who are presently accomplished vhf/uhf operators as a result of the inspiration and guidance of Bill Smith. A related facet of his personality was his willingness to help get other hams' equipment operating. In this pursuit he donated both many hours and many parts.

Our hobby is richer because of Bill Smith's involvement in it. His absence will be felt a great deal.

* Send reports and correspondence to Bill Tynan, W3KMV, Box 97 Burtonsville, MD 20730 or call (301) 384-6736.

alert others of good conditions. In the Washington DC area, the Amsat repeater, WR3ABU, on 146.25/85, of which I happen to be the trustee, is often employed to spread the word that 6 or 2 is open.

Another sector where some missionary work might help build activity is on the Oscar satellites. Almost all vhf operators have the capability to get on the satellite, either the 2 to 10 or the 70-cm to 2-meter transponder. The satellite makes a good place to exchange information with other vhfers, to set up schedules and such. A prime example of this is the moonbounce net which K2UYH, VE7BBG, W1JAA and others hold on many Mode B orbits of Oscar 7. Unfortunately, there are all too many satellite operators who are never heard on other forms of vhf/uhf. Maybe some prodding via the satellite will do the trick in convincing them to try their satellite gear on terrestrial paths. If they are once convinced there is fun to be had on other forms of vhf, they may even put up antennas which aren't pointed up in the sky at a jaunty angle. Don't think that such antennas cannot be used to work terrestrial paths, however. During Field Day a few years ago, when our regular 2-meter antenna didn't work, we resorted to 5-element crossed Yagi, mounted about 8 feet above ground and pointed up at 30 degrees. With this, and 50-watts output on ssb and cw, W3VD was able to make quite a few contacts at distances to about 200 miles. The point is that those satellite setups can be used for communication over respectable distances; so let's do all we can to get these fellows active instead of their reading books or watching TV between passes.

Population of our vhf/uhf bands cannot be increased drastically overnight. Nor can pronouncements from Washington, or Newington, in themselves do the job. Consistent occupancy can only be achieved by all of us getting on and by the missionary work we do among those who are not yet regular inhabitants of *the world above 50 MHz*.

Conferences

One of the important vhf/uhf events of the year is the Central States Vhf Conference. This year's event will be held August 15-17 at Western Hills Lodge, Sequoia State Park, Wagoner, OK, 48 miles east of Tulsa. Two previous affairs have been held at this location and were enjoyed by all in attendance. As in other years, the 1975 conference will feature talks by well-known vhf/uhfers, guaranteed to challenge and inform. Naturally there will be the usual good fellowship and, at the banquet Saturday evening, the 1975 John Chambers Award for outstanding work in vhf/uhf will be presented. Those wishing to attend should send an s.a.s.e. to Ted Mathewson, W4FJ, 1525 Sunset Lane, Richmond, VA 23221.

In the coverage of the first Eastern Vhf/uhf Conference, we incorrectly gave W1SL the credit for the leg work done by Norm Commo, K1LOG. Our apologies to Norm for the error.

First reports from the West Coast Vhf Conference held in San Diego, May 2-4, state that K6MYC won the antenna gain contest with a quad of KLM's new 432-MHz Yagis. The gain figure was stated as 18.7 dB. A single one produced 15.2 dB, so there's some doubt that the range was quite long enough to do justice to large antennas. In the 432-MHz converter noise figure competition there was a dead heat between homebrew units submitted by WA6EXV and WB6IMV. Both came in at 2.4 dB. The WA6EXV converter used a KD6007 into an M6E double balanced mixer while the WB6IMV creation employed an HP21 driving a hot carrier diode mixer. In 432 preamps, WB6CXF copped the honors with an FMT4578 job that measured 0.9 dB.

Contests

The Itchycoo Park Vhf Amateur Radio Society announces its 5th annual vhf contest. This year's affair will be held July 26 and 27 beginning at 1800 local time Saturday and ending at 2200 Sunday. The competition is open to all single operator stations on the 50-MHz, 144-MHz and 220-MHz bands. Each band is a separate contest so don't add the results of the various bands together. Each QSO counts one point with the multiplier the number of counties times the number of states worked. Send logs to WA3NUL, Box 1062, Hagerstown, MD 21740 by August 31. Include an s.a.s.e. if you want a copy of the results.

The "Space Net" contest, celebrating the 6th anniversary of man's first landing on the moon, will be held July 19 and 20. Details can be obtained from WB2MTU/4, Box 20294, Lake Panasoffkee, FL 33538. An s.a.s.e. would be appreciated.

OVS Reports and Operating News

50 MHz. As we write this in mid-May, the 6-meter band is just beginning to come to life after a somewhat slow start. The evening of May 15 produced a good opening from the midAtlantic states to the midwest. There was even some excellent double hop to the Pacific Northwest. K6ZCB, WA4MMP, WA7RTA and K7ICW report a few openings beginning in mid-April. Al, K7ICW, recounts working the former conductor of this column, Bill Smith, W5USM, now located near Dallas, on April 13. Over the weekend of May 3 and 4, WA7RTA near Portland, OR, worked a string of 6s. Art puts in a plea for the East Coast gang to look for him. He has a kW on and is particularly gunning for the New England states.

While we're discussing the Pacific Northwest, K7ZCB informs us that the SMIRK Net in that part of the country meets at 1900 local time Monday through Friday on 50.2 MHz. Action is quite spirited with most active stations in western Oregon and Washington checking in from time to time. Speaking of SMIRK, its membership total is now up to 750. Those of us who are not SMIRK members had better jump on the bandwagon. For details on joining, contact K5ZMS at 7158 Stone Fence Dr., San Antonio, TX 78227.

From the far Pacific we learn that the K2IRT/KG6 beacon is in regular operation from Guam. The frequency is 50.098 and the power is 12 watts into a dipole broadside north and south. Transmission is on cw with "CQ de K2IRT/KG6" sent once every 20 seconds. Guam 6-meter stations monitor 50.150 MHz. For a complete list of beacons operating in the Pacific area, send an s.a.s.e. to K5ZMS (address above). While on the DX kick, WB4OSN tells us that Panama may become active soon. HP1XDG has an a-m cw rig for 6 meters, and Joe has arranged for shipment of a 50-MHz Yaesu transceiver to KZ5WA who already has a 5-element beam. Also thanks to WB2TNC/3, a crystal for about 50.075 has been dispatched to Peru for OA8V. K3NZZ and

K3MWQ provided a converter to go with Paul's Johnson 6n2 transmitter and 5-element Yagi already on the scene. Speaking of DX, WA7RTA informs us that he is starting scatter schedules with KL7IBG.

An interesting propagation phenomenon is reported by K7ZCB near Portland, OR. On March 15 he and WA7WVN noticed an echo on the cw signal of WA7RED, Vancouver, WA. The delay between Bob's main signal and the echo was estimated to be about 0.5 second with a signal level about 4 to 5 S units below the main signal. A check of the transmitter at WA7RED failed to turn up anything amiss. After several successful attempts to repeat observation, the band opened and the Northwest boys concentrated on working W6s. After the band closed, an attempt was made to detect the echo with negative results. A similar effect was observed on 2 meters by WA3NZL about 20 miles north of Washington, DC, at about 0130Z on May 1. Paul states that for about 20 minutes he heard an echo on his transmitted signal with a delay of approximately 0.5 second. He tried various frequencies to make sure that he wasn't being spoofed, but the echo persisted. Then it faded away over the space of a few minutes. For an echo to exhibit a delay of the order of magnitude reported in these two accounts, assuming free space propagation, the distance to the reflecting medium would have to be about 50,000 miles. Has anyone else observed a similar occurrence?

WA4MMP, Chesapeake, VA, near Norfolk, got a good chance to try out his new 8-element, 28-foot-boom, 6-meter Yagi. He had no more than got it into place when he ran across W3ELF/M4 in Newbern, NC, about 120 miles. The next day he worked Mike from about 80 miles to the south of Chesapeake all the way to Dover, DE, about 120 miles to the north. Bill heard Mike again at Wilmington about 180 miles distant. Conditions were nothing special at the time, indicating what 6-meter ssb mobile can do. W3ELF was running a TR6 into a halo about 9 feet above the road. This writer has also worked W3ELF when he was mobile in southern New Jersey.

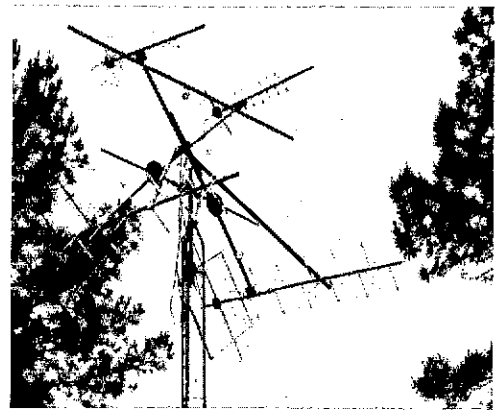
WA5IYX, San Antonio, TX, notes that for March the F2 muf from his QTH to South America was above 35 MHz during 10 days of the month and above 40 MHz only 1 day. We'll keep you informed on Pat's observations as we, hopefully, proceed toward the next high of the solar cycle.

144 MHz. Aurora reports for 2 meters and the other bands seem a little sparse this year but K9KQR, Libertyville, IL, comes up with some tidbits. Dick had been monitoring the WWV propagation bulletins and concluded that a K index of 5 and an A index of 30 to 35 during the week of April 7 indicated that something might be transpiring. Sure enough at 0409Z on April 9, he worked WØOHU Rochester, MN, and WØRLI, Minneapolis. WØOHU, reporting on the same aurora session, states that he and WØRLI noted an interesting effect each while working different stations (WØOHU working WØPMN, KN, and WØRLI working W9PDP, IL). For a 3-minute period, signals lost the usual aurora buzz and were T9 although still peaking north. The remainder of WØOHU's report laments the fact that all too often good conditions go to waste. Ed notes that on March 19 between 0400 and 1200Z a tropo duct existed between his Rochester, MN, QTH and the Topeka, KN, area. He copied 3 Kansas uhf TV stations with good pictures, using nothing more than an 18-inch loop of wire. Alas, no 144- or 432-MHz activity could be scared up. WØOHU also passes along the information that K9UYK in western Illinois worked K1WHS during an aurora session on March 10. He notes that this is a pretty good haul for aurora. That March 10 aurora was quite widespread. From the Veron Vhf Bulletin we learn that DL3YBA in Germany made 144 MHz contacts with Sweden, Norway and Finland. A 432-MHz aurora QSO is also reported between DL3YBA and SM5LE in Sweden. While discussing things international, how would you like to work Mexico on 2 meters? XE1TU, Mexico City, is on and doing business. On May 11, David worked K5VWW, Houston, on an m.s. schedule. He is open for other m.s. attempts with suitably located and equipped stations.

An aurora on the night of April 20 was productive for WB2KLD of Middleburgh, NY, about 40 miles west of Albany. Tom added two new states to his 2-meter total with contacts in Ohio, WA8PKB, and Michigan, K8HWW. A couple of fragments of ssb transmissions were heard from stations apparently in Wisconsin and Indiana. All of this took place above 145 MHz. Strange, many seem to think that all of the action is around 144.1!

Tropo is one form of propagation which does not depend on solar activity and it is certainly the "bread and butter" mode for many operators of 2 meters and higher bands. As an example, WA4MMP, Chesapeake, VA, notes an opening to the Pittsburgh area on the night of March 24. On that one Bill worked W3ANX with weak but solid 5x2 signals. On May 10 Bill was in the thick of it again with excellent signals up and down the coast. At the northern end of the path, K1SAK, Carolina, RI, was one of the participants. One of the Virginia stations which George worked was WA4EMH who was running low power and using an indoor halo. K1SAK, in a QSO the same evening, asked me to remind the 2-meter gang that the East Coast Weather Net meets every Wednesday night at 2000 local time on 145.2 MHz. Also, he and two other Rhode Island stations, WA1QXR and WA1GED, regularly monitor the same frequency. WBØLOR of North Mankato, MN, reports 2-meter tropo openings on the following March dates: 1,2,3,4,14,15,16, 17,18,19,24,25,30 and 31. He particularly cites the three days from the 17th through the 19th as "phenomenal" with good signals out to several hundred miles for a continuous period of 30 hours. The opening was accompanied by damp foggy weather. Another tropo report comes from WA4CQG, Auburn, AL. Dale tells of a very fine opening to Texas on April 18 and 19. Dallas area stations W5HN, W5SID, K5WXZ, and WB5LUA were worked along with K5JRH, K5VWW, and W5UPR in Houston. All had extremely strong signals. In the same report, Dale tells of daily m.s. skeds held with W8TIU in Michigan over a period of the last eight months. Results were such that they conclude that if they had run for an hour each day instead of only 30 minutes, they would have made it about 75 percent of the time. The Lyrids were particularly kind to WA4CQG with exchanges with K1ABR, RI, and W1FJH, MA, for two new states.

The same tropo opening mentioned by WA4CQG provided the fm boys with a lot of fun and some crammed repeaters. WB4BSZ, Pensacola, FL, provides some details. Earl's report cites a number of contacts at about 500 miles including two 146.52 simplex QSOs with W5KGB, Kilgore, TX, 75 miles west of Shreveport, LA. A number of other stations were worked at about the same



WB4UXP's antenna has 70-cm helixes at the top while the 2-meter helixes are at the bottom. Each pair of antennas for both bands is of opposite sense. The conduit in the center is 10 feet long; array size is about 11 × 11 feet.

distance, some through repeaters and some via the simplex route. Earl notes that the opening was very widespread, with distant stations coming from almost every direction. Incidentally, this would appear to be a good point to urge those reporting propagation events to make it clear whether or not repeaters were involved. Please be specific as to which contacts were made direct and which ones were aided by repeaters. Mention also the calls and locations of the repeaters, if known.

The Tidewater Six-Meter Net has spawned a 2-meter offshoot. The new net meets at 2100 local time every Tuesday evening on 145.025 MHz. Net control is WA4MMP and others.

A not previously discovered phenomenon on the West Coast is reported via the telephone answering machine by K6KBE. Mel notes the existence of a condition which has been dubbed "the dusk duct". It appears to form every evening for various lengths of time, from only 30 seconds to as long as 20 minutes. The time of the occurrence is usually between 1930 and 2130 local. Since it is so regular, it is enabling many fellows to get on and make contacts which they might otherwise miss. Numerous QSOs between the Bay Area and Southern California, as far south as San Diego, are the result with a very positive effect on activity. I was able to observe the dusk duct myself on a recent visit at the QTH of WB6NMT in San Diego. With about 50 watts of power, we were able to hold a good conversation with Mike, K6MYC, in San Martin (near San Jose) as well as with a number of Los Angeles area stations including our old friend Gary at K6QEH. It was very nice, indeed, to get a chance to meet and talk with some of the West Coast gang.

Besides the dusk duct, another factor working to increase activity on the West Coast, as well as in other parts of the country, is the emergence of ssb mobile operation, aided and abetted by the new transceivers just now becoming available on the U.S. market. K6KBE lists the following as some of the 2-meter ssb mobile stations now operating in the Bay Area: WA6TVN, WA6YOG, K6USS, WB6MLY, K6MYC and himself. Another part of the country heard from, also via the answering machine, is South Texas. WA5CHK reports great success using a KLM Echo II on 2-meter ssb mobile. On a recent trip from his Houston QTH to Austin, 120 miles away, Dick kept in touch with K5PTG and W5JRH, both in Houston. The antenna used was a squalo about 8 feet above the road. Incidentally, with reference to our question concerning polarization for 2-meter ssb mobile, most reports heard to date seem to favor horizontal. Those who have tried both feel that it is superior from the standpoint of flutter.

Don't think that the EME boys are inactive or that we're ignoring them. WA6UAM reports, via the telephone route, that he has completed a successful two-way with K1WHS in Maine. This gives Paul two states, two call areas, and a distance of 2500 miles. While on the subject of EME, W9UNM injects one sour note. While he states his firm support of moonbounce, Jim feels that some stations in their zeal to accomplish this very difficult feat, bend or even fracture the power rules. Possibly the new 2kW output proposed in Docket 20282 will help. What do you think?

Lance, WA1JXN/WA3GPL, reports that he, in cooperation with Larry Blouin, K1MNS, has produced a very handy and easy to use computer program for calculating Greenwich Hour Angle, declination, azimuth and elevation of the moon. The program is in FORTRAN IV and is especially suited for use on small computers. Moonbouncers interested in receiving a listing and/or punched tape of the new program should contact K1MNS.

420 MHz and Up. With the advent of warmer weather, the tropo conditions are on the upswing. As an example on the night of May 10, W4FJ worked WA1LXU, north of Boston, on 432 MHz. At the same time, the signals of stations which Ted works regularly were far stronger than usual. Incidentally, W4FJ calls CQ to the Northeast every evening at 2200 eastern time on 432.025.

K2UYH reports having worked 26 different stations on 432 EME. This gives Al 8 countries on 70 cm. In addition to his 19 U.S. stations, he has completed one or more two-ways with VE7BBG, G3LTF, PAØSSB, JA1VDV, SM5LE, VK2AMW and ZE5JJ. Who will be the first to make DXCC on EME? Speaking of EME accomplishments, be sure to send in your moonbounce list for the new box soon. Current plans are to run the box in the September column so the deadline is July 15th. List the number of different stations *worked* and the number of states and countries on each band. Be sure to specify the band(s) involved.

From the VERON VHF Bulletin, we get details on the new F9FT moonbounce array for 432 MHz. It consists of 16, 21-element Yagis stacked 2 wavelengths apart. From sun noise tests which Frank and Marc have run, the half-power beamwidth appears to be about 5 degrees. From this they calculate the gain to be 33 dBi. This, they admit, is more than one would expect to get based on a measured gain of 19 dBi (17 dB referred to a dipole) from one Yagi. The additional gain they attribute to the "series-parallel matching system" used. Let's have some more dope on this fellows. With 14 to 16 dB of sun noise being measured and the statement of W1JAA that the F9FT signal is the strongest that he has heard off the moon, it appears that the French creation works. At any rate, the new monster at F9FT has put that station solidly in the EME club. From the 432 EME Newsletter published by K2UYH and VE7BBG, we learn that K8UQA and G3LQR are two other new moonbouncers. K8UQA is using an array consisting

of 16 RIW Yagis. K2UYH terms Dave's signal as one of the best that he has heard from a Yagi-type array. In their QSO on April 21, the K8UQA signal was S3 to 4 at Al's QTH.

The first Europe to Asia EME contact was made April 19 when PAØSSB completed a two-way with JA1VDV. Aki continues to add spice to the moonbounce scene being, so far, the only Asian active. It is understood, however, that several other Japanese groups are building stations.

WA9VXX reports the formation of the Southern Illinois Microwave Society. Aim of the new group will be to work on 432 and 1296 EME as well as other projects of a microwave nature. Those in the area interested in participating should contact Kevin at Box 75, Gorham, IL 62940.

Oscar Happenings

Amsat and numerous amateur microwave experimenters lost a round recently when FCC, in a letter to Amsat, officially denied permission to activate the 2304.1 MHz beacon aboard Oscar 7. The letter, signed by Charles A. Higginbotham, Chief, Safety and Special Radio Services Bureau, takes note of the fact that the authorization sought by Amsat was for operation of the beacon for only 14 minutes per week at times when the satellite would be over the U.S. and that the power output is only 30 to 50 mW. Nevertheless, the Commission believes that damage could be done to the cause of the Amateur Service and the Amateur Satellite Service by allowing the beacon to be turned on. The reason cited for this view is that the frequency in question is not within those allocated to the Amateur Satellite Service at the 1971 ITU Conference on Space Communications. At that conference, the Amateur Satellite Service was established and frequencies assigned to it. Those frequencies consist of all frequencies allocated to the Amateur Service on an exclusive worldwide basis. These consist of: 7.07-7.1, 14.0-14.25, 21.0-21.45, 28.0-29.7, 144.0-146.0, and 24,000-24,050 MHz. In addition, a special assignment was made at 435-438 MHz.

At a recent IARU Region I meeting, held in Warsaw, Poland, and attended by Noel Eaton, VE3CJ, IARU president, a suggestion was made to institute band plans for Oscar 6 and Oscar 7, Mode B. A band plan for Oscar 7, Mode A, is already in quite-successful operation. Amsat was requested to formulate and disseminate plans for the two passbands. Comments and suggestions from readers of this column are welcome. QST

July, 1925

. . . Daylight DX! g2OD and a2CM work England to Australia on 20 meters over a daylight path. H. A. Joyce of the U. of Detroit presents his variation of the Reinartz theory to try to explain propagation phenomena.

. . . ARRL Director Bidwell describes developments in television, which have progressed so far only to silhouettes (no shading), with prismatic discs and lens; the scanning wheel is yet to come.

. . . Having trouble with your new superhet? Editor Clayton takes us through the whole basic circuit, input tuner to audio amplifier, showing possible pitfalls.

. . . Design of extensive gear for the Navy-MacMillan expedition to the Arctic is nearly complete; short waves will get preference, because almost all communication will be in 24-hour daylight.

. . . You can dress up your receiver with a glass panel after reading S. A. Twichell's article on cutting, drilling and reaming plate glass.

. . . 6GD got hold of a Ford roadster and immediately installed a mobile transceiver and loop antenna; there is now barely room for the driver!

. . . More ARRL tests are scheduled for the summer on 40 and 20 meters to explore further the mysteries of propagation. Five meters will get attention also.

. . . The fleet is now in Honolulu, and NRRL aboard the *Seattle* is working back to the States on 54 and 40 meters, with amateurs handling most of the correspondence to the Navy lab in Washington.

. . . A new *QST* department, "I.A.R.U. News," makes its appearance with this issue.

July, 1950

. . . This could be called the W1DX special issue. He opens the new operating series with the fundamentals of basic procedure, "How to Visualize a Phone Signal" follows, helping us understand carriers, sidebands (double and single), bandwidths, and modulation generally. He tops things off with a science fiction piece on QSOing a UFO, even though it isn't the April issue. (We've seen this cited in saucer literature as proof of UFO existence!)

. . . W3AM expands our knowledge of driven arrays with his 3-element beam, all fed with rf.

. . . W1DF's audio clipper has a peak around 700 cycles and drops off nicely on both sides, but its principal purpose is to limit "shot" and other noise as an ear saver.

. . . An early DXpedition is the Guayaquil Radio Club's trip to the Galapagos Islands, signing HC8GRC and making 116 QSOs despite rough weather and gear problems.

. . . Keats Pullen analyzes coil design for link-coupled circuits, providing optimum constants for 52-, 75- and 300-ohm line.

. . . The Editor pleads for protection of 29.6-29.7 Mc. so that mobiles will have a clear spot to work with their comparatively low power.

. . . Oral argument on Docket 9295 was held before six Commissioners, with the League outlining its objections to the creation of an Extra Class license as the sole means of operation in the major phone bands.

. . . W5NW is chosen vice president of the League.
— *WIRW*

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; *Public Service*, W. C. MANN, WA1FCM; *Contests*, JIM CAIN, WA1STN.

Getting the QSLs. The most difficult part of acquiring some of our operating awards is getting the QSL cards from the amateurs worked. DXCC, and its various cupolas, are especially difficult in this respect because the contacts are foreign rather than domestic, the difficulty varying in direct proportion with the rarity of the country involved. With the advent of the new CW-DXCC, it might be well to get an expert view on how to get the QSLs. We are fortunate to have such an expert in our DX Advisory Committee, one W1BIH/PJ9JT who, for many years, has operated from both sides of the fence. This is his analysis, mostly in his words.

Keep in mind that many DX stations have had their fill of QSLing and probably will want no part of sending repeat QSLs to 10,000-plus W/K stations just to satisfy their desire for a new award. While there is no magic formula for prying loose a card from that reluctant 9M2, there are a few things we can do to make it as easy as possible for him to at least stay on the air, rather than renouncing DXing for some other pursuit in which he won't be hounded for a card at every turn.

So, don't pester him with over-the-air QSL requests. It gets rather monotonous to work a string of Ws and Ks and have each in turn plead for a QSL. Very few DX stations will honor such a request until they receive your card anyway.

But let's start at the beginning. Before you even work the DX, get your station in order. A clock that gives the date and time in UTC (GMT) is an absolute must. Some misguided hams still send cards giving the date and time as EST, PST, etc. (honestly!), leaving the DX station or QSL manager to make the conversion, then complain that the DX station doesn't QSL. Even being off five or ten minutes from the correct time, as many cards are, can drastically increase the effort required to find you in a log in which contacts were made at a fast clip. So, check your clock against WWV regularly.

OK, so now you have worked a new country. You didn't bore the operator by telling him how badly you need his QSL, and you have it in your log with UTC date and time correctly. So you should immediately fill out a card and rush it by airmail to his country's QSL bureau, right? Wrong. How about mailing it directly to him with IRCs? Nope, not that either. Just relax, because haste makes waste in this case. Check a late call book and the DX bulletins; maybe he has a QSL manager or a stateside address. PJ9JT has a Connecticut address in the last few callbooks, but many cards are sent to the PJ bureau. Bert, PJ2CW, the competent QSL manager, does a fine job, but often months pass before the cards reach me. Many are airmailed to Curacao (with 21 cents postage) and more postage is required to get them back to Conn. When they arrive, they are part of a discouragingly big stack, and of course require more postage to get a return back to the sender's ARRL bureau. How much simpler and cheaper if the W/K operator had mailed the card directly to me with a self-addressed stamped envelope (s.a.s.e.) in the first place! A PJ9JT card would have been back to him in a week or two at a total cost of only 20 cents.

Some DXers use one of the QSL services advertised in *QST* and other ham magazines. These services keep track of QSL managers or, if none, send your card to the bureau in the DX country concerned – all for a fee, of course.

If you find that there is no QSL manager, use the latest call book or DX Bulletin address and airmail your card direct. Write out the QSO information accurately and legibly. Give the date in day-month-year order. Some cards received for PJ9JT are unbelievable: illegible, date or time missing, incorrect QSO information. One card from a certain W3 (two-letter call, no less!) required

SF SCMs, past and present. On the left, the ever popular active W6BIP shown with new SF SCM W6OAT. Both ops represent the best in good operating.

searching through 5000-plus log entries. (It was four days and 17 hours away from the date shown on his card!)

Make sure your call appears on the information side of the card. If not printed on that side, write it in, even though it is in three-inch-high letters on the other side. Enclose an airmail s.a.s.e. – and I mean *stamped*! IRCs may work, but they are not

W1AW CODE PRACTICE

W1AW transmits code practice according to the following schedule. Approximate frequencies are 1.805 3.58 7.08 14.08 21.08 28.08 50.08 and 145.588 MHz. For practice purposes the order of words in each line may be reversed during the 5-13 wpm transmissions. Each tape carries checking references.

Speeds	*Local Times/Days*	*UTC/Days*
10-13-15	7:30 PM EDST dy 4:30 PM PDST	2330 dy
10-13-15	4:00 PM EDST MTWThF 1:00 PM PDST	2000 MTWThF
5-7½-10 13-20-25	9:30 PM EDST SnTThS 6:30 PM PDST	0130 MWFSn
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 to be sent in the 0130 UTC practice on the following dates, from the May issue.

July 7: It Seems to Us
July 10: Correspondence
July 16: League Lines
July 22: ARPS
July 25: World Above
July 30: YL News

W1AW SCHEDULE (effective February 23, 1975)

The ARRL Maxim Memorial Station welcomes visitors. Operating-visiting hours are Monday through Friday 1 P.M. - 1 A.M., Saturday 7 P.M. - 1 A.M. and Sunday 3 P.M. - 11 P.M., (all times local Eastern). The station address is 225 Main Street, Newington, Conn., about 7 miles south of Hartford. A map showing local street detail will be sent upon request. If you wish to operate, you must have your original operator's license with you. The station will be closed Mar. 28, May 26, July 4 and Sept. 1, 1975.

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

[1]CW Bulletins (18 wpm) and code practice on 1.805, 3.580, 7.080, 14.080, 21.080, 28.080, 50.080 and 145.588 MHz.**
[2]Phone Bulletins on 1.820, 3.990, 7.290, 14.290, 21.390, 28.590, 50.190 and 145.588 MHz.**
[3]RTTY Bulletins on 3.625, 7.095, 14.095, 21.095 and 28.095 MHz.** Bulletins at 170 Hz shift, repeated at 850 Hz shift when time permits.
[4]Starting time approximate, following conclusion of bulletin or code practice.
[5]W1AW will tune the indicated band for Novice calls, answering on the caller's frequency.
[6]Participation in traffic nets.
[7]Operation will be on one of the following frequencies: 21.02, 21.08, 21.11, 28.02, 28.08, 28.11 MHz.
[8]Operation will be on one of the following frequencies: 21.26, 21.39, 28.59 MHz.
[9]When an Oscar satellite is in orbit, daily updated orbital data is sent at 18 wpm on cw frequencies.
[10]Oscar orbital data for the coming week, on cw frequencies.
[11]Oscar orbital data for the coming week, on RTTY frequencies.
* General contact period.
** No 10- or 15-meter activity from 2030-0000 GST.
† Indicates following day when UTC is being used.
All frequencies are approximate.

accepted in all countries and they do mean extra work for the DX operator to get to the post office, make the exchange and affix the stamps. W2AZX runs a foreign stamp service for QSL purposes.

You might get an answer more quickly by sending a homemade QSL card all made out, so all he has to do is sign it and return it in your s.a.s.e. Maybe not as impressive, but it serves the purpose.

Here are some other tips that will assist the DX operator and may save you money:

1) Write his address in the return-address space of the s.a.s.e.

2) Don't seal the outer envelope so tightly that it's hard to insert a letter-opener.

3) Insert the s.a.s.e. so that a letter-opener won't rip it.

4) Some DX stations have odd-size cards. Foreign air mail envelopes (about 4-1/2 × 6") used for your s.a.s.e. will usually accommodate.

5) Omit call letters or other indications of radio involvement from the DX station's address. In some countries this could be embarrassing (or worse!).

6) Use regular mail to U.S. QSL Managers and APO addresses. Most of it goes by air anyway.

7) Some QSL managers like to have the DX call and date of QSO on the lower left corner of the outer envelope.

8) Make sure your postage is correct and that the stamps are really stuck on. Don't use an airmail envelope with surface postage. The post office will either return such mail or put it in the dead letter office.

It isn't going to be easy to get the necessary confirmations for the new CW-DXCC, but if you play it right you may get some cards your fellow DXer misses out on. Good hunting! (Tnx, W1BIH.)

Cross-Mode DXing. One of the items on the DXAC agenda is consideration of removing the rule prohibiting cross-mode contacts for 5BDXCC credit -- essentially, cw to phone and phone to cw. The primary purpose of this rule is to discourage the use of cw in the phone bands.

Most administrations have no regulations requiring separation of modes, but tradition and "gentlemen's agreements" have kept the modes separated through the years -- for the most part, anyway -- for the simple reason that phone and cw are not really compatible in the same segments. Most amateurs realize this, and the availability of DXCC by modes underscores it. The question is, should 5BDXCC permit cross-mode contacts to be counted for credit, thus perhaps encouraging more cw in the phone bands? Let your nearest DXAC member know how you feel about it. -- *W1NJM/W1CW*

5-BAND AWARDS

(Updating the June 1975 listing.)

5BDXCC: (Starting with number 415), SM5CMP K4KQB SM6CWK W3YSH K8HBN DK3HL K2BT YU2BQR W4BQY W1NU.

5BWAS: (Starting with number 212), W7YS W8PBU K2DT WA6KZI KH6RS.

APRIL CD PARTIES

High-Claimed Scores

The following are high-claimed scores. They read, from left to right: Call, score, QSOs, sections, hours of operation. Final scores will appear in the July CD Bulletin. -- *WA1STN*

CW

W2YD (WA2SRQ, op.)	291,870	840	69	20
WA2UOO	276,080	805	68	18
K4PUZ	263,160	767	68	20
W1MX (WA2CNE, op.)	257,280	761	67	19
W5RUB	226,440	662	68	19
WB6ZVC	225,285	648	69	20
W8LHE	218,960	644	68	16
K3OIO	217,700	617	70	10
W8SH (WB8BPY, op.)	216,450	666	65	20
WA3SWF	209,415	602	65	20
WA2DSA	208,325	634	65	19
K2JOC	205,690	610	67	20
WA1UIK	202,290	613	66	18
WA6TLV	195,975	578	67	20
K4DAS	195,030	585	66	20
K4BAI	191,360	591	64	15
WB2FLF	186,240	575	64	16
W3IN	181,675	553	65	--
WA6OTU	175,040	541	64	18
W4BTZ	165,375	518	63	19
W5WMU	161,850	498	65	11
WA9MXG	158,440	462	68	14
W7GHT	157,120	484	64	13
WØETT/7	155,310	497	62	19
WB2PYM	145,925	445	65	10
KØGXR	143,480	422	68	10
WB5HOD	141,810	485	58	20
WB9HAD	140,800	436	64	12
W6BIP	132,925	402	65	16
WØOTF	122,880	378	64	14
K2KIR	120,645	375	63	6
W3ADE	116,800	357	64	17
WB8IJW/8	115,920	368	63	14
K9LGU	114,030	358	63	12
WA2PJL	112,150	358	62	10
W6DQX	108,800	334	64	4
W6IKW	106,500	349	60	20
K7LTV	106,445	342	61	8
WA1POJ	104,690	355	58	10
K3HXS	104,615	339	61	13
WB2RKK	104,465	324	63	4
W5TXA	103,090	330	61	10
W6PRP	101,745	319	63	6
W4HJR	101,120	316	64	11
WA1STN	101,100	333	60	6
K7NHV	100,170	310	63	3
WB6AKR (+WB6OYN)	114,985	375	61	12
WB9KRR (+WB9KMQ)	154,770	462	67	19

PHONE

WB8AYC	186,020	520	71	19
WB2RKK	173,250	487	70	17
KØZXE	152,425	451	67	20
K5LUR	142,140	412	69	18
WB9KRR	137,655	399	69	17
WØLJF (KØPVI, op.)	102,300	330	62	17
WA3SWF	102,175	330	61	7
WB2QBP (WB2UFG, op.)	100,160	306	64	11
WB9KMQ	98,270	313	62	14
WB9HAD	95,400	314	60	7
K3HXS	95,160	308	61	13
K4VFY	82,790	251	58	12
WA1RWU	80,560	301	53	--
K1LPA	79,650	267	59	14
WB2FLF	77,100	250	60	6
W1FJJ	76,175	271	55	9
WA3QYY	69,850	264	52	12
W8LHE	65,250	225	58	4
K2JOC	65,070	237	54	3
WA9MXG	63,720	212	59	7
WAØSEV	56,560	199	56	12
W8EDU (WA3BGE, op.)	55,335	212	51	4
WA1UIK	54,810	205	54	9
W9UMH	53,350	194	55	8
W5HGT	52,530	203	51	9
WA7LKJ/5	52,360	187	56	13
WB9LQC	51,300	186	54	7
W6PRP	40,820	153	52	3
W4MYA	40,400	175	48	5
KZ5WA	40,040	182	44	5
W8NOH	39,600	160	48	3
WA7TZO	37,895	138	53	3
WB6ZVC	37,000	143	50	4
WA2WKH	35,200	157	44	8
W4OZF	35,100	130	25	--
WA2UOO/2	34,440	161	41	4
WA1NRF	31,000	124	50	5
K7HCW	30,730	178	57	7
WB2PYM	48,720	199	48	5
WB5HOD	46,170	167	54	6
W5LL	43,605	165	51	6
WA6OTU	43,420	161	52	6
W4WHK	43,350	165	51	8
K5LZO	42,640	164	52	3
WB5HLR	41,820	164	51	7
WA1STN	41,405	163	49	3
W5WAX	41,340	159	52	8

New A-1 Operators

W1NU W6MHR W6NSK K6RA
WB8NCD W9MFG WØAIB

MAY 10 FMT RESULTS

Reported by W1YL

Conditions left a great deal to be desired in the recent Spring FMT. Participation was down to 136 (reported) with a total of 1649 measurements, thirty two achieving Honor Roll standing. Here are the official measurements used in calculating the averages: early run, 3528.190, 7074.119 and 14,111.490 kHz; late run, 3546.101 and 7070.416 kHz. The late twenty run was not used in calculating the averages. For the September 7 FMT we'll be asking you to measure in *reverse* order, the first period being twenty, moving to forty and then 80 meters. Hopefully this will give everyone a better shot at the twenty meter measurements.

DX CENTURY CLUB AWARDS

New Members

Radiotelephone listings follow the general-type "New Member" and "Endorsement" listings — April 1-30, 1975.

W5NOP	336	WA5EZQ	200	W9VWV	114	WB4TAF	106	YU1GMN	103	18MUW	100
SM6CWK	308	9M2CX	164	JA2BTE	113	WB5IYB	106	YU1NOT	103	K2OVS	100
SM5CBN	298	G3VIE	146	K3BZ	113	W6LS	105	JA5HGC	102	K3HBP	100
K8IDE	295	W2LZX	145	DK2UR	111	LA8GK	105	WA4VAB	102	K7LAY	100
K4RA	281	WA6EYK	139	OZ3TQ	111	W2IFE	104	WB8IOT	102	K8NIA	100
CX3BH	243	YU1NPG	139	ON4JV	109	OH9TD	104	K8MLO	101	K9LYT	100
SM5BNZ	243	DK6FA	137	PAØEHF/W1	109	OK1MAW	104	WB2VEF	101	VE7AQL	100
JA7ZF	237	W6ONV	120	WB9FRG	109	EA8JP	103	W6PRJ	101	W6PEU	100
SM5AYY	224	YU2ROZ	118	WB9IVC	109	OZ6ZS	103	W6ROL	101	WA7OBH	100
W8KNH	218	K4KEW/Ø	117	K5SWW	108	W1FYG	103	WA7IOA	101	W9COY	100
K7RSC	201	DA1RA	116	DJ4OH	106	W1IQ	103	W9NKC	101	W9RR	100
		JH3OTS	116			WB5EDV	103			YO3QK	100

K8DYZ	314	WA8TDY	210	WA4BTC	144	YU2ROZ	112	WB6RMG	106	G3GMC	103
W5NOP	314	JA3LUK	207	DL6EC	141	W9EVD	110	WA3FZT	105	W4ISF	103
W2FPM	285	K7RSC	201	VE7VT	137	SVØWKK	109	W6DD	105	EA8JP	102
W6EJ	252	YU2CAW	191	W2LZX	136	DA1RA	107	I6ICD	104	OE2RIL	101
K8IDE	230	WA5EZQ	187	W6ONV	120	IØZS	107	K8AIY	104	W7BMS	101
W4DUP	222	DL2OW	171	JH3OTS	116	JA3BUB	106	YO9HT	104	WA9EUD	100
W8KNH	216	DK5XN	158	YU1NPG	112	W5LGD	106	WAØVKF	104	WBØISW	100
SM5BNZ	213										

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.

