

# Worldradio

Year 23, Issue 3

September 1993 • \$1.25

## FEATURES

Marionville, MO — Student  
astronauts & Amateur  
Radio

Sacramento Delta — CQ Field  
Day

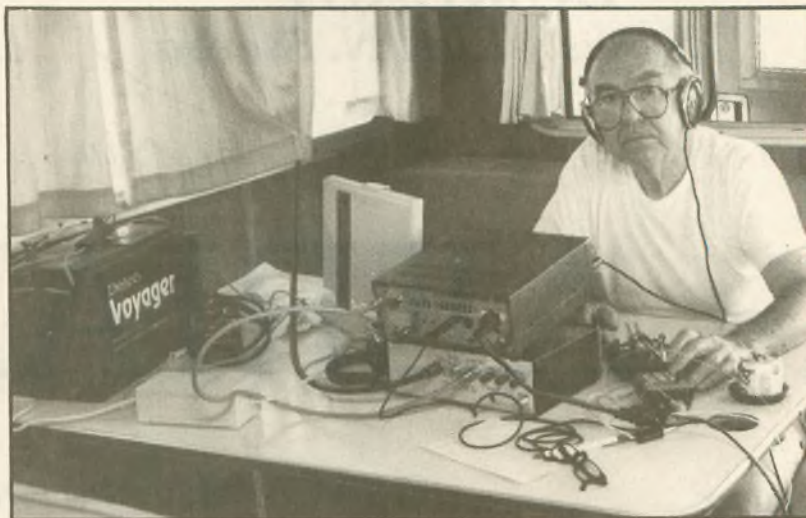
Simi Valley, CA — Assembling  
a VHF SSB station

Tempe, AZ — Antenna facts &  
fancy

Upper Saddle River, NJ — Amateur Radio, past & present

Valley College, NV — Sixty years of club service

White City, OR — VA club station



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## COLUMNS

- Aerials •Amateur Hi •AMSAT-Oscar schedule •Construction
- County Hunters •Digital Bus •DX Prediction •DX World •FCC Highlights
- Hamfests •MARS •Mobile •New Products •Off the Air •Old Time Radio
- Product review •Propagation •Public Service •Publisher's Microphone
- QCWA •QRP •Search & Rescue •Special Events •Station Appearance
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# Worldradio

Year 23, Issue 3

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## Sixty years of club service

### ROBERT HARLOW, WA2FWZ

The members of the Crystal Radio Club in Valley Cottage, New York, honored John Ochs, W2IRA, with a plaque for his long-time membership and service. John was "discovered" in 1934 by the charter members of the club making his experimental radio transmissions before he had a license. He joined the club, and the members coached him in Morse code and theory until he was ready to appear before the Federal Radio Commission of the Department of Commerce in lower Manhattan, New York City, for the license examination. He easily passed the code and written test for the General Class license and received his call, W2IRA.

During his nearly six decades as a member, John has held offices as president a few times and was elected to lifetime membership and treasurer. He has Elmered for members, built many state-of-the-art transmitters and receivers, and participated in Field Day events and emergency disaster drills.

Ochs maintains a thrice-weekly

schedule, conditions permitting, with five of the club's charter members who first persuaded him to get his ticket. They call themselves the "Banana Peel Net" and are located in Arizona, California, Colorado, Florida, New York and Washington.

The Crystal Radio Club, W2DMC, was chartered in 1931 and has been continuously affiliated with the ARRL since that date, making it one of the oldest ARRL-affiliated clubs.

John, a retired licensed electrician is also active in the Coast Guard Auxiliary and a member of the Minisceongo Boat Club on the Hudson River, where he berths his 24 ft. skiff. WR

**Crystal Radio Club President Milt Kahn, WB2JVY, presents plaque to John Ochs, W2IRA.**



## Special event honors 442nd Regiment

### ANN SHAVER, AH6KY

"It's always that way," Dennis Morisada, KH6NJ, laughed philosophically. "Everything about the 442nd is bigger, flashier than the 100th—even the special event stations!"

"He's right," agreed Al Shaver, AH6KX, coordinator of both events, sponsored by Hawaii Army MARS. "We didn't plan it that way. We certainly didn't have any control over propagation. But that's how it worked out."

The two special events were part of the ongoing series commemorating milestones in the development of World War II. WH6F, honoring the 50th anniversary of the 100th Battalion, was held 4 July 1992 and operated solely from Schofield Barracks in central Oahu. The special event station (SES) recognizing the 50th anniversary of the 442nd Regimental Combat Team, 27

March 1993, operated from selected ham shacks on the islands of Oahu and Hawaii as well as from Schofield; depending on the location, the SES was identified as KH6EEU, KH6DFW, KH6QR or KH6IJ.

"We had a lot of momentum going into this one," Shaver explained, referring to the March SES. "In the morning there was the big parade through Waikiki honoring the veterans. As usual, many members of EARC (Honolulu's Emergency Amateur Radio Club) came down to help out. Afterwards, it was natural for them to come to Schofield and participate in another tribute to these heroes."

### Japanese Americans

Following the attack on Pearl Harbor, Americans of Japanese ancestry in Hawaii who were serving in the Army

were disarmed and themselves put under guard. These loyal citizens begged for the right to help defend their country, and they gladly performed menial jobs such as cleaning latrines and digging ditches at Schofield Barracks for several months. Eventually they were shipped to the mainland for combat training before being sent to the European Theater of Operations. This first group, composed entirely of Hawaiian residents, became known as the 100th Battalion.

Because of the 100th's eagerness and dedication, the 442nd was organized a few months later. Members of the 442nd were drawn from internment camps in the United States as well as residents of the territory of Hawaii. The two groups fought together in Italy, France and Germany and suffered tremendous *(please turn to page 13)*

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# CQ Field Day

## ARMOND NOBLE, N6WR

What fun! But, on a more serious level, let's look at the "Basis and Purpose" of Field Day as presented by its sponsor, the American Radio Relay League:

*To learn to operate in abnormal situations under less-than-optimum conditions. A premium is placed on skills and equipment developed to meet the challenges of emergency preparedness and to acquaint the public with the capabilities of Amateur Radio.*

Let's now look at what was written in *Radio Communications*, the publication of the Radio Society of Great Britain in their June, 1993 issue. On the 50th anniversary of their National Field Day they ran a retrospective written by Hilary Clayton-Smith, G4JKS. A few excerpts follow:

"The RSGB Bulletin in 1947 reported, 'Experience gained in the pre-war field days proved to be invaluable to the many who were engaged in the recent hostilities.'"

"In the USA, New Zealand and other countries which have been hit by floods and earthquakes the radio amateur has always been quick to take advantage of such experiences."

"Why do so many people subject themselves to this annual ritual? What is the attraction of NFD? All I can say is, that as a new girl of only 12 NFDs, I have learned a great deal about Amateur Radio from Field Days.

"I have learnt operating skills, to assemble and erect masts, put together beams, cut dipoles, maintain generators—all in torrential rain. I learnt how to use a great circle map, about gray-line propagation, long and short path openings, sporadic E and trans-equatorial propagation.

**John Minke, N6JM, Worldradio's DX Editor, who usually is chasing the rare islands of the world, here works a neighboring section on 40 CW.**



"But the greatest lesson of all was that Field Days are fun!"

And it was again fun for the *Worldradio* Staff ARC. On its 21st FD a houseboat was rented for the weekend. Three operators, all of whom get "old foggy" discounts at restaurants, kept a station on the air for 24 hours straight. The shifts were two hours on, four hours off and then again two hours on.

When 1800Z came around (Is it over already?) the computer said that more than 450 contacts had been made.

So, how was your Field Day? If you did something unusual, send in your story to *Worldradio*.

And, if a couple of weeks later you

were involved in the "real" Field Day in the Midwest floods, share your experiences on these pages. WR

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# Worldradio

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national conversation. You are invited to  
participate.

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ideas and experiences beneficial to the  
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and support the efforts of those who bring  
the flame of vitality to this avocation.

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ance of active radio amateurs concerned  
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tions tool to develop the skill, quality and  
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## PUBLISHER'S MICROPHONE

Walking around Washington DC you  
may see giant monuments erected in  
honor of various politicians. As grandiose  
as all that is, let's now get to some-  
thing really impressive, the names and  
calls of the latest to become **Worldra-  
dio** Super-Boosters (lifetime subscrib-  
ers):

- Tony Mansell, VE4YY, Thompson, MB
- Guillermo Gomez, HK6FIQ, Sunrise, FL
- Robert Schneider, K6OZS, Kingwood, TX
- John Hoyle, KA5WAD, El Paso, TX
- Gary Altig, N7UVL, Reno, NV
- Bruce Garvin, KC6YKJ, Los Angeles, CA

Lane Arbuthnot, KC6AST, of Ramo-  
na, California, has on the top of his  
stationary, "Friendship through Ama-  
teur Radio."

Speaking of AST, that was the brand  
of computer we used on Field Day. All  
hands were pleased with the perfor-  
mance.

Bill McGrannahan, KØORB, ARRL  
Midwest Division director, dropped a  
note, "Excellent magazine, tnx!" And,  
tnx to you, too.

Many of **Worldradio's** readers are  
avid globetrotters. When in Japan you  
may wish to stop in at a meeting of the  
Tokyo International Amateur Radio  
Association. Meetings are the last Fri-  
day of each month (except for August  
and December). Location is the meet-  
ing room of St. Alban's Anglican Church.

Don't be late. Meeting starts promptly  
at 1930 local.

For a contact you can call Jay Oka,  
JA1TRC at 5395-3106 (Tokyo). He  
works at the International Section of  
the JARL. Mailing address is TIARA,  
P.O. Box 119, Akasaka, Minato-ku, To-  
kyo 107-91, Japan. L-o-n-g time  
**Worldradio** subscriber (and Super-  
Booster) Roy Waite, W9PQN, JA1YSH,  
was a founder of the organization back  
in June of 1972.

The attention of the country is rivet-  
ed on the flood disaster in this country's  
midwest. It is certainly a stark re-  
minder for emergency preparedness.  
Do not be misled by those whose an-  
swer is always, "It can't happen here!"  
when the subject of preparing for a  
disaster is brought up.

Necessity often being the mother of  
invention, there is something on the  
market that may solve a dilemma many  
are facing. AEA has a black box that  
enables you to completely operate via  
phone line an HF station at a remote

location. Surprisingly, a dedicated line  
(24-hour, only reaches your remote) is  
rather inexpensive.

Sadly, a lot of the anti-tower rhubarb  
is coming our way from people who just  
don't like to see other people enjoying  
themselves.

Today's younger amateurs have some-  
thing to look forward to. In about 25  
years, the scientists of that day will  
look back on the '90s as we do today at  
the Salem witchburners.

Tomorrow's learned men will howl as  
they think about the "junk science" of  
today—AC being bad for you, the world  
warming and cooling (at the same time,  
depending on who's talking), movie stars  
testifying before congress about a sup-  
posed poison on apples which is so  
dangerous that if you ingested 13,000  
quarts a day of the "poisoned" apple  
juice every day of your life, it might do  
you some harm.

This era will go down along with  
those folks who warned (1800s) others  
against staying on a train more than  
two hours because it would make one's  
blood boil.

Thankfully the *New York Times* just  
ran a massive article putting the AC  
scare to rest and the BBC did a docu-  
mentary about the ozone non-story.

However, there is a laboratory rat that  
has been fed eight pounds of peanut  
butter and jelly sandwiches a day for the  
past six years and it's about to croak.

Many thanks to all writing in with  
book ideas. As worthy as books may be  
about broadcasting, the merchant ma-  
rine, handling Eisenhower's messages  
in North Africa, etc. we are only doing  
books that are specifically and totally  
about Amateur Radio. More pages came  
tumbling in today from one author and  
I think those who read his book will be  
very fortunate indeed.

— Armond, N6WR

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Battery Voltage Readout	YES	NO	NO	NO
Automatic CTCSS Tone Search	YES	NO	NO	NO
Transmit Battery Saver (Repeater & Simplex Operation)	YES	NO	NO	NO
Built-In Vox	YES	NO	NO	NO
One Touch Reverse Button	YES	NO	NO	NO
Dual In-Band Receive (V+V, U+U)	YES	YES	NO	YES
Programmable External Speaker Audio	YES	NO	NO	NO
Optional Digital Display Mic with "S" Meter	YES	NO	NO	NO
AM Aircraft Receive	YES	YES	YES	YES

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CSC-58 Vinyl Case w/ FNB-26/27

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# Explorer Scout Awards

## FRANCIS K. MOY, W1SPG

Explorer Scout Post 73, sponsored by the Central Massachusetts Amateur Radio Association, Inc. and a chartered member of the Mohegan Council, Inc., Boy Scouts of America and the American Radio Relay League, held its seventh annual cookout at Post Headquarters in Worcester, Massachusetts.

The Post, with members from 14 to 21 years of age, is a public service radio communications group supplying radio communications to the Boston Marathon, the Central Massachusetts Health Classic Road Race, the annual Fallon Five Road Race, the Red Cross Medical Team, the St. Patrick's Day Parades, various county anniversary parades, and the forthcoming Columbus Day parade. Post members are also members of the Worcester Civil Defense Amateur Radio Emergency Group, affiliated with the Worcester Amateur Radio Emergency Service,

supplying emergency radio communications whenever needed.

At the cookout, the Explorer of the Year was awarded to Joseph Sugarman, N1PFS, son of Mr. and Mrs. Edward Ramstrom of West Boylston. The Outstanding Achievement Award went to Jeremy Bruce, N1NSZ, son of Mrs. Margie Bruce. Exceptional Service to Post 73 Awards went to Cara M. Rucci, KB1AFI, daughter of Mr. and Mrs. Christi Rucci, and to Christopher J. Mead, KA1WON, son of Mr. and Mrs. Raymond Mead of North Grafton. Volunteer Service Awards went to Wayne M. McHahon, N1MPY, of Worcester; Howard L. Mariotti, KA1NAH, of Jefferson; and Raymond J. Beauregard of North Grafton.

Post President, Adam J. Stachelek, N1IJJ, presented the Appreciation for Devoted and Untiring Work plaque to Post Advisor Francis K. Moy, W1SPG. WR

# Hams help with Special Olympics

On 5 and 6 June the Washington State Special Olympics were held at Fort Lewis, Washington. More than 2,500 disabled participants, attended by over 5,000 volunteers, took part in this annual event. Amateur Radio was used to fulfill the emergency and safety requirements of the Special Olympics organizers.

Wayne, K6DOW, as in years past, arranged for all the communications needed. Responding to his call for help, 25 hams registered on Saturday with 29 hams on Sunday. A total of 35 different hams were on board during the two days. Starting as early as 7 a.m. the events continued on 'til

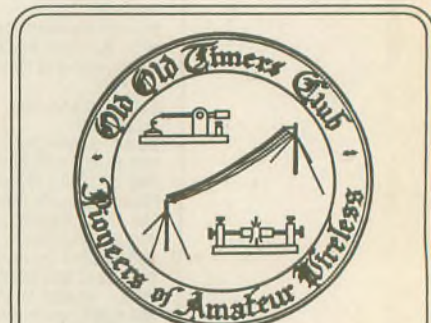
4 p.m. on both days. Using handhelds, mobile and fixed equipment with packet and FM, the crews responded with vigor. Seizures, falls, spills, and a multitude of "incidents" were handled with their usual coolness and efficiency. A total of 54 man-days of effort, not counting planning and set-up time, were recorded for the event. We look forward again next year to the Special Olympics. It is a very rewarding exercise for hams to help such brave and courageous athletes. Thanks to all who helped. —Submitted by M.L. Gibson, W7JIE (a ham who helped). WR



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# VA club station

The VA Amateur Radio Club of White City, Oregon, has 10 to 15 members, both Amateur Radio operators and shortwave listeners. Don Simonsen, K7AEJ, has been a ham for 36 years and is also very active in Navy MARS. He has Elmered many newly licensed hams who have passed through the VA Rehabilitation Center at the VA Domiciliary.

The club station is net control for the VA Amateur Radio Service Net once a week and checks in to the IHN Net, the Armed Force Amateur Radio Net and the Oregon Emergency Net. The club station also sends out many health and welfare messages each month from the VA patients at the VA Domiciliary.

Station equipment consists of the following: Kenwood TS 940S for HF; IC275-H for 2M, FM, SSB and CW; Kenwood TM 241A for 2M packet; a complete Collins station 32S-3 and 75S-3B; and a Kenwood R-2000 receiver for shortwave listening.



**Donald Simonsen, K7AEJ, chief operator at the VA ARC in White City, Oregon.**

The antenna setup includes two towers with triband three-element beams, one 35 feet high and the other 30 feet high. Each beam has an Isopole 2M vertical antenna on top and it turns with the beam. Three hundred feet south of the towers we have 75 and 40M dipoles on 40 ft. poles. There is also a 10M vertical on top of the club station. The club station has worked 128 countries and 40 states in the last two years. We are very grateful to the members of the Rogue Valley Amateur Radio Club of Medford, Oregon, for all their work in set-

ting up and repairing our antennas; VA patients are not allowed to work on elevated antennas or climb on roofs even though we are licensed amateurs.

—Information submitted by Don Simonsen, K7AEJ



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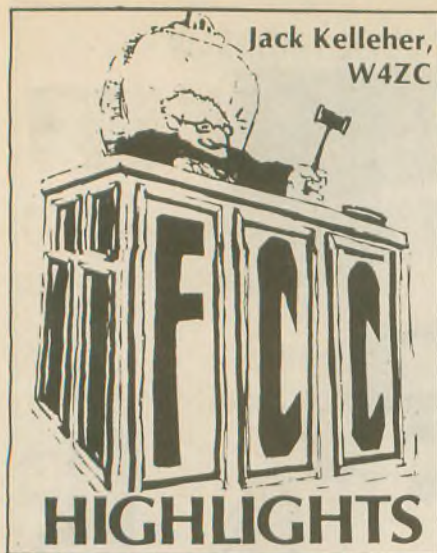


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## HF data communications

In our May column we noted that the ARRL had filed with the FCC a "petition for rule making to establish permanent rules governing automatic control of MF and HF data operation in the ARS." The July column stated that FCC had assigned rulemaking number RM-8218 and had set an initial 30-day comment period prior to issuing a notice of proposed rulemaking.

On 17 May the ARRL filed comments in continued support of its February petition. On 1 June the League, in reply comments, reiterated its original petition for rulemaking and responded to comments of others on the matter (see *ARRL Letter*, 15 June), saying that these comments aptly illustrate the difficulty in making provision for automatic control of HF communications in the heavily occupied high frequency bands.

The League said that a number of comments opposed the creation of band segments within which automatically controlled data stations could operate, because such segments would include

frequencies on which Baudot communications currently take place.

Other commenters suggested that the proposed subbands would be ill advised because they would intermix automatically controlled, incompatible digital communication modes, leading to interference. Still others suggested that certain outdated communications modes (such as Baudot) which do not include error correction or detection, should be prohibited, to make room for newer, more efficient digital modes.

Finally, the League said, a number of commenters suggested that although the proposed subbands are acceptable, they do not sufficiently encourage development of digital message networks. These commenters suggested that to permit significant expansion of data networks at HF, automatically controlled stations should be allowed throughout the HF bands where data communications are permitted.

To minimize interference to other stations, they suggested that automatically controlled stations be permitted to communicate only with stations operated under local or remote control, and that two automatically controlled data stations should not communicate with each other in the HF bands.

The League questioned the interpretations on which these comments are based, and reiterated that the subband concept it proposes is the only plan to date which would accommodate automatic operations while minimizing interference.

According to the *W5YI Report* (15 June) a separate petition was filed on 2

June by a Delaware non-profit corporation identified as the American Digital Society Inc. (whose members are all Amateur Radio operators). In this petition, AX.25 packet communications would not be permitted below 28 MHz.

The Society said the purpose of their proposal is to "... clarify the current rules with respect to unattended semi-automatic control of RTTY and data communications in the high frequency (HF) amateur bands." The petition chronicles the changes in high frequency digital communications that have occurred in recent years. It contends that the current rules have not contemplated the newer technologies (such as PACTOR and CLOVER), and that a modest rule change is required to encourage these and other modes as they become available. The petitioners aver that these new data protocols require substantially less bandwidth than AX.25 packet, and add, "... the performance figures for Packet (the ARRL AX.25) are the poorest per unit of bandwidth of any of the currently used modes."

*Ed: We wonder if this is leading toward unduly fine-grain categorization of subbands. What happens when the next as-yet unidentified protocol for data/packet shows up?*

## Novice test fee controversy

Novice Class operator examinations were folded into the Volunteer Examiner Coordinator (VEC) System on 1 July. In the FCC Report and Order in this matter, summarized in the *W5YI Report* on 15 June, the FCC is quoted as

# 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 June 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	AA0OE	KG0HD	N0XRX	KB0LJZ
1	AA1GY	KD1PZ	N1PRM	KB1AZO
2	AA2OQ	KF2QE	N2VRQ	KB2QKK
3	AA3FD	KE3JF	N3PQT	KB3AWR
4	AD4GZ	KQ4YF		KE4DMW
5	AB5OK	KJ5NZ		KC5BPS
6	AB6UR	KN6OB		KD6YUR
7	AA7XE	KI7OU		KB7WCK
8	AA8LT	KG8CL	N8ZPJ	KB8PCH
9	AA9HR	KF9QI	N9UFS	KB9ISZ
North Mariana Is.	AH0T	AH0AN	KH0CA	WH0AAX
Guam	NH2R	AH2CT	KH2HB	WH2ANG
Johnston Is.	AH3D	AH3AD	KH3AG	WH3AAH
Midway Is.		AH4AA	KH4AG	WH4AAH
Hawaii		AH6MX	WH6NR	WH6CQQ
Kure Is.			KH7AA	
American Samoa	AH8H	AH8AF	KH8AX	WH8ABB
Wake Wilkes Peale	AH9C	AH9AD	KH9AE	WH9AAI
Alaska		AL7PD	WL7LZ	WL7CHE
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stating, among other things, that it believes there is no valid reason to require VEs and VECs who donate their time to absorb the additional cost of providing Novice examinations. The FCC pointed out that the small fee (a current maximum of \$5.60) "... has not hampered the growth of other classes, for which reimbursement is permitted."

In the Order the FCC responded to a question by the ARRL concerning waivers of the test fee. The FCC said, "The examination-by-examination (computation) method allows the VEs and VECs the option of not recovering out-of-pocket costs from any particular examinee. The annual method (used by all VECs, including the ARRL) does not allow such an option." (Actually, the annual computation method of expense reimbursement was authorized by the FCC in 1984 at the request of the League).

The annual method involves totaling up all expenses for the prior year and dividing by the number of examinees. The examination-by-examination method requires calculating the exact out-of-pocket costs of every test session and then charging each applicant a proportionate share up to the maximum of \$5.60.

On 8 May (before the text of the Order was released) the ARRL made a decision not to charge any test fees for Element 2 (Novice 30-question written exam) and Element 1A (5 wpm code) even if the code test was taken after passing the Codeless Technician requirements. This decision appeared to conflict with the FCC Order.

The W5YI VEC contacted its Washington DC attorney to determine if it also could waive test fees for the Novice Elements, and was advised that the Order—which was specifically approved by the FCC Commissioners and has the force of law—was clear: They could not.

### Laugh this one off

We all need a good laugh once in a while to relieve the pain and strain of everyday life. Here's one from *Westlink Report* for 25 June which we just couldn't pass up. The title is "Budget cutbacks to Affect Amateur Radio."

*The sluggish United States economy has now had a direct impact on Amateur Radio, according to Commission spokesman Marvin Lopsong. Lopsong, who is the Junior Assistant Chief of Propagation for the FCC's Frequency Management Bureau, said that the unannounced shutdown of DX on 10M that occurred a little over a week ago was not due to a decline in solar activity, but rather the result of a lack of funds for band maintenance and repair.*

*"This is just a sample of what is to*

*come unless the economy does an unexpected turn-around," said Lopsong, who added that band closures are likely to be more frequent in the next few years as funding dwindles.*

*Amateurs in the United States quickly noted the mid-June event. Comments heard later that day on both 15 and 20M included statements like: "Ten meters was dead this morning," and "I couldn't even talk across town on 10M today."*

*Historically speaking this is not the first time that radio amateurs have been affected by government spending priorities. In the early 1920s, all amateur communications worldwide were terminated when governments diverted funds from civilian scientific research to military operations.*

*A similar situation took place in the early 1940s when massive funding was placed into the government's "Portable Sun Weapons Project" (A-bomb). During the 1960s monies were diverted to the US Lunar Landing Program and away from the Sunspot Support effort, which resulted in lowered sunspots for the better part of 11 years!*

*The FCC's Lopsong has predicted that unless funding policies are reversed, amateurs will begin to experience fewer and fewer days when bands with high maintenance costs such as 10 and 6M see DX openings.*

*Bands like 10 GHz will see no DX at all while 222 MHz may see one opening. The Commission has only been able to allocate \$14.95 to keep 1.25M alive in the 1992-1993 fiscal years, he said.*

### PRB-1, pro and con

Many of us may have whispered "Nirvana" or its equivalent when PRB-1 was approved. Not so the judiciary, witness these most recent and conflictive events.

Item 1: "New Virginia Restrictive Antenna Covenant." On 1 June 1993 the Roanoke Virginia County Planning Commission, an appointed board, approved a recommendation to pass to the County Council for passage into law. The recommendation is their reluctant attempt to conform with the

FCC's requirement that towers be allowed, at least in some fashion.

A year ago a law was passed in Roanoke County forbidding all Amateur Radio towers. The wording as indicated didn't forbid CB towers, etc. The proposed new law would require first, a \$150 application fee; second, a public notice advertisement paid for by the ham; third, a review period during which neighbors, etc., could complain at public meetings; and fourth, that towers must be placed at least 110 percent of their height from any structure or (sic) neighboring property. (Thanks, *Westlink Report*, 25 June)

Item 2: "Ham Operator Loses Tower Appeal." The United States Court of Appeals for the Tenth Circuit has overturned a lower district court decision that would have allowed a Boulder, Colorado, Amateur Radio operator to install an 80 ft. crank-up tower on his property. The case is significant in that the Federal Appeals Court finds Amateur Radio towers and antennas to be unsightly and therefore exempt from the preemption provisions of PRB-1, the 1985 FCC declaration concerning local regulation of Amateur Radio facilities. (Details appear in the *W5YI Report* for 15 June, p. 5, including an interesting court perspective on the FCC Regulations.)

Item 3: "Florida Court sides with PRB-1." A pair of Florida hams have won a partial victory in their fight to keep their antennas up and to stay on the air. The hams say that an appeals court has found that local ordinances limiting tower heights (to) 70 feet are illegal. According to the judge, the local ordinance is preempted by PRB-1 and also by Section 125.0185 of Florida state law. The latter incorporates PRB-1 into state law, making it illegal for municipalities to ban ham radio antenna installations on those grounds.

But the two amateurs still face an even more important court battle to overturn a lower court ruling that holds amateur radio to be "a noxious and offensive nuisance to the neighborhood." This finding is based purely on deed restrictions which may be much harder to appeal, but the amateurs say that they will continue their fight to regain the right to operate their station from their home. (Thanks *Westlink Report*, 10 June) WR

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# Antenna facts, and fancy

## HARRY HYDER, W7IV

Eavesdropping on the bands, one hears a surprising amount of antenna mythology being circulated.

Ron Nott, K5YNR, did a good job of demolishing the "exact length" myth.<sup>1</sup> This was done as long ago as 1935 by the late Robert S. Kruse, W1FG (formerly technical editor of QST) in the ham magazine R/9.<sup>2</sup>

The only case in which length is really important is a beam with parasitic elements, a Yagi. The lengths of the directors and reflectors are important. However, most hams buy these and follow the assembly instructions, which are generally accurate.

Here I am talking about wire antennas, usually dipoles that a ham might erect with no more than the familiar 468/f formula, and also vertical antennas and their ground systems.

Anyone trying to achieve a perfect 50-ohm match would have to vary both the length and the height, and would have to be extremely lucky to ever get there. There is nothing wrong with getting a good match at your favorite frequency, particularly if you have a solid-state rig that does not like a high VSWR. This is what is called "good engineering practice."

But don't carry it to extremes. 1.5:1 is satisfactory, or even higher if you use a transmatch. The VSWR will vary across the band anyway, and if the antenna is for the 75-80M band you will positively need a transmatch, in spite of claims I have heard for broad-band antennas for that band. Yes, a transmatch will give you a couple more knobs to twist when making large changes in frequency, but that is a small price to pay.

Noise RX bridges have become very popular, and there are several on the market. They can be very useful if you

do much antenna work. If the measurement is made at the shack end of the transmission line the measured values of R and X will be different from the values at the antenna, but the VSWR will be the same at both points, unless the line is very long or lossy, in which case the VSWR will be lower at the shack end.

If you would really like to know what the R and X values are at the antenna, you do not have to put the bridge at the junction of the antenna and transmission line. Just measure the physical length of your transmission line before you erect the antenna. The simplest possible operation on a Smith chart will tell you. This opera-

tion can be learned by anyone of average intelligence in five minutes; it involves only simple arithmetic, no high level math. This can be useful, because it can tell you whether the antenna is too long or too short—that is, if you really care.

One final note about antenna length. A new AM broadcast station is being built in my area. The short newspaper item said that they will operate on 1100 kHz and will have three towers, each 198 feet high. I reached for my calculator and figured that this is 0.22 wavelength; a full quarter-wave would be 224 feet. I immediately realized why they stopped at 198 feet. The law requires that towers taller than 200 feet must have obstruction lights, an expensive proposition. Will this shortening affect their field strength? Not noticeably. Economics and

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engineering can not be separated.

Now for grounds for vertical antennas, for which there is much misinformation being circulated.

I heard one ham say over the air that he was sure that he had a good ground for his vertical because the local water table was only 50 feet below the surface. Well, the water table might as well not be there for all the good it does him. At any ham frequency, the waves do not penetrate very far into the earth, and by the time they got to his water table they would be too feeble to have any effect on his antenna.

Even the most highly conductive soils are very poor conductors. The best thing in nature for conductivity is salt water, but unless you live in the middle of a salt marsh, you will need radials for your vertical for best efficiency.

There is an OMEGA station in Norway, operating on 12 kHz. The station is on an island in the middle of a fiord. The antenna, a "T," has its flat top stretched between mountains on each side of the fiord. The down lead, which supplies the useful radiation, drops directly to the station. Now that is a real ground! Even so, long wires are laid into the water to make good contact with the salt water.

The familiar trap vertical gives very good performance considering its cost and ease of erection. There are two varieties. The most common one is quarter-wave resonant. Two resonant radials are usually specified for this antenna. These are really not radials in the conventional sense; they are the missing halves of a dipole. The second

kind is half-wave resonant and the manufacturer says that no radials are necessary. This is almost true; the antenna will work well without radials, but it will work better with them. It is a matter of current density, which for convenience I will specify as amperes per cubic foot of earth.

A quarter-wave antenna has its maximum current at the base and in the soil immediately surrounding the base. A half-wave vertical has minimum current at the base. The maximum earth current is in an annulus one quarter wave out from the base. The earth current density is much less because the area of this annulus is much greater. Hence, the losses are less. Yes, half-wave verticals suffer less from a less-than-perfect ground system than do quarter-wave verticals. I have a half-wave trap vertical and it works very well. My only complaint is that in rainy weather the VSWR goes sky high. This is because the base is at a high-voltage point, and when the base insulator gets wet the antenna is badly detuned.

The real purpose of the radials is to conduct currents induced into the earth back to the base of the antenna with as little loss as possible.

Many hams use untrapped verticals made from various materials such as irrigation pipe or tower sections. Verticals give low-angle radiation, which is good for DX, particularly on the lower-frequency ham bands. There is much information available on top-loading. This is beneficial if the antenna height does not exceed  $5/8$  wavelength, which it seldom does in ham use.

Many hams go to a lot of trouble laying in radial grounds for these antennas, which is all to the good. How many and how long? The only answer to this is as many and as long as possible until you run out of muscle and real estate. The radials in these grounds are non-resonant.

There is a magic number, "120-radials one quarter wave long." Do not take this too seriously. The 120-radial ground came about as a result of a study by Brown, Lewis and Epstein of RCA, published in 1937.<sup>3</sup> George Brown later confessed to my friend Bill Byron, W7DHD, that they had used only 119 radials because they ran out of wire!

