

Worldradio

Year 22, Issue 9

March 1993 • \$1.25

FEATURES

Canoga Park, CA — "Invisible antennas"

Dade County, FL — Battle of Cutler Ridge

Dallas, TX — Boy Scouts' new tower

Dayton, OH — Tornado relief

Escondido, CA — Resonance & field strength

Monmouth, NJ — Tower-cripping Nor'easter

Patchogue, NY — Sporadic-E & aurora propagation

Portland, OR — Books to Fiji

Seattle, WA — Confessions of a code addict (Part 1)



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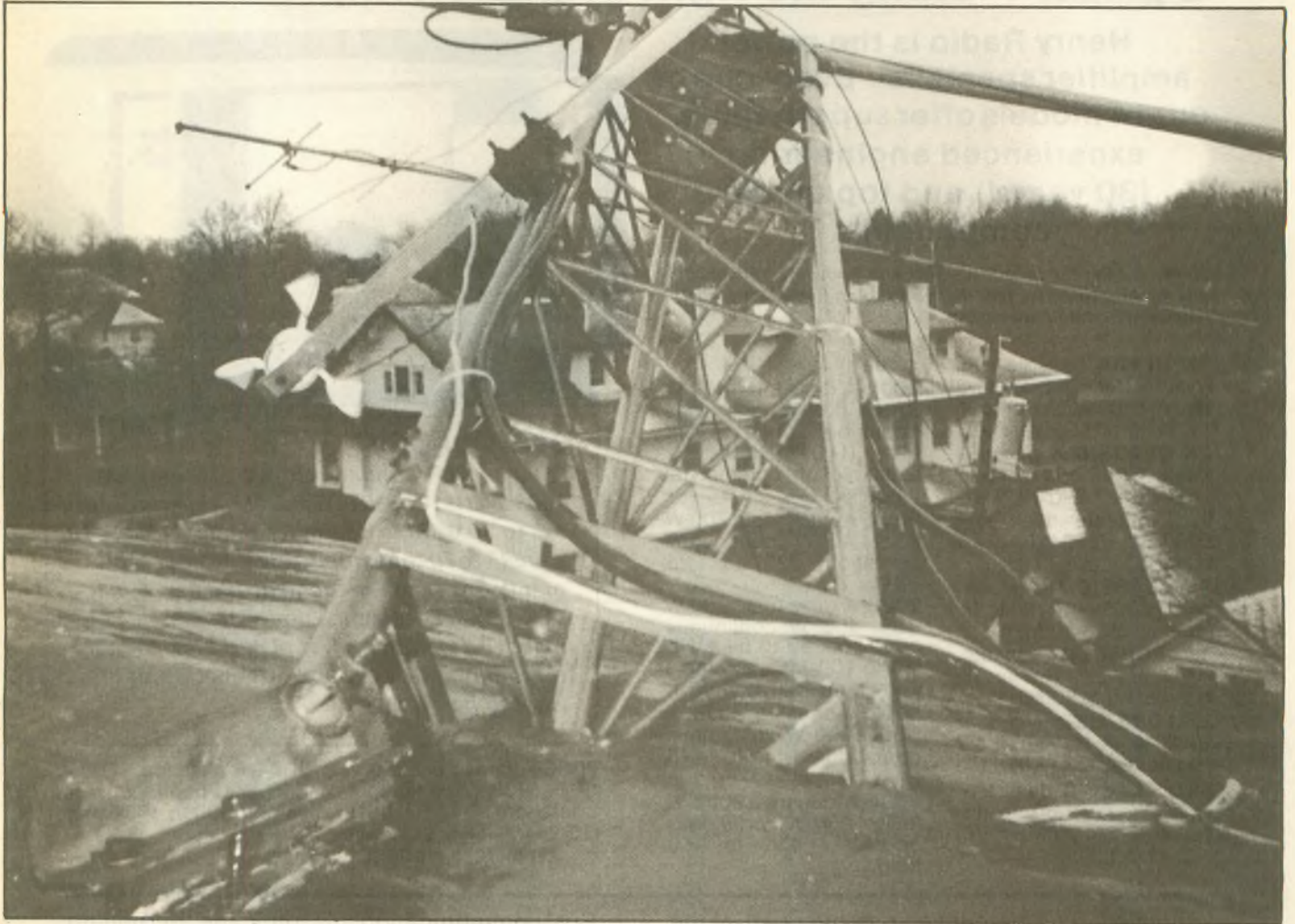
ARRL New England Div. Convention October 1992



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Antennas and weather instruments tumbled when the tower bent in half like a hairpin.

Tower crippling Nor'easter

CHARLES GSPANN, W2ZEE

A rude awakening

Friday, 11 December 1992 got started a bit early for me when the telephone rang. It was just after 6 a.m., and Roy Edwards, KB2LUO, was on the other end blissfully informing me that he was calling from the Monmouth County, New Jersey, Office of Emergency Management, that RACES had been alerted because of an "extra violent Nor'easter" and to get on the air as soon as possible.

It soon became apparent that damage was extensive and that more help was needed at the county OEM. At that point I offered to help out by acting as net control station for a while.

During the times when I performed the duties of net control station on Friday the 11th and Saturday the 12th, a total of 74 stations checked in and participated for varying periods of time. Thirty-four other stations checked in

to offer information or inquire about conditions in this area, and immediately checked out. Separate lists were kept of these activities.

Friday, 11 December

Friday morning was "get-it-together" morning, with amateurs reporting in or trying to get to places where deep water blocked every known avenue of access. By 7:30 there
(please turn to page 30)

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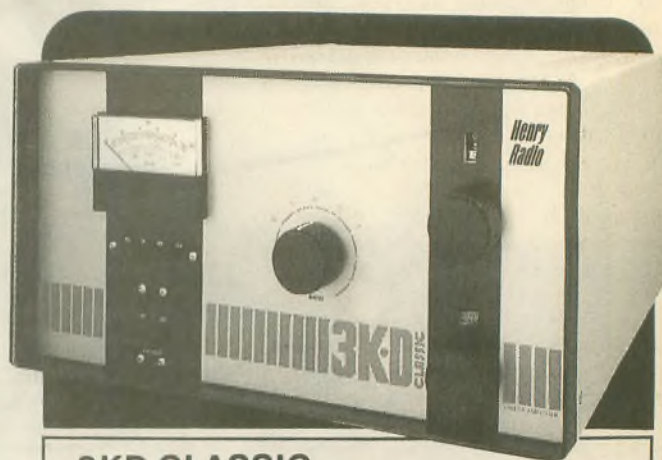
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Nine-year-old Extra

Thomas Donovan of Garden City, New York, is perhaps the youngest amateur Extra operator in the United States.

"It's wonderful to see a resurgence of interest by young people in the hobby, and Tommy has been inspired by many of the articles he's read about young people in ham radio," says Tom's dad, John, N2SPO. "Everywhere we turn, people experienced in the hobby have helped us and encouraged Tommy to keep going. The fact that Tom is only nine years old, just having finished third grade, and has progressed from Novice to Extra in only six months amazes us."

At nine years of age, Tommy is currently a fourth-grader at Stewart school in Garden City, Long Island. It's especially amazing to old-timers of the hobby that such a young person has mastered the electrical theory,



Tommy Donovan, N2STY, awaits his Extra call.

mathematics concepts and Morse code speed of 20 wpm in only six months.

Tom is a member of the ARRL, the

Great South Bay Amateur Radio Club, the Long Island Mobile Amateur Radio Club (LIMARC), the National Amateur Radio Association (NARA), and the Wantagh Radio Club.

Tommy passed his Novice test in (please turn to page 6)

Self-resonance vs. tuner-matched resonance

Considerable vs. relatively insignificant feedline losses

Effective signal radiation patterns of isotropic vs. practical antennas

There are many contrasting yet valid views in the ongoing controversy over antenna efficiency.

The *Worldradio* pages are alive with your own theories. Join in this Amateur Radio community think tank and let us know what works for you.

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You readers are participants — an alliance of active radio amateurs concerned with reality, using radio as a communications tool to develop the skill, quality and full potential of Amateur Radio.

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PUBLISHER'S MICROPHONE

As the phrase goes, "Some people just know how to live."

The latest to become *Worldradio* Super-Boosters (lifetime subscribers) are:

Alvan E. Lawrence, W1SBH, Preston, CT
Jim F. Richardson, N3EZY, Seaford, DE
Bill Blich, AA8GL, Laingsburg, MI
W.S. Cloninger, KB6ICR, Livingston, TX
Charles Sammut, K8MI, San Francisco, CA
Douglas Short (awaiting call), San Anselmo, CA

Charles L. Starke, NX2T, of Briarcliff Manor, New York, was mistakenly listed as NX2J in the January lifetime subscribers mention. Our deepest apologies.

Here, from a letter by Steve Mansfield, N1MZA, at ARRL HQ, is a serious and important thought:

"If we don't actively promote and protect our image and the public decides we're just another species of scanner listener or CB operator, the FCC and Congress won't be so willing to protect Amateur Radio frequencies, and we'll begin to see them disappear."

As to how you can help, Steve mentioned, "We've built a program at the League that draws on the ability and connections of hams around the country to place favorable stories in the local news media about Amateur Radio."

You may wish to contact N1MZA to see how you can help in your local area.

A suggestion from here is: Don't just think about the major metropolitan newspaper. There are weekly or community newspapers in every locale that may be more inclined to present on their pages the local human interest stories of the neighborhood.

While the 1,700 daily newspapers reach about 64 million households, the 7,000 weekly newspapers have a


similar circulation.

Well, there is no end to what you can hear on 20M. The other evening a 7 was HF mobile in Oregon. He was trying to find some small town and was lost. A station in New Zealand came on the frequency. The ZL had a very detailed map of the area in Oregon, and he furnished directions to the mobile station in Oregon.

A very good magazine for the Collins cult is the *Collins Collector's Magazine*. Write to Jay Roman, KB0ATQ, 2465 W. Chicago St., Rapid City, SD 57702, for details.

One of the most highly dedicated Amateur Radio operators anywhere in this world is Bill Welsh, W6DDB. Truly thousands of hams have their licenses today because of Bill. His contributions over the past 50 years could fill a book.

Bill now has a vast amount of printed material which would be of great value to newcomers and old-timers alike. For details, drop a note to



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45527 3rd St. East, Lancaster, CA 93535-1802. I'm sure an SASE would be appreciated. Bill also maintains a vast library of past issues of the radio magazines which are available at a small cost.

DXers who are not yet members of the International DX Association may wish to check in about joining. The organization performs many functions, one of which is furnishing equipment so that rare and semi-rare countries can get on the air. As is the case with all of the non-profit, volunteer run groups, an SASE helps the cause. Write to Bill Jennings, W4UNP, P.O. Box 607, Rock Hill, SC 29731.

Leaning back in your chair after notching your 300th country and feeling pretty good about yourself might be a fine time to think about others whose situation in life might not be so fortunate as yours.

There is an organization of people who were born with severe physical disabilities and are prevented from participating in the workday world the rest of us inhabit.

Through sheer determination many have obtained Amateur Radio licenses. However, due to their circumstances, purchasing equipment is impossible. Donations of equipment (which may require special modifications for handicapped usage) and financial contributions are enabling many to enjoy one of the few life-enriching pursuits available to them.

It is only due to the generosity of others that these particular amateurs may enjoy a hobby that we all regard very highly.

If you care to help, write to Patrick Tice, WA0TDA, Courage Handi-Ham System, 3915 Golden Valley Rd., Golden Valley, MN 55422. Here is an opportunity to make a real difference in the life of someone else.

—Armond, N6WR

Extra

(continued from page 3)

May, his Technician test two weeks later, his General test in July, his Advanced test in September, Morse code at 20 words per minute in October, and his Extra test on 14 November 1992. He's progressed so quickly, the FCC can't keep up with him. Tom's call sign was just changed by the FCC from KB2OZP to N2STY when he went from Novice to Technician to General. As an Extra, he'd like to get a call sign like AA2ZZ before they run out of AA call signs in Region 2.

Amateur Radio operators and their

organizations trying to breathe new life into the hobby by getting more young people involved is really working. "This started out as a way to enrich Tommy's education and challenge his intellectual abilities," says Karen Donovan, Tom's mother and study buddy. "He's so enthusiastic, he easily gets others involved. Not only has he given a half-hour talk to his fourth grade class and hosted a Cub Scout Den meeting about ham radio, he's gotten the whole family involved. Since May, Tommy's dad is now a General, N2SPO; Tom's brother, John, Jr. is a Tech-plus, KB2OZO; and I just

passed my Novice and Technician exams," says Tommy's mom. "Now he has to help me learn Morse code."

When asked, Tommy says he loves the hobby because he likes to meet friends from all over the world. His contacts to date include 11 states and 18 foreign countries as far away as Moldova, Russia and Caracas, Venezuela.

Tom plans to enjoy a lifetime of fun and excitement, communicating with others, helping in emergencies and crises, and exploring the many other facets of this fascinating hobby such as moon-bounce signals and satellite communications. WR

Handi-Hams in need

The Courage Center Handi-Ham System celebrated 25 years of service with their Silver Jubilee in 1992, a year that marked many improvements and expansions.

Code and theory study materials and assistive programs became available for the first time on computer disk. Some items became available in Braille. The commitment to providing materials on audio tape has continued with an upgrading of the tape production system.

Pam Westling, NØEFI, who herself learned Amateur Radio through Handi-Hams, joined the organization as student coordinator. Two successful radio camps were held in 1992 and many licenses and upgrades were achieved. The volunteers continued their fine work, generously giving of their time and talent.

All of this has been done in the face of cuts in staff hours and office space against rising costs of tapes, camp rental, ship-

ping, etc. Although the Handi-Ham System's organizers are experts in stretching each dollar, there is a considerable shortfall to balance 1992's budget.

Do consider sending a gift to support the work of the Handi-Ham System. You will help assure that Handi-Hams will continue to be able to share Amateur Radio with people all around the world who have physical disabilities.

To make a contribution to this worthy cause, contact Patrick Tice, WAØT-DA, manager, Handi-Ham System, at the Courage Center, 3915 Golden Valley Rd., Golden Valley, MN 55422; 612/520-0515. WR

Hams facilitate books to Fiji

EVERETT CURRY, Jr., K6VGL

Last year a hurricane swept through the Fiji island chain. In the aftermath of the storm, a school for 400 students on Waya Island, one of the Fijian group, was badly damaged. Last summer, Jerry Bounds, a Portland, Oregon, man who had viewed Waya Island when he served as a crew member for the *Bounty*, was able to revisit the people he had met there. He was dismayed to find the school damaged and the students using out-of-date textbooks, which were in short supply.

On returning to Oregon, Jerry Bounds determined to find a way to provide new textbooks for Waya Island's students. With the cooperation of friends in Portland, Powell Books, and Airborne Freight, a shipment of 1,750 pounds of books was put together.

One problem remained. There was no way to let the island's residents know the shipment would be arriving at the airport in Nadi (pronounced, nandee). Having seen what Amateur Radio could do to help in unusual circumstances, Jerry Bounds reached out to ham radio for help.

An article appearing in the 21 December 1992 issue of *The Oregonian* in Portland asked for help from the ham community. Everett Curry, K6VGL, of Hillsboro, Oregon, read the article and contacted Luck Hurder, KY1T, at the ARRL in Newington. Luck reminded the group that The Kingdom of Fiji does not have a third-party agreement with the US. However, he suggested contacting hams in Fiji directly.

K6VGL contacted Willard "Spud" Monahan, K6KH/3D2KH, in Manhattan Beach, California, for information on hams in Fiji. The names of hams affiliated with the Fiji Amateur Radio Association, the University of South Pacific, and the American Embassy were identified. With information ob-

tained through these contacts, arrangements were made to contact the school's head-master, then in Suva for the holiday, to notify him of the book gift. The books will be ready for the next school semester, in part, through the help of Amateur Radio operators.

Even when "on-air" radio contact is impossible, Amateur Radio operators are people who "get things done." Special thanks go to Spud Monahan, K6KH, for invaluable assistance. WR

Boy Scouts' new tower

The Circle Ten Council of the Boy Scouts of America has agreed to permit MetroCel (a division of McCaw Cellular) to construct a building and antenna tower at Camp Wisdom, Dallas, Texas.

The building and tower will be shared with K2BSA, the Amateur Radio station of the Boy Scouts of America. This facility will more than double the building space and provide a taller antenna structure than is presently used. Construction is scheduled to begin in February and will take about two months to complete. WR

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Continuous improvement in today's amateur products

STEVE HALL, WM6P

If you live in the competitive world of professional high-tech electronics, then you may have heard of TQM, or total quality management. This new way of running a business is at the heart of becoming competitive in an increasingly competitive world. If you have noticed the ads for US auto manufacturers these days, the stress is on quality. It is their "most important product," claim some.

Part of this new emphasis on quality deals with "continuous improvement." This means that manufacturers can no longer be satisfied with an existing product or manufacturing procedure; it must be improved every day. If improvement isn't continuous in their product line they will be overtaken by the competition.

U.S. auto and electronics companies dominated their respective industries in the 50s, 60s and 70s and then became complacent. Foreign companies saw the weakness of the US giants and surpassed them. This also caused the failure of many past US Amateur Radio equipment manufacturers. As I thumb through an old copy of my first 1962 ARRL Handbook, I see the names that have passed from the amateur market, either from failure or to pursue other markets. Collins, National, Hallcrafters, Gonset, E.F. Johnson and Hammarlund are just a few. In fact, I do not see any of today's most successful manufacturers in this old publication.

A company that has done well and won't be passing from the marketplace is MFJ Enterprises, Inc. This American company uses American design ingenuity and a combination of both American and overseas manufacturing to produce a competitive product line.

The design work is done locally using the talent of hardware and software engineers in the college town of Starkville, Mississippi. They attract graduates from the local college and provide a service to the community by giving job experience to undergraduates. Most manufacturing is done at their main facility in Mississippi.

Ameritron, another American company, has been a popular manufacturer of Amateur Radio amplifiers for many years.

A characteristic of both MFJ and Ameritron is the diversity of their product lines. Ameritron has one of the largest selections of amplifiers in

the industry. They range from small low-power amps to full legal output designs using the newest ceramic-tube designs. There are products for all price classes.

The MFJ product line is too lengthy to detail but is well known for its line of antenna tuners, again from small mobile units to the high-capacity 3kW sizes with roller inductors, some of which I have used successfully in my amateur station for years.

Many manufacturers have entered the amateur packet radio market with excellent products, but MFJ has kept their packet TNC prices low, forcing the rest of the market to remain affordable.

In the past I have reviewed MFJ products including the very innovative MFJ-207 SWR analyzer. I have not seen anything quite like it in my 29 years of hamming. It allows you to determine the standing wave ratio of an antenna, covering from 1.75 to 33.5 MHz, without the use of a transmitter. Due to the low-power operation of the analyzer, antenna adjustments are possible while reading the meter on the analyzer. This is in contrast to typical SWR adjustments using transmitted power. In the past, real-time adjustments were not possible due to radiation from the antenna system. After decades of SWR bridges being marketed, here is something new!

Continuous improvement has led to an improvement of the MFJ-207 with the introduction of the model MFJ-247. This new model has added a frequency counter to the MFJ-207 SWR analyzer to better allow the user to determine the frequency of operation. When not using the unit to analyze antenna SWR it may be used

as a general purpose frequency counter. Under \$200, it's priced no more than other manufacturers' counters without the SWR capability!

In the area of antenna tuners, I have recently tested the MFJ model MFJ-986. This unit is rated at 3kW, capable of tuning antennas designed for use from 1.8 to 30 MHz, both balanced and unbalanced.

The reason I have rated this unit as an improvement over other models, both MFJ's and its competitors', is the ease of tune-up due to a unique design. Having used dozens of tuners in the past, this design is simply easier to use. Using a Differential-T design, one control is eliminated, saving time during tune-up.

Normally when using an antenna tuner the optimum position of two capacitors and either a rotary switch or rotary inductor is required to match an antenna to a transmitter. The Differential-T gangs the capacitors, both input and output on one control. This leaves the rotary inductor as the only other variable control to tune. Frankly, I find it faster to tune this coupler than describe its operation. While MFJ doesn't tout this design as an improvement, I certainly do. I have used it on a variety of non-resonant

(please turn to page 11)

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| G5RV | 80-10 | 102' | \$34.95 PPD |
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| G5RV-JR | 40-10 | 51' | \$29.95 PPD |
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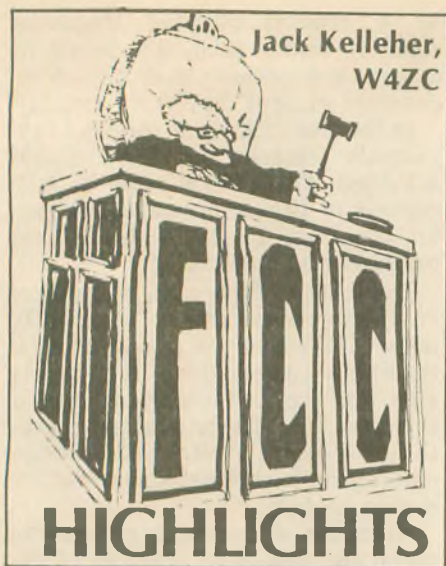
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Proposed rule changes VHF/UHF

In response to three unrelated petitions, the Commission has issued a Notice of Proposed Rulemaking (PR Docket 92-289) which would:

- 1) Create a small new "weak signal" subband (222.0-222.15 MHz) where repeaters would be prohibited;
- 2) Authorize frequency privileges to Novice Class operators in the entire 222-225 MHz band;
- 3) Allow Novice Class operators to be licensees and control operators of repeaters in the 222-225 MHz band as well as in the 1270-1295 MHz segment of the 1240-1300 MHz band.

The Commission said it believed there was merit in the petitions and asked for comments on the proposed rule changes. "They offer improvements in the operational standards for the Amateur Service. The availability of a small protected subband at 222.0-222.15 MHz would facilitate experimentation. Permitting Novice Class operators to be licensees and control operators of repeaters and authorizing them additional frequency privileges would provide

an opportunity for Novice Class operators to become proficient in a wide variety of Amateur Service operations. They would also have more flexibility in selecting the mode of transmission. Choosing the appropriate mode would result in a more efficient use of available spectrum. Comments are invited on the effect that the proposed changes would have on Novice Class licensees."

The FCC noted that they "...amended the Amateur Service rules in PR Docket 90-55 (the codeless Technician Class proceeding) based on, among other things, the amateur community's view that the Novice Class operator license is needed as an entry level for persons who cannot pass the more difficult written examination for the Technician Class license, but who can pass a slow-speed telegraphy examination. Comments are also requested, therefore, on the effect that the proposed changes would have on the current amateur operator license class structure." (*W5YI Report*, 12/15/92; *ARRL Letter* 12/24/92)

Processing license applications

According to John Guili, chief of the Commission's Washington DC computer applications division, the FCC will be upgrading its information systems infrastructure in early 1993, both hardware and software. A new amateur licensing system is scheduled for implementation during the first quarter of 1993.

The FCC plans to move the existing mainframe, batch-oriented system to a

local area network (LAN) based client-server architecture, capable of accommodating both paper and electronic filings from the volunteer examiner coordinators (VECs). The new system will be tested later on in 1993 and plans are to have the VECs file Form 610 applications electronically starting in early 1994.

Guili said he envisions the new process will be similar to accessing a computer bulletin board with its menu of functions—including uploading of Form 610 information. This should greatly speed up issuance of Amateur Radio operator licenses. (*W5YI Report* 12/15/92)

The new broom is sweeping

It is understood that Chairman Sikes of the Federal Communications Commission has submitted his resignation effective 19 January 1993, the day before the new administration takes office.

According to the *W5YI Report* of 1 January 1993: "The big question is who will be the next FCC chairman. We have heard all sorts of names mentioned including present commissioners James Quello and Ervin Duggan. While supposedly an independent agency, the FCC usually adopts the agenda of the administration. What direction the Clinton administration will take on Amateur Radio is anyone's guess. One thing for sure, ham radio has never been a high-priority item at the Commission. Commissioner Sherrie Marshall will also be replaced, since President Bush did not reappoint her.

Amateur Radio Call Signs

Amateur Radio operators often ask the FCC what call signs have been assigned lately. This list shows the last call sign in each group to be assigned for each district, as of 1 January 1993.

For more information about the call sign assignment in the Amateur Radio Service, see Section 97.17(f) of the FCC Rules, or write to the FCC, Consumer Assistance Branch, Gettysburg, PA 17325-7245.

| Radio District | Group A Am. Extra | Group B Advanced | Group C Tech./Gen. | Group D Novice |
|-------------------|----------------------|---------------------|-----------------------|-------------------|
| 0 | AA0KZ | KG0CI | N0UXC | KB0KVV |
| 1 | AA1EW | KD1LZ | N1NZA | KB1ANK |
| 2 | AA2MB | KF2MC | N2TFP | KB2PRF |
| 3 | AA3CU | KE3GE | N3NVF | KB3ALG |
| 4 | AC4YL | KQ4KY | | KD4VFC |
| 5 | AB5JS | KJ5HK | | KB5WQW |
| 6 | AB6PR | KN6EY | | KD6QIP |
| 7 | AA7SX | KI7IV | | KB7RLT |
| 8 | AA8JP | KF8YK | N8WMC | KB8OLY |
| 9 | AA9FP | KF9MQ | N9RSZ | KB9IGV |
| North Mariana Is. | AH0Q | AH0AL | KH0AZ | WH0AAT |
| Guam | NH2L | AH2CR | KH2GL | WH2AND |
| Johnston Is. | AH3D | AH3AD | KH3AG | WH3AAG |
| Midway Is. | | AH4AA | KH4AG | WH4AAH |
| Hawaii | | AH6MH | WH6KD | WH6CQB |
| Kure Is. | | | KH7AA | |
| American Samoa | AH8G | AH8AE | KH8AI | WH8ABB |
| Wake Wilkes Peale | AH9C | AH9AD | KH9AE | WH9AAI |
| Alaska | | AL7ON | WL7HL | WL7CGJ |
| Virgin Is. | NP2V | KP2CA | NP2GB | WP2AHU |
| Puerto Rico | | KP4UO | | WP4LQC |

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FCC BBS

The FCC operates a computer bulletin board open to all. Running at 300-1200 baud, the number is 301/725-1072. It provides many features, including a database that holds records on manufacturers and the equipment they submit to the FCC for approval.

Because many electronic devices are potential RF transmitters, they must be submitted to and approved by the FCC. Each unit is issued a number. Many electronic technicians use this FCC ID number to track down the manufacturer of a certain product. Also available on-line are public bulletins, operational information on the laboratory, information on how to apply for equipment authorization, and latest rulemakings. The BBS allows each user six minutes per call. (*W5YT Report 1/1/93*)

Irregularities

An item in *Worldradio* for July 1992 under the foregoing title reported on alleged irregularities in VE testing in the Los Angeles area. The following item, from *Westlink* for 27 November, puts a different light on the incident.

"Charles Pascal, WB6CIY, and Sandra Crane, N6TFO, have filed an 'Equal Access to Justice' claim against the United States government in connection with the recent 'sting' operation that resulted in proceedings against them by the FCC. Pascal described the action to recover some of the expenses the pair incurred in mounting their defense.

"In late September, Pascal and Crane were successful in thwarting an action that sought the permanent revocation of their Amateur Radio licenses. The FCC pursued the case based solely on allegations made by the American Radio Relay League's Los Angeles Official Observer Corps.

"An Equal Access to Justice claim provides an avenue of reimbursement to defendants in cases brought by the government where insufficient evidence is brought forth to affect a conviction. In the original case against WB6CIY and N6TFO, the FCC administrative law judge was critical of evidence submitted to the court by the government. In a pretrial hearing that led to a consent decree, ALJ Chachkin directed the FCC to investigate those who brought the charges against Pascal and

Crane to determine whether the FCC itself had unknowingly become a party to a vendetta against the pair.

"According to Pascal, his Washington DC attorney George L. Lyon Jr. hopes that a favorable ruling on the request may be forthcoming in 60 to 90 days.

"It is believed by some that this may be the first in a long line of legal actions expected to be brought by Pascal and Crane against their possibly now-discredited accusers."

The 10 December *Westlink Report* contains a related item entitled "ARRL to clamp lid on OO Program" which states: "It appears that the American Radio Relay League is about to clamp the lid on the 'super cops' in its Official Observer and Amateur Auxiliary programs. According to an in-depth report to the League's executive committee by the ad-hoc committee on the Amateur Auxiliary, the time has come to revise the concept of the regional monitoring station to make it clear that the Amateur Auxiliary was and is only authorized to deal with on-the-air monitoring for rules violations and nothing else.

The "Dog" nailed

A Notice of Apparent Liability of Monetary Forfeiture has been issued pursuant to Section 503(b) of the Communications Act of 1934 (as amended) to Michael E. Whatley, WA4D, for "wilfully and maliciously causing interference to other operations in the Amateur Radio service..."

"Whatley, of Alexandria, Virginia, is known on the ham bands by his self-

assigned nickname "the dog," (W-A-4-Dog). On 17 November 1991 the FCC's monitoring station in Allegan, Michigan, monitored and traced a series of interfering transmissions to Whatley's amateur station. The Commission says that Whatley deliberately used these signals to interfere with the communications of other amateur operators on 7257 and 7258 kHz. These transmissions continued throughout the period from 9:03 a.m. to 9:52 a.m. The FCC says that WA4D "wilfully operated on frequencies which he knew were being used and harassed other operators with rude and insulting communications. Mr. Whatley identified himself with his call sign, WA4D ("Willy Able Four Dog") during his communications. When other operators tried to switch frequencies, Mr. Whatley followed them onto the new frequency and continued to harass them," the FCC says.

Whatley was fined \$4,000 for these alleged regulatory violations, but in keeping with the forfeiture guidelines set out in the Commission's policy statement, "Standards for Assessing Forfeitures," the amount was reduced by \$2,000, to \$2,000. The FCC says that no further adjustments appear warranted in this case. Whatley is expected to file an appeal.

Spectrum requirements for the Amateur Service

Our September 1992 column mentioned an NTIA (National Telecommunications and Information Administration) Notice of Inquiry which, among other things, asked for comments on the future spectrum requirements for the Amateur Radio service.

The ARRL's response to the NOI is based in part on a position paper prepared by the administrative council of the International Amateur Radio Union (IARU) prior to WARC-92, cites these specific needs:

- A new shared allocation in the vicinity of 190 kHz (A new LF allocation, for experimentation);
- Retention of 1.8-2.0 MHz (The amateurs' only MF band);
- A common worldwide exclusive allocation of at least 300 kHz in the 3.5-4.0 MHz band, and retention of the additional shared allocation in Regions 2 and 3;
- A new narrow, shared allocation in the vicinity of 5 MHz;
- A 300 kHz-wide exclusive allocation in the vicinity of 7 MHz;
- Expansion of the present secondary allocation of 10.1-10.15 MHz to a primary allocation of 250 kHz;
- A return to the pre-1947 20M allocation of 14.0-14.4 MHz;
- An exclusive allocation of 250 kHz at 18 MHz;

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Improvement

(continued from page 7)

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Fortunately for today's ham radio operator, this competition has led to a wealth of new and improved products. A manufacturer can no longer market the same transceiver or accessory year after year. Now significantly better models must be introduced several times per year. They must continually strive for improvement or be passed by the competition, with you and I, the consumer, receiving the benefit.

WR

Fried batteries

DON R. SMITH, K6CHS

For those of you who have numerous hand-held transceivers, and therefore numerous batteries, here's an idea for a battery charger shutoff that I have used for some time.

Obtain the "garden variety" light timer from any drugstore, market or junk box, remove the cam that turns the timer on, thereby leaving only the off cam intact. Plug the battery charger into the timer, set the timer to the appropriate time (eight hours or whatever), plug the timer in the AC outlet, turn the timer on manually and forget it.

The timer will turn it off but not on, thus you'll have no more fried batteries.

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tween 30 and 50 MHz;

- Retention of the band 50-54 MHz where it now exists, and an allocation of at least 2 MHz in other geographical areas, with at least 500 kHz on an exclusive basis;

- For both the amateur and amateur satellite service, retention of 144-146 MHz as a worldwide exclusive allocation with elimination of existing footnotes that allow operation by other services in some countries, and retention of the band 146-148 MHz in Regions 2 and 3;

- Retention of 222-225 MHz, and access to part of the band 216-220 MHz; or upgraded access to present bands near 400, 900, 1200, 2300, 3300, and 5650 MHz, and at 10 and 24 GHz, for both terrestrial and satellite uses;

- In addition, any modifications in government primary allocations should either leave the amateur secondary allocations unchanged or provide for alternative spectrum.

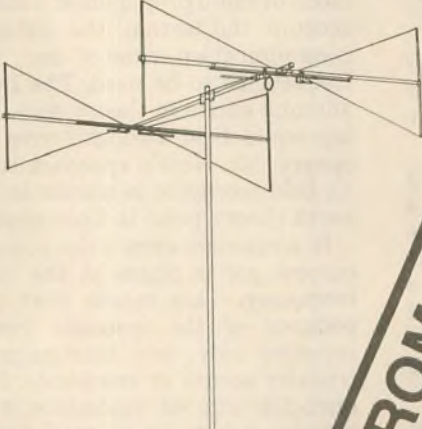
We hope you've all started the new year happily, and resolve to spend more time on the air in 1993.

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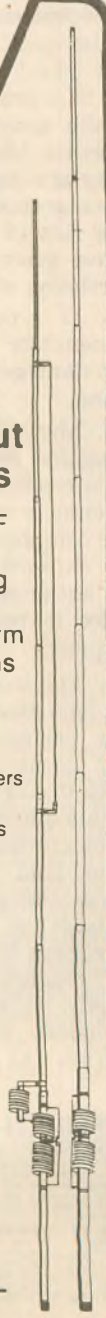
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Resonance and field strength

ART McBRIDE, KC6UQH

The article, "The Myth Of The Resonant Antenna," by Mr. Ron Nott, K5YNR, in the December issue of *Worldradio* is in disagreement with my understanding of antenna and electronic theory. At my suggestion, his article became a discussion topic on the Palomar Amateur Radio Club Thursday Evening Ham Help Net on 2M. Several points were made by several amateurs on the net.

1. There is confusion between "self-resonant" and "resonant" antennas in the article. The test question states "self-resonant"; in the rest of the article he uses "resonant" terminology.

2. The FCC charts shown only apply to a groundwave in the near field of the antenna (less than six wavelengths). Most antenna field strength tests are done in the far field (a distance greater than 100 wavelengths). The rest of the data (field strengths above ground level and ground conductivity) were left out.

3. It is not explained how a 1 kW transmitter could be operated, without damage, into a non-resonant antenna.

4. Mr. Nott does state that a capacitor must be used to operate a 3/8-wave antenna but insists that the antenna is not resonant. Yet any reactive component that is introduced into the antenna circuit becomes part of the antenna circuit and is done so to make it resonant at the operating frequency.

5. The worst error is the fact that the field strength measurements were only performed at ground level. In skip communications we are interested in skywave propagation and injection angle. In the case of a quarter-wave groundplane antenna the maximum field intensity is 30 degrees above the horizon. As the antenna radiator is increased in length the maximum field is lowered in angle until it reaches the horizon at a 5/8-wave length. It has nothing to do with resonance, as it is assumed one must address the complex impedance and

make the necessary reactive corrections to achieve antenna resonance.

6. The question on p. 11 Mr. Nott seeks to eliminate is correct, as any additional components added to resonate the antenna also produce an additional loss. Thus a self-resonant antenna is technically more efficient for the same size radiator.

However, as all antennas radiate in many directions, the sum integral of field strength over the total sphere surrounding the antenna must be considered before any statements can be made as to the antenna's efficiency. It can also be demonstrated that for a given field intensity in any one area of the sphere, a resonant antenna may provide a greater field intensity than a self-resonant antenna, as the self-resonant antenna is a fixed radiation pattern by definition. It is up to the user to pick the radiation pattern that is the most desirable for the desired mode of radio propagation, taking into account the terrain, the distances of communication, time of day, and the frequencies to be used. The Isotropic antenna exists in theory only, delivering equal field strength over a total sphere. Mr. Nott's approach to antenna field strengths is similar to the flat earth theory prior to Columbus.

In a resonant circuit the voltage and current are in phase at the resonant frequency. This means that the impedance of the resonant circuit is resistive only, and maximum power transfer occurs at resonance. For frequencies out of resonance the impedance is both resistive and reactive. The reactive part of the impedance reflects power back to the driving source. This occurs in generating AC (i.e., power factor), and in transmitters (i.e., reactive reflected power).

The same theory applies to an antenna. The antenna and ground circuit form a resonant circuit with the radiating losses appearing as a resistance across an LC circuit. Any length of antenna can be made resonant by including an appropriate reactance in the feedpoint of the antenna and ground system to make the open end of the antenna a voltage point. It can also be achieved by matching the base impedance of the antenna to make the top voltage, but efficient impedance transformation usually requires the use of a resonant LC circuit. This is true even if there are several voltage and current points along the antenna.

The reactance may be either inductive or capacitive to make the antenna electrically a quarter-wave multiple of the operating wavelength. This is only done to make the voltage and current in phase. Once this is done the load impedance must be addressed. It can vary from 10 to 10,000 ohms. This is why a random wire tuner is used, as it performs both the resonating and matching function. The matching function is necessary because most all transmitting equipment is designed to operate with a 50-ohm load only.

An antenna has Q, both loaded and unloaded. The components used in resonating the antenna as well as the surface area of the antenna determine the unloaded Q. The unloaded Q is not easily measured, as it must be done in a totally shielded enclosure where all radiation is contained, such as a cavity resonator.

The loaded Q is a function of the wavelength of the antenna. The greater the length, the lower the Q. For best efficiency the unloaded Q must be at least 10 times greater than the loaded Q. In short antennas the Q is high and the bandwidth is small. The maximum circulating current and voltage present in the antenna circuit equal the driving power multiplied by the loaded Q when measured anywhere as long as the impedance of the measuring point is considered. (Note: The maximum current and voltage are spaced a quarter-wave apart in the antenna. I cannot overemphasize the importance of fusing low-loss inductors, including the conductivity of the antenna radiator itself, and capacitors in the antenna resonator circuit. This is especially important in antennas that are physically less than a quarter-wavelength in size.)

The common mistake made is that these components need only be large enough to survive the transmitter power. In reality, they must handle the loaded Q multiplied by transmit power. If you are operating with low power, you need the maximum anten-

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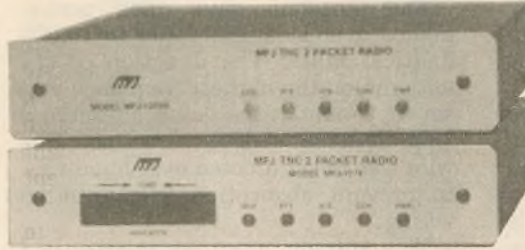
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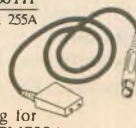
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na efficiency. The resonating components are in series with the antenna, and antenna efficiency cannot be achieved by using small components in the antenna resonating circuit. If you can operate with 2kW into your antenna continuously without damage, you now have an antenna with which you can work QRP and be heard.

Several hams might want to call you a liar when you tell them you are running QRP. Just think what you could do with a 100W. If you operate key down for 20 minutes and nothing is warm after shutdown, then the components are large enough. Any sign of heating is an indicator of loss in power.

A transmission line is designed to be operated at the characteristic impedance only. It can be described as a series of LC circuits that efficiently transfer power over a wide range of frequencies when both ends are terminated with a resistive load of the impedance of the line.

Using coax line to couple an antenna to a random wire tuner makes for a complicated reactance solution for the tuner and, in cases when the base impedance of the antenna is above 300 ohms, the reactive losses of the coax become a large portion of the load on the transmitter. While you can achieve a good match in this configuration, the coax line does most of the radiating and the *field strength* of the antenna goes down proportionately. As the coax line is usually near the ground, most of the radiation from the line is either absorbed or reflected to the sky in an angle that is useless for skip propagation.

This is a common mistake made by radio amateurs in setting up a random length antenna and tuner system. Obviously the random wire tuner belongs at the base of the antenna system and not in the shack. When this is done coax line is now matched, does not radiate, and delivers most of the transmitter power to the random wire antenna tuner where it is then radiated by the antenna to other stations efficiently. A side benefit is an improvement in receiver noise, as the coax transmission line does not act as an antenna to receive noise from other wires near the coax.

In commercial ship-to-shore HF stations I successfully used a remote tuner and a sloping wire approximately three wavelengths long at the highest frequency, which made it directional with a low-angle of radiation, horizontally polarized, on the highest frequency and omnidirectional, vertically polarized, on the lowest frequency with both components in the intermediate bands. By choos-

ing a half-wavelength multiple, making the feedpoint of the antenna voltage, a minimum amount of ground was required. The wire size was at least #6 and the angle of the wire 23 degrees.

This antenna gave good performance over a range of 100 to 10,000 nautical miles. The direction of the antenna on the highest frequency was set up to match the vessel's preferred long-distance sailing direction. The wire was never erected over buildings, to prevent absorption from internal wiring.