G3IOR	330	W9MYD	290	DK9WB	250	W6SO	220	W4DWK	180	K4FNB/1	140
W5UR	325	YU3EY	290	EA2CR	250	WA6KZI	220	WB5DDI	180	K8LUU	140
K4YFQ	315	EA4CR	280	OH2VZ	250	F3IM	200	W6OWL	180	KØHSC	140
OZ1LO	315	W2UBJ	280	OZ7HT	250	K8HBN	200	W9IWX	180	VE2AFU	140
W3PVZ	315	W6BVI	280	VE2AYY	250	PY2CDN	200	WAØVKF	180	W4IMB	140
JA8ZO	310	JA6BZI	270	W1QUS	250	W1KLY	200	YU2RAZ	180	WA4OQO	140
K2OUS	310	K4FJC	270	W3YHR	250	W2EQK	200	I2VDX	160	WA6WEI	140
SM6DHU	310	W2CUC	270	ZL1QW	250	W5IRG	200	K5BYV	160	WB6NSJ	140
W2LWI	310	W5QIX	270	JA3EMU	240	WB5EAZ	200	K9KWK	160	W9RJM	140
W4AUH	310	WA9UEK	270	K4OMR	240	WB5HIH	200	SM7RS	160	W9UDK	140
W6AQ	310	ZL2ACP	270	LU1BAR/W3	240	WB8JEY	200	VE4SN	160	JA3IBU	120
K4CYU	305	9H4G	270	YU2OB	240	W9KM	200	W1AF	160	K7BEY	120
W3DBF	305	JA3BRI	260	DJ1IK	220	YU3CM	200	W2MDM	160	KØFVN	120
W4WSF	305	K6WD	260	DJ3JW	220	DK5AD	180	G3DPX/W6	160	PY4BTK	120
KH6GLU	300	SM6EQS	260	K6RK	220	DL7KI	180	WA7GYR	160	WB2FVX	120
OZ5DX	300	W2REH	260	W1RML	220	HA5KKB	180	WA9ZWL	160	WA6DNM	120
W1BFA	300	W4KN	260	W2PEV	220	I3LAV	180	WØBHC	160	WB6RMG	120
K6HTM	290	W8LAV	260	WB2VFT	220	KØIKZ	180	YU2BOP	160	WA7DYH	120
OZ8BZ	290	WA9IBT	260	W3IXJ	220	OE3EVA	180	G3IKY	140	ZS2EM	120
W8BQV	290	9Q5QR	260	W4SNR	220	WA2DHF	180	JA6WHS	140		

W4AUH	310	K4YFQ	290	ZS1DC	260	JA7ZF	220	WB5HGS	180	YU2OB	160
W6CCB	310	SM6DHU	290	DK9WB	250	K6RK	220	WB5HIH	180	YU2RAZ	160
WA6AHF	310	W4WSF	290	JA6BZI	250	WA4NIB	220	W6BWM	180	VE2AYY	140
F5II	300	W6TTS	290	W2MPK	250	CX6AM	200	WAØPVW	180	WA4LPM	140
HB9AAA	300	F5VU	280	W3YHR	250	W2PEV	200	I3RSK	160	WA4OQO	140
JA8ZO	300	K2OUS	280	CX3BH	240	W7YR	200	K8HBN	160	WB4NXR	140
W5UR	300	OZ6RT	280	I5FCK	240	W8LAV	200	K9KWK	160	9M2CJ	140
W9OHH	300	9H4G	270	WB4PXW	240	W2CUC	180	SM7RS	160	K8LUU	120
XE3EB	300	W9MYD	260	I2LPA	220	WA2DVO	180	W6OWL	160	WB4QWM	120
I1BGJ	290			JA3BRI	220			WØEVE	160		

DXAC Notes

The DXAC has placed the following item on its April 1975 agenda for consideration in August. Written comments are solicited from DXers via Hq. for DXAC distribution.

1) Should the words "cross mode or" be eliminated from the second sentence in paragraph 4 of 5BDXCC requirements?

Paragraph 4 reads: "4. Confirmations showing contacts by any legal mode will be acceptable. However, no contacts made by cross mode or cross band are acceptable, nor will endorsement for mode be given or indicated. Contacts using repeaters or repeater satellites are not acceptable."

Those new to the FMT/OO program are urged to consider appointment as Official Observer. Check with your SCM (page 6) to see if you can meet the qualifications.

September 7 FMT rules will appear in Operating Events, August.

Honor Roll

This top listing is the standing of the frequency measuring leaders. In consideration of the minimum possible error due to Doppler and other unavoidable factors, we accredit as of equal merit all those reports computing 4/10ths parts per million (or better) accuracy. Please note that a participant must submit a minimum of 2 measurements to qualify for this listing.

W1JH W1PIJ K1VHO WA2DVU WA2QMI WA3UFU K3WIK W4NTO W5FMO W5IJW K5LAZ W5QIV W6CBX WA6CKD K6KA WB6MZP WB6OFX W6OQI W6RQ K7CC W8CUJ WA8MSC W9DGV W9MNY W9VOX K9WGN WØDJV WØMDI. WØRUR VE3AC ex-7HM.

In the following tabulation error percentage can be determined by moving the parts-per-million decimal point (the figure shown in parentheses) 4 places to the left. Class I OOs must demonstrate an average accuracy of better than 35 parts per million. Class II OOs must show better than 179 ppm.

Better than 35 parts per million

(.5) K2HT K3HJI W7CX W7WM, (.6) W1BGW W3BEF K3LPP WB6AAL K6DBJ, (.7) Ireland, (.8) W9KO, (.9) W9FKJ, (1.0) WA7FBO, (1.1) WA2CCF, (1.4) WA5ACA, (1.6) W6CBF, (1.7) W9JAY, (1.8) K2EK WB5ASD, (2.0) K1EUM, (2.2) K9BGL, , (3.4) W4OGH, (3.6) W6RNU, (3.8) K2JFJ, (4.2) W3YO WAØRYL, (4.5) VE6MJ, (4.7) K1SOP WAØEFN, (5.1) WB5FMA KH6IJV, (5.4) W9AG, (5.8) W2MDM WB8SCG, (6.0) WBØFTU, (6.2) W9WWT, (6.4) WBØDRV, (6.5) W1GEC, (7.0) W4UCL, (7.5) W2JDC, (7.9) WB4RUA, (8.6) K6QPG, (9.4) W8LAG, (9.6) W9SZR/3, (10.7) K4MZK, (11.0) WA9PVS, (11.4) K7DUE, (11.6) K6GG WB9BUV, (11.8) WA5ZBN, (12.3) WA7HGB, (12.5) W1PL, (13.1) WA7TZO, (14.3) WA4VEC, (14.5) K6EC, (14.7) W3KEK, (15.2) W3ADE, (17.0) WA6ARP, (18.0) W4HU, (18.4) K3CQY, (18.9) WBØCQL, (19.8) WA8OUY/8, (20.6) W6DLL, (21.3) WA1PLD WØUTT, (23.4) WB9MMD, (24.7) KØMKD, (27.2) VE3DDD, (27.4) WAØRIQ, (28.5) W2WSS, (29.5) WA9RVY, (34.6) WB8UKX.

Better than 179 parts per million

(35.4) W1AYG, (36.5) WA8VTD, (37.1) W2GNN, (37.2) K9UQN, (38.0) WB2TFB, (39.6) K9WMP, (44.8) Bill Bingham, (46.5) Andi Bingham, (47.5) W3ZUH, (50.5) Dick Bingham, (52.1) WA1NAE, (60.0) W2SAS, (61.1) W8OW, (63.2) W6AEE WB8JKH, (64.0) WA9DLT, (64.6) WA1SCV, (66.8) W5YF, (70.8) WA2JRX/5 WN2WAE, (78.9) WA6JNF/5, (167.0) K2KF.

The following entries did not meet the minimum criteria for Class II in what seems to be unusual errors involving math, etc.: W9MKL WB4PAG WA3SXU WB9NME.

Feedback

Re the February FMT: W4OGH should be shown with 94.4 ppm and W4KA was really K4KA.

Frequency Drift

Eighty strong on both runs and gave good phase lock, 7 and 14 MHz signals could not be found at all. – W1PLJ. Eqpt. used: R390 rx, Telequipment D54 scope, 10 kHz marker, digitaln. Conditions poor. Thanks for running the FMT. – WA2DVU, Tom, WA3UFU: for info., the results published represent the *average* error in parts per million. – Ed. Interference wasn't too much of a problem this time around. – K3WIK. Eqpt.: 1 MHz osc., freq. dividers to 100, 10, 1, .1 kHz, audio interpolation osc., scope, all-band receiver. – W5FMO. A remarkable lack of dead carriers this time, but band conditions were poor here in the desert. – K7CC. Same simple lashup for over 2 years; I zero your signal by ear on a BC-221 signal in receiver and read BC-221 with homebrew counter. – W9VOX. This month I used the readout of the freq. counter built last January after checking against WWV all day to determine stablity. – W7CX. My first attempt. I'm using a homemade rec-counter attached to a National NCX-5. I use an internally generated 1 kHz tone which is zero beat with the 1 kHz offset of the transceiver. The signal is corrected by adding 1000 to the reading on usb and by subtracting 1000 from the reading on lsb. The counter is only partially complete. When completed, a more accurate time base and receiver phase lock will permit more accurate readings. – WA7FBO. Greatly appreciate your efforts in giving us this activity. – W4QN. I attended the first hour of the Middlesex ARC club meeting, gave my committee reports, drove home for the early run and then drove back to the club meeting to resume my role as coffee pot manager! – K1SOP (Ned, this might be an ideal program for a future meeting night. – Ed). You might mention that I'll be writing many of the OT FMTers gathering info. for an article about FMTs. They might be more receptive to such queries if they see something like this mentioned in the results. – WA1PLD.

SCHEDULE OF ARRL OPERATING AWARDS FEES

	Current		Effective July 15, 1975	
Award	*W/VE Mbr. & DX*	*W/VE Non-Member*	*W/VE Mbr. & DX*	*W/VE Non-Member*
WAS	Return postage	$3 plus postage	$3 includes return cards registered mail	$6 includes return cards registered mail
5BWAS	$10 includes registered mail	Not available	$15 includes registered mail	Not available
DXCC Appn.	$3.50 includes return postage, pin	$8.50 includes return postage, pin	$10 includes return postage, pin	$15 includes return postage, pin
DXCC End.	Return postage	$2 plus return postage	$2 plus return postage	$4 plus return postage
5BDXCC	$10 includes return postage, plaque	Not available	$20 includes return postage, plaque	Not available
Satellite	Return postage	Return postage	$2 includes return registry	$3 includes return registry
RCC	None	None	Free	25 cents

Charges do not apply to: A-1 Operator, Public Service, Old Timer's Club, BPL/BPL Medallion, Code Proficiency, Contests. Novice licensees exempt from all fees.

Operating Events

de W1YL

JULY

3 ***West Coast Qualifying Run*** (W6OWP prime, W6ZRJ alternate), 10-35 wpm at 0400Z on 3590/7090 kHz. This is 2100 PDST the night of July 2. 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. Please include your full name, call (if any) and complete mailing address.

4 ***Straight-Key Night***, a six-hour stretch starting at 0100Z (this is July 3 local time!). Further details page 95 June issue.

5-6 ***7X2 Contest, Radio Club of Tacoma Area Code Contest, CW QRP Contest***, p. 95 June. ***Venezuelan Independence Contest***, full 48-hour period UTC, phone. (Note, cw weekend July 26-27.) Use 80-10 meters. Categories: single op. single band and all band, plus multiop, all band only either single transmitter (only 1 transmitter and 1 band permitted during the same time period) or multitransmitter (no limit to transmitters but only one signal per band permitted. Usual RS(T) plus QSO no. starting with 001. Multipliers: a mult. of 1 for each different Venezuelan zone call areas contacted on each band and a mult. of 1 for each different country contacted on each band. Stations are permitted to contact their own country and YV zone call area for multiplier credit. Contacts between stations in different countries worth 2 points, between stations in the same country on 40/80 worth 1 point, between stations in the same country on 10/15/20 worth 0 points (but are valid for multipliers). The final score is the sum of QSO points multiplied by the sum of YV zones and countries. Log in UTC, indicate YV zone and country multiplier first time only worked on each band. Separate sheets for each band. Usual grounds for disqualification include taking credit in excess of 3% of dupes. Stations not indicating time(Z), band, mode, date, will be disqualified. All entries must be postmarked no later than Sept. 15 for phone and Sept. 30 for cw. Use a separate summary with all scoring info., category of competition, name, address neatly printed plus usual signed declaration. A remittance of $2 (or equivalent in IRCs) is requested with each entry. Send to Radio Club Venezolano, Box 2285, Caracas 101, Venezuela.

11 ***W1AW Qualifying Run***, 10-35 wpm at 0130 UTC transmitted simultaneously 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 local Eastern time) the night of July 10. Underline one minute of top speed copied, certify copy made your full name, call (if any) and complete mailing address.

12-13 ***"Open" CD Party*** cw, p. 52 June. ***Ten-Ten Summer QSO Party***, p. 95 June.

15 ***WG3AS Operation*** (in honor of Apollo-Soyuz), p. 95 June.

19-20 ***"Open" CD Party*** phone, p. 52 June. ***HK Contest, VHF Space Net Contest***, p. 95 June.

26-27 ***CW County Hunters Contest, World-Wide VHF Activity***, p. 95 June. ***YV Contest*** cw, see July 5-6 listing.

26-Aug. 7 ***Calgary Centennial Calgary-to-Mobile Contest***, p. 95 June.

AUGUST

2-3 ***YO Contest***, sponsored by the Romanian Amateur Radio Federation, 1800Z Aug. 2 - 1800Z Aug. 3. Rules unavailable at press time and although a few changes were anticipated the rules should be quite similar to those shown on page 94 of July 1974 *QST*. ***Illinois QSO Party***, Thirteenth Annual, sponsored by the Radio Amateur Megacycle Soc., Inc., from 1800Z Aug. 2 to 2300Z Aug. 3 with a rest period from 0500-1200Z Aug. 3. All bands, cw and phone. The same station may be worked on each mode on each band, no repeater contacts allowed. Suggested areas: cw, about 60 kHz up from the low end of each band; phone, about 25 kHz from the high end of the band (also 21375 and 28675); novice, about 25 kHz from the low edge of the novice bands on the half hour. Illinois stations give RS(T) and county. Others give RS(T) and state, province or country. To score, IL stations add the no. of IL counties, states, Canadian provinces and DXCC countries. Multiply the total by the no. of QSOs for score. IL mobiles add 200 to score for each county of operation (except home county) from which 10 or more contacts were made. Non-IL only, extra multipliers may be counted for working the same county: each group of 8 contacts with the same county gives one bonus multiplier. The sum of counties worked plus bonus multipliers equals the county multiplier. Awards. Legible logs, please. Include a separate summary and show name, address, call and category of operation. Also show no. of contacts, a list of multipliers and claimed score. Postmark deadline is Sept. 15. Include a business size s.a.s.e. and mail to RAMS K9CJU, 3620 N. Oleander Ave., Chicago, IL 60634. Note: RAMS is assisting in the renovation of the famed WWII submarine, the USS Silversides, and will operate from aboard the ship during the contest. Each contact with the sub will count as five regular contacts for scoring. Watch for K9CJU/9 or a possible special call on all bands. We will add the word SUBMARINE to our exchange. Special QSLs will be available (s.a.s.e., please).

6 ***West Coast Qualifying Run.***

9-10 ***European DX Contest*** cw (WAEDC), sponsored by the Deutscher Amateur Radio Club, full GMT period, 80-10 meters. (Note: phone Sept. 13-14; RTTY, Nov. 8-9.) Single op. all band; multiop, single transmitter. Only 36 hours of operation out of the 48 are permitted for single ops. The 12 hours of non-operation may be taken in one, but not more than 3 periods anytime during the contest. Non-EU work EU stations only. Exchange RS(T) and serial number starting with 001. Each QSO worth 1 point. Stations may be worked only once per band. Each confirmed QTC (given or received) counts 1 point. The mult. for non-EUs is determined by the no. of EU countries worked on each band. The multiplier on 80 may be multiplied by 4, the mult. on 40 by 3, the mult. on 20-15-10 by 2. Score is the total QSO points plus QTC points multiplied by the sum total of multipliers from all bands. A QTC is a report of a confirmed QSO that has taken place earlier in the contest and later sent back to a EU station. It can only be sent by a non-EU to an EU. A QTC contains the time, call and QSO no. of the station being reported. A QSO can be reported only once and not back to the originating station. Only a maximum of 10 QTCs to the same station on all bands is permitted. You may work the same station several times to complete this quota. Only the original contact, however, has QSO point value. Keep a uniform list of QTCs sent. QTC 3/7 indicates that this is the 3rd series of QTCs sent and that 7 QSOs are reported. Certificates. Usual disqualification criteria. Contest Committee decisions final. Log 40 QTCs or QSOs per sheet (sheets are available from the DARC). Separate logs per band. Deadline for cw logs Sept. 15, for phone entries Oct. 15. RTTY deadline Dec. 1. Mail to WAEDC Committee, D-895 Kaufbeuren, Postbox 262, Germany. ***Argentina DX Contest***, sponsored by the Radio Club of Argentina, the full 48-hour period UTC, open to all, phone only on 80 through 10 meters. Contact as many LUs in each Argentine province as possible, as well as stations in different countries. Non-LUs must contact at least 10 LU stations. Exchange RS plus QSO no. starting with 001. Each LU station worked earns 3 points per band (the same station may be worked on different bands); other stations worldwide 1 point. Contacts with stations in your own country count for multiplier only. Final score: multiply the total QSO points on all bands by the sum of LU provinces and countries on all bands. Awards. Logs must be received by Sept. 30. Send to RCA Contest, Box 97, Buenos Aires, Argentina. Logs must show name, location, call of participant; include usual log format.

12 ***W1AW Qualifying Run.***

16-17 ***New Jersey QSO Party***, 16th annual, sponsored by the Englewood Amateur Radio Assn., Inc., open to all. Contest period is from 2000Z Sat. Aug. 16 to 0700Z Sun. Aug. 17 and from 1300Z Aug. 17 to 0200Z Aug. 18. Phone and cw are considered the same contest. A station may be contacted once on each band, phone and cw considered separate bands. NJ stations may work other NJ stations. Suggested freqs.: 1810 3535 3735 3905 7035 7135 7235 14035 14280 21100 21355 28100 28600 50-50.5 144-146. Suggest phone activity on the even hours, 15 on the odd hours (1500-2100Z). Try 160 at 0500Z. Exchange QSO no., RS(T), and QTH (ARRL section or country). NJ stations will sent their county. Out-of-state stations multiply no. of complete contacts with NJ stations times the no. of NJ counties worked (maximum of 21). NJ

stations count 1 point for W/K/VE/VO QSOs; DX QSOs count 3 points. Multiply total no. of points times the no. of ARRL sections (including NNJ and SNJ, max. of 74). KP4, KH6, KL7, KZ5, etc. count as both 3-point DX contacts and as section multipliers. Certificates. Logs must show date/time in UTC and time, band, emission. They must be received not later than September 13. The first contact for each claimed multiplier must be indicated and numbered and a check list of contacts and multipliers should be included. Multiops. should be noted and calls of all participating operators listed. Logs and comments should be sent to the Englewood Amateur Radio Assn., Inc., 303 Tenafly Road, Englewood, NJ 07631. A no. 10 s.a.s.e. should be included for results. Stations planning active participation in NJ are requested to advise the EARA by Aug. 2 so that full county coverage may be planned. Portable and mobile operation is encouraged. ***World-Wide RTTY Contest***, sponsored by the Scandinavian Radio Teleprinter Group. Test periods: 0000-0800Z and 1600-2400Z Aug. 16 and 0800-1600 Aug. 17. All bands, 80-10. The same station may be worked once on each band for QSO and multiplier credit. Only 2-way RTTY QSOs will count. Classes: single op. up to 100 w. input, single op. over 100 w. input, multiop. single transmiter (any power), SWL. Exchange RST and QSO no. Points: QSO with own country 5 points, other country on the same continent 10 points, other continent 15 points. In the U.S. and Canada, each call district will be considered as a separate country. Multipliers: each W/K/VE/VO area and the DXCC list. Mailing deadline Sept. 18. Logs must contain: band, date/time(Z), calls, exchanges, points, multipliers. Use a separate sheet for each band and enclose a summary showing scoring, classification, call, name, address. Comments appreciated especially regarding Oscar traffic in future tests. Awards. Send logs to: SARTG Contest Manager, C. J. Jensen, OZ2CJ, Meisnersgade 5, DK-8900, Randers, Denmark. ***Oregon QSO Party***, sponsored by the Emerald Amateur Radio Society, the full 48-hour period UTC. Oregon stations score 1 point for each U.S., VE, KH6 and KL7 QSO per band and 3 points for each DX QSO per band, one multiplier point for each state (Oregon included), VE province, foreign country and Oregon county per band. W/VE (non-Oregon) score 5 points per Oregon QSO per band, 7 points for each Oregon novice QSO per band. Non-Oregon stations score 1 multiplier point for each Oregon county per band and all stations may be worked twice per band (phone and cw), note maximum of 36 counties per band. Single and multiops. permitted. OR stations will compete in five classifications: low power fixed (0-200 watts), high power fixed (over 200 watts), mobile, portable and novice. A bonus of 1000 points will be added to the score of all Oregon mobile and portable stations operating outside their home county. Awards. Suggested freqs.: cw, 1810 3550 7050 14050 21050 28050; phone, 1820 3900 7250 14280 21375 28600; six and 2 meters; repeater QSOs OK; novice, 3710 7110 21110 28110. Logs, summary, signed declaration and s.a.s.e. must be mailed no later than Sept. 13 and sent to: Contest Chairman WA7TDZ, 2188 East Irwin Way, Eugene, Oregon 97401.

23-24 ***All-Asian DX Contest***, cw; full rules p. 105 May, note the cw log deadline is Nov. 30. ***Arizona QSO Party***, first annual, sponsored by the Motorola Amateur Radio Club, from 1700Z Aug. 23 to 1700Z Aug. 24, no time limit, open to all. Out-of-state stations work AZ, AZ stations work all stations. Contacts may be made on both phone and cw once per mode per band, 80-10 meters. Exchange RS(T), AZ county or state, and consecutive serial no. All stations score 1 point per QSO times multipliers. All stations use a multiplier of 1 for 200-1000 watts dc input, 1.5 for 200-10 watts input, and 3 for 10 watts input (and below). AZ stations multiply by the no. of states worked; out-of-state stations use AZ counties for multiplier, max. of 14. Suggested freqs.: cw, 3575 7075 14075 21075 28075; phone, 3935 7235 14335 21435 28535; novice, 3750 7125 21150 28150. Awards. All logs must be postmarked on or before Sept. 16. Include equipment description. For a copy of the results and any award, send s.a.s.e. to Motorola ARC of AZ, Michael T. Wright, 8201 E. McDowell Rd. no. 1260, Scottsdale, AZ 85252.

30-31 ***SSA 50 Contest***, celebrating the 50th anniversary of the Swedish Society the SSA, phone 0600-2400Z Aug. 30, cw 0600-2400Z Aug. 31, 80-10 meters. Non-SM stations will try to work as many SM/SK/SL/SJ stations as possible during the contest. The same station may be worked only once on each band and period and only cw-cw and phone-phone QSOs are valid for the contest. Note two different parts for phone and cw; single op., multiop., and SWL classes. There are only all band and single-transmitter classes. Club stations are classified as multiop. Send RS(T) and consecutive serial no. starting with 001. You earn 1 point per complete QSO. Multipliers are a maximum of 25 per band consisting of the Swedish prefixes as follows: SM1-7 plus Ø, SK1-7 plus Ø, SL1-7 plus - and SJ9. The sum of QSO points on all bands multiplied by the sum of multipliers on all bands equals the final score. Awards. Logs are to be kept as follows: date/time(Z), stations, messages, band, notation of new multipliers, points. Please use separate logs for each band and mode. Use a summary including your call, name, address and class along with claimed score. Logs must be postmarked before Oct. 1 and sent to SSA Contest Mgr., Jan Hällenberg, SMØDJZ, Sleipnergatan 64,7TR, S-195 00 Maersta, Sweden.

SEPTEMBER

3 *West Coast Qualifying Run.*

6-7 *VHF QSO Party, Md.-DC QSO Party, Savaria CCS Contest (HA).*

7 *FMT, Tu-Boro RC 2-Meter RTTY Contest.*

10 *WIAW Qualifying Run.*

13-14 *WAEDC phone, CLARA Day Contest, Pennsylvania QSO Party, Washington State QSO Party.*

20-21 *VE/W Contest, SAC cw.*

23 *WIAW Morning Qualifying Run.*

27-28 *SAC phone, Delta QSO Party.*

Oct. 11-12, CD Party phone.
Oct. 18-19, CD Party cw.
Oct. 25-26, CQWW phone.
Nov. 8, FMT.
Nov. 8-9, SS cw.
Nov. 22-23, SS phone.
Nov. 29-30, CQWW cw.
Dec. 6-7, 160-Meter Contest.
Dec. 13-14, 10-Meter Contest.
Dec. 31, Straight-Key Night.

Strays

Getting to hamfests in the Tennessee area is no problem for this pair, despite their handicaps. WB4PJS does the navigating while W4HBZ, who is sightless, supplies the muscle. TNX to WB4ANX for the picture.

Silent Keys

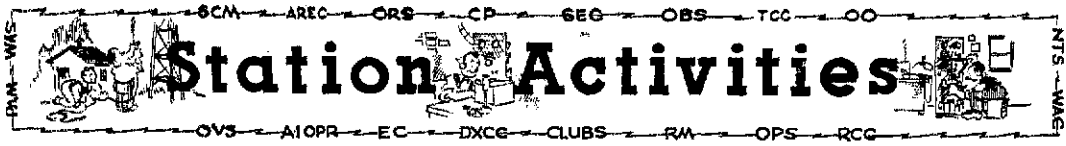
IT IS with deep regret that we record the passing of these amateurs:

W1AHF, William McCormick, Stow, MA
W1AN, Chester A. Kennedy, Portland, ME
W1EN, Forrest L. Adams, White River Jct., VT
W1IQK, Raymond J. Spose, Branford, CT
Ex-W1JE, Joseph E. Walsh, Sr., North Reading, MA
W1PQI, William H. Ray, West Hartford, CT
W2HGD, Fred Pugliese, Maplewood, NJ
WA2HKX, Joseph P. Gillen, Forest Hills, NY
K2KJQ, Richmond W. Myers, Kenilworth, NJ
W2LTI, Frederick Gichner, Sr., Bound Brook, NJ
W2NSA, Arnold J. McCaffrey, Spring Lake, NJ
W2PSY, Norman E. Hjorth, Cherry Hill, NJ
W2ZBS, Rolf W. Carlsen, Saratoga, CA
W3DYP, Nelson R. Schurr, Philadelphia, PA
W3KIY, Russell S. Mauger, Philadelphia, PA
K4FJ, Real C. Chouinard, Lake Como, FL
K4GPB, Donald P. Armstrong, Annandale, VA
WB4JTI, Wallace W. Martin, Jr., Summerville, SC
WA4LCS, Charles B. Schwab, Venice, FL
W4LLD, Charles W. Carter, Charlottesville, VA
W4WH, William D. Hamlin, Pompano Beach, FL
W5CIT, Nathan L. Carriere, Livonia, LA
W5DAA, Henry L. Brewer, Kingsville, TX
W5DY, James M. Washburn, Fredericksburg, TX
WA5FBJ, Dr. M. L. Moreland, Pearsall, TX
W5GJU, Harold D. McFarland, Wichita Falls, TX
W5GVV, Jesse M. Langford, Enid, OK
W5HWY, William W. Bielunicko, Victoria, TX
W5KTW, Alfred O. Walker, Lake Jackson, TX
K5UNC, Martha L. Ligon, McAllen, TX
W5VIA, W. Doyle Fuchs, Sweetwater, OK
W6AGY, Hoyd H. Russell, Capitola, CA
WA6ATF, Eric D. Hamilton, Inglewood, CA
W6CGP, Chester P. Rosa, Los Angeles, CA
K6DJ, Charles H. Hibbard, Pasadena, CA
W6GRS, Hurst Bogue, San Gabriel, CA
WA6IIZ, Alfred R. Cone, Merced, CA
W6JR, A. L. Alexander, Los Angeles, CA
W6NV, Hayes Walter Keiser, Monrovia, CA
W6PXU, Ralph B. Rappaport, Los Angeles, CA
W6QQV, William H. Sanders, Menlo Park, CA
W6RGO, Kenneth E. Nicholson, Kingman, AZ
W6UBP, Frederick V. Lindquist, Los Angeles, CA
K6UNN, Roy W. Garecht, Needles, CA
W7AWP, Jefferson E. Atwood, Seattle, WA
WA7CSM, Hugo M. Leidenroth, Tucson, AZ
W7HRV, Carl E. Braun, West Linn, OR
W7IWW, Dr. Arthur J. Movius, Billings, MT
WA7OWH, George L. Anderson, Wallace, ID
WA7TWH, John E. Kitts, Mesa, AZ
WN7UMJ, Lester L. Graves, Sun City, AZ
W7UPR, Frank B. Hart, Tillamook, OR
W7UWT, Raymond H. McCausland, Bremerton, WA
W8AW, Frank L. Taylor, Franklin, MI
W8HGJ, Carl R. Scott, Akron, OH
WA8KIM, Donald B. Price, Willoughby, OH
W8LMU, Forrest O. Miller, Dayton, OH
WA8LNS, Lyle H. Andrus, Davison, MI
WB8QCM, Steven L. Kempf, Flint, MI
WA9BND, Emanuel Pacilli, Addison, IL
W9CW, Russell Groth, Park Ridge, IL
K9DAS, Edward Green, Wayne, IN
W9DCR, Charles K. Albrecht, Madison, WI
K9ELB, Paul E. Harvey, Columbia City, IN
W9GQH, C. Leo Wick, Fairfield, IL
W9NAL, F. Richard Countryman, Elgin, IL
W9NEJ, Theodore Van Ahbema, Mt. Prospect, IL
WN9OBG, Willard Campbell, Gas City, IN
W9PWH, Earl Stephenson, Chicago, IL
K9SBF, Laurence R. Watson, Jacksonville, IL
WØNWW, Kennyth N. Raymond, Castle Rock, CO
WØYUA, Aldis R. Hendrickson, Jewell, IA
VE3DFF, R. E. Martin, Fort Frances, ON
VE6EQ, Elwyn C. Gilpin, Hughenden, AB
VE3EVV, Walter S. Sherk, Niagara Falls, ON
VE3HGQ, William Cox, Flesherton, ON
VE6HM, Charles H. Harris, Edmonton, AB
VE3MP, Frederick A. Wale, Smith Falls, ON
VE6UQ, William H. Allan, Nanton, AB
VE7PT, Thomas Parkin, Brentwood Bay, BC
PY1HZ, Sylvio G. Rolim, Niteroi, RJ Brazil
VK3IC, Robert B. Wookey, Geelong, Australia

Strays

We're just wondering if professional magician Jim Ward, KH6ICR, could pull a few dozen sunspots out of that hat of his.

Amateur radio has many human-interest stories; a typical one concerns WØHLX, who met an amateur-radio acquaintance of 24 years, PAØJV, last April. Unfortunately, just days after their meeting in Holland, WØHLX suffered a heart attack and became a silent key. WØHLX's XYL intends to continue the tradition of sending PAØJV each issue of *QST*, along with all of the equipment left behind. In closing her letter, she said: "I have been an XYL for 38 years, and I know I am going to miss all that that stands for."



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, K3KAJ 44. W3ZNF is using his editorial talents to produce "Repeat", an excellent Bulletin, for the MID-Del. FM Repeater Assn. K3YHR has worked more countries than States on SSTV. W3WYO has a new TA-33 beam in use. WA3UYJ gave a demonstration and functional information on FAX operation for the First State ARC. The First Staters are using 147.51 fm for a Club Net at 1900 local on Sun. and for their transmitter hunts. HF operation for W3DKX has been all but eliminated because of critical illness in the family. DTN: QNI 74, QTC 63, DEPN: QNI 61, QTC 9. Traffic: W3EEB 74, K3KAJ 67, WA3DUM 66, W3DKX 31, K3YHR 9, WA5KUD/3 4.

EASTERN PENNSYLVANIA – Acting SCM, Paul D. Mercado, W3FBF – SEC: W3FBF. PAM: WA3PZO. RMs: K3DZB, W3EML, K3MVO. The annual section dinner was well attended and the entertainment was well enjoyed. WA3WKR, Explorer Post No. 173 provided communications for a local bi-centennial parade and a road rally sponsored by the Explorer Valley Forge Division. Congratulations to WA3UKZ and WA3QYY for passing Extra Class exam. W3CL was presented with the "Outstanding Pack Rat of the Year" award. The annual EPA picnic will be held on Sun. Aug. 17, 1975 at Lahaska, Pa., and will be hosted by the Penn Wireless Radio Club. Facilities will be available for swimming, boating, fishing, games, sports, 2-meter transmitter hunt, etc. Bring food and cool refreshments. Supervised nursery for children. W3GIMK finally found the SCM's address. WA3WOE is enjoying DX and the traffic nets. W3WRE was the main speaker at recent Pack Rat Club meeting. W3HK is still "happy boy." WA3BJQ says hi. K3MVQ has nothing new. W3EML one of our many loyal traffickers is doing well with health problem. WA3ATQ received a National Service Award from Women Marine Assn. Congrats. The Pa. Institute of Technology Radio Club is installing a repeater on 146.025/146.625 under the call WR3AFJ. WA3QLG will soon be leaving for summer camp at Dover AFB in Del. The American Red Cross is having a simulated, three state drill this month, at JFK Stadium in Philadelphia. Many local radio clubs AREC and interested radio amateurs are participating. WA3REY, EC Lebanon Co. coordinated a communication service for the Valley Forge Trail Riders Motorcycle rally at Indiantown Gap on May 25. WA3QNK reports the Lancaster Co. net (AREC) was activated towards a successful simulated drill concerning radio active leaks caused by a Nuclear Reactor. BPL: WA3ATQ. EPA CW Net had QNI 411, QTC 229; EPA EPT&TN QNI 30, QTC 168; PTTN QNI 161, QTC 79; CMTN QNI 10, QTC 6. Traffic: WA3PHQ 411, WA3ATQ 314, WA3PZO 269, K3DZB 257, W3WRE 255, W3EML 201, WA3QYY 201, K3OIO 117, K3MVO 93, W3IPX 71, WA3VDQ 69, WA3UKZ 55, WA3WOE 37, W3BNR 35, WA3SVJ 29, W3ADE 22, W3HWZ 20, W3LC 18, WA3NDQ 16, W3HK 14, W3LC 11. WA3REY 8, WA3BJQ 1, W3EU 1. W3FBF 1, W3GMK 1, W3GOA 1, W3KCM 1, W3VA 1.

MARYLAND-DISTRICT OF COLUMBIA – SCM, Karl R. Medrow, W3FA – SEC: K3LFD. RM: W3FZV. PAM: WA3EOP. NCM: WA3LPL. BPL to WA3EOP for those originations. It is dawn to dusk farm work for WA3UUM. WA3ZAS a new OPS leads in traffic count. WA3UYB plans to raise that beam soon. Wind damage to towers and antenna experienced by W3MSN, WA3PRW, WA3ZAS, W3AU and W3LPL. WA3SJS has new working hours. WA3UPH/3 reports a fun month with a new QTH and lotsa ham activity. WA3UYF is up with the big scores. W3FZV enjoyed both the CD party and the Fla. QSO party. W3TN and W3JZY were busy renewing acquaintances in the CD party along with W3CDQ a regular. WA3ULH a new ORS is right in there with the rest. WA3WRN has a mysterious shadow that follows him around. K3IQG is regrouping for fall at Loyola with WN3YZE and WN3ZKB potential new ops. W3BHE is pleased to report WA3VKH a new General at 14 years. W3MWD is trying to overcome the traffic load. OO WA3JSZ did okay in the last FMT. W3OKN hopes to get his antenna farm started in WPa before he leaves MDC. W3TN is taking things easy. K3DI busy on MARS schedules and home gardening. W3QU feeling about the same fighting those tough NCS jobs. WA3SJY is a regular on the Inter Con with all his work on 20 and 15. W3BHE finds retirement proves busier than ever. W3RUN and K3GJD apply for OBS to keep the repeater groups informed. The Maydale ARS plans the MDC QSO Party for Sept. 6 thru 8. With the nets – Sessions/traffic/QNI average: MDD 60/216/7.2. MEPN 22/109/24.8. MDCTN 17/76/18.3 and WRPON 12/42/14.9. MDD top brass W3FA, W3FZV, W3EEB, W3MWD and WA3UYF. MDCTN top honors to WA3UYB, WA3ZAS, WA3EOP, W3FA and W3LDD. MEPN toppers were W3ADQ and W3JQN. Others were W3FA, W3HWZ and K3ZPU. Traffic: WA3ZAS 367, WA3EOP 281, W3FA 172, WA3WRN 168, WA3UPH/3 135, WA3UYF 130, W3MWD 104, WA3SJY 95, W3FZV 85, WA3UYB 45, W3OKN 38, K3DI 36, WA3SJS 33, W3QU 29, K3IQG 26, WA3ULH 12, W3TN 8, W3BHE 6, WA3PRW 5.

SOUTHERN NEW JERSEY – SCM, Charles E. Travers, W2YPZ – SEC: W2JI. RM: W2JI. PAM: WA2DSA. The Englewood Amateur Radio Assn., Inc., invites all amateurs the world over to take part in the 16th Annual N.J. QSO Party, Aug. 16-18. General Call is "CQ N.J." Repeater WR2AGO, Gloucester Co. is operating on 147.78 and 147.18. WA2POG passed the Advanced Class exam. Congrats. The NJSN continues to make excellent progress as reported by WB2RMK with 30 sessions and 293 QNI and 85 QTC. This report sets the record for the NJSN. NJN mgr. WA2DSA reports the early net with 30 sessions, 467 stations and 163 traffic. The late session operated on 30 sessions with 260 stations and 112 traffic. W2ORS is putting together a Heath keyer. W2REH is rebuilding his quad and erecting a 65-ft. vertical for 3.5 MHz. WB2EYF of Atlantic Co. reports club sponsored code and theory classes as a part of the Ram Assn. ARC Program. SEC W2JI is very much elated with the splendid response to the AREC program. WB2KET was appointed EC for Cape May Co. AREC membership now includes 106 members with EC appointments on the increase. The DVRA recently installed a new Stationmaster for the repeater WR2ADE. K2SNK and WA2IFL along with other members of the club did an excellent job in the installation. Traffic: W2YPZ 12, W2REH 10, WB2SFX 10, W2IU 3, W2JI 3, WB2EYF 1.

WESTERN NEW YORK – SCM, G.W. Hippisley, K2KIR – SEC: W2CFP. Appointments: WB2THS (new ORS), W2FZK (renewed ORS). All appointments must be renewed every two years to remain in force. It is not necessary to send the certificate to me; endorsement stickers are now used. PSHR to W2OE and WB2JRX this month. Saw lots of WNY gang at the Dayton Hamvention. Batavia hams W2FEA, W2FEY, WA2AIV provided communications for CD and Red Cross during the Apr. 4 blizzard which closed the Thruway. W2CFP reports EC W2HPQ now handles AREC matters for Schuyler County. W2FR notes his electric tractor and rotary inverter will run a 150-watt HF transceiver for about 15 hours with no noise, no gasoline, and no exhaust fumes. New gear this month for W2TJO (SB-104) and WA2EAJ (GTX-10), VHF news: WA2HUP happy to make 6- and 2-meter skeds (cw) with anyone interested. Several control features being added to WR2AEI (28/88 Rochester) over the summer. WB2FXY trying ATV on 440. WR2ADG (449.25/444.25) up and running in Rochester. Monthly hidden transmitter hunts held on Buffalo repeater WR2ABU; contact WB2OIF for details. Low bands: Former Auburnian K2QIW now /1 in Merrimack, NH, and hopes to keep in touch via ESS. K2SIL settles in nearby Nashua, NH, after nearly eight years in Hawaii. WB2JRX signed WE2ITU during ITU week. Advanced Class licenses to WA2FVI and K2KWK, who is active on 20 and 40 SSB/CW. WB2FXY glommed onto 9K2DJ and VQ9R. WB2WPA trying solid-state broadband preamps for his HF receiver. New officers of SUNY at Buffalo ARS WA2NPQ are WA2AOG, pres.; K2BFQ, veep. RAGS members once again provided communications for the annual YMCA Marathon under the leadership of W2YRL and K1YHR. EC reports received by W2CFP for Apr. list seven drills and one actual emergency. Santa brought K2KIR a new 40-meter beam (if at first you don't succeed...) in time for the July Open CD Party. To test it, KIR worked 3D2RM, who turned out to be former Batavian ex-W2KUV. Small world out there. When vacationing this summer, don't forget to visit the Antique Wireless Assn. Museum, Bloomfield Academy, East Bloomfield, NY. Traffic: W2RUF 357, WB2IRX 263, WB2UBW 241, W2FR 223, WA2ICB 167, W2OE 102, W2MTA 75, W2FZK 71, WB2VND 55, WB2QIX 55, WN2VRJ 50, WA2DRC 45, W2ROF 41, WA2HSB 37, WA2PUU 31, W2PZL 31, WB2KUN 29, WB2AEK 24, WA2TPC 21, W2HYM 19, K2OFV 18, W2RUT 17, K2KIR 15, W2ZOJ 12, W2EAF 10, WA2AIV 8, WA2EAJ 8, K2IMI 6, WA2NPQ 4.