If you examine the curves of radial length and number in the RCA paper, you will see points of diminishing returns where more and longer radials give less and less improvement. In the late 1970s I was preparing to erect a 60 ft. vertical that I planned to use on 40, 80 and 160. I laid in 36 radials, varying between 80 and 120 feet in length to keep them all inside my property.<sup>4</sup> Laying 120 radials may be fine for an AM broadcast station because laying wire into the ground is cheap compared to the total cost of an AM broadcast antenna.

The article by KC6UQH in the March issue of *Worldradio* is a mishmash of comments on K5YNR's article by members of KC6UQH's radio club.<sup>5</sup> Most of the comments do not seem to relate directly to anything that K5YNR said, and a couple of them I find mystifying, particularly the one about the loading and unloading Q of an antenna. I wish someone would explain this to me.

The FCC curves supplied by K5YNR are calculated rather than measured values. And yes, they are for field strength at ground level, because that is what a broadcast station is interested in. I doubt if there are many  $5/8$ -wave towers on the broadcast band, if any. They are too expensive. Most broadcast stations these days use several towers in a driven array. The stations are usually located outside of town, and the towers are phased to direct the radiated power to cover as much of the center of population as possible. Sta-

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tions that must reduce power at night to avoid interfering with other stations on the same frequency frequently revert to a single radiator at night.

Few hams are able to erect their ideal antenna. They must do as well as they can with their limitations of space and height. This usually means

as long and as high as possible. I have heard some weird antennas described over the air whose owners claimed worked very well. I do not doubt this. Almost any antenna will work to some extent.

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Antenna," *Worldradio*, Dec. 1992.

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3. Brown, Lewis and Epstein, "Proc. of the IRE," RCA study, Jan. 1937.

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5. McBride, Art, "Resonance and Field Strength," *Worldradio*, March 1993. **WR**

## SPECIAL EVENT

(continued from page 1)

losses. They are remembered as the most highly decorated unit of World War II.

Using the call sign KH6IJ, the March SES also paid tribute to Katashi Nose. Nose, the dean of Amateur Radio operators in Hawaii, is an avid DXer and Elmer to countless hams in Hawaii and elsewhere. Recently he retired from



**Ron Hashiro, KH6JCA, takes a turn operating the SES.**

writing a weekly column on Amateur Radio for Honolulu's evening newspaper. Although he was not able to participate as a control operator, Nose monitored much of the action during the SES.

Scores of stations working the SES recognized the call sign. "Why that's Nose's call sign," remarked Bill Kling, KI6PG, when he made contact with the station. "I have his QSL card right here on the wall!" Ed Wood, KØAB, Harold McBirney, KV4AM, and dozens of other callers inquired about Nose's health, asked to have their regards conveyed and related interesting stories of earlier contacts with him. Nose's call sign was recognized by overseas hams, too. Peter de La Mothe, Z2/G3VIE, called from Zimbabwe and volunteered that he had worked Nose many times before

and was positive the YL operator could not be the real KH6IJ.

### 442 vet joins amateurs

The premier operator of the special event—if such a position exists—was

Kazumi Oda, N7KHF, himself a veteran of the 442nd. "No, it was the other way around," Oda insisted. "Participating in the special event was the highlight of my trip to Hawaii."

Oda, a resident of Portland, Oregon,



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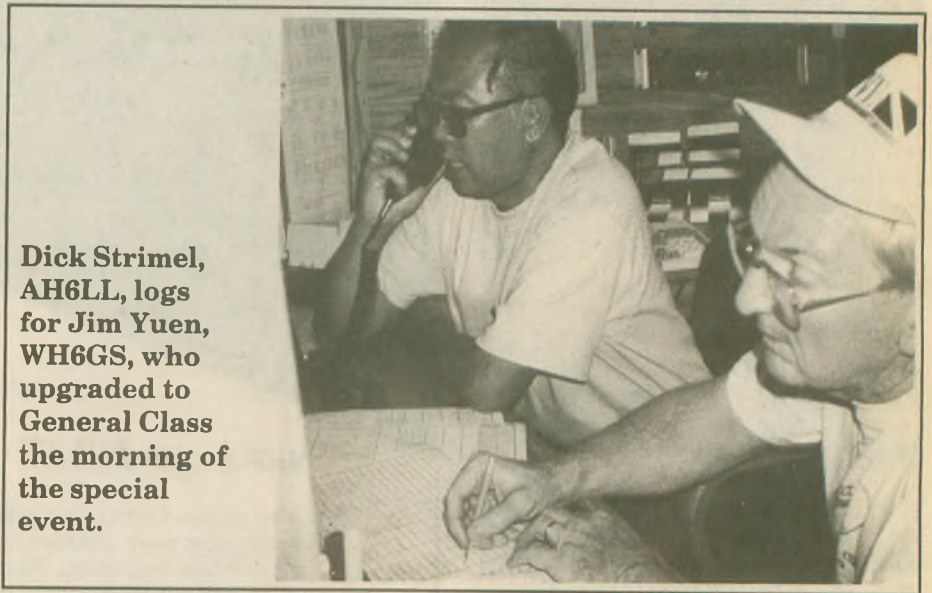


**Dennis Morisada, KH6NJ, presents Kazumi Oda, N7KHF, with a commemorative shirt and hat.**

and an active member of the Hoodview Amateur Radio Club, had all but forgotten about the 442nd's upcoming 50th anniversary celebration when he saw the notice about the SES in *Worldradio*. He dropped SES coordinator and QSL manager Shaver a note, asking with characteristic modesty if he could

visit the station. Shaver replied promptly, invited Oda not only to visit the station but also to plan to operate for a time. Oda joined Shaver in attending the monthly meeting of the Emergency Amateur Radio Club, where Morisada was finalizing plans for the club's assistance with the upcoming parade honoring the 442nd. Morisada originated the idea of honoring the 100th and the 442nd with special events.

Making the reasonable assumption that he would be marching with his wartime buddies, Morisada did not recruit Oda to help with parade control. Morisada soon learned, however, that Oda would not be permitted to appear in the parade. Incredibly, when he had tried to register the day before, the organizers told him that he had to have an official shirt and hat to be able to join the ranks—but all the shirts and hats were gone and therefore he would have



**Dick Strimel, AH6LL, logs for Jim Yuen, WH6GS, who upgraded to General Class the morning of the special event.**

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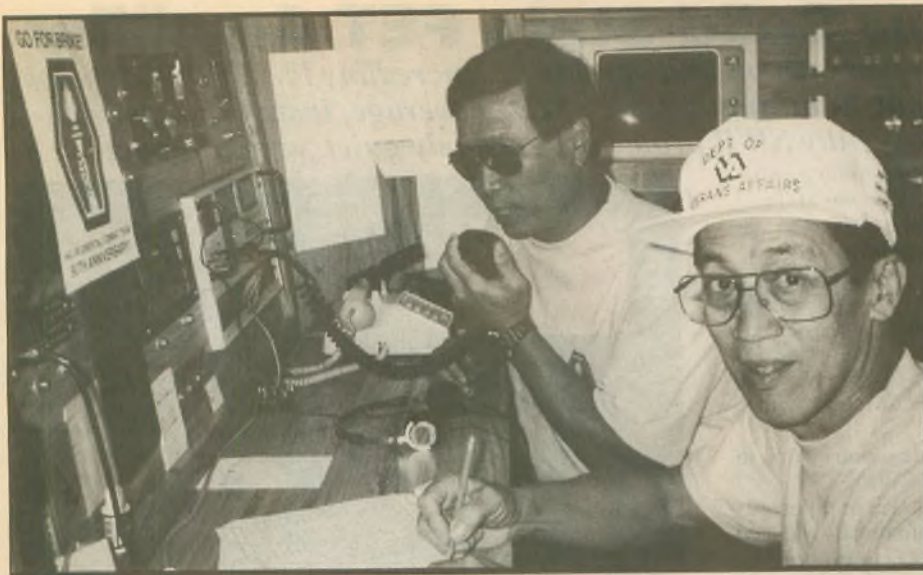
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to be a spectator. When Morisada heard this, he assigned Oda to a prime location, the reviewing stand in front of Waikiki's grand old dame, the historic Moana Hotel. As a parade volunteer, Oda was entitled to a commemorative shirt and hat!

When Oda reported for duty at the reviewing stand, parade coordinator Boyd Yamashita insisted Oda join the other dignitaries in the VIP section. "I just thanked him," Oda later remarked, "and told him I'd rather help EARC. And I'm glad I did."

**Features, news,  
stories  
big and small,  
Remember that photos will  
enhance them all!**





Ray Hasegawa, KH6JOI, and Mel Yoshioka, KH6TB, partake in some special event operation after assisting with the parade.

Following the parade, Oda went to the Army MARS Station at Schofield Barracks in central Oahu and spent time operating HF single-sideband. In one of the little coincidences that make Amateur Radio so much fun, Oda's first contact was with KA7TIX, Frank Denham, a friend from the Hoodview club.

### One SES, four call signs

"We decided to organize this SES a little differently from the four previous ones," Shaver explained, referring to the other World War II retrospective special events sponsored by Hawaii Army MARS. "This time we used four different call signs. We decided to try it this way so that we would have maximum operating flexibility. There was a big contest that same weekend, and propagation is very spotty now. If we had all used the same call sign, as we've done before, we would have been limited to one station per band per mode. This way, two different stations using different call signs but both honoring the 442nd could take advantage of a band opening. The arrangement worked out very well!"

Schofield Barracks was the primary location for the SES, with three operating positions available at all times. More than 30 individuals took turns at the microphones and keys. On the air at various times were Don Shook, AH6A; Jim and Bev Yuen, WH6GS and GT, respectively, who upgraded that very morning; Pat Guerin, NH6UY, Trevor Noble, WH6KB, and Robert Harper NØODE. Walt Brenner, KH6/DJØFX, a Lufthansa employee who just happened to be in town, operated both CW and voice late at night at Schofield. Two operators, Masahiro Hasegawa, KH6/JI4KXA, and Pete Larson, WH6LE,

were recruited after they worked the SES from their homes, giving their QTHs as Honolulu!

Operating from their own shacks on Oahu were Wally Mitchell, KH6EEU, and Len Withington, KH6AFG, who also operated as KH6IJ. A few hundred miles away on another island, Tuck Kuwada, KH6DFW, and George Heloca, KH6QR, worked from their facilities at Kona, Hawaii.

### Familiar participants

Because this was the fifth SES in the occasional series, many of the participants were now familiar to the operators. Nick Rodillas, N6RND, who has made numerous contacts on all the previous SESs, somehow couldn't locate any contacts other than Withington, who was operating on 15M. Gordon Corey, N7PMW, Wayne Lee, N5EVI, and Ron Hobbs, KC6VHU, were among those identifying themselves to operators as alumni of earlier commemorative events.

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"Once again, we had a successful special event," observed Marcus Reed, WH6D, MARS Area Director. "Everyone had a good time, particularly here at the Gateway Station. We had a good mix of experienced operators and people new to Amateur Radio. Many who dropped in were codeless Techs and they got a good taste of how much fun HF can be.

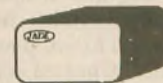
"And we sure honored the 442! Having Kaz here was the icing on the cake. We told their story so many times on the air, and people here enjoyed talking with a genuine 442 vet. It couldn't have turned out better." WR

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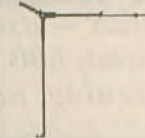


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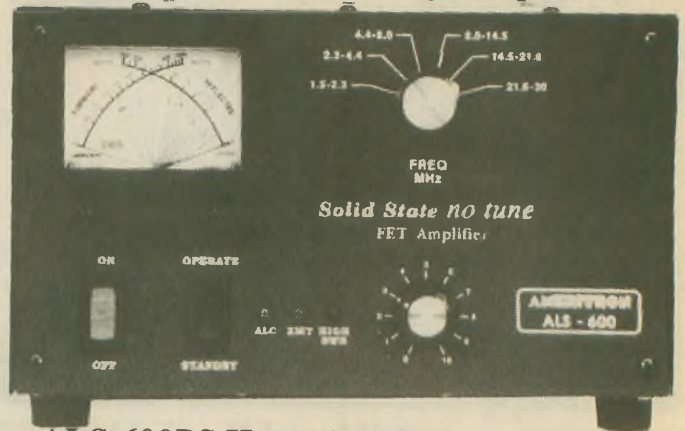
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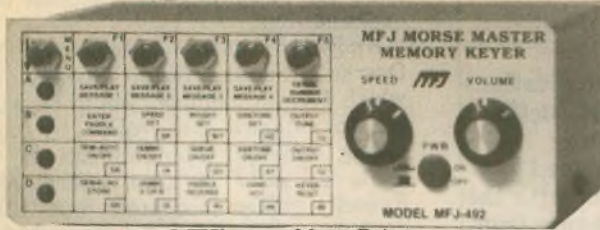
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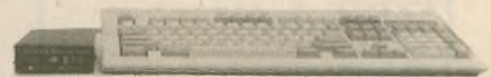
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**Communications Officer Justin Buntin maintained contact with the astronauts from the command center.**

## Student astronauts and ham radio

**GARY E. MEYERS, KY0B**

Last November, I received a phone call in reference to a program involving high school students from many countries throughout the world. It is known as the International Space Simulation. The caller was a Mr. Fussell, a high school teacher at

Marionville, Missouri. He and several of his students would be participating in it. He wanted to make use of Amateur Radio to communicate with other schools during the exercise, and he called me to request that I teach a class. Their goal was to have the required Amateur Radio licenses in time for their project.

A few days later I met with Mr. Fussell at the school. We discussed the requirements for the two entry level licenses, as well as the approximate time required to complete a course for each license class. Next, we compared this estimate against their deadline for the space simulation project. The result allowed adequate time to complete a course. Due to the time required by the FCC for processing applications, however, I explained there would be very little hope of receiving

their licenses in time for the scheduled blast off—assuming they passed the examinations.

Knowing that members of the Ozarks Amateur Radio Society, of which I am a member, would be willing to support the project by providing amateur communications, I made an offer to that effect. Mr. Fussell gladly accepted but also desired to pursue an Amateur Radio class. The Technician Class license was chosen.

The class was small in number compared to previous ones I had taught. It consisted of two teachers and seven students. The first meeting started with the showing of *The New World of Amateur Radio*, an excellent film to introduce Amateur Radio to the beginner. The remainder of this first meeting was given to questions and answers (there were many), and provided a chance for teacher and students to become acquainted. I started teaching Element 2 at the next meeting, followed by Element 3A. I used several visual aids during the course such as overhead slides, homebrewed equipment and boxes of assorted radio parts for identification purposes. With the cooperation of two local hams, Wilton Veale, W0VLB, and Harvey Stephenson, WB0QKE, the students received some on-the-air experience. These field trips provided a welcome break for classroom routine and created enthusiasm among the students.

The class ended two weeks ahead of schedule and I made arrangements to have a VE testing team available to administer the exams. Once we had the exams behind us, our concentration shifted back to getting ready for the space simulation exercise. Lift-off was set for 11 a.m., 16 February. This left us about two weeks and a lot of work. One of the first items on the list was to install an antenna for the HF

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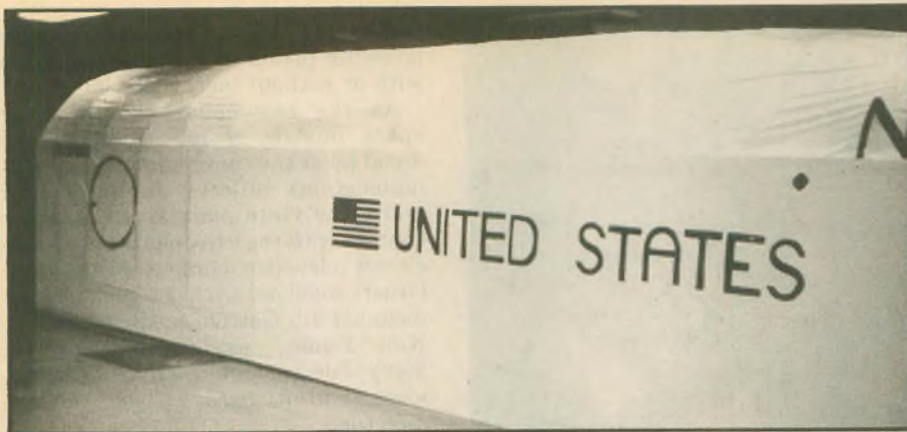
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Outside view of the space module.

bands. It was to be a permanent installation, and I agreed to meet with them on the following Saturday afternoon to help.

They selected a four-band vertical for the antenna and fastened it to a tiltable mast built by the school's industrial arts teacher. After hoisting it in place, we used sheet metal screws to secure it to the roof and attached four guy wires for added support. With this arrangement, the base of the vertical rested about 10 feet above the flat metal roof. Next, the coaxial feedline needed to be run to the rig in the radio room. An unused vent pipe close to the installation provided a made-to-order path for entry into the building. Getting it to the radio room from this point turned out to be a simple matter of feeding it above the drop ceiling tiles and guiding it down the wall. While I was using a hot soldering iron to mate a PL-259 connector to the coax, two of the students broke the earth with an 8 ft. ground rod. A heavy wire was fastened between it and a copper ground bus attached to the wall behind the operating position. This provided a good RF ground to connect the station equipment.

We used a Kenwood TS-520 and took some SWR readings. It was below 2:1 on all bands except 15M. Placing a tuner in line remedied the higher reading and enabled the use of all four bands. I seized this opportunity to review some of the theory taught during the class session on antennas and explained the need for installing radials. Since it had been a long afternoon, we decided to stop for the day. As I readied to leave, one of the students asked if we could make a couple of contacts. Although tired, I agreed and tuned up on 40M.

Calling CQ netted us two quick contacts and a 20-over-S-9 report from both of them. This further confirmed my belief that the metal roof would make an excellent reflector for a vertical. As I left the school that evening

I felt confident that everything was ready for our club to provide the needed communications via Amateur Radio.

The weekend before scheduled lift-off, southwest Missouri received its worst snowstorm of the year. Schools closed, and the awaited space mission was postponed. Although other schools participating would "fly" as scheduled, the Marionville astronauts, disappointed, set a new lift-off date. The Amateur Radio function changed to that of a special event station, preventing the need to cancel this part of the program.

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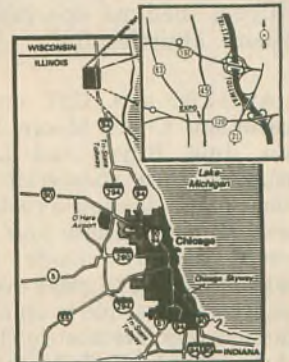
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Student astronauts, left to right: Duane Gibson, flight commander; Julie Bilyeu, medical specialist; Luke Janes, payload specialist; and Chuck Moore, shuttle pilot.

At 11:00 a.m. CST on 8 March, astronauts Chuck Moore, Duane Gibson, Julie Bilyeu and Luke Janes launched their spacecraft and "Mission Comet" became a reality. For the next 72 hours, these four astronauts would sojourn inside the space module. Trying to make everything as realistic as possible to an actual space mission was foremost in the planning of the module. Built on the order of a typical greenhouse, it provided three

main rooms. The largest was the laboratory where all the experiments would be performed. The remaining two rooms consisted of sleeping quarters and a sanitation room which included a camper-style chemical toilet and a makeshift shower stall that required the recycling and purification of the astronauts' water supply after bathing.

The international mission theme for this year's simulated flight was "Earth, our home biosphere." With this in mind, a heavy agenda kept the four astronauts busy performing some 26 experiments, ranging from manufacturing crystals to analyzing the effects of acid rain on the earth's ecosystem. Studies of particular interest were in geotropism (the effect of gravity on plant life), phototropism (growth movement due to the in-

fluence of light), and hydroponics (growing plants in a nutrient solution with or without inert material).

As the astronauts manned their space module, a full support crew stood by at the command center. Communications officers Justin Buntin and D.J. White maintained constant contact with the astronauts via closed-circuit television, computers and HTs. Others involved with the ground crew included Jill Catron, medical advisor; Kim Evans, payload chairperson; Mary Fussell, public relations supervisor; and Richard Fussell, mission director.

Several contacts made via special event station KY0B informed the world of the activity. The high school's computer division designed a certificate to commemorate the event for all who QSLed. During operating times, several students and parents enjoyed their first experience talking over Amateur Radio.

In addition to holding an open house for visitors during the simulated space mission, local newspapers and television stations provided coverage. (This also doubled as a plug for Amateur Radio.) Although these young people were unable to get their Amateur Radio licenses in time for their goal, Amateur Radio did make a profound impact on the mission. They now have a school radio club, and Mr. Fussell is hoping to include Amateur Radio as part of his curriculum during the 1993-94 school year.

It was a lot of work, to be sure. More than 1,000 man-hours and two-thirds of the school body worked in one way or another on the project. These young people are proud of their accomplishments, and rightly so. Unlike some school-related activities, the motivational factor was neither competition between the students nor between other participating schools. Success meant working together and sharing all information learned with all participants.

Next year, if you tune across the bands some evening and happen to hear calls coming from "outer space," give them a shout. You just might get to talk with an astronaut during the International Space Simulation, and perhaps work that same young person again someday—from a real shuttle mission.

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# PUBLIC SERVICE

## Area hams help highway patrol

MIKE CAFFERKY, AA6WQ

Getting a flat tire while driving in the freeway fast lane with heavy traffic can land you in the center divider parking lane, a very tight spot. So can any number of car problems. It almost happened to me one day while driving on the San Bernardino freeway (I-10 in southern California): My timing belt broke.

When a timing belt breaks, the engine merely stops running and won't run again until the defective part is replaced. I had just finished a conversation on CW with a friend from the San Diego area and was ready to send out another CQ when it happened. Fortunately, I had enough room to signal and then coast across four lanes of traffic to a wide emergency parking lane off the freeway.

I felt relieved that I was not back on the freeway in the center divider lane, but I still felt helpless. Cars whizzed by at 65 miles an hour, their drivers totally unconcerned that my car was dead. Expensive cars raced by with drivers holding cellular telephones to their ears. They were busy trying to get to work. I realized that many people who get stranded on the freeway aren't so lucky—especially the ones who get stuck at the center divider—if they cannot get to a telephone.

When I was in a safe location I pulled out my 2M radio and dialed in 146.82 MHz, W6FNO repeater located on Johnstone Peak. Since it was morning drive time, I knew I would find Ralph, N6NYK, monitoring. Ralph was there and passed a message for me. What a relief that was.

Like the other two dozen volunteer

radio operators do each day, Ralph takes a turn monitoring W6FNO for traffic reports he can pass along to the California Highway Patrol from his home in Pasadena. Ralph reports that, on the average, these volunteer traffic handlers pass about 250 calls per month from mobile radio operators who spot traffic problems like accidents, debris in the road and stalled vehicles.

W6FNO is the longest continuously operating VHF FM repeater in southern California. Dedicated to serving the public for over 25 years, W6FNO and the operators who listen actively support the Red Cross, several search and rescue activities and other public services. However, it is the daily grind of passing requests for assistance to the California Highway Patrol which goes unnoticed. While there are several repeaters in southern California, W6FNO is one of the very few who have maintained the steady focus on handling emergencies.

You won't hear ragchewing on 146.82 MHz. Unlike several other repeaters which, at times, are dominated by a few operators putting forth a seemingly endless stream of banter, W6FNO volunteers maintain a constant vigilance to help others and to keep the frequency clear for emergencies.

There have been occasions on which I have heard other repeaters being used for ragchewing and have desired to pass emergency information on their frequencies. After several minutes of attempting to break in to the conversation, all I got in response

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was silence, chuckles or sometimes a comment, "Sorry old man, no one here to help you." Unfortunate, isn't it? Fortunately there is a repeater which can always be counted on for help—W6FNO.

Educational material supplied by the W6FNO volunteer team makes several helpful suggestions on how to use and *not* use the system. For example, after an earthquake in the area, everyone living in the whole region is aware that this event has occurred. Using W6FNO to ask a friend if he or she has felt the earthquake is *not* acceptable. Channel time is too valuable. If the channel is busy with non-critical traffic, the weak low-powered station may have trouble accessing the repeater. Users are asked to keep their transmissions very short. To help them with this, the repeater has an automatic 30-second reset timer.

Appropriate uses of 146.82 MHz include the following: 1) Any situation where there is immediate peril to life or property on the highway such as stalled or abandoned vehicles in an active freeway lane, large obstructions in an active traffic lane, vehicles in the center divider, and accidents; 2) Fire emergencies; 3) Medical emergencies.

Volunteer operators who monitor 146.82 MHz are trained to determine which types of situations warrant handling traffic. They will ask the reporting radio operator for specific information such as exact location, apparent status of those involved (whether anyone appears to be injured), how many people appear to be involved, and descriptions of the vehicle or people involved.

I asked Ralph one evening for some examples of interesting situations where he was involved in passing traffic. One time he got a call from a mobile operator that a boat was in trouble on the freeway. Over the years

there have been the mix of bath tubs, ladders, port-a-potties, animals and people which were spotted in active traffic lanes—common occurrences in southern California. One mobile operator reported a house fire he spotted as he was driving on the freeway. No emergency equipment had yet arrived. Some operators have reported what appeared to be drunk drivers. Broken or errant sprinklers along the landscaping next to the freeway sometimes gets reported and, while this situation is not an emergency, California Department of Transportation does want to find out about these so they can be fixed.

Southern California freeways have a useful safety feature built in: the blue boxed emergency telephones located every mile or so. Every month in Los Angeles County these telephones are used over 70,000 times by stranded motorists. The blue telephones connect callers directly to California Highway Patrol dispatch operators who provide appropriate assistance. But there are no blue telephones in the center divider.

If you get lucky, you may be helped

by one of those guys gripping a cellular phone as he races by. On the average, 950 cellular telephone calls to 911 (routed immediately to CHP dispatch) are made every day in Los Angeles County. But you may not get noticed by someone with a cellular phone. Then what? Someone may see you, take the next exit, find a pay phone and call for help. This happens. Every day the Highway Patrol receives about 113 calls from land lines dialed in to 911.

There are other callers, too: the Amateur Radio operators who participate in the informal safety network for southern California freeways by monitoring 146.82 MHz. It was this safety network which saved the day for me when my timing belt broke.

If you drive the southern California freeways, keep your 2M radio aboard and help out. Better yet, if you have a few hours per month at home where you can monitor the frequency, make contact with the Edgewood Amateur Radio Club or N6NYK and get involved. There's a driver of a stalled car out there somewhere who would be grateful if he knew you had helped. WR

## Level of activity

STANLY HARTER, KH6GBX

Here are some tips we'd like to pass along for dedicated and well organized public service volunteers. They are the people who accept the basic premise that, "Barring any higher personal priority, I will respond each time I am called out. I do this because this is what I really like to do."

Volunteers in this "Level A" category are typically those in search and rescue, firefighters, law enforcement reserves, the Radio Amateur Civil Emergency Service and certain other civil defense volunteers.

Some volunteer groups are first line responders with a highly developed callout system. Their parent agency

radio pages, telephones or otherwise signals the volunteers on each and every callout. This may happen from once to several times a month.

The majority of volunteers, however, don't get called out anywhere near that often. Their chance to serve may be only once or a few times a year. This doesn't mean to say that their level of skills required is any less than the more frequent responders.

Amateur Radio operators are usually in this category, whether they are in the RACES, ARES, etc.

Let's call the volunteer head of this group the OIC or officer-in-charge. It (please turn to page 73)

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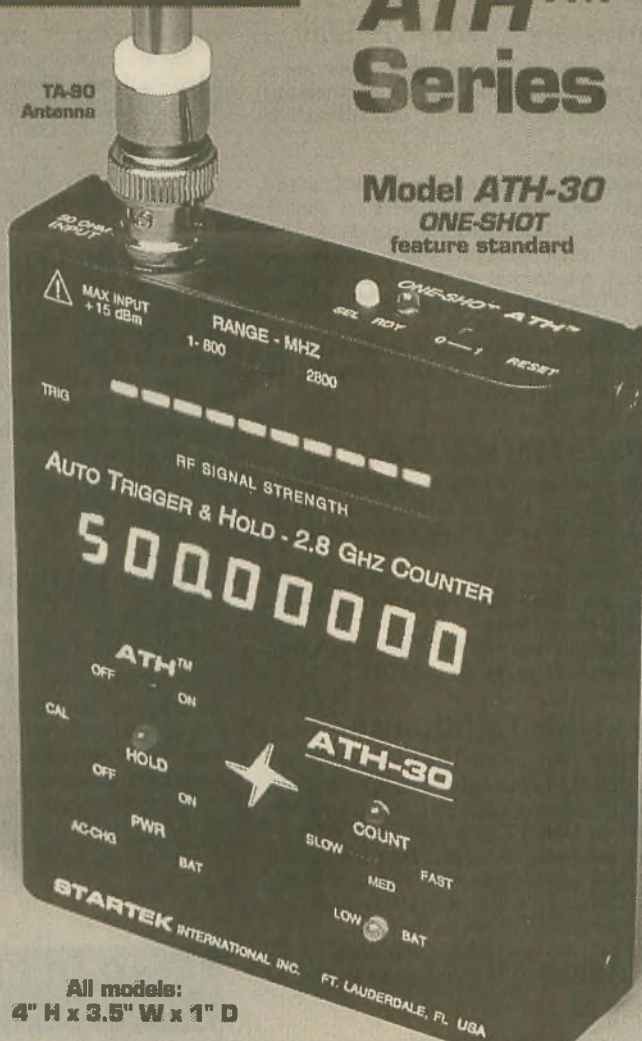


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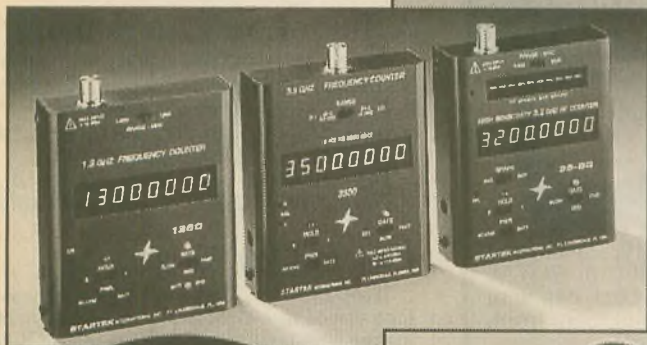
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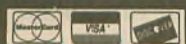
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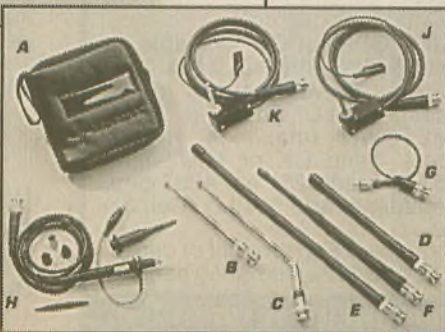
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# SPECIAL EVENTS

## Hamfesters "WAHM" Day

The Hamfesters Radio Club will operate a special event featuring individual members operating from their own stations and calling "CQ WAHM Day" on 18 September 1993 from 1200 UTC to 2400 UTC.

Operation will be in the lower 25 kHz of the General class bands, 28.410 MHz for Novice SSB, 146.43 MHz simplex and on packet.

Special event operating times will be announced at regular net meeting times, Sunday at 0100 UTC for the 10M net and 0200 UTC for the 2M net.

For further information contact George Gruenthaler, 16819 So. Le Claire Ave., Oak Forest, IL 60452; 708/560-0136.

## Heritage Harvest Days

The Lapeer County ARA will operate WZ8C 11-12 September 1993 in celebration of Heritage Harvest Days at Ponds Nature Center, Dryden, Michigan.

CW operation will be in the Novice 40M subband and 14.058. SSB will be in the General subband of 40 and 20M.

For certificate, send QSL and SASE to WZ8C, P.O. Box 47, Hadley, MI 48440-0047.

## Twin Lights Lighthouse

The Ocean-Monmouth ARC (OMARC) will operate 1600Z 11 September through 1600Z 12 September to commemorate the Marconi Memorial Twin Lights Lighthouse Radio Site.

Operation will be up 10 kHz from the bottom of the Novice subbands and 10.145, 10.045, 18.080 MHz and the bottom of the General 80-15 and Novice 10M phone subbands.

For certificate send 9 X 12 inch SASE (or \$1 US) to OMARC, P.O. Box 75, Bradley Beach, NJ 07720.

## Winesburg Fall Fair

The Clyde Amateur Radio Society will operate station NF8E from 1600-000Z 18 September and 1600-2200Z 19 September 1993 from the Winesburg Fall Fair.

Operations will be on CW, 7.125 and 21.150 and phone 7.250, 14.300, 21.400 and 3.900.

QSL certificate via SASE to Steve Karr, NF8E, 302 Hamer St., Clyde, OH 43410.