This antenna was easy to erect and consistently outperformed many other types of antennas, including commercial-built cubical quads, log periodic,

and Yagi arrays. This type of antenna is an example of utilizing operating wavelength to vary antenna pattern versus frequency, using reactive components to achieve resonance on all bands. This is done without any mechanical changes to the antenna configuration. The preferred matching network used is a pi (C-L-C) for best harmonic suppression. Careful tuning will yield a 1:1 match on each frequency.

A recently licensed amateur operator, KC6UQH has held a valid commercial radiotelephone license since 1962 and has been involved in the design, construction, repair and installation of shipboard MF/HF transmitters for over 30 years.

Special Events...

Fly-In commemoration

The Fort Pierce ARC will operate KN4RY on 6-7 March from St. Lucie Airport to commemorate the Experimental Aircraft Association Fly-In.

Operation will be on 20, 15 and the Novice portion of the 10M phone band from 1600-2300Z.

For QSL or certificate, send 9 X 10 or #10 SASE with two units of postage to Fort Pierce ARC, P.O. Box 0004, Fort Pierce, FL 34954.

Norwegian Lady anniversary

The Virginia Beach ARC will operate WA4TGF 27-28 March to commemorate the 102nd anniversary of the *Norwegian Lady*.

Operation will be on CW—10 kHz up from the bottom of the Novice subband; phone—3.880, 7.280, 14.280, 21.280 and 28.363 from 1400Z 27 March to 2000Z 28 March.

For certificate, send QSL and SASE to VBARC, P.O. Box 62003, Virginia Beach, VA 23462.

Cherry Blossom Festival

The Macon ARC will operate W4BKM 27-28 March from the 11th annual Macon Cherry Blossom Festival.

Operation will be on CW: 7.135, 14.035, 21.135 and 28.135; phone 7.235, 14.235, 21.335 and 28.335 from 1300Z-2200Z both days.

For certificate, send QSL and 9X 12 SASE to Macon ARC, P.O. Box 4268, Macon, GA 31204.

442nd Regimental anniversary

The Hawaii Army MARS will operate a special event station on 27 March from the Army MARS station at Schofield Barracks and selected other sites on Oahu and the neighbor island to commemorate the 50th anniversary of the creation of the 442nd Regimental Combat Team.

Operation will be on all bands, all modes. Look for operations in the lower portion of the General and Novice subbands. Satellite and slow-scan TV activities are planned as well as CW, voice and digital communications.

For commemorative QSL, send QSL and SASE to Al Shaver, AH6KX, Apt. #608, 84-265 Farrington Highway, Waianae, HI 96792.

Telephone RFI solution

Fortunately there is no telephone interference while my transmitter is operating on 10, 15, and 20M. But when it is on 40M, strong RFI occurs.

After the telephone company tried RFI chokes and bypass filters with no success, I reasoned that the telephone line might have a resonance at some multiple of a quarter-wavelength at 7 MHz. The phone company then added 15 feet of line to their circuit.

This resulted in detuning the telephone line and eliminating the RFI.

—Sam Peck, W6COR,
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Battle of Cutler Ridge

(part I)

ALBERT J. GEHA, KF8JQ

Last summer I worked with the Toledo Disaster Medical Assistance Team, helping out in Dade County, Florida, immediately after Hurricane Andrew. My main function was the communications officer for the team, and I also received and delivered health and welfare messages for the DMAT members. I acted as the command center net control for our field hospitals and clinics, and I was in direct and constant communications with the National Disaster Medical System contingent located in Cutler Ridge, Florida. The following is an account of my experiences in this effort.

28 August

At 2230 the call came that we had been activated and were to depart at 1130 Sunday the 30th.

I never imagined that they'd really call us. The thought of being on the DMAT (disaster medical assistance team) seemed exciting. But to really participate as a radio operator in an actual disaster made me wonder if this wasn't out of my league.

But there was no choice, I was the only operator they had available at the time. The other amateur was an R.N. and he would be too busy with his nursing duties. "Okay, Denny," I whispered into the receiver, "I'll be ready."

The slumbered voice of my XYL said, "Who was that?"

"Wrong number, honey."

"Wrong number my eye," she said as she rolled over, mumbling an expletive about radio amateurs. I would explain to her in the morning.

29 August

I dug out my dated duffel bag with my old fatigues in it. The smell of mothballs made me think back to when my waist size was a 32 in 1967. At least the duffel bag hadn't shrunk. Then I gathered all the equipment and antennas I thought I would need. The local ARES group was more than willing to let us use whatever we would need.

I packed all the gear in large plastic storage containers. The 2M 5/8-wave antenna and a fishing pole (how else to string my G5RV up high?) were stuffed into a long cardboard tube. Besides three HTs and a 2M mobile rig, I also took my Yaesu 757 GXII and an MFJ 949D tuner. A tool box with solder, solder gun, connectors, black tape, a

full assortment of tools, and a large roll of duct tape was also secured.

In retrospect, the one essential item which should have been on the list is a frequency counter. There were many different frequencies in use by the various relief agencies, either on amateur or commercial bands. Oftentimes our own contingent of personnel worked with the different agencies out in the field hospitals; they would take medical care to the disaster victims afraid to leave their homes. Sometimes we did not know which frequency they were using, yet if we'd been able to figure it out we could have tuned in on one of the HTs

and remained in radio contact with our own personnel.

Our group consisted of primarily medical personnel from local hospitals in Toledo: Medical College, St. Vincent's, Toledo Hospital and St. Charles. There were 42 of us, most of whom were nurses and EMTs. I am a laboratory technician from the Medical College Hospital, but my duties were communication and debriefing.

We departed from Toledo 180th tactical air base at 1133. We arrived in Opa-Locka at 1422. As we disembarked they lined us up on the tarmac next to the plane until we had all gotten off. The blistering sun beat down on us as we stood there waiting for the order to walk the 200 yards to the hanger. After reaching the hanger, someone came around and distributed MREs. We wait-



The scene at Cutler Ridge was one of devastation.

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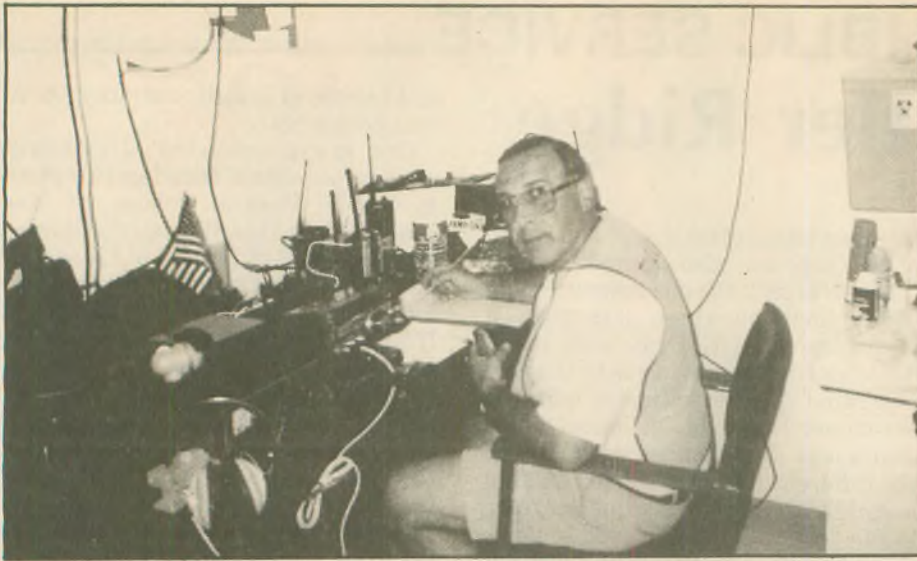
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ed for buses to take us to Cutler Ridge. This is where the DMAT set up their headquarters.

At approximately 1630 they asked us to stage a reentry into the hanger from the tarmac so that they could tape our arrival for the media. At 1645 Admiral Mason welcomed us with a National Disaster Medical Service (NDMS) official that accompanied him. He said we will probably be held in reserve for the time being. At 1830- we were still waiting in the hanger at Opa-Locka air base. Stress and frustration began to set in; the role call was taken again for the third time.

Two school buses arrived at 2200.



Albert Geha, KF8JQ, volunteered as net control for the DMAT.

Finally on board with only our personal gear, we were given a police escort to Cutler Ridge. Our caravan of motorcycle police (it was well after curfew) and buses arrived at Cutler Ridge at 2300. We were met by two officials from NDMS and were told we must remain on the buses until they decided what to do with us for the night. There was nervous talking now as most were getting restless and uncomfortable.

It was pitch black outside except for a few mercury vapor lights that drown out one's immediate surroundings. As our eyes became accustomed to the dark we noticed large amounts of debris and broken limbs surrounding us. It had not been not evident on the trip from Opa-Locka, but now we were getting our first glimpse of the immense destruction.

What was I doing here? I should be home watching Jay Leno at this hour of the night, I thought. Instead I'm standing in the midst of this garbage heap, strewn with broken building materials and the stench of dead animals and rotting refuse.

Our executive director, Churton, and one of the physicians emerged from the government center building. Fortunately it was decided to billet us in the municipal building hallways for the night. It was too late to pitch the tents in unfamiliar surroundings. Cots were brought up from the basement, and we crashed.

1 September

0700. With my face and arms covered with mosquito bites, I began the battle of the duffel bag and trying to find an open sink to shave and brush my teeth, using a canteen to rinse; the local water was contaminated.

Evidence of Andrew hit like an awesome nightmare. Buildings of concrete

were shattered like wooden houses, the insulation hanging from splintered windows. Large, leafless trees, snapped like toothpicks, lay on the debris-cov-

ered ground. From the top steps of the government center, the highway and the Visqueen draped roofs on the other side were visible.

The municipal building was the location for the NDMS headquarters and clinic, manned by the Gulf Coast DMAT. The radio shack was inside the clinic at the northeast corner, away from view. Cots were set up in the shack for the operators. No one challenged us as we strode by the armed 82nd Airborne guards and into the radio shack. I thought it odd that officers were not being saluted by the enlisted men. Time change, I guess.

I introduced myself to Steve, N4GXX. My eyes were on the extensive equipment on the long 10 ft. table. A TS440 was blaring on a MARS frequency. I spotted a number of familiar looking 2M rigs with a variety of commercial HTs neatly tucked in their chargers waiting to be used. There was the usual spaghetti of wires leading every which way, eventually making their way through the window to the rooftop.



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As I expected, Steve, N4GXX, and later Dale, N4SGQ, were extremely helpful and eager to assist in any way they could. The vigil they kept with me during our stay in the tents next to the government center proved to be invaluable. Our armed 82nd Airborne sentry was pulled out from guard duty our first night in the tents. The only contact we had with any semblance of authority at the NDMS headquarters was with Steve and Dale on 445 MHz.

They directed me to the management services unit (MSU) radio command center. I was introduced to the operators and given the frequencies to mon-

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itor and operate during our deployment.

Upon returning to the municipal building next door, they informed us that we would be going to a place called Country Walk, at the edge of the zoo. Apparently this section had not had any medical services since the hurricane, and according to the authorities very little if any attention was directed to this area, so we would be seeing a large volume of patients per day. In addition we were warned that there were still monkeys roaming the area and to remember that the dogs were hungry and confused and to keep our distance from them.

At 1030 we loaded our personal gear

back on the pallets in anticipation of being sent to Country Walk. The government center maintenance people started cleaning up the entire area, as President Bush was arriving that day. Soldiers manned every doorway and all exits and entrances. They restricted our passage and made sure we were all wearing our IDs.

I wasn't yet able to unpack my radios or antennas. The debriefing representative was continuously asking me whether we would be able to make radio contact in Toledo. I tried to assure her that conditions permitting, we would. I began to wonder why I came along; the portable phone was in order so what did they need with amateur

bands? I would soon learn.

1600 I walked back to the government center and used the TS440S in the radio shack. Mike, WB8MZZ, was calling for me on one of the predetermined frequencies, on 20 and 15M. Later I would conclude the only band that was available just about anytime was 20M. The question is, was it worth dragging along a multi-band antenna? Although 20M was good just about anytime, it behooves one to have the capability for all the low bands. This is why I think the G5RV serves the purpose, plus it is easy to pack.

Worldradio's April issue will have the conclusion of this interesting public service account.

Tornado relief

Ohio amateurs join forces

ROBERT R. McKAY, N8ADA

The ability of Amateur Radio clubs to work together as a team in disaster relief was demonstrated during the recent tornado that left a path of destruction through southwest Ohio. The tornado was just one of 24 that wreaked destruction through the south and Midwest the weekend before Thanksgiving.

Four prominent clubs were deeply involved in providing information to the National Weather Service prior to the storm, and then providing emergency communications until telephone service was restored; the Preble County ARC, Treaty City ARC, Miami Valley FM Association and the Dayton ARA played the major roles in the operation.

The tornado dropped out of the sky in southeast Indiana, crossed into Ohio and ripped an 18-mile path of destruction through Preble and Darke counties. Many farms and rural businesses were destroyed before it tore into the small town of Arcanum, Ohio. There it destroyed much of the business district and many homes. Considering the extent of the damage, it was a miracle no lives were lost and few serious injuries occurred.

The Miami Valley FM Association

operates the Weather Net for the area at the National Weather Service in Vandalia, Ohio. The Weather Net was activated at 5 p.m. Sunday, 22 November 1992. It was apparent that severe weather was moving in.

Frank Schwab, W8OK, Bob Green, K8JXE, and Ralph Le Gore, W8FPA, operated the net throughout the evening. Roger Owens, WD8DJR, emergency coordinator for Preble County, the first area to be affected, had spotters out and they reported the first touchdown.

Dave Beam, WA8KZR, emergency coordinator for Darke County, was on the scene in Arcanum shortly after the tornado struck at 6:30 p.m. Without power or telephones and many, many homeless, it was apparent much help would be needed. He called Ron Moorefield, W8ILC, district emergency coordinator, and asked for help.

Ron rallied the forces and by 8:30

p.m. Leslie Brewer, KB8IDM, DARA van coordinator, and 10 operators were on their way to Arcanum to assist the Treaty City ARC (Green-ville, Ohio) and the Arcanum amateurs. The van would remain on site for two days until telephone service was restored. Ernie Hudson, KI8O, emergency coordinator for Montgomery County, assembled relief crews for the operation. Thirty amateurs were on site Monday morning.

The van, set up in the middle of town, served as command post for the police and fire departments as well as the Red Cross and Emergency Management Agency. The disaster overwhelmed the local Red Cross as they tried to feed and house the many homeless. Many of the area amateurs have been trained by the Red Cross in damage assessment and were able to help with this task.

The Preble County ARC continued to work in the rural areas as there was much destruction in the tornado's path. As the clean-up progressed, the amateurs received the heartfelt thanks of the many helped during the disaster.

As Lt. Governor Mike Dewine toured the area, observing his first amateur operated disaster communications effort, he was amazed at the "all-volunteer operation" and the amateurs' ability to move in rapidly and provide a complete area-wide communications system.

Ron Moorefield, W8ILC, coordinated the operation and said, "As always, we learn things from each disaster." He reaffirmed, "Always keep your batteries charged. You never know when you will need them. Also, always carry your ARES card; you can't help if you can't get in." WR



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Sporadic-E and aurora propagation

KEN NEUBECK, WB2AMU

For several years, sporadic-E propagation has been regularly observed by radio amateurs on the HF and VHF bands, from as low as 21 MHz up to as high as 220 MHz. It is a common form of propagation on 50 MHz during the summer season in the Temperate Zones of the earth. Sporadic-E is a local effect, as opposed to F-layer propagation on the HF bands. During E openings only a small region of the Temperate Zone is generally affected at one time. By observations, radio amateurs are able to estimate the general size and shape of the sporadic-E cloud during specific time intervals.

The first time that I heard sporadic-E on 6M, I was fascinated by the strong signals that I heard from one region of the country. Sporadic-E on 6M brought a dead band to life for a short period of time, ranging from a half hour to several hours. It turns out that this was not my first experience with sporadic-E; I found a number of short-skip contacts in my earlier logs on 10 and 15M during the peak summertime sporadic-E season. Yet the effect on 6M was tremendous because the band was dead for long periods of time. I began to investigate further into this phenomenon.

I found out that many questions on how sporadic-E clouds are formed had plagued radio amateurs for years. One theory has attributed E cloud formation to thunderstorm activity. Another ties it to the K index of the sun. Yet there are many instances of contradiction to these theories over the course of a year's worth of observation. For example, not all thunder-

brought up new ones for me to ponder.

The scientific definition for sporadic-E clouds is a plasma which is a collection of charged particles that, in certain states, have the ability to reflect radio signals over a broad frequency range. These clouds are located in the E-layer of the ionosphere, roughly 70 miles above the earth's surface. The creation and location of these E-clouds have been the subject of many discussions and theories. The theory presented here on Sporadic-E cloud generation states that sporadic-E cloud activity in the various zones of the earth is tied directly to activity related to the sun or the earth's magnetic field.

For a period of over two years, I have made daily observations on 6M to listen for various openings. I kept a daily log of whatever propagation I heard each day. This not only includes sporadic-E propagation, but also meteor, aurora and F2 skip. While sporadic-E occurs frequently on the HF bands, I found that 6M was an excellent band for me to observe the effects of sporadic-E and aurora phenomena. This is because, unlike the HF bands, which have daily F skip, 6M is generally quiet, which makes it easier to observe radical changes in the band during an E opening.

Unlike the study by Pat Dyer on 88 MHz sporadic-E openings presented in the March 1992 *QST*, I was looking merely for the existence of an opening occurring on any given day on 6M and not to the total duration. I have tabulated the results in Table 1. The location of my station is at a latitude of 47N, and I will show how this is

| | J | F | M | A | M | J | J | A | S | O | N | D | Total |
|--------|---|---|---|---|----|----|---|---|---|---|---|---|-------|
| Es | 1 | 0 | 0 | 0 | 15 | 13 | 6 | 1 | 0 | 1 | 2 | 6 | 45 |
| F2 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Au | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Meteor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Totals | 4 | 1 | 0 | 0 | 16 | 13 | 6 | 2 | 0 | 1 | 2 | 6 | 51 |

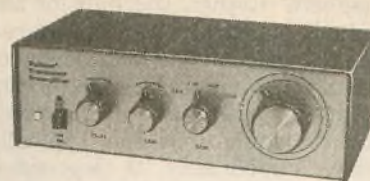
Table 1. 1992 6M observations at WB2AMU (41N, 73W)

storms bring sporadic-E activity and not all sporadic-E openings occur when thunderstorms are in the area. Writing to Emil Pocco, W3EP, the noted VHF expert, provided many answers to my questions but also

relevant to the level of sporadic-E activity that I hear.

The first conclusion that I drew from my listening on 6M was that statements made by hams and radio publications about when sporadic-E

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occurs are not quite correct when they say that sporadic-E is common in the spring and the fall in the Northern Hemisphere. Rather, the bulk of the sporadic-E openings are clustered around the shortest and longest day of the year, 21 June and 21 December. Sporadic-E openings are scarce around the equinox season, typically the days surrounding 21 September and 21 March. Though not impossible, openings in the months of March, April, September and October are rare in the Northern Hemisphere, particularly in the higher latitudes of each of the Temperate Zones.

Using what I observed coupled with what Pat Dyer observed on 88 MHz for 11 years, one can find a basic pattern for sporadic-E openings that is repeated from year to year with some variations. The openings appear to be independent of sunspot count, but not from sunspot location on the sun and the angle of the earth to the sun during the year. This holds the key to the mystery of why sporadic-E occurs when it does and very seldom during the equinox months in the Northern and Southern Temperate Zones.

Further investigation revealed that sporadic-E was a subject of research for scientists for years, and I found a collection of papers on the subject in *Sporadic-E Propagation*, edited by Ernest Smith, which was published in 1962.

Smith determined that the earth could be divided into distinct zones known as the aurora zones, the Temperate Zones and the equatorial zone, shown in Figure 1. In addition, many of the papers concluded that sporadic-E propagation which occurred was caused by different sources. Many of the papers made use of the intense observations of radio conditions that had taken place in the late 1950s, leading up to the International Geophysical Year (IGY) that took place in 1959.

One study was conducted by Chadwick on determining whether there was any correlation between the sunspot count and sporadic-E, and he used data from three different locations around the world (Peru, Alaska and Washington). This data was based on all sporadic-E openings greater than 5 MHz observed at these locations through the course of several years.

He concluded that the results obtained "undoubtedly fail to represent the actual relationship between the variables" (sunspot count and percentage of E openings). He cited earlier studies on the subject which yielded inconclusive results. However, the data he collected showed that sporadic-E openings were constant in

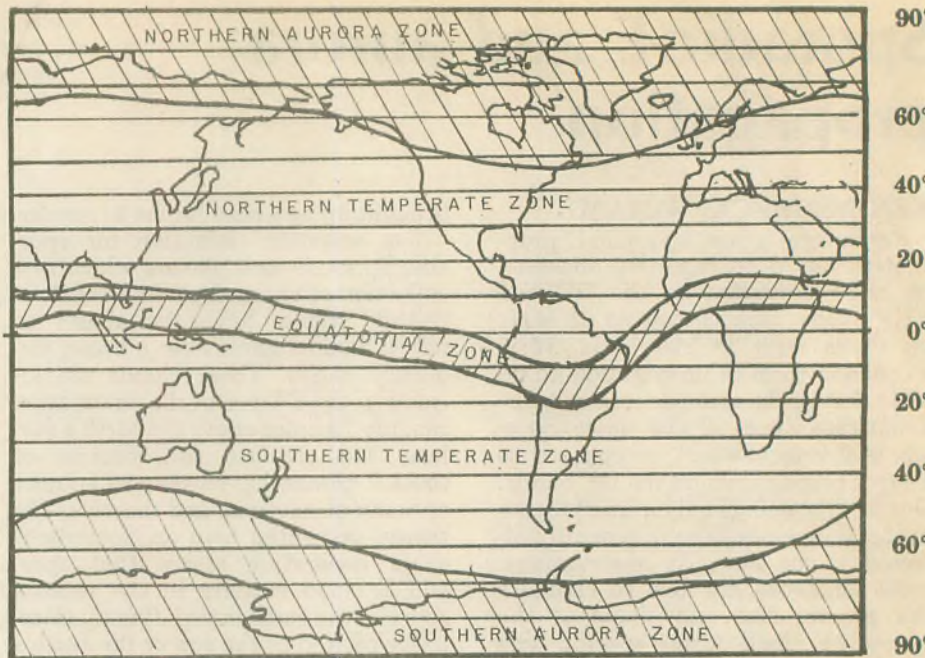


Figure 1. The general zones for aurora and sporadic-E occurrences as determined by scientific data. Note the reflection around the areas of the magnetic north and south poles for both aurora zones; the equatorial zone follows these magnetic deflections also.

the area of the equator and better than 90 percent of the openings occurred during daylight hours. Other data from Alaska showed more aurora type openings to give an even rate throughout the year.

Smith showed that aurora propagation was very common in latitudes above 60 degrees, and for the northern aurora zone the intensity was greater by as much as three to one on the Canadian side versus the Siberian side (see Figure 2). There is no doubt that the location of the magnetic north pole in the northern part of Canada is one of the main reasons for this. In fact, the location of the pole at 100W and

76N in my college physics books corresponds with the graph by Smith that shows the highest percentage of aurora openings surrounding the pole area. The phenomenon of aurora openings in the Temperate Zones corresponds well with days of very high electromagnetic activity.

Sporadic-E, on the other hand, has no correlation with days of high electromagnetic activity. This can be determined by using statistical measures on data that was present in the May 1988 QST. See the sidebar for precise calculations.

Yet even though sporadic-E and aurora propagation are not directly related, there is an indirect relationship between the two that ties into the unique physical characteristics of the earth and its relationship to the sun. First let's examine sporadic-E.

The earth during the longest day of the year in a particular hemisphere is at its maximum angle of 23.5 degrees from the sun's equator. It is the same angle in the negative direction during the shortest day of the year observed in the winter (see Figure 3 and Table 2). Sporadic-E events have a high correlation to when the earth is perpendicular to the active regions of the sun. Sunspots are an obvious indication of an active region, but other activity is also occurring. These active regions are called M-regions by scientists, and not only do sunspots appear

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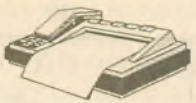
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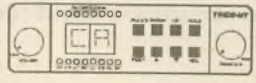
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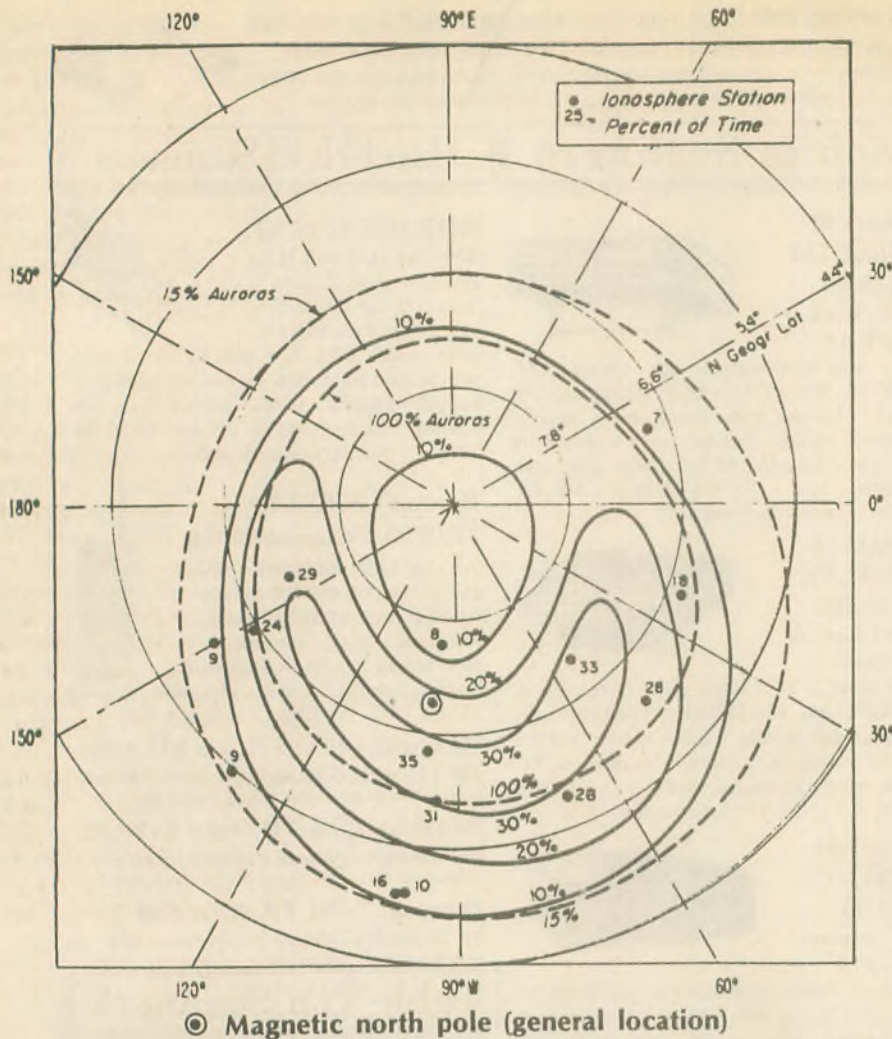


Figure 2. Results of observation of openings recorded in the northern aurora zone by Ernest Smith in 1954. It has been noted that the highest amount of openings occur in the area of the magnetic north pole, indicating a direct correlation between the magnetic field and aurora openings.

but also other solar activity such as flares and prominences.

It is well known that a large solar flare will wipe out most HF communications. Solar flares are an example of varying intensity charges that will interact with the earth's ionosphere in different ways that such radio frequency communications will either be enhanced or inhibited. However, there are different levels of solar flares, and it is believed that one of these types of solar events is involved

in sporadic-E propagation. These active regions, as indicated by the sunspots, move toward the equator of the sun from both sides of the solar

equator during the solar cycle.

While sporadic-E is not directly linked to sunspot count, it has a direct relationship with where the sunspots are located on the sun during the solar cycle. Recent observations in space by astronauts indicate that solar activity in the form of the corona (sun's atmosphere) has a direct impact on sporadic-E and aurora openings on earth.

Recently a beautiful photo was taken by the space shuttle of the aurora borealis that surrounds the poles. Scientific books such as Alex Smith's *Radio Exploration of the Sun* show that the sunspots reside in the most active area of the sun where other phenomena such as flares and solar prominences are active. Hence, the sunspots are a visual indication of where the most active regions of the sun are at any particular time.

Figure 4 shows the graph of the location of the sunspots with regard to the 11-year cycle. It can be seen that the overall range of sunspots during the cycle is from 40 degrees to 5 degrees above and below the sun's equator. Strangely enough, all indications seem to show that during the yearly cycle, sporadic-E activity seems to be present when the earth is in line with the active region of the sun. The yearly variations between the latitudinal position of the sunspots are so small that sporadic-E activity appears to happen during the same time year in and year out. There is one exception, however; when a new solar cycle begins.

Looking at Figure 5, one can see the earth's relation to the sun's active regions during the course of a year. The maximum angle that the earth reaches in relation to the sun is 23.5 degrees, either in the positive direction for summer or negative in the winter. It can be seen that during both the winter and summer months, the earth is offset from the sun's equator and is roughly perpendicular to the sun's active region.

It can be explained why sporadic-E events occur during the winter months at lesser intensity. The hemisphere that is in winter can still receive hits from the sun's active region, although at lesser intensity because of the increased distance to the sun. Scientific data by Chadwick shows that during the June solstice the Northern Temperate Zone gets an average of 40 percent of sporadic-E openings, while the Southern Temperate Zone sees about one third as many openings at the same time (winter for the Southern Zone). This trend is reversed during the December solstice when the Northern Zone is in its winter season. This pattern holds true

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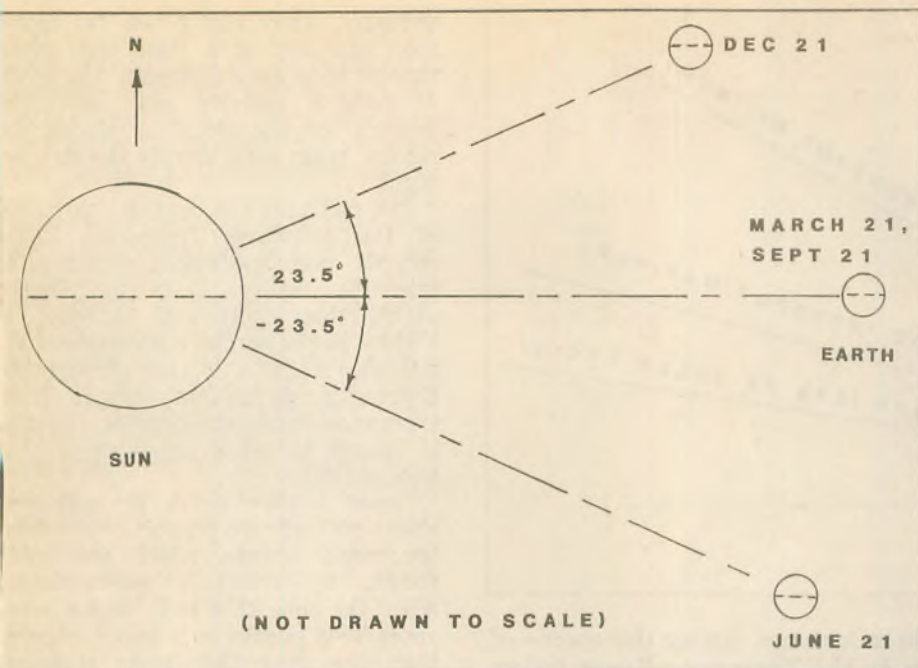


Figure 3. The maximum and minimum angles of the earth to the sun during the seasonal milestones throughout the year.

for most years during the solar cycle, except at the beginning of a new solar cycle.

What happens in the beginning of a new solar cycle is what scientists believe to be the straightening of magnetic lines throughout the sphere of the sun (see Figure 6). Solar activity is somewhat scattered throughout the sun. This would explain why in 1986, which was the beginning of a new

solar cycle, even though the number of recorded E events were lower during the summer months, the overall

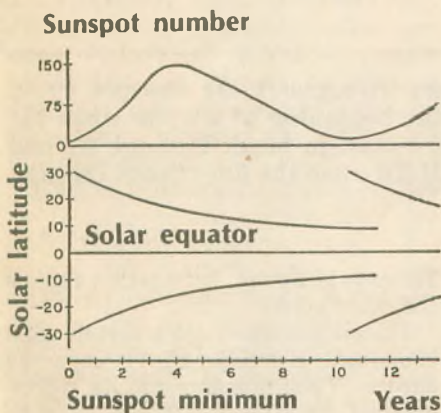


Figure 4. The location of the sunspot regions by latitude on the sun throughout the course of the solar cycle. The location of sunspots, rather than the count, is a correlating factor to sporadic-E openings in the Temperate Zones of the earth.

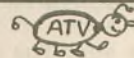
average was the same as other years because more activity was observed during the spring and fall months of that year. This is confirmed when examining the data compiled by Pat Dyer which was presented in the March 1992 issue of *QST*. The year 1986 showed lower peaks during the summer months of June and July, which correlates well with the occurrence of the solar minimum a few months prior.

The sun, like the earth, also rotates on its axis, which takes approximately 27 days to complete. Hence, the areas of high activity as indicated by sunspot clusters will be in a different position as the earth faces the sun each day. This would explain why in the summer months, there may be several consecutive days of sporadic-E occurrences punctuated by a few days of no activity. The activity may appear random when in fact it is merely a function of when certain areas of the earth are exposed to areas of the sun that are projecting high levels of activity.

Observations on 6M at my home QTH in Patchogue, Long Island, located at 41N and 73W, have followed the model that I have stated for the Temperate Zone. During the past two years, I have not observed any

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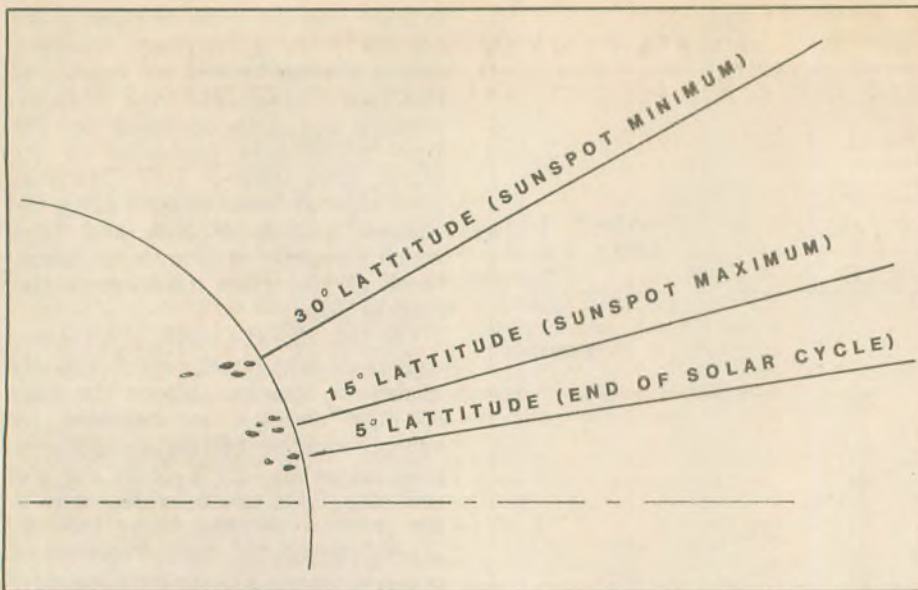


Figure 5. The sunspot regions at certain milestones during the course of the sunspot cycle. Sporadic-E openings in the Temperate Zones follow solar activity in the areas of the sunspots at different solar latitudes throughout the solar cycle.

sporadic-E openings taking place during the equinox months of March and September. The earliest event of sporadic-E taking place in the fall that I have heard was on 23 October 1992, with a one-hour opening into the southern US. The earth-to-sun angle on that date was 8.5 degrees which tracks with where solar activity is emanating from the sun. The earliest spring opening at my QTH has been in early May.

Sporadic-E events are local-area events rather than involving entire regions. It can be observed on radio that activity that sparks sporadic-E clouds on the earth affects the E-layer in spots, as opposed to the sunspots affecting entire regions of the F-layer. Charged particles from the sun are projected toward the magnetic layers of the earth via the shear effect of the solar wind. After an event where the solar electron particles interact with ion particles in the E-layer, the force of the solar wind coupled with particle movement allows the newly created cloud to drift. This phenomenon can be tracked by use of mapping mid-points between two radio stations to determine the size of the cloud.

As contrasted to E events, F-layer activity is not mapped quite as easily. Sporadic-E clouds are, by nature, very

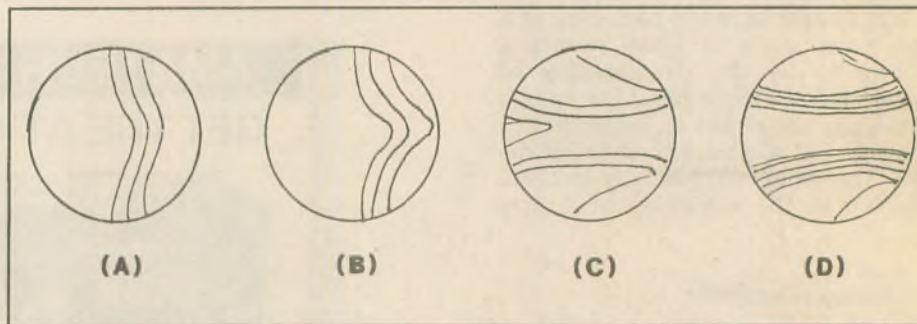


Figure 6. Sunspots' latitudinal location throughout the sunspot cycle, Babcock's hypothesis. (A) represents the beginning of a cycle when the solar magnetic lines beneath the surface start to bend. Through (B) and (C) the lines stretch around the sun until (D) when the lines break through the surface as active regions.

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unstable. They rarely last for more than one day at a time and, even though they may dissipate, the level of particle activity may be high enough for the cloud or clouds to reform again later during the day or night.

The fact that the southern latitude of the Northern Temperate Zone records more sporadic-E events is a scientific reality. Data by Smith shows that sporadic-E activity is highest in the northern hemisphere at latitudes from 10 degrees through 30 degrees during the June solstice. This is because, in the summertime, the sun is closest to areas surrounding the latitude 23.5N.

Areas further north in latitudes above 30N will see proportionally less sporadic-E events, which has been proven by scientific observations. Also, the zone that is in winter sees sporadic-E events at a lesser impact than the zone that is in summer because of increased distances between that zone and the sun. At my QTH in Long Island, I have seen about an 80-percent reduction in the duration and in the number of sporadic-E openings on 6M in winter. This model provides the basic explanation for sporadic-E openings in the

Temperate Zones. Now let's examine the other zones.

The aurora zones see a certain kind of sporadic-E activity that is known as aurora. This phenomenon is distinguished by the fluttering or echo sounds that occur in radio signals during this propagation. The aurora openings are tied directly to major solar disturbances that result in high magnetic activity in the Kp index. The fact that the aurora zones have the highest incidence of these events can be explained by the fact that the magnetic field strength of that area (because of the proximity of the magnetic poles) dominates the E-layer above it more



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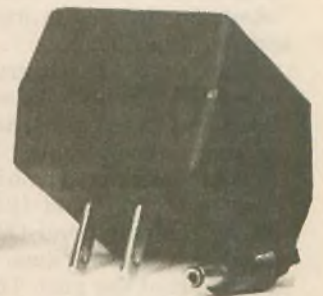
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Using statistical tools on sporadic-E data

There are many statistical tools that mathematicians use to determine whether certain parameters are dependent on each other such that a correlation exists. One math technique that can be used in interpreting sporadic-E data is the Chi-squared Test of Independence.