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

Kit SB-104, 31 lbs., mailable 669.95*
Kit SBA-104-3, 400 Hz CW crystal filter, 1 lb., mailable 36.95*
Kit SBA-104-1, Noise blanker, 1 lb., mailable 26.95*
Kit SBA-104-2, Mobile mount, 6 lbs., mailable 36.95*
Kit HP-1144, Fixed station power supply, 28 lbs., mailable 89.95*

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

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

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

SB-634 station console combines 5 convenient accessories

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

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

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

SB-644 remote VFO

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

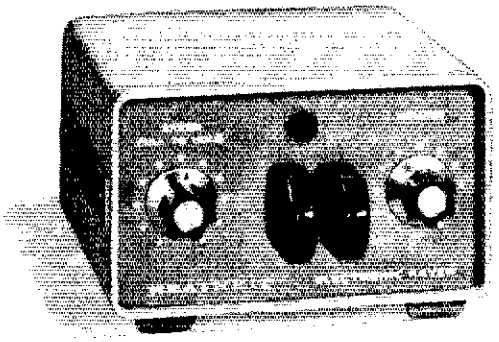
Kit SB-644, 10 lbs., mailable 119.95*

SB-604 station speaker— response-tailored to SSB

Designed to match the SB-104 in styling and performance. The "604" uses a 5 x 7", 3.2-ohm speaker. And there's room inside for the HP-1144 power supply. With connector cable and plug.

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

New Heath Ham Accessories



New solid state Heathkit Electronic Keyer...49.95

Sending code's easy with the HD-1410 whether you're operating base or portable. The dot and dash paddles' travel and tension are easily adjustable. When the two paddles are treated as one, the HD-1410 operates like a single-paddle keyer with dot and dash memories. Iambic operation forms most characters with reduced wrist movement. Dots and dashes are self-completing and always in proper proportion. During construction, you select the speed range you want up to 35 words per minute or up to 60 words per minute. Operates on 120 VAC or 12 VDC. Adjustable sidetone frequency, built-in speaker, headphone jack, weighted base. Styled to match our famous "SB" line.

Kit HD-1410, 5 lbs., mailable **49.95***

HD-1410 SPECIFICATIONS — Keying Speed: Variable from under 10 to over 35 or from under 10 to over 60 wpm. **Keying Output, Positive Line to Ground:** max. voltage open circuit or spikes — 300 volts. Max. current — 200 mA. **Keying Output, Negative Line to Ground:** max. voltage open circuit or spikes — 200 volts. Max. current — 10 mA. **Audio:** internal speaker or jack for optional hi-Z (at least 500 ohms) headphones. **Sidetone:** adjustable from 500 to 1000 Hz. **Internal Controls:** sidetone frequency, paddle tension, paddle travel. **Rear Panel Connections:** AC power cord, 12-volt power input, keyer out, headphones, receiver audio in, ext. key. **Temperature Range:** 0°C to +40°C (typ. −10°C to +40°C) or approx. 50°F to 105°F. **Power Requirement:** 120/240 VAC (±10%), 60/50 Hz, 3.5 watts or 10-14.5 VDC, negative ground, 150 mA. **Dimensions:** approx. 3" H x 5" W x 7½" D. **Net Weight:** 3 lbs.

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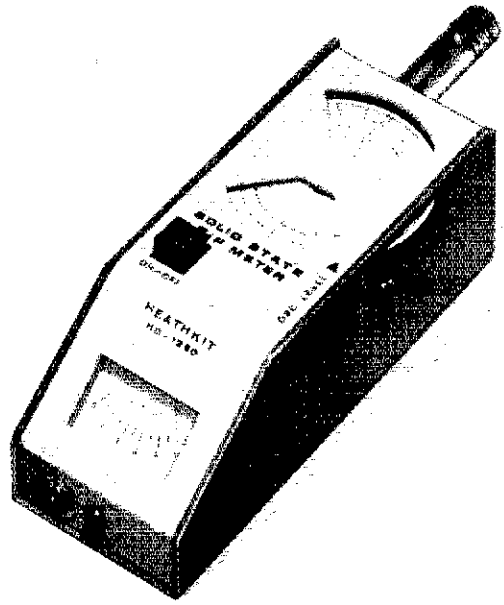

New solid state Heathkit Dip Meter...59.95

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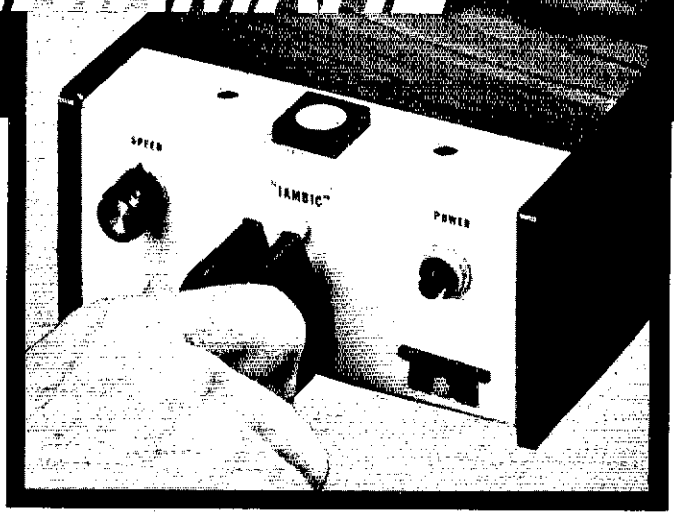
WESTERN PENNSYLVANIA – SCM, Donald J. Myslewski K3CHD – SEC: W3ZUH. Asst. SEC: K3SMB. PAM: K3ZNP. RM W2KAT/3, W3NEM, W3LOS, W3KUN. WPA CW Traffic Net mee daily on 3585 kHz at 7:00 PM local time. Pa. Traffic Training N meets daily on 3610 kHz at 6:30 PM local time. Pa. Phone N meets Mon.-Fri. on 3960 kHz at 5:30 PM local time. Recei appointments made: W3HDH as OO and ORS; W3YD as OO. Laur Highlands VHF Society repeater is now operational on 146.07/.6 MHz in the Mt. Pleasant area. WA3PMT, K3MOB, WA3RV WA3JBQ, WA3YMT, WA3TGR provided communications in Pitt burgh during a walkathon. WA3WUD passed the General Cla exam. The Crawford Amateur Radio Society is providing dail monitoring for an emergency network of the Crawford Count Emergency Health Services Council. Keep up the good work fellow A special note to all amateurs in the WPA Section concerns publ relations. If you as a club or an individual are doing something i regards to public service, contact your local newspaper and let the know. A little publicity goes a long way. The WPA CW Traffic N had 30 sessions for the month of Apr., 400 stations check in, an handled 212 messages. The Pa. Phone Net had 22 sessions, 70 stations check in, and handled 493 messages. PSHR: WA3VBM 4- K3CR 39. Traffic: W2KAT/3 451, WA3VBM 231, W3UT 14 K3CB 114, K3CR 86, W3RUL 68, W3EGJ 63, WA3RBS 5. WA3TTS 48, WA3SWF 38, K3CHD 30, W3KUN 17, W3SN 1 K3OFN 16, K3SMB 15, W3HDH 12, K3VQV 10, K3SJN 8, K3JS 6, W3TTN 5, W3IDO 3, W3LOD 3.

CENTRAL DIVISION

ILLINOIS – SCM, Edmond A. Metzger, W9PRN – Asst. SCM Harry J. Studer, W9RYU. SEC: W9AES. PAM: WA9LDC. RM K9ZTV. Cook County EC: W9HPG. (Net, Freq., GMT/Days, Tfc., ILN, 3690, 2330 Dy, 152; ILN, 3690, 0300 Dy, 106; Ill Phon 3915, 2145 Dy, 256; NCPN, 3915, 1200 MS, 25; NCPN, 391 1700 MS, 139; IEN, 3940, 1400 Su, no report. New General an Novice Licensees are WA9QOH and WN9QJW. WN9OLF waiting fo General ticket. K9DDA received a new Drake T-4XC from his XY WB9DED reports his local CD and area hams are preparing for large Des Plaines River Canoe Marathon where 1000 canoes a expected to start. K8PCL/9 has new FPM No 300 receiver to brin in the tough ones. The Sangamon Valley RC Inc., (Springfiel participated in a fund raising Walkathon sponsored by th Sangamon County March of Dimes on Apr. 26. New O appointment is W9FNN, The Wheaton Community Radio Amateur new publication is "Hamletter." K9GHR and WA9NEL are th Editor and Assoc. Editor. WB9PEO, WA9WXC, K9OLS, WB9EO and WB9LXA are new officers of the club. The Peoria Hamfest wi be held on the 2nd Sun. in Sept. The Chicago FM Club was te years old on Feb. 25, 1975. Bradley Univ. (Peoria) with operato WB9IEP and WA9WDP scored second in the nation in the fin annual College Bowl contest sponsored by Texas A & M. WA9TX of this club will sponsor a Ham letter for the Peoria area. Thos interested contact him. WA9NRI was honored by the York Radi Club as lead story in their Apr. publication. W9ZAK was feted b his Quincy friends on his 99th Birthday. WB9PLI and WB9OCH a new Generals and WN9QMZ is a new Novice from the same are WB9KCT (and not WB9KET) is the call of the Hersey ARC previously reported. The Starved Rock Radio Club is erecting a ne Ringo antenna. Their secy. just returned from a cruise to Nassa San Juan and St. Thomas Islands. The Tri-Town banquet was Lansing with a good crowd present. The Hamtesters annual Hamte will be held the 2nd Sun. in Aug. at Santa Fe Park south of Chicag This column's sympathy to families and friends of K9SBF an W9PWH who recently passed away. WB9LWN is now an Advance licensee and K6SKY/9 is sweating out his Extra Class ticket. Th Rock River Hamfest was held Apr. 27 with FB attendance. Th annual party for the Chicago Amateur Radio Club's OTs was hel on Apr. 22 with Phil Haller W9HPG and Karl Kopetzky K9AQI their speakers. W9MVE is the only BPL for the month. Traffi (Apr.) W9NXG 384, WA9VGW 268, WB9NDZ 195, W9MVE 15 W9HOT 116, W9OYL 90, W9IXV 84, K9ZTV 74, W9AES 6 WB9IMB 62, K9KHI 56, W9LNQ 54, WA9ULP 53, WA9JJE 5 W9KR 41, WN9OLF 38, WA9MZS 35, K9BGL 26, WB9DED 2 W9PRN 24, K9WMP 18, W9HPG 9, W9RYU 6, K8PCL/9 6, K9DD 1. (Mar.) WN9OLF 24, W9HPG 11.

INDIANA – SCM, M.P. Hunter, WA9EED – SEC: W9UM PAM: W9PMT. (Nets, Freq., GMT/Day, QNI, QTC, Time, Mgr. ITN, 3910, 1330,2300 Dy, 2130 M-S, 3380, 448, 2790, K9DC QIN, 3656, 0000,0300 Dy, WB9OMX: IPON, 3910, 1300,2130 S 91, 7, WB9AHJ; Hoos, VHF, 50.58, 426, 5, 704, W9PMT; IN 3740, 2330 Dy, WB9MDS. The managership of ITN has been turne over to K9DCX. Our hearty thanks to WA9OAD for his service the net. The Central Ind. QCWA has been established with W9C as pres. and W9EL as secy. The NIUA publication announc Indiana's only 220 MHz repeater is operational in Ft. Wayn Logansport has a new repeater call, WR9AFN. Congrats to the Ind DXers for a great finish in SS. Congrats to WB9LHI and K9UJ f top cw/fone entries. The Indy Hamfest promises to be gre according to the planners. The summer noise is beginning to rai havoc with the 75-meter DXing but some goodies are still ther WB9LTY has purchased a new 80-ft. steel tree. K9OTB was host FP8DH for two weeks. WB9MDS has written a good artic concerning ham radio for his school paper. W9VNE has defected

TEN-TEC ULTRAMATIC KEYER



MODEL KR50

- **SUPERLATIVE "FEEL" 5-50 GRMS PADDLE FORCE**
- **AUTOMATIC OR MANUAL WEIGHTING**
- **DIT AND DAH MEMORIES WITH SEPARATE DEFEATS**
- **"STRAIGHT KEY" OVERRIDE FOR QRS OR TUNE-UP**
- **GUARANTEED FOR LIFE BEARING PIVOTS**

A sparkling new keyer with a host of exciting features. A powerful aid to cleaner, more articulate CW that is relaxing to use and a joy to copy.

The paddle assembly will delight the CW purist as well as the recent graduate from a bug or hand key. The superlative "feel" is attained by a magnetic return force, instantly adjustable to exactly the right touch for you.

Weighting, the ratio of dit and dah (bits) lengths to the spacing between them, is either automatically or manually varied. In the automatic position, it is programmed to lengthen the bits at slow speed for enhanced smoothness and decrease them as you advance the speed, for highest articulation. Or, it can be adjusted to a constant value.

The KR50 is versatile. Dit and dah memories are provided for full iambic (squeeze) keying. Either dit or dah, or both, may be turned off for operation as a conventional type keyer. Self-completing characters at all times.

A convenient "Straight key" is built-in for QRS sending or tune-up. Also an internal side-tone and 115VAC/12VDC operation is provided.

The KR50 is designed to have a permanent place in your shack for the years, perhaps decades, ahead. An investment in the enjoyment of CW.

PRICE $110.00

KR20-A

Paddle has unique principle with excellent feel for rhythmic CW. Characters are self-completing. Bit weighting is optimized for normal speeds. Manual key button conveniently located for hand sending. Side tone signal, Reed relay. Plug-in circuit boards. 115VAC or 6 to 14 VDC. HWD 2½" X 4½" X 8¼", Wt. 2½ lbs.

PRICE $67.50

KR1-A

This is the paddle mechanism used in the KR50. Requires 6-14 VDC for adjustable electromagnetic paddle return force. Adjustable contact spacing. For iambic or conventional keyers. "Straight key" button. Housed in an attractive metal case with cream front panel, walnut vinyl top. Size: 2" X 4" X 6", Wt. 1½ lbs.

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KR5-A

Similar to the KR20A but without monitor signal and AC power supply. A great value. For 6-14 VDC operation. Size HWD 2" X 4" X 6". Weight: 1½ lbs.

PRICE $38.50

KR2-A

The paddle used in the KR20A. Single paddle for non-iambic keyers. "Straight key" button conveniently located, cream aluminum case with walnut vinyl top. Size: 2" X 4" X 6", Weight: 1½ lb.

PRICE $15.00

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SEVIERVILLE, TENNESSEE 37862
EXPORT: 5715 LINCOLN AVE., CHICAGO, ILL. 60646

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CPS-1 Conv. supply 17
SCC-1 VHF calibrator 19
CC-1 Conv. console 39
TC-6 6m xmit conv. 175
TR-3 Transceiver 299
RV-3 Remote VFO 59
TR-4 Transceiver 395
TR-4/NB Transceiver 459
TR-4C Transceiver 449
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FF-1 Xtal cont. adapt. 34
TR 6/NB 6m transceiver 599
2N1 Transmitter 99
T-4XB Transmitter 375
T-4XC Transmitter 425
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TR-72 2m FM Xcvr 225

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P-26 AC supply 45
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HQ-170C Receiver 159
HQ-170A Receiver 189
HQ-170AC Receiver 199
HQ-170AC/VHF Receiver 259
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HQ-180 Receiver 239
HQ-180A Receiver 259
HQ-215 Receiver 219
S-101 Speaker 15
S-200 Speaker 19
NS-1 Noise immunizer 24
HX-50 Transmitter 175

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HS-24 Mobile spkr 9
DX-20 Transmitter 29
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500CX Transceiver 389
500CX/SS-16B Xcvr 439
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117C AC supply 65
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117XC AC supply 85
14X DC module 39
14C DC module 49
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14-117 DC supply 99
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FTDX-560 Transceiver 995
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FT-2 Auto 2m FM Xcvr 249

All items are subject to prior sale. Amateur Electronic Supply reserves the right to sell such items as power supplies with their matching equipment only, and not seperately - depending upon our stock situation. To insure quality, our used gear is serviced and made ready for shipment after we receive your order - so please allow for a possible delay (approximately 5 to 10 working days).

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SAVE Up to **$240**

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10 watt Metrum II	$399	$279
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AA-10 10 watt 2 meter Amplifier	49.95
AC-10 supply for TR-22/AA-10 TR-72	44.95
Extra crystals for TR-22, TR-72 each	5.00
DSR-2 Digitally synthesized Receiver	2750.00
2C	$295.00
2AC Calibrator for 2C	18.75
2CS Speaker for 2C	22.00
2CQ Speaker/Q-multiplier for 2C	49.00
2NB Noise Blanker for 2C	26.95
R-4C Receiver	549.00
4NB Noise Blanker	65.00
Filters: 250, 500 cycle; 1.5, 6.0 kHz	50.00
MS-4 Speaker for TR-4C, R-4C, SW-4A	22.00
TR-4C Transceiver for 80-10 Meters	599.95
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MN-4 Antenna Match Network	110.00
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WV-4 RF Wattmeter (20-200 Mc)	74.00
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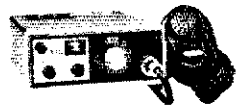
Teletype Commercial – 4 crystals	18.00
Time & Freq. Std, WWV – 5 crystals	22.00
Tropical Broadcast – 3 Crystals	13.50
RP-500 Receiver Protector	90.00

TR-72



TR-22C

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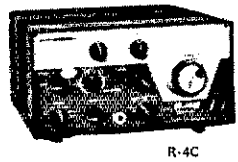

R-4C

L-4B

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Account Number:

Expiration DATE _____ *Master Charge Interbank number _____ (4 digits)

Name:

Address:

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☐ Send used gear list

8-Land. We're glad to have K9IQY back on the air. Traffic: (Apr.) W9QLW 198, WA9OAD 143, WB9OMX 143, W9EWH 120, W9UMH 85, WB9EOT 78, WB9MDS 64, K9PUI 59, W9UEM 48, K9EQT 44, WB9DIX 38, WA9OKK 31, K9RPZ 28, K9EZX 27, W9MCJ 25, WA9CYG 22, W9ENU 22, WA9OHX 20, K9KFM 19, WA9IHZ 18, K9YBM 18, WN9PEZ 16, W9PMT 15, W9YB 14, W9KWB 12, K9CBY 8, WA9BVS 7, WB9HCH 6, W9HUF 6, W9JGE 6, W9CL 1. (Mar.) WA9CYG 22.

WISCONSIN – SCM, Roy A. Pedersen, K9FHI – SEC: K9PKQ. PAMs: W9AYK, WA9LRW, K9UTQ. RMs: WB9ICH, K9KSA, W9MFC, K9LGU. (Nets, Freq., Time(Z)/Days, QNI, QTC, Mgr.): BWN, 3985, 1145 M-S, 469, 363, W9AYK; BEN, 3985, 1700 Dy, 607, 94, WA9LRW; WNN, 3725, 2215 Dy, 118, 22, WB9ICH; WSBN, 3985, 2230 Dy, 1387, 202, K9UTQ; WIN-E, 3662, 0000 Dy, 318, 168, W9MFC; WIN-L, 3662, 0300 Dy, 196, 107, K9LGU; WSSN, 3662, 2330 MWF, 72, 22, K9KSA; WIPON, 3925, 1701 M-F, 617, 41, WA9NIX. WB9NME has WAS. WSSN certs to WA9KRF, WB9KRR, WB9KMQ, WB9LKC, WB9LSS. OVS to WB9LSS. WSBN endorsed K9ANV. K9UTQ reports jr. op. born Mar. 19 almost has the code down pat – hi. W9CTI/1 going to Africa, will be there 7 months to a year, operating a mission net. ORS to WB9KRR. EC endorsed W9LQC. I regret to report WA9HJE a Silent Key. Any YLs in Wisc. work low bands? Contact WB9MFC. Dane County Swapfest Sun. Sept. 28. Don't forget to check all the Wisc. cw and phone nets. WB9JGV has purchased K9EYA's beam and rotor. K9IMP back on the air. WSBN certificate to WB9LKC. K9CPM made BPL. K9EYA has moved to Niagara. WN9PTX worked ZL2GH. WB9KPX nominated for 9RN RM effective June 1. New Novice WN9QZB, also WN9QZA. Traffic: (Apr.) K9CPM 1073, W9DND 249, WB9KRR 228, WB9KPX 194, WA9QVT 138, K9FHI 137, WB9NME 94, WB9ICH 75, K9LGU 67, W9MFG 65, W9AYK 62, WB9ABF 52, W9IHW 52, W9PD 50, K9JPS 46, W9PVH 41, K9UTQ 45, WA9LRW 40, WB9HLS 34, WA9PKM 32, K9KSA 31, WA9KPF 26, WB9JSW 19, WB9NKC 19, W9BKD 15, WB9NRK 14, WN9PTX 13, WB9LSS 10, WB9KMQ 9, K9ANV/9 8, WN9PYG 8, W9WJH 6, W9YFW 5, K9EYA 3, WB9LKC 3, WB9NLS 3, WB9HRP 2. (Mar.) W9ESJ 20, W9YFW 5.

DAKOTA DIVISION

MINNESOTA – SCM, Tod Olson, WØIYP – SEC: WAØOFZ. PAMs: WAØYVT, KØFLT, WBØFTL. RMs: KØZXE, WAØYAH. Chief ORS: WBØLOR. Chief OO: WAØPRS. THE MINN. CALLING FREQUENCY IS 3925 kHz. (Net, kHz, Time/Day, Sess. QNI, QTC, Mgr.): MSN-1, 3685, 6:30P Dy, 30, 170, 71, KØZXE; MSN-2, 3685, 10:15P Dy, 22, 82, 29, WAØYAH; MSPN-N, 3945, 12:05P Dy, 29, 931, 126, KØFLT; MSPN-E, 3925, 5:45P Dy, 29, 931, 116, WBØFTL; PAW, 3925, 9A-5P xSu, 166, 3452, 275, WAØYVT. Appointments to date: ECs: WAØOEF, WBØBAM, WAØFPL, KØVMW, WAØKMR, WAØUAH, WØIRJ, WBØKEK, WØPAN, KØTWV, WØFIT, KØIKU, WBØHRO, WBØENX, WBØONE, KØKLY, KØCNC. OPSs: WBØANT, WAØRLD. OO: WBØANT. New officers of the Mobile Amateur Radio Corps are WBØADV, pres.; KØFHC, vice-pres.; WØJTP, secy.-treas.; WØDEK, KØOSS, WØBSI, dir. WØGYH attended the Fresno DX meet in Apr. Many Minn. hams made it to Dayton – WBØANT, WBØDHQ, WBØDSJ, WAØMHJ, WAØRBW, WAØVKP, WØGEI, WØPAN, WØBUO, WBØHOX, and many others. WAØVIK is home after surgery, as is WØTLE and WAØVAS. WAØVUP has a new rig. WBØBQA has a Canadian Marconi DT-65 on 2FM (.03 microvolt sens). WBØLOR is again on the air and working on the Worked All Minn. award. WAØEFW is the coordinator for the Minn. Amateur Radio Exhibit at the State Fair; don't miss it, if you're going, tell your friends too! WNØMEB advises that a Minn. Novice net meets on 7125 kHz Sun. after at 5:30. Be sure to check in and tell others. Traffic: WBØHOX 581, WØQMV 187, KØZXE 119, WAØYVT 118, KØCVD 87, KØCSE 65, WBØLOR 55, WØIYP 48, WAØTFC 45, WAØURW 39, WBØFTL 37, KØFLT 35, WAØYAH 35, WBØCPC 34, KØZBI 32, WBØFMI 30, WAØMMV 30, WAØYWA 29, WAØCCA 26, WAØIIB 19, WAØFZQ 13, WAØJPR 13, WAØGLI 12, WØWAS 12, WBØCYM 10, WBØGMJ 7, WBØJYT 7, WØDBB 6, WAØWOV 5, KØSXQ 3, WBØBQA 2.

NORTH DAKOTA – SCM, Harold L. Sheets, WØDM – ORS: KØPVG. OO: WØBF. 700 guests and Minnkota Power people joined in honoring WØGFE on his 35th Anniversary as head of that Organization at the Grand Forks City Armory Auditorium. Congrats Andy! WBØHHC is leaving us for the sunny clime of Fla. where he has accepted a new charge as pastor. WØOEL joined the ranks of 2-meter fm with a new Swan rig. WAØSUF busy with 40-meter DTRN net. The high water at Fargo and Minot called for emergency measures on the part of the ham fraternity there. WBØFUO reports that 19 members of the Minot ARC responded for dispatching sand bag trucks and around the clock dike patrol. KØALL reports that 11 amateurs responded to the call of the Red Cross to aid in many ways. Their 2-meter repeater station and base stations did a fine job. More complete details found elsewhere in QST. Don't forget the International Peace Garden Hamfest and begin to make plans for being there on July 12 and 13. (Net, kHz, CDST/Days, Sess., QNI, QTC, Mgr.): Goose River, 1990, 0900 Su, 4, 53, 0, WØCDO; RACES, 3996.5, 1830 S-S, 30, 532, 50, WBØATJ-WAØSUF. Traffic: WBØHHC 122, WAØSUF 71, WØCDO 31, WØDM 15, WBØBMG 8, WØMXF 3, WAØJPT 2.

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SOUTH DAKOTA – SCM, Edward C. Gray, WAØCPX – During this summer season with the potential of storms it is important that all the groups in the state review their plan of action. It is important that a member of your group gets to the Emergency Operations Center as soon as possible. With the static conditions so often associated with a summer storm the importance of two meters can't be over-emphasized. It is also important that the repeater can be supplied with emergency power. It is also important that your group contacts local officials and do some planning with them. Net reports: Morning Net and SDN CW are active; NJQ Net – 829 check-ins and 32 formals; Evening Net – 1422 check-ins and 43 formals. Traffic: WAØKKR 156, WØHOJ 90, WAØUEN 90, WBØIJV 59, WBØEVQ 48, WAØVRE 24, WAØNZA 1.

DELTA DIVISION

ARKANSAS – SCM, S.M. Pokorny, W5UAU – SEC: W5RXU. PAM: W5POH. RM: W5MYZ.(Net, kHz, Time/Day, QNI, QTC, Mgr.): OZK, 3765, 0000 Dy, 210, 44, W5MYZ; APN, 3937, 1100 MS, 680, 24, W5POH; M/Bird, 3925, 2130 MF, 550, 18, WA5ZWZ; ATN, 3995, 2230 Dy, 327, 49, WB5IGF; ANN, 3715, 2300 Dy, 48, 10, WB5IGF; ARN, 3995, 2330 Dy, 569, 48. ORS to W5SHY. New Ark. hams, WN5s NZL, NZM, NZN, NZO, NZP, NZQ, NZT, OAH, OAO, OAP, OAZ, OBQ, OBY, OCB, OCC, OCG, ODJ, OEB, OEC, OEU, OEV and OEW. Regret to report W5SYX, WA5SZB as Silent Keys. Our sympathy to their families and friends. Your SCM had a several hour meeting with W4WHN, Delta Dir. at Little Rock on Sat. Apr. 5. Attended the OZK doings Sun. Apr. 6 and Club meeting at Ft. Smith on Mon. Apr. 14. Need reports from clubs, repeater groups and other activity. PSHR: WB5IGF 56, W5MYZ 49. Traffic: WA5IGF 123, W5MYZ 85, W5UAU 38, W5EIJ 31, WB5GAX 24, WB5GWU 16, W5TXA 9, W5KL 8, WA5ILS 7, WB5GSB 5, W5SHY 2.

LOUISIANA – SCM, Robert P. Schmidt, W5GHP – Asst. SCM: John Souvestre, WA5NYY. SEC: W5TRI. RM: WA5ZZA. PAM: WB5FKU. VHF PAM: WA5KND. Congrats to W5KC on receiving the BR Ham of The Year award at the Baton Rouge Hamfest. 12 appointees attended the BR Hamfest LO meeting, as well as the Delta Division Dir. and Vice Dir. W4WHN and WB4ANX. The La. Council of ARC passed a resolution to form a State Weather Net. All interested hams contact K5DPG or K5SVD. K5TTC active in traffic work and has made BPL for Apr. Westside ARC had a nice evening out meeting with their XYLs at the Officers Club. Our next hamfest will be in Alexandria Aug. 9. The Jefferson Club announces the New Orleans Hamfest is Oct. 11 and 12. W5OWS now trustee for the VHF Club of N.O. 34/94 repeater. New member of LAN/LAN WB5NWO. W5QEP moved to Lafayette. New appointments: W5YN OBS; K5TTC ORS, WN5NSR ORS fl. Twin Cities Club of Monroe has new novice class started with 16 enrolled. WA5TUD lost eleven-element 2-meter beam to tornado. WB5DVS active on 2 meters. WA5KQN, former LAN member now in VA., call WA4ZOD. WA5YOU active on 2-meter weather watch. (Net, kHz, Time, QTC, QNI, Mgr.): LAN, 3615, 7:00 & 10:00 PM Dy, 272, 384, WA5ZZA; LSN, 3703, 8:30 PM M-F, 60, 150, WA5IQU; LTN, 3910, 6:45 PM Dy, 65, 305, WB5FKU; LRN, 3587.5, 7:30 Su, 3, 10, W5GHP. Traffic: K5TTC 190, WA5IQU 153, W5GHP 152, WA5ZZA 141, WB5FZJ 120, WB5KFA 101, W5MI 90, WB5LBR 76, WA5PRI 70, WB5ASD 41, WB5NWO 22, WB5IKT 17, WB5JZQ 14, WA5QVN 10, WA5MMD 9, WB5DVS 8, W5HGT 3, WN5NSR 2, WA5YOU 2.

MISSISSIPPI – SCM, W.L. Appleby, WB5DCY – Asst. SCM: C.E. Gibbs, W5LL. SEC: WB5FXA. Appointments: WB5FHA RM; K7QDH/5 OVS; WN5MDR ORS fl; WB4HRR/5 OPS. Section Net Certs to WB5NPM, WA5YOU, WB5BUE. Cert of Appreciation to K5OAF MTN mgr. Silent Keys: W5OFE, W5AO & ex-W5ESJ. Magnolia Repeater Assn. (Starkville) officers W5AER, pres.; WB5EJB, vice-pres.; K5JEP, secy.-treas. Vicksburg ARC picnic huge success. Welcome to new Miss. amateurs: WB5OAI, WN5OCH, WB5OES, WN5OAL, WN5OAV, WB5OBH, WN5NZE, WN5OBO, WB5OEP, WN5OEI, WB5OET, WB5OGW, WN5OGS, WN5OFZ, WB5OHI, WN5OGP. Most of our section clubs have Novice classes in progress. New MTN mgr. is WB5FHA who edits a monthly MTN newsletter. New asst. mgr. MSBN is W5EDT. Upgradings: K5RSI Extra; WA4KWO/5 General; WA5ZLX, WB5LXW Advanced. WB5EHI has new 80-meter antenna. WB5KUJ, W5UCY, WB5JBW, WB5FHA, WB5MTQ heard in Apr. CD Party. South Miss. ARC formed Hattiesburg. WN5MDR new asst. mgr. MSN. WA4KWO/5's new shack is hurricane proof. WB5KXT on 6 meters. Code & Theory classes started in Hattiesburg. K5RSS has new HB 80-meter vertical. WN5MDR working DX on 15 meters with new coax dipole. WB5BKM active on Daytime RN5. 37/97 repeater should be operational in Biloxi area in Aug. per W5TIF. WB5JBW heard DXing on 20-meter cw. K5RSS, K5RSF heard 40-meter cw DXing. WA5MUE heard on MTN. WB5KUJ, MTN & MSN OBS traded 1 yr of college for new Ford 3000 Diesel Tractor. PSHR: WB5FHA. WB5MTQ, WB5IUS. MSBN QNI 963, QTC 138; MTN QNI 185, QTC 56; MSN QNI 49, QTC 12; CGCHN QNI 1933, QTC 219; MTN (Mar.) QNI 183, QTC 69. Traffic: WB5FHA 87, W5EDT 74, WB5BKM 60, WB5DCY 35, WB5MTQ 35, WB5KUJ 30, W5NCB 28, WB5BUE 22, W5WZ 18, WB5HVY 10, W5BW 8, WN5MDR 8, WB5JBW 2, WB5FML 1.

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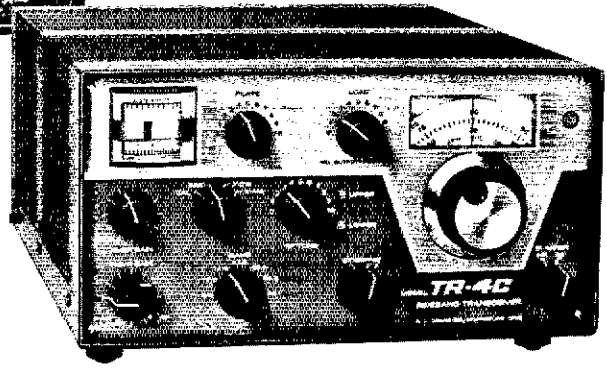

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TENNESSEE – SCM, O.D. Keaton, WA4GLS – SEC: WB4DYJ. PAMs: WB4PRF, K4LSP. RM: WB4DJU. (Net, Freq., Time-(Z)/Days, Sess., QNI, QTC, Mgr.): TPN, 3980, 1040 M-F, 77, 3821, 272, WA4EWW; 1145 M-F, W4PFP; 2330 M-S, WB4YPO; 1300 SSuH; TCN, 3980, 2330 S, WA4ZBC; TWN, 3980, 2100 S, 8, 147, 2, WB4DYJ; TN, 3635, 0000 Dy, 28, 218, 133, K4YFC; TNN, 3707.5, 0000 Dy, 27, 177, 41, WN4FZU; ETVHFN, 50.4, 0000 TThS, 13, 141, 0, WA4YKN; ETVHFN, 145.2, 0000 WF, 8, 38, 0, WB4DZG; ETTMN, 28.7, 0000 WF, WB4NFI; MTTMN, 28.8, 0100 TF, 7, 53, 0, W4EAY; ACARECN, 146.28/146.88, 0000 T, 5, 105, 1, WB4ZSZ; KCARECN, 146.52, 2130 F, 4, 25, 3, WA4ZBC; WTVHFN, 146.37, 2000 S, 146.97, 0130 F, 11, 141, 4, WA4VVX. The FACT club of Lebanon has a license for their open auto-patch repeater (WR4AMT) to operate on 146.34/146.73, hopefully to be on air by June 1. WA4UAZ appointed OPS and ORS effective Apr. 1, 1975. The Blount County AREC net has been changed from Wed. to Thur. night effective Apr. 17. Traffic: K4CNY 334, K4KCK 63, WA4UAZ 62, WB4YPO 57, W4RUW 53, WB4DJU 35, WN4FZU 34, WB4ZSZ 34, WB4MPJ 31, WA4GFS 21, WB4DYJ 20, WA4ZBC 18, K4YEH 16, WB4GTW 14, W4TYV 14, WB4ANX 11, WB4CMQ 10, WB4PRF 10, W4CYL 7, WB4DDV 6, WA4KFS 6, K4UMW 5, W4SGI 4.

GREAT LAKES DIVISION

KENTUCKY – SCM, Ted Huddle, W4CID – SEC: WA4GHQ. (Net ONI/QTC for Apr.): KRN, 291, 24; MKPN, 804, 58; KTN, 1242, 114; KYN, 311, 191; KNTN, 78, 17; 6D AREC, 63, 3. WA4NDG is the new pres. of E. Ky ARS Club which is now sporting 18 members. Some new Hamfest dates are: Somerset – July 13; Louisville – Sept. 28. The License Plate contraversey is still holding with our having to go to the Ky. Court of Appeals to keep the plates. No date set as yet, but additional funds for legal fees will be needed. KY4BSA operated at a recent Boy Scout Camporee and handled 61 pieces of traffic. Traffic is entering the summer doldrums with none over 100 QTC! Traffic: WB4ZML 90, WA4IGS 79, WB4AUN 71, WB4EXQ 69, WA4GHQ 66, KY4BSA 61, WB4EOR 51, W4CID 49, W4BAZ 39, WB4BYV 34, WA4VZZ 33, WA4FAF 25, W4CDA 17, WN4IKF 15, WB4FAT 12, WA4AGH 11, K4HFD 4, WB4WND 1.

MICHIGAN – SCM, A.L. Baker, W8TZZ – SEC: W8MPD. RMs: W8JYA, W8RTN, W8YIO, K8KMQ, WB8NII. PAMs: W8BJIX, K8LNE, WB8BYB. VHF PAMs: WA8WVV, K8AEM. (Net, Freq., Time/Days, QNI, Tfc., Sess., Mgr.): OMN, 3663, 0200/2300 Dy, 1140, 322, 87, W8JYA; GLETN, 3932, 0230 Dy, 606, 60, 30, WB8OBR; MACS, 3953, 1500 Dy, 916, 263, 35, K8LNE; BR/MEN, 3930, 2230 Dy, 719, 94, 30, WB8BYB; UPEN, 3922, 2230 Dy, 569, 33, 33, WB8IEH; MNN, 3720, 2230 Dy, 253, 78, 30, WB8JAD; WSBN, 3935, 2300 Dy, 799, 65, 30, WB8JIX; Mi6M, 50.7, 0000 MS, 169, 24, 18, WA8VXE. W8CVQ reports SW Mich. 2M net QNI 58 in 4 sessions. 2M Catfish net had 58 in 4 sessions as reported by WA8WVV, K8IED. WA8ENW, WB8DJS have received Amateur of the Month awards from the MACS net. W8VWY and K8ZJU on the air from new QTH, DeWitt, Shiawasse ARA active during 16 inch snow fall of Apr. 2nd. Central Mich. ARC busy during the flooding in Lansing. Pleased to report new Novice WN8UDD a 13 year old YL, WB8NII and WA8YUZ are now Advanced Class operators. The MNN starts its 5th year. WB8EUN is the proud recipient of 5BDXCC certificate. K8RUR is new State Repeater Council chmn. I am advised that no 2M pairs are left in the Detroit area. WB8BZR now W8LQZ. WB8RXS has a new homebrew keyer. WB8MTI now active on 2M. Received OO report from newly appointed WB8SWL, good call letters for an OO. RRegrettully I report the following as Silent Keys: W8AW, W8WI, WB8QCM, W8LME, K8UNS, W8FOL, W8SDR. Traffic: (Apr.) WB8JAD 228, K8KMQ 223, WB8ITT 156, K8DYI 112, WA8WZF 93, W8TZZ 91, W8OW 90, WB8DKQ 83, WB8IIX 79, W8MO 77, W8NOH 77, W8GLC 76, W8RTN 64, WA8TBL 63, WB8HYR 52, WB8FBG 49, K8LJS 48, WB8NCD 44, W8YIO 41, WB8OBR 35, W8EU 33, WB8BYB 32, WB8DJS 31, WB8JMI 29, W8EOI 28, WB8EEU 25, W8UFS 24, W8VIZ 24, K8PYN 22, W8WVL 22, K8IED 20, W8DT 18, K8AMU 17, WB8DTT 17, W8JUP 17, K8LNE 17, W8TBP 17, WA8MDK 16, WB8MKU 16, W8LOU 14, W8SCW 14, WA8ENW 13, W8IUC 13, W8UOQ 13, WB8GKB 12, K8GXV 12, WA8PDN 12, K8WRJ 12, WB8NII 12, W8BEZ 11, WA8CUP 10, WA8YPY 10, WB8APN 9, W8FZL 9, W8SDB 9, W8ACW 7, W8QBE 7, W8DCN 6, W8NLO 6, WB8EUN 4, WA8WVV 4, W8RNQ 3, K8ACO 2, WA8MTI 2. (Mar.) WB8RXS 81, WB8EEU 39, WB8NII 32, K8SWW 7, W8SWL 4, WB8RFK 1.