## WWII sub USS *Silversides*

The Muskegon Area Amateur Radio Council will operate W8ZHO from 1400Z 25 September to 1700Z 26 September 1993 from on board the WWII submarine USS *Silversides*, docked in Muskegon, Michigan.

Suggested frequencies are 3.855, 7.255, 14.255, 21.320, 28460 and W8ZHO repeater 146.34/94 for local contacts.

For certificate, send QSL and 9 X 12 SASE to William Bowman, KF8QT, 1661 Kings Ct., N. Muskegon, MI 49445.

## WWII submarine USS *Requin*

The Breezeshooters ARC will operate a special event station, W3XX, from the USS

*Requin* SS481 2-3 October 1993.

The station will be on the air from 1400Z to 2100Z both days. Phone frequencies are 28.450, 21.350, 14.250, 7.250 and 146.52. CW frequencies are 28.150, 21.050, 14.050 and 7.050.

For a QSL card and certificate, send 8.5 X 11 SASE to Ron Berry, WB3LHD, 326 Sunset Dr., Bethel Park, PA 15102.

## Colorado Days

The Royal Gorge ARC will operate special event station NC0A from the suspension bridge over the Royal Gorge in commemoration of Colorado Days.

Operation will be from 1400-2100 UTC 25 September 1993 in the lower portion of the General Class subbands (phone and CW) on 10, 15, 20 and 40M.

For a special 8.5 X 12 QSL, send QSL and SASE to NC0A, 1011 Harrison Ave., Canon City, CO 81212.

## Oyster Festival

The Greater Norwalk ARC will operate KA10FN 2100Z 10 September to 2100 12 September 1993 to celebrate the 17th annual Oyster Festival and the 125th Anniversary of Sheffield Island Lighthouse.

Operation will be in the lower 25 kHz of the General 80, 40, 20 and 15M phone subbands, and the Novice 10M phone subband.

For certificate, send QSL and SASE to Greater Norwalk ARC, c/o Norwalk/Wilton Red Cross Bldg., 43 North Ave., Norwalk, CT 06851.

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## Cranberry Festival

The Monroe County ARC will operate KA9ETH, 1400-2200Z 25 September to 1400-1900Z 26 September 1993 to commemorate the 21st Annual Warren's Cranberry Festival.

Frequencies are 14.270, 21.370, 28.370.

For a certificate, send QSL and a 9 X 12 SASE to Marshall Kiel, N9FVU, P.O. Box 344, Tomah, WI 54660.

## OIN Three States DXpedition

The Vancouver Mountain Radio Club will operate W7WY from 4-14 September 1993 on the state line of Oregon and Idaho where it meets the Nevada state line. Work three states and four counties in one contact.

Operations will be CW and phone 160 through 10M 24 hours a day in the General portion of the band.

For a certificate or QSL card send a 8 X 12 SASE to Vancouver Mountain Radio Club, W7WY, P.O. Box 1622 Vancouver, WA 98668.

## Port Townsend Boat Festival

The Jefferson County ARC will operate W7LD at the Port Townsend Wooden Boat Festival on 10-12 September 1993 between 1700 and 2400 UTC on the General bands for 15 and 20M and 28.440 on 10M.

Station will reciprocate with an event QSL card. Contacts will be made with marine nets.

For further information contact Olly Gardner, KA6OZZ, Box 65156, Port Ludlow, WA 98365; 206/437-0568.

## Butte Valley Fair

The Keno ARC will operate special event station WD6EAW at the Tulelake-Butte Valley Fair on 10-12 September 1993 at Tulelake, California, near the Oregon border.

This station will operate in the lower portion of the General bands. Operating hours will be from 1600Z to 2400Z. For special QSL cards, send an SASE to WD6EAW Special Event, P.O. Box 653, Keno, OR 97627.

## Auburn-Cord-Duesenburg

The North East Indiana ARC will operate N9JHF 1400Z-2100Z 5-6 September 1993 to honor the Auburn-Cord-Duesenburg days.

Operation will be in the lower 25 kHz of the General phone and CW bands, 40-10M.

For QSL card, send QSL and SASE to NE1ARC/ACD, P.O. Box 745, Auburn, IN 46706.

## City of Oak Ridge

The Oak Ridge, Tennessee, ARC is sponsoring a second special event station commemorating the 50th birthday of the City of Oak Ridge on 12-30 September 1993 on all bands.

A four-color certificate is available, please SASE to operator's home call.

It's your club

Do more than belong, participate.

Do more than care, help.

Do more than believe, practice.

— William Arthur Ward

## Product Review

### NW2L instructional videos reviewed

**NORM BROOKS, K6FO**

CQ Communications has announced the first four of a series of Amateur Radio instructional videos that should be available at your favorite radio store. I had the opportunity to preview these four tapes and I'm very much impressed.

The titles of the first four are: *Getting Started in Ham Radio*; *Getting Started in Packet Radio*; *Getting Started in DXing*; and *Getting Started in Amateur Satellites*.

Each of the tapes is professionally written and directed by Rich Moseson, NW2L. Rich has won three Emmys and numerous other awards for his work at CBS. I understand he has 20 additional titles lined up for production, making a total of 24 so far.

I have one criticism to level at these tapes, which does not negate their overall high qualities. They show too much sophisticated equipment, much of which is not necessary to "get started" in the subject being covered. For example, in the *Getting Started in Ham Radio* tape, an amateur's equipment is shown which has a panel with huge red lights running across like a scanner. This would probably be okay for a *Star-Trek* movie

prop, but is not needed to get started in ham radio. Similarly, the use of a computer is overdone in the amateur satellites tape. They show satellite antennas being controlled for direction by computers, when this is not necessary to get started. As a matter of fact, when I got started in satellites, I didn't have a computer. I used the \$10 cardboard Satellites satellite tracking device available from AMSAT. I was able to figure azimuths, elevation angles and acquisition times just about as accurately as those stations that had computers.

The best segment, I believe, was on the DX tape. Cynthia Wood, KD4ACW/AA, with a 50W transmitter and a dipole antenna, knocked off contact after contact with some impressive DX stations. I had to smile as I watched these, because her transmitter gave the camera TVI. I had this very same problem when I made a tape of the Sacramento Radio Club operating on Alcatraz Island.

On the whole, I recommend these tapes. I feel they would be most useful for radio clubs to purchase and use as meeting programs. Then they could be loaned out to individual members for viewing at home. Just remember to not get too intimidated by the complexity of the equipment shown.

If your dealer does not yet have these videos, they are available from CQ Communications, Inc., 76 North Broadway, Hicksville, NY 11801. The price is \$19.95 each plus \$3.50 shipping and handling. WR

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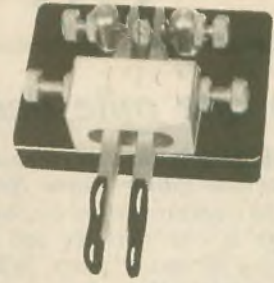


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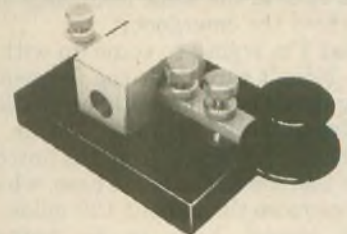
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# OFF THE AIR

## From one mile deep

The following letter was received by our Associate Editor Norm Brooks, K6FO. The question raised by Senator Goldwater is one that we too have been asking for many years. What is the best answer? We ask our readers to give us and Senator Goldwater the benefit of your experience. Address your answers to Norm Brooks, K6FO, at Worldradio, 2120 28th Street, Sacramento, CA 95818.

Dear Norm,

Just back from another trip down the Colorado River, my sixth one, and I hasten to write you for some advice.

On one of my previous trips, I took along a gasoline generator, one of my rigs and an antenna, and I worked 40 different QSOs out of the bottom of the Grand Canyon. This trip was done on one of the new commercial ventures, and I think there were about 40 passengers. The question was constantly in my mind — what happens if someone breaks a back, a leg, or is in real danger down here? The only way they now have of communicating is with aircraft that might pass over and would tune in the same frequency and give them the emergency.

What I'm trying to come up with is a rig, I don't care what the frequency range would be, that would be possible to dependably operate, within a distance of 100 miles, from the bottom of the Canyon to the home base, which is never more than about 120 miles. It would almost have to be battery operated, so we're looking at around 13V, I suppose, or if need be, the fellows could fix up a little generator to handle the load.

I wish you would give this your thoughts, and give it to some of your other people. The only thing you have to keep in mind is that you're talking about radio communications from a canyon that is a mile deep, and some of the walls might cause interference. But that isn't the way propagation is set up; it goes straight up, then bounces around. I'd sure welcome your suggestions on this, and I hope you can come up with something.

BARRY GOLDWATER, K7UGA  
Scottsdale, AZ

## Growth at any cost?

The "Equal time" editorial on page 32 of the April issue, written by AA2LK, prompted me to write. I agree with his thoughts 100 percent. I was beginning to think that I was the only one who saw the hobby being "watered down" by ever-decreasing licensing requirements. Now I read that, among other ridiculous actions, test material has been rewritten "so as to be at the 12 or 13-year-old level."

I went through the ranks from Novice to Extra by studying, practice, building gear, and more studying. My "test aids" consisted of a dog-eared copy of the ARRL Handbook and a copy of the FCC rules applicable to Amateur Radio. I suppose there has been a market for test material from day one, but being able to purchase all of the questions and answers, verbatim no less, is almost laughable. What is the point of all this?

I thought amateurs were supposed to be technically proficient and knowledgeable. The only requirement now seems to be good memory skills.

Knowledge of the actual content of the test material is now unnecessary, it seems. I have seen several articles in ham publications recently touting the accomplishments of 10 and 12-year-olds getting their tickets. This is great

to see, but without exception, the individuals stated that they could not have done it without having the test material available to memorize. "I could not have done it without those Gordon West tapes," or, "I missed a couple of questions—I did not remember seeing them on the W5YI test material." What a bunch of hogwash!

If anything, tests should be made more difficult. The hobby is a privilege with rewards duly given to those willing to put forth some effort.

On a brighter note, I'm glad to see that the FCC is finally taking some action against the blatant offenders among us. I'm sure most of the accused individuals will tie things up in court, however, deterring the FCC from taking further expensive action with their limited budget. I would favor that a percentage of membership dues, magazine subscriptions or license fees be directed to the FCC so their efforts can be sustained.

Do we really want growth at any cost? Let us continue to attract newcomers to the hobby but not by lowering the standards that were once such an important part of the inherent value of the Amateur Radio operator to the rest of society.

RON OSTMAN, WB0NYQ  
Mt. Iron, MN

## "Destinated" archaic

Tom Carten's, K1PZU, defense of the verbal monstrosity "destinated" (*Worldradio*, June, 1993) missed the mark. Tom says "destinated" is in the *Oxford English Dictionary*, which is true. The *OED* is the arbiter of etymology, if not always of current usage.

What Tom didn't mention is that the *OED* refers to "destinated" as archaic. But more to the point is the *OED*'s definition of the word. Those who use "destinated" might be surprised to learn that "destinate" means: 1) ordain or appoint; 2) appoint or predetermine in the way of fate or a divine decree; 3) devote in intention to a particular purpose or use, or; 3b) be designed by nature.

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Chances are, none of those meanings are what the ham who uses the word "destinate" intended. As for Tom's claim that "other works ... list the term," I cannot find it in *Webster's Ninth New Collegiate Dictionary* (a prescriptive work) or in *The American Heritage Dictionary, second edition* (a descriptive work).

I for one vote for using plain English: "I have arrived at my destination."

WILLIAM F. BLINN, N8POV  
Worthington, Ohio

## Coincidence?

After reading "True Story" on page 35 in the February '93 issue, I thought back to when I received my call.

I worked at Naval Radio Station NPI during the last part of WWII. NPI was a direction-finding station located on the Farallone Islands about 30 miles west of the Golden Gate bridge. Overcast skies and fog often made navigation very iffy. In order to find their location, operators would call for bearings. The request in CW is

QTE? or "What is my bearing in relation to you?" My answer to QTE was QMO, or send a series of MOs slowly so a bearing could be taken.

When the weather was foggy with visibility down to a few feet we were busy the complete watch, often with several ships waiting their turns to get bearings.

When my call was issued I was more than a little surprised to receive WA9QMO. At first I thought someone at the FCC knew me!

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K4LVZ

## STATION APPEARANCE

Send Worldradio a picture of your shack and the staff will choose a winner to receive a free one-year subscription! Stations will be judged by neatness (wires tucked away, etc.) and accessibility of equipment. Monetary value of equipment is not a consideration.

Winners will also receive a top quality, Laserjet-printed copy of the DXCC and WAS BeamHeadings list (a \$15.95 value) compliments of Jack Hurray, W8JBU.

This month's winner is Gerald Skinner, K4LVZ.

I am just finishing my station up and am still looking for a suitable linear. In the meantime, I am operating "barefoot."

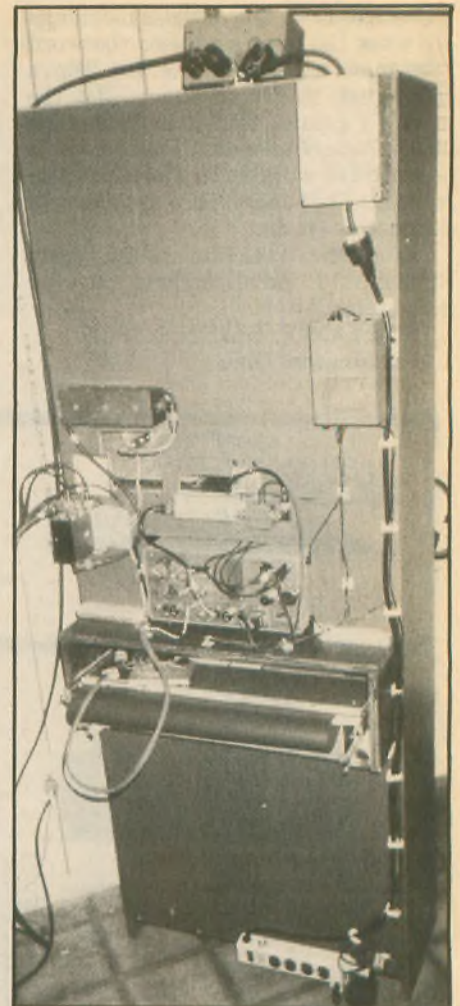
The station is contained in a Sauder bookcase, modified with a center unit that holds the transceiver and a drawer and operating shelf.

The station currently is a Kenwood TS-520S, with a DG5 digital readout, followed by a homemade antenna tuner and an MFJ SWR bridge. I use a Heil mic headset and a homebrew electronic keyer with a Bencher paddle and a "McElroy" straight key. The unit on top of the bookcase is a pair of AC meters reading the line voltage and the line current. Antennas are a 75M dipole and a Hy-Gain five-band vertical.

For many years I used a homebrew



K4LVZ's station is neatly arranged from front to back.



linear with four 811s, but it is too big and clumsy for this station.

A 2M Kenwood hand-held is mounted to the left of the Kenwood TS-520S.

The back view shows that my train-

ing in building equipment before WWII hasn't been forgotten.

Naturally, there is an extensive junk box and work bench in the garage. Currently, I am rebuilding an HRO-M that I have used for over 30 years.

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## Amateur "Hi"



This month's winner is from Chuck Collier, KE5AF, of Canyon, TX. Tube, or not tube . . .

During a recent SSB contact I passed along the information that the rig I was using was a venerable old

HW-101.

The reply came back, "Oh yeah, that's one of those radios that's full of those funny glass things that turn orange and get hot."

I loved it.



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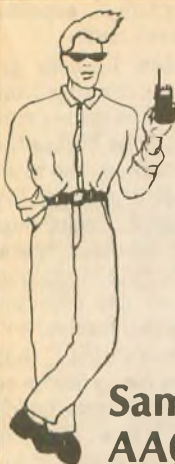
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# The Youth Forum

**Sammy Garrett  
AAØCR**

#8 Willow Ct., Florissant, MO  
63031

As you may have noticed, The Youth Forum took a brief vacation recently while a change in authors was made. Due to a heavy class schedule, Travis Wise, KB8FOU, stepped down a few months ago. I am very grateful and excited to be continuing this column. I hope my columns and features will be as enjoyable and informative as Travis' were.

For those of you who don't know me, a few personal words are in order: I have been licensed since 1990 and am an Extra Class amateur. Throughout my Amateur Radio career I have been involved in several St. Louis area radio clubs and public service communication groups. In 1991 I had the honor of being selected as the *Westlink Report* Young Ham of the Year. At that time I began my Amateur Radio journalism career. I am very much looking forward to continuing that career with the Youth Forum column.

I have operated in most modes, but I spend most of my time on HF CW and phone and on 2M phone. I especially enjoy CW and contesting, and I'm proud to be a member of the K4VX contest crew. I'm the ARRL assistant section manager for youth activities in the Missouri Section. I am currently a sophomore in high school and am 15 years old. Outside of radio and school activities, I enjoy drama, wrestling, and judo.

I want this to be a column that I can share with you, the readers. Please write to me with your ideas and comments, and just to let me know what you're doing in your community. The address is #8 Willow Ct., Florissant, MO 63031. I'd love to hear from you!

### Starting a school radio club

As much as some of us may be

dreading it, the time has come to start back to school. Now, although going back to school isn't always a pleasant experience, many young amateurs have found a way to make the transition a bit easier. So what is this miracle cure, you ask? Well, it might be as close as your hand-held radio!

In the past few years the number of amateurs under the age of 18 has been steadily growing. Due to this rise in the hobby, school Amateur Radio clubs have been popping up all over the country. These clubs are a great way to have fun and expose many more young people to Amateur Radio.

Starting a radio club at your school might not be as hard as you think. The first step is to start talking with some of your teachers or principal. For any school organization to be successful, help and support from the faculty are essential.

Begin by explaining exactly what Amateur Radio is. It's probably a good idea to focus on the entire hobby. It's important to show school administrators how varied and valuable Amateur Radio is. Stress how much a radio club could benefit the school and the students. For example, many principals are delighted to learn that a few students with hand-held radios could help save lives in the event of a natural disaster. Building international friendships and helping students understand lessons about every subject imaginable are also big selling points for a school radio club.

Once the faculty has approved the idea, it's time to see what the students think. Many clubs start out with a special demonstration. Try to make this event as big and exciting as possible. The more activities and fun that your demonstration provides, the more members you'll recruit. Remember, Amateur Radio is as varied as the people who are involved in it. There's something for everyone. Your club's demonstrations should appeal to as many interest groups as possible. You might want to consider inviting some of the local special interest groups such as amateur television or emergency communications groups. These organizations are always looking for new members and, like most hams, are more than happy to help young people

get involved in the hobby.

Also, it's important to involve kids who are already licensed in your demonstration. This helps dispel myths that only rich old men can be amateur operators. Try to find young people who are enthusiastic and who will be able to get prospective club members excited and motivated.

As soon as your club's demonstration is over, it's time to start holding regular club meetings. Before you do this, though, it's a good idea to decide what goals the club has. Talk with some of the members to get an idea of what it is they would like to get involved in. Once this is done, planning meetings and activities will be much easier.

A few years ago when I was helping to start a radio club at my school, our biggest problem was getting students licensed. Even after nearly a year of meetings, almost no one had earned a ticket. After some thinking, some of the club members decided that our meetings weren't properly organized for the purpose of getting students licensed.

If your club's goal is to get the members licensed, a great deal of time must be spent each week on license preparation. At the same time, you can't forget to have fun. Try to divide your meetings between studying and talking on the radio or doing other things that members can enjoy.

When a few members get licensed, your club meetings will probably be a bit more enjoyable. Don't forget to keep the meetings exciting and interesting, even if all you're doing is taking turns making contacts.

Also, don't forget to try new things. There are countless operating events and activities which school radio clubs can get involved in. Many clubs have a lot of success in the School Club Roundup, Novice Roundup, and Field Day contests. Other school clubs sponsor transmitter hunts and attend hamfests.

Additional interesting club activities include building electronics projects and inviting guest speakers to meetings. But whatever your club does in its meetings, don't forget to have fun and keep the club going. It's also very important to keep school officials posted on the club's activities. As long as they know you're doing good things for the school, they'll do good things for the club.


The important thing to remember about organizing a school radio club is that the whole purpose is to have fun and to introduce more young people to the hobby. No one can undertake such a process alone. Use your resources and enjoy yourself! Good luck and 73!

WR

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# OLD-TIME RADIO



## Amateur Radio, past and present

CHRISTINA S. ROHDE,  
N2OFY, DJ5LR, HB9HAQ

Once in a while television newscasters, during the coverage of a catastrophe like a hurricane or other life threatening situation, mention that "ham operators" are instrumental in rescue missions and the establishment of communication lines at a time when nothing else works. Ham operations have also occasionally been considered "nuisances" when their strange signals show up in someone's television reception and telephone conversations. People then automatically look at the strange large antennas in their neighborhood as suspect, and perceive them to be the point of origin for these "signals." In order to derive a better understanding of ham operators and radio in general, let us step back in time and take a look at the evolution of ham radio and its meaning today.

Ham radio operators are people of different races, religions, gender, education and interests who share one common bond—the desire to exchange personal and technical information between each other locally and afar.

In 1860, Samuel F.B. Morse devised a means to generate electrical impulses on wires and send them over long distances. He came up with an alphabet which, after modifications and adjustment for different languages is still the basis for the Morse code used in long-distance communication of all types.

Having established communication on the various continents via landline Morse code, the next logical need was intercontinental and ship-to-shore communication. James C. Maxwell developed the mathematical basis for what is now known as electromagnetic wave and its propagation.

It was Guglielmo Marconi's contribution in 1901 which looked to long distance propagation and found suitable receiving/transmitting circuits and frequencies and, of course, antennas which allowed these electromagnetic impulses to propagate over vast distances. Marconi's test became famous after he repeatedly sent the letter "S" as a distinct signal across the Atlantic.

The early commercial receiver/transmitter stations were very crude by

today's standards and the form of communication was Morse code, not voice operation. There was ample "down time" between the messages and traffic so the radio operators began to use the equipment to "talk" to one another on a friendly basis.

This was the beginning of ham radio. Then logically these individuals would ask how they could obtain similar stations and use them for personal enjoyment. Since the technology was relatively straightforward, it did not take long before individuals began stringing long wires between trees and using stray parts from the commercial stations to set up their own.

During World War I, all Amateur Radio transmissions were forbidden. Following WWI, further development of "radio equipment" continued. Amateur operators were now required to have an operator's license which the government issued (initially to universities or other similar institutions). One of the earliest acknowledgements of a contact I have seen was one my grandfather used at a German university-based station with the call sign EK4AAL.

In the United States, the Federal Communications Commission is the regulatory body which defines the rules and regulations for radio amateurs. In Germany the Federal Office for Postal Affairs and Telecommunications is responsible for regulating the operators. The Swiss equivalent is the Post Telephone Telegraph (PTT) Office.

In all instances, individuals interested in obtaining ham licenses have to prepare for a test which covers legal aspects of ham operation, opera-

tional procedures, technical aspects, and proficiency in Morse code.

In the United States, licenses are divided into five classes, ranging from Novice to Extra Class. The more proficient the individual and the higher the category of license obtained, the more privileges that operator is granted. By international agreement, minimum joint requirements for amateur operation were agreed upon. It is important that different countries use common frequencies and operating modes.

The European community has issued a European license, similar to an international driver's license, which is valid throughout Europe. The individual uses the call sign issued in his or her native country.

Some ham radio operators are quite determined to do the unusual. They will go to remote places to establish what is called a DXpedition. They might select a deserted place such as the South Sandwich Islands. This small group of people travel to the distant site and in a short period of time attempt contact with thousands of other stations throughout the world. The final acknowledgment of the contact, the QSL card, contains the date, time, frequency and mode of the contact as recorded in the logbook. Some operators display these contact records on the walls where the radio equipment is kept—the ham "shack." Our family's ham shack is located in a large area in the basement of our home, and my father and I use it daily.

Observing my father maintain contact with my grandfather in Germany every weekend was one of the many reasons I became an Amateur Radio operator. Contacting many of my father's friends and acquiring a large number of my own friends internationally has been an enjoyable experience. This hobby has even helped me in my school studies, giving me additional insight relative to mathematics, physics, and geography, as well as the various cultures of the individuals with whom I am in contact.

We owe much to those electronics pioneers and dedicated individuals who have taken the technology of radio and enhanced it, making it useful in their daily lives and fun as a hobby. The future of Amateur Radio depends on the way future operators use it, experiment with it and appreciate it; these privileges must not be taken for granted. WR

*Veterinarian to cat owner:*  
"Give him one of these pills every four hours. Then use this to stop your bleeding."  
—TSRAC

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# DX WORLD

John F.W. Minke III, N6JM

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## W100N

The following DXer was recently issued *Worldradio's* Worked 100 Nations Award:

459) Edward T. Coha, KG8J; 6/27/93

## Uganda (5X)

Regularly near 21.323 MHz is Bruno Goll, 5X1A, of Kampala. Look for Bruno between 1745 and 2100 UTC. He has no particular pattern as to which days.

Also active from Uganda is 5X1B, who prefers CW operation on 15M. Look for this one near 21.030 MHz after 1900 UTC.

A third station reported this past period was 5X1C, who was worked on 17M at 2300 UTC on 18.111 MHz. He was also worked via RTTY on 231.086 MHz at 1945 UTC.

## Juan Fernandez (CE0)

CE0ZIS hands out the contacts for this one. During the early part of June he was found often on 14.247 MHz from 0030 to 0400 UTC. He was found on both modes on the 15M band. Try 21.017 MHz at 0145 UTC and 21.223 MHz at 2300 UTC.

There were reports also of a CE0B-WY and CE0YFL, which are most likely on Easter Island.

## Eritrea (E35X)

The Norwegian DXpedition to Eritrea is history. The group started at 1830 UTC on 1 June using the call E35X and closed down on 9 June at 0620 UTC. About 20,000 contacts were made with about 125 countries. The operation took place mainly on 10, 15 and 20M, SSB and CW, with some contacts on 40, 80, and 160M. RTTY was also used. The operators included LA1EE, LA6VM, LA9DL, and JF1IST. In addition, future Eritrean Radio Amateurs participated in the operation, making the start of Amateur Radio in the independent Eritrea.

During the DXpedition a three-day seminar was held at the Telecom office, with some 15 attendees. A four-day seminar was held at the Asmara Tech-

nical School with about 35 participants. The introduction of about 15 ARRL manuals and 20 sets of lecture notes represented the first updating of technical literature at the school in decades. The radio equipment left by the DXpedition replaces 40 to 50-year-old nonworking equipment. Amateur Radio is now being used in the lectures to visualize and to give hands-on demonstration of electronics and communications theory. Code training classes continue with the provided training tapes, cassette players and keys. The setting up of the club station was attended by over 100 people and was covered by the Eritrean press, radio and TV. Out of all this the Asmara Technical School Radio Club was started with an elected chairman and 26 members.

QSL requests for this operation should be sent to Ruth Tollefsen, LA6ZH, P.O. Box 17 Tveita, N-0617 Oslo, Norway. It is requested that only one contact per card be sent (for those of you who worked E35X more than once). Cards will not be ready until the end of the summer. QSL requests received direct will be returned direct provided an SAE and sufficient postage is included.

## Belarus (EV)

The former Soviet republics have been assigned new call signs. The block that includes the prefix EV is to go to Belarus. One report states that they take affect in 1994 although several have been in use for the last year. Therefore, most likely the following calls reported on 20M are that of Belarus, and not Russia:

EV5DX	14.024 MHz	1015 UTC
EV7AA	14.009 MHz	0430 UTC
EV8A	14.009 MHz	0200 UTC
EV9A	14.011 MHz	1045 UTC
EV0N	14.003 MHz	0445 UTC

Seventeen-meter activity included the following:

EV8A	18.074 MHz	1230 UTC
EV9A	18.075 MHz	1130 UTC

There were several calls with the RC2 prefix, which would have been assigned to the former Soviet republic of Byelorussia. Under the new plan the RC2 prefix is assigned to Russia. So, unless you work one of them, it is anybody's guess which one it belongs to.

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## St. Peter and St. Paul Rocks (PY0S)

Karl Mesquita Leite, PS7KM, is planning a DXpedition to St. Peter and St. Paul Rocks (SA-014) around January or February next year. Using the calls PY0SK and PY0SP, they plan to spend about three weeks operating all bands and modes, so really no one will need this one after they are through.

The estimated cost approaches some \$4,000 (US), which covers the cost of food, generator rental, accumulators, fuel, antennas, coaxial cable, etc. They will be operating as the Natal DX Group and they are requesting financial support. They are also looking for a small computer for RTTY operation. For further information or if you wish to help financially, please contact Karl at the Natal DX Group, Caixa Postal 385, 59001-970 Natal, RN, Brazil.

## Mellish Reef (VK9M)

The big date is coming fast and will be a month away by the time you read this. Mellish Reef (OC-072), a small uninhabited reef some four to five days by boat off the coast of Australia, ranks in the top 20 most needed countries. Look for the operation beginning 19 September for about 10 days of continu-

Don C. Wallace, W6AM  
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ous operation to 28 September.

The team, including VK4CRR, VK2BJL, VK2BEX, P29DX, V73C, WA4DAN, K5VT and G3WGV, will operate all bands 6 to 160M, SSB, CW and RTTY. There will be five HF stations at two sites, each completely self-contained. With strategic placement of the antennas and careful selection of operating frequencies, two stations will be able to work simultaneously on the same band, one on SSB and one on CW. This will be used at times when propagation warrants.

A 30 ft. tower will be positioned on the reef along with several 20 ft. masts. Yagi antennas will be used on the high frequency bands, while vertical antennas will be used on the low bands.

Three generators capable of over 10kW combined will be used.

While each participant is contributing personally to the costs of the DXpedition, it will be necessary to acquire additional assistance. Your consideration in making a donation will be very helpful and appreciated. All donations will be returned if for some reason the DXpedition should be cancelled. Transportation and landing permits have been obtained.

Contributions may be sent to Murray D. Adams, WA4DAN, 403 East 14th Street, Greenville, NC 27858; or Bill Horner, VK4CRR, 26 Iron Street, Gympie, QLD 4570, Australia. Please include an SASE for a bulletin update that will be sent prior to departure.

## Chagos (VQ9)

Very active from Diego Garcia (AF-006) in the Chagos Archipelago is Jim Wilson, VQ9AC. Jim works both SSB and CW and has been worked on several bands. Try the following frequencies and times:

10.103 MHz	2230 UTC
14.030 MHz	1145 UTC
14.255 MHz	0215 UTC
18.084 MHz	1800 UTC
18.150 MHz	1730 UTC
21.029 MHz	1830 UTC
21.315 MHz	1615 UTC
24.904 MHz	1500 UTC

Other calls reported from this one include the following:

VQ9CE	21.315 MHz	1600 UTC
VQ9ET	21.350 MHz	1745 UTC
VQ9GB	14.016 MHz	1600 UTC
VQ9GB	14.200 MHz	1630 UTC
VQ9JT	7.012 MHz	0115 UTC
VQ9JT	21.317 MHz	1645 UTC
VQ9KC	18.081 MHz	1930 UTC
VQ9MW	21.282 MHz	1645 UTC

## San Felix Island (XQØ)

Active on 17M is XQØX almost daily between 0000 and 0400 UTC on 18.070 MHz. This station is located on San Ambrosio Island (SA-013) of the San Felix group.

This station's activity is not limited to 17M, as he is also very active on 15M. Look for this one between 21.000 MHz and 21.030 MHz after 2230 UTC, or on 20M near 14.020 MHz between 0130 and 0530 UTC. One sole report on 40M was on 7.005 MHz at 0345 UTC mid-June, where he was working into the East Coast.

Although most of his activity is CW there was a report of him at 21.425 MHz around 2200 UTC on 23 June where he worked a deserving DXer in New York.

## Cayman Islands (ZF)

Mike Zane, K6URI, reports that he will be operating from the Cayman Islands (NA-016) as ZF2VA 5 through 17 September. Mike plans on some extensive 15M CW operation in the Novice bands.

## North Cook Islands (ZK1)

Dick Paille, N7NKG, will be active from Manihiki Atoll (OC-014) in the North Cook Islands from 5 August through 1 September singing with ZK1XR. Dick says that he will operate both SSB and CW, 15 through 80M. He will also attempt some 10M work during the meteor shower in August.