One of the studies involving sporadic-E was conducted by Pat Dyer in the April 1988 *QST* ("Sporadic-E Propagation Review," Emil Pocock). This particular study measured the daily magnetic index (Kp index) and the sporadic-E observations on 50 MHz during the three-month period of May through July of 1965 as measured in San Antonio, Texas. This data can be interpreted to see whether there is a correlation between sporadic-E and high levels of magnetic activity. Using a Kp index of 2 as the dividing line between low and high levels of activity we get the following data:

- 1) No Es observed with $Kp < 2 = 10$ days
- 2) No Es observed with $Kp \geq 2 = 7$ days
- 3) Es observed with $Kp < 2 = 56$ days
- 4) Es observed with $Kp \geq 2 = 19$ days

From this data a table of values can be constructed:

| | Kp index ≥ 2 | Kp index < 2 | Total |
|---------------------|----------------------|-------------------|-------|
| Days Es observed | 19 | 56 | 75 |
| Days no Es observed | 7 | 10 | 17 |
| Total | 26 | 66 | 92 |

We calculate expected values for each matrix location and make a table:

$$(Fe)_{11} = (75 \times 26)/92 = 21.2 \quad (Fe)_{21} = (17 \times 26)/92 = 4.8$$

$$(Fe)_{12} = (75 \times 66)/92 = 53.8 \quad (Fe)_{22} = (17 \times 66)/92 = 12.2$$

| | Observed (Fo) | Expected (Fe) | (Fo - Fe) | (Fo - Fe) ² | (Fo - Fe) ² / Fe |
|-----|------------------|------------------|-----------|------------------------|--------------------------------|
| 1,1 | 19 | 21.2 | -2.2 | 4.84 | 0.23 |
| 1,2 | 56 | 53.8 | 2.2 | 4.84 | 0.09 |
| 2,1 | 7 | 4.8 | 2.2 | 4.84 | 1.01 |
| 2,2 | 10 | 12.2 | -2.2 | 4.84 | 0.40 |
| | | | | | $\Sigma = 1.73$ |

The degrees of freedom for a 2×2 matrix is 1 and, using a 90-percent confidence level, we get a Chi-squared value for one degree of freedom of:

$$\lambda_{.10}(1) = 2.71$$

Since the sum of 1.73 is less than the Chi-squared value of 2.71, we accept the hypothesis of independence that a sporadic-E event at this location is independent of the Kp index values regardless of whether they are high or low. This same analysis can be used in determining any correlation between sporadic-E and thunderstorm or meteor activity.

effect on some sporadic-E openings, particularly in the area of the equator. David Layzer has noted, "A marked rise in the incidence of sporadic-E has also been found to accompany some meteor showers." This is certainly true with the data collected by hams during the Persid meteor showers that occurred in mid-August. Also, there are some regions in the world that see higher sporadic-E activity than other areas at the same latitude. Scientific data has shown this to be true in the area of Japan and Southeast Asia. These variations will require further study of other factors such as higher mean temperatures and

what amount of metallic ore may or may not be present in these areas.

There is no positive correlation between sporadic-E activity and thunderstorms. This is stated by many scientists and is proven by statistics that show the independence of the two events. Statistics also show the independence between the daily Kp readings and the observance of sporadic-E happenings in the Temperate Zones.

In the case of thunderstorms, it is more of a coincidence of severe electronic activity with thunderstorms. The sporadic-E clouds are located in the E-layer which is approximately 70

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miles from the earth's surface. Thunderstorms typically occur at less than 10 miles from the surface of the earth. I remember flying at 30,000 feet above one when flying across the country. It is inconceivable that a local event such as a thunderstorm would affect the E-layer which is 60 miles higher in altitude.

It is more likely that some events that precipitated E cloud formations may aid in inducing a thunderstorm if the particles settle down. If such an incident were to occur, it would suggest that thunderstorms may indicate when some sporadic-E activity is present but not be the actual cause of such an event. This works in the same way for the relationship of sunspots and sporadic-E having an indirect correlation.

Sporadic-E has a strong daytime or diurnal presence. Yet why do sporadic-E events seemingly appear at night at times, sometimes occurring many hours after sunset? A classic example of this situation occurred on 6 January at my location on Long Island when, after 10:30 local time, sporadic-E propagation came in, allowing 6M contacts to Labrador, Quebec, Minnesota and North Dakota. The skip lasted over two hours to just past midnight.

One of two things had occurred; either the sporadic-E cloud had developed during the day over the Atlantic ocean and eventually drifted over the upstate New York area, or it was a case of a cloud reforming at night after having appeared earlier during the day and dissipating. It is known that during peak times, highly charged plasma clouds may break up and reform several times. One of the difficulties in monitoring such events on 6M is that there is not a constant population of hams who are present during the weekday daylight hours. Additionally, it is surmised that there are many more sporadic-E cloud openings that are never observed because of their location at the time. This would be true of clouds that develop over large areas of water such as an ocean, or over sparsely populated areas.

In conclusion, it has been shown that different latitudes of the earth are affected differently by the forces that

generate sporadic-E and aurora propagation. Sporadic-E activity is strongest around the time of the June and December solstice for the areas from 0 to 30 degrees latitude (for both hemispheres) with somewhat less strength in regions of 30 to 60 degrees latitude. Regions above 60 degrees see year-round aurora openings with the largest number of openings occurring in the areas near the magnetic poles. Regions from 30 to 60 degrees see a mixture of both sporadic-E and aurora activity throughout the year, with the equator seeing no aurora activity and year-round sporadic-E daytime activity. Sporadic-E is governed by solar activity in the areas of the sunspots while aurora is governed by the effects of the strong magnetic fields near the poles.

For radio amateurs, the timetable developed for these types of propagation is helpful when conducting a VHF expedition to various locations at different latitudes. An expedition to the area of the equator would mean looking for daily sporadic-E openings on 6M, while a trip to northern Canada would involve looking for aurora-type propagation.

Amateurs in the Temperate Zones should use the angle information in Table 2 as a guide for monitoring sporadic-E. As a general rule of thumb for most years, amateurs in these zones should monitor the band whenever the absolute value of the sun's angle to the earth is greater than 5 degrees. Also, when in the winter season, amateurs should expect the frequency and intensity of sporadic-E events to be about one third the summer activity while still falling in the expected time frame of angles greater than 5 degrees.

I would like to take issue with statements that some amateurs make about 6M. One myth that is being passed is that, with the sunspot count going down, you should sell or put away our 6M gear. While it is true that F2 skip activity will drop off considerably on this band, there is no proof that sporadic-E and aurora activity will disappear during the sunspot minimum. There may be some yearly variations, but the average activity for the entire year should be the same. Thus, amateurs should continue to monitor 6M for this type of activity. WR

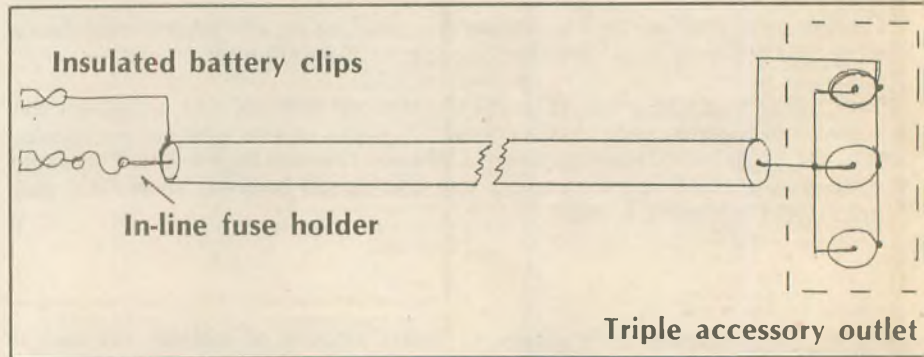
Foolproof mobile power connection

CURTIS WILSON, W0KKQ

Attempting to take power from the fuse-block or cigarette lighter can cause received and transmitted noises

from your transmitter can wreak havoc on some ignition and injection systems.

After more than 40 years of mobile



from a wide variety of sources. Interference in the opposite direction is also possible; in modern day cars, RF

operation, I've found only one seemingly foolproof method of connecting power to one's mobile rig. The coaxial power cable, affectionately called the Direc-connect, solves a multitude of noise and interference problems.

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ty is more than adequate for most mobile rigs. Shield braid of the coax is grounded at the one lowest resistance connection possible, the negative post of the vehicle battery.

The cable can be routed through the firewall of most vehicles without additional drilling by utilizing holes that already exist. Some of these holes are plugged with rubber plugs which can be removed; others have cables but are often roomy enough to pass an additional cable through.

Construction is straightforward,

but a few words of caution concerning safety and economy are in order. Above all, don't forget to fuse the cable for positive protection of vehicle and radio equipment. Second, be sure the concentric (hot) lead and shield braid are both covered with insulation right out to the battery clips. The use of insulated battery clips is recommended (Radio Shack 270-343, 30A; 270-344, 10A). This reduces the likelihood of accidental short circuits beneath the vehicle hood.

Be sure the routing and installation

of the cable is in its permanent place before final pruning of the cable to length. A couple feet of extra cable is easier tolerated than one rendered worthless by cutting too short. *Caution: Do not connect the clips to the vehicle battery until all other steps of construction and assembly have been completed!*

A Radio Shack triple accessory outlet, stock number 270-1544, is first connected to the end of the direct-connect, then mounted beneath the vehicle dash to complete the job. WR



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Nor'easter

(continued from page 1)

was even a report of water over the bridge on Tinton Avenue in Tinton Falls. Soon there were reports of 40 ft. yachts floating down streets which were now under three to four feet of water.

All along the Monmouth County coastline, one community after another reported Ocean Avenue closed due to water and debris such as sand, boardwalks, paved walkways and streets were ripped up and deposited on the normally beautiful, scenic roadways and front lawns. Before 9 a.m. the Garden State Parkway northbound was closed from exit 114 to the Raritan River bridge. Boats which had broken loose from their moorings drifted perilously close to the very edge of the flooded parkway's northbound outer roadway in the Morgan Creek area.

And, through it all, Amateur Radio operators ended up in harms way while people from all over offered blankets, food, clothing, water and even emergency generators just to help others—total strangers, nonetheless neighbors.

By 10 a.m. Monmouth County had officially declared an emergency, municipal EOCs throughout the county had come to life, schools had become shelters and volunteer organizations were on the scene providing personnel and material. Hours before, the Amateur Radio community had settled in and was providing communication assistance between the shelters, their sponsors, and the Monmouth County OEM in Freehold.

Hour after hour as the storm continued to batter the area, Amateur Radio was called upon to provide more and more communication assistance. Police, fire and EMS traffic was interspersed with reports to county OEM of wires down, trees on fire, trees across roads, flooding, missing persons, requests for evacuation, for oxygen, for medical assistance, for prescriptions, for mutual aid, for food, blankets, cots and more. Add to that the messages requesting the Dive Team from Howell, New Jersey be sent to the Rumson area for a rescue mission requiring the use of their Zodiac boat and the vectoring of relief operators around the storm-generated obstacles to get them to their assigned sites with minimum delay. A formidable task to be sure, nevertheless accomplished with an all-volunteer corps and without missing a beat.

Saturday, 12 December

Saturday brought with it more of



The W2ZEE roof was pierced with fallen antenna tower and equipment.

the same. Packet stations and digipeaters were up and running using the ARRL/ARES database, but more packet stations could have been used. By noon, the storm looked like it was weakening. The morning high tide had rolled back to the sea, taking with it most of the high water, and the natives in the shelters were getting restless with thoughts of getting back to their homes to assess the damage and begin salvaging what they could. With that came requests for updated weather information.

When a report came from Manahawkin, by way of Amateur Radio, that the rains had stopped, that there was only light snow and light winds, message content changed and became more "logistic" in nature. Traffic relative to the number of evacuees remaining, projections of shelter closings and arrangements for transporting some of the evacuees from one shelter to another, including the dispatching of an ambulance to transport one invalid, was routinely handled.

By early evening, a number of the shelters had closed. Those remaining open had telephone service and could communicate with each other and the

Red Cross chapter house in Shrewsbury by telephone, so there was some doubt as to the need for Amateur Radio operations for the following day.

Although high tide at Sandy Hook was expected at 9:43 p.m., it became apparent by 8 p.m. that it would not cause much of a problem. Thus it was that at 8:22 p.m. the RACES/ARES net was officially closed by message from the county OEM in Freehold.

Reflections

From the standpoint of a net control station, perhaps the most important event which took place during the entire emergency was the cooperation received from the amateurs responsible for the operation of the Bangor Pennsylvania, repeater.

Early on Friday afternoon, the first day of the storm, during one of the periods when W2ZEE was acting as NCS, and with the help of N2OWN contact by Amateur Radio was made with a Bangor control operator through the Bangor repeater itself. To accomplish this John, N2OWN, had to program the Bangor PL tone into his rig while Charlie, W2ZEE, took the Asbury Park repeater off the air.

The conversation between N2OWN and the Bangor control operator could be heard very clearly at W2ZEE, and as soon as an agreement was reached W2ZEE turned the Asbury Park repeater back on. That kind of cooperation is most sincerely appreciated because without it, any emergency service effort would be severely hampered and the good reputation of

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Amateur Radio everywhere would suffer. Tactical call signs might have been used effectively but no effort was made to use them.

A number of stations called in to the net to say that they were available, gave a telephone number where they might be reached and signed out of the net. Well, that's nice, but what guarantee was there that the phone system would be operative, should the need for their services arise? And what NCS, in the heat of emergency traffic, can afford the time to search through his station log for the name and telephone number of someone who'd called in? It must be understood that stations should not call in to a net until they are ready to stay in the net and monitor or are able and willing to handle an assignment.

Offers to handle health and welfare messages by way of private telephone were received and duly noted, but this net was an emergency traffic net. Health and welfare messages must, of necessity, be held until after emergency traffic has been handled.

Emergency traffic was not limited to the Asbury Park Repeater. The Middletown RACES Repeater was also in operation and remained in operation even after the tower on which the antenna is mounted bent in half like a hairpin.

Packet operations were severely limited only because there were not enough operators, but even at that, its utility was demonstrated most effectively.

Operators from the counties to the north and the south of Monmouth County called in to exchange information. Most valuable to us were the weather reports, especially those from the Manahawkin area.

ARRL's northern New Jersey section manager, Richard Moseson, NW2L, also called in to the net to say that the NTS was available to handle outgoing traffic and that a New Jersey statewide emergency net was being organized on 3.950 MHz.

Unknown to many was the fact that radio links connecting Army MARS, Navy MARS and the US Coast Guard were available via Amateur Radio operators.

In looking back, it is apparent that better antenna installations, permanent or temporary, are a must for future emergency use at designated shelters and a number of police headquarters and emergency operating centers.

For those stations which cannot participate actively in the emergency, it would be a big help if handwritten notes or tape recordings of the proceedings could be made for use after

the emergency. A small cassette recorder and a bunch of C90 cassettes, properly marked, would be ideal.

Certainly, the Amateur Radio operators who participated in the emergency are to be commended. Many took assignments which, whether they were aware of it or not, placed them in perilous situations. When the Postal Service, "Neither rain, nor sleet, etc.," was curtailed in a number of communities, Amateur Radio operators were still out there providing communications. Even W2ZEE

stayed on the air with emergency power, and after the roof-mounted antenna tower and all the antennas blew down and poked a big hole in the roof, W2ZEE continued with a makeshift 2M antenna sitting on the floor of the shack.

Apparently, learning does take place by observing and following example. Messages were kept short and net discipline was superb. I can only add my most sincere thanks for the help from all who participated. Congratulations for a job well done. WR

Confessions of a code addict

W7JWJ has taught Amateur Radio classes continuously since 1946. He learned, after a number of years of doing research, conducting code tests and studying books on the psychology of learning, that there are five fundamental factors for code success.

HARRY W. LEWIS, W7JWJ

If you have ever visited a hamfest held somewhere in the Pacific Northwest during the past 20 years, you have probably seen me. I was the one tucked away in a small corner conducting a code contest.

You may have remarked, "Wow, does that guy love code!" Well, not really.

If you stayed around long enough you may have seen me putting on a code copying demonstration in excess of 80 wpm. On a good day, when the ionosphere was rarified, I may have pushed a little higher. You may have

commented, "For that guy the code sure must have been easy." Like heck it was!

I confess, as I now enter the golden years of my life, that I'm slowing down considerably. Why, at the 1988 ARRL National, I only copied 76 wpm and may have even left an "e" out of a word. Of course, it may have been left out of the text in the first place. Who knows? Who cares?

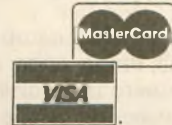
So let me tell you how I got from there to here. As a kid depression survivor of the 1930s, I was exposed to the magical world of wireless and decided to become part of it. I found one prerequisite was knowledge of the Morse code, which I set about to learn by entering a radio and telegraph school upon graduation from high school.

As code students we competed one against the other to advance to the head of the class. There was this at-

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tractive young lady who could copy almost as fast as I so I studied harder and longer, sometimes practicing code six to eight hours per day until I could copy 45 wpm. No way would she beat me! She did. I confess I must have been a real male chauvinist.

After a few years of military service as a flying radio operator and instructor, I entered the real world of telecommunications, radio and television broadcasting and finally educational communications. I've worked for nine radio stations, three television stations, a telephone company, a computer center and a few more places. With all of this I've apparently been unable to hold a steady job. To this I also confess.

However, somehow during all this time, I've managed to teach Amateur Radio classes continuously each year since 1946 and, in so doing, have assisted nearly 3,500 individuals in obtaining their amateur licenses. That's a lot of students.

I've sent a lot of code by hand. I believe no other instructor has taught similar classes for so long and only one other graduated as many students. That I love touching Amateur Radio is no secret for which a confession is required.

After teaching for a decade or so, my class records noted the ever increasing age of incoming students—initially an age average of 15 years but in more recent years triple that number. Secondly, it was observed that it was taking longer and longer for the students to learn code. This was a concern to me and I tried to do something about it.

I started conducting code contests at hamfests in order to attract high-speed code operators and learn their code acquisition secrets. I confess, I didn't conduct these contests for the fun of it. I had an ulterior motive.

Contest after contest went by and I learned more and more code teaching and learning methods. As I applied what I had learned, my code copying speed gradually went up and up until on good nights when the moon was out and the dogs would howl, my typewriter would whirl along with preheard text at speeds approaching 100 wpm. But, I confess, my students' ability did not materially improve as I'd anticipated.

Why not? I'd learned after a number of years of research doing code contests, studying numerous books on the psychology of learning and practical teaching in class, that there must always exist five fundamental factors if one expects to have success in the copying of code.

The first, I found, as have other instructors long before me, was that the

mental factor or psychological self-motivation must predominate to the degree that lesser factors be placed in correct and proper perspective. I admit that getting students to believe this is almost impossible.

The second factor found was diet, always diet. First and foremost, the overconsumption of sugar, processed food and meat products seemed always to impede the code learning process. My new students were now frequently the middle aged pot-belly and thunder-hip crowd. They came complete with various symptoms of degeneration, such as obesity, stroke and heart attack, along with magical pills expected to season a lifetime of sowing wild oats. However, even the younger students fared little better. I confess that commitment to health may not be the American way.

The third factor I'd found necessary in successful code learning was exercise before and during practice process; and the fourth factor was correct methods of code practice itself. Our Morse code is uniquely composed of sounds, some of which are so simple that we commit them to memory after only one hearing, and other sounds which have no immediate mental association with anything in the universe. Attempts to quickly learn the code by intelligent individuals can thus be one of the most frustrating times of their life and result in hundreds of hours of wasted effort that could be funneled into more productive learning. Successful code learning eventually results in the individual copying totally in the subconscious mind, but that does not occur until that mind has been trained. I admit to studying the application of this principle for a good number of years.

There is another small factor that I've simply called the technical factor. It embodies the rise and decay time of the code envelope, the frequency and timbre, associative consonant, and consonant and vowel combinations that enhance the code learning process. For me there were many practice sessions observing the oscilloscope connected to the code machine (the machine with all the knobs on the front that individually shaped the envelope) and the earphones with the individual volume controls to optimize the sound of code, for my individual

receptive senses. There were those crazy combinations of letters that I'd assembled, and then there were those pushups before practice, usually up to 150 every day. How I hate doing pushups!

With knowledge does not necessarily come wisdom, however. Eventually I simply ceased to copy code whatsoever and ignored most of what I had learned about the complex code learning process. I spent time checking into 2M nets, watching reruns on the boob tube and munching munchies until I'd gained 60 pounds.

Finally there came the morning that I awakened in a strange environment. It was a hospital room. I'd had a heart attack. My condition was my own fault—to this I confess.

Dutifully I obeyed the doctor's orders, ate the prescribed diet and swallowed tons of pills. I gradually got worse and painfully panted while climbing the stairs to the ham shack, while I had difficulty even telling a dot from a dash at a mere 40 wpm.

Eventually came the moment of truth when I realized that I had to fix my own condition. I flushed my heart medication down the toilet. I started copying code again and doing those pushups. I lost 60 pounds and put a new roof on my home and even started running. I hate jogging. I like to run.

Applying what I'd learned in code research I became a vegetarian, consuming no sugar, no fat and no processed foods, with the philosophy that if it don't need cookin' don't cook it! I now prepare most of my own food, attempting to provide a correct amino acid mix along with adequate nutrients and vitamins. I hate cooking.

Not so many months ago I entered another code contest and copied at only 76 wpm. I was ashamed of my copy, but I admit it was the best I could do at that time.

At age 65 I decided against retirement and targeted an electronic teaching position of high school vocational students with a diverse national background. Recently I played a videotape to the class about the world of ham radio and then asked if any of the students might like to be radio amateurs. One young lady from Thailand, who speaks eight languages, summed up the collective opinion of the class by stating, "I no want to be old talk potato! Me going be young design engineer!" I confess, with her I agree.

I finally confess that I firmly believe that code should not be a requisite part of the entrance level into Amateur Radio. This requirement was a great deterrent to the technological advancement and continuation of our hobby.

WR

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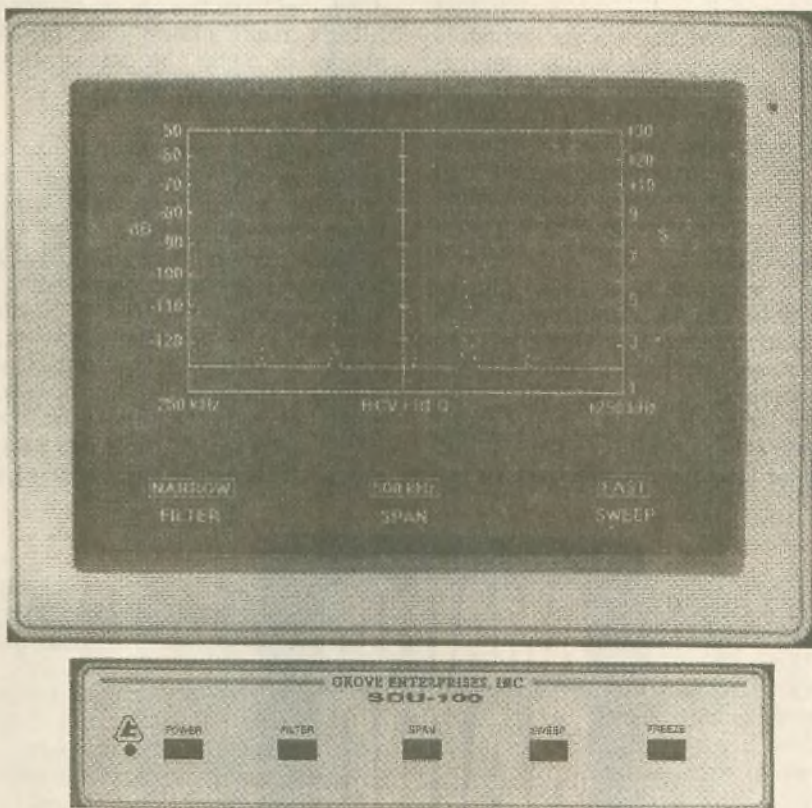
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The MagicNotch is an automatic notch audio filter which requires no tuning or user intervention. When the unit detects any continuous carrier heterodyne, it filters it out using a very sharp notch band rejection audio filter. The unit is used in SSB mode to eliminate intentional or unintentional carrier noise.

The filtering is done by a switched capacitor active filter (SCAF) which is scanned through the audio frequencies. A control circuit monitors the filter output and stops scanning when the output drops. The filter then phase-locks to the interfering signal and tracks any variations in its frequency until the interfering signal disappears.

Installation

You receive one 1/8 in. mono plug, a power plug connector, and a cable with 1/8 in. plugs on each end. This gives you plenty of ways to hook up the unit. My transceiver had an external 1/8 in. speaker jack in back, so I just plugged one end of the supplied cord into it and the other into the receiver jack of the

filter. I found an unused 12VDC power supply from my junk box that just happened to have the correct type plug attached to it, so I only needed to plug it in the filter's power jack. There is protection for the filter if you use the wrong polarity while hooking up the needed DC voltage supply. You can tell if it is correct by sliding the front switch (there is only one switch) to the "bypass" setting—if correct, the LED light will turn on green. Now the only thing left to do is to connect a cable or line from the filter's speaker jack to an 8-ohm speaker. With the installation done, you have the option of using the filter's front phono jack for headphones or using the default external speaker you just hooked up.

Actual use

The sliding front switch has three positions: *off*, *bypass* and *on*. In the *off* position audio is passed directly through to the speaker. The *bypass* position turns on the unit, and the LED indicator is green under normal SSB signals and turns red if a carrier heterodyne is detected; however, the audio is still just passed directly through the unit to the speaker or headphones. In the *on* position, if a carrier is detected the unit will cancel it out; this is the position to be used when

you are being interfered with.

You will notice a very small time delay between the time the unit detects a heterodyne and when it cancels it out for you. This is due to the work it does to "lock on" to the offending signal while temporarily stopping its normal scanning mode. You may also notice a delay when the carrier has gone; this is done so that CW signals will be notched out as well as straight carriers.

You can leave the unit in the *on* position for "no-hands-on" automatic rejection if you wish. This way, the only way you can tell there is a carrier is by the LED light staying red. On multiple carriers the unit will concentrate on only one at a time. You can influence the choice of carrier by varying the volume and/or adjusting the RIT temporarily to get the filter to lock on to the other carrier.

When I encountered the first carrier I wanted eliminated and flipped the switch to *on*, I could hardly believe what I *wasn't* hearing anymore. I thought the carrier had discontinued transmitting so I put the filter back to *bypass*, but I found that the carrier *was* still there. I switched back to *on* and again I heard no carrier coming through.

The unit so effectively knocked out

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carriers that I found myself doing the above more than once to see if the carrier had stopped or if it was the unit that eliminated them. You have to hear it yourself to be convinced. (You can get a demonstration by calling JCom's number, below.) You will notice no distorting of the SSB quality when the filter is eliminating a carrier, which should please audio buffs.

On more than one occasion on 75M nighttime operation, it made it arm-chair copy listening to nets that were being interfered with by someone throwing a carrier or heterodyne. The same went for some of our now notorious 20M net operations. Built-in notch filters are good to excellent in our radios, but they are Stone Age com-

pared to the effectiveness of this automatic filter.

Conclusion

I have not tested the other external filters on the market that are similar to this unit, but I can say that the Magic-Notch does what it is supposed to do—get rid of an unwanted carrier while listening to SSB. Some of the newest rigs may have something like it built in, but for 95 percent of the non-digital rigs on the air it is a great way to knock out carrier interference without even having to touch a control button or knob.

MagicNotch specifications

Notch depth 40dB

| | |
|--------------------|------------------------|
| Gain | 0dB |
| Active range | 200-3500 Hz |
| Filter Q | 10 |
| Power output | 2W (8 ohms) |
| Power required | 10-14VDC |
| —standby | 40mA |
| —full output | 200mA |
| Minimum signal for | |
| lock | 20mV PP |
| Maximum signal | 4V PP |
| Audio connectors | .125 in. mono phone |
| Power connector | .220 in. coaxial |
| Size | 5.5 × 3 × 1.25 inches |

The MagicNotch is available for \$114.95 (includes shipping and handling) from JCom, P.O. Box 194, Ben Lomond, CA 95005-0194; 408/335-9120. WR

Rupp digital SWR and power meter

It is late at night. The back aches, throat is dry and your eyelids are like sandpaper. Such is the life of a con- tester.

CQs are going unanswered. Stations called never come back.

When waking, after having fallen asleep, you, with a clearer head, realize that the transceiver, amplifier and antenna were all on different bands.

A Rupp power/SWR meter would have prevented that sorry showing. The Rupp would have been "beeping" at you. Yes, you set the SWR point and if the condition gets to that point, the alarm goes off.

This unit, manufactured by Rupp Electronics (5403 Westbreeze Trail, Fort Wayne, IN 46804—write or call

219/432-3049 for more information), covers 1.8 to 30 MHz and up to 1625W.

The LC display is ¾ inch high. The SWR is automatically calculated with even less than 1W, and you can see the SWR during modulation whether you're on SSB, CW, FM or AM. Three modes may be selected; power only, SWR only, or an alternating between the two.

The cost is \$210 fully assembled; kits range from \$124 to \$159.95.

What is most interesting about this unit is that on every page of the instruction manual is the call sign KU8T, which is Thomas Rupp's. It is nice to see someone with that kind of pride in what he does. Also, if you have a problem, you know who to call. None of that

corporate anonymity here.

With the Rupp power meter you are looking at peak envelope power. The display is updated every half-second, during which time 240 samples are taken.

The beauty of a meter like this is 1) no parallax error, and 2) you are seeing exact numbers, not visually interpolating on some meter.

By seeing what the peak power produced is, you can avoid overdriving an amplifier and thus avoid splatter and distortion. For the QRPer, here it says in big numbers: 5W.

After many months of use the comment is: highly pleased. The alarm feature is a good one. The sense of certainty it gives regarding power, rather than relying on a flopping needle, gives one a feeling of being in command of what's going on. WR

Dubious of decibels

There are many applications that use logarithmic ratios, expressed as decibels, to compare 1) a measured magnitude to a specific reference level or 2) two different magnitudes/forces.

Those in category one are useful in defining specific voltage gains or power levels. For example:

dBv: A voltage level referenced to 1V normally.

dBm: A power level referenced to 1mW, normally.

dBv_g: Voltage gain, sometimes without reference to impedance.

dBd: Power gain of an antenna referenced to a standard dipole.

dB_i: Power gain of an antenna referenced to an imaginary antenna (a point source) called an "isotropic source."

The category-two comparisons are

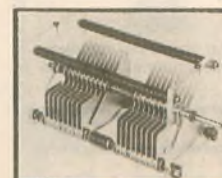
useful in measuring any two power, voltage or current levels, regardless of their strengths or amplitudes. If it takes *x* number of watts to drive a linear amplifier to an output of *y* watts, the amplifier's gain in dB equals 10 times the log of (*y* watts divided by *x* watts).

As it turns out, doubling a power level equals a 3.0dB gain. In going from, say, 10W -> 160W, the gain could be pretty well estimated, as in this example:

With a table of logarithms or a calculator, smaller power gains under 3.0dB show that a 1.0dB gain occurs when a power level is increased by 25 percent and that a 2.0dB gain occurs when the level is increased by 60 percent. This 1.0dB/25 percent and 2.0dB/60 percent relationship makes

the calculation of power gain fairly accurate without the log tables or calculator.

In the first example, a 10W -> 160W gain equaled 12dB. What would the gain be for a 10W to a 200W level? Well, the 10W -> 160W = 12dB as before. From 160W -> 200W is another increase of 40W. 40W divided by 160W is 0.25 or a 25 percent increase. This is equal to 1.0dB, so the total gain, 10W -> 200W = 12dB + 1dB or 13dB. —SARA SLIP



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We found Howard's, NE2U, station particularly noteworthy because it is set up for a visually impaired amateur.

My call was W2QMD from 1941 to 1961, when I let my license go. I got back into Amateur Radio in 1982 as KA2QFI after retiring, and in 1983 I became NE2U. You are never too old for this hobby and it is one of the few for the visually impaired.

Most of the equipment in this picture was bought in the last two years. I



worked at the K-Mart as greeter and as bag packer at a grocery store part-time to fund it.

Does this layout look any different from yours? Well, Mr. Magoo and I think so because all the meters, dials and the monitor are six inches from our noses. The desk has adjustable shelves and the TS-530S is on a little table so it can swing around and be in focus with the monitor.

The rest of the gear is a homemade bracket with electrical conduit mast mounted on the house to hold my tri-band. I also have an inverted V at 108 feet for all bands. The computer is a Commodore 64C and a Microlog Air-1 TNC. I use an MFJ tuner, electronic key and a printer to copy the QSOs for the log and for fun to review RTTY and

AMTOR. My 2M rigs are a DJ-160 Alinco HT and a Heath HW 2036 which are connected to a homemade beam on top of the other beam.

The table on the left holds my VCR, talking book, and a scanner to monitor the repeaters. The train on top is to remind me of when I was a kid.

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Amateur "Hi"



Bob Beudet, W1YRC, sends us this month's winner. If you can't impress someone with what you've got, look to the heavens?

Several years ago, I installed a 10/20M SSB rig in my car and used it every day in my one-hour drive each way to and from work. My co-worker, Scotty, K1AUN, really liked the setup and many days we would go to the parking lot at lunchtime and work some DX.

Well, one day a new secretary was hired and Scotty, trying to impress her, filled her ears with tales of all the rare places we could contact. After several days of inviting her, she accepted a demo invitation.

As luck would have it, the bands were stone dead. After calling CQ many times, I said in frustration, "Oh, Lord help us." W1HWK, Father Dan Linahan, heard the CQ only five miles away and answered, "I don't know if the Lord can help you, but could I try?"



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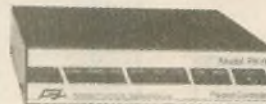
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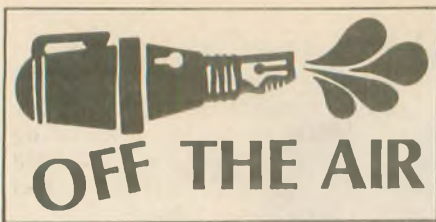
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Bicycle mobile interference

I want to comment on a recent article in the January 1993 issue, "Mobile noise reduction," by Lawrence Earl, KG7DL. The article is excellent, and I agree with everything except the very last sentence!

I am an active member of the Bicycle Mobile Hams of America, a group with 225 members in 36 states and four countries. I am an active bicycle mobile operator with 36 states and 14 countries confirmed while running 2W on the HF bands (40, 20, 17, and 15M).

Bicycle-mobiling on HF, as you can imagine, presents its own set of very unique problems, including *noise!* For example, I have spent the past several months scratching my head over an intermittent noise that only starts when I go above 10 mph and goes away with a slight pull on the front brake. This turned out to be a bicycle version of wheel bearing static that was cured by a very slight increase in bearing tension.

Other sources of noise that drive the cyclist crazy are:

Power lines. Mobiling in your car, you usually drive through the most offensive noise sources rather quickly. On a bicycle, you spend much more time with the noise, since you are traveling at only a quarter of the speed.

Electric fences. Since most bicycling is done on lightly traveled rural roads, the electric fence QRM can be significant.

Passing motor vehicles. On those occasions where you are in a noise-free environment, Murphy will serve up an old Ford or some other offensive source of automobile ignition interference.

Seriously, operating HF from a bicycle is the most fun I have had in my 34 years as a ham and, based upon many of my contacts, there is a surprising interest in the subject.

A free sample copy of the *Bicycle Mobile Hams of America Newsletter*, published quarterly, is available by sending an SASE to BMHA, P.O. Box 4009-M, Boulder, CO 80306. (BMHA will also have a forum, complete with demonstrations, at the 1993 Dayton Hamvention.)

NED MOUNTAIN, WC4X
Roswell, GA

In the fog

I can't believe I read in *Worldradio's* January issue, page 45, the article in Gordon West's column, "When HF Whips Won't Load."

I think Gordy's been out in the fog off Newport too long. He states, "To solve the problem of high SWR you need a better feedpoint condition and,

to solve this problem, it may require a coil and/or a capacitor to bring the feedpoint impedance back to near 50 ohms."

I can relate to that (more or less), but what I can't relate to is his prior statement that if you added an antenna tuner to your system you would only be masking the problem (fooling the transmitter). Most tuners I have seen consist of a coil and two capacitors that are adjustable. Whatever happened to the term "conjugate match"?

BILL SHATHMANN, KM6BS
Valinda, CA

Slap in the face

As a newly-licensed no-code Technician, I recently received my sample issue of *Worldradio* (January 1993). I am highly offended by the letter in the Off The Air column submitted by Sam Davis, K4RGK, of Glenwood, Alabama, and wish to offer my rebuttal.

Mr. Davis has been a tremendous problem on a very large-coverage repeater for quite some time now, espousing fantasy philosophy about the US government at the highest level involved with low-level drug trade in Crenshaw County, Alabama. With that preface, one can understand Mr. Davis' rambling mentality in his letter. Perhaps the problem with 2M operation in central Alabama is not with "pirate drug dealers" or no-coders, but is overuse of the airwaves for the purpose of eccentric philosophical soapboxing.

Frankly, I find it hard to believe that a magazine such as *Worldradio* would print a letter that, in my opinion, is a slap in the face to no-coders who will soon represent 50 percent of the Amateur Radio market.

NANCY U. MICHAEL, KD4THE
Montgomery, AL

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The "Contest Contest"

I know that many hams hate contests, but lots of us tolerate them. And then there are those who simply hate them. Well, I'm about to suggest, of all things, a new contest called the "Contest Contest."

After 50 plus years of hamming, I have participated in contests of all sorts—Field Day, DX, QSO parties, SSB, 160M, ad nauseam. They all have one thing in common: thousands of stations swapping meaningless numbers. In DX contests everyone is 5 and 9, even if it takes three repeats.

Hams have always taken pride in their ability to handle emergency com-

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communications, even though not very many of us seem to be willing (or able?) to prepare, send or receive a message in proper form. Did you ever try to get someone to accept a Field Day message for extra points? These days when the FCC and others seem determined to take bands away from us, we need to do everything possible to justify our existence.

We have many extremely bright and talented people in Amateur Radio. Why not have a "Contest Contest" to encourage these people to strain their brains and come up with some improvements to our threadbare contests. Instead of exchanging nonsense, maybe someone can devise contest exchanges which will hone our communications skills and be of great importance in convincing the FCC and the public at large that we hams are really worth the large chunks of spectrum that we occupy.

Ham radio is under attack, and we have already lost part of the 220 MHz band. It is very likely that the FCC and commercial interests have received examples of "typical Amateur Radio activities." Think of their reaction to the usual 75M SSB QSO, or the chaos of a DX contest, or pileups on stations in "new" countries, or "repeater jamming." I think something must be done immediately to provide good, solid ammunition for those attempting to defend our position. What better way than to drastically upgrade contest operations?

The easiest thing to do is to do nothing. Unfortunately for us, the multi-million-dollar communications industry will continue to pursue the idea of taking over more VHF and UHF ham bands. We must do many things, including increasing utilization of the relatively unused portions of the 6 and 2M and higher bands, starting immediately. Tomorrow may be too late.

GEORGE FRANKLIN, W0AV
Liberty, MO ARNS Bulletin

Responsible new group

In the January issue there was a letter under the head, "Drug Pirates" that implies that FCC inaction of unlicensed individuals on amateur bands is one step worse than the "no-code" entry level regulation.

As the local radio club in the letter writer's area, we are benefitting by the no-code entry provision. Other than amateurs moving into the area, the majority of new members this year

have been via the no-code path (approximately 20 to 30 percent of club membership at this writing). This new group has attended meetings regularly, participated in public service events, used the repeaters in a responsible manner and have continued to upgrade! We can use more of this "problem."

If a drug ring is on 2M in our area, then hopefully it will be reported to the local authorities or DEA. This should be more discouraging than an NAL from the FCC


STEVEN SCOGGIN, N4WVW
Prattville, AL

Wake Island '62-'66

I have just completed the computerization of all my logbooks dating back to 1952. Between 1962 and 1966 I operated as both KH6COY and KW6DS from Wake Island.

If there are any hams out there who have made contact with me while on Wake and need that island, I still have some QSL cards. If they send me an SASE, I will be glad to research my database.

ARNOLD SAMUELS, KH6COY
Ocean Shores, WA



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AWARDS

FAR scholarships

The Foundation for Amateur Radio, Inc. of Washington DC, plans to administer 47 scholarships for the academic year 1993-1994 to assist licensed radio amateurs. The foundation fully funds five of these scholarships with the income from grants and its annual hamfest. The remaining 42 are administered by the foundation without cost to the various donors.

The foundation awarded 43 scholarships for the 1992-1993 school year to recipients from 20 different states.

Licensed radio amateurs may compete for these awards if they plan to pursue a full-time course of studies beyond high school and are enrolled in or have been accepted for enrollment at an accredited university, college or technical school. The awards range from \$500 to \$2,000 with preference given in some cases to residents of specified geographical areas or the pursuit of certain study programs. Clubs are encouraged to announce these opportunities at their meetings, on their nets, during training classes, and in their club newsletters.

Additional information and an application form can be requested by letter or QSL card, postmarked prior to 30 April 1993, from FAR Scholarships, 6903 Rhode Island Ave., College Park, MD 20740.

The Foundation for Amateur Radio

is devoted exclusively to promoting the interest of Amateur Radio and those scientific, literary and educational pursuits that advance the purpose of the Amateur Radio Service.

Grants-In-Aid

The Radio Club of America, Inc. has awarded several financial assistance grants to young students pursuing undergraduate college work in electronics.

Kenneth M. Miller, K6IR, a member of the club's board of directors, stated that 1993 grants total \$11,550. The grants have been awarded in amounts ranging from \$500 to \$1,050 each. The majority of the students are licensed Amateur Radio operators who need to receive financial aid to help in paying for tuition and related textbooks.

The source of funds for this program are contributions made by many of the club's members who have enjoyed successful professional careers in the electronics industry and who wish to contribute funds to assist the newcomers to the industry.

This Grants-In-Aid program is the major activity in the club and has received worldwide acclaim for the role it plays in assisting young students achieve successful completion of an academic program.

For information contact Kenneth M. Miller, K6IR, Chariman, Grants-In-Aid

Committee, 16904 Geroge Washington Dr., Rockland, MD, 20853-1128; 301-774-7709.