OHIO – SCM, Hank Greeb, W8CHI – Asst. SCM: William K. Shaeffer, WA8MCR. SEC: WA8COA. PAMs: WA8VWH, W8MOK. RMs: WA8WAK, WB8KKI. Montgomery/Green Co. AREC responded to a tornado alert, and provided emergency communications for relief efforts after a touchdown at Waynesville. Among those assisting were K8DNE, W8DPW, WA8DZG, W5ED W8ENQ, K8GAK, K8GKJ, WB8GWO, WA8HYP, WB8ICL, W8ILC WB8JJB, W8JUK, W8KKF, W8KRJ, W8LLY, WA8MQP, W8ODN W8OEL, WA8PIA, WA8POI, WB8QXN, W8RIH, W8RKL WA8SED, K8SNJ, WB8SPU, WB8TEK, K8THO, WB8TTD WA8VBC, WA8WKT, WA8YNV, K8YQH, W8ZCV, W8ZAU WR8ABE, WR8ABF, and WR8ACV were used. March of Dimes was assisted by NWOARC (Lima), Central Oh AREC (Columbus)

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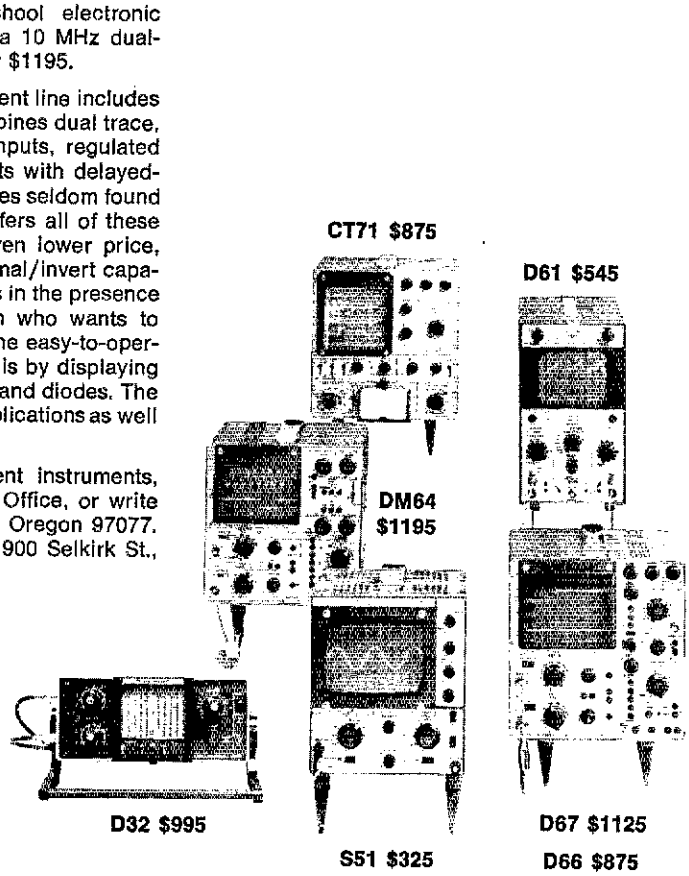

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Montgomery/Green Co. AREC (Dayton). Apricot Net (Cleveland) provided communication for Loyalty Day Parade, Apr. 27. WB8QIS and W8RSW are among the Extra Class operators. Queen City Emergency Net (Cincinnati) assisted American Cancer Society. My apologies for those traffic reports which I miss getting into the column. To ensure maximum probability that your total gets in use the nets or a Form I by mail. W8LT now on 6-meter SSB, with a kw into four-elements at 1000 feet. Cincinnati, FM Club is trying a monthly on-the-air meeting 9:00 PM, first Wed., 146.28/88 MHz. WN8PIY passed the General Class exam. Dayton Hamvention was a great success. Traffic: W8PMJ 280, W8PTT 255, WA8HGH 218, WA8MCR 182, K8LGA 172, WB8KKI 144, W8DIL 118, W8MGA 103, W8CUT 97, WB8OZA 95, W8FGD 84, W8MOK 79, W8IBX 75, WA8ZNC 73, W8QZK 65, WB8SMD 65, WB8KWD 62, W8ENI 58, W8ILC 50, WB8SGF 50, K8VMI 49, W8IMI 48, W8CXM 44, W8OUU 44, K8QYR 43, WA8WH 39, WB8QXN 36, K8MLO 34, K8BYR 33, WB8JGW33, WB8GGR 32, K8DHJ 30, WB8MGW 30, W8JD 29, WA8ETX 28, W8SUS 27, K8YUW 25, WA9MWF 23, WA8DWL 21, W8GOE 20, WA8SSI 19, WB8CJU 18, WA8UET 18, WB8KQJ 17, W8OE 17, W8DCX 16, WN8PIY 14, WA8MIH 13, WA8MHO 12, WB8TEM 12, WA8VTD 12, W8ARW 11, WB8AYC 11, WA8TSX 10, W8BOV 8, WA8ESX 7, K8KWO 7, WA8MAZ 7, W8DPW 6, K8JPF 6, W8UQT 6, K8CKY 5, W8LOH 5, W8LT 5, K8BAX 4, W8BHL 4, WA8ETW 3, W8LZE 2, WB8PGW 2, W8LAU 1, WB8RAR 1, (Mar.) WA8JXM 6.

HUDSON DIVISION

EASTERN NEW YORK – SCM, Graham G. Berry, K2SJN – Asst. SCM/RM: Gary J. Ferdinand, WA2PJL. SEC: W2KGC. RMs: WA2PJL, WB2JXW, WA2FBI and K2DN for RTTY. NYS 3.675 MHz daily at 2300 and 0200Z. ESS 3.590 MHz daily at 2200Z; RTTY (NYR) 3.613 MHz daily at 2300Z. NYSPT&EN 3.925 MHz daily at 2200Z. Divisional P/R Net 2nd at 4th Sun. 3.925 MHz at 2100Z. ECs and asst. ECs welcome to join in for discussion of problems. All Section members and club secys. Please Note! With about half of his fourth term of office to go, your SCM has had to resign – changing call to a "4". Please be sure traffic reports, column information, club news letters etc. as well as special reports of unusual activity go from now on to Gary Ferdinand, WA2PJL, Sunset Trail, Clinton Corners, N.Y., 12514. It's been a pleasure working with the Section and its members, and I'll miss many of you I've come to know in the past seven years. Give WA2PJL the kind of cooperation I've had and the Section will continue to be well represented in QST each month. Albany ARA held annual Dinner with W2ZCV as speaker; WB2KLY, WA2KUL and XYL, WB2JLR and XYL and WB2DXM on committee. Club station K2CT had two public service jobs in Apr. Harmonic Hills ARA heard W2AO on Contest Winning. Communications Club of New Rochelle had W2LH with new presentation on Antenna Basics. Schenectady ARA met with Dir. K2SJO and member panel on proposed Rules Changes. Westchester ARA heard K2BQO on his European trip of last summer. Overlook Mt. ARA Annual Banquet, with K1ZND on his trip to visit European Amateur Societies. K2AYQ and WA2PCK led Glens Falls AREC group in handling 18th Annual White Water Derby at North Creek, N.Y., aided by WA2AQD, WB2RPL, WB2YBL, WB2VWD, WA2QZW, WB2BZJ, K2PBF (new General, congrats!), WB2JDD, WB2FRV, WB2OMP, WB2GCN, WB2ZOR, W2FEM and WB2RTA. Good job! K2DN says RTTY check-ins and traffic need improvement. W2KHQ EC for Greene Co. plus Columbia – all counties in ENY now covered. K2FWR expects to be on 2FM from Lake Superior this month (July). To all – 73 es BCNU de K2SJN. ARL 63. Traffic: (Apr.) WA2PJL 324, W2BIW 101, WB2TGL 54, K2DN 49, K2TTG 45, K2SJN 30, W2SZ 25, K2FWR 22, K2OUA 21, WA2PAU 17, WA2HHO 10, WB2RUZ 9, WA2CYJ 5, WA2FBI 2. (Mar.) WA2HHO 38, W2SZ 25, WA2FBI 4.

NEW YORK CITY AND LONG ISLAND – SCM, John H. Smale, WB2CHY – Asst. SCM: Art Malatzky, WB2WFJ. SEC: K2HTX. RM: WB2LZN. PAM: WB2EDW. VHF PAM: WB2RQF. The following are major AREC/RACES Nets: join 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, 50.52 MHz, 146.20 fm; Nassau, 28.72 MHz, 145.68 am; Suffolk(West), 28.73 MHz (Hunt.), 145.59 am; 28.65 MHz (Smith.), 147.21 fm; 28.610 MHz (Babylon), 146.94 fm; Suffolk (East), 146.82 fm. Note: Net times between 2000 and 2100 local, Mon. Congratulations to new appointees: WB2VTN OPS, OVS; WB2WBH ORS, OPS. Ten Meter AREC Net of Nassau Co. participated in the March of Dimes "super walk" on Apr. 27. Net handled over 200 messages, following stations active were WB2DOP, W2ZAI, W2SFV, WA2HUF, WA2SUH, K2PAY, WB2ZYQ, WB2WXS, WA2JON, WB2EHM, WA2KOC, WA2WAI. My station now has a second harmonic, YL and Mother both doing fine. WN2WOI just got his Heath receiver fixed and will be active as soon as he gets an antenna up. W2AHV is now the proud holder of an Advanced Class license. WB2FJX has picked up a TS 520 and hopes to get active in the low bands. WB2LZN now with a SSB rig, an Atlas 180, and he expects to be able to ONI the fone nets soon. WB2OYV has cleared the bugs out of his rig and is now back on the air, he also acquired a "gooney box" for fm. W2MQG now with Extra Class ticket, he also has retired from WNYC after 30 years, and son and grandson WN2RYL

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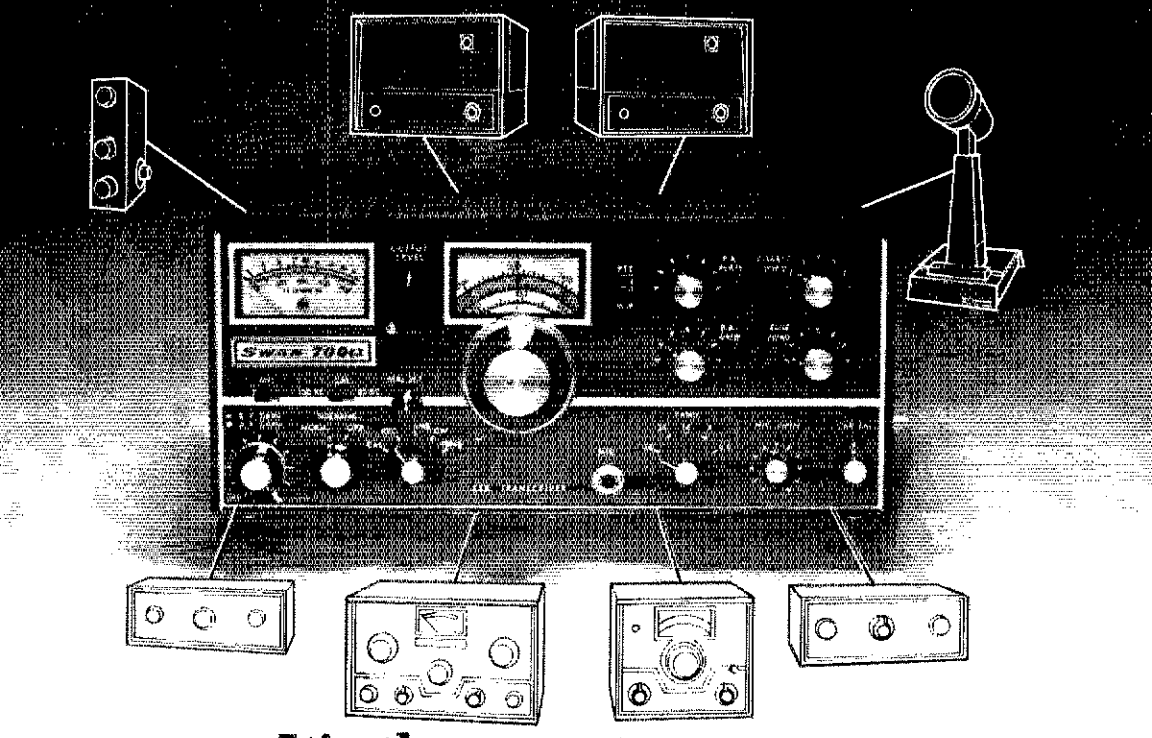

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NORTHERN NEW JERSEY – SCM, William S. Keller, III, WB2RKK – (Net, Freq., Time(PM)/Days, Sess., QNI, QTC, Mgr.): NJN, 3695, 7:00 Dy, 30, 467, 163, WA2DSA; NJN, 3695, 10:00 Dy, 30, 260, 112, WA2DSA; NJPN, 3950, 6:00 Dy, 30, 527, 208, WA2DVE; NJPN, 3950, 9:00 AM Su, 4, WA2DVE; NJSN, 3730, 8:15 Dy, 30, 293, 85, WB2RMK; NJPON/VHF, 146.52, 10:00 SuTh, 8, WA2EPI; PVTEN, 145.71, 8:00 Dy, 30, 182, 21, WA2OPY; NNJ/VHF, 145.81, 8:30 M-F, K2DQT. SEC: WB2PBO. RMs: WA2DSA, WB2RMK. PAMs: WA2DVE, WA2OPY. New appointments: WA2FZJ EC for Highland Park and vicinity. All amateurs are encouraged to join AREC thru their local EC or WB2PBO. K2DQT new EC for Belleville & vicinity. OO reports received from K2EK, W2FJK, K2JFJ, WB2TFH, W2TPJ, W2YD, and WB2YGK (who moved to Wash. in June). Rutgers ARC: WA2NPP, officers for the coming season are WB2AEH, pres.; WA2NLP, vice-pres.; WA2AYU, secy. They recently held a very successful open house, which included a demonstration of RTTY. On Apr. 27 the Cranford AR Soc. held a successful auction benefiting the Mt. Carmel Guild. Belleville ARC W2FOY, celebrated the 50th anniversary of their net, which meets on Sun. at 9:15 AM on 146.504. WB2BCC recently spoke about antennas and transmission lines at the New Providence ARC. K2OOJ reports 5 new Novice licensees in their club. Congrats to the following on their accomplishments: WA2SRQ on attaining first place nationally in the Apr. CW CD party, WB2RKK on placing 2nd nationally in the Apr. Phone CD party, WA2SLF on obtaining the WAC award, WB2IWH on receiving the WPX No. 479 award, and WA2GEZ on his new Advanced license and DXCC. W2CVW continues to come closer to 5BDXCC with 95 confirmed on 40, and 77 confirmed on 80. Good going, gang! K2BHL and WB2RMK have new antenna tuners. WB2RMK a new HR 10 receiver, and K2KF now experimenting with short vertical antennas for 80 meters – a la W2EMI style. K2OBW reports the AMSET net which meets each Tue. at 9 PM (0100Z, Wed.) on 3850. He also reports working FY7AS via Oscar. K2EK spent most of Apr. in Fla., WA2GSP recently KH6, and W2DEO continues his many travels. Much of the NNJ gang, including most of the NJDXA, attended the Dayton Hamfest during Apr. The Wireless Institute of the Northeast, WIN is looking for new members. Anyone interested in joining this contest club should contact WB2RKK. All ARRL members are invited to participate in the open CD party this month. See this issue for details. Traffic: (Apr.) WA2DSA 526, WB2RKK 253, K2BHL 172, WA2BSU 92, K2OOJ 71, WA2NPP 61, W2SWF 57, W2CU 56, WB2RMK 56, WB2VTT 55, WA2CCF 51, WA2DIW 42, WB2HSG 42, WA2PCE 42, WA2DVE 36, W2ZEP 35, WA2OPY 31, WA2SLF 29, WA2SRQ 18, K2ZFI 18, K2DQT 14, WB2TDI 13, W2CVW 12, WA2OVE 10, W2YD 9, WB2KNS 8, K2KF 7, WA2OJU 7, WA2UOO 7, WA2QJV 6, W2SHM 5, WB2ELF 5, K2MFF 3, WB2PBO 3, W2WOJ 3, WB2ZPM 3, WB2RJJ 2, WA2SHT 2, WA2SOU 1. (Mar.) WN2UDI 1 and WN2RSF respectively, are now going for their Generals. Ex-K2DDK, ex-W1GRE now back on L.I. as W2IAL with OTH in East Meadow. WN2WRT has passed his Advanced. LIMARC handled 48 public service reports during the month of Mar. Larkfield ARC is contemplating putting up a 220 rptr, they have been assigned 223.02 in and 224.62 out. Now is the time to start making plans for the annual NLI picnic to be held in Aug. This also includes the annual Hudson Division Directors championship softball game, the winner to receive the "Golden Resistor" award, which has been won by NLI for the past two years. Brooklyn College ARC K2APZ now active on SSTV. Other stations that have upgraded are: WB2FGB, WA2MXI and WA2PFZ to Advanced, WB2UKE to General. RSGB meets every Mon. at 2100 local on 21,430 MHz, and new check-ins are invited. Traffic: WB2LZN 221, W2EC 171, WA2VPA 160, W2MLC 95, WB2WBH 57, W2HXT 39, WB2TPO 38, WA2WKH 29, WB2OYV 25, WA2USJ 20, WN2WRT 20, WB2VTN 19, WB2CHY 17, K2JFE 4, WB2JSJ 3, WA2JZX 2.

MIDWEST DIVISION

IOWA – SCM, Max R. Otto, WØLFF – The Cedar Valley ARC hosted our Midwest Dir. WØFIR at their Apr. meeting. Oct. 5 is the date for a hamfest sponsored by the Cedar Valley Club. The late ice storm leveled many ham antennas, along with power lines. WAØGZE and others with WØDDW as NCS provided communications for Lincoln, Iowa. Our Vice Dir. WØLFF braved a snow storm for an eyeball with the O'Brien County Club. Congrats to WBØOUP and WBØIVD on becoming Advanced. WØBVO again showing off Amateur Radio to schools in Cedar Rapids. Results of the Iowa 75-Meter Net election show WAØVZH and WAØACX as mgrs, WØSVS a new dir. on the board, and WAØDAG as secy. treas. KVØISU operations during Veishea at Iowa State Univ. was very successful. WRØACO 16/76 has found a permanent home on one of the Lab buildings at ISU. During summer vacation OBS WBØDGB will bullentinize the Creston repeater WRØAGK 19/79. WBØMCZ received his General ticket on the 17th try. If this isn't a record, it surely demonstrates persistance. WØBX getting a new sky hook. KØFLY, WBØENL and KØGFU are new ECs. Happy 4th everyone. (Net, Freq., Time(Z)Days, QNI, QTC, Sess., Mgr.): Iowa 75 Meter, 3970, 1730 M-S, 1459, 133, 26, WAØVZH; Iowa 75 Meter, 3970, 2300 M-S, 1070, 53, 26, WAØACX; Tall Corn, 3560, 2330/0300 Dy, 302, 93, 60, KØAZJ. Traffic: (Apr.) WAØADX 286, KØAZJ 205, WØYLS 103, WAØVZH 34, WØLCX 31, WAØKHF 17, WØMOO 14, WØLFF 12, WØOMV 8, WBØAVW 6, WAØGZE 2. (Mar.) WØMOO 53.

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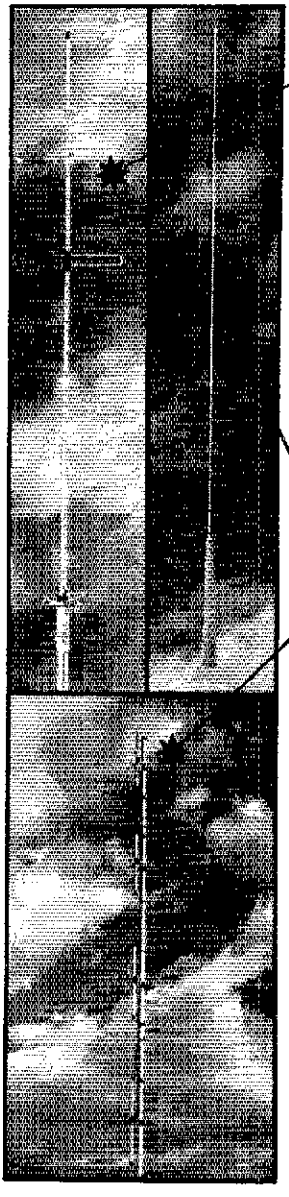

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KANSAS – SCM, Robert M. Summers, KØBXF – SEC: KØJME RM: KØMRI. PAMs: WAØSFV, WBØBCL. VHF PAM: WAØEDA KØNL and KØJMF were in the hospital. Mid-States Mobile Monito Service reporting for Apr. QNI 925 serving only 17 mobiles an handling 81 QTC. You Mobilers remember 3920 kHz each evenin following the KSBN and any Zone AREC net. NCS will be takin more frequent pauses for QNI from the weaker signals. Apr. traffi net reports: KWN QNI 440, QTC 149; QKS QNI 482, QTC 18; QKS-SS QNI 49, QTC 33. KSBN QNI 948, QTC 146. KPN QN 108, QTC 24. 18 of the 19 AREC Zones reporting activity th month for a total of 1108 QNI and 129 QTC. I need an activ amateur in Wichita to work Zone 9 as an EC. Do I have a worke WAØOMB mgr. of Central States Tfc net reports, WØBVM is hom from hospital also. Apr. report for net QNI 588, QTC 56. Tex doing a fine job as mgr. Mar. QNI 802, QTC 36. Traffic: WØFI 168, WØHI 145, KØMRI 138, WØINH 104, WØOYH 104, WØCH 87, WAØLBB 67, KØBXF 59, WBØHBM 54, WBØCZR 53, WAØSE 43, WØOF 38, WØPB 33, KØJMF 30, WAØMLE 30, WØRBO 2 WBØKWI 26, WAØKUP 24, WØGCJ 19, WAØGNC 11, WØASY 1 WBØLKA 8, WBØGVR 7, WØFDJ 5, WAØOWH 5, WØKL WAØWXY 3.

MISSOURI – SCM, B.H. Moschenross, WAØFMD – Ass SCM/SEC: Cliff Chamney, KØBIX. New appointment: WAØQOA ORS. (Net, QNI, QTC): MOSSB, 1348, 120; MEN, 605, 70; MO 214, 130; MON2, 128, 43; MOAREC, 131, 9; MSN, 89, 74; ST AREC, 69, 1; SCEN, 55, 4; JC2AN, 49, 0; WEN, 8, 1. KØAH WBØIVU, WBØIXS and WBØLRU are trying to organize a club Mexico. Any takers. Northwest Mo. Hamfest was a big succes Thanks to PHD ARA for sponsoring the event and the invit CPARA's licensing project at the Harry S. Truman children neurological center is progressing satisfactorily. Several other grou including the WECOMO ARC have provided assistance. Don't forg the Zero Beaters Hamfest in Washington on Aug. 3 and t Southwest Mo. Hamfest in Springfield on Aug. 24th. The Jefferso Barracks ARC would appreciate check-ins on their net on 145.28 at 2100 CDST, Thur. KØBQI put up a coaxial dipole and has a ne speech processor which should help his OBS work on 10 mete WBØFKY has a new 2-meter rig and trying an OBS sked on 146.5 at 1745 CDST, Tue./Thur. WØODI has retired and plans to do a l of fishing. KØOGU was PHD Amateur of the Month. KØSZK pass First Class phone. WBØFTB completed requirements for mer bership in the 10-10 Net. KØTVO has been appointed vice-chmn. the ARRL VRAC. WNØJTX and WNØOAR passed General, ar WBØCFQ passed Advanced Class exams. New Novices are WNØPBI WNØPBL, WNØPCG and WNØPDO. WBØJJR and WBØJWY receiv their General tickets, and WBØNQH his Tech. Congrats to a Traffic: (Apr.) KØONK 686, WBØHSP 147, WBØJWM 117, WØOT 94, WØBV 90, WAØFMD 57, KØRWL 53, WBØLMW 41, WBØLR 27, KØBIX 25, WØOUD 24, WØGBJ 18, WØVZK 16, WAØYNC WAØKUH 15, KØENH 13, WAØQOA 11, WØBVL 7, WØFQM KØAHL 4, WBØFKY 4, WAØMOF 3, WAØFKD 2, WBØLTD WØUCK 2. (Mar.) WØBV 116.

NEBRASKA – SCM, Dick Dyas, WØJCP – Congratulations to who recently upgraded their license when the examiner was Omaha. Received a nice letter from WBØMNK who was one of tho who upgraded. WØYPH passed the 1st class radio-telephon Holdrege area ARC pres. is WBØCLP and secy-treas. is KØMV Lincoln ARC provided communications for the Apr. March Dimes Walkathon. (Net, Freq., GMT/Days, QNI, QTC, Mgr.): NE 1, 3700, 0000 Dy, 60, 2, WAØGHZ; NSN 1, 3982, 0030 Dy, 857, 4 WAØLOY; NMN, 3982, 1230 Dy, 989, 10, WBØGWR; WNN W 3950, 1300 M-S, 506, 3, WØNIK; AREC, 3982, 1330 Su, 170, WØIRZ; CHN, 3980, 1730 Dy, 1500, 16, WAØGHZ; SHN W 3950, 1830 M-S, 210, 15, WØPL; NAN, 3980, 2000 M-F, 532, WAØAUX; QCWA, 3980, 1400 S, 66, WØFQB; NSN, 3982, 23 Dy, 1160, 30, WAØLOY; EA NEB AREC, 16/76 Dy 0200Z, 57 42, KØGND. East Neb. AREC Special WX Net Apr. 26 QNI 3 QTC 153. Traffic: WØVYX 37, WAØCBJ 36, WØSGA 28, WØH 27, WØJCP 20, WAØLOY 16, WØFQB 15, WØYFR 14, WØAFG WBØJWQ 12, WAØGHZ 10, WØHTA 10, WØPL 10, WØVEA KØSFA 7, WØGEO 6, WBØKCV 6, WBØGMQ 5, WØMW 5, WAØP 5, WBØFRG 4, WØNIK 4, WAØPTK 4, KØUDW 4, WAØEEI 2.

NEW ENGLAND DIVISION

CONNECTICUT – SCM, John McNassor, W1GVT – SE W1DGL. RM: K1FIR. PAM: K1YGS. VHF PAM: WA1OYE. (N Freq., Time/Days, Sess., QNI, QTC): CN, 3640, 1900 & 2200 D 60, 497, 377; CPN, 3965, 1800 M-S, 1000 Su, 30, 541, 242; VFH 28/88, 2130 Dy, 30, 362, 35; CSN, 3725, 1730 Dy, 30, 269, 1 High QNI: CN – W1CTI and WA1QME. CPN – WA1HLP, W1NQ WA1RA1RXA and WA1TGE. SEC W1DGL extends thanks to for outstanding work on SET – final report shows fine results. reports from WA1s RXA, HYN and QME. Dir. W1HHR bu replying to restructuring mail, sends thanks for comments. Danbu CARA Conn. QSO Party was a great success again this year, th thanks to all who took part. I enjoyed attending their Annu Dinner Meeting. The 22nd Annual CN/CPN Dinner Meeting was w attended and much enjoyed. All Nets represented. Section N Certificates were presented. The First Annual W1MPW High Q awards were presented to W1CTI for CN, W1NQO for CPN and

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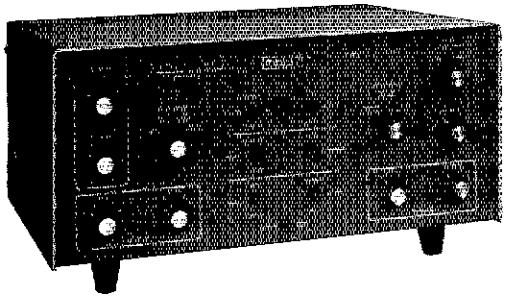

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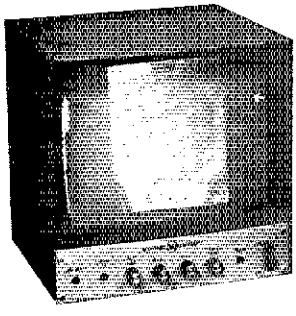

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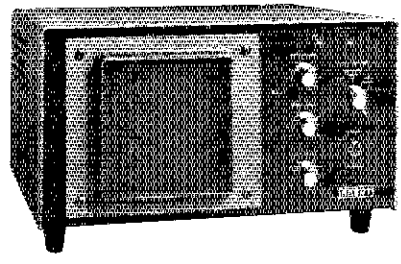

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WA1FCM for CN/CPN. Thanks to K1EIR and K1YGS for al arrangements! Shoreline ARC still growing, General License Clas very productive. New officers for Murphy's Marauders: WA1KID pres.; WB2OEU, vice-ptes. & act.; WA1ABV, vice-pres.; W1GNC secy.-treas. Congratulations to: WA1QME & WN1UAX on Apr BPL; WA1SHO & W1FXG on Extra Class; WN1TNR & WN1SD2 General; WA1SSH for 5BDXCC; and to W1ENL for Outstandin Amateur of the Year award from Danbury CARA! Now that Fiel Day is over, why not get the ARRL Antenna Quiz to use at the nex club meeting! Hope your Field Day was great! Traffic: (Apr. WA1QME 499, WA1TGE 426, WA1FCM 268, WN1UAX 226 WA1GFH 171, WA1SHO 110, WA1RYL 101, W1EFW 98 WA1HLP 82, WA1RUR 80, W1CII 73, W1GVT 64, WA1TXM 62 W1AW 46, K1YGS 44, WA1STN 43, WA1RXA 32, WA1PHJ 28 W1DGL 26, WN1UHN 17, WN1TNR 16, W1KV 14, WA1JCN 13 WA1OPB 12, WA1IKN 11, W1QV 10, WA1SWJ 9, WA1RZC 7 WA1JGA 6, W1CUH 5, W1BDI 4, KP6BC/1 1.. (Mar.) W1EFW 227 WA1PHJ 59, W1AW 29, WA1IKN 20. (Feb.) WN1TNR 62.

EASTERN MASSACHUSETTS – SCM, Frank Baker, W1ALP - SEC: W1AOG. New ECs: WA1AER, W1PNH, WA1RTR, W1UD now OPS. Ex-W1JE, WA1IBL, WA1RCD, W1AHE, WA1UGC W1PRR, WA1FTY are Silent Keys. W1AQE now retired. T9 Clu had a Ladies Night at Casali's. W1AOG received reports from ECs WA1s DXI, PGY, TEH, QKD, KZT; K1s PNB, NFW, CCW; W1 BAB, UJF, EQH, BB, GNM. W1HY back in NH. W6SDA ex-WA1KNE, W1FNQ in NH. K1HRV appointed as Public Relatio Asst. by W1HHR. Special events station WL1CEN in Lexington wa on during Bicentennial Celebration. Middlesex ARC subsidize publication of the EMRIPN bulletin for 1975. WA1MKP and XY WA1PIT went to DL & HB9-Land and now she is out in W6 W7-Land. WA1OJK/1 helped start a club at Boston Univ. are on th air, waiting for a call. W1HHR & W1ALP attended the annua banquet of the Norfolk County RA, new officers are: W1QVN pres.; W1PNH, vice-pres.; K1VUJ, secy.; W1SYC, treas. WA1IFE ha HW-202 on 2 fm, also WA1CTT. W1EOH has standard 146A W1AGN back from Phoenix, South Shore Club had auction. K1EP now OO I. K1REW home from Fla. WA1UKT on 80 & 20 wit SB400-SB300. WN1TZO, WN1STJ have their General. Walthar ARA meets on 1st Tue. of each month at the VFW building o Carter St., officers are: K1LPI, pres.; WA1GEP, vice-pres WA1GAR, secy.; W1HDJ, treas.; K1MON, trustee; WR1ABV K1MUC, chmn, repeater comm. Officers of the Town of Barnstabl RC are WA1UWL, pres.; K1OIK, vice-pres.; WA1MEB, treas K1EPL, secy. K1OUO back from Fla. ON6WL, PY1RO at W1L QTH. Medford CD group furnished communications at Patriot's Da Parade, WA1RIY and repeater group. WN1UGJ & WN1UAX manag MCNN. WB2IVG coordinator of ECARS & pres. MIT RS, WM board members: WA8PJJ, WB2OWC, WB5CCT, WA7YN WA1UQE now in Medway. W1DQM new job in W8-Land. Chelm ford ARA had Ladies Night at WA1SDZ's QTH, Framingham R had Flea Market. Quannapowitt RA had a film and a talk on "IC's by W1MXC. W1AOG, K1CCW, W1PL, W1ALP appointed asst. di by W1HHR. Cape & Islands 2-meter repeater on for Walkathor WA1UWL, K1LEK, WA1KUI, W1HFZ, W1OIK, K1EPL, WA1HW2 W1NPR took part. WA1GEP, W1GNM gave talk & demonstration o ham radio to the Cub Scouts in Arlington. WA1UZB new t Westport. Capeway RC met at K1IPB's, next meeting was held a the Alamo restaurant with 20 couples present. WA1FQV has RTTY W1CGR has fourty-four-elements on 2. (Net, Freq., Time/Day ONI, QTC, Mgr.): NENN, 3720, 1830 MWF, 102, 54, K1PNE EM2MN, 145.8, 2000 M-F, WA1IFE; NFEPN, 3945, 0830 Su, 72 6, W1KKD; EMRIPN, 3898, 1730 Dy, 158, 182, WA1OJU; EMR 3660, 1900/2200 Dy, 390, 331, WA1MSK; Cit. House, 3925, 110 M-S, 448, 246, W1UX; Mass. Tfc & Ragchew, 50.63, 2030 M-F 111, 5, W1GJK. Traffic: (Apr.) W1PEX 911, WA1QZX/1 288 WA1MSK 259, WA1MHJ 204, WA1OKD 176, WA1OJU 147 W1UX 140, K1PNB 136, W1OJM 129, K1PAD 109, W1AEC 100 WL1CEN 97, WA1UIK 93, WA1QQR 92, W1DMS 90, W1EIH 8 W1EMG 73, W1DMH 65, WN1UGJ 62, K1BZD 39, W1MX 2 WA1PAZ 19, WA1IFE 16, WA1RGA 16, W1GJK 10, W1EOH W1PL 5, WA1FNM 2. (Mar.) W1OJM 114, WN1UGJ 105.

NEW HAMPSHIRE – SCM, Robert C. Mitchell, W1SWX – SEC K1RSC. RM: WA1GCE. PAM: K1YSD. Welcome to WN1UU WN1UVT, WN1UTN, WN1UTU, WN1UTO, WN1UWI, WN1UX WN1UXN & WA1UWM. RM WA1GCE report of the NHVT N shows 111 check-ins and 52 traffic. K1LMS worked 5 new ones the DX test. WA1HZN home on leave will return to the Air Force

Alaska. WA1JSD had FD generator all tuned up and ready. K1AC is liaison for NHVTN and the newly reorganized NH Traffic Ne This net, with W1OOV as mgr. is most welcome as the NH sectio needed a phone net where traffic could be handled and route efficiently. Totals for the month show 259 check-ins & 48 traffic 21 sessions. Check-ins are increasing daily. Traffic: (Apr.) K1AC 38, K1LMS 37, K1PQV 28, W1JB 13, W1BYS 3, W1SWX 2. (Mar WA1GCE 43, K1LMS 43.

VERMONT – SCM, James H. Viele, W1BRG – SEC: W1VS (Net, Freq., Time(Z)/Days, ONI, QTC, Mgr.): VTSB, 3909, 220 M-S, 1130 Su, 642, 104, WA1PSK; Carrier, 3935, 1300 M-S, 58 38, W1JLZ; Vt. Phone, 3909, 2130 M-S, 96, 9, W1KKN; VTRFI

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3909, 2200 Su, 81, 20(BQB; NHVTN, 3685, 2230 Dy, W1GCE. Welcome new amateurs WN1UTH, WA1UTS, WN1UVE, WA1UVL, WA1UVM, WA1UVN, WN1UWE, WN1UWO, WN1UXE, WN1UXI. W1ENC will be /VE3 from McCauley Lake, Canada through Sept. BARC International Field Day at Charlotte Aug. 10. K1NKT is appointed OPS. Traffic: K1BQB 97, W1LMO 12.

WESTERN MASSACHUSETTS – SCM, Percy C. Noble, W1BVR Asst. SCM: C. Nelson Julian, W1DVW. SEC: WA1DNB. 75 Meter PAM: WA1MJE. CW RM: W1DVW. VHF/UHF PAM: W1KZS. Sun. WMEN held 4 sessions, QNI 91, traffic 9. WMPN held 22 sessions, QNI 249, traffic 43, total of 61 different stations. WMN held 30 sessions, QNI 157, traffic 117. WM AREC Net held 22 sessions, QNI 200, traffic 10. Berkshire AREC held 2 sessions, QNI 24. New appointment: W1DVW as Asst. SCM. Incidentally, all appointments and renewals since Feb. 1974 have been for a 2-year period. Some of the League's newer members seem to be unfamiliar with the fact that QST carries monthly SCM reports. The SCM would be interested in your monthly activities. SCM's addresses are on page 6 of all issues of QST. WA1RWU has a new TA-33 Tribander. WA1JRW putting up a 50-foot tower and a TA-33 beam. CMARA: VQ9XX and his wife VQ9YL were guests at the club meeting. HCRA: W1OWJ presented the details of his new Solid State receiver. K1HYL has been appointed asst. Dir. of the New England Division. MARC: K1PNB conducting code and theory classes. W1UD has been appointed asst. Dir. of the New England Division. NOBARC: WB2PNB, K1DEU, W1KSD putting in a lot of effort keeping the Greylock 2-meter repeater on the air. Thanks also to WA1RZO and his brother for their work on the Spruce Hill repeater. V. of Lincoln: "Murphy" was kind of busy bugging the repeater but believe all set now. Traffic: W1BVW 114, W1DWA 100, WA1RWU 93, W1BVR 78, W1TM 57, W1KK 46, WA1MJE 42, W1HI 30, W1ZPB 30, WA1PLS 15, K1RGQ 15, WA1BXP 7, WA1DNB 7, W1KZS 6, W1IQU 3, WA1OLK 2.

NORTHWESTERN DIVISION

ALASKA – SCM, Roy Davie, KL7CUK – A new EC for the Homer/Kenai Peninsula area is KL7IEW. KL7EKO has resigned. KL7APH at Larsons Bay was responsible for saving a large shrimp boat and its crew. See the Public Service section for details. KL7GCH reports that he is still frozen in with no mail delivery in months. KL7JDO is getting out a monthly bulletin to all ECs. WL7IGN, KL7ECX and WL7IGW are reactivating the AKN net, a slow to moderate speed net designed to encourage Novices on their code proficiency and public service. KL7FSE has had some very bad experiences with car accident, fire in his place of business etc. KL7HLC handled emergency traffic for medical aid to an expentant mother in the remote area of Nuiqsut. KL7HLC is EC for the North East Arctic. I need news items from any station in Alaska, no appointment needed to send in news items. KL7CHX back home and on the air. Repeaters now on are: 16/76, 22/82, 34/94 in Anchorage and 34/94 in Fairbanks. Traffic: (Apr.) KL7HLC 9, KL7GCH 8, KL7JDO 5. (Mar.) KL7JDO 6, KL7HLC 5.

IDAHO – SCM, Dale A. Brock, WA7EWV – SEC: W7JMH. PAM: WA7HOS. (Net, Freq., Time, Sess., QNI, QTC, Mgr.): FARM, 3,935, 0200 Dy, 30, 1195, 35, WA7HOS; IMN, 3.582, 0130 M-F, 22, 221, 85, W7GHT; RACES, 3.99, 1415 M-F, W7KDB; Ida Silver, 3.93 0100 MWF, W7IY. WA7TRO and WA7LRP of Lewiston-Clarkston Amateur Radio Club have just about completed the Sprouts Springs 19/79 repeater. WA7CTS now has twenty-two elements on 2 meters. The Idaho Mont. Net will soon be moving to 3635. W7IY reports a successful C.D. Party. K7UBC should be maritime mobile by the time you read this. Traffic: W7GHT 272, W7FIS 8, W7GBD 8, W7IY 1.

MONTANA – SCM, Harry A. Roylance, W7RZY – SEC: WA7IZR. PAM: WA7PZO. Congratulations to the hams who participated in the furnishing of communications to Boulder and Lincoln. New CW net meets at noon at 3735 kHz. K7TQM is the new Mont. Traffic Net Mgr. Mont. traffic net has 108 members. MTN had 1316 check-ins, 22 sessions and 34 pieces of traffic. IMN had 22 sessions, 85 pieces of traffic and 221 check-ins. WA7OBH is QSL mgr. for VE8RCS the northernmost station in the world. WIMU hamfest is progressing with plans being made and will be held Aug. 1, 2 and 3rd. Traffic: W7TGU 23, W7NEG 19, WA7PZO 4, K7KPX 4, WA7OBH 2.