## Senkaku Islands

Bob Winn, W5KNE, editor of *QRZ DX* refers to an article in the 21 June issue of *US News & Report* that dis-

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cusses the Spratly Islands and the Senkaku Islands. These are a small group of islands northeast of Taiwan and are reported to be claimed by Japan, China and Taiwan—something like that of the Spratly Islands.

The group is listed in the IOTA Directory as Senkaku Archipelago and belonging to Japan. As no operation has taken place from this group no reference number has been assigned. Perhaps an operation from this group could bring us not only another IOTA credit, but a new DXCC credit as well.

## IOTA

During Field Day the Western Washington DX Club operated as W7FR from Whidbey Island (NA-065), which is included with the San Juan Islands.

EU-032	Re Island	F1OYT/P
EU-082	Kil'din Island	4K3ZO
	14.226 MHz	1300 UTC
EU-089	Corvo Island	CU9C
	14.260 MHz	0645 UTC
EU-131	Buel del Lovo	I3BQC/IL3
	14.260 MHz	0445 UTC
EU-149	Pakri Island	ES2RW/2
	14.262 MHz	0615 UTC
EU-161	Kharlov Island	4K3GW
	14.028 MHz	2315 UTC
NA-010	Cape Breton Island	VE1AL
	14.260 MHz	0130 UTC
NA-036	Vancouver Island	VE7DWK
	14.260 MHz	0130 UTC
NA-062	Key West Island	KF7IO/4
	14.260 MHz	0530 UTC
NA-110	James Island	N4AH
	14.260 MHz	0130 UTC
NA-129	Banks Island	VE3VRO/VE8
	14.260 MHz	0200 UTC
NA-131	Jenny Lind Island	WB1CBY/VE8
	14.258 MHz	0200 UTC
NA-138	Amelia Island	W5IJU
	21.260 MHz	1700 UTC
NA-140	Smith Island	KC4AUF
	14.260 MHz	0100 UTC
NA-148	Baker's Island	N6EK/1
	14.260 MHz	2200 UTC
NA-181	Trutch Island (Estevan Group)	VB7DSU/7
	14.260 MHz	0045 UTC
SA-054	La Orchila Island	4M5I
	14.260 MHz	0400 UTC

Al Phillips, NN7A, reports that all direct QSL requests for his V31JZ and HR6/NN7A operations have been answered. Along with Mike, NG7S, they made 1,380 contacts as V31JZ on South Water Caye (NA-180), which was a new one for IOTA chasers. This included some 1,164 contacts on CW with 216 on SSB. Art made 840 contacts from Guanaja Island (NA-057), with 838 of these on CW.

Dick Schott, KA2PHQ, recently gave out many new ones for the IOTA types. On vacation in eastern Canada Dick drove some 4,418 miles plus 200 more on 15 ferries. In 25 days Dick made some 5,458 contacts from eight different island groups.

The Golden Isles Chapter 187 is a



George Beckley, V73EX, is very active from Majuro Atoll in the Ratak Chain (OC-029). If you need a 40M contact with this one try 7.180 MHz at his sunset. QSL requests go direct to P.O. Box 3012, Majuro, MH 96960. With that ZIP code a 29¢ stamp will do. (Photo courtesy of KDØJL)

recently chartered chapter of QCWA. Most of the members reside on the islands in southern Georgia. Members of this chapter will give you NA-058.

Active on CW in the recent WPX and IARU contests was VE3UWC/VE2. This one is located on Ellesmere Island (NA-008). He is just 10 degrees from the North Pole.

Much of the IOTA activity is on SSB on or near 14.260 MHz. Be sure to check that spot frequently as activity shows up often unannounced, such as that of Fred, VE3VRO, who came on from Banks Island in the Northwest Territories. None of the DX bulletins gave advance warning. That was a new one for many of the deserving IOTA type, including many of those on the Honor Roll.

## IOTA annual listing

The IOTA program continues to grow with more and more deserving DXers

seeing the light. Each May the Honor Roll is tabulated with the top IOTA chaser on top. At the top of the list is that of F9RM with 703 islands worked, followed by that of 11ZL with 702 islands worked. Number three is Canada's Garry Hammond, VE3XN, with 691 islands. The rest of the American and Canadian DXers are as follows with their island count:

VE7IG	674
W9DC	674
W9DWQ	674
W4BAA	671
K2PPY	648
K2VV	591
KD7SO	572
KC8PG	537
W9NZM	527
K2EYJ	517
K8DYZ	512
WT2O	508
KE4I	482
W1ENE	470
VE6VK	467
K5MK	464
N6BOI	461
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K6DT	458
W3KH	453
N3CWP	431
VE6PW	420
KM4RX	404
WD8MGQ	402

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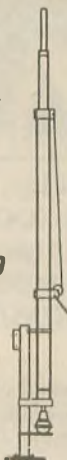
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Handles 10 sq. ft. at 50 mph  
Pleases neighbors with tubular streamlined look  
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55' Freestanding Crank-Up  
Handles 18 sq. ft. at 50 mph  
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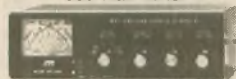


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## MFJ-949 E

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Built-in dummy load  
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## KANTRONICS

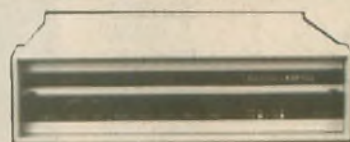
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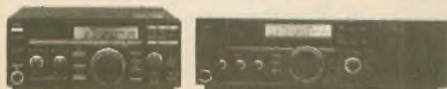


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2 Mtr. HT 2.5W (5 watt optional)  
Easy mode operation  
Scanning + clock  
**Call For Special Price**

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2M/440 Mhz



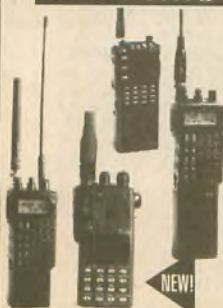
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Rich, WA9WYB, Mgr.  
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Joe, KD8GA, Mgr.

**SAN DIEGO, CA 92123**  
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(619) 560-4900  
(800) 854-6046  
Tom, KM6K, Mgr.  
Hwy 163 &  
Claremont Mesa

**PHOENIX, AZ 85015**  
1702 W. Camelback Rd  
(602) 242-3515  
(800) 444-9476  
Gary, WB7SLY, Mgr.  
East of Highway 17

**SUNNYVALE, CA 94086**  
510 Lawrence Expwy. #102  
(408) 736-9496  
(800) 854-6046  
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Lawrence Expwy.  
So. from Hwy. 101

**ATLANTA, GA 30340**  
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(800) 444-7927  
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**VAN NUYS, CA 91411**  
6265 Sepulveda Blvd.  
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(800) 854-6046  
Jon, KB6ZBI, Mgr.  
San Diego Fwy  
at Victory Blvd.

**WOODBRIIDGE, VA 22191**  
14803 Build America Dr  
(703) 643-1063  
(800) 444-4799  
Curtis, WB4KZL, Mgr.  
Exit 54, I-95, South to US 1

**Bob Ferrero W6RJ**  
President/Owner

**SALEM, NH 03079**  
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K5FNR 386  
W5BOS 379

The bottom of the Honor Roll was that of G0NXJ with 370 islands confirmed. There were several others with an impressive island count, but not enough to make the list.

### DXCC credits

The DXCC desk reports documentation for the following calls has been received and approved with the following start dates:

3C1TR	6 April 1993
4J1FS	May 1992
5R8DS	30 April 1993
5X1DX	26 April 1993
5X1XX	27 April 1993
9M0S	26 May 1993
BV2/WD8E	17 Feb. 1993
C9LCK	22 April 1993
D2AXYK	25 Sept. 1992
H44/I4LCK	02 Aug. 1992
J80I	26 April 1993
KH5K/N9NS	All operations
KH5/N0AFW	All operations
S79CK/D	27 April 1992
T30AJ	11 Dec. 1992
V47I	11 May 1992
VU7SF/API	15 Dec. 1992
ZX0F	22 March 1993

### DXCC backlog

At the end of June the backlog of unprocessed DXCC applications was down to only 155 (23,630 QSL cards). Applications being sent out the end of May were received about two weeks earlier. Five applications were received prior to that time. Consider the fact that at the end of January, just some five months earlier, the backlog was 2,460, or 172,154 QSL cards.

The addition of Czech Republic, Slovak Republic and Macedonia brought in half again more applications than that usually received during a typical June.

### Logging program

We had been looking for a logging program that would satisfy our needs. At Dayton we purchased *GEMRADIO* written by Dr. Antonio Salvadori, VE3NXQ. We were attracted to this particular program as it supported the IOTA program. Presently we have entered almost 4,000 contacts and have some reservations about the program.

As for the IOTA features you cannot get an overall listing of what you have worked. Instead, it lists what you worked by mode and band. We wrote to Toni regarding this and his response was that most users preferred that feature and saw no reason to change it. This is strange as there are no band or mode endorsements to the IOTA program.

As for DXCC purposes the program does not recognize deleted countries and often adds the wrong country code. This is entered automatically by the program based on the country prefix. One then has to exit the program to make the correction. However, this also requires going back in and recreating the DXCC files as the original entry error was recorded as such. With a large database this takes a lifetime. We suggested the elimination of this automatic feature.

Another bad feature is that you cannot change the name or location for multiple entries of the same call sign. Big deal, you might say. But what about when you work a club station that has more than one operator or the station has moved to different locations?

Perhaps the program is suitable to the brand new ham who is making brand new contacts, but to DXers who wish to enter their DXCC standings into the database they are going to have problems.

The program also claims to import contacts from other programs such as the world famous *CT*. It doesn't do that either, at least the latest version of that program. Toni says I should send him a copy of the latest file. It should be the other way around.

Now that I have mentioned my displeasure with my logging program, does anyone use a program that they are completely satisfied with? By this I mean does it support the DXCC program, including deleted countries? Does it support the IOTA program? Will it satisfactorily import data from other programs?

### German Islands Award

DL5EBE informs us that he is working at creating a German Islands Award that will be similar to that of the Italian Islands Award. Every German island, rock, sandbank, etc., will count. This should be an interesting award for those who chase islands.

### Pitcairn Award

*Worldradio* recently learned that the missing Dr. Gary O'Toole, KB6ISL, is now KI7HO, residing at 7535 Winchester Road, Silver Springs, NV 89429. We know of only one certificate appli-

cant who has been refunded his \$5 by a personal check from O'Toole.

### Antique QSLs

Bill Eckels, W8ZNH, sends us another card from Saarland, this time with the 9S4 prefix. Bill worked 9S4CM on 20M CW back on 6 October 1957. Unfortunately, Bill worked this one about two months after it counted as a separate DXCC country.



### QSL information

SWL type Edmundas Strazdas, LY-A-7, is interested in becoming a QSL manager. Anyone who needs a manager in Lithuania should contact Edmundas at P.O. Box 67, 4520 Marijampolė, Lithuania. Edmundas is also looking for information on awards and other DX information, but is on a limited budget.

In our July column we printed the wrong QSL route for VP2MFA. It should have read via K8SJ, whose address is Stu Stephens, P.O. Box 266, Girard, OH 44420.

The QSL bureau for Slovakia (OM) is SARA, P.O. Box 1, 85299 Bratislava 5, Slovak Republic.

### QSL routes

1B1AB	-G0ITX	5W0R	-JR1PFO
3C1TR	-K8JP	5W1LJ	-HB9TL
3D2QB	-SM3CER	5W1MM	-JE61BJ
3D2RW	-ZL1AMO	7Q7BW	-G0IAS
	(see note 2)	7Q7BX	-G0IAS
		7Z1AB	-KN4F
3D2TL	-HB9TL	8A2ISL	-YB2FRR
3Z0KN	-SP3PMA	9A4AA	-9A2AA
3Z9BB	-SP9NLK	9K2ZZ	-N6BPM
4J4JJ	-GW3CDP	9M8S	-W4FRU
4K2BY	-DL6ZFG	9M8ZZ	-PA3FWQ
4K3GW	-I1HYW	9Q5CME	-WA1ECA
4K3RRC	-I1HYW	9Y4H	-K6NA
4K3ZO	-LA8PF	9Z4LX	-WA2NHA
4K4/UA3TAX	-DL8AAM	9Z4SXT	-WA2NHA
4K4/EK250RA	-I1HYW	A35EA	-ZL1AMO
4K4N	-G4WFZ	A61AD	-WB2DND
4K5RRC	-I1HYW	A71BH	-OE6EEG
4L0JA	-JP1BJR	APA5	-KC7V
4L1BR	-UF6FFF	BV4FH	-KA6SPQ
4L4MM	-RF6FFT	BV4OB	-KA6SPQ
4L5A	-IK3HHX	BZ4DHI	-I1YRL
4L8A	-OH1HPS		(see note 2)
4L9A	-IK3HHX	C56UBA	-DL7UBA
4M5I	-I2CBM	C91AI	-CT1CUM
4M8I	-I2CBM	CETAOY	-CE7ZK
4N1K	-YU1ABH	CUIAC	-W2FXA
4N1Z	-YU1AVQ	CU3/N0HFL	-WA1ECA
4N5DRS	-YU5DRS	CU9C	-CU3AN
4O4KC	-YU1FW	D2/C91AM	-ZS6WLN
4O4XR	-YU1FW	D2EYE	-OZ1ACB
4U1UN	-W8CGN	E35X	-LA6ZH
4X/W3GG	-W3CG	ED2LAE	-EA2CBY
5H0EA	-EA4ARE	ED4IBA	-EA5OL
5N0ASW	-W3HCW	EJ2GSI	-HB9ASZ
5N1DMA	-W4DVJ	EP2YL	-UH8AAQ
5N6MRE	-K4ZKG	ER0F	-RB5FF
5N6NEM	-W4DVJ	ER7Z	-18YCZ

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# DX Prediction — September 1993

EV6DX	—DL5BAC	SV5/K5BDX	—NA5U
EV7AA	—UC2AHZ	SV8/DJ2GM/P	—DJ2GM
EV9A	—F6AML	T72EB	—T70A
EX9A	—UM8MDX	T94IW	—DL8OBC
EX9M	—DF8WS	T94ON	—DL8FBC
EX8F	—DL8ZFG	T94QI	—DL3KCI
F10YT/P	—F6ANA	T97B	—DJ0QJ
FF8KLC/P	—F6ELE	T99A	—I4QGU
FH/DK5WL	—DL90H	TA8ZA	—TA6C
FH/DK5WN	—DL90H	TJ1JD	—F1MOW
FO8AR	—JA8FGC	TM3P	—F1LTU
FO8KAT	—JH1PFW	TM6YEU	—F1JPA
FR5ZU/G	—VE2NW	TM6ACO	—Bureau
	(see note 3)	TM6SM	—F8DGT
FY6FO	—F6BYZ	TR8KPJ	—F6CDK
GB6IB	—GM0GMN	TR8LC	—FD1PYJ
GB2TI	—GM3ITN	TR8OBO	—WA4OBO
GB75RAH	—G4CES	UA8X/EK250RA	—11HYW
GM0FEH/P	—G0FEH	UA8Y/UZ8AM	—U28AM
GS9TSB	—GM3YOR	UA6LP/RV8Q	—UA6LP
H28A	—5B4NC	UA9AB	—KF2BH
HG67DX	—HA1KSA	UB2JZ	—W2FXA
HL93IWD	—HL1IWD	UB3JWV	—W2FXA
HP1XTX	—N2LUG	UH0Q/KT5X	—KT5X
HS6ZAA	—KM1R	UI8A	—G3LZK
HV3VV	—I0WDX	UN7FW	—KD7H
IO1IOE	—11RPO	UO6OAL	—I8YGZ
IP1TI	—11ANP	US0RR	—DL5YVM
J28BM	—K1SE	US0U	—RT6UN
J42T	—SV2AVP	V29PE	—G3DLH
J5AAB	—CT1WU	V63DJ	—VE7ELA
JH1MAO/JD1	—JH1MAO	V12AUS	—VK2WI
JT5DX	—JA7FWR	VP2MFA	—K8SJ
JU5DX	—JA7FWR	VP8COI	—G0KOM
K5DEA/5N4	—N6PSI	VQ9AQ	—WN8O
KB6TFH/5N4	—W4DVJ	VR2EK	—G3AUA
KC4KBP/HB0	—DF8AN	VX3A	—VE3FOI
KH2/JE1SLP	—JE1SLP	XF1G	—XE2EAA
LA/PA3FBT	—PE1LAG	XO7G	—VE7XZ
LY/UT3UA	—LY1DS	XQ3CJ	—JA3GFY
LY1TR	—LY1BD	XU3DWC	—PA0RYS
N9M/DW/5N6	—WA1ECA	XU3ENF	—FA3ENF
OD5ZN	—IK7SUE	YB9MPK	—VE7UBC
OD5ZN	—IK7SUE	YF1PGP	—FD1PYI
OH0AAQ	—OH2NRV	YJ0ATL	—HB9TL
OH0MAM	—OH1VR	YN1PCP	—N4JR
OJ0/OH1VR	—OH1VR	Y81DRF	—W2PD
OJ0/AH6MM	—WA6IET	YW6LT	—W1AF
OL5PLZ	—OK3DRK	Z31AA	—YU5AA
ON4JUL	—Bureau	Z31CN	—YU5CN
OZ/SM3TLG	—SM3TLG	Z31PK	—YU5KVD
P29JJA/A	—JH7MSB	Z31RB	—YU5XTC
P29JJA/P	—JH7MSB	Z31VV	—YU5XCS
P49T	—W3BTX	Z31Z	—JR1PFO
PJ2/AH3D	—OH2BH	Z32ET	—YU5DRS
PY0SK	(see note 1)	Z32FK	—YU5DRS
PY0SP	(see note 1)	Z32JA	—YU5XTC
RU1A	—KC1WY	Z32KO	—YU5FSO
RV7AA	—NT2X	Z32KV	—YU5FCA
S01MZ	—EA2JG	Z32MB	—YU5MB
S51DQ	—YU3DQ	Z37CEF	—YU5CEF
S51DX	—YU3HR	ZA1AC	—LZ21P
S54ZZ	—OE8SKQ	ZA2F	—OH3GZ
S66A	—YU3EA	ZF2AH	—N6RLE
SM0FWW/OH0	—WA4JTK	ZF2JI	—KG4AR
SV1BRL/8	—SV8AQY	ZF2JT	—N6RLE
ZF2NE/8			—W5ASP
ZF2QM			—W6OSP
ZK1AJJ/ZK1			—JR2KDN
ZK1AJJ			—JA2TBS
ZS8MI			—ZS1CDK
			(see note 4)
ZS9A			—ZS11S
ZW7AB			—PS7AB
ZX8A			—PY5BVL

7Q7DW	—P.O. Makwasa, MALAWI (see note 6)
7Q7DX	—P.O. Makwasa, MALAWI (see note 6)
9Q5LN	—Tom Bridges, US Embassy Pretoria, South Africa RIMC, Washington, DC 20531-9300
AR5N	—Pakistan Amateur Radio Society, GPO Box 1450, Islamabad, PAKISTAN
HB0/DL1ECU	—Helmut Enger, Kottsiepen 78, D-42369 Wuppertal, GERMANY
S92ZM	—Glen Britt, C.P. 522, Sao Tome, D.R.S.T.P. via Portugal
T30NJ	—Fr Karl J. Elsener, P.O. Box 231, Bikenibeu, Tarawa, KIRIBATI
TA2ZZ	—JA4HCK, Hideo Baba, 430 Minami, Tattori 600, JAPAN
TA5C	—P.O. Box 73, Adana, TURKEY
UJ8JA	—P.O. Box 255, Dushanbe, TADZHIK

Maximum useable frequency from West Coast, Central US and East Coast (courtesy of Engineering Systems Incorporated, Box 939, Vienna, VA 22183).

The numbers listed in each section are the average maximum useable frequencies (MUF) in MHz for contacting five major areas of the world centered on Africa-Kenya/Nairobi, Asia-Japan/Tokyo, Oceania-Australia/Melbourne, Europe-Germany/Frankfurt, and South America-Brazil/Rio De Janeiro. Chance of contact as determined by path loss is indicated as bold \*MUF for good, plain MUF for fair, and in parentheses for poor. UTC in hours.

WEST COAST					
UTC	AFRI	ASIA	OCEA	EURO	SO AM
10	(12)	*14	*20	(10)	*17
12	(17)	*13	*17	(14)	(14)
14	(23)	*15	*14	19	24
16	(26)	13	(16)	20	30
18	27	12	(13)	18	*33
20	26	20	25	(14)	*33
22	22	*25	31	(11)	*35
24	(19)	*28	34	(10)	*28
2	16	*26	33	9	*24
4	*16	21	31	*13	*20
6	(14)	*18	28	(11)	*17
8	(12)	16	*23	(10)	*16

CENTRAL USA					
UTC	AFRI	ASIA	OCEA	EURO	SO AM
8	(15)	(10)	*19	(10)	*16
10	(19)	10	*17	(9)	*16
12	28	*14	15	17	20
14	32	(14)	18	20	*27
16	32	(13)	(16)	20	*31
18	*31	(12)	(13)	18	*33
20	26	21	25	(13)	*33
22	21	22	31	(11)	*34
24	*18	20	33	(10)	*28
2	*16	(16)	29	9	*24
4	*16	(13)	27	*12	*20
6	17	(12)	22	*11	*17

EAST COAST					
UTC	AFRI	ASIA	OCEA	EURO	SO AM
7	16	(10)	*19	(10)	*16
9	(17)	9	17	14	*16
11	27	*14	15	*19	19
13	32	(12)	(19)	*21	*26
15	32	(11)	(17)	*21	*31
17	31	(10)	(15)	*19	*32
19	*28	(13)	(21)	16	*33
21	23	(19)	29	(11)	*32
23	*20	20	33	10	*31
1	*17	(16)	29	10	*26
3	*14	(13)	26	9	*22
5	*17	(11)	22	*11	*19

VE3UWC/VE8—39299 Cloverleaf, Harrison Twp, MI 48045
VK1FF —Jim Muller, WB2FFY, PSC 277 Box 152, APO, AP 96549
XU3RLD —P.O. Box 2420, Bangkok 10501, THAILAND
YI1DZ —P.O. Box 7361, Baghdad, IRAQ (see note 5)
YI1MI —P.O. Box 5864, Baghdad, IRAQ
Z31CN —P.O. Box 73, 92300 Koccani, MACEDONIA
Z31BU —P.O. Box 467, 91000 Skopje, MACEDONIA
Z32GB —P.O. Box 38, 92001 Stip, MACEDONIA
Z32RC —P.O. Box 60, 92000 Stip, MACEDONIA

1. The QSL route for all SSB, RTTY, 6M, packet and satellite should be sent via PS7KM; contacts on CW (HF) go via PT7WA.
2. Direct only!
3. If your Callbook is older than 1993 use VE2DWK.
4. Please include US \$2 with SAE.
5. Do not send US currency—use IRCs.
6. There is no P.O. Box number in the address.

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The Miss California Pageant in San Diego included some 38 talented young ladies all competing for the title that would allow her to compete in Atlantic City this September for the title of Miss America. This DXer's daughter, Miss Gold Country, was not in the top 10, but she did get a talent award. WR

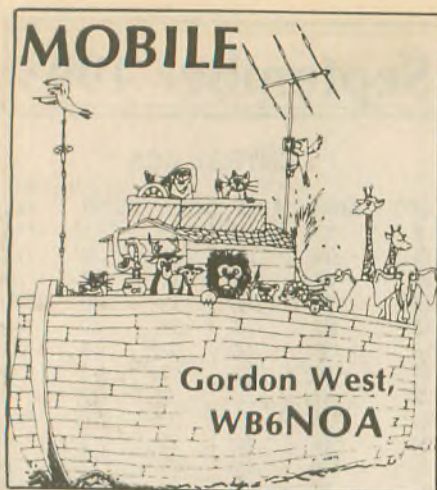
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### Mobile horizontal antennas

There are many advantages for horizontal antenna polarization from your mobile, mobile marine, or mobile home. Horizontally polarized antennas reduce manmade noise interference dramatically, and their low silhouette could allow you to get your mobile home or big vehicle into areas that might otherwise wipe-off a big whip.

### HF considerations

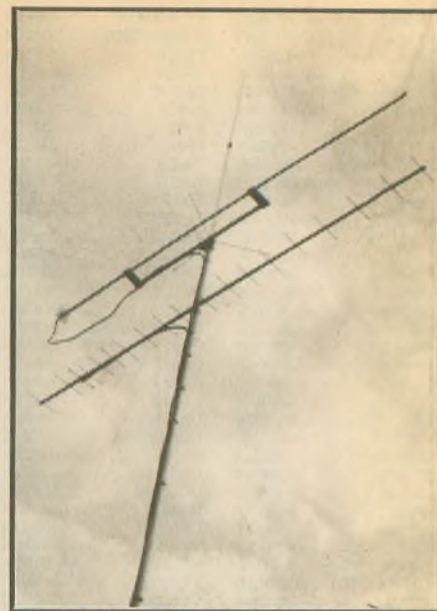
Down on high frequency where antenna lengths are relatively long, metal vehicles won't normally accommodate a 10 through 160M horizontal-type antenna system. But, good news if you drive a mobile home with fiberglass roof construction. A horizontal wire, run just a few inches above the fiberglass roof line and tuned by an automatic longwire antenna coupler, may put out a terrific signal. The automatic coupler is mounted up high within the fiberglass roof, and the ground braid goes to an overhead metal stringer. The antenna is high voltage wire GTO-15, and it travels around the outside of the fiberglass roof and performs well. Even though the antenna wire must pass by a few grounded metal beams, the majority of the signal makes it out on the airwaves for good high frequency operation. For a free set of coupler application notes, call SGC, Inc., 206/746-6310, and speak with George.

Horizontal wire antennas for all oth-

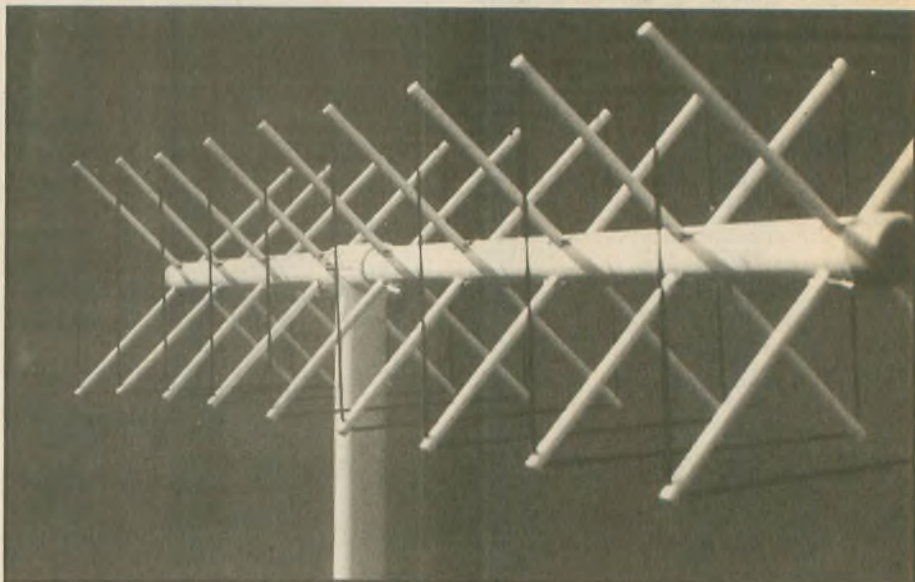
er metal-roof vehicles must be elevated a minimum of 24 inches above the roof line to work at all. The automatic antenna coupler from all of the major manufacturers is a fun way to give it a try and see how well it works on 10 through 160M mobile.

Horizontal polarization for VHF and UHF mobile stations is largely confined to SSB weak-signal operators. On 6M, many old-timers (like me) remember the Saturn halo. This big round loop, horizontally polarized, was a great way to stay in touch groundwave with other 6M SSB weak-signal stations who would also run horizontal polarization. For sporadic-E skywave work, mobile horizontal polarization is not absolutely necessary. A vertical whip works quite well. But going horizontal dramatically cuts down on local electrical noise, so consider the new style 6M loop from M<sup>2</sup> Electronics, Fresno, California (209/432-8873). Ask for Mike, K6MYC.

On 2M and 432 MHz, skywave prop-



For tropo DXing on VHF and UHF SSB, you will do better on horizontal polarization.



Feeding a quad so the balun is on the bottom will give you horizontal polarization.

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## 2M horizontal loop, from M<sup>2</sup> Antennas.

agation occurs so rarely that antenna polarization really won't factor into your antenna decision. And if you work 2M FM and 440 FM through repeaters, stick with your regular single-band or dualband whip—it's vertical, and this gives you solid copy in to local repeaters.

But there are some exciting moments on 2M and 432 MHz single sideband. On 2M, mobile and base SSB work occurs down at 144.200 MHz. On the

70cm band, tune to 432.100 MHz. Both bands use upper sideband. On VHF and UHF SSB, polarization is always horizontal. This allows you to cut down on the noise while picking up on distant stations well over 200 miles away. Long-range radio propagational beacons are also horizontally polarized. All of the real serious weak-signal work is horizontal, and horizontal mobile antennas for all of these bands are available from M<sup>2</sup> Electronics.

On the 2M and 440 bands, the size of the horizontal omnidirectional loop or square is relatively small. Their performance is extremely narrow and preset to the weak-signal portion of the band. As long as you have approximately 18 inches of separation above any metal on your vehicle, the VHF and UHF horizontal antennas will work fine. You might even stack the antennas to pick up an approximate 2.5dB gain in all directions.

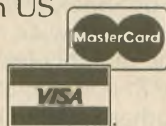
VHF and UHF horizontal polarization could have a benefit to FM stations wishing to operate simplex. Since most FM stations transmit vertically, two mobile stations operating with horizontal polarization will enjoy a dramatic decrease in signal levels from other stations operating miles away, and a substantial increase in mobile-to-mobile performance. The lower noise floor on horizontal makes for great mobile simplex operation—both on high frequency as well as on the VHF and UHF two-way station, also running a horizontal antenna system, at the other end of the circuit.

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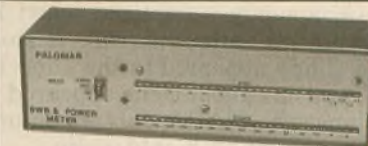
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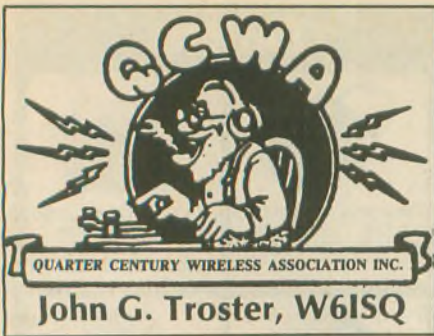
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### Lucky 67

Congratulations Larry W. Sidor, NT9O, of Dyer, Indiana. You were number 67 in the membership roster as published in the summer *QCWA Journal*. For the good fortune of being number 67, and, most importantly, being now a full-fledged member of QCWA, you will receive a personal letter of congratulations from our esteemed General Manager, Jim Walsh, W7LVN.

### A notable two of us

This month I'm going to tell you about two folks you may have met before: Cindy Wall, KA7ITT, more commonly recognized when she's behind a book stand; and Gene Kowalewski, W1TEE, more commonly recognized when he signs an "/m" after his call. A story about Cindy appeared in the June '92 *QST*, and one about Gene appeared in Ace Jansen's, N3AHA, July '92 County Hunter column in *Worldradio*.

Significant for you, QCWA reader, member or non-member, is to know that both of these well-known amateurs are One Of Us, QCWA members! Cindy proudly states, "I joined QCWA just as soon as I was eligible!" We interviewed them both and borrowed a bit from the above referenced articles to profile their interesting backgrounds for our QCWA members.

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### QCWA, Author

First of the three books written by Cynthia Wall, KA7ITT, and published by the ARRL was *Night Signals*.

Imagine this tense situation: Marc, a college student, experienced hiker, radio amateur, has slipped from a trail in Oregon's Cascade wilderness and finds himself incapacitated with a broken leg, wet and cold at the bottom of a ravine, when it begins to snow. He's wisely carried with him his 2M handheld and, fortunately, had a QSO the day before with a new-found friend, Kim, who will become the heroine. But soon after the accident, Marc finds his hand-held battery is dead. He needs to get that 2M rig activated to help the posse find him. What does Marc do?

I'm not going to tell the story, but I can reveal that the solution to Marc's problem was developed by Cindy's brother, W6RHM, an electronic engineer. Her father was W6VGQ, and her grandfather, 9YD, so she grew up in a radio environment. Later, her step-mother, the late Lenore Jensen, W6NAZ, became her radio mentor and introduced her to the ARRL which was looking for an author of books for young people involving Amateur Radio.