Award nominations

Nominations are now being sought for the 1993 awards to be presented at the ARRL Atlantic Division convention. The convention is held in association with the Rochester, New York Hamfest, 21-23 May 1993. The awards are commemorated by handsome plaques to be presented at the hamfest banquet.

"Amateur of the Year" nominees should be outstanding all-round amateurs from the Atlantic Division with strong record of service to the amateur community.

An award for lifetime service to Amateur Radio, the "Grand Ole Ham," is open to Atlantic Division OMs and YEs who have been licensed at least 30 years or are at least 50 years of age. The Atlantic Division "Technical Achievement" award may be presented to an individual or to a group.

Complete information on the awards and nomination procedures is available from Richard Goslee, K2VCZ, 2 Elaine Dr., Rochester, NY 14623. The deadline for nominations is 1 April 1993.

DARA scholarships

The Dayton Amateur Radio Association, Inc. is offering eight scholarships to hams graduating from high school in 1993. The scholarships this year each are in the amount of \$2,000, up from \$1,500 in previous years.

The DARA Scholarship Program is open to any FCC licensed Amateur Radio operator graduating from high school in 1993. There are no restrictions on the course of study planned by the student, nor does he or she need to be planning on a four-year baccalaureate degree. However, schools awarding associate degrees or any technical institution selected must be accredited.

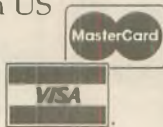
The awards will be based on a combination of financial need, scholastic achievement, contributions to Amateur Radio and community involvement.

Application forms may be requested from DARA Scholarship Committee, 45 Cinnamon Court, Springboro, OH 45066-1000. Applications must be postmarked no later than 15 May 1993, and winners will be notified by telephone around 1 June 1993.

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Silent Keys

Dale Jurrens, KB5JFN

Dale "Al" Jurrens, KB5JFN, died on 5 November, 1992, in Belan, New Mexico, at home. Al was only a ham for the last couple of years of his life. He had a simple station—a Kenwood TS-440S/AT and an Outbacker mobile antenna. He didn't make a lot of contacts; he always preferred listening to amateurs' talking.

If you were one of the few lucky hams in the world to QSO with KB5JFN, you talked with a guy who came to the hobby after his oldest son bugged him for more than 25 years. You met a man who took the testing process so seriously, he actually *learned* all that stuff, not being satisfied with just memorizing it. He struggled with the Morse code because his oxygen-starved mind could no longer process data as quickly as it had when it was healthy. (As a Navy chief sonarman in WWII, he could copy 30+ wpm in his then-healthy head.)

He studied for about a year, preparing for his Novice and Technician exam at Union County College in Cranford, New Jersey. Another year later, he

took his General at a DVRA test session in Pennington. Although he passed the written, he never was able to get 13 wpm down on paper fast enough to make the grade. His doctors and his children finally convinced him that it wouldn't be a violation of some moral code to apply for a medical waiver.

Going through his papers, I found only one log entry: W3DMM, Don, near Reading, Pennsylvania, on 28.690 on 15 March (year unknown). I also found one QSL card from a Florida ham, KC4ZRV, also a retired Navy "swap jockey," as his card states. Al had a copy of *Operating an Amateur Radio Station*, complete with notes. And, like all good hams, he had a certificate from the ARRL denoting his membership.

He never won any contests. He never passed a radiogram. I'm not sure if he ever had a CW QSO. He probably wasn't quite sure what packet and stellites are for. No, he wouldn't be mistaken for a super-tech. Yet we're as proud of his becoming a ham as anything else he did in his 69 years here on earth. —*Information submitted by Gerry Jurrens, N2GJ*

Al Slater, G3FXB

World famous DXer and contest enthusiast Al Slater, G3FXB, died on 10 November 1992 at the age of 64 from a heart attack after getting up in the middle of the night during a severe wind storm to secure his antennas. He had retired some years ago after suffering a mild heart attack.

One of the most active HF contest operators of the last two decades on both SSB and CW, Al was at the top of the Mixed DXCC Honor Roll, a strong supporter for many years of the FOC (First-class CW Operators Club) and was inducted into the DX Hall of Fame at Visalia on 23 April 1988. His most recent honor was election to the CQ Contest Hall of Fame.

Al was known worldwide as a premier operator and an ambassador for Amateur Radio. Aside from being a frequent visitor to the US, he had also visited Australia and New Zealand in recent years, and he had made a recent visit to the Soviet Union.

Al leaves six children and his wife, Maud, who has always been a supporter of his DX pursuits. —*Information submitted by Ken Miller, K6IR*

I won't QRT

My hair is white and I'm almost blind,
The days of my youth are far behind.
My neck is stiff and I can't turn my head,
Can't hear one half of what's being said.
My legs are wobbly, can hardly walk,
But glory be, I can surely talk,
This is my message as I want it to be,
I'm still a'kicking, and I won't QRT!

The rig is ancient, tubes rusting in the sockets
And nary a dime left in my pockets.
So you think my shack's a total wreck?
To tell you the truth, it *does* look like heck!
My dipole is rusty and sagging on the vine,
Neighbors' TVI is at least 20 over 9!
But it's a wonderful world of ours,
Shade and sunshine and beautiful flowers,
So you can take it from me,
I'm glad I'm living, and I won't QRT!

When I reach the end of my row,
I hope to the lovely home I'll go.
And then when I leave this house of clay,
If you'll listen closely I'm quite apt to say,
Well, folks, don't worry 'bout me,
I've just passed on, and I won't QRT!

Don Raduziner, W6BDD



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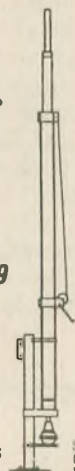
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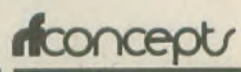
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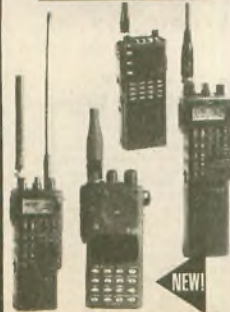
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There were no certificates for *Worldradio's* Worked 100 Nations Award issued during this past period.

North Korea (P5RS7)

What a Christmas present for the deserving DXer! North Korea finally came on the air with an unusual call of P5RS7 issued by the military authorities. The operation was restricted to CW and SSB. No operation on the WARC bands or RTTY was permitted.

Any contributions for this operation should be sent via the manager of the operation, JA1HGY. He is also the QSL manager. Most likely, this recent operation will now open the door for future operations from this newly added DXCC country.

The team was still active the first few days in January. One local DXer called us on the landline telling us that they were easily workable (we had thought they had already finished their DXpedition) so we gave it a try and worked them.

This is the second time this local DXer gave us a helping hand. The first time was at 3 a.m. to tell us Heard Island was on looking for W6s. Everyone was pleased except the XYL, who didn't appreciate early morning telephone calls.



Yunus Chaudhry, AP2MYC, recommends that all QSL requests to Pakistan go via the bureau and, all incoming and outgoing cards have been cleared as of December 1992. He also asks that green stamps not be sent, as it is against the law for Pakistanis to receive them. Look for this one on SSB, 15 and 20M. (Photo courtesy of KDØJL).

Czechoslovakia (OK)

According to a note in *QRZ DX* Czechoslovakia was to be divided into two countries at the beginning of the year. The two new republics, Slovakia with its capital as Bratislava, and the Czech Republic with its capital as Prague, are now using the prefixes OM and OK, respectively. Although no action has been taken by the DX Advisory Committee we recommend that you work the two now for two possible new ones to the DXCC countries list.

For the 1993 ARRL DX Contest the Czech Republic (OK/OL) and the Slovak Republic (OM) will count as separate multipliers. Their DXCC status is now pending before the ARRL DX Advisory Committee. The ARRL International DX Contest, CW, runs from 0000 UTC 20 February until 2400 UTC 21 February; phone portion is to be held on 6-7 March.

Maldives Islands (8Q7)

According to *The DX Bulletin* Carlo Amorati, I4ALU, was to have been on

the DXpedition junket again, stopping off at the Maldives Islands, 28 December through 6 January. He would have signed 8Q7BX. We have seen no reports of his activity.

There was a report of 8Q7AZ working the west coast on 17 December on 20M SSB near 14.179 MHz around 0200 UTC. There were no other reports. Try the long path for this one.

QRZ DX reports that JA8CMS should have been signing 8Q7KA the early part of January. Also, Andreas Söchting, DK6AS, should have signed 8Q7XX the latter part of January.

Nauru Island (C2)

The Long Island DX Bulletin reports that C21NR on Nauru Island often checks into the HIDXA Net on 14.222 MHz after 0400 UTC. He will accept schedules for contacts on other bands. However, there have been no other reports for any station on the island. *The DX Bulletin* reports that Brian Rous, ZL1ACX, will be on the island through the middle of April signing C21BR. He

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too is supposed to be checking into the HIDXA Net.

Andorra (C3)

Resident DXer C31LL has been very active recently, all on CW. He was reported on 80M in December on 3.504 MHz at 2245 UTC. For a 40M contact listen for him between 7.001 and 7.003 MHz after 2245 UTC, and on 17M between 18.071 and 18.080 MHz 1300 to 1600 UTC.

Also reported from Andorra was C31HK who preferred SSB. Look for him between 21.229 and 21.265 MHz 1600 to 1800 UTC.

The Gambia (C5)

There has not been much to report on activity from this one. On 15M CW we found C53GQ on 21.025 MHz at 2230 UTC with C53GS on 21.023 MHz at 2215 UTC.

C53/SMØJHF was also reported active during the month of December, including 30M on 10.102 MHz at 0200 UTC.

Djibouti (J2)

This is another one of those elusive ones to find. Ron Faulkner, W6TUR, reports working Jean, J28BF, with a weak signal into southern California at 1500 UTC on November 25 near 14.023 MHz. A few days later Jean was worked by another California DXer on 14.010 MHz at 1530 UTC.

SSB types might want to look for J28BG, who was worked on 12M near 24.945 MHz at 1400 UTC and in the Novice band on 10M at 1300 UTC on 28.477 MHz.

Mongolia (JT)

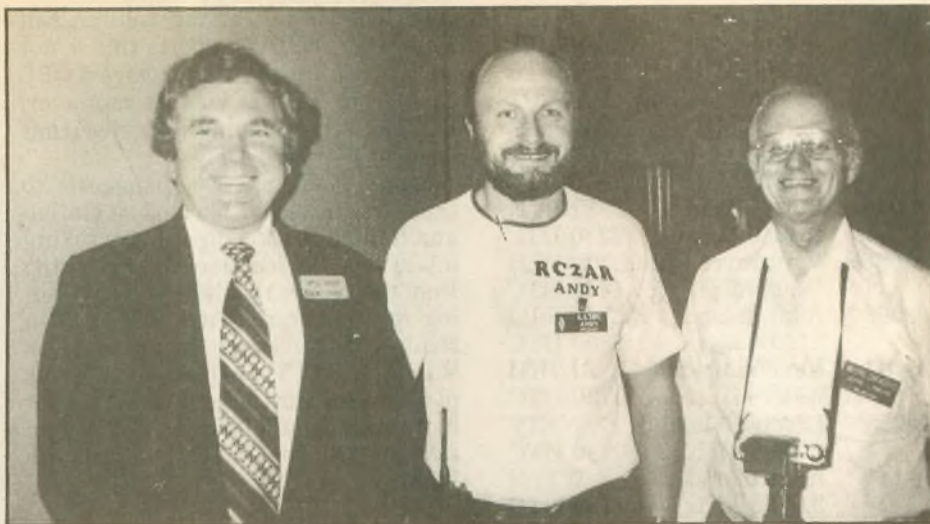
There may be only a few stations active from this one, but the activity by them has been plentiful. In fact when one of them wound up on the same frequency as the North Korean DXpedition station (P5RS7) he was told to QSY-politely of course.

Very active on 20M SSB has been JT1BG who can often be found between 14.194 and 14.197 MHz from 0100 to about 0400 UTC. Also sharing the band with him is JT1CS, found between 14.190 and 14.256 MHz around 0130 UTC. On 9 December there was a JT1V on 14.240 MHz at 0200 UTC.

On 20M CW the following have been reported:

JT1BR 14.008 MHz 0100 UTC
 JT1CS 14.039 MHz 0130 UTC
 JU83ØC 14.034 MHz 0200 UTC

Seventy-five meters produced some happy DXers with JT1BG worked by a Mid-Westerner on 3.790 MHz around 1200 UTC two days before Christmas and JT1CS on 3.800 MHz at 1145 UTC



Why are these gentlemen smiling? Obviously, because they are having their picture taken. Visiting DXers at the recent DXPO-92 in College Park (left to right) Boris, WF3J/UB5KAF; Andy Stchislenok, AA3BG/RC2AR, and John Minke, N6JM, enjoy the attention. Photo courtesy of AA3GB, who says he is the first DXer from Belarus to receive a US call, an Extra Class call at that!

on 15 December working into New Hampshire.

On 15M CW look for JT1BR between 21.013 and 21.031 MHz around 0130 UTC, or JT1CS on 21.021 MHz at the same time.

Turkey (TA)

On the WARC bands we have TA2BK reported active on 30 and 12M. Look for this one near 10.105 MHz at 2300 UTC and 24.899 MHz around 1400 UTC.

At least five other calls were reported from Turkey recently:

TA1AL 28.516 MHz 1445 UTC
 TA2KA 21.010 MHz 1530 UTC
 TA2XB 14.007 MHz 1545 UTC
 TA3D 7.012 MHz 0000 UTC
 TA8FG 7.002 MHz 2300 UTC

IOTA

There always seems to be some activity on the bands for IOTA chasers. W2RPH is presently active from the Nettles Islands (NA-141) and should be there through 1 March. Over in Norway LA9DAA will be active for more than a year from Vardo Island (EU-141).

If you are wondering what IOTA means, it is simply we deserving DXers

chasing islands. The IOTA program-Islands on the Air-was created by noted British SWL Geoff Watts and is now administered by the RSGB.

Here are a few islands that have appeared on the bands mid-December

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| | | |
|------------------------|-------------------|-----------|
| through early January: | | |
| EU-008 | Isle of Skye | GMØIQD/P |
| | 21.260 MHz | 1700 UTC |
| AS-018 | Sakhalin Island | UAØFDX |
| | 21.261 MHz | 2345 UTC |
| AS-102 | Quemoy Island | BVØARL/9 |
| | 21.255 MHz | 2315 UTC |
| NA-013 | Corn Island | YNØYN |
| | 21.260 MHz | 2230 UTC |
| NA-036 | Vancouver Island | VE7DEH |
| | 7.005 MHz | 1345 UTC |
| NA-039 | Adak Island | KL7/N3LBJ |
| | 21.260 MHz | 2330 UTC |
| NA-041 | Revillagigedo Is. | AL7KH |
| | 3.767 MHz | 0700 UTC |
| NA-055 | Islesboro Island | NR1V |
| | 14.260 MHz | 0130 UTC |
| NA-140 | Kent Island | W3YN |
| | 21.260 MHz | 1730 UTC |
| SA-008 | Tierra del Fuego | LU8XPA |
| | 21.260 MHz | 0000 UTC |

If anyone thinks N6JM is confused with Revillagigedo Island, check it out. It is part of the Alexander Archipelago in Alaskan waters. That's where Ketchikan is located. Also, it's pronounced the "gringo" way, as they don't understand Spanish up there.

IOTA types may also be interested to know that the Papua New Guinea Amateur Radio Society has made an effort through one of its members, Steve Telenius-Lowe, P29DX, to put their islands on the air. The society is also pushing for a P29 Activity Weekend, probably sometime in September. We have a current list of calls that are resident in the various provinces. However, we have no map that shows the boundaries and cannot correlate the islands to the provinces. P29KDE is in Manus province and this looks like the Admiralty Islands (OC-025).

Miscellaneous

Harry Angel, VK4HA, according to *QRZ DX*, is reported to be Australia's oldest living amateur, who celebrated his 101st birthday on 14 December.

Jim Noll, in response to our comments on IRCs in our January column, suggests selling obsolete IRCs to collectors. Jim says he is a collector, so if you wish to unload any of these old versions contact him at P.O. Box 3410, Escondido, CA 92033; telephone 619/745-7424.

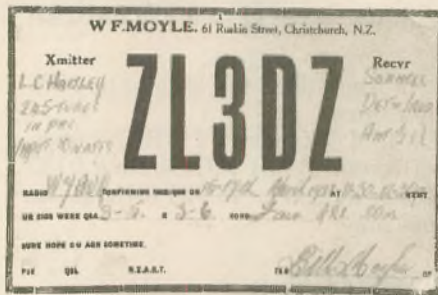
Regarding TF5TP as one of the pi-

rates listed in our January column, Bill Vandiveer, K2DW, reports this is not so. He just happened to receive a QSL card from TF5TP via his manager, DL7MQ—the same day he received that issue of *Worldradio*.

Glenn Pladsen, AEØQ, suggests to those frustrated with a modest station and limited to attic dipoles, try taking a trip to a DX location and operating from there. As a result he will be heading for Ambergris Caye (NA-073) in Belilze. In November he operated as V31RY on RTTY, AMTOR, and CW. He plans to return the end of March for more activity of RTTY and CW. Glenn says to QSL his V31RY contacts via WNØB.

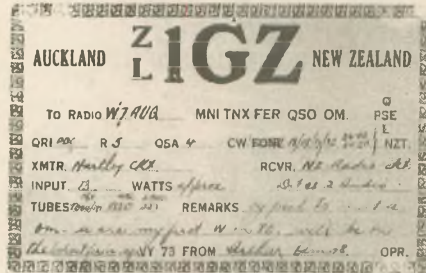
Antique QSLs

Last month we had a little item regarding DXing in 1932 by Milton "Pete" Peterson, W7AUQ. Here are two of the QSL cards of the stations he had mentioned. The first is that of ZL3DZ, who



had remarked that after all the power he had wasted in the last three days calling W7AUQ, he wanted a card. On his card, Bill Moyle, the operator of ZL3DZ, indicated that he was running 10W input. And this was on 80M!

The other card is that of Arthur Amos,



ZL1GZ, whom Pete had worked around midnight, New Zealand time, on 18 April 1932. Their contact lasted about 50 minutes and was completed with the

exchange of QSL cards and usual photos of the day. Yes, the exchange of photographs was common then.

Back in 1970 Pete came across Arthur's card and found that he was still listed in the *Callbook*. Of course, he decided to renew the correspondence after all those years. We have printed Arthur's reply in part.

"Many tnx for your card to me affirming our QSO in April 1932. No, I will never forget my first big thrill as a ham. At that time I had only been on the air since January of that year and I was extremely low powered. It caused quite a sensation around the district. I even got a small mention in one of the local papers. Rig was 210 in Hartley, 27 speech amp, modulation 250. Input phone about 4½W, about 13W CW. I enclose your original card, which I would like back when you have time."

We checked our 1992 copy of the *Callbook* and found that Arthur is no longer listed. If he is still with us, Arthur would be 90 years old. He served in both world wars, and was only 15 years of age when he served in the first one.

QSL information

Neil Penfold, VK6NE, reports that our QSL route for VK9CW via VK6XW is wrong. The operator does not collect QSL cards via the bureau and his call is not in the *Callbook*. VK6XW handles cards for VK9CY. Also, Lionel, VK6LA, has gone to Cocos Island again for an indefinite stay and is signing VK9CB.

Neil also reports that operators of the following calls are not picking up their QSL cards from the VK9/VK0 bureau: VK9LA, VK9LB, VK9LF, VK9LM, VK9ND, VK9ZM, VK9ZW, VK9AB (1987), and VK9NP (1987).

Charles Ragan, N9NGG, and others report that the QSL route for CEØY listed in our January column is incorrect. The correct route should have read K6VNX-not K6VXN. Charles is also looking for routes for the following calls: CR3R, FR5DX, RYØQ, TK5EP and V44NK. A check with *The W6GO/K6HHD List* shows only the last two. Try for TK5EP via Patrick, P.O. Box 228, F-21079, Ajaccio, FRANCE, and for V44NK via Karl, P.O. Box 549, Nevis Island, WEST INDIES. As for CR3R, FR5DX and RYØQ, use the *Callbook* address, (if given), or via the bureau.

QRZ DX reports that those of you who are still waiting for QSL cards for YXØAI or 4MØARV should try again through the following address: YXØAI-YV5ARV, 3180 Leewood Terrace, L-208, Boca Raton, FL 33431. Please include an self-addressed envelope and IRC or green stamp. Do not include US postage, as the cards will be processed in Caracas.

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QSL routes

| | | | |
|------------|---------|----------|---------|
| 1B1NCC | —G0ITX | P5R57 | —JA1HGY |
| 3D2AC | —SM0NZY | RH8BKA | —WA2NHA |
| 3D2DM | —AB4LX | RO4OA | —SP9HWN |
| 3D2TO | —JA1OEM | S51UF | —YU3UF |
| 3W1D | —SP5ES | S52DD | —WA4WTK |
| 3W4VL | —OK3IA | S53RV | —WA4JTK |
| 3X0HNU | —F6FNU | S55AA | —YU3AI |
| 4N4AX | —WA4WTK | S57DX | —YU3BQ |
| 4N4CQ | —YU4CQ | S59UN | —YU3ZV |
| 4N5RB | —YU5KTX | S75S | —I5JHW |
| 5B4/G4RWD | —G4RWD | S79ELY | —JA1ELY |
| 5B4/G4ZVJ | —G4ZVJ | S79MD | —FD6ITD |
| 5H3MT | —JA3PAU | SJ9WL | —SM0HUK |
| 7Q7MO | —JA3PAU | S03NL/1 | —Y54NL |
| 8Q7BX | —I4ALU | S06OP | —DJ4OP |
| 8Q7KA | —JA8CMS | S09DO | —DJ6DO |
| 8Q7RA | —JA8CMS | S09EFW | —DL1EFW |
| 8Q7WX | —AA0CR | T28AA | —N4FJL |
| 8Q7XX | —DJ8MT | T32AF | —K7EHI |
| 9F2CW | —DK7PE | T32BE | —WC5P |
| 9J2KY | —JA8XPX | T32VU | —DJ3TF |
| 9M2NA | —VE3CHZ | T65C | —WA6CDR |
| 9N1JAR | —JM1LAW | TF5TP | —DL7MQ |
| 9X5AB | —DL6NA | TI2IDX | —WA9BKB |
| A22JP | —KC4UCE | TL8DF | —FE1LBM |
| A35JR | —K0JA | TU2PA | —KE0LS |
| A35MW | —JK2PKT | TZ6RM | —K5UK |
| A35ZY | —SM0NZY | UB5WJ | —WA6CTF |
| C56/G3RZ | —G3RZ | UC1WWR | —GW3CDP |
| C6AGN | —KA1DIG | UJ8JI | —IK3HHX |
| CY0NSM | —VE1CBK | UX1A | —KC1WY |
| ES5RY | —DJ0JB | V2/VE3BV | —VE3CPU |
| ET3JA | —FD10YK | V31RY | —W0NB |
| ET3JR | —FD10YK | V47FV | —N3JCL |
| ET3RA | —HB9CVB | V47G | —NL7GP |
| FG5FZ | —F6FNU | V63MC | —JH8BKL |
| FK8FU | —NA5U | V63SM | —JQ1EEL |
| FT4WD | —F6AXX | VA1S | —VE1AL |
| FY5FA | —F6GNG | VK9CB | —VK6LA |
| H44/P29JA | —JH7MSB | VK9CY | —VK6XW |
| H44IO | —Y49RO | VK9NY | —JH5OWN |
| H44XO | —Y49RO | VP2MBM | —N5DXD |
| HF0POL | —SP9DWT | VP2MBO | —KE9XY |
| HS0ZAA | —KM1R | VP2MCX | —N5KXN |
| IB1E | —I1RBJ | VP2MFA | —K8SJ |
| IU0PAW | —IK0SHF | VP2MLD | —KC4DWI |
| J5UAI | —NW8F | VP2MR | —N5DXD |
| J79MAE | —DL5MAE | VP8VN | —G4LGG |
| JES1VW/JD1 | —JA5AUC | VQ9BB | —K8BJZ |
| JU830C | —JT1KAA | VR6BB | —JF2KOZ |
| JW0F | —SP2GOW | VR6JJ | —JF2KOZ |
| JW9XG | —LA9XG | V56PQ | —JAIJKG |
| JX7DFA | —LA7DFA | XU5S | —F6FNU |
| JY40ZH | —JY3ZH | XU6TO | —PA0EQ |
| KA1VFP/T5 | —KA1VFP | XU7VK | —HA0HW |
| KC6DX | —JA2NVY | XU8VC | —F6FNU |
| KC6MN | —JH2BCN | YB7LGA | —KA6KKK |
| KC6TH | —JA0DCQ | YJ0AAA | —JH7MSB |
| KH0/KD4RCC | —JF1VXB | YJ0ARW | —ZL1AMO |
| KH2/JH1FNS | —JH1FNS | YN0YN | —KN9P |
| KH2C | —JA9AG | ZA1AB | —HB9BGN |
| KH2H/KH0 | —JS1BLS | ZF2NJ | —K0BJ |
| KH4/W3HUV | —W3HUV | ZF2SZ | —WB6OKK |
| N2QHO/D2 | —N2QHO | ZF2TB | —KJ6HO |
| OM3CLK | —OK3CLK | ZF2TG | —WQ5W |
| OM3KFO | —OK3KFO | ZK1AZY | —SM0NZY |
| OM3RM | —OK3RM | ZK2XJ | —JA3JM |
| OM3TGT | —OK3TGT | ZY8IS | —PT7BI |

DX Prediction — March 1993

Maximum Useable Frequency from West Coast, Central U.S. and East Coast (courtesy of Engineering Systems Incorporated, Box 939, Vienna, VA 22183).

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CENTRAL USA

| UTC | AFRI | ASIA | OCEA | EURO | SO AM |
|-----|------|------|------|------|-------|
| 8 | (16) | 11 | *19 | (10) | *18 |
| 10 | (15) | 10 | *17 | (10) | *17 |
| 12 | 27 | *13 | 14 | 18 | 22 |
| 14 | 33 | (14) | *23 | 22 | *30 |
| 16 | 35 | (13) | 20 | 21 | *33 |
| 18 | *34 | (13) | (18) | 18 | *35 |
| 20 | 28 | 22 | (22) | 13 | *35 |
| 22 | 23 | 23 | 30 | (11) | *35 |
| 24 | *20 | 21 | 35 | 11 | *34 |
| 2 | *18 | (15) | 29 | 10 | *28 |
| 4 | *18 | (13) | 26 | 10 | *24 |
| 6 | 17 | (11) | 22 | *11 | *20 |

EAST COAST

| UTC | AFRI | ASIA | OCEA | EURO | SO AM |
|-----|------|------|------|------|-------|
| 7 | 16 | (10) | (19) | *10 | *18 |
| 9 | (16) | 10 | *17 | (13) | *17 |
| 11 | 30 | *13 | 14 | *20 | 21 |
| 13 | *35 | (12) | *24 | *23 | *30 |
| 15 | *35 | (11) | 21 | *23 | *33 |
| 17 | *37 | (10) | (18) | *21 | *35 |
| 19 | *31 | (13) | (16) | 19 | *35 |
| 21 | 26 | 20 | (27) | 13 | *35 |
| 23 | *22 | 21 | 33 | 11 | *34 |
| 1 | *19 | (15) | 28 | 11 | *28 |
| 3 | *17 | (12) | 26 | 10 | *24 |
| 5 | *17 | (11) | 22 | 10 | *20 |

WEST COAST

| UTC | AFRI | ASIA | OCEA | EURO | SO AM |
|-----|------|------|------|------|-------|
| 10 | (12) | *14 | *20 | (10) | *18 |
| 12 | (12) | *13 | *18 | (10) | (15) |
| 14 | (22) | *15 | *15 | 20 | 27 |
| 16 | (26) | 14 | *20 | 21 | *33 |
| 18 | 28 | 13 | 18 | 18 | *35 |
| 20 | 28 | 22 | (22) | (12) | *36 |
| 22 | 23 | *28 | 30 | (11) | *35 |
| 24 | 20 | *30 | 34 | (10) | *35 |
| 2 | *18 | *27 | 36 | 10 | *28 |
| 4 | *16 | 20 | 31 | 10 | *24 |
| 6 | (14) | 17 | 28 | *12 | *20 |
| 8 | (13) | *15 | *24 | (11) | *18 |

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LU8XPA—Box 55, CP9410 Ushuaia, TF, ARGENTINA

N2RHP/T5—David L. Smith, 9437H Few Loop, Fort Drum, NY 13602

R0H—EuDXF, Box 620260, 5000 Köln 60, GERMANY

S51HB—Box 1, 65282 Cerknno, SLOVENIA
S51XE—Boris Tusek, Jerebova 9, 65282 Cerknno, SLOVENIA

S52CD—Tone Crv, Bukovo 3, 65282 Cerknno, SLOVENIA

S54DL—Darko Laharnar, Trg 31 Divizijev, 65282 Cerknno, SLOVENIA

S57AL—Ivo, Box 1, 61253 Radomlje, SLOVENIA

S59AB—Box 1, 65282 Cerknno, SLOVENIA
S59WA—Box 1, 65282 Cerknno, SLOVENIA

W0RJU/KP5—Randy Rowe, Box 891, DeSoto, TX 75123

WA4DAN/KP5—Randy Rowe, Box 891, DeSoto, TX 75123

XR6M—Box 1234, Temuco, CHILE
ZD7DP—Desmond, Box 86, ST HELENA ISLAND, South Atlantic

Many thanks to the following contributors: VK6NE, K2DW, AA3BG, W6ISQ, W6TUR, KC6WYX, N6ZZ, W7AUQ, K8SJ, N9NGG, KD0JL, AE0Q, Jim Noll, Papua New Guinea Amateur Radio Society (P29AS), Salt City DX Association (KB2G), Western Washington DX Club (WA0RJY), American Radio Relay League (K5FUV), CQ Ham Radio, The DX Magazine (VP2ML), Long Skip (VE3IPR), The W6GO/K6HHD List, The Long Island DX Bulletin (W2IYX), QRZ DX (W5KNE), and The DX Bulletin (VP2ML).

We recently received a photo from our good friend, Jack Troster, W6ISQ. It shows this DX editor in one of his finer moments at Visalia trying to send CW with one's posterior. The facial expressions can mean several accomplishments, such as "Hey, wow, I got on the list!" We are not sure if we should print the photo as perhaps with that stupid look we may lose all our readers. Anyway, we shall see! 73 es gud DX! de John N6JM. **WR**

AA4VK/KP5—Randy Rowe, Box 891, DeSoto, TX 75123

C21BR—Brian Rous, Box 478, NAURU
E28DX—VIROJ S., Box 89, Bangkok 10220, THAILAND

HL0BQT/5—Box 559, Pusan, KOREA
J43A—Box 30, Amalias 27200, GREECE

KC6OK—OKDXA, Box 73, Owasso, OK 74055

KC6RR—OKDXA, Box 73, Owasso, OK 74055
KC6SS—OKDXA, Box 73, Owasso, OK 74055



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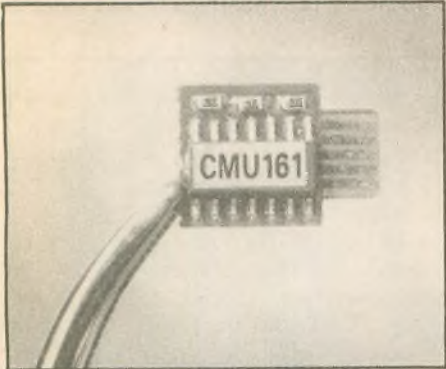


Gordon West,
WB6NOA

Mega memory chip

The 2M band is the country's hot-bed of activity. And if you are constantly on the move, local 2M repeaters are a fun and sure way to get on the air with the locals for roadside assistance, directions, and just fun ragchewing.

The modern 2M and dualband hand-held transceiver may also pull in the local weather channels on 162 MHz,



200 channels, ready to go.

highway patrol and sheriff frequencies at 155 MHz, plus downtown city police at 460 MHz. And if you are like me, you have a little black book with all of these local area frequencies written down to help you reprogram your hand-held or mobile radio *fast* when you get into the new area.

Gee, wouldn't it be neat if manufacturers of single-band and dualband Amateur Radio hand-helds could imbed all of the local ham and scanning frequencies into a tiny chip that you might select and plug in when you get into a new area? Think of the possibilities—for you air travelers, you could unplug your local chip, plug in the new chip for the area you are going, and as soon as you step off the plane, your hand-held is ready for local Amateur Radio and scanning action. And as you drive out to the suburbs, you might even unplug your city chip and plug in an area chip for all of those distant

repeaters that will cover your route along the way out of town.

This technology has arrived. It's found in several popular hand-helds, and most people don't know it!

- Kenwood TH-78 dualband hand-held
- Alinco DJ-180 VHF hand-held
- Standard 168/468 single-band hand-helds
- Standard 188/488 single-band hand-helds

In all of these hand-held Amateur Radio transceivers, memory channel information is stored on a tiny plug-in chip no larger than your little fingernail. The factory plugs in the chip, closes up the unit, and you program the frequencies you want. Medium-priced hand-helds will offer up to 40-channel memory, and the less expensive hand-helds may offer up to 10 or 20-channel memory. Some features include amateur or scan-receive frequency; amateur transmit offset; CTCSS encode/decode settings; scan or scan lockout (some sets); paging and digital selective calling (some sets).

On all of these units, except for the brand new Standard C188/488, this plug-in chip is deep within the internal circuitry of the hand-held transceiver and can only be changed by completely disassembling the set. But you could upgrade your 10-channel or 20-channel capabilities to a mega-memory of 100 channels, and there are even some chip sets out there for up to 200 channels!

It was the Amateur Radio industry's first Japanese hand-held manufacturer, Standard Communications Corporation, to bring us a whole new concept in programmable technology for instant chip changes. They put the chip on the *outside*!

When you buy the Standard VHF or UHF thin hand-held, it comes "standard" with a brain-dead (as they all are) 40-memory channel chip. At turn-on, it comes up 146 MHz on 2M, or 440 MHz on 70 cm. This is the way they all do

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Get your duck out and above the car roof to increase signal range to your local repeater! Perfect for the traveling Amateur who doesn't want to carry a Meg Mount or has two cars. • Matching 6' coax is \$10.95 or get BOTH mount and cable for \$23.00! connectors are all BNC. • Rubber Ducks now available from \$15 for 2 meter 1/2 wave. Dump your old HT stubble !!!



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For dipoles 3-30 MHz, 6 Kw PEP 1:1 or 4:1 ratio. Model 2K \$84.95



1.7-30 MHz, 3 Kw PEP, 1:1 or 4:1 ratio. Model 1K \$49.95



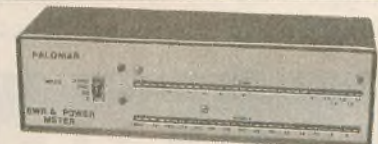
1.7-30 MHz, 350w PEP, ratios from 1:1 to 16:1. Model PB \$26.95
Model UU \$26.95



For high SWR applications-tuners, multiband dipoles. 2 Kw CCS @ 10:1 SWR, 1.7-30 MHz, 1:1 or 4:1 ratio. Model SB \$79.95

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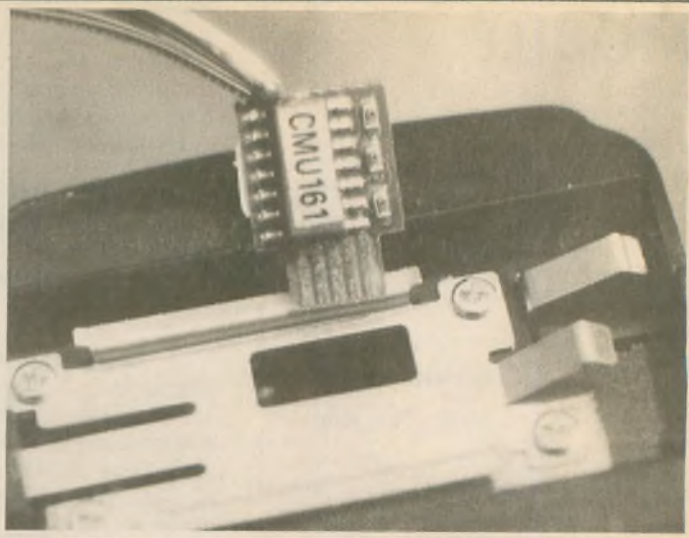
until you begin to memorize those ham channels and scan channels of your choice.

Now here comes the good part—you can buy a handful of additional 40-channel, or 200-channel, EE-PROM memory chips, and then spend a night programming up the chips for your expected area of travel. Or, you could program up different memory chips for different types of scanning and hamming—both Standard units feature out-of-the-box, wide open scanning capabilities from 115 MHz to 175 MHz receive—400-474 MHz receive for the UHF set.

The tiny EE-PROM chips require no memory backup. Once they are programmed, they are set for life. This means you can carry them in your pocket and pop them in and out with your two fingers in less than a couple of seconds. No tweezers required, as were necessary with the earlier Standard 168-468 hand-held transceiver, where the chips would go in through the battery compartment. And best of all, you don't need to disassemble the entire set to get at the chip, as you would with the Kenwood or Alinco units. Icom and Yaesu are still contemplating whether or not this type of feature will really take off.

Hey, if it doesn't cost you anything for

This chip requires a steady hand to place in position. Total time: 30 seconds.



the capability, I think it's great! And once you get one Standard hand-held all programmed up, you can even clone another Standard hand-held right over the air. This cloning business takes a little bit of time, but nonetheless, it can be done.

Down the line I see Amateur Radio dealers stocking chip sets for selected areas of the country featuring pre-programmed ham channels, pre-programmed local area scan channels, the National Weather Service channels, and

a host of other frequencies that you might be surprised to hear on your little amateur transceiver featuring "out-of-band" reception.

I don't mean to encourage you to get lazy about learning how to program your hand-held—I'm simply saying, wouldn't it be nice to buy a tiny little chip set for that distant city trip, as opposed to purchasing a repeater direc-

HANDHELDS

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2-meter and 430-450 MHz. 42 memories. Simultaneous receive of both bands. Dual VFOs each band. PL encode/decode. Paging feature. DTMF autodialer (10 memories, 15 digits each). Auto repeater shift. Scanning features. Auto power-off. Battery saver. Extended receive. Audible command verification. Keypad and rotary-dial frequency entry. Battery packs available from 2.3 to 5 watts. More.

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The Kenwood chip-change requires opening the unit completely to gain access.

tory and spending hours ahead of time programming your hand-held and then completely unprogram it when you get back home? Just pop out your local chip, plug in your new chip, and you're ready to roll! Makes sense to me. I already have 32 different chip sets for my little thin Standard C188 hand-held for my upcoming trips across the United States.

WR

Visit Your Local RADIO CLUB

For information on how to get your club listed in "Visit Your Radio Club," plus receive many other benefits, write to Club Liaison, Worldradio, 2120-28th Street, Sacramento, CA 95818.

ALABAMA

Montgomery Amateur Radio Club (W4AP). P.O. Box 3141, Montgomery, AL 36109. Meets 3rd Mon./monthly, 7 p.m., State Trooper Dist. Office, Coliseum Blvd. & Federal Dr. Nets Sun. 8:30 p.m. 146.84+ and Thurs. 8:15 p.m. 147.18+. Info: Fred, KB4JX, (205) 270-0909.

ALASKA

Anchorage Amateur Radio Club, Inc. Meets 1st Fri./monthly, 7 p.m., Alaska Pacific Univ. Carr-Gottsten Cntr., 4101 University Ave., Anchorage, AK. Fred S. Wegmer, KL7HF, Pres.

North Pole Hamsters ARC. Meets 1st Mon./monthly, 7 p.m., VFW Bldg., Old Rich Hwy. & VFW St., P.O. Box 56424, North Pole, AK 99705.

ARIZONA

Central Arizona DX Assoc. (CADXA). Meets 1st Thurs./monthly, 7 p.m., Salt River Project Pera Club, 1/2 mi. West of 68th & Continental Dr., Scottsdale, AZ. Rptr. K5VT 147.32/92. Packet Cluster nodes (S): 145.09, 144.93, 145.03. Info: Warren Hill, KF7AY, (602) 396-2218.

Cochise Amateur Radio Assn. (CARA). Meets 1st Mon./monthly, 7:30 p.m. at club facility on Moson Rd., Sierra Vista, AZ. WA7KYT/R 146.16/76 rpt.

Scottsdale Amateur Club. Meets 1st Wed./monthly, 7:30 p.m., Scottsdale Sr. Cntr., 7375 E. 2nd St., Scottsdale, AZ. Net Tues., 7 p.m., 147.18 rpt. Info: Barney Fagan, KB7KOE, (602) 861-2817.

Tucson Repeater Assoc., P.O. Box 40371, Tucson, AZ 85717-0371. 2nd Sat./monthly, 7:15 p.m., Pima Co. Sheriff Bldg., 1750 E. Benson Hwy. Net Thurs. 7:30 p.m. 146.22/82 (146.88-, 147.08-, 448.550-, & 145.15 Packet).

CALIFORNIA

Amador County Amateur Radio Club. P.O. Box 1094, Pine Grove, CA 95665. Meets 1st Thurs./monthly, 7:30 p.m., Jackson Sr. Cntr., 229 New York Ranch Rd., Jackson, CA. Info: call 146.835.