OREGON – SCM, L.R. Perkins, WA7KTU – Asst. SCM: Daniel T. O'Connell, WA7TDZ. SEC: W7HLF. RM: K7OUF. PAM: K7RQZ. (Net, Time, Freq., QNI, QTC, QNC, Mgr.): BSN, 0030, 3908, 745, 84, 15, WA7QDC; OSN, 0145, 3585, 148, 90, WA7TXV; AREC, 0200, 3993, 424, 3, 2, WA7RWM; Nuclear, 1630 Su, 50.250, QNI 33, 4 Sess., W7FFE; PDXAREC, 0230, 04/64, 262, 2, K7WWR. Many people on VHF in Ore. will miss W7HUR, who became a Silent Key this spring. Fran was one of the pioneers of amateur VHF/FM working out of the Portland area. Best wishes and good luck to W7HHH. We hope some of the problems stemming from the auto accident a few years back were straightened out during your stay at the hospital. Repeater frequency coordinator for the Ore. Section is K7DVK. Before we have some of the bad experiences more populated sections have had, why don't you get in touch with Dick get that new machine coordinated with others in

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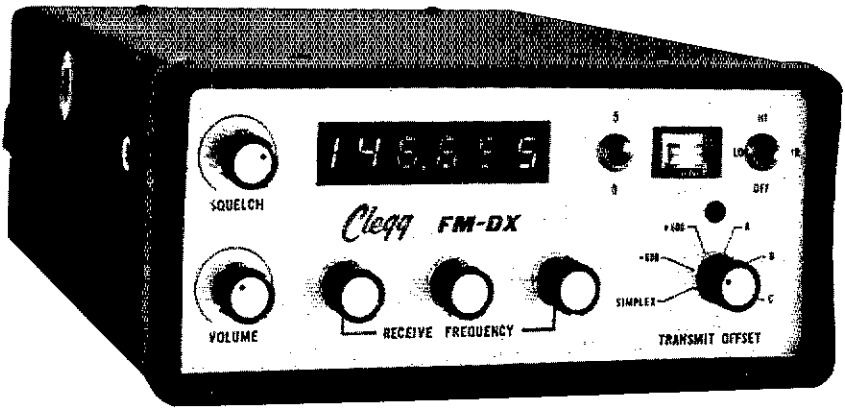

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the state? Does your club send a bulletin to other clubs? If not, why not? Traffic: K7QEG 142, K7JWD 138, W7ZB 110, WA7YFU 77, K7NTS 72, WA7QDC 51, WA7UJO 51, K7OUF 46, W7DAN 35, W7IWN 34, WA7KIU 21, W7LT 8.

WASHINGTON – SCM, Mary E. Lewis, W7QGP – SEC: W7IEU, PAM: K7YRQ, VHF PAMs: K7GWE, K7LRD, RM: K7OZA. (Nets, Freq., Time, QNI, QTC, Sess., Mgr.): NTN, 3970, 11:30, 1316, 82, 30, W7PWP; NWSSB, 3945, 18:30, 649, 45, 30, W7FIM; NSN, 3700, 0200Z, 451, 196, 30, WA7NDB; WSN, 3590, 18:45, 327, 101, 30, W7LG; WARTS, 3970, 18:00, 2381, 180, 30, W7QGP. K7OZA taking over as recorder for WSN as K7OXL has moved to Tex. W7AIB traffic down this month as station was closed down early for vacation. Upgrading congratulations to WA7BBJ, WA7WMD & WA7UFS to Advanced; K7PFR from Tech(C) to General and K7IPQ to Extra Class. From the numbers at FCC office every Fri. several more have also have upgraded. W7IEU says thanks to those who helped in making operation shore patrol a success and also to those who let us do our thing. Why not join us next year? W7AXT has joined the ranks of 144 MHz users. WA7WMB working low bands from new QTH, also a great big congratulation on being elected secy.-treas. for Society of Broadcast-Engineers for Wash. K7GWE completed WAS on Oscar 6 by working W5PNY. One or two QSLs yet to come in and then off to ARRL for that wall paper. Nice going. K7GWE also reports SMIRK Net on 50.2 MHz at 1900 local time has good attendance covering W. Wash. and N.W. Oreg. Mt. Baker ARC annual Spring Banquet very well attended also the Dial Twisters ARC in Spokane. Sorry I missed the Mt. Baker, but both banquets were the same nite. The Skagit Hamfest attendance between 400 & 450, several came up for the day and did not register, 335 dinners were served. The former Evergreen State Net again active 1700 daily 3920 check in. Traffic: WA7OCV 142, WA7BDD 115, K7CTP 109, WA7VHW 68, W7APS 64, W7BQ 51, K7OXA 50, K7OXL 45, W7PWP 35, W7SYS 34, W7LG 29, WA7KNW 27, W7BUN 20, W7AXT 10, WA7RCR 10, W7AIB 9, W7IEU 9, W7EBU 8, WA7GVB 4.

PACIFIC DIVISION

EAST BAY – SCM, Charles R. Breeding, K6UWR – Asst. SCM: Ronald Martin, W6ZF. SEC: WB6RPK. Asst. SEC: WB6DSL. I'm pleased to announce WA6DIL has resumed his ORS and RM duties. Both the Oakland RC and the Grizzley Peak VHF ARC had successful auctions. The combined Silverado AR Society and North Bay AR Assn. membership had a fine tour of the Navy transmitting facility at Dixon. At the Apr. meeting of the Northern Calif. Contest Club, WA1PID gave a talk on the Contest Dept. at League HQ. Your Vice-Dir, W6VZT was the speaker at the Apr. meeting of the Hayward RC. WB6DHH is working over a C.E. 10B. He would like to hear from anyone with info on the coils. W6CBF, WA6VEF and WB6WBG report being active in the CD Party. Even with a new airplane, W6DNY still finds time for the low bands. W6ZF working over the rectifiers on the big rigs so those fine West Coast Bulletins will keep coming. K6SUW now on the SARO repeater. From CCRC the following were listed as new Section calls: WN6JJZ, WN6JFZ, WN6KAB, WA6HTR, WN6HUC, WN6JYI and WA6JSW. Watch for information on the Calif. QSO Party to be held in Oct. Thanks to the efforts of the Calif. Contest Club it looks like all counties will be on. Here is your chance to work all Calif. Counties in one week end. Traffic: (Apr.) K6HW 479, W6JXK 126, WA6IPI 122, W6TYM 109, K6PMG 38, WB6VEW 37, WB6WBG 8, K6UWR 6, W6ZF 3, WA6VEF 2. (Mar.) W6TYM 122.

HAWAII – SCM, Pat Corrigan, KH6GQW – SEC: KH6IKB. ORS/OPS: KH6IAC. EC Windward Oahu: KH6HOU. EC Leeward: KH6HRG. EC Maui: KH6HHG. Still looking for people to help in emergency preparedness. Need EC for Honolulu, contact KH6IKB. KH6FSH has been helping a lot on WESTPAC Tfc. Net. The net is still going well and has been heavily involved with tfc. from Viet refugees. KH6IAC still ramrods the bulk of the tfc. flow. Woody still finds time to DX and work out prop predictions – quite accurate, too! Hon. DX Club met on May 3 with 20282 and other subjects on agenda. Next meeting will see KH6IGJ presented with plaque from club for his contributions. Your SCM had the good fortune to be at Dayton again this year (over 10,000 attendance) and spoke to many ARRL staffers and Directors, including Pres. Dannals and Gen. Mgr. Baldwin. Hawaii section receiving more attention. KH6IJ present at FCC's committee conference on WARC - 1979. Funny to find Nose & I talking on a W3 Rptr. During my trip to Wash. I found most rptrs. have become more sophisticated than last year. Good to have GMP back from his Eastern sojourns. We bid Aloha to KH6IKG and hope to QSO from W6. Bicentennial prefix for KH6 will be AH6 and can be used beginning Jan. 1 without any request. WH6 will be AHL. Traffic: (Apr.) KH6IAC 600, KG6JAQ 144, KG6JEU 92, JG6JED 91, KX6LJ 59, KH6GQW 12. (Mar.) WN4LPL/KG6 8.

NEVADA – SCM, John D. Weaver, W7AAF – NAB and NEWCOM conventions well attended by hams, swelled amateur ranks in Las Vegas at least temporarily. K7ICW worked K7NOM on Oscar 7 mode B for his first Nev. QSO through a satellite. Al now has 393 two-way Oscar QSOs. K7RBM has moved to Chicago. WA7ECT back from Calif. K7HPO now WB4GIB. W7FJM, ex-Nevadan now in Phoenix is looking our way Sun. at 10 AM on

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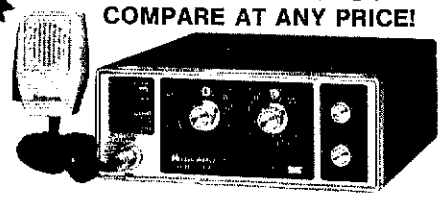

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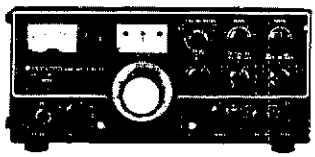

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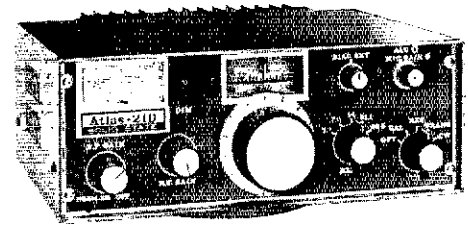

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145.005 ssb, WA7KNK is publishing the NARA News. With school closed for the summer, LVRAC is looking for a new meeting place, hopefully a permanent one. A bouquet to WA7IPA for providing her classroom for meetings during the last school year. Traffic: WA7UEK 81, W7ILX 62.

SACRAMENTO VALLEY – SCM, Norman Wilson, WA6JVD – SEC: W6SMU. New officers of the North Hills RC are WB6EDR, pres.; W6KYA, vice-pres.; WB6DCF, secy.; W6BWZ, treas.; K6TWE, trustee (K6IS); W6NJU, act, chmn. W6PBC is a new OVS in the Roseville area and will soon be active on 50 thru 1296 MHz. W1YL of the ARRL HQ staff gave a presentation to the North Hills RC on HQ operations. WB6ZPO now has a General Class ticket. W6AJY (alias WB6AUH) was the main speaker at the Fresno DX Convention breakfast and W6NJU conducted the DX forum. W6CGJ has a new TR4. K6RPN suffered a temporary reduction in code proficiency due to an unfortunate confrontation with a chain saw. Ouch! Approx. 40 hams attended a recent meeting in Redding. WN6FYP reports novices in the Redding area handling traffic. A petition from Del Norte hams requests that county be transferred to the San Francisco section. W6NJU has announced his candidacy for election as the Pacific Division Dir. Traffic: K6RPN 71.

SAN FRANCISCO – SCM, Rusty Epps, W6OAT – Congratulations to WA6ZQJ, WA6WDR and JA3USA upon passing their Advanced Class exams. Also to WA6RAV who went directly from Tech to Advanced. The Calif. Slow Net for novices meets 0300Z on Wed. and Sun. on 7119. CSN had 8 sessions handling 10 messages in Apr. The Geo. Ladd Pioneer Radio Club of the Telephone Co. just moved the club stn WB6FDT/WR6ACI into plush new quarters in SF. K6LRN has been appointed OO Class 4 and and WB6BDL received an ORS appt. There is a RACES group being organized in Ukiah with prospects of a repeater and a stn with 2 op positions located in the court house. Congrats to WB6BDL who made PSHR this month. W6EAJ will be on 160 meters mobile as soon as work on his antenna mount is complete. Humboldt Co. Radio Club and the Far West Repeater Assn. teamed up to furnish communications for the "Tour of the Redwoods" road race. W6GGR is busy revising his stn, especially the RTTY gear. At a giant meeting of the Humboldt ARC, about 85 amateurs assembled to hear Pac. Div'n. Dir. W6ZRJ discuss FCC Docket 20282. Traffic: W6RNL 111, K6UP 99, WB6BDL 25, WA6BTF 22, WB6UPV 11, W6OAT 4, W6GGR 2.

SAN JOAQUIN VALLEY – SCM, Ralph Saroyan, W6JPU – The Pacific Division Convention was held here in Fresno on May 2-3-4 with over 500 in attendance. Dick Baldwin, General Mgr. of the League was guest speaker. The 26th annual DX convention was held here in Fresno Apr. 19 and 20 with 286 in attendance. W6HYG and W6KUT came up from the south to attend. Ellen White, W1YL from the League was the special guest. The Indian Wells Valley Emergency net operates on 145.35 MHz on AM every Mon. night at 7:30 PM, and they would like you to check in. The West Kern Novice Tfc net meets Sat. at 6 PM on 3720 kHz. If you are a novice, and like to handle traffic, please be free to join this net. WN6FPV is net mgr. W6DPD passed his General Class exam. WB6YCK also passed his General. W6DPD has an HR220, HR6, and a EC175 counter. WB6IJJ conducted the hidden transmitter hunts during the Pacific Division Convention. W6RRN, WB6SUP and WA6HIN are all recuperating and should be up and around by now. W6EYO has an FT101. WB0GMU, ex-WB6WQV was visiting in Visalia. WB6GRI, WB6NON and WB6MBN are active on 2 meters fm. K6ODP is pres. of Calaveras Radio Club. Traffic: WN6FPV 3, WA6CPP 2.

SANTA CLARA VALLEY – SCM, Jim Maxwell, K6AO/W6CUF – SEC: WA6RXB. W6RSY, W6RFF made BPL. W6RFF made PSHR. Newest OO is WA6WEI. WA6UAP worked into Japan via the 70cm-2M mode B of Oscar 7. W6RSY notes heavy tfc to and from the Pacific during the last days of Apr. Early Apr. brought some good tropo on 2, sez WB6JNN. Among those working into So. Calif. were K6MYC, K6PXT, W6IWR. The Associated RCs consisting thus far of WVARA and SCCARA, has been reactivated for the purpose of throwing the 1976 Pacific Division Convention in the San Jose area. Volunteer workers contact pres. WA6WEI and W6ZM for assignments. WVARA went all out for the Knights of Columbus 26 mile Marathon. The 220 repeater WR6AEE played a major role. Participants included K6LU, WA6PWT, WA6WER, WN6BYO, WB6KUK, WB6RGR, WB6SCG, K6RQ, WB6JQC and WA6WLE. W6KZJ ORL with State QSO Parties. The Calif. QSO Party scheduled for Oct. 4-5 this year, under the sponsorship of the NCCC. Contact W6OAT for details. WA6HAD is preparing a personal filing to the FCC on Docket 20282. Dir. W6ZRJ and VD W6VZT have collectively visited 39 Pacific Division clubs during the past months discussing the pros and cons of 20282. The Santa Cruz County AREC net meets each Mon. at 1900 local on 146.52 fm. W1YL turned out a near record of 83 at her recent ARRL presentation at WVARA. Info on the new Bay Area Amateur TV Club can be obtained from WB6EJT. Their on-the-air meeting is held every Tue. at 2100 local on 145.1 MHz. WB6TYA took time out from traffic activities to build a new digital clock. Traffic: (Apr.) W6RSY 1085, W6RFF 281, W6YBV 159, W6BVB 134, W6DEF 45, WB6TYA 36, WA6HAD 24, K6WT 15, W6QNB 7,

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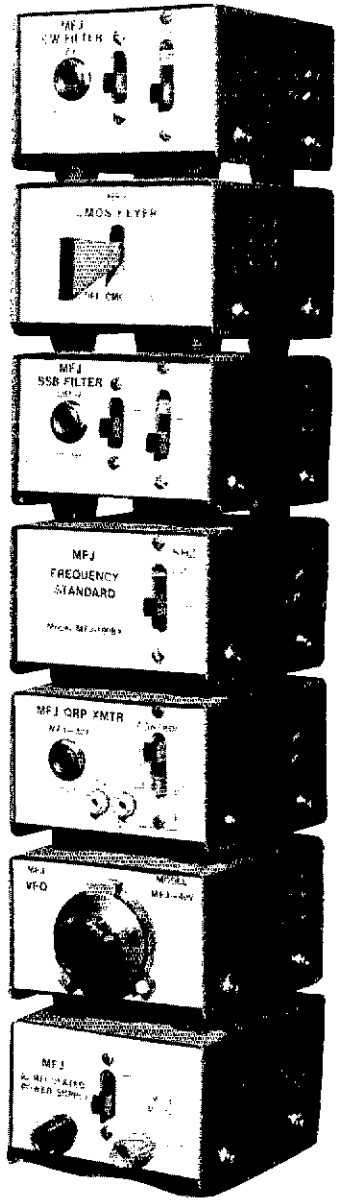

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W6KZJ 6, WB6MXI 3, WA6NDN 3, K6AQ 2, WA6SCY 2. (Mar.) WA6HAD 5.

ROANOKE DIVISION

NORTH CAROLINA – SCM, Chuck Brydges, W4WXZ – SEC: K4FBG. RMs: K4MC, WB4ETF. PAM: WB4JMG. VHF PAM: K4GHR. EC of the month is WA4VNV in Asheville/Buncombe Co. Doc was the pioneer of the Western NC communications plan so contact him for any details. Remember ccw? The Carolinas Net (CN) meets nightly at 7 and 10 PM EDST covering NC/SC and mgr. W4ATA says 81 QTC for Apr, with 30 different stns QNI. CN freq is 3573. New Dir. for JFK Net is WA4KSO, congrats. Third Annual Raleigh ARS Hamfest drew about 900 with good flea market and MARS and net meetings, thanks for a good one RARS. WB4UOU elected new Dir. of JFK Net, congrats. WA4BFT now Advanced Class. W4REZ now K4DJ. EC W4EHF reports 3 new asst. ECs and moving into new EOC at Fayetteville. K4AIH, EC in Murphy, reports nine AREC members. March of Dimes Walkathon in Winston-Salem was aided by 15 operators thru 04/64 repeater WR4ACA and officials were impressed. Don't forget the Antique Wireless Assn. Meet at Winston-Salem July 11-12 which will feature antique radio displays, antique flea market, contact W4DBT for details. NC Six-Meter Assn, NCSMA now at 43 members, contact WB4MXC to get newsletter. Alamance ARC sponsoring the NC QSO Party which will be first week end in Nov. '75. High scorers for '74 NC QSO Party were WA3QNT for national honors and WA4BVA/ Greenville for NC honors and W4OMW/Greenville was high for any mobile stn with 213 QSOs. WB4VHE is now Advanced Class. New repeater in Greensboro is 147.72 in and 147.12 out contact K4CJZ for details. Traffic: (Apr.) W4OFO 102, K4FTB 70, W4RWL 66, K4MC 60, W4WXZ 48, WA4KSO 42, WB4OXT 39, WA4EFZ 29, WB4JMG 29, WB4KHZ 27, WB4FFX 16, WB4MXG 14, K4AIH 12, W4FMN 6, K4DJ 4, WB4TNB 4, K4BF 2. (Mar.) WB4BGL 101, W4FMN 24, W4RWL 19, W4TYE 11, W4EHF 4. (Feb.) W4RWL 38.

SOUTH CAROLINA – SCM, R.H. Miller, WA4ECJ – Asst. SCM: Charles N. Wright, W4PED. PAM: K4GQG. RM: WB4OBZ. The annual Camden Ham Picnic will be held on Aug. 3, so pack the ol' lunch basket and enjoy an outdoor holiday with the gang. No prizes. No tickets to buy. Just family-style fun. Soft drinks and iced tea provided by DX Amateur Radio Club. The management of CN is now in the capable hands of W4ATA. Three new alternate NCS added to SSBN staff are WB4MOT, K4GLT and WØPIM/4. WB4UQS and WB4OBZ are collaborating in organizing a Novice Net. This year's SSBN "Amateur of the Year" award was presented to W4NTO in recognition of his always ready, able, and willing assistance to fellow hams, and for outstanding liaison service over and above the call of duty. K4II is on another trek to Guernsey, Jersey and Germany, operating portable. Carolinas Net 81. Traffic: (Apr.) W4NTO 162, K4ZB 28, K4GLT 14, K4FRX 10. (Mar.) K4GLT 28, K4EAR 22, WA4LOU 9, WA4IVF 8.

VIRGINIA – SCM, Robert J. Slagle, K4GR – Asst. SCM: A.E. Martin, Jr., W4THV. SEC: WA4YIU. Asst. SEC: WA4PBG. PAM: WA9NEW/4. RMs: W4SHJ, K4IAP, WB2VYK/4, WA4AVN, WA4DHY. WA4AJF getting EE Degree At UVa. K4EZL out of town. New QTH of W4SUS almost finished. PAM WA9NEW/4 will move in Aug. D4RN still needs more reps. Refugee message traffic rolling in this month. WB4YXN on 2. W4IGO received General. K4JPO, K4ZKU and WA4TSC active in radio controlled model flying. K4EJY recovering from heart attack. WB4FDT off in mid-June for Israel – will take rig along. W4JUJ reports county hunting very poor with 3021. W4KX visited W6-, W7- and KH6-Lands. K4GTS visited G-Land. New Drake C-Line at WA4CLK. WB4DRB/4 heard own call in W1AW code practice session. Antennae of W4DM withstood the Apr. windstorm but roof did not. K4KA needs Zone 34 to complete WAZ. WA4CLK backed up VSBN and WA4SMR the VSN PAMs while they were out of state. It's that time of year, sailboating vs hamming for W4UQ. New officers of Shenandoah Valley Radio Club: WB4SXJ, pres.; W4WSF, vice-pres.; K4BRK, treas.; WB4WDQ, secy.; W3ECZ, trustee. LO Meeting in Richmond better than ever this year. W4WSF will be using KJ4ITU during ITU week. So far W4QDY and W4YZC only known candidates for SCM race this fall. Nets: QNI/QTC VSN 365/159, VSBN 1102/476, CV2FN 621/71. WA4MMP doing super huge VHF arrays. WA4GHY passed Advanced. Fine article on noise suppression in Tidewater SSBN Newsletter. Also heard from W4HU AMRAD, Va. Beach/Norfolk AREC Newsletter, LARC, and Vienna Wireless Soc. See last month for net skeds. BPL: K4KDJ. Traffic: (Apr.) WA4AVN 343, K4KNP 314, K4KDJ 304, W4UQ 247, K4IAF 174, K4GR 159, W5VZO/4 131, WA4VFW 101, WA9NEW/4 95, WA4PBG 80, WB4FLT 71, WB4KIT 70, WA4HUB 68, K4FEL 67, K4JM 67, WA4EAZ 53, WA4SMR 52, WB4YKM 43, K4VWK/4 37, W4YZC 36, WA4CLK 33, WB4YXN 33, K4KA 29, W4TZC 29, KØPIV/4 26, W4DM 22, WB4DRB/4 21, W4SUS 18, K4EZL 17, WB4OEB/4 15, WA4YIU 13, W4KFC 10, W4LGM 10, WB4FDT 9, W4MK 7, WA4AJF 5, K4GTS 5, WA4WQG 3, W4JUJ 1. (Mar.) WA4CLK 118. (Feb.) W4ODY 209.

WEST VIRGINIA – SCM, K.C. Anderson, W8DUV – Congratulations to WB8IJW, A-1 Op, WB8PAV made PSHR with 6 points. W8CCN and W8LD received 50-year pins at OCWA meeting in Clarksburg on May 3. Jaeger Club station is WB8IOX. Bob

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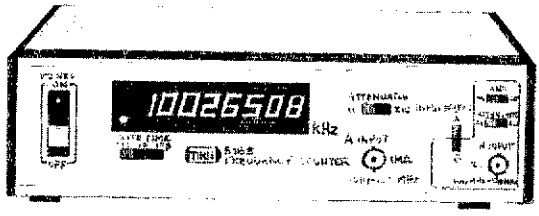

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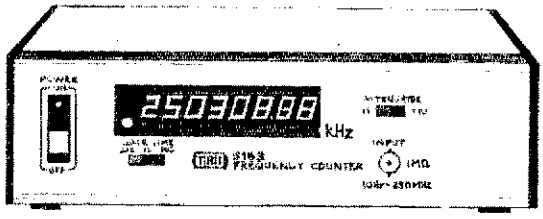

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Charleston and Huntington had successful Walk-a-thon operations for the March of Dimes campaign. WA8KCJ active on Weather Watch Net and directing mobiles thru Huntington via 2M fm. New amateur in Gilmer WN8UTS. W8LGT received OOTC No. 1813. In monitoring for the Intruder's Watch program, W8LGT uncovered some illegal-type operations and reported same to FCC after warnings to the individual failed to remedy the situation. The Greenbrier ARA, W8EFC, has been conducting Novice classes. Plans for the 17th annual WV ARRL Convention at Jacksons Mill were finalized at Council meeting May 3 in Parkersburg. (Net, Freq., Time, Sess., QNI, QTC): WVNN, 3730 kHz, 2130Z, 30, 108, 34; WVMN, 3990 kHz, 1600Z, 30, 592, 92; WVPN, 3990 kHz, 2200Z, 30, 868, 124; WVN, 3567 kHz, 2300Z, 30, 189, 74. *Change in time. Traffic: WB8PAV 94, WB8IJW 87, W8HZA 69, WB8DQX 66, WA8LFW 37, WB8NFZ 31, W8DIV 28, W8EZP 16, K8QEW 14, W8EUE 10, W8CKX 8, WB8MKL 7, WN8SAW 4.

ROCKY MOUNTAIN DIVISION

COLORADO – SCM, Clyde O. Penney, WAØHLQ – SEC: KØFLQ. RM: WBØHCK. PAMs: KØCNV, WAØYGQ. Our sincere thanks and appreciation for a job very well done, go to WØLRN, who has been forced to resign as mgr. of TWN because of pressure of his current work schedule. Congratulations to WØHXB who is the newly appointed mgr. of TWN. TWN certificates have been issued to WBØAXW, KØDRL, WØHXB, WBØHCK and WBØHSZ. CCN extends a warm welcome to WNØNOS, WN7WXQ, WØETT and WNØOYX who recently joined the net. 12th region DTN needs check-ins from Utah and Ariz. and will welcome all comers. W5HRS/Ø reports much improved performance from his Drake rig, which just came back from the factory. The SSN has a number of openings for traffic men, and those interested in handling traffic, and will welcome all check-ins. Net traffic for Apr.: CCN QNI 90, QTC 59, 26 sessions. Hi Noon QNI 746, QTC 15, informals 90, 27 sessions, 1211 minutes. Columbine QNI 1245, QTC 94, informals 299, 1376 minutes. Late Net traffic for Mar.: SSN QNI 170, QTC 65, informals 13, 406 minutes. Traffic: (Apr.) WØWYX 1751, KØZSQ 828, WBØIBS 249, WØHXB 172, WBØHCK 134, KØSPR 94, WØLQ 67, WØIW 58, WØLAE 39, W5HRS/Ø 35, WBØIZO 22, WØETT 13, WAØYED 8, WAØYNQ 4. (Mar.) WØLQ 97, WØPT 34, WAØYED 5.

NEW MEXICO – SCM, Edward Hart, Jr., W5RF – Asst. SCM: Joe T. Knight, W5PDY. SEC: W5ALR. PAMs: W5PNY, W5DMG. RMs: K5KPS, W5UH, WB5KSS received his 30 wpm certificate from ARRL on W6OWP run. K5KPS reported into the SWN from camp, using battery power. The Bean feed was a great success. Among those present were WB8JNI from Mich. and our own Division Dir. WØSIN from Colo. The Southwest Net (SWN) could use a little help. Bad conditions are cutting attendance. SWN meets daily at 1915 on 3585 kHz in Apr. handled 151 messages and had 151 check-ins. New Mexico Road Runner Net (NMRRN) meets daily at 1600 on 3940 kHz in Apr. handled 36 messages and had 763 check-ins. Traffic: W5UH 267, WB5KSS 162, K5KPS 143, K5MAT 128, W5ENI 123, W5RF 81, W5DMG 54, W5YQ 13, WB5KUL 11, WA5OHI 10, W5QNR 10, W5QNQ 5.

UTAH – SCM, Ervin N. Greene, W7EU – SEC: W7GPN. RM: W7OCX. Salt Lake County is conducting classes in Civil Defense Preparedness at the County EOC. AREC cards and decals will be issued to those completing the course. FC WA7SYU heading the effort. Once again area hams assisted the Moab Chamber of Commerce in handling communications for the annual Friendship Cruise over Memorial Day week end. WA7TSB has a new FR22C replacing one recently stolen. There has been a rash of stolen rigs recently. Keep them under lock or out of site. Has yours been inscribed with your name and Social Security number? W7OCX has been named new VP of the Ogden Radio Club. WA7SYV is raising a new tower for a bigger and better station. The Utah Hamfest is scheduled for July 26 at Taylorsville Park. A full day of fun and prizes topped off with a Steak Fry in the evening. Contact W7VEO or K7ZOF for details. Traffic: WA7MFL 64, W7RO 30, W7OCX 28, W7DKB 15, W7EU 10, WA7TSB 6, W7UTM 6, W7HOI 5.

WYOMING – SCM, Joe Ernst, W7VB – Our congrats to the very fine, hard working amateurs who keep our Public Service Nets going through days of fierce static and unfavorable skip conditions. The Wyo. Weather Net, 6:45 AM, MDT, M-S net mgr. K7NQX, and alternates W7SOT and Homer. The Jackalope Net M-S 12:15 PM MDT, on 7260 and 12:30 PM MDT, on 3920 net mgr. W7ILL, ANCS, WA7TCQ, WAØUEN. The Wyo. Cowboy Net, M-F at 6:45 PM, MDT, on 3950 net mgr. W7SDA, ANCS K7SLM, W7CQL, WA7TCQ and W7TZK. On Sun. 8 AM, MDT, 3920, net mgr. WA7NHP, ANCS WA7WFC. The people who guard the CW nets, W7HNI, W7SDA. The 12th Region Daytime SSB Net W7VB and K7VWA. And Army MARS W7VB. A special thanks to our two ladies who handle so much traffic and make so many phone calls, K7WRS and K7VWA. We urge those of you who have the time and facilities to notify the net mgrs. that you may be available to share some of the work load.

SOUTHEASTERN DIVISION

ALABAMA – SCM, Jim Brashear, WB4EKJ – Congratulations to: WA4BDW, listed in Who's Who in South and Southwest; K4JO

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FM-27B 2m FM	299
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22'er FM (ser. 25)	199
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75A-1 Receiver	$139
75A-2 Receiver	198
75A-3 Receiver	269
75A4 early serial	325
75A4 late serial	425
75S-1 Receiver	325
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312B-3 Speaker	19
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KWS-1	650
351D-2 mount	75
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CC-1 conv. console	39
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HQ-170C Receiver	159
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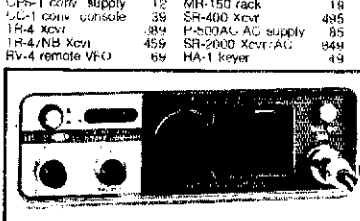

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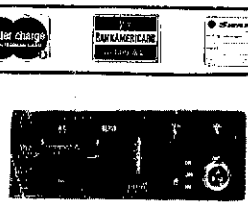

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for passing Extra Class, WA4EUD passing Advanced and to WN4RND on passing Novice class exams. WN4RND is YL o W4ROS and WA4MLK. The Grissom High School ARC displayed amateur radio at the Grissom Spring Festival of Arts. WB4RNW assisted by WN4ERM, operated 40, 6 and 2 meters. WB4UEE wa elected pres., Huntsville High School ARC. WB4FZQ has 800 wat amplifier operating. K4HJM is pres., Southern Country Cousins Net The Birmingham ARC went "all out" and had an outstanding hamfest/convention. The Hokes Bluff ARC call is WA4NBM. Ou newest net is the AENW. Understand the AENT is making a comeback. The AEN nets as I have them are: (Designation, Freq, Local Time/Days): AENB, 3575, 1900 Dy; AEND, 3725, 1730 Dy AENJ, .01/.61, 1800 Dy; AENM, 3965, 1830 Dy; AENR, 50.52 2000 T&Th; AENW, .10/.70, 2000 M; AENX, .34/.94, 2100 T Appointed WB4TVY as EC. Endorsed K4HJM, W4DGH, K4HIC and WB4RCF as OPSs. Don't forget the North Ala. Hamfest 3rd week end in Aug. in Decatur, Ala. In the FMT, K4JK got within 1 eye on 40 meters. We may not lose him to Fla. yet! Traffic: (Apr. WB4EKJ 146, WB4FZQ 119, K4AOZ 78, WB4KSL 64, W4ROS 62 WN4JDH 52, K4LYY 29, K4CUU 20, WA4AJA 15, K4HJM 14 K4VF 11, WA4BDW 10, WB4SVH 10, WB4TVY 4, WA4MLK 3 K4OMD 2. (Mar.) K4LYY 52, WA4ZDW 9.

CANAL ZONE – SCM, Roderick J. Isler, KZ5PI – Preparation are underway for the June Field Day Contest. This year the CZARA will be utilizing the call KZ5FD and are expecting maximum participation by CZ hams. Plans are underway to use all band including 160 and 6 meters and also Oscar. KZ5WA is in the proces of getting on the air on 6 meters and 160 meters. KZ5WA recentl rendered communications assistance between the U.S. Army Cana Zone and the U.S. Military Group in the country of Hondura KZ5IT is very active with Oscar both on 6 and 10 meters and i looking for more Stateside contacts. The KZ5FS 2-meter repeate on 10/17 has been receiving more and more activity from both side of the Canal Zone.

NORTHERN FLORIDA – SCM, Frank M. Butler, Jr., W4RK – SEC: W4IKB. RM: WB4DXN/WA4WIW. PAMs: WA4IZM/75 W4SDR/40, WB4BSZ/VHF. New appointments: WA4BAX as OPS ORS; WB4BMZ OVS. Renewals: K4BDY as EC; WB4PNJ OPS SNCs were earned by WB4NIH and WB4WXP on NFPN; by K4EU as FAST Net; and by W4GSY and WA4VCK on FPTN. Net mgrs are to be commended for good record keeping. WA4GNI is new NF of QFTN; W4SIZ is asst. mgr. of FPTN. NFPN check-ins from Ne Port Richey continue to grow. Both WA4MUV and WB4MUV, t confuse things! Daytona Beach ARA treasury got a boost fro recent auction. Their Newsletter now edited by WB4GHU. GH also into EAN activities. WA4EYW upgraded to Advanced Clas looking for Sumter Co. AREC members. W7EM/4 is asst. CHOP o SOWP Net – 19002. WB4OMG, as Co. EC, was invited to atten planning meeting for emergency reporting center (911). W4KFA WN4LXI and WA4ROV were on Gainesville TV talk show t describe amateur radio. GARS published fine brochure with photo for prospective hams. W4TKE and W4ANN gave Oscar demonstra tion at local high school. Sorry to report W4HQN of Defuni Springs a Silent Key. WB4STD moved to Ga. New hams in Eglin AFB area include WB4MTU, WB4MUP, WA4NNS. WA5YII/4, als WR8AGG/4, testing a 28/88 repeater. Severe floods kept K4LP and others in Okaloosa Co. busy. The new FLORALA chapter o QCWA was formed during FWB Swapfest. The WR4ACZ machin converted to a single-site, single-antenna operation. FFARA picn held at Ft. Pickens; next activity is a 2m transmitter hunt. K4CP passed Extra Class exam. Traffic: WB4GHU 240, W4LDM 23 WA4FBI 199, WB4DXN 191, K4BV 171, WB4SKI 128, W7FM 100, W4KIX 97, W4SDR 69, K4VND 63, W4YSO/4 48, W4RK 45, K4CVO 43, WB4JHQ 37, WA4BAX 33, WB4NJI 30, WA4IIC 21, WB4DAD 19, K4DDY 16, WA4CRI 8, WB4TVQ 8, K4RNS WB4VDM 7, WA4EYU 6, WB4VAP 6, W4IKB 5, WB4NHH 5.

SOUTHERN FLORIDA – SCM, Woodrow Huddleston, K4SC – SEC: W4IYT. Asst. SEC: W4SMK. RMs: K4EBF, W4E WA4GBC. PAMs: WA4NBE, W4OGX. New appointments th month: WB4LWB ORS, K4QG OO-I. OOs reporting: K4DA W4MML, K4QG, WA4UVG. OVS reporting: WA4ZLW. WB4WY has new CP25 certificate. K4DAS has new keyer and paddle. Disne World ARC has new call WA4ABQ and will have a repeater up soo K4TH was active in Festival of States parade in St. Petersburg a Cystic Fibrosis Bike-A-Thon in Tampa as well as Red Cro hurricane emergency test. St. Petersburg ARC enjoyed an eveni dinner-dance boat ride aboard MV Tom Sawyer Apr. 20th. K4Q installing a digital read-out to improve frequency measuremer WA4UVG worked all continents on SSTV in 14 days of intensi effort. WA4GNI is new net mgr. of QFTN. Indian River AR graduated 5 prospective Novices. On Apr. 5, through cooperation SPARC Repeater Team, WR4ALM, and Tampa Bay Repeater Ass 32 2-meter units helped with Festival of States parade in S Petersburg, under supervision of WA4FYR and WB4SIZ. Apr. again found Tampa and St. Pete cooperating to field more than units for simultaneous bike-a-thons for American Cancer Socie and Town-N-Country Jaycees Cystic Fibrosis Benefit. Apr. brought Pinellas Co. Civil Defense hurricane emergency drill with S Pete ARC and SPARC Repeater Team providing "communicati augmentation" between various municipalities and Lower Pinel Chapter, American Red Cross. Apr. 26 start of yacht race, St. P to Isla Mujeres, Mexico, with SPARC Repeater Team gatheri

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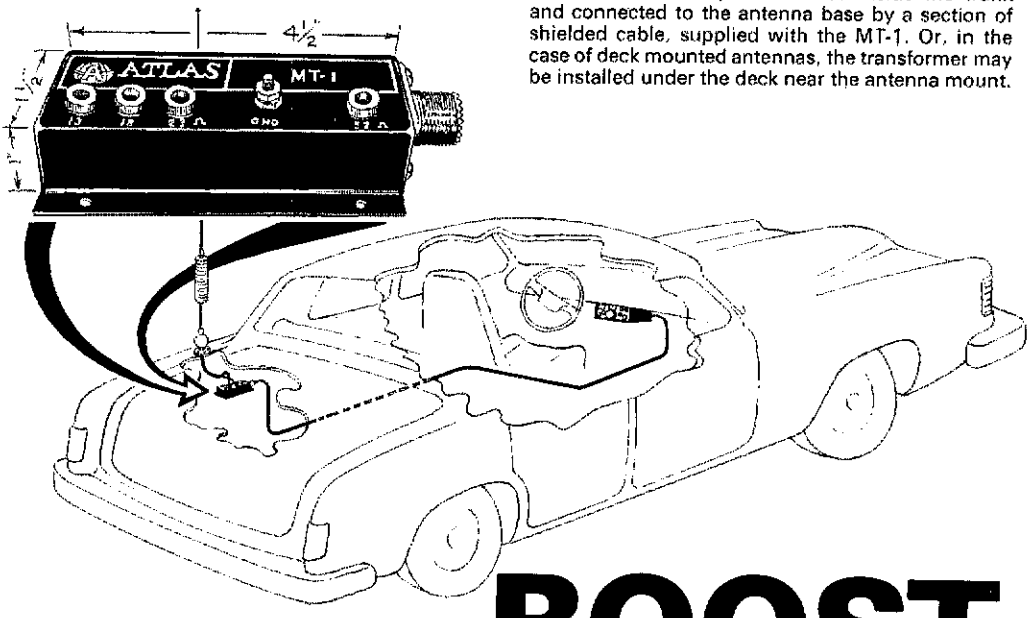

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starting information forwarded through W4GQ and K4NB to XE3DF. Traffic: (Apr.) W3CUI/4 2490, W3VR/4 580, WA4SCK 322, K4SCL 317, K4SJH 210, K4AIZ 143, WA4GBC 112, W4EH 106, WB4WYX 104, WN4JWN 95, W4IRA 92, W4BM 90, W4DVO 86, W4WYR 83, WA4GNI 74, WA4UH 66, K4TH 54, W4IYT 50, WB4KSG 49, WA4EIC 48, WB4AID 42, WB4TRI 39, W4DQS 33, K4QG 33, W4GDK 32, WA4HDH 31, WB4ALH 28, K4CFV 27, K4BLM 26, K3PIE/4 20, W4ILE 19, WA4KKE 13, W4GOG 8, W4SMK 7, WA4UVG 7, WA4UQO 5, WA4LWL 3, W4MML 3, W4TJM 2. (Mar.) WA4GBC 153, WN4JWN 127, WA4GNI 53, WB4ZSO 48, W4IYT 17, W4MML 16, K4DRN 2.