Cindy grew up in Burbank, California, and went to UCLA where she ma-



Cynthia Wall, KA7ITT

jored in English. Her career began with writing children's stories for *Child Life*, *Jack and Jill* and *Teen Life*. She had passed the Novice exam while still in Burbank, but really didn't have an in-

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interest in getting on the air and operating until after she had married, moved to Oregon, and had two sons. "Wouldn't it be nice to talk to Burbank on the radio," she thought. So she and her eldest son, Michael, earned their calls together: Michael, KA7ITR and she, KA7ITT. Her husband encourages her Amateur Radio interest but isn't himself licensed. Her younger son is an accomplished cellist, currently studying and competing in Europe.

Cindy writes from first-hand experience. The amateur calls used in her books actually belong to her family or friends and all "good guy" characters are modeled after people she knows. Her knowledge of the wilderness, ecology, and her love and care of animals is obvious in each book. What you read is not only a good story, it has authentic setting.

Cindy's two other novels published by the ARRL are *Hostage in the Woods* and *Firewatch*. They are built around suspenseful story lines and confrontations in which Amateur Radio plays a vital role, good teen-age adventure books which also introduce Amateur Radio to enquiring young minds. Her new novel featuring Kim and Marc will be about beached whales, smuggling, and the ever-important 2M hand-held. We'll be looking forward to it.

You can meet Cindy at radio conventions around the country where she gives talks and sells her books. When you see her, step right up and say, "I'm QCWA too and I'm proud you are One Of Us!" If you are not QCWA, she will have a membership form for you.

### QCWA, Master Mobilier

Well-known QCWA member, mobile operator Gene Kowalewski, W1TEE, is the only mobile operator who has operated CW mobile in all 3,076 US counties. Gene always has a purpose for these long mobile trips. He has brothers, sisters and daughters scattered all over the US whom he visits regularly. Add to this mobile conventions and reunions with shipmates from destroyers, patrol boats and submarines of WWII vintage, and you can understand why this retired widower is happily on the road.

Even as I write, taking a minute from this hungry computer, I went into the shack and just worked Gene in Lincoln County, Montana, for the last county I needed in Montana! Gene's on his way to a mobile convention in Seattle and then family visits on the way back to East Hartford, Connecticut. If I'm lucky I'll work with him again in Jewell County, Kansas, on his way home.

Gene began his marathon county travels in August 1985, finishing All Counties in the "lower" 48 about four years

later. He used the same 1976 Plymouth Duster to drive the 136,100 miles to accomplish his tour. Radio equipment was an Icom 735 transceiver, MFJ 406 keyer, and a Hustler mobile antenna.

In June 1990, to finish off his 3,076 counties, Gene made the 2,700-mile run to Alaska in a truck with his brother. Then in June 1991, he flew to Hawaii, rented cars on the different islands, and on 28 June, on Molokai, ran mobile counties 3,075 and 3,076 from the county line of Maui and Kalawao for the last of the 51,000 contacts he gave out. He's now well over half-way to the goal of having operated in all counties for the second time around!

Gene has been on the other end of mobiling too. In 1987 he achieved CQ

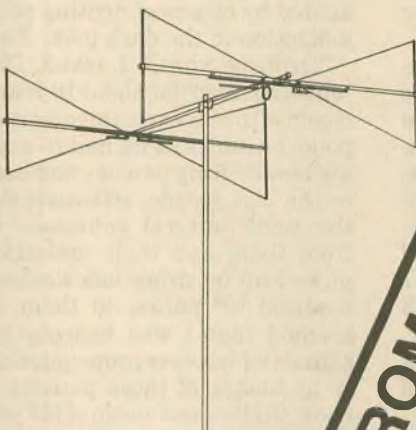
magazine's USA-CA All Counties Award. He also won the MARAC CW Mobiler of the Year award for '87, '88 and '89, plus a special trophy for running all 3,076 counties.

County Hunting is exceptional fun, especially on CW where there are fewer operators and finding counties is more difficult. Drop in on the County Hunter's CW Net (CHN) on 14.056 MHz and follow QCWAer Gene along on his quest for his second 3,076. You can keep up with him and the CHN in Ace's column in *Worldradio*.

Until next month, see you in the DX pileups or on the County Hunter's CW Net on 14.056 MHz. And oh, have you listened to the 14.1 MHz beacons lately? 73 + 25 Jack, W6ISQ. WR

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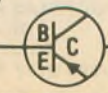
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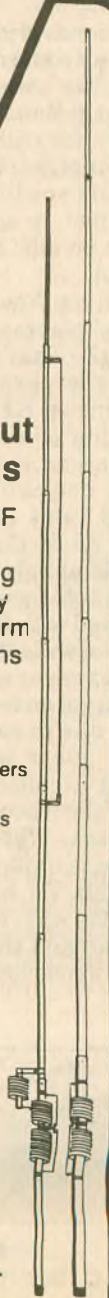
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Friends and neighbors in Radioland, I've got some news for you. Believe it or not, I've observed a new mode of HF propagation. No kidding, something that's for real and not in any book, at least not yet. So let me tell you about it; I think you'll find it interesting and if you live up north like I do, you might even be able to hear what I'm talking about.

As you know, I've been "into satellites," playing radio with the Russian's RS-12. That's what's considered an entry-level satellite, one involving inexpensive HF equipment and only requiring minimal knowledge. In satellite jargon, it uses mode K (15M uplink, 10M downlink) so that's my kind of "bird." But I should add that there's also RS-10 that uses mode A (2M SSB or CW uplink, 10M downlink). Anyway, with both feet firmly planted in HF, I've worked with RS-12 and had my share of QSOs while it was within earshot.

But never wanting to miss a party, I often got on frequency before the "bird" was due to come up over the horizon. And guess what? I started hearing what I called "early birds," RS-12's signals when it was still below the horizon. When it was south of me, it became quite clear that I was hearing signals via hops. Thus, the RF from RS-12 was reflected off the Pacific Ocean and then reaching me via normal ionospheric propagation. And all

the numbers checked out too.

But to the north was another matter. I heard early birds from that direction, up to 11-12 minutes earlier than predicted. Now that started in mid-November and was evident around local noon here in the Northwest. But the signals were coming from Russia, across the dark polar cap, and it didn't take long for me to realize that the numbers did *not* check out in that case.

Putting it as simply as possible, by using the satellite tracking program to find where the signals started from, the IONCAP propagation program showed that the probability of hearing those signals was extremely small, a few percent at most. But I was hearing them day after day for a while, even on consecutive orbits. Amazing! So what was the cause? It sure was more than I could figure out.

I had help from a colleague who, in our younger days, was in my research group back at the Big U. At the moment he's directing some ionospheric work down at the South Pole and when I explained what I was hearing, he reckoned as how I was hearing signals propagated by means of drifting patches of ionization in the dark polar F-region.

"Drifting what?" I asked. I've been "out of the loop" for about 10 years when it comes to new experimental results at polar latitudes so he had to explain to me how drifting patches had been seen in the last decade; scientists detected the weak auroral emissions coming from them and their ionization was picked up by using ionosondes which bounced RF pulses off them. Now it seemed that I was hearing satellite signals which were propagated obliquely by means of those patches. In my book, that's a new mode of HF propagation. Amazing! But I digress.

My colleague's work was in the Antarctic and that was no help to me as I was listening to signals coming across the Arctic. So what could I do to confirm my results, to keep people from thinking that I'd spent too much time chasing "long path"? Well it occurred to me to write a veteran satellite watcher, John Branegan, GM4IHJ, in Fife, Scotland. We'd been in correspondence about RS-12 and maybe, just maybe, he'd

have a log of what he'd been listening to recently.

So I wrote John, giving him the dates and times of my observations and asked if he had anything similar in his logs. You won't believe it but he did. In fact, for the two-week period in late November when I had nine unambiguous events in my log, he had 11 in his log. Moreover, there were three days when we both heard early birds coming over the North Pole. And he also had days with consecutive passes just like I did.

But there was an interesting point: when we heard early birds, it was usually in the hours around our local noon. Thus, John heard them around 1200 UTC in Scotland and I'd hear them around 2000 UTC here in the Northwest. Interesting, no doubt about it. But there's more to the story.


After checking his current logs, John went back to earlier records and found similar events in the '91-'92 winter as well. The very best one from his log is shown in Figure 1, an azimuthal equidistant map centered on Scotland. In addition to the geographic features in the region, you'll see the terminator and the satellite track (shown in two-minute steps) coming up from the south. The date was 16 January 1992 and the time for the start of the satellite track was 1220 UTC.

On that occasion, the satellite passed over Scandinavia and crossed the northern horizon for Fife, Scotland, at 1236 UTC. But the signals continued, off and on, until 1252 when the satellite was south of the Kamchatka Peninsula, around 40N, 170E. The distance from that sub-satellite point back to Scotland was about 9,000 km and the signals were heard coming over the dark polar cap!

That's not supposed to happen according to standard ionospheric theory, but apparently those drifting patches made it possible. So how do we put this picture together in a consistent fashion? For one thing, when last heard on that pass, the RS-12 satellite was well below the polar cap; we can't invoke patches there so how do we proceed?

First, we have to recognize that RF comes down from the satellite, penetrates the F-region and is then reflected off the earth's surface. If you look in any book on satellites, you'll see something about the "footprint" of a satellite. That's the region on the earth's surface where satellite signals may be heard and extends out about 3,300 km from the sub-satellite point.

If you read the "fine print" and think about it, you'll realize that sort of discussion is really geometrical in nature, the sort of thing you'd get if you just ignored the presence of the ionosphere.



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That's what folks do when contacting satellites by VHF or UHF. But I'm not going to make a "big deal" out of that here and now; one can actually re-do the calculation for the case of RS-12's signals going through an ionosphere and the answer differs by only 10 percent, 3,000 km for our case and 3,300 km for VHF/UHF signals. As I said, "No big deal!"

So, taking the case in Figure 1, we only need to find a way to propagate RS-12 signals for 6,000 km, not the 9,000 km from the satellite's last position. That means propagation is going to be by old-fashioned hops and to be successful, some minimum critical frequency foF2 will be required of those drifting clouds of ionization. If you apply the Rule of Three, it's clear that an foF2 value of something like 9-10 MHz is called for if things are to proceed.

Earlier, I mentioned that the drifting clouds of ionization had been picked up by means of ionosondes. What I didn't say was one of those instruments was operating in Greenland, in the hemisphere that I needed data from. So, I got my word processor fired up, wrote the research group that operates the instrument and asked if they had any observations of ionized patches when John and I were hearing RS-12 signals coming across the dark, winter polar cap.

Guess what? I got lucky again! After a wait that seemed like an eternity, word reached me that there were ionized patches over northern Greenland in that period. That took a load off my shoulders and allowed John and me to write up our observations for presentation to the AMSAT-UK meeting at the University of Surrey.

But we haven't "rested on our laurels," as the saying goes. John has been busy, contacting the ZLs and stoking them up for some satellite watching during their recent winter. And we both will be back "on station" with the start of our next winter. After all, we only have a handful of events and this sort of thing should be done over a whole solar cycle.

If you go to your atlas or globe, you can convince yourself that there's not much that people in the Southern Hemisphere can do except listen to the satellite beacons, say 29.357/29.403 MHz for RS-10 or 29.408/29.454 MHz for RS-12. In the Northern Hemisphere, however, there are other possibilities when it comes to studying these patches of ionization. As you may have guessed, I'm talking about fixed beacons, say in the 10M amateur band, rather than only infrequent satellite passes. So that's a project for the future and I'm hopeful that something can be set up to facilitate further study.

## RS-12/13 on 16/1/92 from 1220 to 1254 UTC

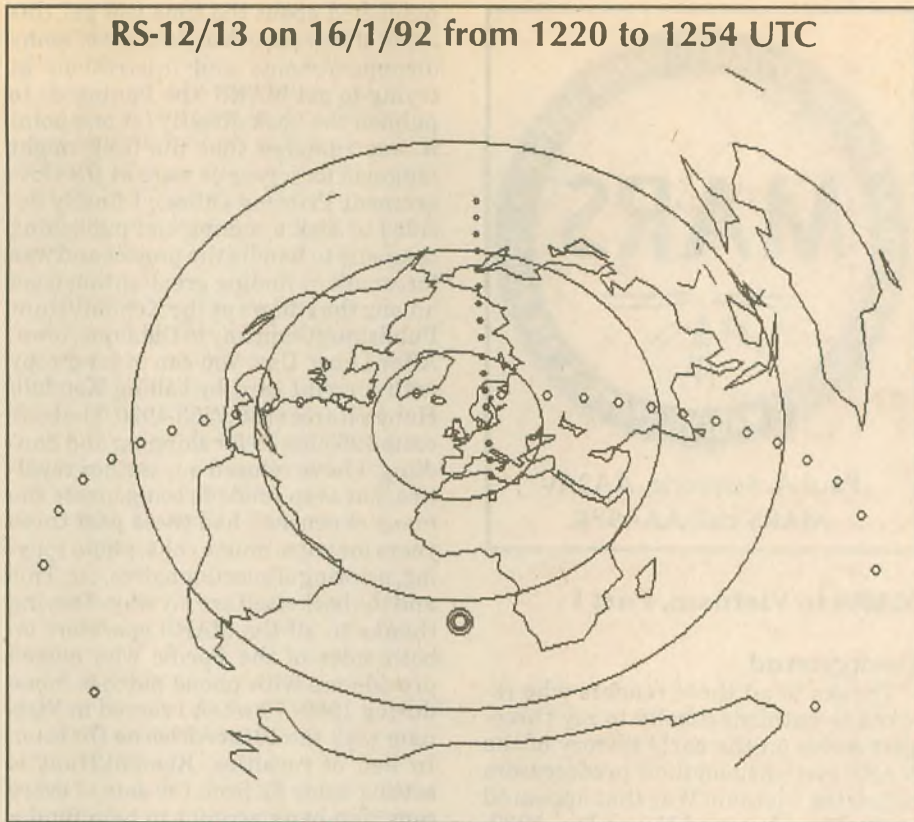


Figure 1

Right now I'm gearing up for the coming winter season and will be there, listening hard for signals from across the dark polar cap. All that starts with the autumnal equinox. But darkness really sets in after the first of October. So if you're interested, tune in then. If your QTH is up north like mine, try listening for signals from the patches of ionization. That'll be a topic you can discuss at your next ham club meeting. In any event, give RS-12 a try; you'll like it, I'm sure.

Just to help you along, let me give you the time for an RS-12 pass on Saturday, 2 October; you should be off work then and able to tune to 29.408 MHz at 2128 UTC when RS-12 comes up from the

south, over the horizon at Los Angeles and heading north. It'll be out of range for Los Angeles by 2145 UTC but I'll pick it up around 2131 UTC so maybe we can have a CW QSO. Listen for me, I'll be the guy who's on 29.420 MHz calling "CQ RS." I'll be looking for your call!

In closing, let me say there's still the whole topic of how those patches get there in the first place and if they'll continue to be there as we go into solar minimum. I'm sure you'll find that quite interesting but it'll have to wait a bit. So for now listen for signals from the patches in the dark polar cap; it'll make the ensuing discussion all the more meaningful to you. WR

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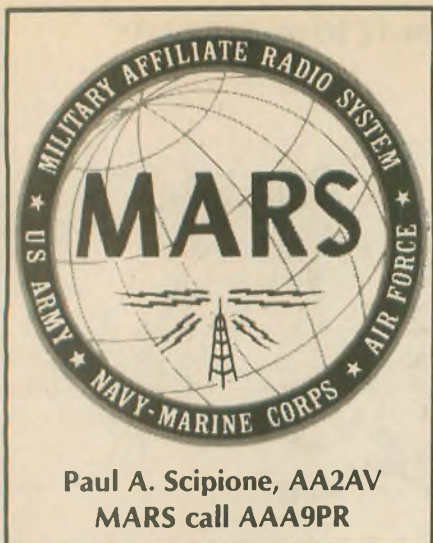
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## MARS in Vietnam, Part I

### Background

Thanks to all those readers who reacted so enthusiastically to my three-part series on the early history of the MARS systems and their predecessors before the Vietnam War that appeared in the May, July and November, 1992, issues of *Worldradio*.

Now I want to take readers through the most fascinating period of MARS history, the years between 1965 and 1975 when incredibly dedicated MARS operators on both sides of the Pacific moved so much traffic that the mind boggles at the statistics—more than 2,000,000 phone patches and nearly 500,000 MARSgrams (RTTY). In Part I (this article), I will describe how stations in the three MARS systems were initially set up in Vietnam during 1965 and 1967, including information about the equipment that was used. In Part II (November '93 issue), I will provide some unforgettable stories from the operators at MARS stations in Vietnam. And in Part III (January '94 issue) I will conclude the series by providing some equally unforgettable stories from operators at MARS stations on the other end of the 8,000-mile pipeline in the continental United States.

All of the information, statistics and stories in this series are taken directly from my book about the history of MARS operations during the Vietnam War, entitled *MARS: Calling Back To 'The World' From Vietnam*, which will be

published about the time you get this issue of *Worldradio*. Because of many disappointments and frustrations at trying to get MARS (the Pentagon) to publish the book directly (at one point it was rumored that the book might languish for a year or more at the Government Printing Office), I finally decided to seek a commercial publishing company to handle the project and was fortunate in finding great enthusiasm among the editors at the Kendall/Hunt Publishing Company in Dubuque, Iowa. After Labor Day, you can order a copy with a credit card by calling Kendall/Hunt toll-free at 800/553-4920. The book costs \$25 plus \$3 for shipping and handling. I have refused any author royalties, not even funds to compensate the many expenses I had these past three years for trips, phone calls, photo copying, printing of questionnaires, etc. This and the book itself are my way of saying thanks to all the MARS operators on both sides of the Pacific who helped provide me with phone patches home during 1969-'70 when I served in Vietnam with the 101st Airborne Division. In lieu of royalties, Kendall/Hunt is setting aside \$2 from the sale of every copy in a bank account to help fund a first-ever reunion of MARS Vietnam-era operators which we are planning to organize at the 1994 Dayton Hamvention. I will provide more details on this event at the end of Part 3 of this series.

### Setting Up MARS in Vietnam

According to Major General Thomas Rienzi, who commanded all Army communications and signal units in the Republic of Vietnam (RVN), the origins of official MARS operations there (I have stories about unauthorized phone patches between American servicemen in Nam and their families back in the United States as early as 1961) came during Christmas 1965, when the rapid buildup of American personnel in Vietnam had surpassed 175,000 in response to the August, 1964, Gulf of Tonkin Resolution. There were no toll telephone services between Vietnam and the US then, except for a few lines from Saigon and US commanders there who were concerned about lonely servicemen not being able to talk with their loved ones over the Christmas and New Years holidays.

On 13 December 1965, two Army enlisted men and HF radio equipment

were airlifted to Vietnam. By 22 December they had established three MARS stations in Vietnam (at Saigon, Cam Ranh Bay and DaNang) and some very lucky troops got free phone calls home over Christmas and New Years. It was from that modest beginning that the MARS Vietnam program eventually expanded to a peak of 84 stations (49 Army MARS stations; 22 Navy/Marine MARS stations; and 13 Air Force MARS stations). There were several dozen additional stations in other areas of Southeast Asia (Thailand, Laos, Okinawa, and the Philippines). The Army program ran via a total of seven nets, each consisting of an in-country (Vietnam) net control station (NCS) and up to five additional in-country stations; the Navy/Marine and Air Force stations were run more informally. The Army NCS station for all of Vietnam was ABBUSA at Long Binh, the giant American base located 25 miles northeast of Saigon. The Navy/Marine NCS station was NØEFD at DaNang, and the Air Force NCS station was A18AIR at Tan Son Nhut Airbase in Saigon. These three in-country command stations coordinated operations through an in-country net on the frequency of 7.824.5 MHz upper sideband. All Army MARS stations in Vietnam were assigned AB8 prefixes; all Navy/Marine stations got NØ prefixes; and all Air Force stations got AIR8 prefixes.

### Equipment used by MARS stations in Vietnam

With few exceptions, MARS Nam stations used Collins HF rigs (52 percent used KWM-2 transceivers, 38 percent used Collins "S" line separate transmitters and receivers, and the balance used Eldico (inexpensive Collins look-alikes), Yaesu and AN/FRC/PRC series military rigs. The Nam stations primarily used Collins linear amplifiers as well (41 percent had 30L1 linears; 26 percent had bigger 30S1 linears; and the balance used various Henry and NC linears). Log periodic antennas were used by 39 percent of the stations, followed in order by 16 percent which used 3-element Yagi beams, 10 percent that had quads, plus a variety of dipoles, rhombics and even a few monoband beams.

The importance of Collins equipment to MARS operations to and from Vietnam cannot be overemphasized. The Collins Company responded immediately to the need for equipment in Vietnam for phone patches, although there is no evidence that the equipment was donated by Collins. The ordered equipment was flown to Tan Son Nhut Airbase in Saigon and then kept in a military warehouse there. Several MARS operators have commented that per-

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sonnel there were very stingy when it came to distributing HF gear and that bribes of various kinds were frequently needed. When all else failed, many enterprising MARS ops broke into the warehouse and carted away needed equipment without benefit of a permit! When MARS rigs broke down, operators would usually personally accompany the rigs (nothing like a two or three-day sightseeing trip!) down to either the Collins Company repair shop in Saigon or to the Army MARS repair shop that was housed in two tractor trailer units parked behind AB8USA at Long Binh. A few MARS Nam ops even wrote home and had tubes and other needed replacement equipment sent over by generous ham clubs back in 'The World.'

### Personal accounts by Vietnam MARS Ops

Fred Acton, K2QAC, who served at AB8AG, Army MARS, Nha Trang, '66-'67: "While I was there on my first tour in Nam, a second Army MARS station, AB8AW, set up in town. It was run by the 5th Special Forces Group. Those guys sure didn't seem to know much about setting up or operating a MARS station, so we were glad to help out. But for guys who didn't know too much about MARS, they sure seemed to be able to get their hands on anything and everything that they needed. They had the best—brand new Collins KWM2s, 30L1 linears, extra tubes, new desk phones, you name it! I never asked those green beanies where they got their stuff from or under what circumstances or what they had to trade to get it. Our station was in the Grand Hotel in Nha Trang, where the commanding general was also located. The whole hotel was pretty well taken up by other military units so we were kind of an after-thought. What they gave us was literally a 'shack' up on the roof of the hotel. That was great being near the antennas, but it was inconvenient for the guys who wanted to call home. The stairs at the Grand Hotel only ran up to the third floor, so we rigged up a ladder that we used to climb from the third floor to the shack on the roof. Most of the time climbing that ladder wasn't any big deal, but it sure was the day that we acquired a Collins 30S1 linear amplifier and I was the guy who had to hoist it up the ladder! The other thing is that I don't want the readers to get the incorrect impression that the Grand Hotel was really grand. It was actually a fire trap. The fuses in that place were just wraps of solder. And after we installed and started operating that 30S1 linear, our fuses needed even more solder wraps!"

Clay Conard, WAØGFS, who served

at NØEFH and NØEFF, Navy/Marine MARS, DaNang, '66: "There were no plans or authorization for a MARS station, but our chaplain (a licensed ham with a W4 call sign), who was well known for his colorful use of four-letter words, was determined to set one up. He kept pushing the brass until they let the two of us fly down to DaNang to seek a station license and authorization from I Corps MARS headquarters. The NCO in charge didn't seem to think much of the idea at first, but the chaplain must have done something behind the scenes and they finally gave us the call sign NØEFF, and we flew back to Quang Tri with a brand new KWM2A, Henry 2K linear and a four-element beam for 20M. We found an empty tent for the station and the guys in the unit (Sea Bees Mobile Construction Battalion 10) scrounged up a 90 ft. telephone pole and mounted the antenna atop it in a fixed position toward CONUS (continental US). We took a spare PRC-47 field radio and an inverted V wire antenna and monitored the in-country net on 3.585 MHz. That proved to be a bad frequency because we were plagued by a lot of high-speed CW. Well, one night, when it got particularly rough to copy the net, I fired up the Henry linear so I could get out better and ended up burning up the antenna!"

Marty Jackson, WB6HON, who served at Air Force MARS station AI8AB, Bien Hoa, '65-'67: "We installed a 90 ft. telephone pole next to the station for our antennas. But on the other side of the pole was the base swimming pool. I recall the pool filling up with dust and dirt when we installed that big pole."

J.R. Kennedy, KB5EFY, who served at AB8AO, Army MARS, Xuan Loc, '67-'68: "Because of my rank I was able to get us all the liquor we wanted. Well, the other MARS ops and I weren't exactly heavy drinkers, so pretty quickly we ended up with an enormous inventory of every kind of booze. At that time we MACV troops could not get the so-called Vietnam jungle fatigues and really felt out of place walking around in stateside fatigues. So we traded off some of our liquor for all the jungle fatigues we wanted. Later on we began trading off the rest of the liquor for other stuff—but that's a whole different story! [Author's note: As fortunate

as JR and his buddies were to have liquor to trade off, keep in mind that MARS operators in Vietnam had the most valuable thing of all to trade off—precious phone calls home!]

Ray Slick, WB9FTY, who served at AB8AV, Army MARS, Vung Tau, '67-'68: "Our station was showing signs of growth, such as long lines of waiting GIs. Even though we had acquired a second teletype van, we were still cramped for space. So we moved into a semi-trailer unit. A concrete pad was poured, large enough to accommodate the two teletype vans plus our semi-trailer. We had three operating positions in the semi-unit and our own repair shop in the vans. Then one of our operators custom-built a really neat phone switchboard so that we could direct any call between any of our three operating positions. We also added a refrigerator to keep canned drinks cool. . . . We then experimented with a fluorescent lamp that we placed near the open wire transmission line. During each voice transmission, the lamp would flicker with the voice modulation. After sunset, this gave our station a unique, psychedelic effect. The final touch was adding a small picket fence around our station. Talk about a state-of-the-art MARS station in Nam, we sure had it!"

Ray Unger, K3FUR, who served at an illegal (field expedient!) station at Qui Nhon in '65: "In September '65 I was sent to Vietnam along with my entire battalion. We left on a big ship from the Oakland Army Depot and it took a month to reach Qui Nhon with a stop at Guam to stretch our legs. We were not supposed to make any radio contacts outside Vietnam because the MARS systems had not yet been established there. But like all good soldiers, our colonel and I (both licensed hams) managed to get some calls back to 'The World' under the guise of being 'military mobile' from the South China Sea. Technically we weren't fibbing because our station in Qui Nhon was within a mile of the coast!"

Thanks to Vic Henry, N7KRE, AARØDCO Army MARS) who sent some beautiful examples of the cloth MARS patches (combined Army, Navy/Marine, Air Force) that he makes. Anyone who is interested in purchasing some MARS patches or other emblems should write Vic at P.O. Box 792, Camano Island, WA 98292 or call him at 206/387-7705. WR

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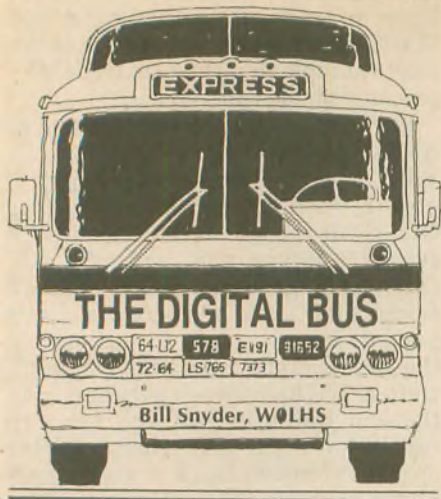
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In my July column I asked for input from people who remember John Williams, W2BFD. John is the guy who, starting about 1946, put a lot of us on RTTY by supplying used teletype machines for ham use.

I got the idea to ask for reminiscences about W2BFD from Ralph Krause, W7IFK. Earlier this year, Ralph mailed me photocopies of his 1948-1949 correspondence with W2BFD, and it was such fascinating reading that it prompted me to ask for more. I'd heard some very uncomplimentary things about John Williams a year or so after I received my model 12 teletype machine through him, so I thought I might be able to scare up some history of those early days. My first reply came from David Winter, W2AUF in Woodhaven, New York. Here is his letter:

"I read your column in the July issue about the early days of RTTY. When you mentioned W2BFD, John Williams, my eyes lit up because it brought back memories of John's efforts to get teletype going in ham radio.

"I also bought a model 12 machine from John and proceeded to get the associated electronic equipment assembled in order to get on the air as soon as possible. (Most of the electronics was of a composite nature and required rebuilding audio transformers so that they could be tuned to the mark and space tones.)

"I finally got my equipment operating before the others, which enabled me to have the first RTTY contact on 2M with John as mentioned in the October 1948 *QST*. On page 17 you will find reference made to the first known RTTY contact on 2M from Brooklyn to Woodside between W2BFD and W2AUF.

"I also remember going to visit John's radio shop, and after he closed it for the day, we would drop in to the local White Castle and eat those little hamburgers, sip coffee and talk ham radio into the

wee hours. I always thought that John was a genius."

During that October 1948 period, I was on my way from Elizabethville in the Belgian Congo to Capetown, South Africa, with stops in the Rhodesias. I was traveling to Capetown to catch a ship back to the United States after spending a year in the so-called Dark Continent. So my recollections of what was going on in the pre-RTTY world of that time are dim. That is probably why I was so fascinated with the correspondence from W7IFK.

Ralph's correspondence with John Williams gave me more of an insight into the supplier of the old machines. Then the letter from W2AUF gave me a tip as to where I could find out more about John and the teletype machine supply.

I went to my favorite ham radio equipment supplier in Watertown, South Dakota, where Stan Burghardt has carefully kept all the *QST* magazines from way back when. There I read the October 1948 article by W2BFD. It was entitled, "The Story of Amateur Radio Teletype." Here are some quotes from the article:

*In the early summer of 1945 Al Waring, W2CFT, dropped into the shack and surprised us in the act of connecting our FSK (frequency shift keying) receiving equipment to the output of a communications receiver. Commercial FSK signals were tuned in and the loudspeaker turned off. Al, a CAA technician with an extensive knowledge of landline teletype, exclaimed, "John, the clicking of that polarized relay sounds exactly like the rhythm of the relays over at*

*CAA. I'll bet that stuff would type if you had a printer here!" In such a simple manner amateur teletype was born. To W2CFT must go the credit for starting us off. He is the "Patron Saint" of ham teletype.*

*Always ready to help, W2CFT put us in contact with a CAA teletype repairman who had heard talk about a batch of printers that had belonged to the old Postal Telegraph Co. and which had been taken over by Western Union. The report had it that they were heaped in a warehouse in Brooklyn, unused. At that time Gus Rinninsland came into the picture. Although not an amateur, he had been interested in various phases of radio for over twenty years. When he saw what was being accomplished in FSK and what was needed for amateur teletype, he threw himself wholeheartedly into our project. At times taking time off from his regular work, Gus followed leads all over New York and New Jersey in an effort to secure teletypes for us.*

*Heartbreak followed the breaking-off of negotiations with WU when that company decided they would need the old Postal Telegraph machines in other fields. Similar negotiations to procure a second batch located in Jersey City failed too. But Gus would not let us drop the matter. His enthusiasm and continual friendly "heckling" resulted in our locating, through connections developed as an old-time wire telegrapher, two companies that would dispose of their machines for much less than had been anticipated, provided it could be guaranteed in writing that the machines would remain in amateur hands (more about this later).*

*In May of 1946 the first two machines were received and within three hours of the time they were unpacked one was connected to the FSK panel and a commercial radioteletype station tuned in. It was a dramatic moment when, after a few false starts, the printer burst into a rhythmical 65 wpm pounding out of a perfectly-typed message saying, "... ah, sorry, OM, but the secrecy provisions of the Communications Act prevent us from telling you, so that is one part of Amateur Radio teletype history you will never know!" The fascination of seeing this "iron horse" clip out the words with never a moment's hesitation from the tape-operated commercial teletype stations all over the world will never wear off. The machines are positively uncanny!*

*That settled it. If commercial high-speed stuff could be copied solid, then it would be a cinch to record amateur transmissions. A one-way circuit on 2M was arranged between W2BFD and the homes of several friends, including W2BDA, W2AUF and ex-F8JM (now an*

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American citizen and awaiting his W call).

The circuits worked right from the start, so a crude and not very effective automatic starter unit (ASU) was schemed up to keep the printer motors off until a signal was received. A rather humorous sidelight developed when the printer installed in a closet in the home of one of the gang started up at 3 o'clock one morning with a loud clatter. He swears to this day that it was done deliberately but of course we wouldn't believe that, would we?