Amateur Radio Club of El Cajon. WA6BGS. P.O. Box 50, El Cajon, CA 92022. Meets 2nd Thurs./monthly, 7 p.m., La Mesa Church of Christ, 5150 Jackson Dr., La Mesa, CA. Rptrs. 147.675(-), 224.080(-). PL 107.2. Nets 147.570 Wed./Sat., 7 p.m. Info (619) 697-2700.

Associated Radio Amateurs of Long Beach, W6RO. P.O. Box 7493, Long Beach, CA 90807. Meets: 1st Fri./monthly, 7:00 p.m. Signal Hill Recreation Hall, 1708 E. Hill St., Signal Hill, CA.

Conejo Valley Amateur Radio Club (CVARC). P.O. Box 2093, Thousand Oaks, CA 91358-0917. Meets 1st Thur./monthly at King of Glory Lutheran Church, 2500 Borchard Rd. Newbury Park, CA, 7:30 p.m. Info on 147.885/285 and 445.925/0.925 (PL 123) or call N6LQ Ernest (805) 499-5398.

Contra Costa Communications Club, Inc., WD6EZR/R. P.O. Box 20661, El Sobrante, CA 94803-0661. Meets 2nd Sun./monthly (except May & Dec.), 7 a.m., Baker's Square Restaurant in Richmond, CA. Info: Ed Caine, KA6OFR, (707) 996-0962.

Corona Norco ARC, (CNARC). Meets 1st Mon./monthly, 7:30 p.m., St. John's Episcopal Church, 526 Magnolia Ave., Corona, CA. Talk-in 146.535 Simplex. Info: John Miller, NF6Y, (909) 735-0284.

Downey Amateur Radio Club. Meets 1st Thur./monthly, 7:30 p.m., So. Middle Sch., 12500 S. Birchdale, Downey, CA. Wkly nets—Thur., 7:30 p.m. 146.595 (S). For info: P.O. Box 207, Downey, CA 90241-0207.

East Bay Amateur Radio Club, Inc. Meets 2nd Fri./monthly, 8 p.m.-10 p.m., Northbrae Community Church, 941 The Alameda, Berkeley, CA. Info: Gordon Firestein, (415) 527-9382.

Fullerton Radio Club, Inc. W6ULI. P.O. Box 545, Fullerton, CA 92632. Meets: 3rd Wed./monthly, 7:30 p.m., Sr. Citizens Center, 340 W. Commonwealth, Fullerton. Net ea. Tue., 8 p.m. 147.975 (-600). Info, Bob Hastings, K6PHE (714) 990-9203.

Gabilan Amateur Radio Club (GARC). P.O. Box 2178, Gilroy, CA 95021-2178. Meets odd months, 2nd Thurs., 7:30 p.m., First Interstate Bank, First St., Gilroy and even months for brkfst., 2nd Sat., 8:30 a.m.

Golden Empire Amateur Radio Society (VEC). P.O. Box 508, Chico, CA 95927. Club call W6RHC, Repeater 146.25/85. Meets: 3rd Fri./monthly, 8 p.m. at 1528 Esplanade, Room 110B, Chico.

Livermore Amateur Radio Klub, (LARK). Meets 3rd Sat./monthly, 9:30 a.m., City Council Chamber, 3575 Pacific Ave., Livermore, CA. Net Mon. 1900 on 147.12+. For info: LARK Secretary, P.O. Box 3190, Livermore, CA 94551-3190. (510) 447-3815.

Marin Amateur Radio Club (MARC) W6SG. Box 151231, San Rafael, CA 94915-1231. Meets 1st Fri./8 p.m.; MARC Clubhouse Bldg. 549, HAFB, Novato, CA (415) 883-9789 (Summer exceptions; contact Pete N6IYU, 924-1578). Sun. AM Club at Red Cross, San Rafael.

Monterey Park Amateur Radio Club (MPARC), K6GIP. P.O. Box 403, Monterey Park, CA 91754-0403. Meets 2nd Thurs./monthly, 7:30 p.m., Community Rm.—City Hall, 320 W. Newmark, Monterey Park. Nets: Tues. 7 p.m. 147.48 Simplex — 7:30 p.m. 28.385 MHz. Info: John Duce, N6EDX (818) 280-7052.

Moreno Valley Amateur Radio Assoc. P.O. Box 7642 Moreno Valley, CA 92303. Meets 4th Mon./monthly, 7 p.m., City Council Chambers—City Hall, corner of Cottonwood & Frederick Sts. Net Tues. 8 p.m. 146.655- (PL 1A). Info, Larry Marcum, KA6GND, (714) 656-1643.

Mount Diablo Amateur Radio Club. P.O. Box 23222 Pleasant Hill, CA 94523. Meets 3rd Fri./monthly, 8 p.m., Our Savior's Lutheran Church, 1035 Carol Ln., Lafayette, CA. Net Thurs. 7:30 p.m. on 147.06(+). Info, George K16YK, (510) 837-9316.

North Hills Radio Club. Meets 3rd Tue./monthly, 7:30 p.m., Elks Lodge, on Cypress at Hackberry in Carmichael, CA. (P.L. 162.2) Net K6IS Thurs., 8:00 p.m. 145.190. 220 Net, Tue. 8:00 p.m. 224.40(-).

Orange County Amateur Radio Club. Meets 3rd Fri./monthly, 7:30 p.m. at 907 E. Vermont, Anaheim, CA. (Between Anaheim Blvd. & State College) Call in on 146.550 simplex. Contact Ken Koehechy W6HHC at (714) 541-6249.

River City A.R.C.S. Meets 1st Tues./monthly, 7 p.m., SMUD Bldg., Don Julio at Elkhorn, Sacramento, CA. License classes offered. For info contact Lyle, AA6DJ, (916) 483-3293.

Sacramento "Old Timers" Amateur Radio Society and Sacramento Valley Chapter #169 CQWA (Quarter Century Wireless Assn.). Meets 2nd Wed./monthly, 8 a.m., Lyon's Restaurant, 1000 Howe Ave. For info contact Paul Wolf, W6RLP (916) 331-1830.

San Fernando Valley ARC. Meets 3rd Fri./monthly, 7:30 p.m., Red Cross, 14717 Sherman Wy., Van Nuys, CA. Net every Thur., 8:00 p.m. KB6C/R 147.735(-).

Santa Clara County Amateur Radio Assoc. (SCCARA) W6UW & W6UU. P.O. Box 6, San Jose, CA 95103-0006. (408) 249-6909. Meets: 2nd Monday/monthly, 7:30 p.m. at United Way, 1922 The Alameda, San Jose. Net all other Mon., 7:30 p.m. W6UU/R 146.385 + /442.425 + PL 107.2

Santa Clara Valley Rptr. Society (SCVRS). P.O. Box 2085, Sunnyvale, CA 94087. (408) 247-2877. 146.76 (-600 kHz), 224.26 (-1.6 MHz), 444.60 (+5 MHz). 2 meter/220 net Mon. 9 p.m. Mtgs.-3rd Fri.

Santa Cruz County Amateur Radio Club, Inc. Meets last Friday/monthly at Dominican Hosp. Ed. Bldg., Soquel Dr., Santa Cruz, 7:30 p.m. Net K6BJ 146.79 Mondays at 7:30 p.m.

Santa Monica—Westside Amateur Radio Club. Meets 3rd Thurs./monthly, 7:30 p.m., Santa Monica Red Cross, 1450 11th St., Santa Monica, CA. Info Net every Tues., 8 p.m., 146.670, -600.

Shasta Cascade Amateur Radio Society (SCARS) P.O. Box 664, Anderson, CA 96007. Meets: 3rd Wed./monthly, 7 p.m. at the C.D.F. Conf. Rm., Grape St., near Parkview Ave., Redding, CA. Net 146.64, Wed., 8 p.m.

Southern California Six Meter Club. P.O. Box 10441, Fullerton, CA 92635. USB Net Tue., 8 p.m., 50.150. FM Rpt. Net Thur., 8 p.m., 51.80/51.30 tx. FM Smplx, call freq. 50.300.

Stanislaus Amateur Radio Assoc., Inc. (SARA). Meets 3rd Tues./monthly, 7:30 p.m., Stanislaus County Admin. Bldg. (lower level conf. rm.), 11th & H St., Modesto, CA.

Tehama County ARC. Meets 1st Fri./monthly, 7 p.m., Sept.-June, CA Div. Forestry Training Rm., Antelope Blvd., Red Bluff, CA. For info: 144.850/145.450 W6SYY/R.

The Trinity County ARC. P.O. Box 2283, Weaverville, CA 96093. Meets 2nd Wed./monthly, at the CD Hall in Weaverville, 7:30 p.m. WA6BXN Rptr. 146.13/73.

Tri-County Amateur Radio Assoc. P.O. Box 142, Pomona, CA 91769. Meets: 2nd Mon./monthly, 7:30 p.m., Covenant United Methodist Church, corner of Towne Ave. & San Bernardino Rd. in Pomona, CA.

United Radio Amateur Club K6AA. L.A. Maritime Museum, Berth 84, Foot of 6th St. San Pedro, CA 90731. Meets 3rd Fri./monthly except Dec., 7:30 p.m. Monitors 145.52 Simplex 10 a.m.-5 p.m.

Vaca Valley Radio Club. Meets 2nd Wed./monthly, 7 p.m., Vaca Fire Dist. Stn. on Vine St. in Vacaville, CA. Repeater: K6HIH 147.475 (-1 Meg) PL 127.3. Ph: (707) 448-4633.

Victor Valley Amateur Radio Club. P.O. Box 869, Victorville, CA 92393. Meets 2nd Tues./monthly, 7:30 p.m., Victor Valley Museum, 11873 Apple Valley Rd., Apple Valley, CA. Talk-in 146-940/340, info net Sun. 7 p.m. 146.940/340.

West Valley Amateur Radio Assoc. P.O. Box 6544, San Jose, CA 95150-6544. Meets: 3rd Wed./monthly, 7:30 p.m. (except Dec.) Cambrian School Dist. Office, 4115 Jacksol Dr., San Jose, CA. W6PIY/R. Net Tue., 8:30 p.m. 147.39 +, 223.96-

Yuba-Sutter Amateur Radio Club (YSARC). P.O. Box 1169, Yuba City, CA 95991. Meets 2nd Tues./monthly, 7:30 p.m., Yuba City Police Bldg., 1545 Poole Blvd., Yuba City.

COLORADO

Denver Radio Club. Meets 3rd Wed./monthly, 7:30 p.m., Denver Red Cross, 444 Sherman at Speer. Club net: Sundays, 8:30 p.m. 147.33 MHz.

CONNECTICUT

Middlesex Amateur Radio Society, (MARS). 5 North Rd., Cromwell, CT 06416. Meets Tues./weekly 7 p.m., Portland Methodist Church, Main St., Portland, CT. Novice classes, VE sessions monthly. Contact Jack, WA1K, (203) 847-8745. Rptr. 147.090 +.

Tri-City Amateur Radio Club. P.O. Box 686, Groton, CT 06340. Meets 2nd Tue./monthly, 7:30 p.m. St. Lukes Lutheran Church at Rt. 12. Novice classes. Info, contact Bob, KA1BB, (203) 739-8016.

DELAWARE/PENNSYLVANIA

Penn-Del Amateur Radio Club. P.O. Box 1964, Boothwyn, PA 19061. Sponsor of KA3TWG/Rptr. on 224.220 covering Delaware & Tri-state area. Infonet Thurs/wkly, 20:00 hrs. or call Hal Frantz, (302) 798-7270.

FLORIDA

Indian River ARC, Inc. (IRARC). 597 Capri Rd., Cocoa Beach, FL 32931. Martin Andersen Senior Center, 1025 S. Florida Ave., Rockledge, FL. Meets: 1st Thur./monthly, 7:30 p.m.

Platinum Coast Amateur Radio Society, (PCARS). Meets 2nd Mon./monthly, 7:30 p.m., Red Cross Bldg., 1150 S. Hickory St., Melbourne, FL 32901.

Sarasota Amateur Radio Assn. (SARA). P.O. Box 3182, Sarasota, FL 34230. Meets 3rd Tues./monthly, 7:30 p.m., Sarasota Memorial Hosp. Auditorium.

South Brevard Amateur Radio Club. P.O. Box 2205, Melbourne, FL 32902. Meets 1st Tue./monthly, 7 p.m., Melbourne Public Library, 540 Fee Ave., Melbourne, FL

Suncoast Amateur Radio Club. P.O. Box 7373, Hudson, FL 34676. Meets 2nd Mon./monthly, 7:30 p.m., First Lutheran Church, corner of Polk & Delaware, West Port Richey, FL. Sponsor of WC2G/Rptr. on 145.35, serving west Pasco County.

GEORGIA

Dalton Amateur Radio Club, Inc. (DARC). Meets 4th Mon./monthly, 7:30 p.m., Magistrate Court Bldg., corner of Waugh St. and Thornton Ave., Dalton, GA. Info, Bill Jourdain, N4XOG, (404) 226-3793.

HAWAII

Big Island Amateur Radio Club. P.O. Box 1938, Hilo, HI 96721-1938. Meets: 2nd Tue./monthly, 7:00 p.m., HELCO Auditorium, 1200 Kilauea Ave., Hilo. Talk-in on 146.760(-), 146.880(-), 147.020(+) and 147.040(+).

ILLINOIS

Amateur Cross Link Repeater Club. 29.680, 52.825, 147.225, 224.480, 921.225, 1292.10 and ATV on 916.25. Meets 1st Fri./monthly, 7:30 p.m. For info call (312) 594-1628. KD9FA Repeater/Chicago.

Fox River Radio League. Old Bank Bldg., 900 No. Lake St., lower level, Northgate Shopping Ctr. & Rt. 31, Aurora, IL. Meets 2nd Tue./monthly, 7:30 p.m. VEC Xams 3rd Tue./monthly, 7:30 p.m.

Hamfesters Radio Club, W3AA. P.O. Box 42792, Chicago, IL 60642. Meets 1st Fri./monthly, 8 p.m. Crestwood Civ. Ctr., 139th & Kostner, Crestwood, IL. Nets: Sun. (local) 0100 UTC, 28.410 MHz; Mon. 9 p.m. 146.43 S.; Packet Mailbox 145.07. Info: (708) 535-3496.

Peoria Area Amateur Radio Club, (PAARC). Meets 2nd Fri./monthly, 7 p.m., 1401 N. Knoxville Ave. For info: (309) 685-6698. Rptrs: 146.25/85 & 147.675/075.

The Starved Rock Radio Club, W9MKS. P.O. Box 22, Tabor St., Leonore, IL 61332. Meets 1st Mon./monthly, 7:30 p.m. Rptr. net 7 p.m. Wed./wkly., 147.721.12.

Tri-Town Radio Amateur Club. P.O. Box 302, Hazel Crest, IL 60429. Meets 1st & 3rd Fri. (Sept.-June), Hazel Crest Village Hall, 3000 W. 170th Pl. Net Wed. 146.49, 8 p.m. Info: (708) 335-9572.

Wheaton Community Radio Amateurs, (WCRA), P.O. Box QSL, Wheaton, IL 60189. Meets 7:30 p.m., 1st Fri./monthly, College of DuPage, Glen Ellyn, IL. Nets Sun. & Tue. 8:00 p.m., 145.39 MHz.

LOUISIANA

Baton Rouge Amateur Radio Club. P.O. Box 4004, Baton Rouge, LA 70821. Meets last Tues./monthly, 7 p.m., Catholic H.S. cafeteria, 855 Hearststone Dr. Rptr. 146.19/79 & 28/88. Net Sun., 8:30 p.m., 146.19/79.

Southwest LA Amateur Rptr. Club, Inc. (SWLARC). Meets 4th Tues./monthly, 7 p.m. in the Parish EOC Rm. W5BII/R 146.073/146.013. Net MWF, 7:30.

MICHIGAN

Chelsea Amateur Radio Club, Inc. Meets 4th Tues./monthly, 7 p.m., Society Bank, 1478 Chelsea-Manchester Rd., Chelsea, MI 48118.

Hazel Park Amateur Radio Club. Hoover Elementary School-Hazel Park, P.O. Box 368, Hazel Park, MI 48030. 2nd Wed./monthly, 7:30 p.m. Sept. thru May. 146.64(-) Call-in. W8JXU Club Call. Net Sun., 9 p.m., 146.64(-).

Michigan Amateur Radio Alliance, (MARA). O-11555 8th Ave. NW, Grand Rapids, MI 49504. Meets 1st Thurs./monthly, 7 p.m., TJ Mfg., 1739 Elizabeth, Grand Rapids, MI. STBY 145.780 + 145.410.

Oak Park Amateur Radio Club. Oak Park Community Center. 14300 Oak Park Blvd. (same as 9½ Mile Rd., west of Coolidge). Oak Park, MI 48237. 2nd Mon./monthly, 7:45 p.m. Talk-in on our 224.36 MHz or 146.64 MHz.

MINNESOTA

Minneapolis Radio Club. P.O. Box 583281, Minneapolis, MN 55458-3281. Meets 3rd Fri. (exc. June, July, Aug.), Mpls. Red Cross, 11 Dell Place, Mpls, 7:30 p.m. Making waves since 1916. Net 147.03(+), 7 p.m. Mon.

MISSISSIPPI

Jackson Amateur Radio Club, Inc. Meets 3rd Thurs./monthly, 7 p.m., American Red Cross Bldg., Riverside Drive, Jackson, MS 39202.

MISSOURI

Gateway To Ham Radio Club, N0DN. Young hams of all ages. Meets 1st & 3rd Sat./monthly, 1-3 p.m., Sacred Heart Sch., 10 Ann Ave., Valley Park, MO 63088 (St. Louis) Net Sun. 8:30 p.m. 146.94 rptr. Beginners classes, VE exams, Club station & mtgs. Info: Rev. Dave Novak—Fax (314) 225-1952.

PHD Amateur Radio Assn. Inc. P.O. Box 11, Liberty, MO 64068. Meets last Tue./monthly, 7 p.m. Gladstone Comm. Bldg. (816) 781-7313, Volunteer Examiner Coordinator.

NEBRASKA

The Ak-Sar-Ben ARC of Omaha, NE. Meets 2nd Fri., 7:30 p.m. at Omaha Red Cross near 38th and Dewey Streets. Main 2M Net Sunday night 0200Z on 146.94-R.

Pioneer Amateur Radio Club, (PARC). Meets 4th Fri./monthly, 7:30 p.m., Fremont Fire Station, Fremont, NE. ARES net 146.67 19:30 CDT/19:00 CST. Info: Dick Klebe, KB0HEC (402) 721-1326.

NEVADA

Frontier Amateur Radio Society, (FARS). Meets: 3rd Mon./monthly, 7 p.m. Denny's Restaurant across from Nevada Palace, 5318 Boulder Hwy, Las Vegas, NV. Net Mon. 7:30 p.m., 145.39 Rptr. on Black Mountain. Club info, Jim Frye, NW70, 456-5396.

Sierra Intermountain Emergency Radio Assoc. (SIERA). P.O. Box 2348, Minden, NV 89423. (702) 265-4278. Meets: 2nd Tue./monthly, 7:30 p.m., Douglas County Lib., Minden, NV. Talk-in: 147.330.

NEW HAMPSHIRE

Great Bay Radio Assn., WB1CAG. P.O. Box 911, Dover NH 03820. (603) 332-9137/332-7343. Meets 2nd Sun./monthly, 7 p.m., Rochester Court House/City Hall. Talk-in 147.57.

NEW JERSEY

10-70 Repeater Assn., Inc. 235 Van Emburgh Ave., Ridgewood, NJ 07450. Meets 1st Wed./monthly (except July & Aug.), 8 p.m., VFW, Valley Rd., Clifton, NJ. Rptrs.: 146.10/70, 223.24/224.84, 449.15/444.15.

Bergen Amateur Radio Assoc. (BARA). P.O. Box 304, Hackensack, NJ 07601. Meets 1st Sun./monthly, VFW Post #6699, E6 Winslow Pl., Paramus, NJ. Nets 28.350 Mon. 9 p.m., 144.400 9 p.m. Wed.

Delaware Valley Radio Assoc. (DVRA). Meets monthly, alternating 2nd Tues./Wed., 8 p.m., Our Lady of Good Counsel Church, West Upper Ferry Rd. at Wilburtha Rd. in W. Trenton, NJ. W2ZQR 146.07/67. DVRA Ham Hotline (609) 882-2240.

South Jersey Radio Assoc. (SJRA). Pennsauken Sr. Hi Sch. at Hylton Rd. & Remington Ave., Pennsauken, NJ 08109. Jan.-Oct. 4th Wed./monthly, 7:30 p.m. Nov.-Dec. 3rd Wed. due to Thanksgiving and Christmas. Talk-in 145.290 rptr. Club call K2AA.

NEW YORK

Amateur Radio Assoc. of the Tonawandas, (ARATS). P.O. Box 430, No. Tonawanda, NY 14120. Meets 3rd Tues./monthly (except July & Aug.), 7:30 p.m., Sweeney Hose Co., 499 Zimmerman St., No. Tonawanda, NY. Talk-in 146.955/.355 rptr. W2PVL.

Hall of Science Amateur Radio Club. P.O. Box 131, Jamaica, NY 11415. HOSARC, 2nd Tue./monthly, Hall of Science Bldg., 47-01 111 St., Flushing Meadow Park at 7:30 p.m. For info call Charlie, WA2JUJ, (516) 420-0046.

New York City Rpt. Assoc., P.O. Box 140819, Staten Island, NY 10314-0019. Meets 2nd Thurs./monthly 8 p.m., Eger Nursing Home. Talk-in Rptrs. 146.880/447.375. Info: (718) 998-1088.

Orleans County Amateur Radio Club (WA2DQL). Meets: Office of Disaster Preparedness (CD), West County House Rd., Albion, NY 14411, 4th Wed./monthly, 7:30 p.m., 145.270 — WA2DQL.

PROS, Pioneer Radio Operators Society. Meets: 1st Wed./monthly (except July/Aug.) 7 p.m., Masonic Temple, Rt. 78, Java Village, NY. Other Wed., 8 p.m. 145.170/144.57- Repeater KC2JY.

The Radio Club of J.H.S. 22, N.Y.C., Inc. WB2JKJ, P.O. Box 1052, New York, NY 10002. 24-hr. hotline, (516) 674-4072, FAX, (516) 674-9600. Non-profit org. using Ham Radio to enhance the education of youngsters, nationwide. Join us — "Classroom Net", 7.238 MHz. 7 a.m. E.S.T. PSE QSL!

Suffolk County Radio Club (SCRC). Meets 3rd Tues./monthly, 8 p.m., Bohemia Rec. Ctr., Ruzicka Wy, Bohemia, NY. Talk-in: 145.21 rptr. Morten Eriksen, KA2UIU, (516) 929-6911.

Westchester Amateur Radio Assoc. (WARA). Meets 1st Thurs./monthly, 7:30 p.m., Scarsdale Town Hall, Scarsdale, NY 10583. All invited. For info call Dan Gabel, N2FLR, Pres. (914) 723-8625.

Yonkers Amateur Radio Club (YARC). Meets 2nd Sun./monthly, 10 a.m., 1st Pct., Yonkers Police Station, E. Grassy Sprain Rd., Yonkers, NY. Info: P.O. Box 378, Centuck Sta., Yonkers, NY 10710. (914) 963-8995. 146.265/865, 445.150/440.150.

NORTH CAROLINA

North Carolina Chapter TSARC. Meets: Mondays, 28.350 on the air, 8:30 p.m. local time, Sat. 10 a.m. on 7240 and Wed. 9 p.m. on 7259. "The Alligators" — all mouth, no ears.

Rowan Amateur Radio Society (RARS). Meets 2nd Mon./monthly, 7:30 p.m., Ruffy-Holmes Sr. Cntr., 1120 Walnut St., Salisbury, N.C. Info: Ralph, WB4AQK, (704) 636-5902.

Stanly County Amateur Radio Club. P.O. Box 188, Stanfield, N.C. 28163. Meets 4th Thur./monthly, 7 p.m. at Stanly Community College, Albemarle, N.C.

OHIO

Ashtabula County ARC. Ken Stenback, A18S (964-7316). County Justice Center, Jefferson, OH. 3rd Tue./monthly. 7:30 p.m. County Rptr., 146.715.

Clyde Amateur Radio Society (C.A.R.S.) Meets 2nd Tue./monthly, 7:30 p.m., Municipal Bldg., Clyde, OH 44811. NF8E Rptr. 447.625/442.625. 444.60 (+5 MHz). Net Sun. 9 p.m.

Firelands Area Repeater Assoc. Inc. Meets 4th Tue./monthly, 7 p.m., First Federal Savings of Lorain, Huron, OH. Freq. of Rptr. 146.805/205. Info: Eugene Hutchins, AA8DL, 45 Welton Ave., Norwalk, OH 44857.

Lancaster & Fairfield County A.R.C. Meets 1st Thur./monthly, 7:30 p.m., American Red Cross, 121 W. Mulberry St., Lancaster, OH 43130. Info Net every Mon., 8 p.m. K8QIK/R 147.63/03 Rptr.

North Coast A.R.C. P.O. Box 30529, Cleveland, OH 44130. Meets 2nd Thurs./monthly, 7:30 p.m. at North Olmsted Middle Sch. cafeteria, 27351 Butternut Ridge Rd., North Olmsted, OH.

Northern Ohio Amateur Radio Society (NOARS). Meets 3rd Mon./monthly, 7:30 p.m., Gargus Hall, Rt. 254, Lorain, OH. Info: Rptr. K8KRG 146.70, DX Alert Rptr. 145.15. "Ohio's Largest General Interest Club"

Springfield Independent Radio Assoc., (SIRA). Call-in 145.45—224.26. Meets 2nd Tues./monthly, 7:30 p.m., Mercy Hosp. and 4th Tues./monthly, 7:30 p.m., Am. Red Cross. Info: Rodney Myers, KB8WV, (513) 399-1022.

Toledo Mobile Radio Association. P.O. Box 273, Toledo, OH 43697. Meets 2nd Wed./monthly, 7:30 p.m., Luke's Barn, Lucas County Rec. Ctr., 2901 Key St., Maumee, OH. WB8HF 147.87/27 Rptr. Rptr. info/swap & shop, Sundays, wkly — 8:30 p.m.

Triple States Radio Amateur Club. Meets Wed./weekly on 28.480 at 8:30 p.m.; 7260 at 9 p.m. Rptrs. 146.31/91 and 146.115/715. P.O. Box 240, Rd. #1, Adena, OH 43901. (614) 546-3930.

Van Wert Amateur Radio Club, Inc. 1220 E. Ridge Rd., Van Wert, OH 45891. Call-in 25/85. Meets 1st & 3rd Sat./monthly, 8 p.m.

OREGON

Central Oregon Radio Amateurs, (CORA). P.O. Box 723, Bend, OR 97709. Meets last Thur./monthly, 7 p.m., Bend Senior Cntr., 1036 NE 5th, Bend, OR. Net Sun. 7:30 p.m. 147.06 + MHz. Info call: (503) 382-1685.

Keno Amateur Radio Club. P.O. Box 653, Keno, OR 97627. Meets 3rd Thur./monthly, 7 p.m., Keno Fire Station. Rptr. 147.32 + W7UFM. Info: Tom Hamilton, WD6EAW, (503) 883-2736.

Oregon Coast Emergency Repr., Inc. P.O. Box 254, Florence, OR 97439. Meets 3rd Sat./monthly, 9 a.m. for brkfst. Net, Wed. night, 7 p.m., 146.800. Info: 997-2323 or 997-3081.

Umpqua Valley Amateur Radio Club, Inc. 450 S.E. Leland St., Roseburg, OR 97470. Meets 3rd Thurs./monthly, 7:30 p.m. Douglas County Courthouse, Rm. 311 Douglas St., Roseburg, OR. Info: W5PIV/146.90/30.

PENNSYLVANIA

Mercer County Amateur Radio Club W3LIF. P.O. Box 996, Sharon, PA 16146. Meets 4th Tue./monthly at 7:30 p.m., Shenago Valley Med. Center, Farrell, PA. Net, Thur. 9 p.m. on 145.350 W3LIF, Digi. 145.010.

Warminster Amateur Radio Club, WA3DFU. P.O. Box 113, Warminster, PA 18974. (215) 672-9985. Meets 1st Thurs./monthly, 7:30 p.m., Neshaminy-Warwick Presbyterian Church, Warminster, PA. Net on 147.690/147.090 Wed. 8:30 p.m. and 28.450 Sun. 9 p.m.

TENNESSEE

Nashville Amateur Radio Club. Meets 3rd Thurs./monthly at Lock 2 Metro Park, located off Pennington Bend Rd. Grilled hamburgers at 6 p.m., mtg. at 7. Info: Jim Lynn, 1621 Jackson Valley Pl., Hermitage, TN 37076.

TEXAS

Brazos Valley Amateur Radio Club (B-VARC). P.O. Box 1630, Missouri City, TX 77459. Meets 2nd Thur./monthly, 7:30 p.m., Sugar Land Community Cntr., 226 Matlage Wy., 3 blks SW of Imperial Sugar Co. at HWY US-90A & Brooks St. (HWY 58) in Sugar Land, TX. Talk-in 145.47, 442.5 rptrs

VIRGINIA

Southern Peninsula Amateur Radio Klub (SPARK). Meets: 1st and 3rd Tue., Salvation Army Community Bldg., Hampton, VA. Rptrs: 146.13/73 & 449.55/(-5) T.V.E Exam Info: (804) 898-8031, W4RTZ.

Virginia Beach ARC. Meets first Thurs./monthly (except July), 7:30 p.m., St. Andrews United Methodist Church, Tucson & Princess Anne Rds., Virginia Beach, VA 23462.

WASHINGTON

The Mike & Key Amateur Radio Club. Meets 3rd Sat./monthly, 10 a.m. Salvation Army Renton HQ., 720 Tobin St., Renton, WA. Talk-in on 146.82 rptr. Doors open at 9:30 a.m.

WEST VIRGINIA

Jackson County Amateur Radio Club. Clark Stewart, W8TN, Pres., 104 Henrietta St., Ravenswood, WV 26164. Meets 1st Thur./monthly, 7:30 p.m., United National Bank of Ripley. Net Mon. 9 p.m. on 146.67/07 WDBJ/U/R.


Tri-State Amateur Radio Assn. Club mtgs. 1st Thurs./monthly, 7 p.m., monthly brkfst 1st Sat. 9:15 a.m., Green Valley Vol. F.D., 16th St. & Norwood Rd., Huntington, WV.

WYOMING

Sheridan Radio Amateur League. 146.82. 926 La Clede, Sheridan, WY 82801. Meets 4th Thur./monthly, 7 p.m., Sheridan College Tech. Cntr.; Saturdays, 8 a.m. at J.B.'s Info: (307) 674-6666, WA7B.

PUERTO RICO

Puerto Rico Amateur Radio Club. P.O. Box 360693, San Juan, Puerto Rico, 00936-0693. Meets every Thurs., 7 p.m., Civil Defence, Rio Piedras (next to AMA & San Francisco Shopping Cntr.). Nets Sun. 9 a.m. on 147.090, 28.450 & 7.250 MHz. Info: Raul Escobar, KP4QL, (809) 765-2745 (daytime).



The Youth Forum

**Travis A. Wise
KB8FOU**

1421 Grace Avenue, San Jose, CA 95125
Home: (408) 267-8849; BBS: (408) 267-6396

Pacificon '92

Pacificon '92, the 1992 Pacific Division Convention, was held in October in Concord, California (San Francisco Bay Area). The youth forum, presented by the ARRL, was, in the words of many of the members of the audience and participants (including myself), "a complete embarrassment to the young ham population."

As I said in the September '92, Youth Forum column, "It is important to keep in mind that these forums are by and for the youth, and any adult involvement should focus on facilitating, helping to direct or coaching, but not taking over the potential of the youth in their leadership roles." This philosophy was not followed at the Pacificon forum, and adult involvement became overbearing and condescending to the young amateurs on the panel as well as those in the audience.

The youth leadership was present at the forum, however, that leadership unfortunately was not allowed to show itself. After an hour and a half of questions such as, "Do you know what a dipole is?" and "What is an HT?" (I am not making this up), it became clear that I'd failed to mention in my previous column the importance of limiting the forum schedule to the attention

span of the audience, while focusing the discussion on important questions and issues.

A one-hour time limit is appropriate for panel interaction and a few speeches. Beyond an hour, the forum or meeting will have exhausted the attention spans of the people in the audience, adults as well as the teens and pre-teens.

I've been told time and time again, "If you don't have anything nice to say, don't say anything at all." I've kept my comments about the Pacificon Youth Forum brief.

Having spoken on several youth forums, including the Dayton Hamvention (a very positive, upbeat and well-organized forum), I must say that Pacificon 1992 was the last youth forum where I will appear on the panel as a speaker; I will soon be turning 18 years old and I feel that this platform should be handed down to the new young hams of Amateur Radio's future. I will continue to participate by supporting young hams with their club, forum, and panel organization, as well as continue with my other activities, such as writing articles encouraging young hams' participation in Amateur Radio.

Age of VEs

Here's something interesting to think about: I saw a message on a computer bulletin board from a 13-year-old Amateur Extra Class. He was discouraged that he would have to wait five years to be able to become a volunteer examiner.

I had never really thought of that; obviously there are other reasons for getting the Amateur Extra Class license beyond the opportunity to become a volunteer examiner, but as he correctly pointed out, "If someone worked that hard to get an Amateur Extra Class license, why would they risk losing their license by helping someone cheat?"

Some of the responses to his inquiry included the fact that persons under the age of 18 are not adults, and therefore not legally able to sign legally binding government documentation.

One ham stated that 13-year-olds are simply not mature and trustworthy

enough to handle testing sessions, and (here's something I found really interesting), "The rudeness of the other 'older hams' towards a younger VE would be embarrassing."

As I've stated in the past, we might not be able to run the test sessions, but that doesn't stop us from being license class instructors, lecturers, or speakers for addressing groups, or serving on youth panels.

Activities for young hams

Shelly Anstey, KBØIWE, a 16-year-old ham in Chariton, Iowa, told me that her school, Chariton High, has started an Amateur Radio club. They have 11 members, and she is one of two females in the club.

Shelly reflected the goals of most young hams by saying, "I am especially interested in trying to meet as many young hams as I possibly can. I know we are an elite group, and it is really rewarding to talk with someone your age who shares your interests."

Like many other young hams, Shelly was looking for clubs or nets geared toward the 13 to 20-year-old population. Her school group had considered starting a Saturday morning youth net, a contest, or even a worldwide organization "for kids, by kids."

She said, "I am working from ground level, and can not do it on my own. I am trying to find as many hams as I can to help me get things rolling. Even if we advertise one net and it fails, at least we tried."

Shelly's ideas reflect a growing trend in our hobby, made apparent by the results of an ARRL survey of young hams, published in *The ARRL Letter* of 11 June, 1992, which showed that young hams have an interest in on-air youth activities, such as "...ARRL-sponsored youth nets and other activities on the air..."

If you're interested in helping Shelly and myself establish one of the mentioned activities going, please drop me a line. As I told Shelly, the only youth net I am aware of is Sammy Garrett's, AAØCR, Youthlink Youth Net, which meets on Mondays on 28.435 at 2300 UTC, and on 14.26 at 2345 UTC. WR

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**Search
And
Rescue
Communications**

Jerry Wellman, WB7ULH
P.O. Box 11445
Salt Lake City, UT 84147

In response to a number of inquiries on how to get involved in emergency communications, let me construct a typical scenario and offer some suggestions.

Let's say my neighbor, Chuck, and I want to become emergency communicators. Being neighbors, we know our work schedules, what equipment we have and what our capabilities are. Because we're close to a local school, Chuck and I meet with the principal and agree to respond to school emergencies. The principal has our phone numbers and Chuck and I outline what we are able to do.

Dale lives down the street and just got his license. He wants to help out too. Chuck and I know Dale from Scout campouts and know his capabilities and schedule as well. So we get Dale on the principal's list too.

Pretty soon each of us has mentioned our "School Response Team (SRT)" to other friends and we're getting a pretty long list in the principal's office. After a couple of responses to exercises and

even a power outage, the principal tells a few other schools. Now your SRT is in demand. Long lists of contacts are being exchanged. Some principals call some on the list and they promise the SRT can do almost everything required.

Bad data!

Things are fine until one day a principal calls the team and discovers his list is out of date. He finally reaches someone and they tell him the SRT can't do what is needed. The principal is upset because he's been misled and now tells other principals that this SRT is a bunch of hogwash.

All of a sudden the SRT is out of business. What happened?

Let me offer some suggestions for a group involved or wanting to get involved with emergency communication. As your group grows, remember some principles of Incident Command. Very important is span-of-control and organization. ICS isn't *how* you do emergencies, it's an organizational structure.

One person can only supervise five to seven people. Your group may want to organize along ICS functions. You would have a commander, an operations chief, a logistics chief and a planning chief. As you gain members, they could be assigned to one of these functional areas.

Your planning chief, for example, could have a training manager, a net manager, a resource manager, and a documentation manager. New members could be assigned some of these specialty areas depending on skill and experience levels. The plans folk may even work with other agencies and put into writing some outlines for response.

First response outline

Working with operations and logistics, the planning chief might determine a first response outline for an agency based on group resources, training and experience.

With a plan, members know what would be required for an agency response, training could be focused and documented, logistics arranged, and operations ready to direct a response.

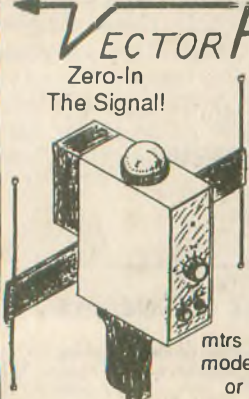
Another key element: resource lists. You need a good resource list. How many packet stations? How many UHF or VHF units? How many people can respond within 30 minutes or 60 minutes? Who is unable to respond, but could act as net control? How many people cannot leave work? Who has four-wheel-drive or snow equipment?

The resource list is pretty critical when you go before an agency to volunteer. Making promises can put you in an awkward position when your resources are not known! It's not a good thing to install a packet station, in an EOC for example, and have no packet response planned. Telling an agency you could staff several EOCs for several days is great, as long as you know you have those resources. One (maybe two) chances is all you get to come through on your promised response. After that, you've got some bad public relations to overcome.

A final area (besides organization, planning and resource documenting) is *alerting*. How is an agency going to contact you? You could give the agency a list of all your people and update it every time a number or name changes. You could all carry pagers and the agency could page someone.

A viable suggestion is actually a combination of the two. Because you have an organization and your section chiefs (ops, planning, command and logistics) are pretty stable, you provide phone numbers for these people. Your group could have a pager as well, but it's important to provide a contact list in case the pager system fails.

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no more than four!) numbers and a pager number is *only* the first step. Unless all your people carry pagers, you'll need some method of alerting them. What has worked well for many groups is to have several "alerting officers" who have the resource list and know who to call. The alerting and resource people would work together and, for example, produce a day and night call-out roster. Specialty rosters would be maintained in case packet stations were needed, or portable responders were needed.

The LiTZ system

Along with the resource list, alerting people and pagers with team management, let me jump on the bandwagon and suggest the "Long Tone Zero" system. Known as LiTZ, this offers some significant benefits.

Here's how it works. On your receiver (or scanner) you have a LiTZ decoder box. When someone needs assistance, they key the repeater, and press the zero key for six seconds. The LiTZ decoder needs about three seconds of the zero tone and turns on the radio speaker (at your desk or nightstand) and the following three seconds serve to alert you that LiTZ has been activated.

There are a number of groups going

this route and I think this is the way to do it! Because it's becoming standard in many areas, it would allow people passing through an area to summon emergency aid on a local calling repeater. I don't like being awakened at 2 a.m. for a QSO on the calling repeater, so this keeps my speaker silent at night unless the zero were keyed. If the ARES group (or any SAR group such as CAP) gets called out, one LiTZ alerts a large number of people.

(The ARRL board of directors approved this as the national alerting system for repeaters. According to *QST* (October 1992) LiTZ repeaters will be designated in future Repeater Directory listings.)

So how do you get a LiTZ magic decoder box? Glad you asked. Several articles in *QST* and *73* have outlined how you can build your own LiTZ box. Before you start looking through back issues, contact Marshall Macy, N7IOB (303 East S. Mountain Avenue #163, Phoenix AZ, 85040). For a very reasonable price, you can get an etched and drilled PC board, a complete kit of parts or even a wired and tested decoder.

The kit took me a couple hours to assemble, looks sharp and worked the first time! This would make a great

group project. I would recommend one member build one first and coach others. After building one, there were a couple of things I would have done differently as I mounted it in the case. N7IOB provides a complete parts list and instructions on how to install and test the unit. The best news is the group purchase discount. Marshall can provide you all the details (sending him an SASE is suggested!). Over many years I've built several decoders but I think this is the best one yet. With completion of my very own LiTZ, all those 10-year-old, sometimes-used alerting boards can be pitched.

Remember that LiTZ is only the vehicle to alerting. It's not the complete answer! Organization, planning, logistics support, resource lists and current member alerting information all combine with LiTZ to ensure a *professional* response!