SOUTHWESTERN DIVISION

ARIZONA – SCM, Marshall Lincoln, W7DQS – RM: K7NHL. PAMs: WA7JCK, W7UQQ. The big summer event for Ariz. amateur radio operators will be the annual Ft. Tuthill Hamfest at the Coconino County Fairgrounds on July 25-27. Members of Explorer Post 710 and the Ariz. Amateur Radio Club operated a 2-meter net at the Thunderbird district Boy Scout Camporee to assist with camp activities, and a HF station handling phone patch traffic to Phoenix. K9DCX was elected pres.; K7NTG, secy.-treas. of the Ariz. Chapter of QCWA. W7HTY, observing 50 years as an amateur radio operator, has been honored by the Ariz. Repeater Assn. With regret, WA7FUO is reported as a Silent Key; killed in a plane crash north of Sedona, W7YS reports being the first 5BWAS winner in Ariz., and being first place low power winner in the Nov. SS. Providing communications at the Western Shrine Assn. Convention parade were members of the Tucson Repeater Assn. and Old Pueblo Radio Club, including K7MMN, W7HTQ, WA7KEF, K7UOY, W7TCQ, K7KQI, W7OAO, WB2WPY/7, W7GMR, W8BID, WA7IHM, WA7RKI, WA7WMR, WA7HEH and K7VAU. New officers of the Prescott Radio Assn. are K7AWL, pres.; WA7UJG, vice-pres.; K7ZUY, secy.-treas.; WN7ZKW, asst. secy.-treas. Officers of the recently-organized Tucson Desert Rats Radio Club are W7KMV, chmn.; WA7ZGM, vice-chmn.; K7CC, secy.-treas.; K3NAS, pro. dir. Nets: Cactus Net QNI 1,256, QTC 447; ATEN QNI 672, QTC 34. certificates to W7RQ, K7NTG and WA7KQE. Traffic: (Apr.) W7UQQ 52, K7NTG 46, K7CC 41, WB2WPY/7 25, WA7YKM 15, W7DQS 14, WA7KQE 6, W7RQ 5, WA7UWG 4. (Mar.) K7NHL 299.

LOS ANGELES – SCM, Eugene H. Violino, W6INH – SEC: WA6DUC. RMs: WB6OYN, K6IVY. Another election over and thanks again to all those who helped me during the recent election. The QCWA held their spring dinner in the San Fernando Valley and 120 members and their XYLs were present. Again congrats to W6PHE, W6FQ, W6CL for their untiring work in making this another success. WA6PYL heard recently on cw, has been very active on 40 meters ragchewing many of the sections members. WA6MEM is in the process of assembling a station on 1296 MHz, is planning to use ten foot diameter dish. (Hope it won't get windy) K6SUJ is to be thanked for assisting K6KRA in getting his antenna system back in operation, but from reports his antenna is still some 20 to 40 degrees off target. The PARC now has computerized mailing labels, thanks to W6EIG, they now have their mailing list and roster under control. Anyone wanting changes in the new roster please contact K6AEH. WA6ZCO advises that he is forming an RTTY group in our section. He is in hopes of organizing a local teletype network in message handling and involvement in AREC. you RTTY buffs should contact Frank and help get this thing off the ground; it will be the first teletype AREC group that I know of. WA6AYW has organized an amateur radio club at his high school and has several students on their way to becoming novice. At a recent Miraleste High School "Open House" Wayne Pernell and Doug set up WA6AYW/6 to demonstrate ham radio to the visiting parents. WA6TLV, WB6ZVC, WB6VZI and WB6OLD attended the recent Fresno DX Convention; they met many of the northern Calif. DXers and a good time by all. K6UYK spending three week vacation in the New England States this summer with family. WA6TCH ran the Henry Radio booth at the Dayton Hamvention, reports that the attendance was around 11 k "wat a mob." The San Gabriel RC reports that 20 of their club members contributed their skills to the Apr. 27 March of Dimes Bikathon/walkathon in the West San Gabriel Valley with a follow up on the Mt. Wilson Trail Race. The Santa Clarita RCs recent T hunt won by K6KCY. They are also about to launch their new two meter repeater, probably be on the air by the time you read this. The location is Magic Mountain input freq 147.35 output 147.735, and thanks to W6KMC for donating a lot of his time and efforts to protect this remote location, with fencing. Congrats to WA6TLV on winning the Los Angeles Section Sweepstakes in the low power class, also FB pix in QST. It has been suggested by IDN and JUG MBZ we use Golden Bear net for SCM outlet when we have a lot of traffic. Traffic: W6INH 227, K6UYK 188, WB6OYN 157, W6HDJ 52, WA6TLV 41, WB6ETB 38, W6OEO 20, K6EA 10, WA6EWY 7, WB6YID 4, W6NKE 3, WA6ZKI 2.

ORANGE – SCM, Wm. L. Weise, W6CPB – Asst. SCM: Dick Birbeck, K6CID. SEC: WA6TVA, RM/PAM: WB6AKR. W6VO reports all set on 2 meters, two vehicles equipped with HR2s. Desert area check in with the new OBS, K6UZ. Harold should have the latest dope. Congrats to W6CPB on passing Advanced Class exam

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1975 officers for the Orange County ARC are WA6LHB, pres, WB6PEX, vice-pres.; WA6BJO, secy.; K6LJA, treas. Things ar popping in the Orange Co. Club – look for them on Field Day, cal W6ZE. It will be Fair time again, July 11-20. An operating statio will again be on the air. Most modes will be covered including RTTY. WB6AKR made a respectable score in the Apr. CD party CW 114,785 pts and 54,040 pts on phone. K6YNB has a ne position with Pepperdine Univ. It has been a long wait, says Wayne K6UZ plans to spend the summer at Big Bear City to get out of the desert heat. W6BUK attended the Antique Wireless Assn. meeting i Los Altos Hills meeting many old friends. K6GMI reports traffic o DRN6 was 90 pieces over same period last year even with the very poor band conditions. W6CPB and XYL plan to spend the month o June touring the Pacific Northwest. Summer holidays will soon b starting, hope all have a very happy and safe trip. Traffic: (Apr. K6GMI 219, WB6AKR 90, WA6IVA 31, W6WRJ 15, K6GGS 14 W6QBD 11, W6CPB 8, K6UZ 4, W6BUK 1. (Mar.) WA6YWS 2 K6GGS 14, W6BUK 1.

SAN DIEGO – SCM/SEC, Cy F. Huvar, W6GBF – Ne appointments for the Section are: ORS WA6IIK and EC fo Southern District WB6JQI. WB6UFL left for the East Coast duty Gud Luk Rick. Congrats to K6DBJ and the Flying Samaritans Inc. W6WMO, WA6SDJ, W6IC, WB6FMV and XE2FBE on a successfu net on 40 meters to get Nurses and Doctors for Vietnam EVA flights. Our Dir. W6KW visited the S.D. County Council ARC an gave an update on League affairs, Docket tabulations and plans fo the future. Council elections were held and results: WB6LBM chmn.; WB6MAG, vice-chmn.; WA6URS, secy.; K6FC, treas. W6JS and K6PM going East for vacation. W6IDY working on QRP rig fo 80/40. WA6DMB and W6VNQ on vacation. My thanks to all wh have written your Congressman on efforts to save 220 MHz. W6YE is proud owner of an IC-230 and has Imp. Vy. on 2 meters. Sorry t hear W6LRU had a fire in his ham shack and is off the air. Did yo know there is an on-the-air Advanced Class study group each da Mon. thru Fri. at 0700 on 3965 kHz taught by K6SQ? Congrats t upgrading licensees: WN6APN, WN6RCC, WA6CGZ, WN6DP WB6ENS, WN6FFT, WA6EGA, WB6FTY, WA6GYB, WB6HC WB6IOF, WB6IFA YF of WA6GXS. Amateur radio classes showin good results. W6CMQ, K6BOT working on 2300 MHz. PSE WB6PVH. Traffic: (Apr.) WB6PVH 191, W6BGF 136, W6DEY 3 W6PZU 16, WB6ERF 13, WA6IIK 11, W6GBF 10. (Mar.) WB6ER 12.

SANTA BARBARA – SCM, D. Paul Gagnon, WA6DEI – SE WB6HJW. RM: K6QPH. PAM: K6YX. K6YX is on the ARRL RF committee. WA6VBS is a new ORS in Carpenteria. Sightfie WN6KYW is a new amateur in Ventura thanks to WN6GSA W6MQF is now W4LGM in the DC area. W6BHZ at Cal Poly had good display for Poly Royal. WA6VVK is in charge of Field Day fo the Estero Club. W6ORE and W6KML are pace setters in th Ventura and Santa Barbara I-Hunts. The SBARC Old Timers Nigh was a great success. Remember the TRICAR annual section picnic San Luis Obispo in July. WA6WKQ won an award at the Ventur Science Fair. The plans for the convention are shaping up well. Kee Oct. 24, 25 and 26 open for a trip to Ventura. WA6DEI an WB6HJW attended a division officials meeting with W6KW Remember the Section AREC net on 3935 at 2000 on Wed. Th Ventura AREC HF net meets on 3931 at 1930 on Wed. Join u WB6EAN and W6ORE attended the Dayton convention. Traffi WA6MBZ 101, WA6DEI 42, W6JTA 19, W6POU 15, WA6VBS 1

WEST GULF DIVISION

NORTHERN TEXAS – SCM, L.E. Harrison, W5LR – As SCM: Frank E. Sewell, W5IZU. SEC: W5SHN. RM: W5QU. PAM W5GSN. Mr. Pyron, Dallas FCC O-in-C spoke before Dallas AR Tue. May 6. Large attendance was expected. Big D QSO Party Ju 7/8 plus FD June 27-28-29. Arlington ARC elected K5JTB, pre K5DOI, vice-pres.; K5VYL, trustee. 80 members meet 3rd Fri. ea month. Navy MARS Tyler State Park Sun. May 18. W5SH Fre Sheet Ft. Worth sez K5AH upgraded from educational post to pr Congrats OM. Best 73 to WB5FLQ as he needs your support. W note with pleasure a separate class for Advanced instructio Chawed Rag RWK WA5FTB pres. plus WA5JMK No. 2 hone continues meet TPL bldg. 7:30 PM 2nd Mon. This is a DX & conte crowd. W5QWF and WA5FTP made Midland this year. Just hea about "Snow-goose" award to Congressman Milford, ex-DL4A Sorry we all goofed on that one OM. The Tyler QCWA group m May 10 at Wyatts Tyler. Irving ARC pres. WA5PCF, VP WA5THB act. mgr. K5QII meet 4th Thur. 7:30 CenTreStn. N/L contain info re. repeater and FD. Your SCM was invited to attend joi meeting of "E" Systems Inc. Garland Division RC Mon. Apr. 2 Attendance 65 plus from Richardson, Irving, Plano, Garland Dallas. Heath equipment displayed, and discussed, also Dock 20282 was discussed with considerable interest. W5TGA appoint Class III OO. It is our understanding that Mr. Prose Walker, W4B will be in Dallas to attend a VHF/FM meeting in Aug. We furth understand there is a movement "afoot" to call a joint meeting all area Radio Clubs, so that W4BW may be heard by everyone. O VHF/OVS work is slowing down. We need more K5WIQ's. PA W5GSN reports the Lake Whitney affair was well attended. W5SE

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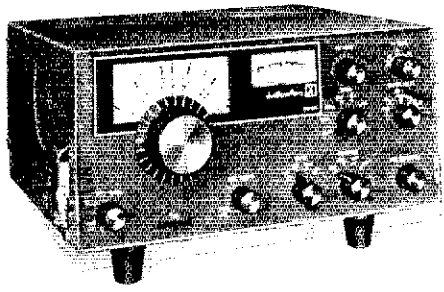

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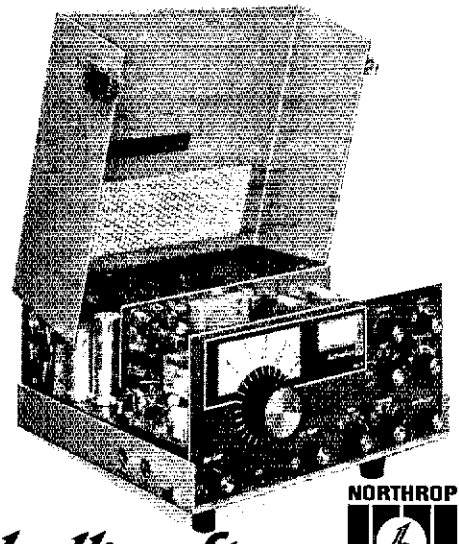

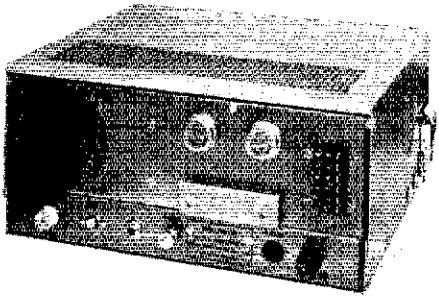

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made it over that way according to my spies. W5JA Dallas Eyebank Net Mgr. reports 26 sessions for Apr., 36 eyes handled, 628 check-ins while W5GSN reports TTN 30 sessions, 238 messages handled, 1578 check-ins and liaison with RN5 Traffic: (Apr.) W5TT 212, WB5DXB 160, WB5MTN 60, WB5MFQ 58, W5GSN 33, WB5MDT 8, W5YK 8, W5LR 7. (Mar.) WB5BFW 156, W5MTN 15.

OKLAHOMA – SCM, Cecil C. Cash, W5PML – Welcome back to Tulsa from W6-Land to ex-K5SWW now W5USH. W5TKC, Maj. in air force in Japan, soon returning and will be stationed in W4-Land. The Broken Arrow ARC sez they had a bust on FD last year but were going all out this FD to put their club on the map. WB5KCU has new Quad up, WN5KGP has new SB-102. W5FW his YF W5PWN along with W5PML/WBØAYU and YF attended the 7290 kHz Traffic Net picnic at Lake Whitney, SW of Ft. Worth the last week end of Apr. Welcome on OAN, (3705 kHz 1830 local time) to WN5NKC and YF WN5NKD; their shack consists of an HW-16, HG-10B VFO, HM-102 power and SWR bridge and the sky hooks are 40- and 80-meter inverted Vee's. Net mgr. WN5KNK sez please, more of us generals through Extra Class come on down there and help him out. There is need for NCSs and liaison stations to go directly from OAN to RN5. Congrats to new Novice WN5OCO, new Tech, WB5OKX and upgrading of WB5JDZ, WB5JGS, WB5LPT and WB5OCN. New Advanced includes WB5HOE, K5KDR, WB5MEA, WA5EAI and WB5CTS. Traffic: W5RB 103, WN5KNK 90, WB5AZS 44, WB5ELG 29, W5FW 26, W5SUG 23, WB5HQX 20, WN5KGP 14, WB5EAY 12, W5PKL 12, WN5NKD 11, WN5NKC 10, W5PML 8, WA5OUV 6, WB5HLR 4, W5JJ 2, WA5WRC 2, WA5FLV 1.

SOUTHERN TEXAS – SCM, Arthur R. Ross, W5KR – SEC: WB5CUR, RM: W5UGE. New PAM is WB5AMN. OOs reporting this month: WA5LES, WA5LTO, WA5ZBN. OVSs reporting this month: WB5CIT, K5ZMS. Tex DX Society officers for 1975: OO WA5LES, pres.; W5SBX, vice-pres.; K5PEL, secy.-treas. OO WA5LES has DXCC 305 endorsement, CP-35 sticker, and A-1 Op award! Nice going. OVS K5ZMS reports Six Meter International Klub (SMIRK) has 747 members in 46 states and 13 foreign countries. OVS WB5CIT has upgraded to Advanced Class. FC WB5EMA has WAS certificate No. 24,902. W5LDA, WB5IDS and K5ERK working hard on Georgetown repeater. Already busy OBS W5KLV is new net mgr. for Daytime RN5 which meets 3:30 PM to 4:30 PM Central on 7290 kHz daily. Houston Area Emergency Net meets 8 PM Central each Wed. on 3898 kHz. RM W5UGE handled several emergency messages relating to Vietnam refugees. FC W5UJJ is new net mgr. for Texas CW Traffic Net; his EC activity includes plans for demonstration of station and message center at National Science Center Safari and will include RTTY. WB5HOD has new 2nd Class commerical phone ticket. WB5FWI reports WR5AGU, 449.2/444.2, in full service; full duplex autopatch to be added soon. K5TAX back on air after absence of several years. W5QO moving to Bryan in June. Tex. Traffic Net and 7290 Traffic Net enjoyed a jointly sponsored picnic at Lake Whitney State Park; the bluebonnets were the most beautiful ever and W5DGG's spaghetti was superdelish! South Texas Amateur Repeater Club provided communication for Corpus Christi's annual Buccaneer parade. Corpus Christi has two new ops: WN5OJC and WN5OJG. Traffic: (Apr.) W5UGF 387, W5TOP 313, W5UJJ 299, K5HZR 218, WA5VBM 160, W5KLV 158, WB5AMN 50, WA5EOE 38, W5RBB 32, WA5ZBN 32, W5QO 30, WB5EMA 25, W5TFW 18, WA5KFO 9, W5KR 8, WA5TWP 8, K5RVF 7, WA5YXS 6. (Mar.) WB5EMA 21, WA5KFO 9.

CANADIAN DIVISION

ALBERTA – SCM, Don Sutherland, VE6FK – SEC: VE6XC, PAM: VE6ALQ. I regret to report the passing of VE6ABC, VE6CQ is recuperating at home. Welcome to the white caners, VE6CFE, VE6CFF. The CARA Centennial Convention Aug. 1,2 & 3 at the Calgary Inn has an imposing array of speakers and special guests confirmed. This is the first time that a convention of this stature has ever been attempted in Western Canada. Remember – this is a full convention – not a picnic type of Hamfest. With many major exhibits, top line speakers etc. The committee has done an excellent job providing something for everyone with a fee schedule to suit all purses. I am personally looking forward to the convention. See many of you there perhaps at the Wouff Hong ceremony. Traffic: VE6FS 149, VE6AMM 15, VE6FK 8, VE6ASI 7, VE6WN 7, VE6AFJ 2, VE6AFW 2, VE6CE 2, VE6FV 2, VE6YW 2.

BRITISH COLUMBIA – SCM, H.E. Savage, VE7FB – East Kootenay officers are VE7BWY, pres.; VE7AIT, vice-pres.; VE7CR, secy. Their monthly paper has a good write up on our VE7CR. VE7WM received his new caddie to drive around his FT-2-B. Don't notice any increase in better signals. Thanks VE8NN, for VE8 news. VE8AJ new call in White Horse. VE8BL has moved to P.E.I. 3782 kHz is VE8 net at 0400Z nightly. VE8MTD active on 20 at Coral Harbour. VE8CF made his class A ticket. VE7ATO worked portable 75 meters by 150-ft. vertical, lift supplied by a kite. South Okanagan AR Society, (Senior Citizen Group sponsored by Government grant) had their ribbon cutting grand opening with many High Officials of Governments, attending. Vancouver's Senior Citizens

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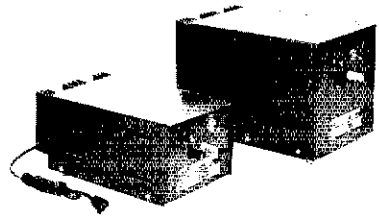

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ARC are now entering into their second year. Listen for VE7SCR on all frequencies and real active. Traffic: (Apr.) VE7ZK 129, VE7CDF 82, VE7BLO 65, VE7QQ 25. (Mar.) VE7ZK 159, VE7CDF 140, VE7BLO 63, VE7DAG 18, VE7QQ 9, VE7TT 8.

QUEBEC – SCM, Larry Dobby, VE2YU – Apr. is the month between the DX contest and Field Day. Numerous clubs are already busy preparing for a bigger and better effort this year. VE2CRL, West Island and Westminster have already had organizational meetings and have their sites picked. The West Island Club held another successful auction in Velois. Amateurs from Que., Ont. and New York state were in attendance. The Ont. Que. Net and the Eastern Canada Net continue to be well represented by stations in the Montreal area. But where are all the other amateurs from the rest of Que. Surely there must be traffic being originated in the rest of the province going to other parts of Canada and the USA. Anyone who has experienced difficulty in routing traffic into or out of the province is asked to contact the SCM for assistance. VE2DRC continues to work closely with Olympic Officials through RASO planning for the large traffic volume that will take many operators during Olympics in '76. Traffic: VE2DR 137, VE2DRC 76, VE2AOJ 54, VE2AID 35, VE2APT 14.

SASKATCHEWAN – SCM, P.A. Crosthwaite, VE5RP – VE5TT has made arrangements with the Manitoba CW Net to handle traffic for Sask. during the summer months. VE5IM will be looking after the Sask. Hamfest which will be held at the Watrous Park. The Hamfest will be a picnic style. The Saskatoon Club will be putting on a series of Amateur Radio programs over radio station CHOS FM. Dates of the program will be announced on the Sask. phone net. Traffic: VE5HP 35, VE5BO 22, VE5RP 14, VE5FT 8, VE5UK 4, VE5RB 3, VE5MP 2, VE5RE 2, VE5UX 2.

MARITIME – SCM, W.D. Jones, VE1AMR – SEC: VE1SH. Where are all the cw operators in the Maritimes? The Atlantic Provinces Net is falling on hard days. The weary half dozen would appreciate some help. The Maritime Clubs did themselves proud this past year, bringing dozens of new hams on the air this summer while last years crop are showing up with Advanced tickets. Don't forget to send your Field Day report to HQ. APN reports QNI 153, QTC 136, sessions 30. Traffic: VE1ARB 112, VE1AMR 99, VE1AAO 37, VE1AMN 12, VO1GW 12, VE1ST 5, VE1AYJ 3.

MANITOBA – SCM, Steve Fink, VE4FQ – RM: VE4PG. PAM: VE4JP. ECs: VE4NE, VE4NW. VE4EW and VE4ZS appeared on the Winnipeg CATV channel and talked on all aspects of Amateur Radio during May. VE4JX, with assistance from VE4MA, worked K2UYH for Manitoba's first EME on 432. VE4MA talked on EME and presented tapes of the tests at the May WARC meeting. MTN mgr. VE4PG now sporting a new SB-104 and SB-230 combination, while VE4VV is setting up for VHF. VE4RM now signing VE6PC in Edmonton, while VE4GB and K3ZVH/VE4 are back in VE4-Land for the summer. We regret to record the Silent Key of VE4PP during Apr. MEPN: 30 sessions, 1206 QNI, 17 QTC. Have a safe and pleasant summer. Traffic: VE4PG 72, VE4XP 36, VE4JA 13, VE4IX 10, VE4QI 9, VE4JP 8, VE4FK 6, VE4FQ 6, VE4VV 4, VE4AU 3, VE4CR 2, VE4NC 2, VE4BX 1, VE4PA 1, VE4TT 1.

ONTARIO – SCM, Holland H. Shepherd, VE3DV – VE3FO is teaching London Air Cadets code and theory. VE3EIM was commercial op in New Zealand and made many runs in ships in South Pacific. London ARC, under VE3BGK, is sponsoring phone patches for the London boys in CF Peace Force in Cyprus. VE3CPW is a member of the fast growing QRP gang. VE3GFN, EC Toronto, is having a big demonstration of emergency communication for Toronto hospital administrators on May 8. Congratulations to VE3VI on receiving 50 year certificate plus endorsements for 54 years as radio amateur. VE3CJR has received his Advanced and is now heard on 75. In last month's column it was reported that The Ont. Trilliums celebrate their 10th anniversary in May but, what was not said was that the TOT members have unselfishly devoted a large portion of their scarce free time of that ten years to helping the less fortunate and to the entire amateur fraternity in general. Their record is outstanding among all service organizations and I know you will all join me in saluting this premier ladies club. VE3AIZ offers her voluntary services in Braille and/or tapes to any Whitecaner radio amateur, or to any ARC or individual for the benefit of the amateur Whitecaner. Thunder Bay amateurs took part in a radio program documentary on Ham Radio over CBQ. VE3AYZ doing a great job as Mgr. of wide-ranging NWON. Ont. amateurs are reminded that good, sharp B & W photos of local amateur activities are eagerly sought by QST Editor. VE3FGT and VF3HK provide liaison between NWON and Southern Ont. phone nets. Traffic: (Apr.) VE3SB 261, VE3GOU 244, VE3FQZ 146, VE3HJA 145, VE3GJG 118, VE3GFN 102, VE3AWE 97, VE+3DPO 89, VE3FRG 80, VE3OV 75, VE3FHF 65, VE3CYR 57, VE3DVF 49, VE3FWD 36, VE3GT 36, VE3FGV 24, VE3GCE 22, VE3FHQ 20, VE3ATR 19, VE3DH 8, VE3GCC 6. (Mar.) VE3AWE 90, VE3GT 83, VE3GEQ 9, VE3VD 2.

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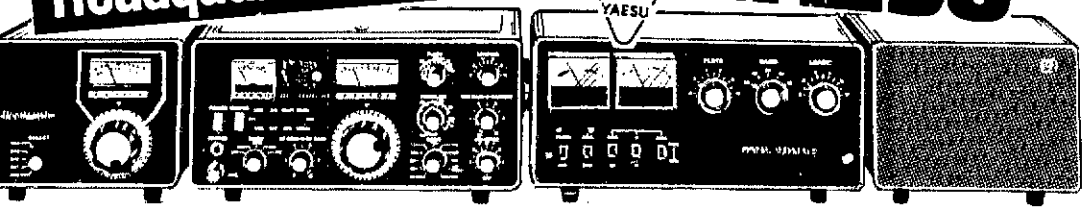

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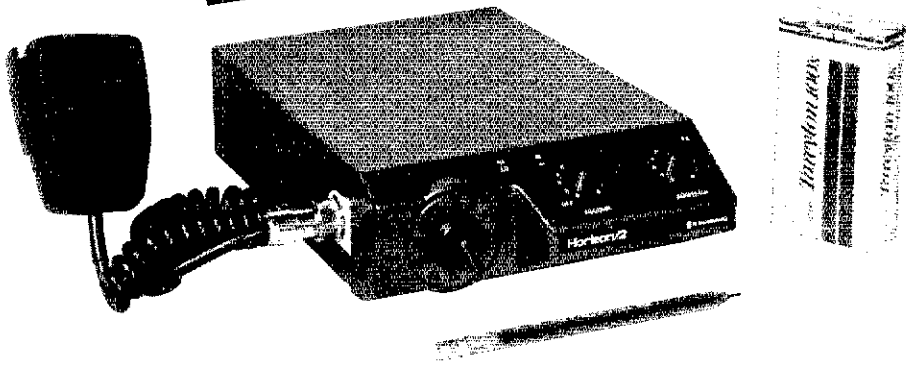

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Happenings

(Continued from page 83)

7) Mr. Haller, as Chairman, reported for the Membership Affairs Committee. On motion of Mr. Sullivan, seconded by Mr. Haller, after discussion, unanimously VOTED that the Board allocates the sum of $1,000 for the construction and maintenance of a **mailable, free standing exhibit** utilizing the Concept Industries design for the promotion of amateur radio and The American Radio Relay League and such pilot program to be evaluated in the New England division.

8) On motion of Mr. Haller, seconded by Mr. Arnold, after discussion, unanimously VOTED that the Communications Manager proceed to appoint necessary regional emergency coordinators for the State of California with the approval of the Executive Committee and concerned Section Communications Managers.

9) Mr. Egbert, as Chairman, presented the report of the Management and Finance Committee. Moved, by Mr. Egbert, seconded by Mr. Arnold, to amend By-Law 4 by adding at the end, "Members choosing to pay dues for more than one year in advance may be entitled to lower rates to be determined periodically by the General Manager. Such schedules of multiple year rates will be published in *QST* whenever there is a change, and in any case no less often than annually," and to amend By-Law 5 by striking the text and substituting: "5. Provided that a member is without sight, or is the husband or wife, brother or sister, son or daughter, father or mother of another member living at the same address and either a Life Member or one paying dues in accordance with By-Law 4, he may at his request pay dues of $2 per year (or a lesser multiple-year rate to be determined by the General Manager) but without the right to receive *QST*, said membership to be concurrent with that of the member receiving *QST*." After extended discussion, moved, by Mr. Price, seconded by Mr. Cotterell, to lay the matter on the table; but the motion to table was lost, 2 votes in favor to 14 opposed; Mr. Price requested to be recorded as voting in favor. Moved, by Mr. Haller, seconded by Mr. Price, to provide a limit "up to a maximum of 10 years." After further discussion, on motion of Mr. Albright, seconded by Mr. Sullivan, VOTED to further amend the proposal by setting a maximum of 5 years; Mr. Griggs requested to be recorded as voting opposed. The question then being on the inclusion of such a limit, the same was VOTED; Mr. Griggs requested to be recorded as voting opposed. Moved, by Mr. Griggs, seconded by Mr. Price, to refer the entire matter to the Membership Affairs Committee for study, but the motion to commit was rejected. The question then being on Mr. Egbert's motion with the addition of a 5-year limit, and a roll-call being required, the same was decided in the affirmative: 14 votes in favor to 2 opposed; all directors voted in favor except Messrs. Griggs and Wicker. So the By-Laws were AMENDED to provide **reduced-rate, multiple-year memberships.**

10) Mr. Shima, as Chairman, reported for the Legal and Regulatory Committee. On motion of Mr. Cotterell, seconded by Mr. Grauer, unanimously VOTED that the Board does now consider informally the charter and duties of the Legal and Regulatory Committee. After extensive discussion of the subject, on motion of Mr. Price, seconded by Mr. Thurston, unanimously VOTED to terminate the informal consideration.

11) The Board was in recess from 3:20 to 3:40 P.M.

12) Mr. Clark, as Chairman, presented the report of the Ad Hoc Committee on Restructuring, and outlined the proposed procedure for handling Docket 20282.

13) Mr. Gmelin, as Liaison Director, presented the report of the Sister Cities Liaison Committee. On motion of Mr. Gmelin, seconded by Mr. Smith, after discussion, unanimously VOTED that the **Sister Cities Liaison Committee** be continued until the January 1976 Board meeting. On further motion of Mr. Gmelin, seconded by Mr. Smith, unanimously VOTED that **exploratory talks with the Town Affiliation Association** be continued, and that such talks consider in depth the feasibility of executing a formal cooperative agreement between the ARRL and TAA.

14) Messrs. Baldwin and Spencer reported for the Ad Hoc Committee on Canadian Division name. After discussion, moved, by Mr. Spencer, seconded by Mr. McConaghy, to amend By-Law 25 to add after the words, "CANADIAN DIVISION," the phrase, "alternatively known as the **Canadian Radio Relay League,**,"; on a roll-call vote, the question was decided in the affirmative, 16 votes in favor to none opposed; so the By-Law was AMENDED.

15) As liaison, Mr. Smith presented the report of the VHF Repeater Advisory Committee. As liaison, Mr. Zak reported briefly for the Contest Advisory Committee.

16) As liaison, Mr. Price reported for the DX Advisory Committee. Moved, by Mr. Price, seconded by Mr. Gmelin, that it is the policy of this Board that appropriate fees necessary to substantially recover the costs of administrative processing by League Headquarters shall be charged recipients of the types of operating awards for which application by the individual recipient is made. Fee schedules shall be developed by the General Manager and shall become effective upon publication in *QST*. Notwithstanding the above provisions, no fees shall be charged for operating awards earned while an amateur is a Novice class licensee. After discussion, on motion of Mr. Sullivan, seconded by Mr. McConaghy, unanimously VOTED to amend the motion to provide separate fees for members and non-members. Moved, by Mr. Gmelin, seconded by Mr. Albright, to refer the entire matter of fees to the Membership Affairs Committee for study, and that a new schedule of fees for DXCC be postponed. After discussion, moved, by Mr. Shima, seconded by Mr. Griggs, to lay the matter on the table; the vote was a tie, 8 in favor to 8 opposed; the Chair voted in favor, so the matter was laid on the table.

17) As liaison, Mr. Arnold presented the report of the Emergency Communications Advisory Committee.

18) The Board was in recess for dinner from 4:40 P.M. until 8:00 P.M.

19) On motion of Mr. Clark, seconded by Mr. Price, unanimously VOTED that the Board now proceed to informal consideration of the various proposals in **FCC Docket 20282.** At the request of the President, Mr. Clark assumed the Chair. The assembly engaged in extensive informal discussion of various docket proposals, during the course of which the meeting was in recess from 9:22 to 9:32 P.M. The Board recessed at 11:12 P.M., reconvening at 8:02 A.M. on May 16, with all

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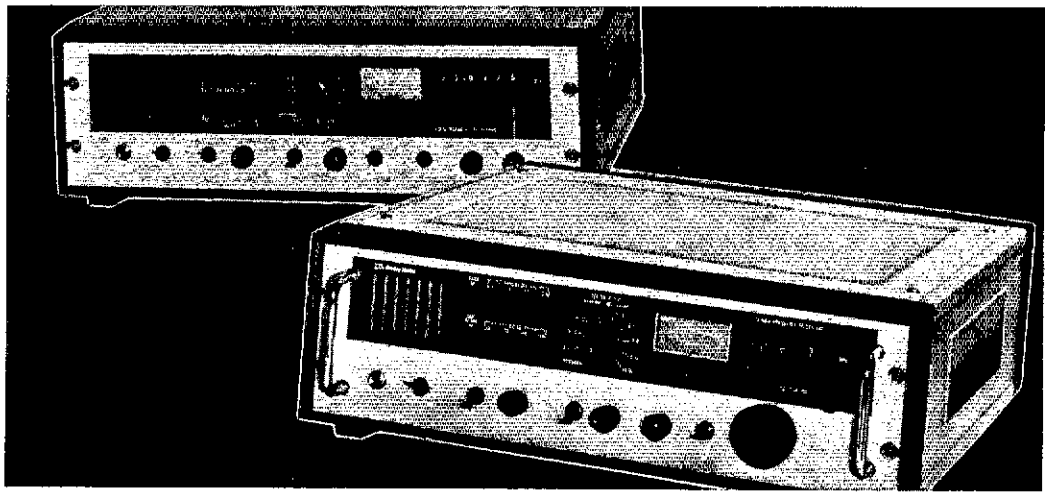

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directors and other persons hereinbefore mentioned in attendance except Messrs. Best, Chapman, Handy, Hart, Houghton, Lindholm and Wayne. With Mr. Clark again in the Chair, the assembly continued informal discussion of Docket 20282. Messrs. Hart and Wayne entered the meeting at 8:15 A.M., and Messrs. Handy and Houghton at 9:15 A.M. The Board was in recess from 9:25 to 9:38 A.M., during which time Messrs. Best and Chapman rejoined the meeting, and again from 10:10 to 10:25 A.M. Mr. Dannals resumed the Chair at 12:10 P.M. and announced the appointment of a Drafting Committee to prepare a summary of the views of the Board as expressed during the informal consideration session, consisting of Mr. Clark as Chairman, and Messrs. Gant, Holladay, Metzger, Sanders and Sumner.

20) The Board was in recess for luncheon from 12:15 until 12:55 P.M., during which the Drafting Committee members retired to commence their task.

21) On motion of Mr. Price, seconded by Mr. Gmelin, unanimously VOTED that the Board now concludes its informal consideration of Docket 20282.

22) On motion of Mr. Zak, seconded by Mr. Cotterell, unanimously VOTED that the Communications Department establish a suitable certificate for presentation to clubs who have reached 50 years affiliation with the ARRL.

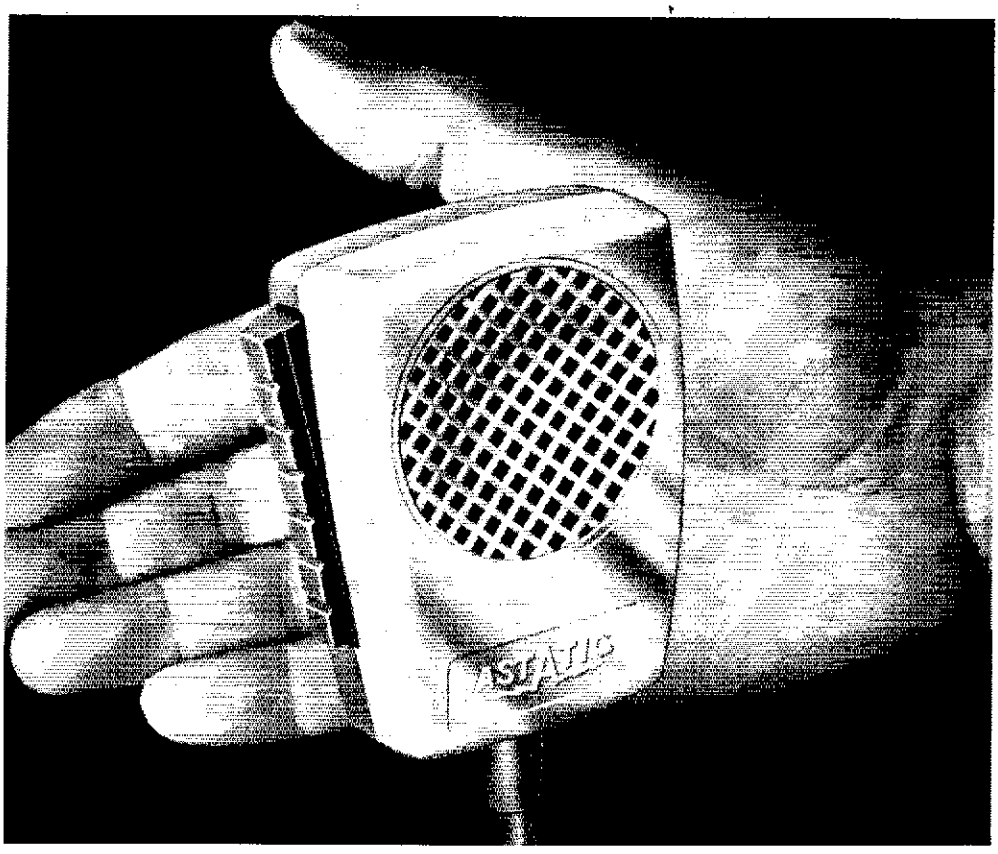
23) Moved, by Mr. Grauer, seconded by Mr. Shima, that the Executive Committee review the duties established for the Legal and Regulatory Committee, as set forth in By-Law 36, to determine the desirability of discontinuing the committee. The Executive Committee shall report results of the review, and any recommendation considered appropriate, to the Board 30 days prior to the first meeting in January. But, after discussion, on motion of Mr. Zak, seconded by Mr. Price, VOTED, 10 in favor to 6 opposed, that the matter is laid on the table.

24) On motion of Mr. Gmelin, seconded by Mr. Albright, after discussion, unanimously VOTED that the International Affairs Committee study the possible publication of a packet of information on international amateur radio and the IARU. This packet to be given upon request to amateurs traveling overseas, for their use in any personal contacts with amateurs in other countries. The object would be to help better international relations between radio amateurs.

25) On motion of Mr. Wicker, seconded by Mr. McConaghy, after discussion, VOTED, 9 votes in favor to 7 opposed, that the President appoint from among the managers of district QSL bureaus, an ad hoc committee for the purpose of developing a set of guidelines to aid in the establishment and operation of ARRL QSL bureaus.

26) On motion of Mr. Griggs, seconded by Mr. Smith, after extensive discussion, unanimously VOTED that the 1978 National Convention Committee at San Diego be permitted to invite amateur radio societies in foreign countries to attend and also to provide non-commercial exhibits as desired to promote international interest in amateur radio prior to the 1979 ITU World Administrative Radio Conference.

27) Moved, by Mr. Albright, seconded by Mr. Shima, that the General Manager petition the Federal Communications Commission to return 21,250-21,270 kHz to joint use by Advanced and Extra Class licensees and to request in its stead



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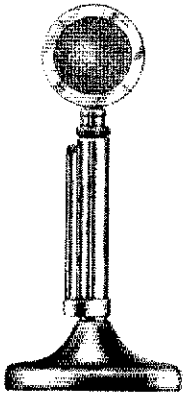

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allocation of a new Extra Class phone subband at 14,175-14,200 kHz. After extensive discussion, moved, by Mr. Price, seconded by Mr. Zak, to refer the matter to the Legal and Regulatory Committee for study; but, after further discussion, on a roll-call vote, the motion to commit was rejected, 6 votes in favor to 10 opposed; Messrs. Haller, Price, Spencer, Sullivan, Wicker and Zak voted in favor; all other directors voted opposed. The question then being on Mr. Albright's original motion, on a roll-call vote, the proposal was ADOPTED, 10 votes in favor to 6 opposed; all the directors voted in favor except Messrs. Arnold, Egbert, Haller, Spencer, Wicker and Zak, who voted opposed.