The first two-way Amateur Radio teletype QSO of record took place between Dave Winters, W2AUF, Brooklyn, and W2BFD, Woodside, Long Island. It was not witnessed by any other amateurs but it will be a long time before either of us gets a bigger thrill out of ham radio. At that time Dave had pressed into service an Abbot TR-4 to do the transmitting job and outside of the drifting, which required retuning of the W2BFD receiver every few minutes, the Abbot made a good showing for itself.

The QST article then went on telling how to order a teletype machine from William's "VHF Teletype Society." In order to get a machine at "cost" from Williams, it was necessary to sign a waiver that the teletype machine would only be used for experimental and Amateur Radio use and would not be resold without obtaining the same waiver from the potential buyer. Williams also sold the machines for certain permitted types of commercial operation at "full price."

The model 12 machine I purchased through Williams in 1952 came from the Chilicothe, Missouri, *Constitution Tribune* newspaper. It had been in service for a number of years, but it worked right out of the crate. It was a real clonker—it shook the shack when it typed. It cost \$50 or \$55, I can't remember which, but it gave me a lot of thrills.

## WWII reunion

Members of the WWII Electronics Training Group will be holding a reunion 9-12 September 1993 at Fort Monmouth, NJ.

In 1941 and 1942 over 1,000 technical specialists with a background in electronics were commissioned in the Signal Corps and sent to England to serve with the Royal Air Force and British Army as radar officers. Details on the elaborate four-day program (reception, tours, banquet, museum visits, radar update seminars, etc.) are available from Harrison W. Moore, Jr., COL SIG C (Ret), 260 Millard Avenue, No. Tarrytown, NJ 10591; 914/631-3683. WR

Now back to Ralph Krause, W7ITK, and his correspondence from John Williams. Here's a bit from the first 1948 letter:

"Please excuse the delay in replying to your letter. There have been several hundred letters received and they are still coming in as constantly as ever. I am afraid we stirred up a hornet's nest.

"Since the appearance of the (QST) article the club has placed orders for over 150 printers and no apparent halt in the requests coming in.

"We now have future teleprinter members in almost every state in the union (at least half) with large groups around Chicago and Southern California."

And so the RTTY mode began on 2M. It was 1953 before the high frequencies were available for ham use, and I was there for the first weekend. I'm glad I was there.

## Eavesdroppings

AMTOR AND PACTOR SEEM TO BE MAKING RTTY A LOST ART. . . YES, I SURE HEAR A LOT OF PACTOR SIGNALS, BUT I CAN'T DECODE THEM WITH MY OLD FASHIONED JUNK HERE. . . ABOUT THE ONLY THING RTTY IS GOOD FOR THESE DAYS IS CONTESTING. . . I SURE WISH JIM AND TAMMY BAKKER

WERE STILL ON THE TELEVISION CAUSE I LIKED TO WATCH THEM BEG FOR MONEY. . . I'M STILL USING THE ROLL OF SOLDER I WON AT A HAMFEST IN 1947. . . IT'S NICE TO HAVE FOOTBALL BACK ON THE BOOB-TUBE CAUSE IF YOU'VE SEEN ONE SLAM-DUNK, YOU'VE SEEN THEM ALL. . . I THINK I BLEW THE FINALS OUT OF MY RIG BY NOT READING THE INSTRUCTIONS. . . I NEED A NEW RAIN GAUGE, MY OLD ONE IS FULL. . . I BEEN AIMING MY BEAM BY LOOKING OUT THE WINDOW SINCE THE INDICATOR WENT BLOOEY, BUT I CAN ONLY SEE THE TIP OF ONE ELEMENT SO I MIGHT NOT QUITE HAVE IT AIMED AT YOU TOO GOOD. . . WHAT EVER HAPPENED TO DX ON THIS BAND? . . . I BOUGHT A NEW 486 THE DAY BEFORE THEY ANNOUNCED THE PENTUPIUM OR WHATEVER THEY CALL IT OUT THERE.

My BBS was off the air for nearly a month, so some traffic to me was lost into the "bit bucket." If I didn't reply to your message, I didn't receive it. Please forgive me. If you wish to write me, my address is Bill Snyder, W0LHS, 1514 South 12th Street. My packet address is W0LHS @ W0LHS.#SEND.ND. USA.NA. 73 and DIT DIT. WR

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**County Hunter**  
**Ace Jansen, N3AHA**  
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So, you're finally gonna start hunting counties. Great! Now, take out that record book and go through your box of dusty QSL cards. Hey, wait a minute, this yahoo didn't put his county on his card. Now what? Well you could look up the city in an atlas or zip down to the post office and look at Publication 65, the National ZIP Code and Post Offices Directory. But, that's kinda the old fashioned way. Now, you can . . .

### ZIP

Enter Hardy Data Systems (Jim Hardy, K4HAV) to the rescue. With HDS's ZIP/County program, you can input a ZIP code (from a QSL card) and the city, state, county seat and county are displayed. I used it several times and it worked very well and quickly gave me what I needed—the county. On a couple occasions, I was looking at a log entry but didn't have a QSL card. If I entered a city and state, ZIP would give me a bunch of ZIP codes. Then I could enter the ZIP code and find out the county. The program also has other features for the 10-10 county hunter such as a QSL printing program and a database of 10-10 members. With the 10-10 database, you can do a search by county and display a list of the first 60 hams in that county. If you needed a county badly you could use this technique to identify amateurs living in the county, write them letters and make a schedule for radio contacts.

Another feature I found interesting was finding out all the cities for a given name. So I tried a city named Jansen. It found Jansen, NE. I've actually driven through Jansen, NE and Jansen, CO on my county hunting mobile trips. Although Jansen, CO is on the map, ZIP didn't find it—maybe it doesn't have it's own ZIP code.

I would certainly recommend this program as a modern alternative to looking for a city on a map to locate a county. If you're actively chasing counties or just getting started, ZIP will make it easier to identify counties you've

contacted or help you find hams in a county to set-up a schedule. The ZIP/County program is available for \$25 from Hardy Data Systems, P.O. Box 7304, Tifton, GA 31793.

### 10-10 county hunting

Just when you thought you've heard of all the possible ways to work a county, here's another one! 10-10 International was originally formed back in 1962 to promote activity and good operating practice on the 10M amateur band. It has grown to a membership of 65,000, with a quarterly newsletter, *10-10 International News* (a 30-page magazine) and a dedicated column in *Worldradio*. 10-10 offers many awards to its members but it wasn't until a couple of years ago that a county hunting award was offered. In a short time, it has become a very popular award.

Contacts for the award must take place on the 10M band and must involve a genuine exchange of calls, 10-10 numbers and counties. Contacts may be to and from either a fixed, portable, or mobile station but must be made after each station has received its own 10-10 number. The best feature of the award is that QSLs are not required, i.e., it's less costly.

The 10-10 county award manager issues a numbered certificate for submission of the first 100 counties. Seals are issued for 500, 1,000, 1,500, 2,000, 2,500 and 3,000 counties and a plaque is available for working all 3,076 10-10 counties. In the November 1991 issue of *Worldradio*, Chuck Imsande reported 160 certificates were awarded, and one individual had reached the 1,000 county level. As of 30 June 1993, 322 certificates were awarded, 67 reached the 500 level, nine reached the 1,000 level, three reached the 1,500 level, and K6SIW reached the 3,000 level. I recently joined the fun and received the basic certificate, #322.

The fee for the basic certificate is \$2 and there is no fee for the seals or plaque. A 10-10 county hunter record book is available from the 10-10 county award manager for \$5 post-paid in the US and \$7 US for foreign members. To receive more information, an award application, or to get a record book, write to Alice Jenkins, NR4R, One Mitchell Lane, Rossville, GA 30741.

If you're not a 10-10 member but are looking for another county hunter challenge, send \$1 and two first-class stamps (with an address label but no SASE) to Chuck Imsande, W6YLJ, 18130 Bromley St., Tarzana, CA 91304-1701. You'll receive a 10-10 info packet including the latest issue of *10-10 International News*.

### 1010CH

Enter Hardy Data Systems to the rescue again! HDS developed a database program for the 10-10 county hunter, though it's more than county hunter software. It also provides record keeping on other 10-10 awards: Bar award, DX award, WAS award, VP-Bar and VP-WAS awards.

*1010CH* is a complete county record-keeping system with all 3,076 counties available in a pop-up window. After the user types a state as the QTH, the window pops up, allowing the user to enter a number (1-3,076) and pick a county. The county appears in the county field of the database reducing typing strokes and misspelled counties. When a new county is selected, the computer beeps and flashes a one-second message alerting the happy user of a new one. Yippee!

The program will display a list of counties worked, needed, and all counties for a particular state. A list of new counties can be displayed or printed. County Bar applications can be printed any time there are more than 100 new counties. Once those counties are submitted, they are flagged so they won't be counted as new or submitted again.

If you're like me, procrastination is common but something you don't worry about—not enough time! I've known about 10-10 county hunting and HDS's program but never got a round tuit, so to speak. When I finally tried the program I became very enthusiastic about 10-10, 10-10 county hunting, and *1010CH*. The program made it easy to keep track of which counties I had contacts for and printing award applications was a synch. The only slow part was thumbing through 15 years of log-books. (Do this sometime even if you're not applying for a new award. I found a contest contact from 1978 with a current good friend, N6TV. We were both teenagers then but only met three years ago.) I entered about 900 contacts in the database, enough to qualify me for a 300 county bar and a 700 10-10 bar for contacting 700 different 10-10 members.

I found the program very easy to use and I liked the pop-up county window. The program's database of all 65,000 10-10 members helped me on occasion; trying to find a name if I missed it during the contact, researching 10-10

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numbers, etc. One nice feature is a duplicate QSO message any time a call or 10-10 number matches a previous QSO. I noticed this when I tried to enter the same call for a second contact or when I entered the same 10-10 number for someone who had changed calls. When working mobile stations who've changed counties, you have to be patient when you receive the duplicate QSO messages, but continue anyway to receive credit for the new county.

There were a few minor nuisances. The database appears to be more for the real-time operator (the time field is directly read from the computer's system clock). When entering contacts from history, an awkward CTRL-T sequence must be used to enter time. Sometimes making things happen automatically can be nice or not so nice—it depends! Every database has its own quirks and once you're used to them, you avoid certain things and figure out the quickest way to enter data. By the way, the reports (award applications) don't care about time, so it turns out to be no big deal.

If you are considering a database program to help you keep track of 10-10 awards and print award applications, HDS's *1010CH* is the best program available. It is available at the above address for \$25.

*CHUBS*, a program reviewed in my January 1993 column, has added 10-10 county hunting to its many county awards it tracks. If you are hunting several county awards, including USA-CA and MARAC awards, consider purchasing *CHUBS* from T.H. Software, Inc., 11912 47th Dr. NE, Marysville, WA 98270.

### 10-10 contests

10-10 contests, both SSB and CW, are a good source for hunting 10-10 counties. Although the county is not part of the contest exchange, many 10-10 members are collecting counties and most contesters won't mind spending a little extra time to share their county. Activity won't be what it was a couple years ago because propagation won't be what it was a couple years ago, but mark your calendar for the first full weekend in February for the 10-10 SSB contest. Watch for announcements in *Worldradio* for a spring and fall contest. Wouldn't it be nice if your 10-10

Here I sit, deep in woe  
After R FB QSO.  
Wonder'n Y-in-L?  
I don't get UR QSL!

F. Sakemiller, W9PRV



### Look Ma! A new 10-10 County Hunter certificate for my wall.

contest log would be compatible with your 10-10 county hunting database?

try to glean some intel and pass on the convention highlights to you. Until November, happy hunting! WR

### 1010

Enter Hardy Data Systems to the rescue again, again!! Jim Hardy, of HDS, developed a very popular 10-10 contest program which parallels contest programs CT and NA. The program has a lot of good features but I have yet to try it during a contest. The user can select a county input option to enter counties into the contest log. New counties are automatically marked. A file conversion program will transfer new 10-10 numbers or new counties to the *1010CH* file. I look forward to trying this program and adding many new counties to my database. Now's the time for you to get your worked county totals up to date; try this program, and be prepared for the next 10-10 contest.

Now that you have a hearty Hardy appetite, I recommend you consider 10-10 county hunting and the software tools available from HDS. As I write this, MARAC is concluding their National County Hunter convention in Seattle and I'm not there. Boo hoo! I'll

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**Jerry Wellman, WB7ULH**  
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There are many ways touted to measure effectiveness as well as catchy slogans, charts and graphs. Well, you can throw them all out. I've hit on a reliable (and easy) way to check a company's effectiveness—the "Bathroom Quota," or simply BQ.

Here's how it works: Maybe you want to go to work for a company or find out how your company is doing. You find an employee bathroom (not used by upper management or customers) and check it out. Is it clean? Is it trashed? Are the

walls covered with graffiti? What's your initial impression? That's the Bathroom Quota. What has this got to do with Amateur Radio?

Think of a company's employee bathroom as one of those areas that isn't critical to company success. The custodians know that the management and customer bathrooms must be spotless. But the bathroom tucked away near the loading dock isn't usually seen by customer or management so it often reflects the attitude of employees.

Now look at some areas of your communications team. There are some tasks or talents that aren't at the top of the "neat" list. You may have a flashy logo, ID badge or even a lot of gear. Your snazzy slide show or agency demonstrations are pretty neat. But tucked away in the corners of your organization are some pretty good indicators of how well you're doing.

One area might be turnover. How many new Amateur Radio operators attend your meetings and get involved? Where are the old-timers? How many of your members have been there longer than two years? How many have a grab-and-go bag ready and a 72-hour disaster kit? Do your members feel informed or are they feeling locked out? If you're in command of a comm. team or any

kind of a response team, you need to find and observe the "employee bathrooms" of your organization. It's these areas that indicate how well you're doing.

### Unequal talents

Someone once claimed that the key to efficiency is the ability to keep it simple. From an operator point of view, simple (to me) is having a specialty and doing it well—not trying (or being expected) to be expert in everything.

An SAR official from New Mexico lamented the fact that it is becoming difficult to find good coordinators. He said they tend to want it all after a couple months in the organization. Your best coordinators are those who have spent a lot of time on a lot of missions in a specialty (communications, operations, planning, logistics, etc.) and have a good feel for how it all works. With some coordination training and experience, some will become good SAR commanders. But it all begins with expertise in a specialty!

As unpleasant as it sounds, we may have been born equal and have equal protections under the US Constitution, but that doesn't mean we're all little molded ingots of sameness. Some communicators don't enjoy public service,

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but building things is their motivation. Others make excellent net control stations while others are excellent traffic handlers. Specialties include CW, RTTY, DX, packet, HF, voice, technical maintenance, networking and just about any facet of Amateur Radio you can imagine.

What it boils down to from an emergency services perspective is that people have specialties and the chief administrator's job is to manage these specialties into something that is greater as a team. Some of your people will not be good PR people, so don't put them with the mayor. Some cannot make decisions, so don't put them on the front line. Match your people to your needs. The most difficult part of being a team leader is to determine that some will simply not fit your needs. This does not say any operator is of lesser value, it just addresses that, depending on your mission, your needs will not be met by some people.

Resource management (i.e. planning) is probably still your most important function. If you don't know what your mission is, you'll have no idea what resources you need. Once you determine what you need to accomplish, you should be developing a list of resources. Without a published (and understandable) mission statement (optimally for each agency you're going to work with) your people will not understand the group's resource needs. If they don't understand, chances are you (as leader) don't understand and you'll wind up unable to gather resources when the emergency strikes.

### As we speak

Each night we watch the news we see the mighty power of nature as a hurricane hits Mexico, heat scorches the East Coast and the Mississippi rolls across towns, roads and homes.

One mayor simply said when nature determines a course there is nothing man can do but watch. I overheard several HF conversations where operators expressed that they wished they had 72-hour kits or at least some water storage; they were unprepared and it was too late. That's pretty much how it happens—either we spend some time in advance preparation, or we find our selves (and our families) in

uncomfortable situations.

There is one sure thing about preparedness: You cannot predict when the need will arise and you will not know what will happen. It may be an earthquake, a storm, a flood or some other emergency. There are some basic things you can do and they don't take a lot of money but they pay big dividends when needed.

Contact your local Red Cross or emergency management office and get a copy of the disaster kit checklist—then DO IT! If you never need the kit, you'll know you're ready and that alone is worth the effort.

### A week in L.A.

Business took me to Los Angeles for a week and I sure enjoyed the visit (but it was good to get home). My scanner was busy as well as the 2M, 220 and UHF rigs. There is sure a lot of activity on the West Coast.

I spent one day south of L.A. in the San Diego area and another day north of L.A. in Simi Valley, Oxnard and Ventura. It's neat to see the diversity and listen to Amateur Radio operators. It was a real kick to listen to the Marine Band and I was impressed with how polite and orderly things are on the calling channel. I was, however, embar-

rassed for the Amateur Radio community as several wide-area coverage repeaters were jammed on a couple of evenings, and I was a little put off when I was asked not to use a private repeater. But in general it was a fun trip and I had a number of simply super QSOs.

Those fun folks at Jun's Electronics (in Culver City) made for a nice diversion one afternoon and they are commended for the way they treat customers. There was a newly licensed couple, husband and wife, who were patiently shown many radios, encouraged to get involved in various activities and directed to some common repeaters to use. It sure makes a difference in attitude and it was neat to see excitement both in the selling and buying. (Another nice business I've dealt with recently is CAPS Unlimited in Texas—it has nothing to do with my trip to L.A., but their outstanding service is always appreciated.)

Have a great summer! Get involved in public service, find your niche and become a specialist! Get prepared and share your talents! Your comments, suggestions and observations are *always* appreciated. See you via packet (WB7ULH@WB7ULH.SLC.UT.NOAM) or on HF (upper 20 and 40M usually). 73 from Salt Lake City. WR

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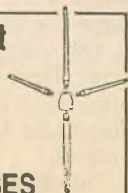
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### The Oak Hills QRP wattmeter

The most fundamental piece of accessory gear in any QRP station is the wattmeter. Not essential, mind you, but low power is the touchstone of our existence, so why not measure just how low you can go? Lots of QRP operators use meters designed for QRO operation—straining to see minute movements as the milliwatts fly through the feedline.

If you've ever craved a wattmeter designed solely with QRP in mind, though, take a look at Oak Hills Research's WM-1. It's a reasonably new addition to the Big Rapids, Michigan, company's kit line. Its \$79.95 price tag may seem a bit much to some, but when

considered as a one-time, life-long investment, the WM-1 is worth it.

The meter's three measurement scales tell the QRP story succinctly: 0 to 10 watts, 0 to 1 watt and 0 to 100 milliwatts. QRO levels need not apply. The WM-1 can also measure reflected power, making it a full service output power and SWR metering device.

In practical use I've found the WM-1 quite useful in achieving a superb match when used with an antenna tuning unit. Here's how: Firing up the "spider" transceiver (reviewed in July's *Worldradio*), the WM-1 is set for reading forward power on the 0-10W range. Keying down, the meter kicks up nicely to a reading of slightly below 1W output.

Switching the WM-1 to read reflected power, the transmatch is tweaked for the lowest meter reading. Keeping the WM-1 set for reading reflected power, now shift to the 0-1W range. Again, tweak the transmatch for lowest meter reading on the WM-1.

Still reading reflected power, shift to the 0-100mW range and tweak the transmatch for lowest meter reading. The meter shows only nanowatts of reflected power—virtually a one-to-one match. That reading is not discernible on the 0-10 or 0-1W ranges.

During routine operation, I generally leave the WM-1 in the 0-100mW range, reading reflected power. Knowing I've got a good antenna match is more important to me than seeing the meter kicking up to about a watt on a forward power reading. It's amazing how much environmental conditions along the antenna—moisture and wind movement, for example—can affect the match.

Oak Hills touts the WM-1 as being "great for portable use." I suppose an argument can be made for that, but its high-profile design would make it awkward for backpacking. The cabinet measures 4 1/2 inches high, 3 1/2 inches wide and five inches deep. The large

panel meter makes the WM-1 very nice for fixed station use. But it sure takes up a lot of real estate when considering taking a wattmeter on a trip into the wild.

The electronic design is clean and simple. Two chips—a CA3160E and LM358N—make up the heart of the power sensing circuitry. The SWR bridge consists of the requisite toroids, which come pre-wound, a couple of diodes and a handful of resistors and capacitors. The WM-1 is powered by a cabinet-mounted 9V battery, which I suspect will last a long, long time. Current drain is typically 1.2mA—not much. No exotic tools are needed for assembly. Adjustment and alignment are made with a digital voltmeter. I used a garden variety, shirt pocket-sized Radio Shack model. The procedure takes only minutes.

I would not recommend this kit for first-time builders. The PC board traces are somewhat difficult to see, as they are "hidden" in a forest green background. With such a backdrop, I found it a little tricky to assure that there were no solder bridges after I'd finished putting in the board-mounted parts. There are also two short lengths of RG58 coax which need to be carefully trimmed and dressed for the SWR bridge. While the process is relatively simple, it's not one I'd suggest for someone who has never used a soldering iron before.

The parts side of the PC board has each component identified and outlined in a white silhouette, adding to the ease of construction. That makes it a real snap to find where any given part should be placed.

With the exception of one missing solder lug, the kit parts were all there. The instructions are straightforward and clear. I was a little surprised, however, that nowhere is the builder told to mount C5, one of four .01uF monolithic capacitors in the kit. I suspect it's merely an oversight on the instruction writer's part. In usual Oak Hills style, the builder is given enough information to do a good job of assembly, but there's not so much that it loses its homebrew feel.

Two rotary switches step the WM-1 through its various functions. The wires connecting them are nicely color coded and are pre-cut by the builder to precise lengths for use inside the cabinet. A large drawing of the wire connections to the switches reduce the chance of error. Drawings of the PC board parts placement in the construction manual also take the guesswork out of the project.

The cabinet is first class. Lettering is crisp and clean on a cream-colored background. The unit's top cover is flat

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black. The WM-1 would look good in a crowd of commercially-produced gear. The WM-1—designed by and for QRPers—is going to be a nice addition to a lot of QRP radio shacks.

### W6SKQ/QRP, Bob Spidell SK

One of QRP's best known and most highly respected voices fell silent in June with the sudden death of Bob Spidell, W6SKQ. He was 56.

Bob, a past contributor to *Worldradio*, *QRP Quarterly*, G-QRP's *SPRAT* and other QRP publications, for many years had been one of QRP's greatest ambassadors. He held memberships in QRP organizations including QRP ARCI (No. 3135), G-QRP (No. 355), VK CW Ops QRP Club (No. 67), Michigan QRP Club (No. 177), NorthWest QRP Club (No. 20), and QRP Club of New England (No. 85), and is responsible for bringing untold numbers of radio amateurs into the world of QRP.

A builder and avid operator, Bob will always be remembered for his untiring advocacy of low-power operation. He was a founding member of the Zuni Loop Mountain Expeditionary Force, one of QRP's best known Field Day groups. Until his death less than two weeks before Field Day 1993, the group had operated under his call sign since its inception.

A friend to many QRPers across the country and around the world, his hearty laugh, distinct fist, kind demeanor, wonderful sense of humor and genuine willingness to help others into our niche of Amateur Radio will be greatly missed. No radio operator loved QRP more than Bob.

### Catalog of the month

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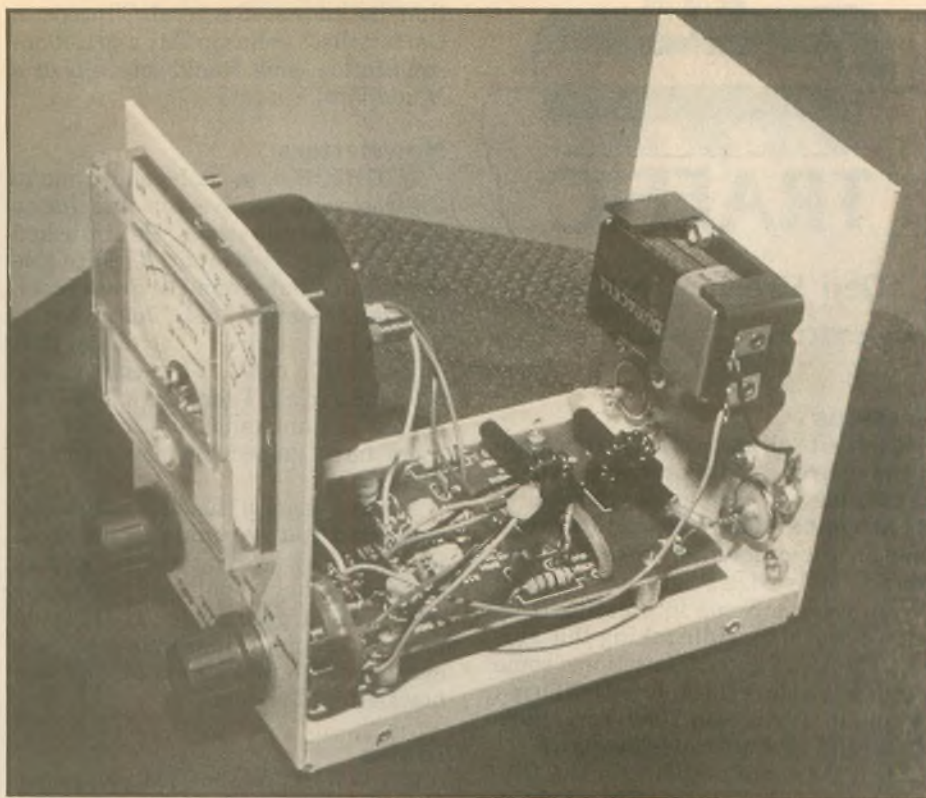
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*QCWA Journal Fall, 1992*

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Inside the Oak Hills Research WM-1 QRP wattmeter.

This month's catalog suggestion is from JAN Crystals, based in Fort Myers, Florida. The company offers a wide range of crystal types—from HC6/U to FT243—for a variety of applications. Frequencies cover just about every conceivable need in the Amateur Radio spectrum.

The company has long been known for its reliable and fast service, and quality products. JAN's catalog is available free by calling 1-800-526-9825. The

company's mailing address is 2341 Crystal Dr., Fort Myers, FL 33906-6017.

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## Sections

Thanks to all the section traffic managers who returned my survey on what's happening in their areas. Several of them will be added to each future column in the order they have been received. I only wish I could get them all to you sooner. Some interesting facts were discovered while taking this survey: There are about 77 sections; some states have more than one—California has nine, Texas and New York have three, and several states have two.

Then there are sections for the District of Columbia, Puerto Rico, and the American Virgin Islands. Several sections don't have an STM. A few SMs wear both hats. All but one of the replies to date have answered the question of what's happening with data (packet), in their area, as: little, or, that they don't know what's happening because no reports are received from any PBBS in their section. The major PBBS here in Virginia were persuaded to report their monthly NTS totals for several years. It may be too pessimistic to say that once they received their BPL award, they quit sending me a report. At this time, only two PBBS in Virginia continue to send a monthly report. One station, WA9FCH, is an APLINK station here in Northern Virginia and was recruited by an NTS person. The other, WA4TVS, was a traffic handler long before he became a PBBS operator. How do we encourage the PBBSs in a section to send a monthly report to the STM reporting their NTS activity?

## City names

WB5ZJN, of Stow, Ohio, responded

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that he knows of several Clintons, a Carterville, a Johnson City and a Johnson Station, plus, would you believe, a Nixon Ford Corner?

## Newsletters

W7GHT, Bill, in Idaho added me to the roster to receive his fine *Idaho Montana Net* newsletter. He also asked the readers to give input. It's sure nice to get comments from the grass roots. One letter simply said, "Just want to let you know there is one ole op that enjoys traffic nets . . . I've enjoyed the NTS most of all. There are a lot of fine people in ham radio and a bunch of them have helped me many times." (KA7IHO)

Another issue of the *IMN* newsletter suggested that we could practice sending traffic by sending a short joke to someone. They should, of course, be brief and in good taste. That would make an evening of liaison assignments even more fun. Bill's is one of the finest newsletters I've seen.

## Idaho

Bill, W7GHT, Idaho STM, gives some history on their NTS activity. "In 1960, K7NHV, then living in Pocatello, Idaho, decided a CW net should be formed. He reasoned that the very few CW operators in Idaho could not support such a net. His assumption extended to Montana, where the answer was the same. So why not combine the two states into one section net? Al, K7NHV, became quite QRL all of a sudden. He asked me to form the net. After considerable correspondence with prospective members, I finally sent out the

'announcement,' setting a date and frequency. The net thus was born. The name (*IMN*, Idaho-Montana Net), later was selected by the members.

"There's always a bit of interest in getting together with other hams. The Boise area, which includes Meridian, Nampa, and Caldwell, have weekly get-togethers. A weekly luncheon is held both in Boise and in Nampa. Additionally, Boise has a rather large gathering each Saturday morning for breakfast or coffee. Lewiston is trying to mimic Boise. That bunch has a monthly supper for hams and their wives. Additionally there is a Saturday morning breakfast/coffee clatch."


## Southern Florida

Florida is one of the states having two sections. It has a unique situation in being part of two time zones (Central and Eastern). This has resulted in checking in to both Region 4 and 5 nets. Bill, K4ZK, Southern Section traffic manager for the past 10 years, is retired from the Foreign Service. His first job was a radio operator on a four-masted sailing schooner cod fishing in the Bering Sea (Bill's 75 years old). He reports:

"Some years ago, Florida was split into Eastern and Western Florida. It was this split which started Florida checking in to both RN4 and RN5. When there is an emergency, we check in to all four cycles of both (EAN/CAN) nets. All of Florida CAN and PAN traffic is routed to RN5.

"At the present time there are nine HF nets and nine VHF nets which are reporting to me. There are three other VHF nets that report occasionally. Of the HF nets, there are four CW and five SSB nets. Several years ago the STMs of Southern and Northern Florida worked out a written agreement designating a number of nets as 'Combined Section Nets.' These net managers send reports to both STMs. QFN is the major all-Florida CW net which meets the regular cycle 4 Regional nets.

"A couple of years ago, the SM and I decided it would be a good idea to get a handle on just how NTS traffic was being handled on the packet network, so he appointed an 'ARRL NTS packet manager.' W8DUV, is the current packet manager. She has been doing an excellent job putting out bulletins on how to handle NTS traffic on packet (I only wish more packeteers would read them!). Packet is handling a good percentage of the NTS traffic. In comparing my December 1992 load with the previous year, there appeared to be a 15 percent drop in the amount of traffic handled on the regular NTS nets. But comparing the packet reports for the



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same period indicated a large increase in the amount of NTS traffic handled there. I operate packet here and quite often am able to feed traffic into places on packet where I have no regular NTS outlet.

"Both sections have devised a joint 'Emergency Operations Schedule for Florida Section Nets.' It anticipates 24-hour operation on various frequencies with one section net following another and other nets acting as supplementary traffic handlers."

Bill says that they have activated this schedule several times in real emergencies and during SET sessions, and it works.

### Eastern Pennsylvania

Harry, W3KOD, STM, reports that while they have lost some members due to amateurs moving away and passing away, the CW nets continue to be the strong point. At the section level, there are three CW nets and one SSB—wow! He says the SSB nets are also in good shape and will go the extra mile to get your traffic to its destination. Harry and the SEC have been trying to encourage more traffic handling in out-of-the-way areas by promoting VHF nets. This has been successful in his own area but has not taken hold section-wide.

As to packet, Harry says, "One nice thing about HF traffic handling is that you send your message to an operator who will relay it, deliver it, or if worse comes to worse, service the message back. Not so with packet. Time after

time, I see packet people going through bulletins while completely ignoring third-party traffic for the local telephone area. The willingness of the packet people to pick up a piece of local traffic from time to time would do much to improve the low opinion many of us have of packet as a traffic handling mode. We need some low-tech phone calls more than their high-tech hype. In the past year I've lost two pieces of traffic that I put on CW nets. Tracing them down, I found both were lost after being put on packet. I had sent traffic to both of these addressees before with no trouble. I know where I can send packet traffic. I know where I cannot send packet traffic. And, I know where I might be able to send packet traffic. Pragmatically, I find the quickest, most accurate and reliable way to move my traffic is still CW. The reason for this, in a large part, is the CW persons' attitude toward traffic handling, as well as being able to pass the traffic under poor conditions. The average CW operator will spend a great deal of time and effort to get the message through before they QTA or give up. When they do give up they usually have alternate routing in mind. With a transmitting operator, a receiving operator and an NCS with

that kind of attitude, the message usually gets through. Traffic handling is an art, not a mode. Traffic handling is either an important part of your amateur activities, or no part at all. High-tech plays its part, but high motivation will continue to be the important factor. Amateur Radio traffic handling is a volunteer effort, and dumping traffic into an automatic system just will not do it. Somewhere in the system we need dedicated traffic handling people, otherwise no amount of high-tech can do the job. Reports from PBBS are few and infrequent."