One final suggestion for your emergency response kits: Include a book to read! Being on site during an emergency doesn't mean you're going to be busy 100 percent of the time. Having a book to read (or crossword puzzles) keeps your mind busy and helps pass the time.

Until next month, 73 from a very snowy Salt Lake City. WR

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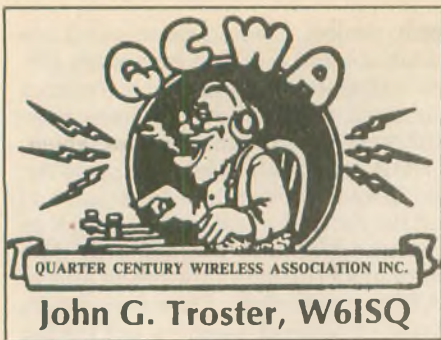
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DISCOVER



Bylaws and constitution

One sure thing about being on a board of directors, sooner or later you have to read the bylaws and constitution of the outfit. When I read the QCWA bylaws and constitution I was amazed and astounded. There wasn't one word about membership being limited to those who have built, owned and operated spark-gap equipment! Now, I admit I read rather rapidly and might have missed a few words here and there, but I didn't see the words "spark" or "gap" anywhere and certainly not placed one after the other.

The constitution did say that "any person is eligible for membership who submits satisfactory proof that he or she is at present a licensed Amateur Radio (wireless) operator, (and) that he or she was licensed as such 25 years prior to making application . . ."

Maybe some of the confusion about spark-gap requirements for QCWA membership developed because of that "(wireless)" notation. Or, perhaps it was the sparks flying out of the QCWA logo. However, without consulting anyone, I will take it upon myself to state unequivocally that it is not required that an applicant have spark-gap experience to become a member of QCWA.

So now that misunderstanding is cleared up as far back as the wonderful, long-ago spark days. That alone should open the flood gates of membership. Three years for 30 bucks. That's all it will cost you to become one of us! The many, the proud, the QCWA.

Now some of you literary-type readers will recognize the foregoing as a little humor and not take it too seriously (even though I wish that I had been a part of that early spark tradition). Actually it was in response to some of my friends' comments about QCWA, such as, "Oh, you mean them old fellas?"

No, I mean those "wise and experienced, gentlepersons of good taste and maturity who happen to have been licensed for 25 years." If you have had a license 25 years, you qualify. Write to Jim Walsh, W7LVN, general manager, QCWA, 159 E. 16 Ave., Eugene, Oregon 97401-4017.

Exceptional free offer

If you join QCWA between the publication dates of the spring and summer QCWA Journal, the youngest and the oldest new members joining during that period will receive a personal letter of congratulation, absolutely free, from our president, Harry Dannals, W2HD. This is not an offer to be taken lightly! We checked with a local hobby shop and other emporia, and learned that Harry's letter and signature, together with an autographed Mickey Mantle baseball card could be exchanged for a Big Mac and a bag of fries at about any McDonalds, offer good Monday through Friday. Okay, okay. You could probably get the burger for the baseball card alone.

Another exceptional free offer. For those of you who have not yet received your free sample of the QCWA Journal, you may request your copy now at the address for QCWA headquarters given above.

Journal review for non-members

The gems in the 42-page winter QCWA Journal are firm in the

memory banks of regular members by now, but as a courtesy to non-member readers I am going to quickly review the contents this one time only.

Right on the front cover is a photo of Barry Goldwater, K7UGA, and his "YF" as they appeared at the Phoenix Convention. That term, YF, is newspeak for XYL, adopted at Phoenix.

Highlights of chapter activities takes up about half the Journal. That's where I start reading, after a quick flip through, of course, to see what I have to look forward to. I enjoy these reports from all over the country about the outside activities, speakers, even the restaurants or other meeting places. And after reading through these reports, I have the feeling that most chapters really could be interchangeable with any other! The meetings in New England are about the same as those in the great Southwest. We all seem to enjoy the same thing. Perhaps that is the strength of QCWA.

The National Convention in Phoenix last fall was reviewed by Secretary John Swafford, W4HU. A short sampling of some of the items of interest from John's report:

The board approved a study by Vice President Lew McCoy, W1ICP, and General Manager Jim Walsh, W7LVN, recommending resuming advertising in the Journal with up to three pages of ads.

President Emeritus Leland Smith, W5KL, reported that 10 new QCWA \$800-general scholarships were established for the 1993-1994 academic year, plus four more \$800-grants named for donors Crosap, Jacobson, Meyerson and Hasslinger. That's 14 scholarships for young men and women Amateur Radio operators who

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will receive QCWA support for their college education. We're proud of that support.

In a separate article in the *Journal*, there was a biographical story about our present scholarship students of the 1992-1993 academic year. During this year, there were nine college students receiving educational assistance. Between them, there are major fields of study ranging from advertising, computer engineering, biology, aviation through math. All are active amateurs and several are pilots. QCWA can be proud of this good-looking group. We wish them success in their college and later careers.

Back to the board meeting. The QCWA Audio Cassettes for the blind program, which is managed by Blanche Randles, wife of Director Wes Randles, W4COW, is another popular and thoughtful service, going strong. Of special note, the board approved moving the amateur station W2MM, licensed to QCWA, from Irvine, Texas, to QCWA headquarters in Eugene, Oregon.

QCWA National Convention

The *Journal* reminds us that the 1993 QCWA National Convention will be held 29-30 October in St. Petersburg, Florida. These conventions are well attended with well-planned activities for members and their guests. For the small price of QCWA membership, it can work out to be an interesting vacation as well as a learning experience. Y'all travel down there!

QCWA QSO party

Unfortunately for those of you who are not yet one of us, this QSO Party is for QCWA members only. But, hey, join up and get in the contest!

By the time you read this, this year's CW portion of the contest, the weekend of 6-7 February, will be history. I hope that I will have had the chance to swap numbers with a lot of you. I'll be looking for you on phone, too; join us for this part of the contest the weekend of 13-14 March.

Observation: ARRL DX Contest and Sweepstakes have log pages that hold 50 QSOs. The CQ World-Wide DX Contest has log pages that hold 40 QSOs per column, with two columns per page. The QCWA Contest log holds only 20 QSOs per page with a spacing of 1 cm per QSO line. Do you think this is significant? Could it be ... ahhh ... after 25 years, naw. However, with a good pair of glasses and a new, thin-line pencil, I can surely

Let us give thanks for small blessings.

write K4LMB in that 1 cm spacing. Youbetcha!

Other Journal items

President Dannals has a page of notes for all members, saying that the QCWA is saving several thousand dollars in printing and postage by holding board and officer elections every other year. Board and officer nominations for the 1994 elections are being called for now.

There are also a few words of wisdom from Jim Walsh, W7LVN, who details the electronic ways members can communicate with QCWA headquarters in Eugene, Oregon. If all else fails, he will accept pen or even pencil (hardness 2H, please) for communications purposes.

Early radio

John Dietz, W2BFU, concluded his interesting two-part article, "Halcyon Days of Early Radio." It's especially enjoyable because he writes about spark-gap radio. Hope you can borrow a copy to read!

Wireless exchange, new members

Then, of course, there is the monthly Wireless Exchange page (i.e., swap shop), hosted by Doug Hensley, WJ5J. This page is always full and closely read.

Finally, there is the list of new members—about 175 in the past quarter. And on the inside back page is the ever-popular application blank for membership. Consider this a personal invitation to use it. WR



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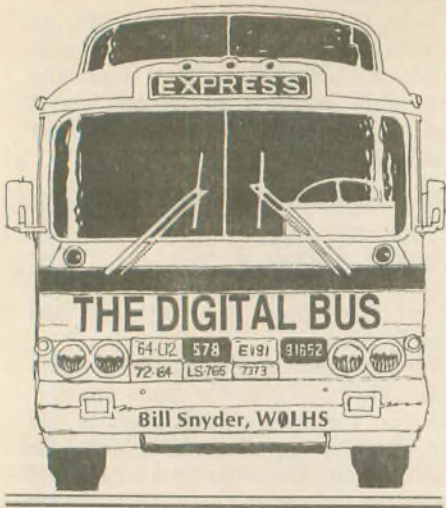
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Recently I celebrated my 60th anniversary of holding an Amateur Radio license and the call sign suffix LHS. As I reminisce in my old age, I'll never forget the day before Christmas in 1932. That was the day I opened the envelope from the FCC and found my station license: W9LHS.

In those days the station license and the operator's ticket were two separate pieces of paper. The station license came from the FCC in Washington and the operating ticket, other than the "temporary" category, from the regional FCC office. So, I had a call sign, but I had to wait for my operator's permission to arrive before I could get on the air.

The delay didn't matter much because I had to build the transmitter from scratch. Those were long days waiting for the "temporary" license I had applied for. The written test for the temporary consisted of 10 essay questions, one of which asked the applicant to draw the schematic of a complete CW transmitter including the power supply.

If I remember correctly, I was asked to draw a tuned-grid, tuned-plate self-

excited rig. If you forgot little things, like a bias circuit resistor, you didn't pass the question.

The temporary was good for six months or until the FCC inspector offered exams within 100 or so miles of your domicile. Then you had to bite the bullet and prove 10 words of International Morse code per minute—both sending and receiving—and do it in front of the FCC examiner.

My "temp" operator's ticket arrived a month or so after the station license was framed and hanging on my bedroom wall. I had a two-tube homebrew regenerative receiver (201A tubes), and I was in the process of building my first transmitter as fast as I could get the funds to buy the parts from the local S.S. Kresge Dollar store and the Lew Bohn Company, a ham radio supplier in Minneapolis.

I never did get the rig finished and on the air before the letter that spoiled my day arrived. It mandated that I show up and take the FCC exam for the "real" amateur operator's license. I was not alone, all the kids in my high school radio club who held temporaries received the same notice. We were to report at 9 a.m. to the Fargo post office civil service examining room for the test.

We all practiced the code like crazy and boned up on the theory. I thought I was ready for the ordeal, but the night before test day I suddenly had a severe tooth ache. It was for real, and so my mother made arrangements for me to have the dentist look at it when he opened his office at 8 a.m. The dentist promptly yanked the pain-causing abscessed tooth and sent me on my way to the post office with a load of novacaine in my lower jaw.

I ran the six blocks from the dentist's office to the exam. I arrived just in the nick of time, the code test was about to begin. The small room was packed with applicants for amateur and/or commercial operating privileges. I wound up in

the very back of the room about as far from the code source as I could be.

When I heard the weak signal I started to panic, license "buck fever" hit me and I promptly flunked the receiving code test. My two high school buddies, W9BTJ and W9MZE, passed with flying colors, but poor old Bill was kicked out of the examining room by the inspector.

I was humiliated, crestfallen and mad. I hated to tell my dad about my failure because he was a railroad telegrapher and had spent many hours teaching me the codes, both American Morse and the International Morse. That night I did spill my failure story. Dad was sympathetic and quietly asked me what I had to do to take it again.

I told him: Either wait six months till the examiner made his semi-annual rounds, or go to St. Paul to the regional FCC office. Dad said simply, "Got to St. Paul, you've got a railroad pass."

So, after the required 30-day re-examination delay, I took the overnight train to St. Paul, Minnesota. I walked into the FCC office with bushels of confidence and waxed the code test with speed to spare.

It took a month or so before the signed operator's wallpaper license arrived in my mailbox. By then I had the transmitting gear ready to go on the air! And I did! However, it was not without problems.

I lit the light on our front porch when I keyed the 50W self-excited transmitter. If our neighbors could read blinker they would have been able to see my call sign. I also put key clicks into the radio in our living room which sounded like gun shots. My mother, in desperation, imposed silent hours when the six o'clock news program and the afternoon soap opera, "Ma Perkins," were on the local station.

About that time the FCC issued new ham ticket regulations. Paramount in the new rule book was the establishment of an advanced license which included 20 and 75M phone privileges. I figured I should make it easy for our neighbors to find out who was ruining their radio reception by going on AM phone.

So I studied the advanced theory which included modulation methods, hopped on the night train to St. Paul and wound up with the advanced wallpaper license. It later became known as the Class A license.

In those days hams had to build almost everything they used: transmitters, receivers, monitors, power supplies—you name it, you built it. That was part of the fun as far as I was concerned. When we met another ham, it wasn't DX or the new commercial transceiver that was the subject of

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conversation, it was the choice of tubes for oscillators, buffers, doublers or final amplifiers.

We argued the merits of self-excited or crystal-controlled rigs; the acronym VFO was not even in the jargon at that point. Keep in mind this was during the days of the Great Depression and money was a limiting factor in the building of ham gear.

We had a great radio club in our high school. The club call sign was W9GTB and it was licensed to the physics teacher, Mr. O.S. Anderson. The rig was built in a wooden 2 X 2 in. frame and it featured two large 852 tubes in a tuned-grid, tuned-plate configuration. The club members had constructed the rig and hooked it to a Zepp antenna which was strung up on the roof of the block-square school building. The transmitter worked great but the home-built receiver was out of kilter most of the time, so two-way QSOs were not too frequent.

There were Amateur Radio clubs off and on in Fargo as far back as 1913. They would spring up and die, spring back and die in a sine wave cycle. One early club was named the Fargo Amateur Radio Transmitting Society for a few weeks. When someone studied the acronym possibilities, the title was quickly changed.

Our clubs held hamfests (no flea markets) every couple years and a hundred hams would usually show up for the banquet. We always had a professional photographer take a group photo of the banquet. He would bring a big 8 X 10 view camera and set it up on top a table and shoot a giant flash to illuminate the dining room and all the ham operators dressed up in suits and ties and new haircuts. It was a social event of great importance.

I recently looked back in my old logbooks. Like I've said before in this column, I wish I had made copious notes of events, people, DX, etc. in my logbooks. I had the first RTTY machine in North Dakota, the first packet station and BBS in the state, but I failed to put my impressions in the log. Keep a good log, make plenty of notes on your progress. You'll enjoy them when you look back over the years from your rocking chair. It is funny what a brief note in a log will bring to mind. How about this one: "War declared—Amateur Radio suspended."

That was in my log for 7 December 1941.

Eavesdroppings

SANTA CLAUS CAME A COUPLE MONTHS LATE TO MY HOUSE AND LEFT A NEW 150 WATT RIG . . . MY ANTENNA WAS COVERED WITH ICE SO IT DROOPED . . . YOU ARE

RUNNING YOUR XMIT SIGNAL DOWNSIDE UP—TRY BUMPING THE F4 KEY AGAIN . . . RTTY IS SO NU TO ME I TURNED THE INVERT OFF . . . THERE SHOULD NEVER BE LOCKED NODES IN A NODE TABLE—SET THE NODES FOR A LOT OF NODE PATIENCE AND NO LOCKED NODES . . . HE PICKED UP 182 RATTLESNAKES ON THAT 42 MILE TEXAS ROAD . . . THANK YOU FOR READING THIS PACKET MESSAGE, I NEED NORTH DAKOTA FOR W.A.S. . . . IF ALL THE ANTS HERE IN FLORIDA DIED AT ONCE, FLORIDA WOULD SINK INTO THE OCEAN BECAUSE I BELIEVE THE ANTS ARE HOLDING FLORIDA ABOVE THE WATER . . . WHEN I SEND MY PACKET-PEN-PAL IN ENGLAND A MESSAGE IT USUALLY TAKES ONLY TWO DAYS FROM IOWA . . . I USUALLY TAKE MY CHRISTMAS LIGHTS DOWN AROUND THE FOURTH OF JULY AND PUT THEM

UP ON LABOR DAY . . . I'M SORRY I DIDN'T ANSWER YOUR PACKET MESSAGE BECAUSE I FORGOT YOUR CALL SIGN AND YOU HAVE TO HAVE THAT TO MAKE IT WORK . . . MY KEYBOARD HAS THAWED ENOUGH NOW SO I CAN ANSWER YOUR PACKET MESSAGE . . . I'M SURE THEY ARE USING SMOKE SIGNALS PART OF THE WAY ON THE PACKET PATH TO NORTH DAKOTA, THAT'S WHY IT TAKES SO LONG . . . I AM LOOKING FOR A COMPUTER PROGRAM THAT SENDS CW AT 12 WORDS PER MINUTE.

Thanks to NØDST, NØSNW, KI7DW, WØHAH and others for help with this column. Write me: Bill Snyder, WØLHS, 1514 South 12th St., Fargo, ND 58103. My packet address is WØLHS @ WØLHS.ND.USA.NA. 73 and DIT DIT or TOOT TOOT, depending whether you are a CW fan or a railroad buff. wr

Go fly a kite

HAROLD PICKLE "Ben Franklin returned" MELDRUM

Everyone said I must have run out of material so I invented something to write, but that wasn't the case.

I am a ham radio operator, and I have been talking to a person in France who is running low power and using a box kite for an antenna. I always wanted to try the same thing and never got around to it.

Finally, I got around to it. Well, my kite wasn't large enough to lift the antenna wire so I went up to John Barney, who had a larger kite. Well, it lifted the antenna wire just great and was flying fine until it hit a down draft and took a nose dive. I pulled on the wire to make it climb but it kept on diving.

John said, "there is a high tension line back of that tree." At once a large

ball of white came at me with three tremendous jolts and that is all I remember until I woke up on the ground with both my arms numb. I jumped up and rubbed my arms and ran in a couple of circles, jumped in my truck and drove home.

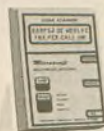
I planned on just seeing if the kite would lift the antenna wire and then I was going to take it to the beach to fly it with my transmitter. Well, it didn't work out that way, as you know. They took me to Marquette General Hospital. My blood pressure taken by caring Ellen Barney was 160/134. When Bob Gardner saw that he said, "Get him to the hospital or he will go into cardiac arrest." That is why they transported me immediately.

The doctor in Marquette never heard of anyone surviving who had had 14,400 volts go through him. I got nine burns in my hands and a large hole in the bottom of my right foot that went to the bone. It is a good thing that I had rubber boots on, although the electric arc went through the inside of my right foot to ground. Thank the Lord I'm still here to write more memories for you. —Alger Delta

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If you're any kind of student of DX and the current HF propagation scene, you know by now that Solar Cycle 22 is heading toward its minimum phase. For me, the main clue was that long path propagation on 20M dropped out of sight, at least on a regular basis, around the middle of July 1992. All the stories I hear about long path now come from those operators who ply the 30 and 40M bands. Alas, my own antenna farm is just not big enough to accommodate beams with the required wingspan. So I am doing other things but still operate in the HF realm.

For example, I'm into satellites. That's right, working the Russian HF satellite RS-12 on a regular basis. I got into this a while ago and must say that I'm not exactly sure why at this moment. Be that as it may, I was influenced by an article, "Working the EasySats," in the September 1992 issue of *QST*. Beyond just listening to satellites, the operational emphasis in that article was on mode A operation, using a 2M uplink and a 10M downlink, with the Russian RS-10 satellite.

Not being a VHF enthusiast, I was more interested in mode K operation, using a 15M uplink and a 10M downlink, with the RS-12 satellite. For one thing, I have enough HF gear and antennas to carry it out without any trouble. Before getting into that, however, let's just digress a bit and talk about HF radio and satellites, starting with day one when Sputnik was launched.

That was back on 4 October 1957 and Sputnik went into an orbit with a 96-minute period at a 65-degree inclination, its perigee down at 170 km and its apogee up at 990 km. It carried a 20 MHz beacon transmitter and spent about 75 percent of its orbital motion under the F-layer peak around

300 km. Because of all the atmospheric drag with a low perigee, it only lasted a few months in orbit. But in that time it could be regarded in an ionospheric sense in much the same way as anything here on earth, except that its position was changing rapidly and it was a couple hundred km above the earth's surface.

To round out that statement, we can say that it would have given line-of-sight signals to some stations below it as well as skywave signals via the F-region to other, more distant receiving stations. For the latter group, the usual methods of ionospheric propagation would have applied, correcting the critical frequency foF2 at any refraction region for the angle of incidence of the beacon signal on the F-region and working out the remainder of the path.

It should be noted that the launch of Sputnik was close to the peak of Solar Cycle 19, the sunspot number being 200. With that and the fact that the beacon transmitter was operating on 20 MHz, it's fairly obvious that while at low altitudes, the satellite could be heard over great distances by skywave propagation. Indeed, there were even reports of something like long path propagation from Sputnik, with signals reported even when the satellite was in locations antipodal to the receiving sites.

In those early days all the simple features that one would expect from a satellite within the lower ionosphere were observed: refraction or deviation of signals and D-region absorption. And when the satellite was above the peak of the ionosphere but its beacon frequency too low to penetrate the F-layer below, downward propagation through the layer failed. But at those very same times skywave propagation below the layer was fully realized by

amateur operators.

Now let's leap forward in time to the launch of the RS-10/11 and RS-12/13 satellites, starting in mid-1987. Both satellites are in near-polar orbits at 1,000 km altitude and have the capability of operating on both modes A and K. Since RS-10 seems to be devoted to mode A and RS-12 to mode K, being a person of the HF persuasion I devoted my time and efforts to RS-12. But before ever trying to contact it, I had to know when it would be within reach of my QTH. For that, I needed a satellite tracking program and the "orbital elements" for RS-12.

There are several tracking programs available, tailored for different types of computers, and you can find them advertised in the Amateur Radio magazines. As for the orbital elements, they are sent out twice a week by W1AW and can be picked up on your local BBS. They come in a two-line format from NASA and you'll need some help, say from the *Satellite Experimenter's Handbook* published by the ARRL, to convert them into a form that your tracking program will accept. But once you've done that, you're in business. Just check on the schedule when the satellite will come into view at your QTH.

Now comes the HF radio part, listening for RS-12's beacon on 29.408 or 29.454 MHz as it comes over the horizon. The tracking program will tell you when you're within the satellite's "footprint" and something of how long you can expect to hear its beacon.

But to make contact, you'll need a separate 21 MHz transmitter and antenna. In that regard, the possibilities are infinite; just to give you an idea of what you can use, I put my old Drake TR-7 on the 21 MHz uplink and run it into a simple vertical antenna. As for the downlink, I use my regular HF setup, a Ten-Tec Corsair and a three-element triband Yagi up at 37 feet to follow the bird as it goes by.

With that system, I have full duplex available to me, transmitting on 21 MHz to the satellite and hearing my own signals coming back on 29 MHz when contact is made with the satellite. The phrase "when contact is made" has two aspects to it—one related to HF propagation and the other to the Doppler effect on signals because of the satellite's orbital motion. The latter is discussed in some detail in all the satellite literature so there's no need to go into it here. But I've never seen anything on the former so I will turn my hand to it here and now.

As you know, successful contacts in HF radio from terra firma depend on keeping one's RF within the ionosphere. That can be accomplished in

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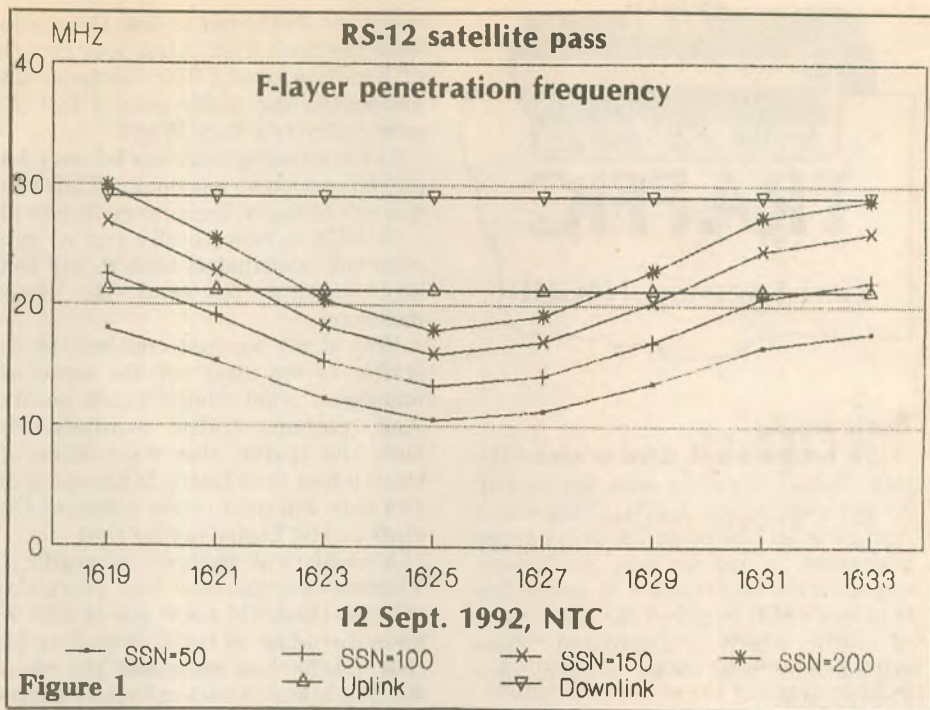
two ways, using an antenna with a low-angle radiation pattern and/or operating at a frequency well below the MUF for a path. The latter is evaluated using an HF propagation program and varies with time, date or season and sunspot number. But if one fails in any respect, the RF from the antenna will go right through the F-layer and on to infinity.

Well, would you believe a satellite above the F-layer peak instead? Indeed, that's the name of the game with the RS-12 satellite, getting the 21 MHz signal on the uplink through the F-layer to the satellite and then copying 29 MHz downlink signals from other stations so as to make contacts. It all sounds easy, but in reality that isn't exactly the case. If, like with Sputnik, the ionization at the F-layer peak is too great, uplink signals will not penetrate the F-layer and reach the satellite. Let me demonstrate the situation using a recent RS-12 pass.

The pass in question was on 12 September 1992 from 1618 UTC, ending around 1633 UTC. At the time, RS-12 was going northward, coming up over the horizon around 22N, 106W and finally going down over the horizon around 74N, 87W. Using the *Quiktrak* program, one can find the azimuth and elevation angles from my QTH at 48.5N, 122.6W to the satellite's path. After that, it was a small task to put together a computer program to find the penetration frequency of the F-layer for RF aimed at the satellite's elevation along its path, from the horizon up to about 20 degrees and then back to the horizon.

The results of such calculations are shown in Figure 1, for levels of solar activity ranging from an SSN of 50, like now, to a sunspot number (SSN) of 200, as encountered at the peak of Solar Cycle 19. In that figure are also shown the steady uplink and downlink frequencies that are used with RS-12. Having said that, one can see the penetration frequency decreases as the satellite comes up into view, reaches a minimum value when the satellite is at its highest elevation and then increases again as it sinks in the sky.

At the present time when the SSN is down around 50 or so, it's clear that the 21 MHz uplink frequency is always above the penetration frequency and one should be able to contact the satellite essentially from horizon to horizon, and the downlink signal, being 8.2 MHz higher, should also be heard as long as the satellite is above the horizon. But with higher levels of solar activity, one can see a shortening of the time interval when the satellite can be contacted on the uplink frequency. Indeed, in going from an SSN



of 50 to one of 200, the time of possible contact is reduced by a factor of almost three, from 14 to five minutes.

Aside from the particular ionospheric aspect of HF communication with satellites discussed above, there

are operational considerations as well. Thus, with circular orbits at 1,000 km altitude, it is clear that orbital motions limit communication times to something like a quarter of an hour, at least during periods of low solar activity. Near the peak of a solar cycle, communication with the satellites would be more restricted, mainly close to times when the orbit is nearly overhead as, under those circumstances, high elevation angles serve to lower the F-layer penetration frequency.

There is another interesting point that would serve to make satellite efforts more attractive, the lowering of F-layer critical frequencies during times of geomagnetic storminess. Thus, when the HF bands go dead because of a high level of magnetic activity, access to HF satellites would be easier, even in periods of high sunspot count. However, the possible range of communication for a low-orbit satellite is still quite limited, nothing to compare with that possible by using F-layer hops below the F-region.

As an example, for the RS-12 satellite at 1,000 km altitude, the maximum distance possible is less than 7,000 km. That's enough to give you complete coverage of the US when the sub-satellite point is centrally located, say over the region around 40N, 95W. That says it's not a mode for DXCC, but more like WAS, so when the bands are dead, it's better than nothing. Myself, I find it interesting now in the midst of all the post-maximum magnetic activity. Try it; you may like it too!



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Book traffic

It's been several months since the new "book" formula was announced by our staff at the ARRL. This was a change from one point for every three addresses to one for one. As I mentioned in the last column, it seems fair that one point is given for each piece of traffic which is originated, since originations now count toward your PSHR total.

I had great hopes that this new formula would encourage people to book their traffic. They have not. I still sit and copy three messages in a row with the same preamble and text. And it's become a quandry at NCS. Stations are supposed to list their books on a net as if each were individual messages. That is, if you have a book of nine, you list nine rather than three as you once would have.

I ran an experiment one day when I received a book of nine. I timed sending the nine as a book and separately. It took about three times as long to send the messages separately. A good NCS looks at the traffic listed and sends stations off frequency to clear all the traffic in the quickest and most effective manner for all the stations. If two stations list traffic for a destination, one station listing five and the other listing nine, the NCS would normally link the one with five first. But, if the nine happened to be a book of nine, it would save more time for

everyone on the net to link the station with the book first. After four months of handling over 1,300 messages and net-controlling many nets, I feel this new policy is a flop. Why?

1) Originating stations haven't had any education to use books. Thus they haven't changed their procedure at all.

2) NCS is now totally out of sync with the anticipated time it will take any station to send its listed messages.

Why don't we just continue to list traffic as we used to? Do some net managers want those extra points? And, perhaps traffic handlers who pass the traffic also want them. Is there a fear that traffic is dropping off and this will give totals a boost? Our staff at HQ keeps saying that.

A statistical analysis of traffic in Virginia over the past four years (five HF and three 2M nets) shows that we have dwindled in traffic handlers but that traffic has remained the same. Adding stats on several major packet PBBSs shows that packet has not intruded into net traffic. Rather, it has both intermingled and established its own clientele. It is therefore not a threat to nets. I repeat, net traffic has remained constant over the past four years. Thus, we don't need this new book traffic count to inflate our figures.

Adding points for traffic is nice and allows us to gain recognition. This recognition has not lured new traffic handlers. The basic purpose of nets is to move the traffic in the most efficient and effective manner. Listing a book of nine as nine instead of three has muddled the whole process. Therefore, I suggest that only the

originator and the deliverer should get one point for one addressee. Everyone else in the chain (receive, send, net listing) should retain the three-for-one formula. If you agree, please let our staff at the ARRL know.

Making message corrections

Can you make corrections in a message? From the beginning, I have heard that you should never make a correction in a message. Transmit it exactly as is.

Does that mean that if you get a message with a preamble reading 12 Mar (instead of Mar 12) or, maybe, June instead of Jun, you should send it along that way? If someone, in their never-ending cautiousness, sends Utah in the address, instead of UT, do you forward Utah to the next person? If someone sends you a message putting in punctuation (as in Reno, NV or John C. Jones), do you ignore it or relay the punctuation? Every time someone sends you an S for an H (as in, 'tsey are going to tse hamfest), do you ask them to repeat it till they can spit out the H, even though you are quite sure they are just going faster than they are able? If someone sends you three messages exactly alike except for the addresses (a book), do you make the next person copy each of them, or do you send them on as a book? Has making them into a book changed anything? The adage to not change anything surely must apply to the meaning of the message and not the techniques of sending it.

Learning to be a traffic handler

How does one learn to be a traffic handler? How did you learn? Most

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seem to pick it up by listening to others. If a new person was listening to you, would he absorb any bad habits?

First nights

Are there any in your area? If you are involved in one, it would make a nice article for *Worldradio*. From the traffic I've passed, it would seem that a city sponsors a New Year's Eve celebration and has an Amateur Radio station there for people to pass "Happy New Year" messages. The following is a message passed from a First Night station (WD8LDY), here in Virginia, to Perth, Australia:

"Happy New Year x Harrisonburg main street is closed to traffic and everyone is celebrating x hope you are doing well x love." Annapolis, MD (WA3YLO), also runs a First Night station each year. Tony, WA3YLO (Bowie, MD), would be happy to answer any questions.

Least is best in CW

Don't discuss your fill. Keep a piece of paper near with a few abbreviations such as WA, WB and BN, if your mind won't focus. Save the pse, need, in the text, phrases. You don't even need a question mark at the end of your fill. QSL means, "I QSL what you have

just sent." QSL NR 1526 is repetitious.

As you copy, underline fills.

Mr. and Mrs. is often sent in CW as M/M. Least is best.

You have lots of traffic with the same preamble (perhaps a special event station): On SSB, this is generally mentioned and after the first message is sent, only the message number and check is given for each following message. The rest of the preamble can be filled in at your convenience. On CW, I have heard everything from an explanation given in advance to just sending the entire preamble each time. The quickest method seems to be to send the first message with no explanation. On the following messages, send up to (including) the check, send a break, wait a second for the receive station to adjust (think ahead and move their pen), and then proceed with the addressee.

What if you get three messages to the same person? After the first message, send the name and AA as always. Then send etc., break, and on to the text.

If a station is copying a message and recognizes the addressee, it is the custom for the receive station to send a break. When the transmit station

hears this break, he proceeds to the text. If the transmit station doesn't have break-in, you will have to wait for the break to text. Don't keep trying to break someone.

Call signs

Should call signs precede or follow the name in the address? If they precede the name, they may be recognized and a break could immediately be given. Since so many seem to follow the name, there must have been a reason at some time to encourage this practice. Does anyone know what it was?

Florida

Florida has many excellent traffic handlers and some interesting city names. A message went to Cape Haze the other day. Would anyone be interested in seeing some traffic handlers listed in this column? A portion of each column could feature one state and their outstanding traffic handlers and a bit on how their traffic is passed. If interested, I could contact STMs (perhaps with a questionnaire), and ask them to send me your calls and anything of interest in your area.

For instance, as I relay a message to Nevada or North Dakota, etc., I often wonder just who are the traffic handlers there and what sort of problems or highlights they encounter. If interested, let me know. WR

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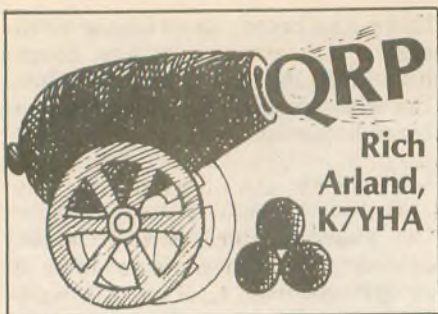
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This is going to be one of those weird columns (I know, I know, most of you think my columns are always weird). It's a tough column to write, which may seem odd since I've been writing this column for almost seven years. Try as I might, one never quite knows how to say good-bye. This will be my last column as QRP editor for *Worldradio*.

I have enjoyed the last several years as QRP editor, writing about one of my favorite facets of the Amateur Radio hobby and meeting some extremely knowledgeable and interesting people. I've had more fun doing this column than human beings are allowed to have and I've relished every minute of it! However, it is time to move on. As a parting favor, please allow me to share with you some personal insights regarding Amateur Radio, as I see it.

Last evening I was listening to the local 2M repeater. The conversation consisted of some rather inane comments by two of the newly licensed no-code Techs. One participant was only 12 while the other was a retired member of our community. What concerned me about this conversation was the poor operating practices in use and the emotional and intellectual gap that

existed between the two operators. After listening for about 15 minutes, I had all I could handle and turned the radio off in disgust. Unfortunately, my 2M FM gear is off more than it's on, owing to my growing dislike for what has happened to this band.

Now, don't get crazy on me, yet. It gets worse! I don't have a problem with the no-code license or these newly licensed radio amateurs. The problem is not with them. It's with *us*! Please allow me to explain.

Two meter FM has become the Amateur Radio version of CB radio. How does that make some of you old-timers feel? The local repeater is the equivalent of a V/UHF "party line." For 99.9 percent of the new no-code Techs, 2M FM is the first (and most likely the last) place they go. One fact that is seldom stressed to these new radio amateurs (and some old-timers need a refresher on this, too) is that hundreds, possibly thousands of extra pairs of ears are listening to our banter on 2M FM. Scanner owners constantly monitor our V/UHF FM frequencies. One can only wonder what non-amateurs, who are listening in on our conversations, think of us as a whole. After hearing some of the utterly disgusting and stupid exchanges on my local 2M repeater, I shudder to think what others envision when they

hear the term *Amateur* Radio operator.

Now before I am accused of being "anti-no-code" let me hasten to explain that I have tried to maintain an open mind regarding the new no-code licenses. However, it hasn't always been easy. While serving with the USAF, I was stationed in two countries (Japan and England) that have no-code licenses for V/UHF operation. I was convinced, after leaving these countries, that should America ever adopt a no-code license, I would find another hobby to pursue. In both Japan and England, 2M has become a vast RF wasteland of poor operating practices and overcrowded conditions. (For those of you who might dispute this statement, I'd be glad to furnish specific examples but the column isn't long enough!) In each case, good operating practices are the exception rather than the rule.

It seems that I have mellowed over the intervening years and, when a code-free V/UHF license was adopted for American amateurs, I maintained cautious optimism. Handled properly, the influx of newly licensed no-code Techs could provide the necessary numbers that the Amateur Radio community needs to revitalize its ranks. I still hold onto these beliefs. The concept of a no-code license is not "bad." However, in order to become a valuable asset to the radio hobby, this new class of radio amateur must be counseled in proper radio procedures.

Offering an operating license to anyone who can memorize a few questions for the FCC examinations and then turning that person loose on our frequencies, without a proper briefing on what is and is not acceptable radio operating etiquette, is not cool. A similar analogy would be to give a person a written driving test and then turn that person loose with a two-ton vehicle, without first checking him out behind the wheel on a driving course!

It is our job, dear reader, to accept this heavy burden as a unique challenge. We need to do our part to insure that the new code-free license holders have the proper tools to do the job of communicating on our amateur bands. We must lead by example. Our operating practices must be pristine and we must stand ready to lend a hand to help the newcomers develop the highest quality operating skills they can. Above all, we must not be patronizing in our attempts to deal with these newly licensed individuals. After all, we were new to this hobby once, remember?

And exactly where and when are we going to "help" these newcomers develop the necessary radio procedural skills? For starters we can begin programming their fertile minds in licens-

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ng class. All you Amateur Radio class nstructors out there, wake up! Your graduates are populating our bands without the necessary tools to be good communicators. Teach them the proper way to engage in a radio exchange during class. Tell them what is and is not acceptable operating practice. Talk to them about what they can and cannot do on the air. Make them aware that they now represent all Amateur Radio operators to the rest of the world.

At club meetings take the time to meet and get to know these newest members of our radio fraternity. If you have heard them engaging in improper operating procedures, take them aside and explain to them your concern and that you are there to offer your assistance to help them learn to be good communicators. Don't come on like "the radio police." Some of these individuals are only copying what other, more experienced radio amateurs are doing on the air. Be ready to defend your position. Above all, be nice to the new operators. Like it or not, they are the future of Amateur Radio.

Changes

Amateur Radio is a dynamic hobby. New technologies rapidly advance all areas of communications, but it seems that Amateur Radio is the last to adopt some of these high-tech ideas. It took years for CW to overshadow spark and SSB to outlast AM phone. Two meter FM was another mode that had been in use for years in the commercial sector before finally gaining acceptance in the Amateur Radio service. Ditto for AMTOR, packet radio and space communications. These technologies have been in use for some time in commercial and maritime services but it has only been recently that these modes have become acceptable to the amateur community. Why?

I have a few ideas. Everyone hates change. The if-it-ain't-broke-don't-fix-it mentality permeates Amateur Radio and especially QRP. Hence, when new technologies (offering new challenges) are presented to the Amateur Radio community, the mainstream radio amateurs (QRPers included) see no reason to change time-honored methods just to accommodate a new-fangled idea. Is it any wonder why the Japanese (who are dynamic people) now dominate and control our electronics, communications, photographic and automotive industries?

Over the last two years of writing this column, I have tried to prod, cajole, excite and intimidate the mainstream QRP crowd into exploring

other aspects of the Amateur Radio hobby. Sadly, with only a couple of exceptions, this has not been met with rousing success. Last year at Dayton, I vividly remember conversing with many big-name and not-so-big-name low power communicators in the QRP hospitality suite. It seemed that everyone was stuck in the homebrew-CW-HF operating experience. Without exception, no one wanted to talk about using AMTOR or RTTY on the bands. Satellite communications? Forget it, pal! HF packet radio? Waddaya, nuts?!

Dayton '92 proved to be a turning point for me. There I met many QRPer's and had a great time. However, I discovered that something seemed to be missing. I realized that I still wanted to grow in the Amateur Radio hobby. To accomplish this I needed new challenges not involving HF operation. Additionally I noticed that, over a two-year period, I had shifted emphasis from the standard QRP CW HF operating mode to space communications.

Having had a long love affair with space communication, once I procured a rig capable of providing access to the various satellites, I turned a corner in my pursuit of the Amateur Radio hobby. Technical and operational challenges abound in the amateur SAT-

COM field. There is something new and exciting happening every time I turn on the FT-726 and access a satellite. There is tremendous satisfaction in assembling a satellite ground station on a tight budget. Amateur space communication is the future of the radio hobby.