28) On motion of Mr. Arnold, seconded by Mr. Thurston, unanimously VOTED that a National ARRL Convention be approved for the City of Baton Rouge, Louisiana, during the week of July 19-24, 1979, under the sponsorship of the Louisiana Council of Amateur Radio Clubs.

29) On motion of Mr. Sullivan, seconded by Mr. Albright, unanimously VOTED to take from the table the question of a schedule of awards fees. The pending question was Mr. Gmelin's motion to refer the matter to the Membership Affairs Committee, and after discussion, on a roll-call vote, the question was decided in the negative, 5 votes in favor to 11 opposed; Messrs. Gmelin, Grauer, Griggs, Haller and Zak voted in favor; all other directors voted opposed. On further motion of Mr. Gmelin, seconded by Mr. Zak, after discussion, voted, 11 votes in favor to 5 opposed, to amend the original motion to provide that "all new fees will be delayed until complete schedules are published in *QST*." Mr. Gmelin requested to be recorded as voting in favor. After extended discussion, on motion of Mr. Price, seconded by Mr. Sullivan, VOTED, 12 votes in favor to 4 opposed, to reconsider the amendment which provided for a delay of fees; Mr. Gmelin requested to be recorded as voting opposed. The question then being on reconsideration of Mr. Gmelin's motion to amend, the same was REJECTED; Mr. Gmelin requested to be recorded as voting in favor. The question then being on the original motion to create a schedule of fees for operating awards, as amended to provide separate fees for members and non-members, on a roll-call vote the same was ADOPTED, 13 votes in favor to 3 opposed; all directors voted in favor except Messrs. Albright, Grauer and Haller, who voted opposed.

30) The Board was in recess from 2:45 to 3:03 P.M.

31) On motion of Mr. Wicker, seconded by Mr. McConaghy, after discussion, unanimously VOTED that the Membership Affairs Committee study and report to the Board on the practicality of strengthening organizational ties with and among the League's membership through establishment of a system of ARRL chapters.

32) Moved, by Mr. Price, seconded by Mr. Shima, to amend By-Law 26 by inserting after the first sentence the words: "He shall have the power to appoint committees." But, after discussion, on a roll-call vote, the result was 8 votes in favor to 8 opposed; those voting in favor were Messrs. Albright, Arnold, Egbert, Griggs, Price, Spencer, Wicker and Zak; those voting opposed were Messrs. Cotterell, Gmelin, Grauer, Haller, McConaghy, Shima, Sullivan and Thurston; so, lacking the required three-fourths majority, the motion to amend failed.

33) Moved, by Mr. Griggs, seconded by Mr.

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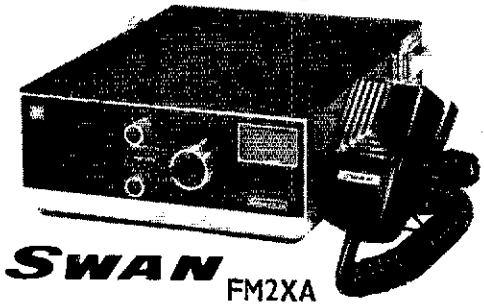

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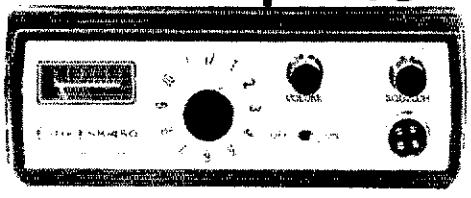

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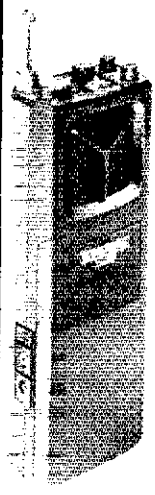

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Thurston, that the Board does hereby direct the General Manager to petition the FCC for expansion of the General Class portion of the 3.8 to 4.0 MHz radiotelephone band. After discussion, moved, by Mr. Shima, seconded by Mr. Albright, to amend the motion to provide allocations as follows: 3650-3750 kHz, Novice cw; 3750-3775, Extra; 3775-3800, Extra/Advanced; 3800-4000, General/Conditional. After further discussion, moved, by Mr. Cotterell, seconded by Mr. Shima, to replace the proposed subbands as follows: 3775-3800 kHz, Extra; 3800-3825, Advanced/Extra; 3825-4000, all but Novice and Technician. After further discussion, on motion of Mr. Haller, seconded by Mr. Zak, VOTED that the matter is laid on the table.

34) On motion of Mr. Albright, seconded by Mr. Zak, after discussion, unanimously VOTED that the ARRL prepare a series of updated instructor's lesson plan guides for use by persons conducting code and theory instruction. A separate guide to be prepared for each license class.

35) Moved, by Mr. McConaghy, seconded by Mr. Grauer, that Paragraph 7 of the Rules and Regulations concerning Advisory Committees be changed as follows: last portion of statement after the word staff, substitute for "and/or" the words "and advise the." But, after extensive discussion, on motion of Mr. Gmelin, seconded by Mr. Price, unanimously VOTED that the matter is laid on the table.

36) The Board was in recess from 3:50 P.M. to 4:05 P.M.

37) On motion of Mr. Wicker, seconded by Mr. Gmelin, after discussion, unanimously VOTED that the Membership Affairs Committee in cooperation with the Communications Manager is instructed to investigate the feasibility of developing training aids in the form of cassette tapes to assist newcomers in learning traffic handling and net operating procedures.

38) On motion of Mr. Price, seconded by Mr. Shima, unanimously VOTED that the President appoint a special committee to investigate the long run requirements for electronic data processing equipment at League Headquarters with a view toward maximizing the effectiveness of resources allocated to computer services, the study to include a review of computer requirements of all headquarters departments.

39) On motion of Mr. Griggs, seconded by Mr. Thurston, unanimously VOTED that the Board does hereby instruct the President to appoint or assign a committee for the purpose of studying the Communications Department and the field organization in the interests of revitalizing their operations and functions, and to report its findings to the Board at its next meeting.

40) On motion of Mr. Price, seconded by Mr. McConaghy, after discussion, VOTED that the General Manager is directed to develop as an addition to the Rules and Regulations Concerning ARRL Conventions a provision authorizing the category "ARRL Approved Hamfests." The proposed rules and regulations shall be submitted to the Executive Committee for their adoption at the September 1975 meeting.

41) On motion of Mr. Griggs, seconded by Mr. Zak, unanimously VOTED that the Board hereby commends Ellen White, W1YL, Doug DeMaw, W1CER, George Hart, W1NJM, and John Huntoon, W1RW, of the headquarters staff, as well as First Vice President Victor C. Clark, W4KFC, for

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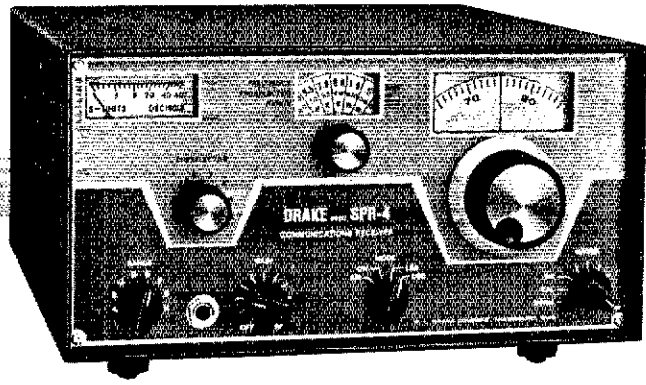

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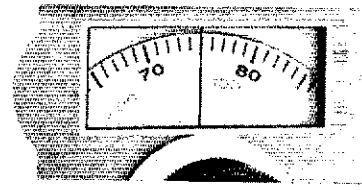

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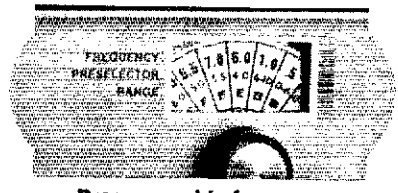

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42) On motion of Mr. Wicker, seconded by Mr. Zak, unanimously VOTED that the Membership Affairs Committee and PR Counsel are instructed to review currently available handout literature and to make recommendations for any additional material of this type which would be helpful in explaining the nature and uniqueness of amateur radio to the general public.

43) On motion of Mr. McConaghy, seconded by Mr. Shima, unanimously VOTED that the Board appropriately commend our General Manager and staff personnel for outstanding performance in the preparation and processing of the ARRL membership survey concerning FCC Docket 20282.

44) On motion of Mr. Griggs, seconded by Mr. Haller, the following resolution was unanimously ADOPTED:

WHEREAS, the Board of Directors of the American Radio Relay League have noted with sorrow the passing of Past Director Fred Schnell, W4CF, ex-W9UZ, ex-1MO, and

WHEREAS, Fred has been one of the real pioneers of amateur radio as radio operator for the Wilson Peace Treaty party after World War I; as the traffic manager of ARRL who organized the Transatlantic Tests; as one end of the first QSO across the Atlantic; as the man who showed the Navy the value of the short waves by means of the NRRL expedition; and as a member of the self-perpetuating Board which voted itself out of business in favor of democracy in 1923,

NOW THEREFORE BE IT RESOLVED by the Board of Directors of the American Radio Relay League that it extend its deepest sympathy to the family of Fred Schnell and its appreciation for his outstanding contributions to the development of amateur radio.

45) The Board was in recess for dinner from 5:17 P.M. to 8:15 P.M., at which time the members of the Drafting Committee returned to the meeting.

46) On motion of Mr. Baldwin, seconded by Mr. Shima, unanimously VOTED, that recognizing the need for certain changes in the U.S. amateur licensing structure, the Board now consider the proposals comprising FCC Docket 20282. (Canadian Division Director Spencer abstained from this and all subsequent actions pertaining to Docket 20282.)

47) On motion of Mr. Albright, seconded by Mr. Zak, unanimously VOTED that while the Board endorses the concept of adding a new beginner class of license conveying limited vhf privileges, it rejects the proposal to divide the Amateur Radio Service into hf-only and vhf-only categories for licensing purposes, as well as the proposal to create a new Experimenter class of license.

48) On motion of Mr. Griggs, seconded by Mr. McConaghy, unanimously VOTED that the license structure set forth by the League's recommendations provide for a single line of amateur license class progression with the following steps: Basic Amateur, Novice, Technician, General, Advanced, and Extra, with the privileges of each to include the privileges accorded lower license classes.

49) Moved, by Mr. Price, seconded by Mr. Haller, that the Board endorses the provision of Docket 20282 creating a new beginner class of

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☐	SLA-1*	.33 h.	Opcna
☐	MAN64	.4 h.	Monsanto

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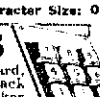

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☐	SN7404	.19	☐	SN7473	.36	☐	SN74132 1.75
☐	SN7405	.19	☐	SN7474	.36	☐	SN74140 2.10
☐	SN7406	.35	☐	SN7475	.59	☐	SN74145 1.05
☐	SN7407	.35	☐	SN7476	.39	☐	SN74148 2.25
☐	SN7408	.19	☐	SN7478	.79	☐	SN74150 .98
☐	SN7409	.19	☐	SN7480	.52	☐	SN74151 .75
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☐	SN7414	1.65	☐	SN7485	1.25	☐	SN74156 .95
☐	SN7416	.34	☐	SN7486	.37	☐	SN74157 .95
☐	SN7417	.34	☐	SN7488	3.95	☐	SN74158 .95
☐	SN7420	.16	☐	SN7489	2.45	☐	SN74160 1.35
☐	SN7412	.45	☐	SN7490	.59	☐	SN74161 1.25
☐	SN7423	.29	☐	SN7491	1.10	☐	SN74163 1.35
☐	SN7425	.29	☐	SN7492	.59	☐	SN74164 1.50
☐	SN7426	.25	☐	SN7493	.59	☐	SN74165 1.50
☐	SN7427	.29	☐	SN7494	.95	☐	SN74166 1.50
☐	SN7430	.16	☐	SN7495	.79	☐	SN74173 1.45
☐	SN7432	.25	☐	SN7496	.79	☐	SN74174 1.39
☐	SN7433	.49	☐	SN74100	1.40	☐	SN74175 1.30
☐	SN7437	.34	☐	SN74104	.44	☐	SN74176 1.20
☐	SN7438	.34	☐	SN74105	.44	☐	SN74177 1.20
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☐	CD4009AE	.59	☐	CD4043AE	1.50	☐	CD4518AE 3.10
☐	CD4010AE	.59	☐	CD4044AE	1.50	☐	CD4520AE 3.10
☐	CD4011AE	.29	☐	CD4049AE	.79		
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☐	CD4017AE	1.75	☐	CD4056AE	2.50		
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☐	CD4019AE	.69	☐	CD4066AE	1.75		
☐	CD4020AE	1.98	☐	CD4069AE	.45		
☐	CD4021AE	1.98	☐	CD4071AE	.45		
☐	CD4022AE	1.70	☐	CD4081AE	.45		
☐	CD4023AE	.29	☐	CD4518AE	3.10		
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100	☐ .79	☐ .99	☐ 1.69
200	☐ .95	☐ 1.25	☐ 1.89
400	☐ 1.19	☐ 1.50	☐ 2.09
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800	☐ 1.59	☐ 1.95	Code: 2 amp
1000	☐ 1.79	☐ 2.25	TO-5 case

6 Amp 1/2 x 1/2 x 3/16 sq.

CLOCK CHIPS ON A "DIP"

WITH DATA SHEETS

☐	MM5311	6-digit 28-Pin	$5.50
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NATIONAL LM-340T VR's

* TO-220 Case * 1 Amp POSITIVE VOLTAGE

$1.75 Each

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	Type	Volts
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☐	LM-340-12T	12 v
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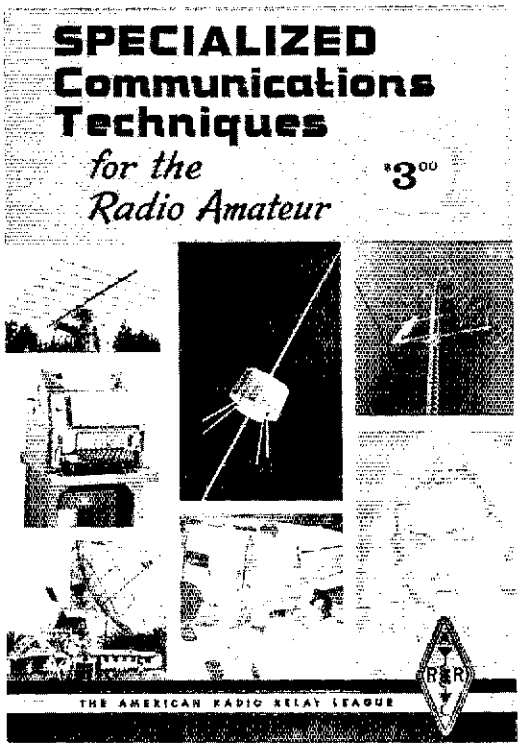

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NEWINGTON, CONN. 06111

license, but that it be identified as "Basic Amateur," and accorded the following privileges and requirements.

1) 145.0 to 145.5 MHz and 222 to 225 MHz;

2) A1, A2, A3, and F3 modes;

3) power input not exceeding 50 watts;

4) written examination the same as the Novice Class;

5) ability to recognize Morse Code characters, but with no speed requirement;

6) examination administered by two proxy examiners of General Class or higher;

7) license term of 5 years, non-renewable but re-obtainable without mandatory time lapse upon re-examination by proxy examiners;

8) call sign to have a distinctive prefix, with the suffix to be retained upon upgrading to another class of license.

Moved, by Mr. Sullivan, seconded by Mr. Thurston, to amend the Morse Code requirement to provide a speed of three words per minute; but the motion was rejected; Messrs. Sullivan and Thurston requested to be recorded as voting in favor. Further moved by Mr. Sullivan, to require a one-year lapse before eligibility for re-examination; but there was no second, so the motion to amend was lost. The question then being on the original motion, the same was unanimously ADOPTED.

50) On motion of Mr. Cotterell, seconded by Mr. Arnold, unanimously VOTED that there be no change in the privileges of the Novice Class license as to available frequencies, mode, and available power, except that:

1) power be determined by the same method as that used for other classes of licenses;

2) the license be granted for 5 years, non-renewable, re-obtainable without mandatory time lapse upon re-examination by proxy examiners;

3) the Novice license holder be granted all privileges of the Basic Amateur license class.

51) On motion of Mr. Wicker, seconded by Mr. Egbert, unanimously VOTED that there be no change in the following privileges of Technician Class licensees: available modes, transmitter power, license term or renewability, and the holding of special station licenses such as club, repeater, control, auxiliary link, and space station; that the following additional privileges be granted: all authorized amateur frequencies above 29.0 MHz and all privileges authorized to the Novice Class; that there be no change in the renewability of present Technician (C) licenses; and further, that both the code test and the written examination for new Technician Class licenses shall be administered on the same basis as General Class.

52) On motion of Mr. Gmelin, seconded by Mr. Grauer, unanimously VOTED that there be no change in the following privileges of General Class licensees: available frequencies, modes, transmitter power, supervision of mail examinations, the holding of station licenses such as club, repeater, control, auxiliary link, and space station licenses; and further, that the General Class license convey the following additional privileges: A1 operation in the 50.0-50.1 MHz segment.

53) On motion of Mr. Thurston, seconded by Mr. Sullivan, unanimously VOTED that there be no change in the following privileges of Conditional Class licensees: available frequencies, modes, transmitter power, the holding of station

It's faster than a speeding bullet!
More powerful than the legal limit!
And able to match long wires with a single bound!

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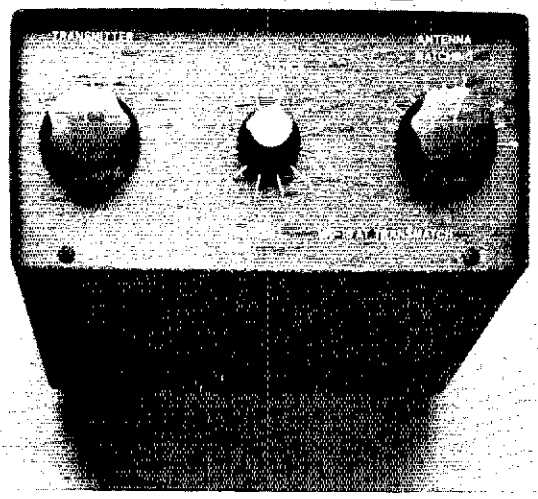

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licenses such as club, repeater, control, auxiliary link, and space station, and license term or renewability; that Conditional Class licenses be issued General(C) or General(D) licenses, as appropriate, as proposed in Docket 20282; that new General(C) licenses be non-renewable, but that new General(D) licenses be renewable upon application; and that there be no requirement for mandatory re-examination of present holders of Conditional Class licenses should their legal residence, mailing address, or station location change to within 175 miles of an examination point.

54) On motion of Mr. Sullivan, seconded by Mr. Thurston, unanimously VOTED that the Board concurs with the FCC proposals not to reduce Advanced Class privileges; but the Board recommends retention of existing power and frequency privileges, and further, that the holder of an Advanced Class license be able, at his option, to apply for a preferred "1x3" call sign.

55) On motion of Mr. Grauer, seconded by Mr. Gmelin, unanimously VOTED that the Board concurs in the following FCC proposals relating to the Amateur Extra Class license: the issuance of a lifetime operator license to anyone attaining Extra Class status, and the change in name of the class of license from Amateur Extra to Extra; but that there be no change in the following privileges of these licensees: available frequencies and sub band exclusivity (except for recommendations adopted earlier in this meeting) and transmitter power; and further, that the written examination for upgrading from Advanced to Extra Class be retained.

56) On motion of Mr. Zak, seconded by Mr. Wicker, unanimously VOTED that the comments filed by the ARRL on Docket 20282 include a recommendation for the following restructuring of amateur code speed requirements:
Extra Class: 20 words per minute
Advanced: 15 words per minute
General/Conditional: 10 words per minute
Technician and Novice: 5 words per minute
with the holders of current General/Conditional and Advanced Class licenses to be given credit for 15 wpm code proficiency.

57) On motion of Mr. Egbert, seconded by Mr. Cotterell, unanimously VOTED that the League's comments in response to Docket 20282 reject, except for the Novice and Basic Amateur Classes, the concept of transmitter power level as an incentive device.

58) On motion of Mr. Arnold, seconded by Mr. Price, unanimously VOTED that the method of determining power level in the amateur service continue to be based upon plate power input in lieu of peak envelope power output.

59) On motion of Mr. Shima, seconded by Mr. Griggs, unanimously VOTED that the Board concurs in the proposal to increase from one to two the number of volunteer proxy examiners required for the administration of mail examinations, neither of whom shall be related to the applicant.

60) On motion of Mr. Haller, seconded by Mr. Albright, unanimously VOTED that the Board concurs with the Commission that no presently-licensed amateur should be forced to change his call sign to reflect class of license, and further, that any system of prefixes to identify class of operator license should be limited to the Novice and Basic Amateur levels.

61) On motion of Mr. McConaghy, seconded

by Mr. Clark, unanimously VOTED that the comments submitted by the ARRL in Docket 20282 request that the holders of the former Amateur Extra First Class license be given credit for the Amateur Extra Class written examination.

62) On motion of Mr. Shima, seconded by Mr. Gmelin, unanimously VOTED that the League filing in Docket 20282 include appropriate comments prepared by the Headquarters staff in response to the footnote dealing with the question of power limitation and measurement for various modes of emission.

63) Because of pressure of other responsibilities, Mr. Shima tendered his resignation as a director of the ARRL Foundation, which was reluctantly accepted. On motion of Mr. Shima, seconded by Mr. Zak, unanimously VOTED that **Max Arnold, W4WHN** is elected as a director of the **ARRL Foundation** to fill the vacancy.

64) On motion of Mr. Egbert, seconded by Mr. Sullivan, after discussion, unanimously VOTED that the General Manager present a summary report of the results of the **ARRL Membership Survey** in the next available issue of *QST*. This report to include the tabulated survey data. It is further moved that the General Manager prepare a comprehensive report on the Survey to include both an analysis and the tabulated data to be made available upon request and receipt of a self-addressed, stamped envelope. Announcement of the availability of this report to be made in the next available issue of *QST*.

65) On motion of Mr. Albright, seconded by Mr. Thurston, after discussion, unanimously VOTED that the League establish a **suitable award**, to be presented to that author whose article **published** in *QST* for that year is judged to have the highest degree of **technical merit**, as judged by the Membership Affairs Committee, and concurred in by the Board of Directors.

66) On motion of Mr. Clark, seconded by Mr. McConaghy, the following resolution was unanimously ADOPTED:

WHEREAS, the Amateur Satellite Program is providing an excellent vehicle for widespread student involvement in amateur radio and space science; and

WHEREAS, the American Radio Relay League is making a concerted effort to assure continuity of Oscar signals which can be received on ten meters using simple classroom equipment; and

WHEREAS, this Oscar Educational Program has been greatly assisted by NASA's Educational Programs Division in the form of expert advice and propagation of ideas,

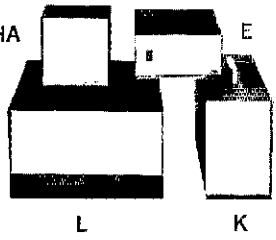
NOW THEREFORE BE IT RESOLVED that the Board of Directors of the American Radio Relay League does hereby commend the **NASA Education Programs Division** and looks forward to our continuing mutual dedication to this stimulating and beneficial educational program.

67) There being no further business, on motion of Mr. Shima, seconded by Mr. McConaghy, the Board adjourned, *sine die*, at 10:22 P.M.

68) (Total time in session, as a Board, 17 hours, 21 minutes; total direct authorizations, $1,000.)

Respectfully submitted,
JOHN HUNTOON, W1RW
Secretary

APOLLO PRODUCTS *by "Village Twig"*



MODEL	WIDTH-HEIGHT-DEPTH	RESALE NET
A	5-⅝ x 2-½ x 3	4.25
AA*	4 x 3-7/16 x 3-⅛	5.50
B	5-11/16 x 3-⅜ x 3-¾	5.85
BB*	5 x 2-½ x 3-⅛	5.90
C	7-¼ x 3-⅜ x 5	7.80
D	8 x 2-½ x 8**	9.85
E	6-½ x 3-15/32 x 7-1/16	9.25
F	7-½ x 4-½ x 10	11.15
G	10-1/16 x 3-5/16 x 9	11.15
HA	5-⅛ x 5-½ x 4	7.85
D1	Mtg. bracket set for D	.40
J	5 x 3-½ x 5-¾	8.35
K	4-⅜ x 7-⅜ x 11	15.00
L	11-⅛ x 6-⅛ x 12-¾	22.95
M	11-⅛ x 8-⅛ x 16-¾	24.40
NA	12-⅛ x 5-⅞ x 12-1/16	23.80

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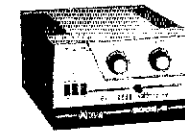

"L"

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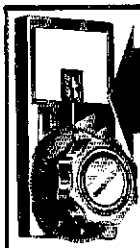

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The standard comprehensive manual of amateur radiocommunication. 52nd Ed.

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Based on the accepted method of sound conception. Covers the basics on up to high speed "copy".

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Includes *License Manual, How to Become a Radio Amateur, Learning the Radio Telegraph Code* and free booklet "Operating an Amateur Radio Station" (not pictured).

I would like these publications shipped to me postpaid. (The prices above apply to U.S.A. only.) Ship to:

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Total enclosed or charge to MC or BAC Account: $ _____

Charge to my: Bank Americard No. _____ Expires _____

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THE AMERICAN RADIO RELAY LEAGUE, 225 MAIN STREET, NEWINGTON, CT 06111

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.

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(4) Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 20 cents per word will apply to advertising which, in our judgement, is obviously non-commercial in nature. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 20-cent rate. Address and signatures are charged for, except there is no charge for zipcode, which is essential you furnish. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 60-cent rate. Provisions of paragraphs (1), (2) and (5) apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions. No checking copies can be supplied.

(8) No advertiser may use more than 100 words in any one advertisement, nor more than one ad in one issue.

(9) Due to the tightness of production schedules, cancellation of a Ham-Ad already accepted cannot be guaranteed beyond the deadline noted in paragraph (5) above.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QCWA Quarter Century Wireless Association is an international non-profit organization founded 1947. Any Amateur Radio Operator licensed 25 or more years is eligible for membership. Members receive a membership call book and quarterly news. Write for information. Q.C.W.A. Inc., 2012 Rockingham St., McLean VA 22101.

PROFESSIONAL CW operators, retired or active, commercial, military, gov't, police, etc, invited to join Society of Wireless Pioneers — W7GAQ/6 Box 530, Santa Rosa CA 95402.

FREE sample copy Long Island DX Assn. bulletin. Latest DX news. Business size s.a.s.e. to the L.I. DX Assn., P.O. Box 73, Westbury NY 11590.

EDITING a club paper? Need public relations help? You should belong to the Amateur Radio News Service. For information write: Rosemary Willis, 9276 Borden Ave., Sun Valley CA 91352.

THE New York Radio Club invites Hams to club meetings, 2nd Monday of each month, 8:00 PM at the Williams Club, 24 E. 39th St., NYC. For information: Box 614, NYC 10028.

RADIO museum now open. Free admission. 25,000 pieces of equipment from 1850 telegraph instruments to amateur and commercial transmitters of the 1920s. Amateur station W2AN. Write for information. Antique Wireless Association, Main St., Holcomb, N.Y. 14469.

THE 28th annual Turkey Run Hamfest and VHF picnic sponsored by the Wabash Valley ARA, Inc., will be held Sunday, July 27, at Turkey Run State Park near Rockville, Indiana. Don't miss the midwest's finest flea market. XYL Bingo, refreshments, camping facilities and park recreation for the kids. Also this year, banquet July 26, 7:30 pm featuring guest speaker W9NTP, in park dining hall. Banquet by reservation only, $6.50/person; reservation deadline July 1. Activities begin 9 AM Sunday, talk-in 146.94 W9UUU/9. For details/ticket/banquet reservations S.A.S.E. WVARA Hamfest, Box 81, Terre Haute IN 47808.

HAMFESTERS 41st hamfest and picnic, Sunday August 10, 1975, Santa Fe Park, 91st and Wolf Road, Willow Springs, Illinois, Southwest of Chicago. Exhibits for OM's and XYL's, famous Swappers Row. Information, contact John Raiger, K9DRS, 8919 West Golfview Drive,Orland Park, Illinois 60462. Tickets, write Joseph Poradyla, WA9IWU, 5701 So. California, Chicago IL 60629.

RADIO society of Ontario 1975 convention hosted by the Ottawa Amateur Club at the Skyline Hotel, Ottawa, Canada, October 3rd, 4th and 5th. For information contact P.O. Box 8873, Ottawa, Canada K1G 3J2.

QSLs??? "America's Finest!!! Samples 50c. DeLuxe 75c. Religious 50c. (Deductable) Sakkers, W8DED, Box 218, Holland MI 49423.

PICTURE QSL cards of your shack, etc. from your photograph or art work. 500 — $14.00, 1000 — $19.25. Also unusual non-picture designs. Generous sample pack 35c. Half pound of samples 65c. Raum's, 4154 Fifth Street, Philadelphia PA 19140.

TRAVEL-PAK QSL Kit — Send call and 25c; receive your call sample kit in return. Samco, Box 203, Wynantskill NY 12198.

FREE Samples—Stamp appreciated. Samcards, 48 Monte Carlo Dr., Pittsburgh PA 15239.

QSLs, samples 20c. Fred Leyden, W1NZJ, 454 Proctor Av., Revere MA 02151.

QSLs 300 for $4.65, samples 20c, W9SKR, Ingleside IL 60041.

QSLs "Brownie" W3CJI, 3035A Lehigh, Allentown PA 18103. Samples with catalog 35c.

DELUXE QSLs, Samples 20c. Petty, W2HAZ, P.O. Box 5237, Trenton NJ 08638.

DON'T buy QSL cards until you see my free samples. Fast service, economical prices. Little Print Shop, Box 9848, Austin TX 78766.

FRAME Display, and protect your QSLs with 20 pocket plastic holders. 2 for $1, 7 for $3, prepaid and guaranteed. Tepabco, Box 198T, Gallatin TN 37066.

QSLs. Second to none. Same day service. Samples airmailed 50 Include your call for free decal. Ray, K7HLR, Box 331, Clearfield UT 84015.

QSLs — Variety, value, quality, custom. Samples and catalog 20c. Alkanprint, Box 3494, Scottsdale AZ 85257.

RUBBER stamps $2.50 includes postage. NJ residents add tax. Clints Radio, W2UDO, 32 Cumberland Ave., Verona NJ 07044.

QSLs catalog. Samples 35c. Ritz Print Shop, 5810 Detroit Ave., Cleveland OH 44102.

COMPLETE 36 page QSL catalog! 300 cuts, stock and ink samples. Ten sample QSLs. 25c. Cornelison's, 321 Warren St., N. Babylon, NY 11704.

QSLs from "Bullet", creative designs, fast service, economical. Send 20c for samples to Bullet Printing Co., Box 3033, Waco TX 76707.

QSLs printed. Fast service. Samples for 25c. Castle Press, Brass Castle, Washington NJ 07882.

CREATIVE QSL cards. Personal attention. Imaginative new designs. Send 25c. Receive catalog, samples. Wilkins Printing, Box 787-1, Atascadero CA 93422.

N.&S. QSL's, Samples 25c. P.O. Box 11184, Phoenix AZ 85061.

3-D QSLs — Far more spectacular, little more cost. Samples 25c.(refundable). 3-D QSL Co., Monson 2, Mass. 01057

CANADIAN Surplus Catalog and flyers $1. Etcox Electronics, Box 741, Montreal Canada H3C 2V2.

PEORIA Hamfest — September 14, Peoria, Illinois. Same place as last year. Note change of date. For further details see Hamfest Calendar. Banquet Saturday, September 13, 5:30 PM at V. Junction — $6 per person. Two motels within walking distance. Reservation deadline August 30, cancellation September 8, 150 maximum, so get reservations in early. For hamfest tickets, $1.50 advance ($2.00 at gate) write Earl Kimzey, WA9SCA, RFD 1, Hanna City, Illinois 61536. For banquet reservations write Larry Pearsall, W9FDY, 2224 W. Herold Ave., Peoria IL 61604.

MONTREAL Hamfest 75, Aug. 3, MacDonald College Farm, Ste. Anne de Bellevue. Giant fleamarket, technical sessions, family fun, $2.50/adult. Information, contact VE2RM, Box 201, Pointe Claire-Dorval, Quebec, H9R 4N9.

FOUNDATION for Amateur Radio annual Hamfest Sunday October 19, 1975 at Gaithersburg Maryland Fairgrounds.

FINDLAY Hamfest — Sept. 7, Riverside Park, Findlay, Ohio. For advance information, write Clark Foltz, W8UN, 122 W. Hobart, Findlay OH 45840.

WARREN Hamfest, Sunday, August 17, Yankee Lake, Ohio. Dealers' displays. Swimming and picnicing. Giant Flea Market (Vendor's fee: $1/car plus registration). A $3 registration includes XYL tickets. Info: Hamfest, P.O. Bix 809, Warren OH 44482.

BLUEFIELD, W.VA. Hamfest August 24, bigger this year. Big flea market, free space. For information contact K4CGF, Ralph, Rocky Gap VA 24366.

THE Grand Rapids Amateur Radio Association will hold it's annual Swap & Shop Saturday, Sept. 20, 1975 at the Fairgrounds in Hudsonville, Michigan. Food will be available, $2 at the gate, no charge for tables or trunk sales. Talk in on 16/76 or 94/94. See you there!!!

MANUFACTURERS, Distributors! The Memphis Hamfest will be bigger than ever. The dates are Saturday and Sunday, October 4 and 5. Best location possible — State Technical Institute, Interstate 40 at Macon Road. Security. Contact Chairman, Harry Simpson, W4SCF, Box 27015, Memphis TN 38127. Phone (901) 358-5707.

HALL of Fame Hamfest and Auction, Rain or Shine, August 3, 1975, Canton, Ohio. Come to Canton for football's greatest weekend. Saturdays activities — parade, enshrinement, NFL Game, Cincinnati vs Washington. Sunday — Hamfest and auction at Stark County Fairgrounds. Motel and camping space available. Call WF8HOF, 146.19/79 or 146.52/52. Further information write WA8SHP: 73 Nimishillan St., Sandyville OH 44671 or call W8SWB, 216-455-4449.

DO-it-urself DX-pedition, stay at ZF1SB, Cayman Is. Vertical antenna and Caribbean at your doorstep. Diving, fishing if band folds. Write Spanish Bay Reef Resort, Box 800T, Grand Cayman, B.W.I.

VP2M-Land. Modern house overlooking ocean, constant sea breeze. Hygain quad at 70 ft, inverted V, SB 200. $90 weekly. Doc Beverstein, 60 Amsterdam, Toronto M4B 2C2. Tel (416) 755-2117.

WANTED: Swan Mk II linear. Please state condition and price. EI0CI, Roevehcagh, Kilcolgan, Galway, Ireland.

CASH paid for your unused tubes and good ham and commercial equipment. Send list to Barry, W2LNI, Barry Electronics, 512 Broadway, NY NY 10012.

CALL toll-free (800) 327-7798. Ask for Bob Hoffman (Jaro Electronics Corp.) We buy all types of tubes. Top prices paid for Varian, Eimac, Amperex. Address: 412 27th Street, Orlando FL 32806. In Florida call collect (305) 843-9551.

SPIDERS for boomless quads. Heliarc welded aluminum. Al's Antennas, 16473 Greentree Blvd. No. 32, Vicotville CA 93292.

VERY in-ter-est-ing! Next 5 big issues $1. "The Ham Trader," Sycamore IL 60178.

TRANSFORMERS rewound, Jess Price, W4CLJ, 507 Raehn, Orlando FL 32806.

NOVICES: Need help for General ticket? Complete recorded audio-visual theory instruction. Easy, no electronic background necessary. Write for free information. Amateur License, PO Box 6015, Norfolk VA 23508.

WE BUY electron tubes, diodes, transistors, integrated circuits, semiconductors. Astral Electronics, 150 Miller St., Elizabeth NJ 07207. (201) 354-2420.

MOBILE Ignition Shielding gives more range, no noise. Kits and custom systems. Literature. Estes Engineering, 930 Marine Dr., Port Angeles WA 98362.

TELETYPEWRITER parts, manuals, supplies, equipment. Toroids. S.a.s.e. for list. Typetronics, Box 8873, Ft. Lauderdale FL 33310. W4NYF. Buy parts, late machines.

MANUALS for ham gear before 1967. Large s.a.s.e. for quote on specific manuals. W0JJK, Hobby Industry, Box Q864, Council Bluffs IA 51501.

WANTED: An opportunity to quote your ham needs. 36 years a ham gear dealer. Collins, Drake, Ten-Tec, Swan, Kenwood, Tempo, Regency, Icom, Hy-Gain, etc. Trades, terms. Request catalog. Chuck, W8UCG, Electronic Distributors, 1960 Peck, Muskegon MI 49441. (616) 726-3196.

SWAP-N-Sell ads free in Tradio. Box 4391, Wichita Falls TX 76308.

AMSAT/OSCAR 6-7 slides, set of 5 — $1.25 Lift-Off and Equipment. Proceeds AMSAT, K6PGX, P.O. Box 463, Pasadena CA 91102.

WANTED, Make, Model and Serial Numbers of stolen ham gear, for big list. W7UD, 3637 West Grandview, Tacoma WA 98466.

FM receiver, preamp, scanner, UHF converter kits. Hamtronics, 182 Belmont, Rochester NY 14612.

COMING to Florida? Use our club station or your own rig and our all-band antennas to work DX or your home town. All hams welcome. Details — H.E. Saxton, W4QED, c/o Spanish River Inn, Delray Beach FL 33444.

TELETYPE equipment for sale, for beginners and experienced operators. RTTY machines, parts, and supplies. Special Lorenz model 15 KSR checked out — $95 and Lorenz 15 ASR — $145 plus shipping. Atlantic Surplus Sales Co., 3730 Nautilus Ave., Brooklyn NY 11224.

SIGNAL/one owners: special one year service-contract. Write for details. CX7A, mint, — $1295. Tuneable audio filter, 60 db notch, also has peak and low-pass included — $69.50. PACE Electronics, 5717 Genematas, Tucson AZ 85704. (602) 888-5234.

GEOCHRON wanted: Electronic wall mounted map-clock, reviewed 1967 QST. WB4SEO, 908 Penn Avenue, Atlanta GA 30309. (404) 874-7725.

FOR SALE: Two national NCL 2000 linear amplifiers. New tubes, mint condition — $350 each. F.O.B. original owner. Otto J. Supbski, 53 Hayward St., Yonkers NY 10704. (914) 969-1053.

SELL: 40-3el Wilson beam — $175. W3TV, Box 73, Shelocta PA 15774.

GALAXY III — 80, 40, 20 M ssb/cw xcvr with ac and d.c. power supplies and Hustler Ant. with 20M, 40M resonators. — $250. E.J. Jones, Quail Valley, Batesville AR 72501. (501) 793-6783.

COLLECTION QSTs, July 1923-July 1971. Complete, perfect, bound. Offer? Royse, Box 1478, Benson, Ariz 85602.

BUILD your own radio desk/console cabinet. Design drawings, photographs, $4.75. Bill Morris, WA5RSC, P.O. Box 20302, Oklahoma City OK 73120.

FOR SALE: Collins 351-D2 mobile mount, never used. Original carton, complete with cables, caps and instructions; MP-1 mobile power supply. Both $145. Plus shipping. Clark, W3H2.

SERVICE by W9YKA. Professional grade lab, FCC commercial license. Amateur and commercial SSB-FM equipment. Repairs, calibration, modifications, consultation. Low overhead, reasonable rates. Write or call Robert J. Orwin, Communications Engineer P.O. Box 1032, La Grange Park IL 60525. (312) 352-2333.