### Net control stations

If you are a net control station, on an HF net, please let me know (via a radiogram or letter) whether you feel listing book traffic, on your net, is more effective the old way (three for one), or the new way (one for one). Thus, if someone has a book of nine, would you prefer s/he list this traffic as three or nine? While it would be handy to be able to list "I have a book of nine" and make everyone happy, NCS often doesn't have the time, space, or inclination, to divide by three. I think we have to choose which is more important; whether nets are run well or get extra points. WR



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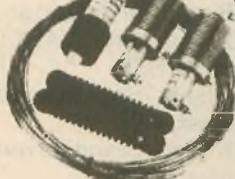
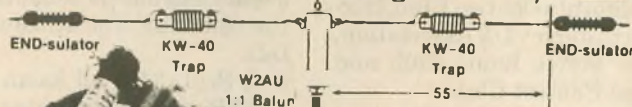
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# Worldwide DX CONTESTING

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## The 38th European DX Contest (WAEDC)

The 1992 European DX Contest was very competitive in both the CW and SSB sections and also the international club competition.

Tops among non-European club entries was the Frankfort Radio Club with 5,168,230 points, followed by the Araucaria DX Group of Brazil with 3,135,765 points and the Yankee Clipper Contest Club with 2,173,656 points.

Other North American club entries in order of score included the Boiled Owls of New York, Texas DX Society, Florida DX Association, NCC (VE), Fox River League, North Texas Contest Club, Fredericton ARC (VE), Hoosiers Contesters, Potomac Valley Radio Club, Northern California Contest Club, Dixie DXers, North Jersey DX Association, NCDXF, San Mateo Radio Club and the San Diego Contest Club.

## Continental winners

The high scoring stations by continent in the single operator, CW and SSB events were:

	CW	SSB
Europe	LY5R	OE6MBG
Africa	EA8AB	5U7M
Asia	P30ADA	RH0E
North America	V21AS	K2TW
South America	PP7JR	ZW9A
Oceania	ZL3GQ	YB2FRR

The winning North American score for the CW weekend, V21AS from Antigua, was 2,164,734 points. The operator was YU1RL.

## KZ2S tops US CW entries

Those US stations scoring at least

100,000 points in the single op category in the CW weekend included KZ2S—973,350; AA1DD—658,980; KC1XX—552,133; K2TW—540,154; N6AR/4—492,492; K2LE—464,178; AA3B—349,899; N3RS—338,348; K1XM—324,000; K3WW—281,088; N2MM—275,096; K3IPK—274,784; AA2DU—251,086; W2AX/1—247,806; KC1F—235,440; W2UP/3—205,088; K2SX/1—156,585; AB2E—124,914 and NX3A—110,349. The high scoring station for Canada was CJ1IW with 102,443 points.

## Leading North America and US

US stations scoring at least 100,000 points in the single op category during the SSB weekend were K2TW, continental high with 722,988 points; N8RA/1—488,592; K3IPK—420,099; KC1F—353,349; N4UH—323,990; N9KAU (by JF3NRI)—312,045; K3WW—301,087; W2UP—210,210; KA5W—115,328 and W8KKF—100,245.

## Back to 48 hours in 1994

DARC's WAEDC contest manager, Herb, DL2DN, writes *Worldradio* that the contest will return to a 48-hour format in 1994. This year's, 1993 test, remained at 36 hours. Contact Herb for a contest booklet with complete scores, photos, comments and entry forms for WAEDC, plus rules for the Worked All Germany (WAG) contest which is held in October. The address is WAEDC Contest Committee, P.O. Box 1126, D-74370 Sersheim, Germany.

## September kicks off fall contest season

The DX Contest season begins with a fury in September as three major world events and one national contest crowd the calendar. The schedule looks like this:

- 4 - 5 Sept. 34th All Asian DX Contest, SSB and the Bulgarian DX Contest
- 11 - 12 Sept. 39th WAEDC European Contest, SSB
- 18 - 19 Sept. Scandinavian Activity Contest, CW
- 25 - 26 Sept. Scandinavian Activity Contest, SSB

Space does not allow printing the rules for each of these events, but the rule highlights are found in *QST's* Con-

test Corral and *CQ's* Contest Calendar. K4IIF has official rule sheets, application blanks and logsheets for most DX contests. Send SASE for information.

## The Bermuda Contest results

The Bermuda Contest is an annual competition involving the US, Canada, the UK, the Federal Republic of Germany (FRG) and Bermuda.

On 14 June 1993 the contest committee of the Radio Society of Bermuda (RSB) announced the following results of the 1993 Contest: USA—Ken Geistfeld, WV3R; Canada—no winner for 1993; UK—Bob Cummings, G10KOW; FRG—Christian Janben, DL1MGB; Bermuda—Glen Cuoco, VP9ID. High scores for Germany and the US were tallied by DLIYAF and WB2YQH, respectively. However, these stations had been previous winners and the contest rules do not allow a repeat winner. The 1994 contest, with amended rules, will be held on 19-20 March 1994. Mark your calendars accordingly.

The RSB advises that a temporary reciprocal permit for Bermuda can be obtained by applying, with a copy of the operator's license, to the Department of Telecommunications, P.O. Box HM 101, Hamilton HM AX, Bermuda.

## World Wide South America CW Contest

The contest was back on track in 1993 after a serious fire at the headquarters of the contest sponsor, *Antenna-Electronica Popular Magazine*, destroyed all records and most of the logs for the 1991 contest and severely impacted the 1992 edition.

The results for 1992 have just been received. Each of the following band winners was a European station: 7 MHz, LY2BAI; 14 MHz, UT4JWC; 21 MHz, HA8VK; 28 MHz, YU7SF. South American band winners were: 7 MHz, PY2HF; 14 MHz, LU1ICX and 21 MHz, PP1CZ. There was no entry on 28 MHz.

## Contesting from the islands

Last month we provided addresses for licensing authorities in various island countries with the hope that it would help with your future contesting plans. In this issue we list a number of hotels and guest houses which have hosted DXer/contesters in the past. We do not pretend to be a travel agency, but each of the following was suggested to us in a letter from a DXer or contestee who has operated satisfactorily from the location. Though these establishments have hosted Amateur Radio operators, there are no guarantees, as managements change from time to time.

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For example, a few years ago I stayed at a multistory hotel which allowed me to put up a beam and string wires all over the roof. They gave me a ladder, a key to the door and provided a man to help. Then, a few years later, under new management, I was told that the liability was too great and they couldn't allow me on the roof. C'est la vie!

Here are some potential spots for you. In some cases the writer provided an address, a phone number and a FAX number, in other cases only one of the above. Note that area code (809) numbers may be dialed directly from the US. Other numbers will require the international access number 011. Good luck!

### Anguilla, VP2E

#### Rainbow Reef Villas

P.O. Box 130, Anguilla, British West Indies; phone 809/497-2817

#### Cinnamon Reef Beach Resort

Little Harbor, Anguilla, British West Indies

#### Masara Resort

Katouche Bay, Anguilla, British West Indies

#### Shoal Bay Villas

Call Scott Calder International: 800/223-5581

#### View Fort Country Inns

P. O. Box 42, Anguilla, British West Indies; 809/497-5450

### Antigua and Aruba, V2

#### Sandpiper Reef Resort

P. O. Box 569, Antigua, British West Indies; 809/462-0939

#### Barrymore Beach Apts.

Runaway Bay; 809/462-4101

### Aruba, P4

#### Americana Hotel

P. O. Box 218, Aruba; 2978-24500

#### Holiday Inn

2 L. G. Smith Blvd., Aruba; 2978-23600

Two-bedroom cottage owned by Carl, AI6V, 1724 Via del Verdes, Concord, CA 94521-1930

### Bahamas, C6A

Two-bedroom villa on Great Abaco Island: Write Steve Rutledge, 712 South Overlook Drive, Alexandria, VA 22305; 703/348-9431

#### Chub Cay Club

Phone 800/662-8558

### Lucayan Hotel and Marina

809/373-8881

House owned by Chod Harris, P. O. Box 50, Fulton, CA 95439

### Barbados, 8P

#### Beachcomber

P. O. Box 1020, Bridgetown, Barbados; 809/432-0489

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P. O. Box 115, Bonaire, Netherlands West Indies; 599-7892

### Belize, V3

Ramon's Reef Resort on Ambergris Caye  
Phone 026-2071

#### Pelican Beach Resort

P. O. Box 14, Dangriga, Stann Creek District, Belize; 501-5-22044

### Bermuda, VP9

#### Stonington Beach Hotel

Phone 809/236-5416

### British Virgin Islands, VP2V

#### Long Bay Beach Resort

P. O. Box 433, Roadtown, Tortola, BVI; 809/495-4252; FAX 809/495-4677

### Dominica, J7

#### Castle Conform Guest House

P. O. Box 63, Dominica, West Indies; 809/449-2188

#### Portsmouth Beach Hotel

P. O. Box 34, Dominica, West Indies; 809/449-5142

### Grand Cayman, ZF

Write Ron Sefton, ZF8AA, P. O. Box 30, Little Cayman, Cayman Islands, British West Indies; 809/948-3255

### Grenada, J3

#### Hibiscus Hotel

P. O. Box 279, Grand Anse, St. George's Grenada, West Indies; 809/444-4233; FAX 809/440-4124

#### Hotel Balisier

P. O. Box 335, St. George's; 809/440-2119

### Jamaica, 6Y

#### Holiday Inn

Rose Hill, near Montego Bay; 809/953-2485; FAX 809/953-2840

### Montserrat, VP2M

Contact Neville Bradshaw Agency, P.O. Box 270, Plymouth, Montserrat, West Indies; 809/491-5069

### Saba, PJ6

#### Lookout Cottage

c/o David Johnson, Windwardside, Saba, Netherlands Antilles

### St. Kitts, V4

#### Golden Rock Estate

Phone 809/468-3346

#### Sun and Sand Beach Villages

Phone 809/465-8087; FAX 809/465-6745

### St. Lucia, J6

#### Hotel LeSport

Cap Estate, St. Lucia, West Indies

### St. Maarten, PJ8

#### Villa Veda

Contact George Rand, K2KTT, 312 E. Tenth St., #5, New York, NY 10009

### St. Martin, FS

#### Coralita Beach Club

P. O. Box 175, Marigot, 97150, St. Martin, French West Indies; 590-87-3181; FAX 590-87-3120

### St. Pierre and Miquelon, FP

#### Hotel Robert

Via SPM Tours, 38 Gear Street, St. Johns, Newfoundland A1C 2JS; 709/722-3892

### Turks and Caicos Islands, VP5

#### Third Turtle Inn

Providenciales, Turks and Caicos Islands, British West Indies; 809/946-4230; FAX 809/946-4650

#### Erebus Inn

Via Coral Connexions, P. O. Box 350164, Ft. Lauderdale, FL 33335; 809/946-4240 or 809/946-4836

One-bedroom house owned by Jody Millspaugh, VPSJM: Write to P. O. Box 350567, Ft. Lauderdale, FL 33335

### Trinidad and Tobago, 9Y

#### Farrell House Hotel

Claxton Bay, San Fernando, Trinidad and Tobago, West Indies; 809/659-2271

And finally, a good source of information specifically on operating from the Caribbean area is the Caribbean Licensing Guide. Contact Craig Maxey, WB7FRA.

WR

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# CONSTRUCTION

## Assembling a high-performance VHF SSB station

STEVE HALL, WM6P

Two-meter SSB operators seem to come in two grades: those who have assembled a modest station with hopes of reasonable performance; and those who accept no compromise. For a small percentage of station owners only the best will do, and a serious station takes a dedicated effort. Let's take a look at assembling a high-performance station by taking a systems approach.

In southern California I have studied what has worked for me and others whom I have met on the air. While many of the lessons learned could apply to a satellite station I am confining my discussion to applications of weak-signal terrestrial contacts.

I have been an amateur for almost 30 years and there aren't too many modes I haven't tried over the years. For a lot of us with stations covering many bands, HF, VHF and UHF, no single area of ham radio becomes a true specialty. But for some hams a single facet becomes a passion and is pursued to the state of the art. At this point no detail is too small and no incremental gain in performance is to be overlooked.

Many of my observations are just that—observations—and are not the only path to performance. These lessons have worked for me or others and represent a reasonable starting point toward your own brand of SSB station for 2M.

### Antennas

As with most radio stations the antenna, while not the only important element, is be classified by some as the most important. As far as performance of a radio "system," money spent on the antenna system is not an area to cut corners. If a large compromise is made in this area no amount of money spent in other areas such as radios or amplifiers will make up the difference.

The performance of commercially made ham antennas has made serious strides in the past 10 to 15 years. Take a look at an old ham publication or antenna handbook and you will see how far we have come. Smaller manufacturers, due to computer designed tools, are now able to engineer antennas of the highest performance, competing with the larger traditional manufactures. Two that come to mind are M<sup>2</sup> Enterprises, in Fresno, California, and Rut-

land Arrays, in New Cumberland, Pennsylvania. Both have specialized in antennas for the sideband enthusiast. Antennas optimized for SSB operation often are narrow band, with optimum gain and low SWR in the SSB portion of the 2M band. In Southern California M<sup>2</sup> is extremely popular. Many contest winners in the Southern California area are running two or more M<sup>2</sup> antennas in large arrays. Boom lengths are generally over 25 feet. While excellent station locations may allow smaller antennas to be used successfully, all things being equal, bigger is better. Unlike HF contesting where excellent propagation may favor your location for a period of operation, VHF propagation rarely favors any particular area for long. You have to make your own big signals with superior gain and power.

I have recently replaced a good but older 11-element beam, with a newer K1FO design from Rutland Arrays. It is the Model F015-144, 15-element with a 25.1 ft. boom and an advertised gain of 13.8dB. The improvement was immediately evident. Reliable contacts out 200 to 400 miles became commonplace. Normally two or more large mountain ranges must be crossed for most contacts from my home in Ventura County, California.

Construction of the Rutland antenna was straightforward. I took the time during the construction and installation to ensure that the antenna would be right the first time. One trip up the tower is enough for me.

Support from Tom Rutland, owner of Rutland Arrays, was prompt and thor-

ough when I had a question about the construction. Tom likes to hear from and help his customers and takes the time to explain how to optimize the use of his products. I highly recommend his specialized product line. He is very popular with East Coast EME enthusiasts.

While good antenna height is important, the biggest concern is to get above the local terrain. This includes trees and buildings in the neighborhood.

### Preamps

I have participated in roundtable QSOs that have gone on the better part of an evening discussing the benefits of receiver preamps, including the issues of mast mounting vs. in the shack; GaAsFet vs. Mosfet; and hard keyed vs. RF sensed switching. Everyone has an opinion, here are mine.

All of the 2M multimode transceivers that I have owned, and that is quite a few, have benefited significantly from additional preamplification. In most cases up to 20dB gain does not seem to be excessive. How much external gain is too much is a debatable question and must be determined by experimentation using the preamp and transceiver in question.

My experience after numerous weak-signal tests has shown that even some very expensive transceivers benefit from a good external GaAsFET preamp. These can be either stand-alone units, built into external transmitting amplifiers, or mast mounted units. The optimum location is at the antenna feed point. This location will optimize the signal-to-noise ratio of the signal received at the preamplifier's input. But mounting the preamplifier at the antenna feed complicates installation. Additional connectors introduced in the feedline are exposed to weather and makes the antenna system more susceptible to failure if water enters the feedline.

A second problem is that power must be available at the antenna for the amplifier. This is provided either by an external 12V power cable or, in some cases, a provision is made by the manufacturer to run the power up the feedline center conductor, eliminating an additional cable. The Landwehr 2M preamplifier I use required an external powerline. Additionally my power ca-

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ble has a line to key the amplifier during transmission rather than rely on the amplifier's internal RF sensing circuit to perform the switching. Depending on the manufacturer's designs, when transmitted power level exceeds a few hundred watts a hard keyed line must be used to switch the remotely located preamplifier from receive to by-pass to prevent burnout.

I found mast mounting to be beneficial, though only marginally so on 2M. The decision to mast mount or not is a function of your feedline loss. If your loss is calculated to be much more than about 1.5-2dB then it may be worthwhile. If your coax run is short (under 75 feet) or hardline is used then you may not notice the difference between mast mounting and having it in the radio room. Due to the location of my shack in relation to my tower location, I have a 160 ft. run but use a very low-loss coax. Comparing the use of my Landwehr mast mounted unit to the GaAsFET unit built into my TE Systems high-power amplifier, the benefit of mast mounting is noticeable but very small. If convenience and price are an issue don't bother to mast mount unless your feedline length is excessive. I'm certain that at frequencies above 2M, such as 420 MHz, the difference would be worthwhile in nearly all cases.

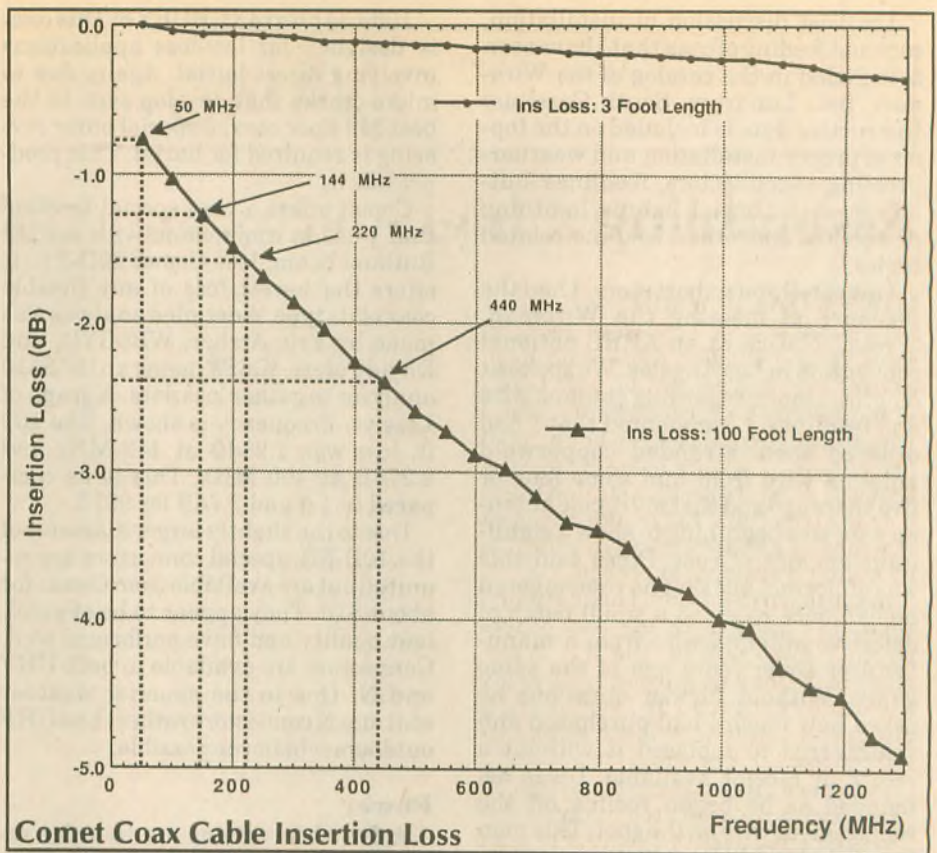
Both of the units I have used, the Landwehr and the TE Systems, are superior preamplifiers and the use of one or the other is a mandatory addition to my Icom IC-275A transceiver. Other MOSFET unit preamps I have tried were not even close in performance.

### Feedline

If you can afford new or can find reasonably priced used hardline, use it. It offers the lowest loss of any feedline type and does not deteriorate as does flexible coax, which can allow water to enter your feed system with the deterioration of the outer covering. But once again there are tradeoffs to be considered. My experience with 9913 coax and Comet D-10 coax has been excellent. Even with lengthy runs (160 feet) losses have been manageable.

Flexible coax over a period of years will deteriorate. This deterioration begins the day the coax is manufactured, not when you install it. Beware of the swapmeet specials; coax sold here may never have been installed but may be quite old and well into deterioration.

With age the outer jacket forms micro-cracks, allowing water to enter. Normally the effects of this deterioration is slow and subtle. Under normal use you may not even notice the gradual degradation of the feedline unless test equipment is used to record bench-



Comet Coax Cable Insertion Loss

mark loss and impedance measurements. After five to 10 years, however, the losses of flexible coax can hinder top

performance. Be prepared to replace coax after a few years if you want it to keep its edge.

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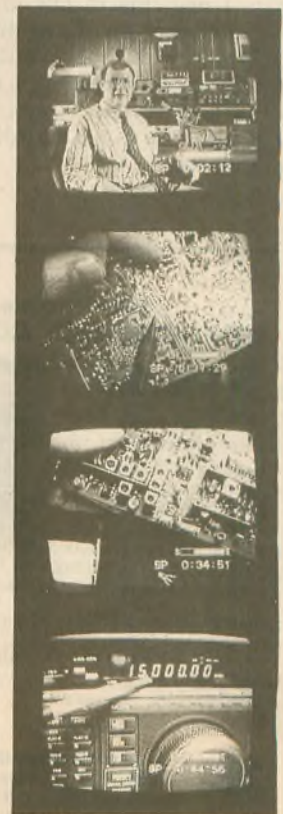
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The best discussion of installation, care and feeding of coax that I have seen is included in the catalog of the Wireman, Inc., Landrum, South Carolina. Instructive data is included on the topics of proper installation and weather-proofing of connectors, feedlines suitable for direct burial, baluns, lightning protection and other feedline-related topics.

I must tell you a short story. I had the pleasure of meeting the Wireman, "Press," N8UG, at an ARRL national convention in Los Angeles. We spoke at length on topics regarding antenna wire and feedlines. I commented that I had ordered some stranded copperweld antenna wire from him some four or five years ago and that my dipole antenna wire was beginning to show a significant amount of rust. Press said this was abnormal but that he remembered he had once received a small batch of defective antenna wire from a manufacturer some years ago of the same gauge. Without further questions he asked how much I had purchased and volunteered to replace it without a record or receipt available. I was astounded as he began reeling off the replacement wire on the spot. This man stands behind his products.

The Wireman offers two coaxes with special properties worth discussing:

**102-CQ Flexi 4XL IIA:** This coax is similar to 9913 but has a multi-strand center conductor, offering superior flexibility. I use this in low-loss applications involving feedlines subjected to rotor movement. Solid center conductors may break with enough movement. While I have not experienced this problem myself, the use of a multi-strand is good insurance.

**103-CQ Flexi 4XL BURY 8:** This coax is designed for low-loss applications involving direct burial. Again, due to micro-cracks that develop even in the best Mil Spec coax, a special outer covering is required for burial. This product has it.

Comet offers a very special feedline that I use in conjunction with my 2M Rutland beam. It is Comet 10D-FB. It offers the lowest loss of any flexible coax of its type. A detailed analysis was made by Eric Archer, WB6GYD, and David Peters, K16FF, using an HP 8510 analyzer to gather loss data. A graph of Loss vs. Frequency is shown. The 100 ft. loss was 1.28dB at 149 MHz and 2.27dB at 400 MHz. This is as compared to 1.6 and 2.7dB for 9913.

Due to the slightly larger diameter of the 10D-FB, special connectors are required but are available from Comet for about \$10. They appear to be of excellent quality and have performed well. Connectors are available in both UHF and N. Due to the superior weather seal, use N connectors rather than UHF outdoors whenever possible.

### Power

A few observations are in order regarding the use of high power in this application.

On high frequency bands, high power is generally unnecessary for most contacts. In fact, for the majority of contacts high power is a poor idea due to the crowded band conditions. The rules change on 2M SSB. The bands are generally not crowded (except during contests), and the use of more than your transceiver's original 10-25W is welcomed by the station at the other end of your 100 to 400-mile path. In fact it is

probably going to be required.

On the West Coast, with most of us living in valleys, additional power is a must. I normally run 400W with a solid-state amplifier. The overall performance of my station improved significantly when I traded my 150W amp for the larger one.

### Conclusions

You will have noticed that I have not even addressed different transceivers. Any of the better solid-state units that have been manufactured in the last 10 years will give excellent performance. Never have I heard any reasonable argument that suggests one brand will perform where another will fail to make the contact if you properly attended to the items such as preamps, antennas, feedlines and sufficient power.

I have tried to pass along a few ideas and observations that have made 2M SSB DXing work for me. These stations don't assemble themselves and it has taken a serious investment of time to attend to the smaller details that have made the difference. I hope you enjoy the satisfaction of working DX stations that only a high-performance station will allow.

### Manufacturers list:

Rutland Arrays, 1703 Warren St., New Cumberland, PA 17070; 717/774-5298 7p.m. to 10 p.m. EST

The Wireman, Inc., 261 Pittman Rd., Landrum, SC 29356; 800/727-9473

NCG Companies (Comet), 1275 North Grove St., Anaheim, CA 92806; 714/630-4541

M<sup>2</sup> Enterprises, 7580 N. Del Mar, Fresno, CA 93711 WR

## Pennsylvania plates

### DAVID L. HELLER, K3TX

Several changes in the Pennsylvania call sign license plate program are in process following a recent conference with the director of the DMV and Steve White, WA3IAO, and Dave Heller, K3TX.

The legend is being changed to "AMATEUR RADIO." The "slash-zero" die is to be used for zero-calls.

The prohibition of more than one call plate per amateur is to be removed, with "W3XXX-2," etc. with the Amateur Radio legend to be available. Additionally, changes in the procedure for obtaining the call plates are probable to simplify the process, reduce costs and avoid errors.

It is suggested that Pennsylvania amateurs wanting to obtain plates contact K3TX at P.O. Box 224, Morrisville, PA 19067. WR


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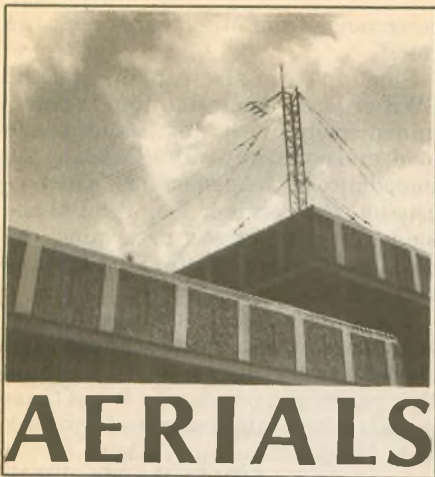
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# AERIALS

## KURT N. STERBA

I'm looking at an advertisement for a vertical antenna that claims 4 to 12dB gain when compared to a 9 ft. whip.

The antenna making the claims is itself a 9 ft. whip, which means, of course, that this 9 ft. whip is vastly superior to any other 9 ft. whip. I know that someone will explain this to me, but I doubt the claim.

I questioned the spectacular gains claimed in another antenna advertisement. Naturally, there was a call to the *Worldradio* offices. The caller said that the claims were true because some antennas work much better than the theory would lead you to believe (as I remember, about 10dB better than a quad, for this 3L Yagi).

This is not the first time that the claim has been made that some antennas work better than you'd imagine. The other time, also, the offer was made that a rebuttal to my article would be welcome. Neither time has such an answer been sent in.

Now, while hammy operators may think it's a big deal when they pop for \$20 to get the *ARRL Antenna Book*, there are others who pony up \$75 for a book one-tenth the size of the *ARRL book*. There are antenna books that cost \$100!

Now I've got one particular book that is so thick that if I dropped it it would probably just kill Ol' Blue, who is sitting here while I put these words down on my Remington. Believe me, nowhere in any professional-level book does it talk about antennas that work better than the theory behind them.

Nobody with fud after his name has ever made such a claim. I'd wager a pint of Jack Daniels on that. Anything about an antenna can be proven, or disproven, before it is ever built, mathematically. And, nobody has any more radians to work with than anybody else. Sure you can say the winner of such and such contest used this antenna. Yes, but what did the winner of that contest

use before there was this new marvel antenna?

Oh, me. Here are data sheets. 3L Yagi on an 18 ft. boom: 11dB over a dipole. That's when the Yagi is 70 feet above ground (adding in the ground reflection). Chee, I wonder what it is at 140 feet? Or if the antenna is over salt marsh?

I'm thinking that if they put their antenna up on a 70 ft. tower to measure it, why didn't they put up some other company's Yagi on another 70 ft. tower so we could have a real switch-back-and-forth contest and then they'd have some really valid claims to make.

Then I read it all again, a little closer. This is all in a computer, calculated gain. OH!

There is another company I know of that actually drags their Yagis out to a range, hauls them up the towers and measures them. That is called REALITY. There's a lot of flat land in Nebraska.

Believe me, if anyone ever wrote an article about how (with real proof) an antenna worked better than it should, I would be the first one to urge that it be printed. Should you write such an article please leave out the facts that you flunked junior high math, are also working on a perpetual motion machine and that the idea for your antenna was given to you by Martians as they whisked you to Venus in their faster-than-light space roadster. Also, do not mention that Elvis invested the R&D money in your company last week.

I see in a catalog a 10M 2L Yagi with a boom about .13 WL that claims: "Gain: better than 6dB." While a one S-unit improvement is indeed worth \$99.50, this won't do it. First, a 2L Yagi is doing a great job if you get 4dB gain. What this company has done is add in the isotropic gain (2.1) to give you the "better than 6dB."

Lil promised last month to bring some dimensions for a 3L wire 10M Yagi you could hide in the rafters of your garage.

The reflector is 17 ft., 10-7/8 in.

The driven element: 16 ft., 8-7/8 in.

The director is 15 ft., 6-5/8 in.

The boom Length is 6 ft., 11-1/8 in.

The driven element from reflector distance is 3 ft., 4-7/8 in.

Gain will be about 6dBd with a front-to-back ratio of about 15dB.

While a smidge more gain and a tweak more F/B would have been possible, this was designed for maximum bandwidth and ease of matching! Nothing fancy needed. Just cut the driven element right in half and attach your 50-ohm feedline.

Depending on whether your garage is over dry and cracking Oklahoma earth or a North Carolina bog there may have to be some minor tweaking. Any SWR under 1.5:1 means nothing. WR

(Kurt goes by his hideaway name so people will not come by his antenna factory and find Judge Crater and Amelia Earhart stuffing the instruction manuals into the shipping boxes.)

...

## Letters to Kurt

Perhaps you and *Worldradio* could sponsor an antenna competition, in the spirit of the old Bendix Trophy air races. You could offer a substantial prize (e.g., a lifetime subscription to *Worldradio*, or maybe Oregon) for anyone presenting an antenna design using no more than 10/8 wavelengths of wire which, on a real test range, will produce 8.7dBi or more.

Perhaps a more useful vehicle would be an annual competition, monitored by people like Roy Lewallen and Walt Maxwell, in which the highest gain antenna design presented wins the "Sterba Trophy." The design would be limited to some specific amount of radiator (e.g., 10/8 wavelengths). Such a competition could go a long way toward diminishing the stupid claims we keep reading. If the Sterba Trophy was awarded last year for 6.2dBi it would

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YOC and NEC/Yagis require a math coprocessor; MN and YO come with both coprocessor and noncoprocessor versions. All except AO run on any IBM PC compatible with graphics. All programs include extensive documentation. Add 7.25% CA, \$5 overseas. Visa, MasterCard, U.S. check, cash, or money order. 3.5" or 5.25" disk.

Brian Beezley, K6STI  
507 1/2 Taylor, Vista, CA 92084  
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help someone claiming 8.7dBi look very foolish.

Please keep up the good work.  
**ED FARMER, P.E., AA6ZM**

...

My hand-held has always operated very well, so I thought I would check the rubber ducky for gain.

Using my station receiver for a rough check, I found that the ducky has a gain of 30dB. Look again. With the ducky I read 40 over 9! With the D (capital D for Dummy) I read 10 over 9. That comes to a rough 30dB.

If you would like a more accurate measurement, I can take the hand-held outside the ham shack.

Keep up the good work, O GREAT DEBUNKER!

**ROBERT S. HOPKINS, K6MUP**

...

I look forward to your articles each month, and I am glad to cheer you on as you debunk some of the claims made by antenna companies, and other false data presented in ham magazines.

I shudder when I see some of the stuff being presented to the eager readers of *Worldradio* by unknowing authors.