As emerging third world countries petition the ITU for more and more of our HF spectrum (and get it!), radio amateurs will be forced to move up in frequency. Relying more heavily on orbiting spaceframes containing high-tech transponders, the face of Amateur Radio will change, and a dramatic change it will be. Not only is this concept fascinating, it's exciting as well, and I want a front-row seat for the action.

To those of you who have been faithful readers of my QRP column for the last few years, let me say a heartfelt "Thanks." A big thank-you also goes to the QRPer's who have purchased my books on low-power communications. It was my desire to make available a source of information on basic and advanced QRP operation that would benefit the radio hobby. This column, coupled with the publishing of the two books, was the high point of my involvement in the low-power communications arena.

I would ask that you give Richard Fisher, KI6SN, the same support you have given me as editor of the QRP column. I have been seriously looking for someone to replace me since June of last year. After careful consideration of several well-known QRPer's, I settled on Richard. Halfway through our first telephone conversation I knew I'd found someone who could not only do the column justice, but was eager to assume the duties as QRP editor.

I hope that I have provided some entertainment for you over the last seven years and that I have served to stimulate your desire to try low-power communications. Don't worry, I'm still going to be active on QRP. My first love will always be the low-power arena. CU on the air. 72, 73 de K7YHA SK. WR

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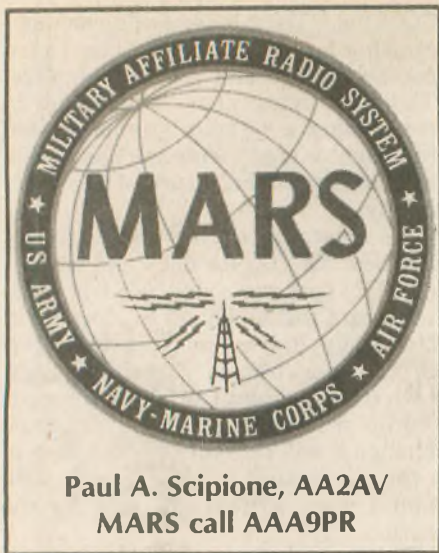
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You may get a large amount of truth into a brief space. —Henry W. Beecher



The unthinkable — Part II

Wow—I didn't really mean to scare you! I have never had such a response to any of my previous MARS columns like I had to Part I of this article in the January 1993 *Worldradio*. The article hadn't been out more than a day when the phone started ringing—and it has kept ringing, both lines. The old-fashioned mailbox has been full, as has my packet mailbox, averaging four or five MARSgram messages each week.

Everyone seems to be discussing my scenario of what would happen if the long-predicted major earthquake (7+ on the Richter Scale) were to occur along the New Madrid fault that underlies the Mississippi River from Missouri to Louisiana. The purpose of Part 1 was to describe the consequences of such an earthquake and to identify MARS as an organization that could play a key role in assisting people directly affected by the earthquake, and the country as a whole, in rebounding from what would surely be our worst natural disaster. Army MARS participated in a major earthquake exercise in October 1992 en-

titled Rolling Thunder/Missouri Thunder, and here in Part II I want to discuss the performance and experiences of MARS in detail.

Operation Rolling Thunder/Missouri Thunder

At exactly 1300 hours UTC on Friday, 23 October 1992 an earthquake registering 7.4 on the Richter Scale was simulated to have occurred three miles west of Cape Girardeau, Missouri. More than 500 men and women of Army MARS, all Amateur Radio volunteers, went into immediate action, providing two-way emergency communication, disseminating official military orders, passing emergency medical and engineering traffic and providing other key services via the full spectrum of MARS modes and frequencies: single sideband, CW and RTTY on HF radio, FM repeater and simplex on UHF and VHF, RTTY and various modes via satellite. Missouri Thunder operations took place over a 12-state area and were timed to coincide with the Missouri Air National Guard exercise called Steel Cure II. A third exercise was also timed to coincide with the Guard and MARS exercises, this one by the National Disaster Medical Service, which mobilized its disaster medical assistance teams (DMATs) throughout the operational area.

Army MARS members in eight states (Missouri, Arkansas, Tennessee, Kentucky, Illinois, Alabama, Mississippi and Indiana), encompassing two MARS/Army areas (Central and Eastern) and four MARS/Army regions (Four, Five, Six and Seven) mobilized at several dozen Army Reserve/National Guard armories and more than half a dozen active-duty military posts and bases, in their cars and trucks at more than a hundred mobile sites, as well as from their own QTHs. MARS operators in four other states (including New Mexico and Oklahoma, which both sent their state

DMAT teams to Missouri) also participated. The majority of MARS operators used emergency power sources and operated, ate and slept out in the field for the entire 48-hour emergency preparedness exercise.

From official after-action reports we know that these dedicated MARS operators performed magnificently even though they operated in locations and circumstances that were far from the comfort of their own homes and radio shacks. Take, for instance, the husband/wife team of Charles AAA9PC, and Virginia, AAT7XQ Schilling of Kansas City, who hit the road that weekend in their van, equipped with an Icom 735 and vertical antenna for HF and an Alinco 45W mobile rig and magmount antenna for UHF/VHF.

The Schillings operated mobile all weekend, driving diagonally across the state from north-central (Princeton, MO) to southeast (Poplar Bluff), a distance of more than 300 miles. They kept in constant communications with one or more Army MARS nets, stopping only to refuel the van and themselves. They originated 12 messages and received 14. Upon arriving at Poplar Bluff, the Schillings directly supported the emergency communications needs of Mr. Richard Stump, director of the Missouri State Emergency Management Agency, installing a Kenwood TS-440 and other HF equipment in Mr. Stump's basement regional emergency operating center (EOC).

Several other Army MARS operators spent the entire weekend accompanying the commanding officers of key units within the Missouri Army Guard and Army Reserve, providing both HF and VHF/UHF communication wherever they went—headquarters in armories, mobile headquarters in Jeeps and Hummers, even in helicopters and boats. These intrepid civilian members of Army MARS had to make do with the same rations and living quarters as members of the military. In fact, you might say that many of them became members of the active-duty military at least for the duration of Operation Missouri Thunder.

"I really can't say that the choice was any better than it was when I was in the service more than 20 years ago," one member of Missouri Army MARS told me by phone, "but the coffee is just as good as it was back there. Industrial strength and guaranteed not to let you fall asleep at the rig!"

Other MARS operators had the experience of working with geologists who were simulating the taking of seismographic readings at remote points around the state, an activi-

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that would be the key to predicting aftershocks, had this been a real earthquake. These intrepid operators sent me a pile of brochures and technical papers about earthquakes that I am still trying to plow through. In addition to being experts about radio, it seems that our midwestern MARS ops are also experts about such things as spreading vs. subduction earthquake zones, epicenters vs. hypocenters, ancient faults underneath tectonic plates, and the dynamics of earthen crust.

Still other MARS operators, individually and in pairs, accompanied military convoys and mobile medical teams for the weekend. Here is just a partial list of the organizations which had one or more Army MARS operators assigned during Operation Missouri Thunder: General Services Agency; Veterans Administration and VA Hospitals; FEMA, the Federal Emergency Management Agency; the Missouri State Emergency Management Agency; the Missouri Highway Patrol; Missouri Public Health Services; CUSEC, the Central US Earthquake Consortium; the US Geologic Survey; National Earthquake Information Center; the Missouri Department of Natural Resources; the American Red Cross; the Center for Earthquake Studies (Cape Girardeau); and the National Disaster Medical System (FCC) facilities in Kansas City, St. Louis, Lincoln, Little Rock and Jackson, Mississippi.

The military facilities and units that had Army MARS operators assigned to them during Operation Missouri Thunder include: the Missouri National Guard; the Missouri Air National Guard; the Air Guard 131st Tactical Flight Wing; the 239th Tactical Communications Company; the Army Corps of Engineers; the Military Airlift Command at Scott AFB in Illinois, as well as other MAC facilities at Oklahoma City, Oklahoma, and Jackson, Mississippi; the Regular Army at Fort Leonard Wood, Missouri; and the US Army Information Service Center (St. Louis). In addition to the military units listed above, Army MARS operators kept in constant contact with Army MARS Central Area Director Leon Ritter at Fort Sam Houston, Texas, and the chief of Army MARS worldwide, Robert Sutton, at Fort Huachuca, Arizona.

Every member of Army MARS who participated in the earthquake exercise carried a chart that listed all modes, frequencies, and nets. The chart also had the home phone numbers and net assignments of every scheduled MARS operator. The frequencies ranged from 4 MHz to 920 MHz! This

detailed frequency plan was developed jointly by John Monson, AAA9EC, Army MARS National Emergency Communications coordinator and Jim Johnson, AAA7MO, Missouri State director of Army MARS, in coordination with Chief of Army MARS Bob Sutton, AAA9A. Detailed propagation studies and forecasts were made, with changes in frequency, from the high MHz to lower MHz charted against UTC time.

About the only problem that one of the mobile MARS teams encountered was not being allowed into a military airfield they had been assigned to cover because they lacked official military ID cards. But they were not hauled away to the local jail and I am happy to report that they were admitted later. All MARS operators were present and accounted for at both the beginning and end of the exercise, none were injured or got lost, and all report having met their individual or group objectives. In short, without Army MARS the military would not have been able to meet its own and public needs had the earthquake actually occurred.

By the way, experts tell us that there is better than a 50 percent chance that a 7+ earthquake will occur along the New Madrid fault by the year 2000 and that the earthquake that occurred there in 1811 was the most intense ever to hit the North American continent. If and when "the big one" occurs in the American heartland, or anywhere else in our country, the men and women of Army MARS will be fully prepared.

How did MARS perform so well during Operation Missouri Thunder?

Unlike unpredictable forces of nature like earthquakes, the efficient performance of MARS during Missouri Thunder was no accident! It was the result of two key events within Army MARS during the past few years:

The first event was a New Madrid

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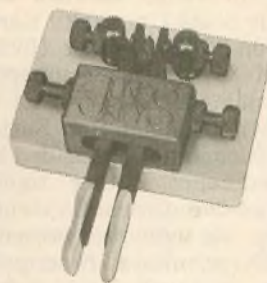
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area Army MARS conference that was hosted in Memphis, Tennessee, by Ken Schildt, AA9AT/TN, state director of Army MARS, and the Memphis State University Earthquake Center on 17 September 1992. More than 200 MARS members from throughout the Midwest, as well as Army MARS Chief Bob Sutton and other national staff, attended the full-day conference. Major topics discussed were: nature and extent of the probable earthquake; presentations by earth scientists; descriptions of possible damages; and far-ranging discussions of the ways in which Army MARS could provide emergency communication services to assist the military.

The second and closely related event was development of an Army MARS worldwide earthquake OpPlan (operations plan) developed by Army MARS Chief Bob Sutton, AAA9A, Army MARS Emergency Director Bill Miller, AAA9ED, Army MARS Emergency Coordinator John Monson, AAA9EC, Army MARS Publications Coordinator Charles Schilling, AAA9PC, and Army MARS Central Director Leon Ritter, AAA6C. This 17-page plan became the basis for the even more detailed Missouri Thunder OpPlan (more than 80 pages long!) that specifies the roles, objectives, plans and goals that the Army MARS system should have in any major disaster situation, not just in Operation Missouri Thunder.

I cannot overstate the importance of the OpPlan and the fact that, for the first time in its nearly 70-year history, Army MARS has a clear sense of what

it is, what it should be doing and who it should be doing it for. This represents nothing short of a "revolution" within MARS. The difference certainly showed in Operation Rolling Thunder/Missouri Thunder as it will in all of our upcoming plans and training.

"We have a clear sense of who we are, of our unique skills and resources, and of how to use those skills to provide vital communication skills to our customers within the military," Army MARS Chief Bob Sutton told me recently. "And the key to the whole thing is just knowing who our customer is and meeting the needs of that customer."

In the case of Army MARS, our global customer is the United States Army. In the case of specific operations or state MARS organizations, the customer is the specific Army command, unit or post. We meet with the commanding officer of the unit, ascertain his or her specific emergency communications needs, match those to our resources and personnel, and then develop a detailed OpPlan that contains specific goals, operational objectives and expected outcomes. Once Army MARS has provided the needed services, we then meet with our customer again to see just how well we satisfied the needs of his/her military unit, and then learn from our successes and mistakes.

As a professor of marketing in the School of Business at Montclair State University in New Jersey, I have to smile at this revolutionary new way of doing business within Army MARS because it matches the definition of marketing—knowing who your customer is, ascertaining his or her needs and wants, and then basing all of your

business activities on satisfying the customer's needs.

Although we in MARS are perhaps best known for the millions of phone patches and MARSgrams we have run for US troops during wartime and assignments to remote overseas locations (yes, those American troops and their loved ones back home in a sense are our "customers"), and though we are also known for sharing invaluable HF, VHF and UHF communications skills with active-duty Army personnel (yes, those soldiers too are our "customers"), before now we still felt like a stepchild, somehow unsure of our exact reason for being.

This is no longer the case. There are new faces, a new sense of mission and a new vitality among the more than 4,000 civilian and military volunteers within our system. We are the best in the world at what we do—providing emergency and special situation communications services to the military—and there is a sense of real contribution to our country. Members eagerly participate in nets, training and more involved exercises such as Missouri Thunder, volunteering more than 600,000 hours of service each year.

Let's see, at an average wage of \$12 an hour (the average American worker makes \$25,000 a year for 260 eight hour work-days), that means that we are volunteering more than \$7 million of professional time each year. Also consider that recent estimates show Army MARS providing cost/benefit leverage of more than 25 to one (for every dollar spent on MARS, the US Army receives services worth more than \$25). In this era of new federal austerity, MARS is one of the best things going, whether or not there is an earthquake at New Madrid or anywhere else.

If you would like to become a member of Army MARS, please write to our headquarters to receive a membership application kit: Chief, Army MARS, USAISC, Attn: AS-OPS-OA, Fort Huachuca, AZ 85613-5000. Readers who have comments about this column or suggestions for a future MARS article can write to Dr. Scipione at 5 Burr Drive, Metuchen, NJ 08840. WR

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The "Apartment Dweller" dipole

The following is reprinted from the November 1989 and April 1990 Badger State Smoke Signals

HARVARD D. HAMER, K9YHO

After moving into a second-story apartment, where no outside antennas are allowed and where the attic is not accessible, I spent a year thinking about ways to build an efficient antenna for indoor use. The final result provides surprisingly good performance while occupying relatively little indoor space.

I did not try any window-ledge-type antennas because of the lack of an effective counterpoise or a good RF ground.

I began experimenting with an indoor antenna. The master bedroom had the most available clear wall space, so, having an understanding wife, I started hanging wires on the outside wall. (There is apparently no foil insulation in the walls; if so, this project would probably have been "foiled" from the beginning, since the foil would have acted as a shield.)

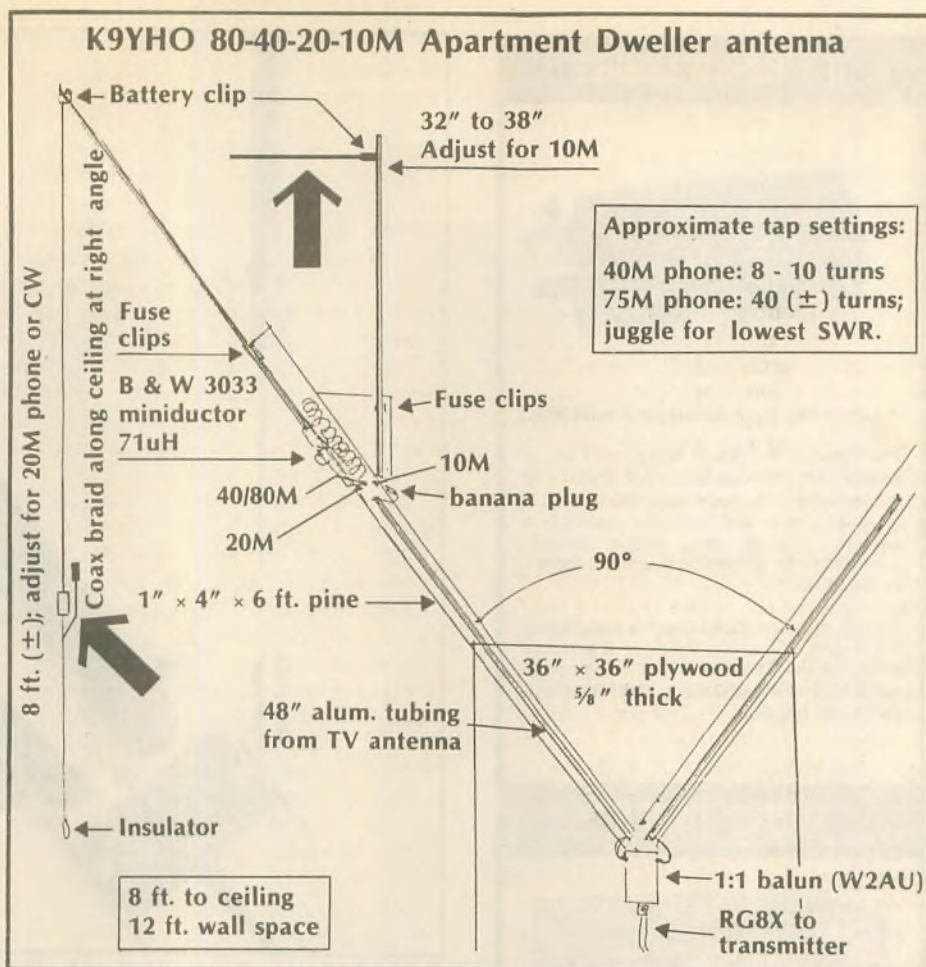
A shortened, balanced dipole in a V configuration seemed to offer the most efficiency while occupying a reasonably small area. I began by stringing 40 feet of RG8X coax from the ham shack to the center of the bedroom wall. The V configuration was chosen for two reasons: 1) to (hopefully) make it less directional; and 2) to make changing bands easier, since the coils are lower and easier to reach.

The first version of the antenna employed switches to change bands and divorce unused elements. However, the switches were changed to banana plugs and jacks for better efficiency. Shielded braid from RG58 coaxial cable is used for all flexible leads and interconnections, as well as for the 8 ft. extensions along the ceiling. The finished antenna looks somewhat like a ram's horn.

A low-pass filter is used at the output of the transmitter, but no tuner or RF ground is needed. A 1:1 balun is used at the antenna feedpoint, making the antenna a balanced dipole on all bands.

The loading coils are B&W #3033 mini-ductors (71uH). The connections to the taps on the coils are made with Mueller micro-clips. Other construction details are left to the builder.

Tune-up is accomplished in the following manner: Begin adjustments on 10M. Adjust the lengths of the vertical stubs for lowest SWR in the part of the 10M band where you usually



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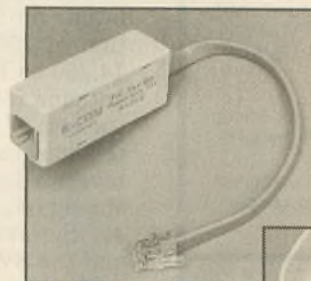
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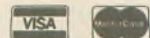
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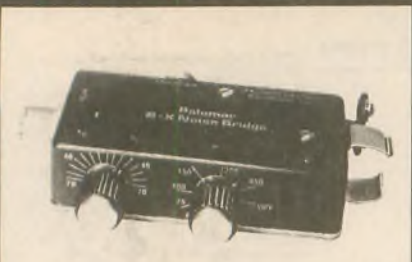
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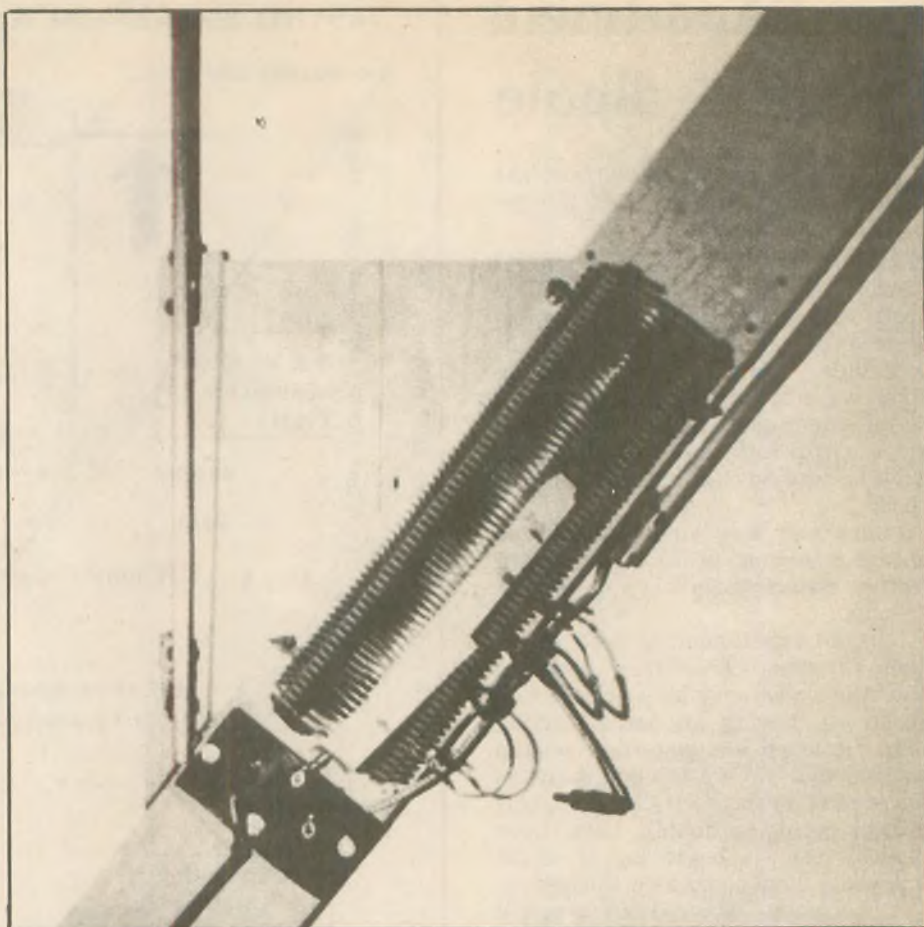
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One of the loading coils is shown here. The bakelite plate with banana jacks for changing bands is at lower left, and a 10M element is at left.

operate. The SWR on my antenna came down to less than 1.5:1 from 28.5 - 29 MHz.

Operation on 15M can be had by using the approximate settings for 40M; this provides three quarter-wave-lengths on each side of the antenna.

Next, unplug the connections from the loading coils. Adjust the 8 ft. braids for the lowest SWR in the portion of 20M you prefer (in my case, 14.250 to 14.350 MHz). To adjust the antenna for 40M, connect the plug to the end of the loading coil and adjust the 40M taps for lowest SWR in your favorite segment of the band. The tap should be at about eight to ten turns. I set the antenna for 7.2 to 7.3 MHz, and the SWR was less than 1.3:1.

The bandwidth on 75M is about 70 kHz, and the tap will be somewhere around 40 turns. Of course, you may tap the coils at several points for different operating frequencies on 75 and 80M. A strip of tape on the coils you mark settings so you can change frequencies quickly.

A word of caution: When in operation, there are some high RF voltages present on any antenna while transmitting; locate the antenna where it cannot be touched!

I made my antenna so that I could

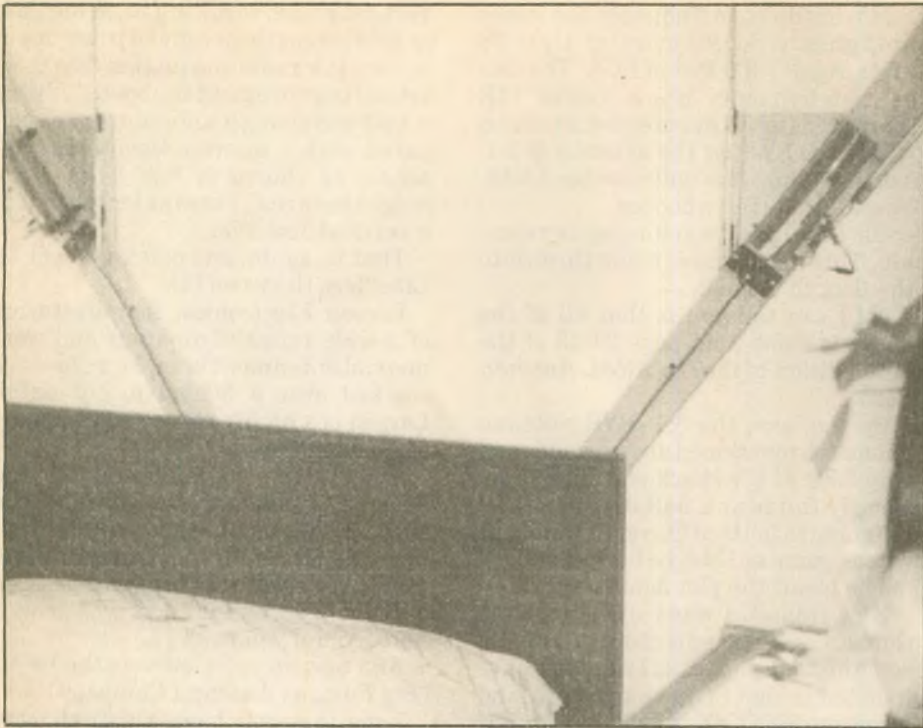
disassemble it easily and store it under the bed when company comes. The 3 ft. square base has strips and storm window catches to hold the arms in place, and the tubing is held in place in modified 3AG fuse clips.

Since this antenna was designed, I obtained a rig for the WARC bands; of course, I also modified the antenna to work on those bands (30, 17, and 12M). The modified parts of the antenna are indicated by the large arrows on the illustration. Here are the modifications:

For 30M: Set the plugs on the loading coil assembly to 40M. Then, move the 40M taps down the coil one turn at a time, until resonance on 30M is obtained.

For 17M: Break the 8 ft. legs at about 36 inches from the outer ends, and insert insulators. This produces a dipole. Adjust for resonance by adjusting the length of the inner part of the 8 ft. legs. Connect a short pigtail lead with an alligator clip so that the insulator may be bridged with the lead; that restores the antenna to operation on the other bands.

For 12M: Set the plugs on the loading coil assembly for 10M. Twelve-meter operation is accomplished by clipping two 16 in. #12 cop-



This view shows most of the complete Apartment Dweller antenna. Not visible are the 8 ft. sections of braid, removed from old coaxial cable. As noted elsewhere, this antenna may be easily modified to operate on the WARC bands.

Photos by Harv Hamer, K9YHO

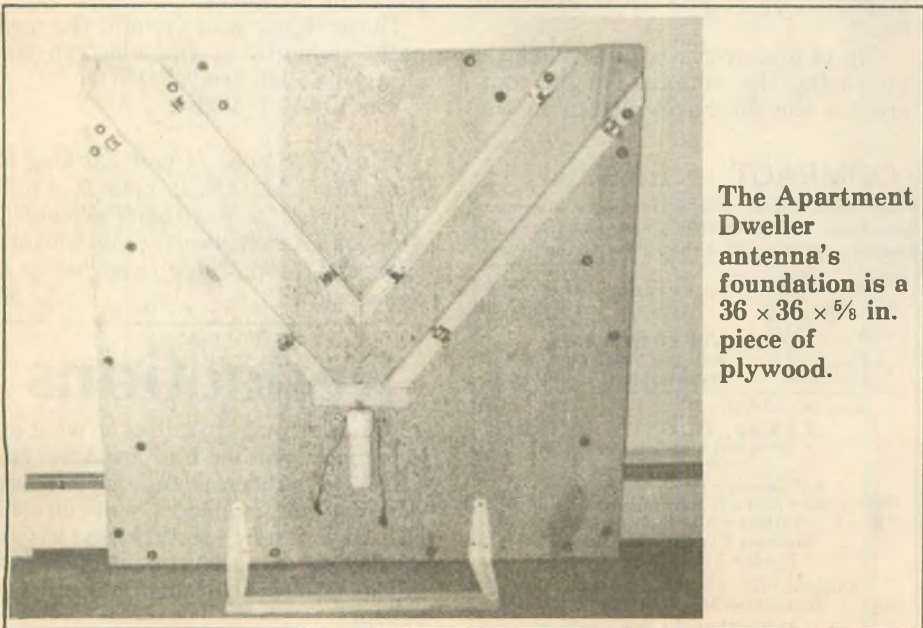
per wires near the tops of the 10M vertical elements; this adds the length needed for resonance on 12M. Use battery clips on the #12 wires. Adjust for resonance by sliding the wires up or down on the 10M elements. In my case, about six inches from the top of the 10M elements works fine.

Tuning the original antenna and these modifications can be done using a dip meter, a noise bridge, or an SWR bridge. I hope these mods will get you on the WARC bands.

Considering its relatively small size

and its unorthodox appearance, the Apartment Dweller works very well. I have worked stations in every direction; the antenna does not seem to favor any one direction over any other, likely due to its configuration. Signal reports are generally good, even when working DX stations during a contest.

If you need more information or if you have questions, please send me an SASE, and I will try to answer them. I would enjoy hearing from other builders of the Apartment Dweller antenna.



The Apartment Dweller antenna's foundation is a 36 x 36 x 5/8 in. piece of plywood.

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KURT N. STERBA

They're trying to kill me. It's a plot! An evil conspiracy.

Their plan is to send me into apoplexy, from the likes of which I'll never recover. They want to kill an old man.

That is the only reason I can see for what was recently printed by the kids who work at *Newington News*.

It made more sense when it came from West Hartford. Possibly there is something in the water, maybe chloride, at Newington.

A question was asked in which the situation was a run of 100 feet of coax. The laboratory staff answer was: "You're wasting a great deal of power heating 100 feet of coax with precious little radiated at the antenna."

Oh, where is my digitalis? "Precious little radiated"??

The loss in 100 feet of RG8 foam, at 14 MHz, is 3/5 of a dB. With plain old RG8 the loss will be 4/5 of a dB. Who will be able to hear the difference?

"Precious little radiated"? Pray tell, where did it all go that there is only "precious little" remaining?

In another question the answer was: "Operating with a high SWR can result in considerable feedline loss."

My dictionary calls "considerable" "rather large." Now, what is "high SWR"? 4:1? In that condition the additional loss (caused by the SWR) will but equal the loss of the line that would exist with a perfect match. (You are, of course, using a tuner.)

You have to have grotesque SWR before you even get close to a 3dB loss, which would correspond to half an S-unit.

Moving down in frequency the losses drop greatly. So let's move up. Up to 28 MHz. Again, 100 feet of RG8. The line at that frequency has a loss of 1dB (perfect match). Let's create a situation where the SWR at the antenna is 3:1. The *total* line loss will now be: 1.5dB. Yes, all that. Big whoopee.

Oh, I can hear the yelling and screaming. This magazine is being thrown to the floor in disgust.

All I can tell you is that all of the above is right from page 24-13 of the 16th edition of the *The ARRL Antenna Book*.

By the way, the 3:1 SWR antenna mismatch mentioned above would read only 2.3:1 at the shack end of the line. Nobody can hear a half-dB difference! I'm going to tell that Oliver Stone about what's going on. Maybe he will make a movie about the plot against me.

New subject. I was looking through the catalogs. Thought about getting Lil some hi-fi earphones so I wouldn't have to listen to that Strawinsky stuff. And I see an XXXXXX XXXX indoor FM antenna. And I quote: "Full size (seven feet, two inches) half-wavelength antenna brings in more distant stations with less noise than electronically amplified antennas. Omnidirectional. Our low price \$180. (Where's Ralph Nader?)

Gadzooks! Why didn't I think of something like that? The people who buy that are dumber than the hammys. It has no electronics, it is but a half-wave vertical for \$180. But wait! A half-wave, for 88 MHz (the bottom of the FM broadcast band is about five feet, three and 13/16 inches long. What's the other two feet (seven feet, two inches) for? (Remember "half-wave"?)

Strange stuff is going on. Well, back to 144 MHz. To the engineers at the "El Bizarro" antenna company: Please look at page 2-34 of *The ARRL Antenna Book*:

"Up to just over a half-wavelength, increasing the antenna height compresses the directive pattern in the

vertical plane, resulting in an increase in field strength for a given power input at very low radiation angles. The theoretical improvement is about 1.7dB for a half-wavelength antenna when compared with a quarter-wavelength antenna, as shown in Fig. 33A. (Note: height here really means length, but in a vertical direction.)

That is, again, one point seven (1.7). Like, less than two (2).

Larsen Electronics, manufacturers of a wide range of amateur and commercial antennas, claim, for a 5/8-wave stacked over a 5/8-wave, but 5dBd. Larsen is a highly respected company. More should emulate them.

And, to the manufacturer of "The Pretzel," I challenge you to find one shred of data published in any engineering or reputable amateur level publication that supports your position of 6dBd. You find it and I will print it here. And if you can't . . .

And now an open letter to the BFAC (Big Famous Antenna Company).

I see that you have a four-element Yagi for which you claim 10.2dBd gain. If you answer my challenge I will print your letter in my column.

1. What is the gain (over a dipole) obtained by adding your reflector over the driven element alone?

2. Now that you have a two-element Yagi with the gain you've specified what gain (over the 2L) is obtained by adding the first director?

3. Now that you have a 3L Yagi (with the gain you've specified) how much gain is added by the second director?

If you don't answer my challenge, everyone will point at you and go HA HA! And if you do . . . everyone will have a good laugh.

For those who complain that my articles are not technical enough, I will give you some technical.

Those of you who thought the magnetic strength of the electron was 1.00115965246 are WRONG!

It is 1.00115965221.

(Kurt N. Sterba is now working on Book II of Aerials. If, after it is published, he is not elected as a Fellow of the American Association for the Advancement of Science, there is no justice in this world.) WR

Reflections

Take a moment to reflect on what experiences you've had in Amateur Radio. If you have something to share with *Worldradio* readers, write an article! All your news, features and letters are happily accepted at our 28th Street offices (2120 28th St., Sacramento, CA 95818).

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"Invisible" antennas

STEVE KATZ, WB2WIK/6

Dear OM Kurt,

Enjoy your articles and your *Aerials* book—a laugh a minute. I thought I'd report on my relative successes using simple but well-optimized antennas on HF. Living in a townhouse, I am restricted to nearly "invisible" antennas, but I do have access to my roof and have installed a number of short but effective antennas there.

One which has served me very well is the Spider made here in Canoga Park. For an antenna only six to seven feet tall, it has amazing performance when installed over a worthy counterpoise. In my case, I use 16 radials connected to the ground side of the feedpoint, four radials resonant on each band on which the Spider operates (in my case, this is 10-14-18-28 MHz). The radials slope down slightly from the feedpoint which is elevated four feet above a flat roof and tied to hooks in the roof itself. The Spider is mounted to a large air conditioning unit on the roof (but the whole antenna is above the A/C box), which provides a bit of additional groundplane as well as a real electrical ground for makeshift lightning protection.

Although this antenna is a mere .07 wavelength tall on 30M, which, one would think, might reduce its radiation efficiency to about 15 percent at best, I have used it to work 42 states, 29 DXCC countries and all continents on 30M CW with 100W of transmitting power — not much worse than many folks I hear using big antennas.

On 10M, I can readily compare the Spider installed as described with another set of resonant antennas: my half-wave wire inverted V dipole, which is hung from a tree limb in the yard at about 30 feet above ground and has 2½ times the aperture of the Spider), and my quarter-wave vertical whip on my car, which is a system that works extremely well. (The whip is a 102 in. stainless steel CB whip on a 3/8-24 ball mount bolted through the fender wall, about three feet above ground, with an excellent groundplane provided by my Volvo station wagon!) The results of "A-B" comparisons between the Spider and these other two antennas indicates it works as well or better than the other two systems almost all the time.

The caveat regarding the Spider's power rating can be largely ignored. The manufacturer rates the antenna at 150W maximum. I assumed the rating was based on loading inductor heating (especially on a hot, sunny day) and high voltage that may be present at the top-mounted loading

coil tip (since voltage at the end of a quarter-wave is at a maximum), which might be a fire hazard if the antenna were mounted close to flammable materials.

However, I have used the Spider at 500W PEP, both on SSB and CW, with no problems; the only ill effect noted is some detuning on the lowest frequency band, which in my case is 30M. I have the antenna tuned for literally nil VSWR at 10.125 MHz under normal conditions, and after transmitting at high power for several seconds, this tuning point shifts somewhat and creates some reflected power after some key-down time. Upon cooling off, the antenna returns to its original tuning point. Still, no smoke, no sparks, no flames.

Because the Spider is so short, when it is set back several feet from the edge of a flat roof, it cannot be seen unless viewed from a long distance away (like a few blocks). My Spider is mounted at about 36 feet above ground, four feet above the roof of a three-story building. It's not a beam on a 70 ft. tower, but it appears to be only 20-30dB down from such a desirable installation, and that's not all that bad. (After all, when the "big guns" are 30dB/S9 at the DX end, and

I'm only S9, that's a real workable signal.)

My other "hidden" antenna is a three-band inverted V dipole hung from a tree limb in the yard. This is a pair of parallel dipoles cut to 7.15 MHz and 28.4 MHz, and the 40M section works well as a 3/2-wave antenna on 15M. I initially cut this thing per the formula for free space, then installed it to find it resonant below each band edge, probably due to its low height and a lot of end-loading capacitance, especially on 40M. But when I pruned the antenna for a nearly perfect 50-ohm resistive match, using my noise bridge and a receiver out at the antenna feedpoint, while its VSWR dropped to nearly perfect, its performance fell off!

No question about it: The W1AW transmissions on 40M, as well as CHU observatory signals on 7335 kHz, dropped a couple S-units on my receiver when I had the antenna "properly" tuned, and came right back up to snuff when I "detuned" the antenna to full-size per the free-space formulas. I puzzled over that one for quite a while and then decided to forget about it—no arguing with success. The darned thing has a VSWR of about 3:1 right now in the middle of 40M but works out like gangbusters and has provided me with contacts all over the planet. Feeding this system with about 150 feet of RG8X ("mini-8") coax makes the VSWR look a bit better in the shack, anyway, but it's still about 2.5:1. The ATU in my TS850S/AT matches that instantly and allows the transmitter to produce full power.

Just another mystery in the world of aeriels. Keep up the good work.

STEVE KATZ, WB2WIK/6
Canoga Park, CA

WR

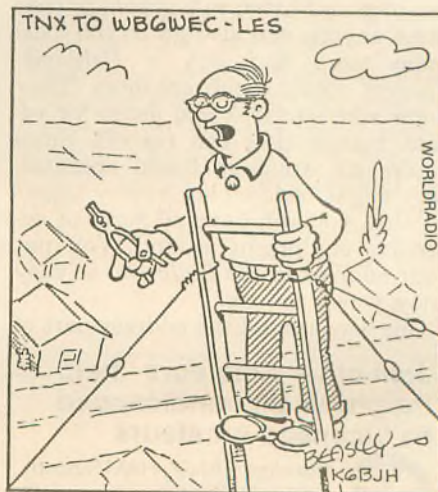
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AO, YOC, and NEC/Yagis require a math coprocessor; MN and YO come with both coprocessor and noncoprocessor versions. All programs include extensive documentation. Inquire about commercial licenses. Add 7.25% CA, 5% overseas. Visa, MasterCard, U.S. check, cash, or money order. For IBM PC, 3.5" or 5.25" disk.

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HEADS UP, BELOW --- I BELIEVE I'VE HOOKED THE GUY WIRES TO MY LADDER INSTEAD OF THE TOWER!

OLD-TIME RADIO



In my ninth decade

RAYMOND McCARDLE, W4BTA

In taking down my amateur station "wall paper" some months ago, I was wondering what, if anything, I had done worthwhile in my life. I became aware that I am in the ninth decade of my life; I was born in June of 1906.

I became a licensed Amateur Radio operator in December 1931. I was W9AMT, in Aurora, Indiana. I was transferred to my present location, Louisville, Kentucky, after WWII, being too old for combat duty but being an experienced Morse telegrapher for the Postal Telegraph Company and the Western Union, and having been employed by the Western Electric Company at Chicago, Illinois.

I went to an Amateur Radio code class just to see if I could improve my code receiving. I found it easy and I became a radio ham. I was assigned W4BTA after my move to Louisville.

I had volunteered for USNR active duty in WWII, and while being interviewed by an officer upon finishing "boot

camp" at Great Lakes, he wanted to know if I would like to be a radar operator. After explaining what radar was and the fact that the services needed operators quickly, I was sent to Virginia Beach, where a hotel had been taken over by the US government specifically to train radar operators.

From there I was assigned to the USS *Augusta*, which became Admiral King's Flagship and eventually led the invasion at Omaha Beach. General Bradley, and I believe General Montgomery, were also aboard when we went in to Normandy. We also came back to the US and picked up President Truman, took him to Antwerp, Belgium, from where he went by air for a conference at Potsdam. We were halfway back across the Atlantic bringing the president home when he came on the squawk box and told the crew that he had authorized the dropping of the A-bomb on Hiroshima, and he would order another dropped, if necessary. He did, on Nagasaki. He told us the war would be

over by fall. It was.

Beginning with the Ohio River flood in 1937, I found by looking over the thank-yous, plaques, letters, etc., that I had been active in every major disaster, including two wars. I was called back for one year service in the Korean War, and only missed the Vietnam War because my service application was lying in the company clerk's desk at Standiford Airport at Louisville; the young man was killed in a car accident and my enlistment was never processed, and I did not follow it up.