LOW and Medium frequency radio scrapbook. Unique new handbook dedicated to the experimenter. Receivers, converters, coil winding, antennas, loops, the nonlicensed communication bands and the FCC rules. Over 100 pages chock-full of diagrams and data. Nostalgia for the old-timers and an introduction to radio communications for the newcomer. $4.75. Cornell, 225 Baltimore Avenue, Point Pleasant Beach NJ 08742.

WANT: New AD - 1530; new ham II rotor w/box; new SB 104; new SG GR — 78, ideal for tourist. Sell/trade SB 110 w/matching Hygain antenna (just 2 hours cookin from new). No dealers. WA0GYX, George, 1107 N. Scott No. 3, Belton MO 64012.

BUILDERS Teflon stock. Write W9TFY, Frank Wirt, Alpha IL 61413.

MANUALS for ham gear before 1967. Large s.a.s.e. for quote on specific manuals. W0JJK, Hobby Industry, Box Q864, Council Bluffs, IA 51501.

DISPOSE of 450 old magazines. 350 QSTs beginning Jan. 1931 — 1930s, 1940s, 1950s, all solidly complete. Plus 100 CQs, 73s, others. Boxed, ready to go. $75. Bob Farmer, 3009 No. Columbia, Plainview TX 79072.

WANTED: Schematic and information on Multi-Elmac Model PMR-8 receiver. Bruce Campbell, WA5HQY, 5114 Mercer #2, Houston TX 77005.

COLLINS 51S-1 receiver, approx. 7 yrs. old in excellent cond. $1,200 or best offer. ETG, Box 402, Crested Butte, Colo. 81224.

UPGRADE your ham license NOW. Let Posi-Check help you. Original, expertly devised, multiple choice questions and diagrams covering all areas tested over in FCC exams. IBM sheets for self testing. Keyed answers with explanations. Novice Class — $3.35; General Class (including latest rules and regulations) — $5.10; Advanced Class — $4.65; Extra Class — $4.90. First class postage prepaid U.S.A. Air mail 25c extra per copy. Send check or money order to Posi-Check, P.O. Box 3564, Urbandale Station, Des Moines IA 50322.

COLLINS KWM-2 w/rejection tuning and DX Engr. compressor — $725, 516F2 supply — $135; D-104 — $25; Standard SC-R146A 2MFM with x'tals and all the toys, $285; Mobile 2M ant. 15; Triasto MM-35 telescoping mast tower — $135; Hy-Gain TH6DXX tribander — $145. W1FDA (802) 985-2843, 864-0544.

ALL Solid State Swan SS-200, $575. Heath SB 220 linear — $400. W5WAD, 2311 Fannin, Midland, TX 79701.

SELL: R-390-A good condition — $325. Will ship, also have few R-390-A parts at half anybody's price. George Tate, 306 Thornwood Dr., Taylor SC 29687.

MOBILE Ops. Tired of ignition noise? Please send s.a.s.e. for info on shielded ignition systems. Summit Enterprises, 20 Elder Street, Yarmouthport, MA 02675.

GALAXY 5 Mark 2, AC-35 power supply, calibrator, vox, turner mike, speaker $3. Paul Johnson, WA0YMC, 1941 Karlin Dr., St. Louis MO 63131, (314) 822-0727.

WANTED: Technician who can restring dial cord in ATC-1 Regency converter. Company refuses to service its old equipment. W3VDA, P.O. Box 1333, Harrisburg PA 17105.

HW101 e/w 400 Hz cw filter, HP13B ac and HP23B dc power supply, SB600 speaker. All in excellent working condition and just — $395. WA1SSX, 10 Wampus Ave., Apt. H, Acton MA 01720. Phone (617) 263-0615.

COLLECTABLES: QSTs, periodicals, parts catalogues and spare parts. 1919-1940. Send for list. W8DIJ, 10595 Euphemia-Vernon Rd., Lewisburg OH 45338.

BOWMAR MX55 rechargeable calculator, brand new - $25 Kodak D10 instamatic movie outfit complete, brand new — $75 Skill chain saw, brand new — $45. WB8CFN, 135 Overhill Rd. Birmingham MI 48010.

TELETYPE 14 tape punch — $50; 14 TD tape reader — $25; 1 page printer — $50; Johnson Viking Valient — $100. All excellent, with manuals. Pick up only. R. M. Mendelson, 2 Somerset, Berkeley Heights NJ 07974.

TRANSFORMER, 720 VCT 1000 mA, dual primary — $35; IBM electric typewriter, model B, good condition — $125. K3MNJ 8361 Langdon St., Phila. PA 19152.

WANTED: Club station looking for Collins S-Line. Desire 32S-3 75S-3, 312B-4, 62S-1 and 30S-1. Must be in original condition and excellent shape. Mike Repinski, 8520 Garfield Blvd. Cleveland OH 44125.

JOHNSON Ranger-II transmitter — excellent condx — $150 or best offer; Hornet TB-500 Triband beam — $45; Knight R-10 receiver, needs alignment — $25. Jim Rush, 1221 Hilltop Court Bloomington IL 61701. (309)-828-0320.

WANTED: Heath SB-610. Also need power transformer for Heath DX-20, part 54-54. For Sale: HW-32A — $70. Dial 617-695-0286, 33 Colburn Street, North Attleboro MA 02760

DRAKE SPR-4 for sale, like new, w/noise blanker & power cord — $400 or trade for Siltronic 500c. Phone 324-1084 or write Lynch, 820 W-157th St., Gardena CA 90247.

EASY-WAY tilt tower — $75; TA-33 JR. — $40. All in good condition. Tower pickup only. No shipping. W1OER, 13 Barbara Rd., Waltham MA 02154.

FOR SALE: Mint Tempo One & AC-1 p/s. Spkr, original cartons — $350. Also, mint Swan MB-80 — $180. Both purchased Sept., 1974. WA7OKF/5, 991 N. La Salle, Abilene TX 79603.

MUST SELL: Like new, SB-102, w/p.s. speaker in cabinet. D-104 mike, assorted accesories to give you a complete rig. Excellent condition. New finals. Cost nearly $500 in kit form, will sacrifice for only — $350 or best offer. Possible delivery to you. WA4EPH, 14310 Rosebud, Chesterfield VA 23832. (804) 739-3035 (evenings).

TOWER For Sale. Rohn HDX-49, less base. Top section damaged — $200. pick up deal. W2HTR, 14 Phyllis Drive, Succasunna NJ 07876.

WANTED: Someone to practice cw with, for general license. NYC area. Call (212) 371-9009. John, WB2SWP.

APACHE TX-1, mint condition. Manual included — $90. M. Lindquist, W1ORG, 35 Wayne Dr., Plainville CT 06062.

YAESU FT101B For Sale. Five months old. Excellent condition. Only 7 hours use. $500 firm. Larry R. Salis, WB2FQH, 131 Station Road, Kings Point NY 11024. 516-482-0397.

ROHN 25G and 45G tower sections wanted, will take down, pick up. W1 and W2 areas preferred. M.S. Pride (203) 621-6392.

POWERSTATS (4) Superior 1256-B, 240V in, 0-280V out, 28 amps, swap for ham stuff. WA3JYI, 209 Mendell Place, New Castle DE 19720. (302) 328-5085.

FREE: 8 extra crystals of your choice with the purchase of a new ICOM IC-22A at $249. With the 10 crystals which come factory-installed in the IC-22A, this gives you a total of 18 crystals! For equally good deals on Collins, Drake, Ten-Tec, Kenwood, Swan, Atlas, Midland, Standard, Regency, Tempo, Alpha, Genave, Hy-Gain, CushCraft, Antenna Specialists, Hustler, Mosley and others, write or call Hoosier Electronics, your ham headquarters in the heart of the Midwest, and become one of our many happy and satisfied customers. Hoosier Electronics, P.O. Box 2001, Terre Haute IN 47802. (812) 894-2397.

HT-37 — $160; SX101-Mark 3 — $130. Both in very good condition. Fred Maas, Rt. 3, Box 86-H, Santa Fe NM 87501.

WANTED: Hallicrafters equipment, amateur or commercial equipment, converted or not. Give model, condition, price. Perry Yantis, 282 Thurman Ave., Columbus OH 43206.

FOR SALE: Drake T4XC, AC-4, R-4C, MS-4, phone patch, mike, and bug (package only) — $1,000. C.J. Mozzochi, W1LYQ, Box 1315, Hartford CT 06101. (203) 527-8635.

WANTED: 6 Volt American auto radios, need not be working. Carl Huether, Hobbs Rd., Pelham NH 03076.

SELL: Collins 75A-4 Serial 4048 with speaker. Mint — $450. R. M. Whittemore, 203 Heath, Brookline MA 02167.

WANTED: SB-610 monitorscope, WB2FSL, 234 E. 19th St., Paterson NJ 07524. (201) 345-4419.

WANTED: Two National NPW-O or PW-O dial assemblies and drive units. G.S. Nupp, W0OMD, Box 93, Montrose CO 81401.

FOR SALE: NYE Viking Match Box, used two months, 2Kw model with bridge, $255. K8AXK, Don Bergen, 106 Marigold Lane, Manetta OH 45750. (614) 373-5981.

DRAKE: ML-2 with 10 channels, AC/DC supply — $199. Dave, WA1UQC, (203)693-2700.

FOR SALE: Excellent Heath SB401 and SB303 combination. Works and looks like new. All cables, instruction books and crystal pack for SB401. Prepaid for — $525. Jack Yeoman, W8VHY, R.R. 4, Washington C.H., OH 43160.

HEATHKIT Marauder HX-10, — $169. Collins 75S-3B, — $529. K3VNR, 6619 Powhatan Street, Riverdale MD 20840.

WANTED: Motorola HT-220 or Wilson, with Charger. WA4NBN, Del Popwell, 904/733 9518, 1946 Sweetbriar LN, Jacksonville FL 32217.

WANTED: 32S3 B or C, like new, no modifications. Also 30L1. T. Stuart, 5041 Jakeman St., Virginia Beach VA 23455.

MINT Clegg-22ER, MK2 — spare final — $195. W1KO, 211 Circuit, Hanover MA 02339.

DRAKE TR-22, case, two mikes, 8 xtal pairs, cables, auto patch pad, AC-10 supply, AA-10 and AA-22 amplifiers — $350. SBE-34, SB-2 codaptor, SB-2 Vox, mobile mount, cables — $200. All good condition. WA0SHO, Paul Rehm, 424 West Linden, Fremont NE 68025.

WANTED: CW transmitter (T-9er) per pp. 179-185 ARRL Radio Amateurs Handbook 1975. Must be well made, in excellent condition, and complete (160 m. optional). Fully and precisely aligned, with all crystals and tubes, and ready to "fire up". Write (after 15 July) to Woodbury, 12 Meadowbrook Road, Dover MA 02030. Firm price plus UPS insured shipping.

UNUSED Ham-M/TR-44 (Ser 3-4-5) control unit — $25. VE3AXD/W0, 2710 Monterey MN 55416.

SALE: Tektronix 545 — $495; Plug-ins — $50 each; HP counter — $99; Power meter — $40; AC-VTVM — $45; Pulse gen. — $75; Measurements 80 signal gen — $150; Hallicrafters T54 TV sp44 Panadapter — $40 each; AN/JA PR-4 115 V ac receiver 74-1000 MHz — $145; TS-186C frequency meter — $75; HRO 60 with 9 coils — $325. Lots more. Sase for list. Steve Lipsky, W2VVN, 12 Flamingo Road North, Roslyn NY 11576. (516) 626-3067.

SPECTRONICS Digital Display DD-1 compatible FT-101, FT-101B. New, mint original carton — $135. Shipped. WA5WQF, 835 Merridel, Houston TX 77024. (713) 468-4208.

WANT Ghirrardis radio physics course, condx. and price to WN5LOT, RT 3, Box 112, Comanche TX 76442.

DESPERATE need Drake 2-BQ Q Multiplier, will pay $25 and shipping. WA6FIS, 1653 Fifth, Manhattan Beach CA 90266.

WANTED: Old Heathkit catalogs (1962 and earlier). Mail to K6HPR, 5044 Park Rim Drive, San Diego CA 92117.

WANTED: Johnson Matchbox, Kilowatt size, must be super clean. Kishiyama, 917 Micheltorena St., Los Angeles CA 90026.

WANTED: Swan Model 420 remote VFO and Model 22 adapter. W6NAL, 507 Lewis Street Los Angeles CA 90042.

WANTED: KWS-1, 75A4, 51JH, mint, no mods. W7IYW, 7535 NW Skyline Blvd, Portland OR 97229. (503) 286-4293.

CLIFF Dweller control unit wanted. Also spare antenna parts. W3PS, 9509 E. Bexhill Drive, Kensington MD 20795.

MN-2000 wanted, name your price. Champion vibroplex ($10) and MN-200 ($75) for sale or trade. W1LF, 2 Ripley Lane, Weston MA 02193.

VHF/UHF goodies! Rigs, parts, etc; S.a.s.e. for list. WB2WIK, 636 Succasunna Road, Mt. Arlington (Landing) NJ 07850.

FOR SALE: All good, Heath SB-303 cw, am, and ssb filters, manual and spkr. $275; SB 401 xtal pack, manual, mike — $275. Both $500 or best offer. Knight T-60, xmtr, 3740 xtal and manual — $35. WA4AOS, 7130 Nancy Ave., Columbia SC 29204. (803) 754-8582.

WANTED: Knobs for HT32. W8BP, 2002 Werner, Marquette MI 49855.

WANTED: 0.5 or 0.8 kHz and 2.1 kHz filters for 75A4. Many thanks. Paul Beavin, WB9PEL, 3540 Deerfield PL, Columbus IN 47201. (812) 379-9628.

SELL: Watkins-Johnson model WJ-6007, 1 to 4 GHz pre amp, 25 dB gain, 6 dB N.F. — 115 V ac, like new. Best offer over $250, or trade two mtr. xcver, W6RNU, John, (408) 923-3293.

SX-111 receiver. Meticulously maintained, excellent condition. — $125. Devere Logan, W1HEO, 175 Fairmount Terrace, Fairfield CT 06432. (203) 367-7530.

GO SSB/CW 10-80M for $135. Heath HX20, HR20, HP20AC. Ameco CB2/PS1 2MTR converter 14/28 MHz IF. — $20. After 7/13/75 K2HTO, (212) 231-3635.

MODEL 15 TTY, BC640. Best offer, no shipping. Derligher, 10617 Debra, Granada Hills CA 91344. (213) 360-3643.

SELL: SB104 with p/blanker HP1144 supply, mint condition — $925 FPM 300 with blower and mobile Mtg Brkt — $325. WB8GGM, Rt 1, Box 306, Galion OH 44833.

DRAKE TR-4, AC-4, MS-4. — $395. WA0TJY. Mike Parkin, 107 Wilson Blvd., Fairfield IA 52556.

HAMMARLUND SP600-JX for sale — $250. Knight T150 w/RTTY capabilities — $100. HR10 — $40. Rack cabinets 26x19x16 — $25. 18x19x16 — $20. WA3RGB, 315 Hudson Drive, Newark DE 19711.

QUAD KITS — $14.50 to $25. Boomless Spider Mount — $12. Send s.a.s.e. for information. WAC, 404 Sanders Rd., SW, Huntsville AL 35802.

HEATH HW101, transceiver, AC and DC power supplies. Antennas, factory aligned, perfect — $295 postpaid. SB301 receiver — $195. Want 2-meter gear. K7GGL, 3772 State, Salem OR 97301. (503) 364-1207.

FOR SALE: Hallicrafters linear HT45, SR160 with power supplies. HE30 rcvr. Knight T60 xmitter, Eico 460 scope. Make offer. K2CYH, 2 Buttonwood Drive, Parlin NJ 08859. Phone (201) 721-6915.

COLLEGE forces sale of new Heathkit SB-401 and SB-303. Both new in Dec. '74. Complete with cables, Heath mike, cw filter, manuals. Will sell complete for $725 or separate: 303- $375, 401 w/mike — $400. You ship. WB0LFR, Tim Burgess, 1160 Howard, Delta CO 81416. (303) 874-3550.

62-S Collins for sale. Mint condition. Used very little. Henry Heymann, W5PDP, 1715 Lakeshore Drive, New Orleans LA 70122. (504) 283-1457.

DRAKE TR22 FM transceiver, all accessories, 5 channels, crystaled — $235. J. Vick, 26 Princeton Circle, Longmont CO 80501.

HEATH HW-7 1975 transceiver — $64; HW7AI supply — $16; HD-10 keyer — $29; MFJ CWF-2BX filter — $18; HS-24 speaker — $8. Shipped prepaid USA W7JUA, 5041 Saxon Way, Eugene OR 97405.

DRAKE TR3, A/C MS4 supply, factory checked Mar. 75. — $415 or best offer. 835-9658, Wayne Warren, 3645 Fiajole R4, Midland MI 48640.

HT-220 kit for sale. Includes following brand new items. Case, 6 crystal board with all resistors, coils, hardware, etc. Battery, 4 sets of crystals, Flex antenna, new mainframe with all controls, knobs, etc. With Spectronics Motorola board. Complete. Ready to wire in 6 crystal board, align and talk — $220. Bill Smitherman, WA4YFI, Rt. 4, East Bend NC 27018. (919) 699-3139.

MUST Sell: Mint Tempo One SSB transceiver, Tempo AC one power supply with loud speaker, matching Telex C610 headphones, prefer local deal, best offer over $200. Hunton, W3AG, 1806 Princeton Avenue, Williamsport PA. 17701.

WANTED: Collins 30S-1. Condition unimportant if priced right. K8SWR, 44903.

COUNSELOR — Penna. Brother-Sister Camp seeks Ham Radio college man with a General license. David Blumstein, 1410 East 24th St., Brooklyn NY 11210.

DISCOUNT prices plus full warranty on new guaranteed items: CDE HAM-2 117.00; Belden 8448 rotor cable 12c/FT; Hygain TH6DXX (240 list) cost 192.00; Mosley classic 22 179.00; 15% discount Triex W, MW towers. Supermast—FOB Calif: Belden 8214 RG8FOAM 22c/FT; 8237 RG8/U 18c/FT, RG62B/U 8c/FT; Centralab 100PF/15KV transmitting cap 5.95; CDE .001/10KV doorknob 1.95; Raytheon S11A 15.00/PR; Sorensen ACR20000VA AC regulator 150.00, write specs; Longwire: Phosbronze 22GA/7STD 2.50/1000FT; Quote TS250, Atlas 210; old tubes (IV,7V, etc) Write needs; Collins; prices FOB Houston, prices good until Aug 1; Madison Electronics, 1508 MCKINNEY, Houston TX 77002. 224-2668. Nite (713) 497-5683.

RTTY: For Sale. Model 19 teletype with table, tape reader and converter. Good condition. — $85. Frank Rose, WB6MSH, 3806 S. Flower, E, Santa Ana CA 92707.

HAMMARLUND HQ110 — $95; National NC200 w/NCXA — $250; Clegg 99 — $59; Gonset Comm IV 6 meters — $95; Gonset Comm III 6M — $65; Lafayette HA800 receiver — $85; Drake SC6 — $60; SC2 — $75; CC1 — $29; Essco TU7 tty converter, both speeds, — $75; National NCX5 MKII transceiver w/NCXA — $345. Wanted, 5 UPI tube, keyer, paddle. W2FNT, 18 Hillcrest Ter, Linden NJ 07036.

DX-ENGINEERING R.F. speech processor for TR4 — $85. R. Huntington, W6TCQ, 5014 W6TCQ, 5014 Mindora Dr., Torrance CA 90505.

SELL: HW-100, HP-23 w/SB600. Factory aligned & checked — $200; TR-22-C, used very little — $175; Eimac AF-68 w/M1070 p/s — $50; Collins mobile mike, like new — $15; Eico 710 Dipper f/wired — $30; Super Twoer w/xtals — $30. Steve Spevock, Rt. 2, Rivesville WV 26588.

WANTED: Clean Drake 2B, serial number over 8000, with 2BQ and 2AC. Will pay $150 plus shipping. Jim Cain, WA1STN, RFD 5, Box 23, East Hampton CT 06424.

FOR SALE or trade: Collins R-390 w/spare parts — $400, or will trade for Swan 350C, 500 or comparable transceiver. R. Bridges, WB5GSA, (512) 865-3724 P.O. Box 108, Muldoon TX 78949.

SIGNAL/ONE. Expert repairs. K6BE. (415) 548-1889.

HEATH HP13, DC supply, SBA-100-1 mount $30; VHF engineering 10 watt amp, $12; Eico 720, $35. Want CA5 adapter for Hickok tube tester.[Rick Stealey, Box 313, Chester NJ 07930. (201) 879-6723.

DRAKE: R-4C, T-4XC, 1-AC4, 1-MS4 — $850; SB200 — $200. All less than one year old. Will ship. Clif Power (617) 344-2620.

WANTED: Joystick antenna with manual. Walt Packard, W5LZP, 2429 Nottingham PL, Grand Prairie TX 75050.

SELL: Swan 500C, 117 XC p.s., 508 ext. VFO. Complete, in very good cond. — $490. Bob Cascone, WB2FSL, 234 E. 19th St., Paterson NJ 07524. 345-4419.

CRYSTALS airmailed: Nets, MARS etc. — Novice, active FT-243, all frequencies, minimum five, 40M, 15M, 10M — 99c each. 80M $1.75. Cover bands inexpensively — rock solid — less than five 80M $1.99, other $1.50. Novice six crystal three band edge marker and QSO package (good with VFO) — $7.95. Four band package (including 10M) $9.95. General purpose: FT-243 .01% — 32pf. — 3500 — 8600 kilocycles $1.90, (five $1.75 each), 8600-13000 fundamentals, 10,000-30,000 overtones $2.95. For .005% add 50c each. 160M four for $9.80. Airmail 20c/crystal, 1st-cl 15c. Free listings, 160M to 2M. Bob Woods, W9LPS, "Crystals since '33." C-W Crystals, Marshfield MO 65706.

HT-37 — $100; SX-101A — $125; FPM-300 — $395. K2BO, E.M. Weed, Morris Plains NJ 07950.

WANTED: One Ameco Model PCL-P preamp or similar Ameco model. L.T. Caruthers, 4115 White Pine Drive, Raleigh NC 27612.

WANTED: Two new 4-400A's. Also 0.5 and 2.5 kHz mechanical filters for Collins 75A-4. Ken Shaw, WB6VHE, 88 W. 41st Avenue, San Mateo CA 94403.

WANTED: Both antenna wafers for HQ-170A Hammarlund receiver. Will take full index or entire receiver for parts. WA1MIR, Alsop, 70 Sherwood Lane, Norwich CT 06360.

SWAN 300B-VX2, Shure mike with three extra final tubes, practically unused — $450 firm. K8DPV, 1483 Foxwood, Cincinnati OH 45231.

HEATH SB301 — $175; SB401 — $175; SB200 — $175. Excellent condition. You pay shipping. James Lollar, 418 W. 18th, Ada OK 74820. (405) 332-4734.

QUALITY STAINLESS! Threaded, washer hardware. Walt, W8BLR, 29716 Briarbank, Southfield MI 48076.

SALE: SB-301, SB-401, SB-600, SB-610, SB-620, HD-15, extras — $650. Two HT-220E, extras. David Rogers, 1914 Blair, Nashville TN 37212. (615) 385-2813.

ALPHA-77, mint, warranty — $1395. Alpha-374 Demonstrator — $1150. Payne Radio, (615) 384-2224.

GONSET Comm III w/mike, crystals, manual — $70. 6M Squalo — $7; APX-6 — $25; Vibroplex Blue Racer w/case — $19; Heath VF-1 — $15; AT-1 — $20. Want HW-7 or PM-3. Fred Wagner, W7HSS, 3142 S. Eastview Ave, Tucson AZ 85730. 886-4215.

JOHNSON Match Box with reflected power meter built in — $65; Also, copies of QST 1957-1965 in binders. Best offer. R. E. Faucett, 703 Hutcheson Dr., Blacksburg VA 24060. (703) 951-3679, W4DML.

HAM II rotor, unbelievably low price — $115, plus shipping. Brand new, limited quantities. NEEE, Box 145, Wethersfield CT 06109.

HOSS Trader Ed says, "The horse thief has come and stolen our hay; now my stable is empty!" Remember, if you didn't buy it from the Hoss, You Paid Too Much! New Atlas 180 transceiver, $439; Demo TR-4C, $479; New Display Swan 700CX, $519; Demo T-4XC, $479; New demo Atlas 210 transceiver, $489. New Demo HR-2B, $189.95. New Rohn 50-ft. foldover tower, prepaid, $339.95; Demo Ham-II rotor, $109. Hoss Trader Specials: Drake TR-4, $375; R-4C, $439; T-4XC, $459; Mint R-4B, $329, and T-4XB, $355. Some left — New Collins at old prices! Moozy Electronics Company, P.O. Box 506, DeWitt Arkansas 72042, Tel. (501) 946-2820.

HEATHKIT HW-101 with 400 Hz cw filter and HP23A supply — $270; SB200 amplifier — $200; SB610 scope — $75; HM102 wattmeter — $18; all excellent condition. Barry Orr, 14 Ravine Drive, Matawan NJ 07747.

SELL: HW-7, excellent condx — $55. J. Thurtell, R1, Paw Paw MI 49079.

FOR SALE: Heath SB-102, HW-16 with HG-10B, HM-102, HD-15, HN-31, Turner Plus Three mike, and Mosley TA-33 Master beam. Write to Ed Urbanik WA3QLG, 923 Linda Vista Drive, West Chester PA 19380 for price information. All gear in good condition.

SELL: Collins 75S-3B ser. no. 16478 — $525; excellent condition, price firm. WA2JLM, 175 East 17th St., Huntington Station NY 11746.

SELL real nice Collins KWM-2 with 516F2, just went through at Collins — $800, or will take some 2 meter gear in trade. Richard Schark, 417 North Ferry, Ottumwa IA 52501. Ph (515) 682-5741.

HEATHKIT Warrior HA-10 Linear. Good condition, presently in service — $95 firm. WB2AWL, Gaston Tallet, Clifton NJ 07012.

Ht-37 transmitter with refinished cabinet, very good — $120; Astatic D-104C mike — $25; Midland 22-224 mike with pre-amp — $15. Both excellent. Jeff Hodge, WA2AFN, 8850 Wenner Rd., Buffalo NY 14221.

KWM-2A, power supply, speaker. Used less than six months, ex. cond. $1200. R. Richards, Box 132, Windham NY 12496. Phone (518) 734-3898.

WANTED: Hammarlund HC-10 — Advise price and condition. John Truitt, 428 S. Ashland, LaGrange IL 60525.

WANTED: Match Box, HP23, HG10. Sell: HW32 transceiver, HT40 transmitter, S40B, S38B receivers. WN4INU, 1006½ 21st Avenue North, St. Petersburg FL33704.

HAVE to clean out ham-shack, no reasonable offer refused. Test gear, 6 meters, ATV, SSTV, etc., list s.a.s.e. W4API, Box 4095, Arlington VA 22204.

FOR SALE: Heathkit SB-200 linear, new finals only several months old — $200; G.E. Progress Line 2 meter FMXCVR, dual freq. with control head and cables — $100. Need to buy 2 KW linear, SB220 or what have you? Call collect person to person, Ed, WB4IXB, AC (615) 352-9498.

SELL: Drake TR4 with AC and DC supply — $425. Ham M rotor — $65; Heath HA14 Kompact KW AC supply — $95. Roger Paulson, Box 4, Needham MA 02192.

GALAXY V Mark 2, transceiver, AC power supply and 300 cycle cw filter — $200. F.O.B. W0ZQJ, P.O. Box 875, Moorhead MN 56560.

NATIONAL NC303 receiver — $125, good condition, will ship anywhere you pay. WM. M. Nye, W7DZ, 1614 130th N.E. Bellevue WA 98005.

WANTED: SBE-34 transceiver. W9BMS, Olsen, 5678 New Hampshire, Chicago IL 60631. (312) 631-0167.

PLANNING Europe in July or August? Have camper with mobile amateur radio station — will meet you for eyeball QSO when in vicinity southwest Germany or northern half France. Send itinerary. Vandegrift, A/C Div., USAMMAE, APO NY 09052.

NEW TV Cameras, only $129. Color VTR decks — $195. W6DOM, Haas Enterprises, 6017 Majorca Court, San Jose CA 95120. (408) 997-0132.

BUY—SELL—TRADE. Write for monthly mailer, give name address and call letters. Complete stock of major brands new and reconditioned equipment, call us for the best deals. We buy Collins, Drake, Swan, etc. SSB & FM. Associated Radio, 8012 Conser Overland Park KS 66204, (913) 381-5901.

NOVICE station: Eimac AF-68, xmtr, PMR-8 rcvr, M1070 ps, cables and manuals, mint — original owner — $195. WB9CVV, 12 Chandelle Dr., Hampshire IL 60140. (312) 683-2422.

SELL: Heath SB104, N.B., cw filter, speaker, HP1144 power supply — $800. Myron C. Pogue, 3770 22nd St., Boulder CO 80302.

WANTED for Oscar — TV2, TC2, HA2 or similar converter for Oscar. Advise price by airmail. KV4AD, Box 2126, St. Thomas V.I. 00801.

EXCELLENT condition, Heath SB-303 with all filters and SB-600 station speaker — $350. WB9MH, 442 N. Main, Oregon WI 53575.

WANTED: Johnson Navigator. State condition and price. W6ENZ, 2131 W. Palmyra, Apt. B, Orange CA 92668.

VIKING Ranger xmtr with antenna relay — $90. Good condition, no shipping. E. Hartnell, W9DP, Salem WI 53168.

MINT round emblem Collins 75S3B receiver, covered filters, 85K — $645 F.O.B. firm, no trades. Thomas, W2UK, Juniper Place, Colts Neck NJ 07722.

FOR SALE: Motorola HT220 hi-band portable. Six freq., omni housing with omni battery. Leather case and manual. No charger. No xtals. $400. Write WA1HCG, Lenn Berman, Tolland Stage Rd., Tolland CT 06084 Tel. (203) 872-7605.

WANTED: National XCU-27 100kc calibrator, also a National VX-501 remote VFO. Send quote to Larry WØPSH, 10725 Dahlia St., NW, Coon Rapids MI 55433.

TEKTRONIX Fast Rise Mercury Pulser type 108 — $75; Howlett-Packard model 415A standing wave indicator — $65. FOB origin. Both with manuals. W7LU, Kelen, 2916 Oriole Dr., Sierra Vista AZ 85635.

HT-44 with PS-150, 120V ac supply — $180; SX 111 RV'R — $80. J. Michel, 9 Hennessy Dr., Huntington NY 11743.

FOR SALE: One hybrid quad antenna, HQ-1, with W2AU balun — $65; one vibroplex semi automatic key "deluxe original" — $25. Both like new. WN5OCL, J. de Souza, Box 834, Alief TX 77411. (713) 498-0194.

HEATHKIT SB104 with noise blanker, cw filter, remote VFO, speaker, ac power supply. Assembled and never used. In cartons sealed by Heath, which claims all units meet Heath specifications. Submit offers over $320 to Marihugh, 708 North Lea, Roswell NM 88201.

R4B Drake receiver for sale — $300; R4A receiver — $260. Swan all band transceiver (80-10 meters), remote VFO, and Swan AC power supply for sale — $280. R. Myers, 221 Long Swamp Road, Wolcott CT 06716. (203) 879-0561.

HEATH SB-303, SB-401, SB-610, SB-600, HD-10, mic patch, digital clock, other accessories. All perfect, with manuals, $750. Prefer you pick up. WB6BGD, 474 Rienstra Ct., Chula Vista CA 92011.

SELL Drake R-4B, manual and extra crystals — $300. Hammarlund HC-10 converter — $40, you ship. Wanted, HR05 and power supply. State condition and price, including shipping. K9UKX, 51625 Chestnut Road, Granger IN 46530.

KEYBOARD, Morse encoded, easy to operate — $129.95. Keyer — $49.95, with memory — $99.95. Fully guaranteed. Logic Division, Box 62201, Los Angeles CA 90062.

WE buy ham estates, Radios Unlimited, Piscataway NJ WA2RMZ, 201-752-4307.

DRAKE TR-3 with p.s., Heathkit 2000-W linear (new), Heathkit SB610 scope, CDR rotor, Heathkit HM-102 heavy-duty swr meter, SSB-2 transistorized mike, quad antenna, and assorted misc. items such as meters, etc. Package deal only, asking $1200. From the estate of WA4RKL/9. Mrs. Helen Phillips, 2004 Sunnyside, Dyer IN 46311. (219) 865-2606.

YAESU FTdx560/570/401 owners — Want 160 meters? Send a dollar for May 1975 issue of monthly FT newsletter. Creditable towards dues if you join the International Fox-Tango Club. Or send business-size S.A.S.E. or two IRCs for complete club information. Milt Lowens, WA2AOQ, 3977 F. Sedgwick Ave., Bronx NY 10463. Q.

SELL: New Tentex 4 band rec — $50; Scope — $50; Galaxy 5 all band trans. complete with mike,speaker, p.s. — $300. D. R. Heineken, WA5OHI, 505 E. Aztec, Gallup NM 87301.

HR2A w/xtals and preamp — $170; HQ110 — $110; HX20, HR20, HP20 — $200. Prefer local area. WB7AAU, 626 Ave. C, Snohomish WA 98290.

KWS-1, No. 998, 75A-4, No. 5484, 3 filters, SC-101 console $1500. Trade: KWM-2, PM-2, CC-2 for a CX7A/B. Must be perfect! Sell 312B-5 — $375; 32S-1, 516F-2 — $425, 75S-1 — $275, Telrex Little Bertha (76 ft) with boom-to-mast plates for 4 beams. T-matched Telrex 3-element 10, 15, 20 beams. Cash and carry $1000. James Craig, 29 Sherburne Ave., Portsmouth NH 03801.

AN offer you can't refuse. Buyers and Sellers see our display ad in this issue.

SELL New surplus 4-1000A tubes, new crated 4kv 1 amp transformers, $70; Singer type SSB-4 Spectrum analyzer, mint, $300; Collins 62S1, 10 hrs. use, mint, trade for 51S1 receiver in same shape, or $800; Looking for National receiver, ANWRR-2 receiver in mint to clean shape. HP525A, Northeastern 14-26C, or any Elmac, Bomac, Collins, Tektronix, Booten, GR products, all letters and phone calls answered. Michael D. Harrison, 431 Windsor Pl, Oceanside L.I. NY 11572. Day (516) 536-5320, night 764-3873.

SWAN 350 (late) — $270; 117XC AC supply — $85; Vox VX-1 — $20; Sure 444 — $20; Heath O-10 scope — $50; Heath HM-20 — $25; Heath HD-15 — $20; RCA Sr. Voltohmyst, WV-98C — $60; HBR-13C receiver (20 meter coils only) completely documented — $50; BC 453 receiver — $10; Johnson low-pass filter — $10; Dow TR switch — $25; B&W 5 position coaxial switch — $8; Hy-Gain balun BN-86 — $10; QST 1963-1974 — $25; FOB Rochester, William Campbell, 60 Highland Avenue, Rochester NY 14620.

REGENCY floor models and demos at big savings! Full factory warranty. HR2B, $229, now — $199.95, HR2MS, $319, now — $289.95, HRT2/nicad, $229 — now — $199.95, HR212, $259, now — $229.95. Add $3.50 per for shipping and handling. Vegas Radio, 1108 So. 3rd, Las Vegas NV 89101.

CLEANING out the shack? Don't throw it away. Donate it to a worthy cause. Our beginner/Novice class can probably use it. Contact WA3QNS, (215) 279-1517.

WHY waste time looking for a used 220 fm transceiver when for $197 you can buy one of the best performing units on the market, brand new. For details, see our display ad in this issue. Discount Electronic Supply, Inc., 999 Asylum Ave., Hartford, Conn. 06105. Phone (203) 549-1674.

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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 850 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 card 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
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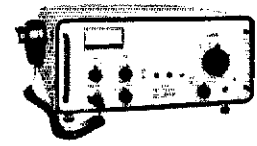
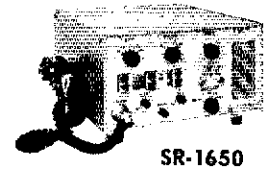


AN/URC-77 150 W
SSB TRANSCEIVER



SR-1650
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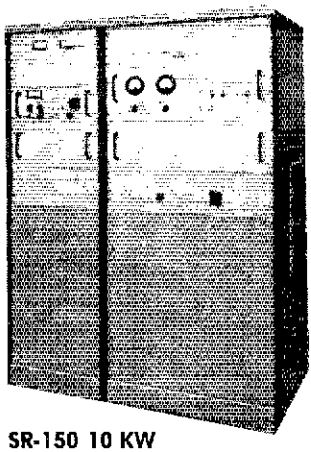

SR-150 10 KW
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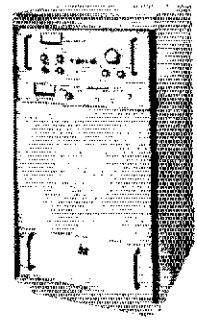
AN/FRT-91 1 KW
ISB TRANSMITTER



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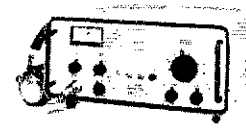

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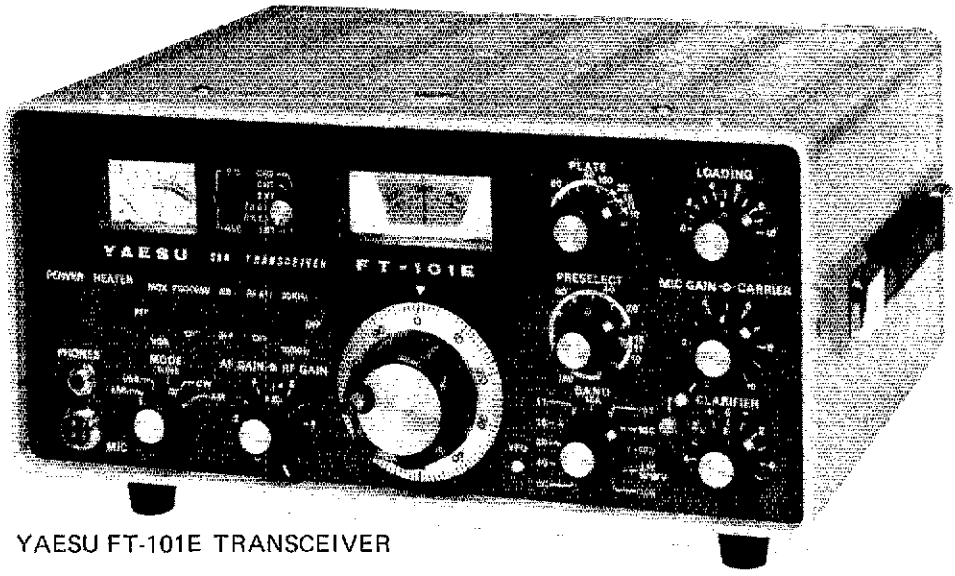

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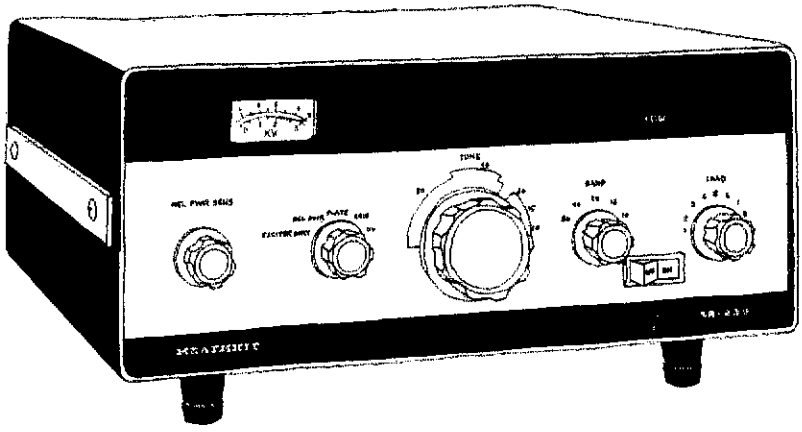

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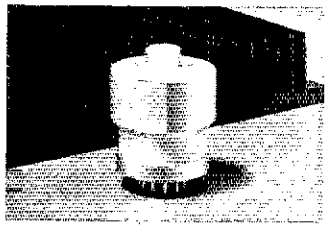

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