I have a three-ring notebook, 1 1/2 inches, full. Included is a personal letter from Mr. Forrestal, secretary of the Navy; one from Rear Admiral Olds, commander of the Commonwealth of Kentucky; numerous plaques from the American Red Cross; and cards for three gallons of "quite rare" blood donations.

I have told my heart and lung specialist that I intend to live to see the so-called 21st century come to pass. San Francisco was mostly destroyed the year I was born, and I have seen the same disaster again, and even got to see Halley's Comet return after 76 years.

My Lord, and guide, has been with me and I have satisfied my purpose to a great extent, even though I have enjoyed my radio work as a hobby. **WR**

Loose lips lose equipment

Ah, yes, going on vacation at last! Well, I might as well get on the repeater and tell Joe, N6NNN, down the street that I am going to be in the wilds of Montana for a couple of weeks.

Bad mistake. Who else is listening to the repeater? Remember, anyone can own and listen to a scanner. That same anyone can also go to the local radio store and buy a *Callbook*. Thieves aren't dumb anymore. They know where to look and listen for vacant houses they can rip off. Since you're an Amateur Radio operator, they might feel you are a juicy target because you will have all sorts of expensive equipment around. You put your address in the *Callbook*, so they know where to look.

One way around the address part of

it is to get a P.O. Box and have that listed as your address with the FCC. Hard to find out where a P.O. Box lives.

The wisest thing is to not advertise on the repeaters when you are leaving town for an extended period of time. And don't talk about other hams being out of town on vacation. You paid cold hard cash for your belongings and it is a good feeling to come home from a vacation and see that they are all where you left them. —*Radio Amateur Information Network*

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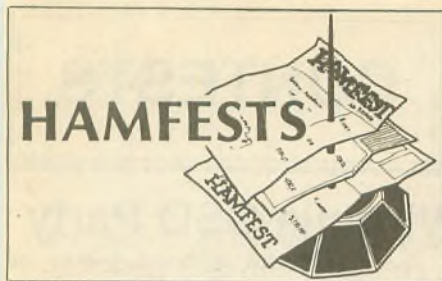
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Arizona

THE SCOTTSDALE ARC is hosting their spring hamfest on 13 March from 7 a.m. to 4 p.m. at the Scottsdale Community College. Features include commercial exhibits, swapmeet, transmitter hunt, prizes, technical sessions, meetings and VE exams at noon. Overnight parking on site for self-contained RVs Friday and Saturday. Admission is \$2 per car general parking or \$5 per swap space. Talk-in on 147.78/.18; simplex 146.52. Contact Ron Avery, WB6PEB, 9039 N. 127 St., Scottsdale, AZ 85259-6113; 602/391-2388.

Connecticut

THE RADIO SOCIETY OF NORWICH is sponsoring the annual Ham Radio Auction on 13 March from 10 a.m. at the Senior Citizen's Center, Waterford Municipal Complex. Admission is free and there will be food available. Wheelchair accessible. Bring equipment to be auctioned. Set-up at 9 a.m. Talk-in on 146.07/.67R. Contact Bob Dargel, KA1BB at 203/739-8016.

Florida

THE MARTIN COUNTY ARA is sponsoring its 17th annual Fabulous Treasure Coast outdoor hamfest on 27 February from 8 a.m. to 3 p.m. at Langford Park in Jensen Beach. Features include prizes, amateur packet demonstration, free parking, free space for tailgating, snack bar and VE exams at 9 a.m. Talk-in on 147.060 (+600). Contact Martin County ARA, P.O. Box 1901, Stuart, FL 34995, or call George, W3WU at 407/879-0239, or Don, K8BXT at 407/286-4782.

PLAYGROUNDARC will host its 23rd annual ham/swapfest 20-21 March from 8 a.m. to 5 p.m. Saturday and 8 a.m. to 3 p.m. Sunday at the Fort Walton Beach Fairgrounds. Features include large flea market, commercial vendors, forums and meetings. Admission is \$4 at the door, with ladies and persons under 16 admitted free. Tables are \$10 per day or \$15 for both days. Contact PARC, Box 873, Fort Walton Beach, FL 32549, or call Jim Jajuga, KD4NHQ at 904/651-5362.

Illinois

THE STERLING-ROCK FALLS ARS is holding their 33rd annual Hamfest 21 March from 7:30 a.m. at the Sterling High School Field House. Features include Large flea market, free parking including areas to accommodate self-contained campers and mobile trailers overnight, concession stand and VE exams with walk-ins between 8-10 a.m. only. Admission \$3 in advance, \$4 at the door. Tables \$5 including electricity. Bring your own cord. Vendor set-up times on Saturday from 6-9 p.m. and on Sunday beginning at 6:30 a.m. Talk-in on 146.25/146.85. Contact Lloyd Sherman, KB9APW, Sterling-

Rock Falls ARS, P.O. Box 521, Sterling, IL 61081; 815/336-2434.

THE LIBERTYVILLE AND MUNDELEIN ARS, assisted by the North Shore Radio Club, will hold its annual LAMARSFEST on 28 March from 8 a.m. to 2 p.m. at the Lake County Fairgrounds. Features include large indoor electronic, radio and computer swapfest, commercial exhibitors, rest area, free parking and public cafeteria. Admission is \$4 in advance with SASE and \$5 at the door. Swapfest tables are \$10, wall tables are \$15 and commercial tables are \$25 by reservation only. Vendor set-up time is 6 a.m. Talk-in on 147.345+ repeater and 146.52 simplex. Contact Frank Avellone, W9GLO, LAMARSFEST '93, P.O. Box 437, Lake Bluff, IL 60044; 708/234-4124 before 10 p.m.

Indiana

THE MICHIGAN CITY ARC is holding its annual Spring Hamfest and Computer Flea Market on 27 March from 8 a.m. to 2 p.m. at Rogers High School in Michigan City. VE exams will be given. Admission is \$4 per person over 10 years of age. Tables are \$5 each. Electricity \$2 per table. Vendor set-up time is 7 a.m. Talk-in on 146.52 simplex and 146.37/97 (PL 131.8). Contact Jack Lemley, N6SYJ, 384 Hawthorne St., LaPorte, IN 46350; 219/325-0951.

Kentucky

THE LINCOLN TRAIL ARC will hold its annual hamfest on 27 March from 8 a.m. at the Pritchard Community Center in Elizabethtown. Features include refreshments, free parking and VE exams at 9 a.m. Admission is \$4 in advance and \$5 at the door. Tables with one chair are \$7.50 in advance and \$10 at the door. Vendor set-up time is 8 p.m. Friday and 6 a.m. Saturday. Talk-in on 146.38/98 and 146.52. Contact Whitey, WD4GDA, P.O. Box 342, Vine Grove, KY 40175; 502/877-2234.

Maine

THE PORTLAND AMATEUR WIRELESS ASSOCIATION (PAWA) will hold a flea market and hamfest on 27 March from 8 a.m. to 2 p.m. at the Stevens Avenue Armory in Portland. VE exams will be given at 10 a.m. Admission is \$6 from 6:30-8 a.m. and \$4 from 8 a.m. to 2 p.m. Talk-in on 146.73/13 or 147.09/69. Contact Marty Feeney, K1OYB at 207/772-1682.

Massachusetts

THE SOUTH SHORE ARC will hold its annual indoor flea market on 28 March from 10:30 a.m. to 3 p.m. at the Viking Club in Braintree. Features include refreshments and free parking. Admission is \$1. Tables are \$12 in advance and \$14 at the door. Vendor set-up time is 9 a.m. Contact Dave Hammond, KC1AZ, 62 Lakecrest Path, E. Weymouth, MA 02189; 617/337-5301 evenings before 11 p.m.

Amateur Radio Language Guide

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SPEAK TO THE WORLD

MT. TOM ARA is sponsoring a hamfest on 7 March from 9 a.m. at Smith Vocational School in Northampton. Features include flea market, commercial dealers, tailgating, refreshments, handicap accessibility and VE exams at 10 a.m. Admission is \$3, under 12 free. Tables are \$12 in advance and \$15 at the door. Tailgating is \$5 per space. Vendor set-up time is 8 a.m. Talk-in on 146.34/94. Fly-in at Northampton or Barnes Airport. Transportation available upon request. Contact Jim, K1MEA, 316 Main St., Easthampton, MA 01027; 413/527-3199 from 7-9 p.m.

Missouri

THE JEFFERSON BARRACKS ARC will hold its 33rd annual radio auction on 12 March beginning at 7:30 p.m. with doors opening at 5 p.m. at the Concordia Turner's Hall in south St. Louis. Features include a fish fry for a reasonable price and free coffee and cake. Admission is free. Talk-in on 146.94 and 145.21. Contact Vivian, WD0EMS, or Scotty, KA0FJA, 4121 Fabian Dr., St. Louis, MO 63125; 314/631-4068.

New Hampshire

THE INTERSTATE REPEATER SOCIETY is holding their annual Amateur Radio Flea Market on 13 March from 8 a.m. to 3 p.m. at the Lions Hall in Hudson. Features include door prizes and a raffle. Admission is \$2. Vendor spaces are \$10 each before 1 March. Talk-in on 146.85 (-600). Contact IRS, P.O. Box 693, Derry, NH 03038.

New Jersey

THE CHERRYVILLE REPEATER ASSOCIATION II will host its annual Flemington Hamfest on 13 March from 8 a.m. to 2 p.m. at the Hunterdon Central High School Field House in Flemington. Features include indoor/outdoor flea markets, forums, QSL card checking for DXCC, WAS and VUCC, food and refreshments, free parking, handicap facilities and VE exams. Admission is \$5. Talk-in on 147.375+. Contact Keith Burt, KF5FK, P.O. Box 308, Quakertown, NJ 08868-0308; 908/788-4080.

THE SHORE POINTS ARC will sponsor its 11th annual Springfest on 6 March from 9 a.m. at Holy Spirit High School in Absecon. Features include heated indoor selling area, outdoor tailgating, free parking and refreshments. Admission is \$4, non-ham XYLs and children free. Tables are \$5 per 8 ft. section. Outdoor tailgating is \$5 per painted parking space. Vendor set-up is 7 a.m. Talk-in on 146.385/985. Contact SPARC, P.O. Box 142, Absecon, NJ 08201.

THE DELAWARE VALLEY RADIO ASSOCIATION will sponsor HAMCOMP '93 on 21 March from 8 a.m. to 2 p.m. at Mercer County Community College in West Windsor. Features include refreshments, handicap accessibility and free parking. Admission is \$5 in advance and \$6 at the door. Indoor spaces with 8 ft. table are \$20, outdoor tailgating spaces are \$11. Vendor set-up time is 6 a.m. Talk-in on 146.07/67. Contact HAMCOMP '93, P.O. Box 7024, West Trenton, NJ 08628; 609/882-2240.

New York

THE WESTCHESTER EMERGENCY COMMUNICATIONS ASSOCIATION is holding its ninth annual hamfest and computer show on 21 March from 9 a.m. to 2 p.m. at Yonkers Raceway in Yonkers. Features in-

clude free parking, handicap accessibility, major equipment dealers, hot and cold refreshments, large tailgate area, door prizes, radio tech clinic and VE exams at 9 a.m. Admission is \$5, under 14 free with adult admission. Seven ft. tables are \$15 each. Talk-in on 147.060R. Contact Tom, WB2NHC, or Jeanne, N2NQY, Raffaelli, 544 Manhattan Ave., Thornwood, NY 10594; 914/962-9666.

North Carolina

THE MECKLENBURG ARS is holding its 1993 Charlotte Hamfest and Computerfair 13-14 March at the Charlotte Merchandise Mart in Charlotte. Features include major manufacturers and dealers, swapfest tables, forums, activities, awards, off-street parking and VE exams on Sunday. Admission is \$6 in advance and \$8 at the door. Swapfest tables are \$18 in advance. Contact Charlotte Hamfest, P.O. Box 221136, Charlotte, NC 28222-1136; 704/841-4267.

Ohio

THE LAKE COUNTY ARA will hold its 15th annual Hamfest and Computer Show on 28 March from 8 a.m. to 3 p.m. at Madison High School in Madison. Features include forums, flea market, indoor transmitter hunt, high-speed CW contest, door prizes, QSL and VE exams. Admission is \$4 in advance and \$4.50 at the door. Tables are \$6 for 6 ft. and \$8 for 8 ft. Talk-in on 147.210(+). For info, send SASE to Roxanne, Lake County Hamfest, 5777 Fernwood Ct., Mentor on the Lake, OH 44060; 216/257-2036 weekdays from 6 p.m. to 9 p.m. and weekends 10 a.m. to 4 p.m. or 216/352-6756 weekdays 10 a.m. to 4 p.m.

THE CHAMPAIGN/LOGAN ARC is holding its third annual Spring Hamfest and Computer Show on 28 February from 8 a.m. to 2 p.m. at Kenton Senior High School in Kenton. Features include vendor presentations, door prizes and VE exams at 10 a.m. Admission is \$4 in advance and \$5 at the door. Tables are \$8 in advance and \$10 at the door. Vendor set-up time is 6 a.m. Talk-in on 147.00+. Contact Jerry Temple, N8MTZ, 402 Chesney St., Kenton, OH 43326; 419/675-5281.

THE CUYAHOGA FALLS ARC is holding its 39th annual hamfest on 7 March from 7 a.m. to 3 p.m. at the St. V. Center in Cuyahoga Falls. Features include wheelchair accessibility and food. Admission is \$3 in advance and \$5 at the door. Tables are \$5. Talk-in on 87/27. Contact Bill Sovinsky, K8JSL, 2305 24th St., Cuyahoga Falls, OH 44223; 216/923-3830.

THE TOLEDO MOBILE RADIO ASSOCIATION is holding its 38th annual Hamfest/Computer Fair on 21 March from 8 a.m. to 3 p.m. at the Lucas County Recreation Center in Maumee. Features include parking and facilities for the handicapped, forums and security. Admission is \$4 in advance and \$5 at the door. Regular tables are \$10 and wall tables are \$15 in advance. All tables are \$20 after March 19. Vendor set-up times are 5-9 p.m. Saturday and 5-8 a.m. Sunday. Talk-in on 147.27+. Contact Don Selleck, KB8KLM, 505 Fourth St., Toledo,

Benjamin Franklin wrote in 1758, "A word to the wise is enough, and many words won't fill a bushel."

OH 43605.

THE TEAYS ARC is holding a hamfest on 28 March from 8 a.m. to 4 p.m. at the Pickaway County Fairgrounds in Circleville. Features include coffee, refreshments and lunch, door prizes and drawings. Admission is \$4 in advance and \$5 at the door. Tables are \$5 in advance and \$6 at the door. Talk-in on 147.180+. Contact Dan Grant, W8UCF, 22150 Smith-Hulse Rd., Circleville, OH 43113; 614/477-3026.

Pennsylvania

THE PENN-DELARC will sponsor the Penn-Del Hamfest on 21 March from 8:30 a.m. to 2 p.m. at the NUR Temple in New Castle, Delaware. Features include indoor/outdoor reserved swaptables, tailgating, commercial exhibitors, door prizes, refreshments and VE exams. Admission is \$5, XYLs and kids admitted free. Swaptables are \$10 with electricity and \$8 without electricity, tailgating spaces are \$6. Vendor set-up time is 7 a.m. Talk-in on 224.220- and 147.225+. Contact Penn-Del ARC, P.O. Box 1964, Boothwyn, PA 19061; 215/497-2124.

THE 6TH ANNUAL YORK SPRINGFEST will be held 14 March from 8 a.m. at the York Fairgrounds in York. Features include indoor tables and blacktop tailgating, food, refreshments, prizes and VE exams. Admission is \$4, age 12 and under and unlicensed spouse free. Inside tables are \$15 and \$20. Tailgating spaces are \$5 each. Talk-in on 146.37/97 and 447.275. Contact York Springfest, P.O. Box 526, Red Lion, PA 17356; 717/843-7864.

Texas

THE FOUR STATES ARC will sponsor its fourth annual hamfest on 6 March from 8 a.m. at the YWCA building in Texarkana. VE exams given at 1 p.m. Admission is \$3. Indoor tables are \$5. Vendor set-up time is 6 a.m. Talk-in on 146.62. Contact K5AVH, FSARC Hamfest, 1206 Canadian, Texarkana, TX 75503; 903/792-2080.

THE MIDLAND ARC is holding its annual St. Patrick's Day Swapfest 13-14 March from 9 a.m. to 5 p.m. Saturday and 8 a.m. to 2:30 p.m. Sunday at the Midland County Exhibit building in Midland. Features include huge inside flea market, dealers, T-hunts, concession stand and VE exams at 12 p.m. Saturday. Admission is \$8 in advance or \$9 at the door. Tables are \$10 each for the first four and \$15 each additional. Contact N5TQU or N5UNH, MARC, P.O. Box 4401, Midland, TX 79704; 915/697-9404.

Wisconsin

THE TRI-COUNTY ARC will hold its annual hamfest on 21 March from 8 a.m. at the Jefferson County Fairgrounds in Jefferson. Admission is \$4. Six ft. tables are \$4 each. Contact W9MQB, 213 Frederick St., Fort Atkinson, WI 53538; 414/563-6381 evenings.

CONTESTS

Virginia QSO Party

Sponsored for the eighteenth year by the Sterling Park Amateur Radio Club, the Virginia QSO Party is scheduled for 1800 UTC 20 March until 0200 UTC 22 March. All licensed amateurs are invited to participate.

Operation: Fixed stations may be worked once per band/mode. No cross-mode or repeater QSOs. Indicate all single operator/multi-transmitter or multi-op/multi-transmitter operations for consideration as separate categories for certificates only. Work VA mobiles in each county they operate. Mobiles parked on county lines count as one QSO and as many county multipliers as they offer. Mobile stations count fixed stations only once as multipliers. Mobiles receive a bonus of 100 additional points overall for each Virginia county in which they log a valid QSO.

Suggested frequencies: 160M through 2M, except no WARC band QSOs permitted. CW-1805 kHz and 50 kHz up from the band edge on others. SSB-1815, 3860, 7260, 14260, 21360, and 28360 kHz. *Novice/Tech-* 10 kHz up from the edge of the novice CW band edge and 28360 on SSB. All frequencies plus or minus QRM.

Exchange: QSO number and QTH—county for VA stations; state, province or DX country for others.

Scoring: Count one point per SSB, two points per CW, and three points per QSO with a VA mobile. Virginia fixed stations multiply QSO points by the total number of VA counties, provinces and DX countries. VA mobiles add to this the bonus points for Virginia counties in which QSOs were logged. Others multiply QSO points by the number of Virginia counties worked (maximum of 95) to obtain final score.

Awards: Plaques will be awarded to the top scoring Virginia and out-of-state stations, and to the top CW-only, Novice/Technician, club and VA mobile stations. Certificates go to the high scoring single operator in each state, Canadian province, and DX single/multi and multi operations.

Logs: Follow standard ARRL contest guidelines. Logs must include name, call sign, mailing address, band/mode, QSO number sent and received, and time of contact in UTC. For club competition (minimum of three valid entries) indicate the name of the club. VA mobile stations indicate mobile operation and log QSOs by county of operation. Novices and Technicians include a copy of your current license as proof of status. Include a summary sheet and a duplicate sheet for 200 or more QSOs. Mail your entries by 15 April 1993 to Virginia QSO Party, c/o William T. Free, W3FTG, 3627 Great Laurel Lane, Fairfax, VA 22033-1212.

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Information in "New Products" is supplied by the manufacturers to acquaint *Worldradio* readers with new products on the market.

AEA FSTV transceiver

AEA introduces the VSB-70 fast-scan TV transceiver, which joins the RLA-70 amplifier and the 430-16 antenna to form the ultimate 420-440 MHz ATV station.

The VSB-70 uses vestigial sideband, the same method used by commercial TV stations to concentrate almost all of the power into one sideband, reducing bandwidth and conserving spectrum space.



Use the crystal-controlled receive for a set frequency or use the VFO for other frequencies or drifting transmitters. The VSB-70 hooks up to your television and displays both received images and your monitored transmitted signals on the screen. A versatile hook-up with a common 10-pin camera connector or video and audio RCA inputs allows hook-up to virtually any camera, camcorder or VCR.

The VSB-70 also features 1W PEP output, separate microphone and PTT inputs with high-quality construction. For further information contact your local AEA dealer.

Uni-Cable interface

Oak Bay Technologies' Model CA-232U Uni-Cable™ provides the first universal solution to packet TNC-to-transceiver interfacing. The Uni-Cable will interface virtually all TNCs to any transceiver which uses an 8-pin microphone connector.

The Uni-Cable comes complete with easy to follow instructions, a presoldered microphone connector and cable which dramatically eases the interfacing to the transceiver and a special interface unit. Users can easily program and reprogram the cable interface to match essentially all 8-pin transceivers from Alinco, Kenwood, Icom, and Yaesu to any TNC. This feature facilitates changing transceivers as only the programming changes, not the cable.



The CA-232U Uni-Cable requires no soldering. Future options will include a universal handheld interface for portable operation.

This unequalled interface provides high value and is manufactured in the US by Oak Bay Technologies of Redmond, Washington. The CA-232U Uni-Cable is available through your Amateur Radio dealer.

Azimuth weather stations

Over three years in development, the new Azimuth WeatherSTAR Generation II sta-

tions are now available and feature greatly expanded, state-of-the-art capabilities, with virtually all weather functions now available to the user—wind, temperature, rain, humidity, barometric pressure. Build a system to fit your needs. At your option you can add rain, outside humidity and dew point, and the most exciting computer interface capabilities ever available on a stand-alone system.

WeatherSTAR Wizard II includes all the most requested features—inside and outside temps, wind direction, wind speed; the WeatherSTAR Monitor II, our top-of-the-line model, includes all of these features, plus barometric pressure and inside humidity. Both units record highs and lows and tell you the time and date they occurred.



Our Rain Collector (RG4) can be added to either Wizard II or Monitor I, allowing you to measure daily and accumulated rainfall. An external humidity temperature sensor can be added to the Monitor II to let you track outside humidity and dew point.

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- 1,000 watts

| Cat. # | Band | Cat. # | Band |
|--------|-----------|--------|-----------|
| 9175 | 75 meters | 9115 | 15 meters |
| 9140 | 40 meters | 9112 | 12 meters |
| 9130 | 30 meters | 9110 | 10 meters |
| 9120 | 20 meters | 9106 | 6 meters |
| 9117 | 17 meters | | |

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A series of programmable alarms can be set to let you know when conditions rise above or fall below certain points. To protect your valuable antennas, you can set an alarm to go off when the wind speed gusts hit the danger point. And, you can see the prevailing wind direction to point your antennas to minimize wind drag.

With WeatherSTAR Monitor II you can see the "barometric trend" arrow right on the big LCD display; you can set an alarm to go off when the atmospheric pressure changes significantly over an hour. This can give you significant advance warning of approaching storms or other drastic changes in the weather. A dew point alarm can be set to warn when temperature approaches 2 degrees F of dew point.

You can set the units to read data in either US or metric units of measure, or a combination of the two. A reversible mounting base allows you to display unit on a desk, table, shelf, or to mount it on a wall. Use the "auto scan" routine to review all weather conditions at the touch of a button, or enter your own scan selection.

Two added features on the WeatherSTAR Monitor II make it especially easy to watch changing weather conditions. A "compass rose" shows wind condition and speed at all times. And, a "barometric trend" arrow shows, at a glance, if pressure is rising, falling or remaining stable.

For those with an interest in tracking and comparing historical data, either unit can be connected to the WeatherSTAR Link data storage module. The Link will store data until it is transferred to an IBM-PC compatible computer, where the sophisticated, user-friendly WeatherSTAR Link software will allow you to graph, summarize and analyze the collected data. Its serial interface RS-232 allows you to use a modem to capture this data from a remote site... and download for analysis elsewhere.

Affordable enough for home use, the WeatherSTAR Wizard II and WeatherSTAR Monitor II outperform other weather stations, which often cost twice as much or more with regard to both features and accuracy. Call or write today: Azimuth Communications Corp., Dept. WR, 3612 Alta Vista Ave., Santa Rosa, CA 95409; 800/882-7388; 707/577-8007 or FAX 707/573-1482.

Free book catalog

Ham Radio Bookstore has just released a new and greatly expanded book catalog. Sixteen pages are stuffed with books for radio amateurs, SWLs, scanner buffs and electronic hobbyists. Publishers included: ARRL, SAMS, MFJ, Tab, CRB, Universal and many more. Over 400 items are in stock in the bookstore. We ship all orders promptly and strive to give the best service possible.

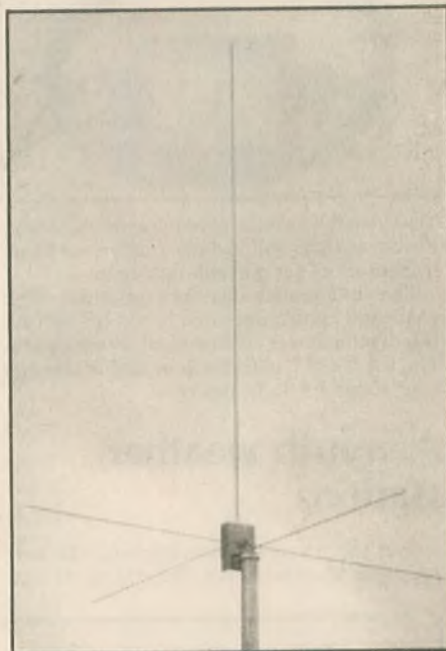
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MFJ groundplane antenna

MFJ Enterprises, Inc. announces release of the new MFJ-1750 5/8-wave groundplane antenna for 2M; only \$19.95.

This new 5/8-wave groundplane for 2M is an incredible bargain, indeed. It gives you maximum possible calculated gain of all single-element antennas.

The MFJ-1750 features MFJ's Rapid Tune Radiator™ with innovative spin-to-tune for quick and easy adjustment for lowest SWR. It handles 300W and covers the entire 2M band with SWR below 1.5 over the full 4 MHz range. A shunt-fed matching network is included to ensure the lowest possible SWR and bleed off unwanted static charges. There is also a ceramic antenna insulator for lowest RF loss and maximum radiated power.



The MFJ-1750 is easy to install on any 1 in. or 1½ in. mast with single U-bolt (included). The antenna sports MFJ's permanent bonding technology. This exclusive high-tech finish actually bonds itself to aluminum molecules. It will not come off unless the metal disintegrates! A terrific antenna built to last.

It comes with MFJ's one-full-year unconditional guarantee. For more information or to order, contact any MFJ dealer or MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762; 601/323-5869; FAX 601/323-6551; or order toll-free at 800/647-1800.

Ameritron current protector

Ameritron announces the new ICP-120 or ICP-240 InRush Current Protector for linear amplifiers for only \$79. It is the best investment in protection and long-term amplifier reliability you will ever make. It works with any and all linear amplifiers, protects both ex-



pensive tubes and costly power supply components from excessive current at turn-on and its cost is less than a single repair bill. Installation is a cinch: simply plug your amplifier's AC cord into the Ameritron InRush Current Protector box, then plug the protector's plug into the wall socket.

The Ameritron ICP-120/ICP-240 step starts your amplifier through a high-power current limiting resistor. The resistor is then shorted with a relay to give a start-up sequence that is easy on the tube and power supply components. This stops damaging inrush current, allows your cold tube to warm up slowly and maximizes durability. Excessive inrush current to cold tube filaments is the leading cause of tube failures. The second most common failure is shorted diodes caused by high charging current to filter capacitors. Both of these problems are eliminated with the Ameritron ICP-120/ICP-240.

All Ameritron amplifiers have this critical protection. Now you can add the protection to your own amplifier without complicated wiring. Momentary high voltage "spikes" can also cause damage to your amplifier. The Ameritron InRush Current Protector has built-in varistors to absorb these spikes before they cause damage. Install an Ameritron InRush Current Protector, and you can enjoy switching on your amplifier any time. Work with nearly all linear amplifiers. Ameritron ICP-120 for 120V up to 12A; ICP-240 for 240V up to 20A continuous.

For more information or for the location of your nearest Ameritron dealer contact Ameritron, 921 Louisville Road, Starkville, MS 39759; 601/323-5869; FAX 601/323-6551 or toll free at 800/647-1800.

Which way is north?

A simple way to determine directions for installing your antenna. Shove a stick into the ground. Mark exactly the tip of its shadow. One hour later, mark its shadow tip again. A line drawn through these two marks runs East and West. The stick will lie South of the line.

—AA6E
Poway Amateur Radio Society

Fight Sun Spots!

Fight the lack of them by replacing your dipole with a HalfSquare in the same place at the same height. The band will open earlier and close later. Distant signals will rise above the noise, and near signals will sink. The DX will think you bought a linear.

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When will AMSAT-OSCAR-13 be in range?

ROSS FORBES, WB6GFJ

Those just starting out in the world of OSCAR communications would like to know when they can hear a satellite. The following charts are produced to give you a rough idea as to when OSCAR-13 will be within range of your location. The three charts as printed are centered on the following geographic locations: East = New York City; Mid = St. Louis, MO; West = Reno, NV.

As you read the chart nearest your location,

keep in mind the following details — all dates and times are given in UTC. The date is printed on the left hand column and the UTC hour along the top.

A dash mark indicates the satellite is out of range and therefore not able to be heard. The letter "B" indicates OSCAR-13 is audible at that location and signals should be heard between 145.810 and 145.880 MHz (SSB and CW). A letter "O" indicates the satellite is audible, but the only signal you will hear is the

telemetry beacon on 145.810 MHz. The letter "L" indicates the satellite is audible but you will hear signals between 435.650 and 436.000 MHz (SSB and CW).

Remember, if a letter is printed on the chart, you should be able to hear OSCAR-13.

For more information about OSCAR, please send a SASE to either of the following: Project OSCAR, P.O. Box 1136, Los Altos, CA 94023-1136; AMSAT-NA, P.O. Box 27, Washington, D.C. 20044.

| Station East | HOUR - UTC | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------|------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 4/01 | L | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/02 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/03 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/04 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/05 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/06 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/07 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/08 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/09 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/10 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/11 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/12 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/13 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/14 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/15 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/16 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/17 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/18 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/19 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/20 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/21 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/22 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/23 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/24 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/25 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/26 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/27 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/28 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/29 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/30 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |

| Station Mid | HOUR - UTC | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------|------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 4/16 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/17 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/18 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/19 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/20 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/21 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/22 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/23 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/24 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/25 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/26 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/27 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/28 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/29 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/30 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |

| Station West | HOUR - UTC | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------|------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 4/01 | L | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/02 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/03 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/04 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/05 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/06 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/07 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/08 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/09 | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B | B |
| 4/10 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/11 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/12 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/13 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/14 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/15 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/16 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/17 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/18 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/19 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/20 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/21 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/22 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/23 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/24 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/25 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/26 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/27 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/28 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/29 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| 4/30 | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |

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VE exam schedules

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Worldradio, 2120 28th St., Sacramento, CA 95818.

Please mark the envelope "VE Exams."

List the location, any information examinees should have (advance registration, etc.) and the name and telephone number of a person to contact for further information.

p/r=pre-register

w/i=walk-in

| Date | City | Contact | Notes | Date | City | Contact | Notes |
|--------------------|-----------------|---|---------------------|-----------------------|-------------------|--|-------------------|
| Arizona | | | | Massachusetts | | | |
| Apr. 3 | Tucson | Joe, K7OPX 602/886-7217 | w/i only | Apr. 5 | Cambridge | Bob, N1KDA 617/593-1955 | |
| Arkansas | | | | Michigan | | | |
| Apr. 17 | Mountain Home | Gerald, WM5W 501/430-5123 | p/r | Apr. 22 | Trenton | Stan, K8SB 313/676-6248 | p/r |
| Apr. 10 | West Memphis | Gene, AB5BL 501/739-4029 | w/i OK | Missouri | | | |
| California | | | | Apr. 28 | Seneca | Les, AA0GY 417/781-4331 (d), or 417/776-8420 (e) | w/i OK |
| Apr. 10 | Anderson | 916/347-0373 | w/i OK | Nevada | | | |
| Apr. 4 | Chico | W6YKU 916/342-1180 | p/r pref. | Apr. 10 | Reno | Don, WS2Z 702/851-1176 | w/i |
| Apr. 10 | Cottonwood | Christopher, N6WMF 916/347-0373 | w/i OK | New Jersey | | | |
| Apr. 17 | Culver City | Walt, KM6MQ 714/373-6077 | w/i only | Apr. 17 | Bayonne | Bob, N2IYY 201/435-5953 | w/i OK |
| Apr. 3 | Cupertino | 408/243-8349 | w/i OK | Apr. 15 | Bellmawr | WA2VQG 609/546-7710 | w/i |
| Apr. 18 | Eureka | 707/826-0767 | w/i OK | Apr. 10 | Cranford | 24-hr hotline: 201/377-4790 | |
| Apr. 24 | Fairfield | Jerry, AA6NO 916/662-0801 | w/i only | Apr. 14 | Fort Monmouth | MARS 908/532-5354 | w/i |
| Apr. 6 | Fremont | KJ6EP 510/791-6818 | w/i only | New York | | | |
| Apr. 24 | Fresno | Bill, N6HAV 209/227-3684 | w/i only | Apr. 7 | Hamburg | Norm, KD2KK 716/824-1148 | p/r only |
| Apr. 4 | Hanford | Carleton 209/924-4221 | w/i only | Apr. 21 | Lancaster | Chuck, WD2AIK 937-3592 | p/r only |
| Apr. 29 | Long Beach | W6LRF 714/847-6370; N6LUH 310/592-1713 | w/i OK | Apr. 17 | North Tonawanda | Vern, AA2AC 716/634-5276 | p/r only |
| Apr. 3 | Ontario | Harry, KM6LO 818/810-0442 | w/i OK | North Carolina | | | |
| Apr. 17 | Redwood City | 408/255-9000 | w/i OK | Apr. 24 | Asheville | Norman, N4NH 704/253-1192 | w/i OK |
| Apr. 17 | Sacramento | Lyle, AA6DJ 916/483-3293 | w/i OK | Apr. 10 | Marion | Cecil, WB4UCF 704/724-4007 | w/i OK |
| Apr. 10 | San Jose | AA6IY and KG6XF 408/255-9000 | | Apr. 17 | Rutherford County | A.B. Brackett, KO4BJ 704/245-6334 | |
| Apr. 10 | San Pedro | Elvin, N6DYZ 310/325-2965 | p/r pref.; w/i ltd. | North Carolina | | | |
| Apr. 10 | Santa Maria | KI6XG 805/922-8509 | w/i OK | Apr. 11 | Salisbury | Isabelle, AB4UX 704/284-2414 | w/i OK |
| Apr. 17 | Stockton | Ed, N6XMA 209/952-5996 | w/i only | Ohio | | | |
| Apr. 10 | Sunnyvale | 408/255-9000 24-hr. | w/i only | Apr. 3 | Cincinnati | Herb, WA8PBW 513/891-7556 | w/i OK |
| Apr. 17 | The Sea Ranch | Frank, W6MN 707/884-4336 | w/i only | Oklahoma | | | |
| Apr. 24 | Vacaville | Irene, KK6XB 707/446-8376 | w/i only | Apr. 16 | Pawhuska | KY5J 918/337-4335, or WT5Z 918/287-3665 | w/i OK |
| Colorado | | | | Oregon | | | |
| Apr. 10 | Denver | Glenn, W0IJR 303/360-7293, 24-hr. voicemail | w/i OK | Apr. 14 | Medford | Dale, N7IXS 503/772-6865 | p/r |
| Apr. 17 | Westminster | AA0BZ 303/421-2795; N0HNR 303/278-4280 | p/r or w/i | Apr. 12 | Portland | KA7MIF 503/642-5803 | w/i OK |
| Connecticut | | | | Pennsylvania | | | |
| Apr. 25 | Milford | NB1M 203/933-5125; WA1YQE 203/874-1014 | w/i | Apr. 3 | Erie | W3CG 814/665-9124 | w/i |
| Florida | | | | Apr. 17 | Hermitage | WM3H 412/347-5960 | w/i |
| Apr. 5 | Dunedin | Marv, WC2G 813/938-7810 | p/r or w/i | Apr. 2 | Nazareth | John, WX3C 215/767-4778 | w/i |
| April 17 | Melbourne | WB9IVR 407/724-6183 | w/i OK | Apr. 1 | Philadelphia | ND3Q 215/482-0386 or 215/879-0505 | p/r pref.; w/i OK |
| Apr. 27 | New Port Richey | Marv, WC2G 813/938-7810 | p/r or w/i | Rhode Island | | | |
| Apr. 10 | South Miami | Ross, AC4KZ 305/233-7462 | w/i OK | Apr. 8 | Providence | NN1U 401/231-9156 or 401/454-6848 | w/i OK |
| Georgia | | | | Apr. 24 | Slatersville | Bob, W1YRC 401/333-2129 | w/i OK |
| Apr. 24 | Dalton | Bert, N4BZJ 404/673-2214 | p/r only | South Carolina | | | |
| Hawaii | | | | Apr. 17 | Columbia | Ray, N4WR 803/345-3373 | w/i OK |
| Apr. 17 | Hilo | AH6P 808/935-8893 | w/i | Tennessee | | | |
| Idaho | | | | Apr. 12 | Blount County | Carroll, W4PCA 615/982-5839 | w/i OK |
| Apr. 10 | Boise | W7JMH 208/343-9153 | w/i | Apr. 15 | Fentress County | Mike, AB4BX 615/879-8626 | w/i |
| Illinois | | | | Apr. 11 | Jasper | Charles, KD4XX 615/942-5116 | p/r pref. |
| Apr. 17 | Loves Park | Paul, WB9HGZ 815/987-6754 | p/r; w/i | Apr. 10 | Johnson City | Charles, AC4QF 615/743-5144 | w/i OK |
| Indiana | | | | Apr. 17 | Knoxville | Ray, N4BAQ 615/688-7771 | p/r pref. |
| Apr. 17 | New Albany | Dick, K8GVU 812/246-6377 | w/i OK | Apr. 10 | Memphis | Win Guin, W2GLJ 901/754-4552 | w/i OK |
| Apr. 13 | New Carlisle | 219/654-3007; or KK9T 219/654-8084 | p/r | Apr. 10 | Roane County | Richard, AA4KS 615/354-4281 | w/i OK |
| Apr. 4 | Terre Haute | K9EBK 812/466-2122 | w/i OK | Texas | | | |
| Iowa | | | | Apr. 10 | Houston | Jim, KB5WAM 713/486-2032 | |
| Apr. 24 | Council Bluffs | Lorraine, AA0BS 712/322-1454 | w/i OK | Apr. 13 | Houston | ND5F 713/464-9044 | p/r pref.; w/i OK |
| Maryland | | | | Apr. 17 | Houston | Paul 713/351-8930 | |
| Apr. 27 | Annapolis | Ed, W3DEQ 410/647-0370 | p/r pref.; w/i ltd. | Apr. 10 | Midland | KT5G 915/694-9450 | w/i OK |
| Apr. 22 | Baltimore | 410/426-8255 | w/i OK | Apr. 24 | San Antonio | K5JWK 512/657-1549 | w/i |
| Apr. 4 | Landover | Freddie, NG3G 202/546-9348 or 301/773-2898 | w/i OK | | | | |
| Apr. 17 | Laurel | WB3GXW 301/572-5124 after 6 p.m. | p/r pref. | | | | |

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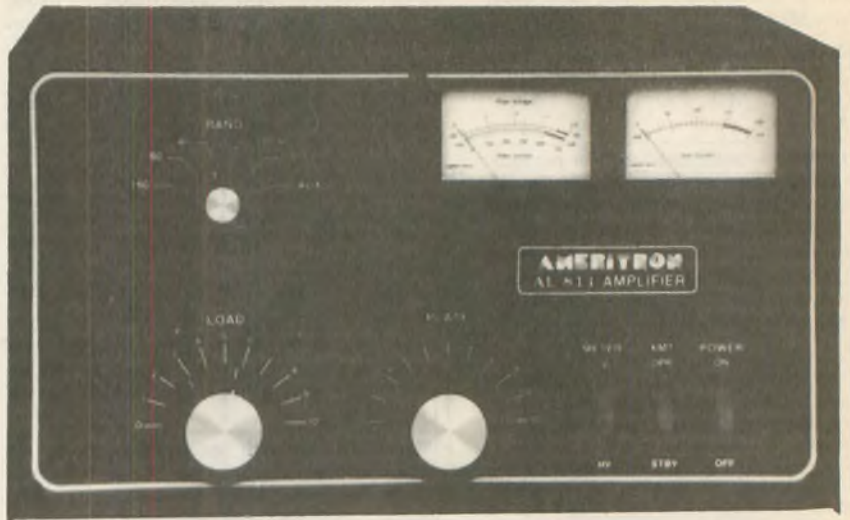
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This large volume of air flow keeps the 811A tube temperature safely below the tube manufacturer's rating — even with a key down carrier at 500 watts output.



AERIALS

Kurt N. Sterba
& Lil Paddle

Foreword by
Walt Maxwell, W2DU



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