The most recent example is an article which discussed several topics, but when referring to a situation where a transmatch was used to lower an SWR in the shack, said, "While you can achieve a good match in this configuration, the coax line does most of the radiating and the field strength goes down proportionately."

Whoa! Hold on a minute! Don't you feel compelled to explain to your readers that the SWR "in" a coax transmission line or, for that matter, the SWR "on" an open transmission line doesn't cause the line to radiate? Or, that any small amount of radiation that does occur is caused by something else, like induced antenna currents, or maybe the antenna current which can flow on the outside of the coax shield if a balun is not used?

In the next paragraph the reader is advised that "obviously the random wire tuner belongs at the base of the antenna 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 tuner where it is then radiated by the antenna to the other stations efficiently. A side benefit is an improvement in receiver noise, as the coax transmission line does not act as an antenna to re-

ceive noise from other wires near the coax."

Shouldn't you also explain that the SWR on a transmission line is determined solely by the impedance of the load, and not in any way affected by the impedance of the generator? When receiving, the receiver front end is the load and its impedance determines the SWR, not the impedance of the antenna which is now the generator.

I read and enjoy all the articles in *Worldradio*, and most of the data presented is very instructive. I do think that you might point out a few of these pitfalls, which might sidetrack the reader in his quest for knowledge.

**JACK PRITCHARD, WR3R**

## Hamventure events

Dr. D. Kent Cullers, WA6TWX, will be the keynote speaker at Hamventure '93, the ARRL Southwestern Division Convention to be held 17-19 September in Ventura, California. The keynote address will be delivered at the convention banquet, Saturday night, 18 September at the Ventura Holliday Inn.

A licensed ham operator since 1961, Dr. Cullers shares the fascination thousands of other radio hobbyists share, that is, receiving signals sent over long distances. That makes him right at home as part of NASA's Search for Extra Terrestrial Intelligence (SETI) project. His keynote address will combine both passions, sharing some of his observations on the NASA efforts with an audience of avid Amateur Radio operators.

Dr. Cullers is a leading expert in electronics and research engineering. He is presently Signal Processing Subsystem Manager and Mathematician at NASA Ames Research Center, supervising the development of hardware and software for signal detection in NASA's SETI project. He has been involved with the SETI project since May of 1980. Dr. Cullers is the author or co-author of many scholarly works in the field of radioastronomy.

Dr. Cullers' address may bring new meaning to "DX," as the SETI project will attempt to identify signals that have traveled not thousands of miles, but many light-years! In short, if E.T. is attempting to phone us, NASA'S SETI team doesn't want to miss the call.

Also featured at Hamventure '93 will be a day-long workshop on digital signal processing (DSP) to be held on Friday, 17 September and conducted by Jon Bloom, KE3Z. Jon is the ARRL's senior engineer and editor of

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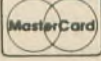


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*QEX*, the ARRL magazine for experimenters.

According to Marc Holzer, N6UNX, chairman of the convention, few subjects have captured the attention of amateur operators who use the HF bands, as has DSP. "DSP will eventually revolutionize the hobby," he said. "It is the next logical step for-

ward in refining the way we process information that is transmitted and received. We are very pleased and excited to be presenting this forum as a part of Hamventure '93."

The DSP workshop will cover DSP development to applications. Topics covered include a DSP technical orientation and Amateur Radio applica-

tions for DSP, with specifics on signal generation, demodulation and specialized filters.

Tickets for Hamventure '93 may be obtained by writing: Hamventure '93, P.O. Box 3000-267, Santa Barbara, CA 93130. Tickets for the banquet featuring Dr. Cullers are \$30 per person. WR

## Cheap and easy antenna launching

COLIN NEAL, N3LCU

I have discovered through reading and experimentation that I can cheaply and easily get my wire antennas as high as 70 to 80 feet up into the trees at my place.

For equipment I use a simple slingshot (about \$8), a 500 yd. roll of 12 lb. monofilament (\$2), some 3/4 oz. lead sinkers (\$1), and an empty five-gallon bucket or cardboard box (free).

Wait for a sunny day with little or no wind. Sun makes the line easy to see; wind can get it hopelessly entangled in the tree branches. Tie a sinker to the monofilament and pull off about 100 feet of line. Put the spool in the bucket and feed in the line. Just drop the line in the bucket; it will tend

itself without becoming tangled.

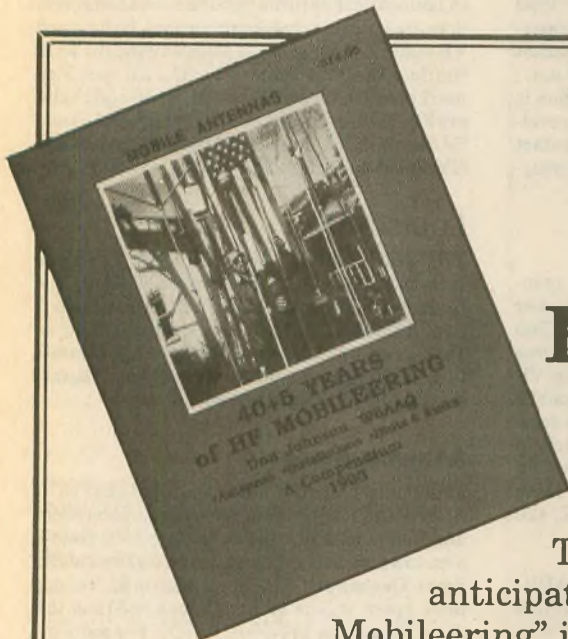
Place the sinker in the slingshot and aim just above the desired support branch. A hefty pull on the slingshot will launch the sinker and line as high as 70 or 80 feet. If you miss, pull the line down and feed it back into the bucket as before. You can break the sinker off by pulling hard if it's stuck in the tree (that's why you need to buy several sinkers), but get behind another tree when you do so — otherwise, you may hit yourself with the sinker.

Once you're over the desired branch, pull more line off the spool and lower the sinker to the ground. Attach a feeder line to the monofilament, hoist

the feeder line over the branch, and then use that feeder line to hoist your antenna wire (the 12 lb. test monofilament is not strong enough to haul up most antennas).

Try it — it's cheap and easy and it has worked great for me. One warning: Never shoot in a direction where a loose sinker could hit someone. With a real hefty pull, or a tangle of line coming out of the bucket, you can break the sinker loose from the line, making it a potentially dangerous flying projectile.

I tried using an inexpensive closed-faced spinning reel to tend the line, but the friction in the system would seldom let me loft a sinker higher than 30 or 40 feet. I found that the "bucket" system of line tending was cheaper, faster and more efficient. WR



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## Arizona

**THE FAMILY AMATEUR RADIO EVENT** on 19 September 1993 begins at 10 a.m. at Rawhide, north of Scottsdale, and is sponsored by 13 local Amateur Radio clubs of Phoenix. Features include an all-day swapmeet, working stations, ATV, packet radio, contests, food, hay wagon rides, clowns, kids' face painting, RACES van seminars, AMSAT, exhibits, raffles, unique QSL exhibits, straight key demo and commercial exhibits. Admission is \$1 in advance or \$2 at the gate; \$2 parking, \$5 tailgate. Talk-in frequency is 146.76. For more information write to FARE, P.O. Box 9219, Phoenix, AZ 85068.

## California

**ARRL 1993 SOUTHWESTERN DIVISION CONVENTION** is having their Hamventure '93 in the Commercial Building of the Ventura County State Fair Grounds on 17-19 September 1993. (See "Hamventure Events," p. 64 this issue.) For more information contact Gregory T. Lane, K7SDW, 3970 Coronado Circle, Newbury Park, CA 91320. Call Monday through Friday before 5 p.m. at 805/499-7223 ext. 777 (voice) or ext. 431 (FAX); after 6 p.m. call 805/498-0454.

**RIVER CITY ARCS and CSU-SACRAMENTO RADIO CLUB** will be sponsoring a swapmeet on 25 September 1993 from 7 a.m. to noon in the north parking lot at California State University off US 50 at Howe Ave. exit. Features include a pancake breakfast and refreshments. Swapmeet sellers, \$5; buyers, free. Talk-in on 145.25 and 145.230 both -dup with PL of 162.2. Contact Gary Webbenhurst, KC6URB at 916/381-6602, evenings, for more details.

**THE KINGS AMATEUR RADIO CLUB** is sponsoring a swapmeet and T-hunt on 3 October 1993 starting at 8 a.m. at the Hanford Fraternal Hall. Features include door prizes, tri-tip barbecue and t-hunt. Seller's fee is \$5, buyers get in free. Free RV parking. Talk-in on 145.11(+), 147.33(+), 224.44 or 441.900. For more information contact Rick, WB6VFZ at 209/945-2266 or 583-9377.

**THE LIVERMORE AMATEUR RADIO CLUB** is sponsoring the East Bay Area Radio/Electronics/Computer Swap Meet on 3 October from 7 a.m. to noon at Las Positas College. Features include covered spaces in the event of rain, refreshments and free parking. Admission is free. Sellers pay \$10 space fee. Talk-in on 147.045(+), 145.350(-) PL 100 Hz from the east. Contact Noel Anklam, KC6QZK, at 510/447-3857 evenings or leave message at 510/783-2803.

## Georgia

**THE DALTON ARC INC.** will host a late-sum-

mer free ham/swapfest on 11 September 1993 starting at 8 a.m. at the Historic Praters Mill seven miles north of Dalton. Talk-in on 145.230 - or 147.135(+). Soft drinks and snacks will be on site. Bring your own table or tailgate. For information call Richard, KB4MJW, at 706/226-2583.

## Illinois

**THE BOLINGBROOK AMATEUR RADIO SOCIETY** is holding its annual hamfest and computer fair on 12 September 1993 at the Inwood Recreation Center, in Joliet. VE examiner test session for all Amateur Radio license categories will be conducted from 9 a.m. to noon. Refreshments are available. Admission is \$4 in advance, \$5 at the gate. Gate opens at 8 a.m. (6 a.m. for dealers) with hourly drawings for door prizes. Call 708/739-9309 for more information.

**THE PEORIA AREA AMATEUR RADIO CLUB** will sponsor Peoria Superfest on 18-19 September 1993 at the Exposition Gardens, Northmoor and University Streets, Peoria. Features include manufacturer representatives, a huge outdoor flea market, indoor vendors, ladies' activities, FCC license exams, food and prizes. Admission (good for both days) is \$5: two prize stubs with advance tickets; one prize stub with tickets at the gate. Youth under 16 enter free. Talk-in on 146.76 repeater. For information send SASE to The Peoria Area Amateur Radio Club, Box 3508, Peoria, IL 61612-3508; or call the club answering service at 309/685-6698.

**THE SANGAMON VALLEY RADIO CLUB** will hold the New Berlin Hamfest at the Sangamon Co. Fairgrounds on 26 September 1993 from 8 a.m. to 1 p.m. Features include commercial dealers, free flea market, food service, packet BBS meeting, VE testing from 8 to 9:30 a.m., overnight parking (no hook-ups). Admission is \$5. Indoor tables \$10. No outdoor tables provided. Talk-in on 147.315(-) and 224.68(-). Contact Don Pitchford, WD9EBK, RR#1 Box 104, Springfield, IL 62707; 217/789-4519.

## Indiana

**THE HUNTINGTON COUNTY ARS** is sponsoring its fifth annual hamfest on 3 October 1993 at the PAL (Police Athletic League) Club in Huntington from 8 a.m. to 2 p.m. Features include an indoor flea market, free parking, VE testing, and the building is handicap accessible. Admission is \$3.50 in advance or \$4 at the door. Vendor 8 ft. tables are available for \$5 each on a first-come first-served basis. Talk-in on 146.085/685 and 448.975/443.975. For more information contact Ray Tackett, KC9DZ, 420 Market St., Andrews, IN 46702.

**THE WABASH VALLEY AMATEUR RADIO ASSOCIATION, INC.** will sponsor the WVARA Homecoming Hamfest on 2 October from 7 a.m. to 4 p.m. at the Clay County 4-H Fairgrounds in Brazil. Features include indoor flea market, VE

testing (10 a.m.), 2M T-hunts, door prizes, bingo and breakfast and lunch available. Admission is \$5; vendor tables \$5 each. Talk-in on W9UUU 146.85 or 444.35. For further information write to WVARA Hamfest, P.O. Box 81, Terre Haute, IN 47808; or call Keith Reedy, 812/466-3134 or 466-4899.

## Kansas

**THE KANSAS STATE ARRL HAMVENTION** will be held 24-26 September 1993 at the Ramada Broadview Hotel in Wichita. Features include ARRL/VEC testing, forums, flea market, commercial vendors and a banquet on Saturday. Contact Len Warren, NØQHZ, 6233 Millsboro, Wichita, KS 67219-1637.

The 10-10 CONVENTION is being held in conjunction with the Kansas State ARRL Convention, which will provide 10-10 members the additional benefit of attending all of the ARRL Convention activities, workshops, forums and programs on 25 and 26 September 1993. Features include a forum at 10 a.m. on Saturday, 25 September, and a 10-10 banquet is scheduled for Saturday night. For a registration form and additional convention information, send an SASE (#10) to Ed Redwine, K5EJR, #11843, convention chairman, 9 Yellowrose Lane, Augusta, KS 67010.

## Kentucky

**THE ARRL KENTUCKY STATE CONVENTION and GREATER LOUISVILLE HAMFEST** will be held on 2-3 October 1993 beginning at 8 a.m. at the Commonwealth Convention Center in Louisville. Features include commercial vendors, flea market, ladies' programs, forums and VE testing. Admission is \$6 in advance or \$8 at the door; children under 12 admitted free. Flea market spaces are \$12., tables are \$6 and chairs are \$2. Talk-in on 146.88. For information send SASE to GLHA, P.O. Box 34444-W, Louisville, KY 40232-4444; 502/551-4118.

## Louisiana

**THE ASCENSION ARC** will hold "Gonzales Hamfest '93" on 18 September 1993 at the Gonzales Recreation Center from 8 a.m. to 3 p.m. Admission is \$3. Vendor set-up at 7 a.m. Talk-in on 147.225(+), CTCSS 107.2. Contact Wayne Russell, 40390 Sycamore Ave., Gonzales, LA 70737; 504/622-3964.

## Massachusetts

**THE SOUTHEASTERN MASS AMATEUR ASSOCIATION** will hold their annual hamfest and flea market on 12 September 1993 from 8 a.m. to 3 p.m. at the club grounds, 54 Donald St., South Dartmouth, MA. Admission is \$2. Vendor table space will be \$8 in advance or \$10 at the door. Talk-in on 147.000/147.600. For more information contact Michael Enos, P.O. Box 79064, North Dartmouth, MA 02747.

## Michigan

**THE L'ANSE CREUSE ARC 21st annual Swap and Shop** will be held on 19 September 1993 from 8 a.m. to 2 p.m. (EDT) at the L'Anse Creuse High School, Mt. Clemens, MI. Features include inside tables, outside trunk sale spaces, refreshments and snacks. VE exam sessions at 11 a.m. (contact Don Olszewski, WA8IZV, at 313/294-1567). Admission is \$3 in advance, \$4 at the door. Inside vendor tables \$10. Outside

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trunk sale space at \$4 per space upon arrival at swap. Vendor set-up at 6 a.m. Talk-in on 147.08/.68 MHz or on 146.52 MHz. Contact Ted MacKinnon, NW8W, 19534 Warwick, Beverly Hills, MI 48025-3970; 313/647-1628.

THE ADRIAN ARC will hold their 21st annual Hamfest/Computer Show on 26 September 1993 at the Lenawee County Fair Grounds from 8 a.m. to 2 p.m. Features include VE testing (walk-in), inside table sales and outside trunk sales. Admission is \$4 in advance and \$5 at the gate. Vendor set-up time after 5 a.m. Talk-in on 145.370. Contact Dennis Boydston, WE8Z, 2383 E. Clearview Dr., Adrian, MI 49221; 517/265-8054.

## Missouri

THE OZARKS ARS will hold its annual picnic and swapfest on 12 September 1993 from 8 a.m. to 2 p.m. at the Monett City Park. Features include free tailgating space, free parking, playground facilities, non-ham events and a potluck lunch. Admission is free. Talk-in on 146.97/146.52. Contact Gary Meyers, 1201 S. Madison, Aurora, MO 65605; 417/678-3376.

THE ST. PETERS ARC swapfest will be held 26 September 1993 at the St. Charles County Community College rear parking lot from 7 a.m. to 1 p.m. Features include flea market, food and refreshments. Admission is \$1 per person. Flea market space is \$3 and includes one admission. Talk-in on 145.41 MHz and 444.275 MHz. Contact Walt Franzer, WXØC, 1333 Pegasus Trail, St. Peters, MO 63376; 314/278-1993.

## Nebraska

AK-SAR-BEN ARC, INC. is sponsoring their fourth annual fall flea market on 19 September 1993 from 8 a.m. to 1 p.m. at the Millard Social Hall in Omaha. Features include free admission, free parking and free coffee. Donuts are available. Tables are \$4 each. Consignment table available. No tailgating. Talk-in on 146.34/94. Contact Ken Noel, AJØA, 402/592-2338 after 7 p.m.

## New Jersey

THE CHERRYVILLE REPEATER ASSOCIATION II will sponsor the Flemington Fallfest on 11 September 1993 from 8 a.m. to 2 p.m. at the Warren County Fair Grounds, Route 519, Harmony. Features include indoor/outdoor flea markets, VE exams, QSL card checking for DXCC, WAS and VUCC. Food, refreshments, handicapped facilities and free parking. Admission is \$5. Talk-in on 147.375(+) and 146.820(-). For more information contact Keith Burt, KF5FK, P.O. Box 308, Quakertown, NJ 08868-0308; 908/788-4080.

## New Mexico

THE ALAMOGORDO ARC will hold their ninth annual hamfest on 3-4 September 1993 at the Otero County Fairgrounds from 3 p.m. to 9 p.m. on Friday, and from 8 a.m. to 2 p.m. on Saturday. Features include no-host banquet on Saturday, air conditioned facilities, ample parking, handicapped parking, free RV (dry) parking, overnight in-building security, dealers and swap tables. VE testing at 9 a.m. on Saturday for all classes of license; contact Ole Jorgensen, WA5IPS, 505/437-5896. Admission at the door is \$6. For hamfest informa-

tion, contact Bill Leehan, N5SUM, 505/437-9781.

THE NORTHERN NEW MEXICO ARC will sponsor a hamfest on 18 September 1993 from 8:30 a.m. until 4 p.m. at the Glorieta Baptist Conference Center, 16 miles southeast of Santa Fe. Features include prizes, VHF contesting, forums, free parking, and arts and crafts displays for the ladies Coffee and donuts will be available, and other food and drinks, including a pot luck, will be served elsewhere on the grounds. Contact Bonnie Griffiths, KDØJQ 505/662-9155 for information on ARRL VEC exams for all license classes. Admission is \$5 in advance and \$6 at the door. Swap tables are \$5. There will be no tailgating. Talk-in on 146.52, 145.19(-), or 147.30(+). Contact Helenrose Burke, W5IXS, P.O. Box 73, Ojo Sarco, NM 87550.

## New York

THE ELMIRA ARA will hold their 18th annual Hamfest-Computerfest on 25 September 1993 from 6 a.m. to 4 p.m. at the Chemung County Fairgrounds in Horseheads. Features include pancake breakfast, free flea market, FCC exams at 9 a.m., dealer displays, door prizes, free parking, refreshments, QSL contest, camping (\$12 for hook-up) and a bunny hunt. Admission is \$3 in advance and \$4 at the door. Talk-in on 147.96/36 or 444.20. Send SASE to Dave Lewis, 465, CR 13, Van Etten, NY 14889; 607/589-4523 for more information.

THE METRO 70CM NETWORK will sponsor their Giant Electronic Fleamarket on 26 September from 9 a.m. to 3 p.m., rain or shine, at Lincoln High School. Features include hourly prizes, free coffee, free parking, free radio tune up, food and refreshments. Admission is \$5; youth under 12 admitted free. Vendor tables are available at \$10 for the first and \$15 each additional in advance; \$12 each at the door. Set-up at 7 a.m. Talk-in on 440.425 PL156.7, 146.910/146.310, 223.760/222.160 PL 67.0. For further information contact Otto Supliski, WB2SLQ, 914/969-1053.

THE HALL OF SCIENCE ARC, INC. will sponsor a hamfest on 3 October 1993 from 9 a.m. to 3 p.m. at the New York Hall of Science parking lot in Flushing Meadow Park. Features include commercial dealers, tune up clinic, computers and parts, door prizes, food, refreshments, and free parking. Admission by donation is \$5 for buyers and \$10 per space for sellers. Vendor set-up time is 7:30 a.m. Talk-in on 444.200 or 146.52. Contact Arnie Schiffman, WB2YXB, 81-22250th St., Bellerose, NY 11426; 718/343-0172 evenings only.

## Ohio

THE FINDLAY RADIO CLUB is having its 51st annual hamfest 12 September 1993 starting at 8 a.m. at the Hancock County Fairgrounds in Findlay. Features include Buckeye Beles, ØSS-

BN, Mad River and an Icom hand-held will be awarded every hour of the hamfest. Admission is \$4 in advance and \$5 at the gate. Vendor cost is \$8 for inside tables and \$5 for trunk sales. Vendor set-up times are Sat. 3-9 p.m. and Sun. 6:30 a.m. Tables held until 9 a.m. Talk-in on 147.75/.15 and 449.15/444.15. Contact the Findlay Radio Club, Box 587, Findlay, OH 45839; 419/423-1440.

THE GREATER CINCINNATI AMATEUR RADIO ASSOCIATION will sponsor the Cincinnati hamfest on 19 September 1993 from 8 a.m. to 5 p.m. at the Syrian Shrine Oasis, I-275 at exit 54. Features include commercial dealers, indoor and outdoor flea markets, free parking, handicap parking, ARRL forum and representatives, Hurricane Air Show Team, hidden transmitter hunt, prizes, food, refreshments and donuts. ARRL VE exams on 18 September at 9 a.m. (pre-registration required—phone 513/574-1653. Admission is \$6 in advance; juniors under 12 enter free. Vendor set-up time is 1 p.m. on 18 September. Talk-in on 145.19, 145.37 and 146.88 MHz. For more information contact John Haungs, WA8STX, c/o GCARA, 10615 Thornview Dr., Cincinnati, OH 45241-2709; 513/563-7373.

THE HAMFEST ASSOCIATION OF CLEVELAND, INC. is holding a hamfest and computer show 26 September 1993 from 8 a.m. to 4 p.m. at the Cuyahoga County Fairgrounds in Berea. Features include technical forums and non-ham activities. VE exams will be administered early. Admission is \$4 in advance or \$5 at the gate. Tables are \$15 inside, \$4 outside flea market. Set-up time is 6 a.m. Talk-in on 146.73. Contact CHA, P.O. Box 81252, Cleveland, OH 44181-0252.

THE INDEPENDENT RADIO ASSOCIATION will be holding its annual Springfield, Ohio, hamfest and computer show on 3 October 1993 from 8 a.m. to 4 p.m. at the Clark County Fairgrounds. Features include ARRL forum, packet forum, DX forum, hourly door prizes, two major prizes and all vendors and flea markets are indoors. Admission is \$5 (\$4 in advance) with children under 12 admitted free. Tables are \$10 (\$8 in advance). Talk-in on 145.45 and 224.26 MHz. Contact the Independent Radio Association, P.O. Box 523, Springfield, OH 45501 (SASE) or call Carl Patterson, KA8LGS, at 513/323-6680.

RADIO ASSOCIATION OF ERIE, INC. will sponsor a hamfest on 11 September 1993 from 8 a.m. to 2 p.m. at the Franklin Township Firehall, west of Erie. Features include prizes, tailgating, free porter service, QSL drawing and Great Erie Ox Roast. VE exams at 9 a.m. at Franklin Center Methodist Church, Rt. 98, one mile north of hamfest. Admission is \$4. Vendors must have admission ticket; tables are \$8 each. Set-up time 5:30 a.m. Talk-in on 146.01/61. Contact Tom McClain, N3HPR, 3954 Solar Dr., Erie, PA 16506; 814/833-1640.

## Pennsylvania

THE UNIONTOWN AMATEUR RADIO CLUB, INC. will hold its 44th annual GABFEST on 11 September, 1993 from 8 a.m. to 4 p.m. on the clubhouse grounds. Features include free coffee until 11 a.m., prizes and grabbag giveaways. Admission is free. Vendor space is \$10, set-up time is 7 a.m. Talk-in on 147.045(+) or 147.255(+). Contact Dr. Antho-

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ny S. Pyzdrowski, N3JZN, 15 Hatfield Lane, Uniontown, PA 15401; 412/437-8819.

COLUMBIA MONTOUR ARC is sponsoring a hamfest/computerfest on 18 September 1993 starting at 8 a.m. at the Beach Haven Carnival Grounds. VEC testing at 1 p.m., advanced registration only. Admission donation is \$3, XYL and kids under 12 free. Tailgating is \$1 per 8 ft. space plus general admission. Talk-in on 147.225(+600) or 146.52. Contact Dave, WC3A at 717/752-6851.

THE 38TH YORK HAMFEST and COMPUTER SHOW will be held 25-26 September 1993 from 8 a.m. to 4 p.m. at the York Fairground on Rt. 74, Carlisle Ave. in York. Features include commercial exhibitors, manufacturers, computer and software vendors, food, free parking, handicapped parking, VE exams on Saturday at 9 a.m. Admission is \$4. Inside vendor tables at \$35 center, \$40 on wall both days with electricity. Vendor set-up time is 6 a.m. Call 717/764-4805 for tables only. Tailgating spaces at \$4 each plus admission. Talk-in on 146.37/97. Contact York Hamfest, P.O. Box 351, Dover, PA 17315.

## Virginia

THE DANVILLE-SOUTH BOSTON HAMFEST will be on 25 September 1993 at the National Guard Armory in Danville. VE exams will be given on a pre-registration basis. For more information, contact Bonnie Manasco, AB4KO, 2107 S. Boston Road, Danville, VA 24540; 804/822-6070.

THE TIDEWATER RADIO CONVENTIONS, INC. will sponsor the 18th annual VA Beach Hamfest and Computer Fair, ARRL Virginia State Convention and Popular Communications SWL Convention on 2-3 October 1993 beginning at 9 a.m. at the Pavillion Convention Center in Virginia Beach. Features include special guests Gordon West, WB6NOA, and Roy Neal, K6DUE; commercial booths and free parking at the doors; banquet on Saturday; and special forums. Admission is \$5 in advance or \$6 at the door. Contact Lewis B. Steingold, W4BLO, 1008 Crabbers Cove Lane, Virginia Beach, VA 23452; 804/486-3800.

## Washington

NORTH KITSAP ARC is sponsoring its second annual Amateur Radio/Electronics Swap Meet and Flea Market on 2 October 1993 from 9 a.m. to 4 p.m. at the Kitsap County Fairgrounds in Bremerton. Features include commercial displays, dealers, ARRL information and bookstore, consignment sales, door prizes and free parking. Admission is \$4 per person. Kids under 12 enter free. Vendor tables are \$12 each and include two free admissions. Commercial space is \$25. Vendor set-up is on 1 October from 6 p.m. to 10 p.m. and 2 October from 6 a.m. to 9 a.m. Talk-in on 145.31(R). Contact North Kitsap ARC, P.O. Box 2268, Silverdale, WA 98383; 206/871-7099.

## Wisconsin

THE MARAC NORTH CENTRAL MINI CONVENTION will be held on 9-11 September 1993 at the Karakahl Inn in Mt. Horeb. The MARAC, or Mobile Amateur Radio Awards Club, appeals to the county hunter enthusiast. For further information send SASE to K9DCJ, 5780 CTH K, Blue Mounds, WI 53517-9713; 608/795-2672.

# CONTESTS

## W7DK Loggers Party

The W7DK Loggers Party sponsored by the Radio Club of Tacoma, in conjunction with the Washington State Salmon Run, will be held during two periods GMT: 1200Z 25 Sept. to 0700Z 26 Sept. and 1200Z-2400Z 26 September.

**Suggested frequencies:** CW—1.805, 3.560, 7.045, 14.060, 21.060, 28.060; phone—1.865, 3.925, 7.260, 14.280, 21.380, 28.380; Novice/Technician—3.700, 7.125, 21.150, 28.160.

**Awards:** Handsome Loggers certificate is available free of charge to any amateur who submits a log of 10 (five if outside the 48 contiguous states) two-way contacts with W7DK members.

**Logs:** Must contain the calls and names of the club members worked, dates of each contact and the applicant's name, call and address. All must be typed, printed or written legibly.

Submit logs to: Logger, The Radio Club of Tacoma, P.O. Box 11188, Tacoma, WA 98411.

## YLRL Howdy Days

This contest will take place from 1400 UTC Wednesday, 8 Sept., to 1200 UTC Friday, 10 September.

**Eligibility:** All licensed women operators worldwide are invited to participate.

**Procedure:** Call "CQ YL."

**Operation:** All amateur bands and modes may be used. A station may be worked only once on each band for contact points. No crossband, net or repeater contacts. The maximum power output that may be used at any time during the contest is 750W on CW and 1,500W PEP on SSB.

**Exchange:** YLRL member or non-YLRL member.

**Scoring:** Score two points for each YLRL member contacted and one point for each non-YLRL member. NO MULTIPLIERS.

**Logs:** Contest logs must show for each QSO the date, time, band and call sign of the contacted station. Logs also must show the QSO number and RS(T) sent and received, and whether contact was YLRL or non-YLRL member. Include your claimed score for each QSO. Please

print or type submitted logs. No carbon copies, but photocopies are acceptable. List your name, call address YLRL status (member or non-member), and your claimed score. For each duplicate contact that is removed by the YLRL vice president a penalty of three additional and equal contacts will be exacted. Logs must be signed and will not be returned. Send logs postmarked no later than October 10 to: Carla Watson, WO6X, 473 Palo Verde Dr., Sunnyvale, CA 94086.

**Awards:** Top scoring YLRL member will receive her choice of YLRL pin, charm or stationery. Top scoring non-YLRL member will receive a one-year YLRL membership certificate.

## First the Sterba Curtain, now . . .

We received a nice new electric blanket for our anniversary. Dual control! Ever see what happens when you get the controls backwards? But what to do with the old reliable yellow electric blanket? It still looks pretty good and, being good Yankees, we must find a use for it.

Gazing at the coiled pattern of wire inside led to an idea — there must be at least 50 feet of wire in there! Pinned it up on the clothesline and gazed some more.

Clipped a couple of leads onto the plug—80M was nothing to write home about but loaded up just fine on 40. Could hear a VE3 calling CQ but a little weak, so rotated the clothesline to beam in on him. An hour later had the VE3 and Wisconsin in the log. Can't wait for summer to go portable at the beach!

—WAIWPR, Maine Slow Speed Net

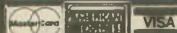


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**NEW PRODUCTS**

Information in "New Products" is supplied by the manufacturers to acquaint *Worldradio* readers with new products on the market.

ware is a Smith Chart simulation program for the IBM PC and compatible computers, but does not require a detailed knowledge of the Smith Chart. *MicroSmith* is a tool for designing matching networks with fixed or variable L-C components, stubmatching sections with transmission lines, etc. It's all done graphically on the computer screen.

Version 2.00 supports frequency-dependent terminations, a powerful feature added with this release of *MicroSmith*. The program also supports many other useful and innovative features such as the conjugate plot mode (displaying the complex conjugate of the actual impedance—useful for a variety of network analysis problems such as determining the matching range of a transmatch), automatic disk storage of the circuit in memory when the user exits the program

with automatic retrieval at the next run, or the user may save any circuit in memory to disk and retrieve it at any time. A step-and-sweep mode for network tuning is featured. The program allows files from other programs (e.g., *SPICE*) to be read and displayed. The program permits manual entry of reflection coefficient data from measurements or from other programs such as *MININEC*, and contains built-in printing routines for Epson and Epson-like printers. It offers 12 pages (screens) of on-line help information.

ARRL *MicroSmith* version 2.00 supports Hercules, CGA, EGA, VGA and Super VGA graphics displays. Required are 272K of RAM and DOS 2.0 or higher. Earlier versions of *MicroSmith* were offered by Hayward Electronic Systems and a limited number of distributors. ARRL *MicroSmith* version 2.00

## Eagleware SuperStar

Eagleware Corporation is shipping Version 4.0 of *SuperStar*, a high-frequency circuit simulator which runs on IBM and compatible personal computers. This fourth-generation program utilizes new and unique analysis algorithms with numeric efficiencies as much as an order of magnitude greater than sparse matrix algorithms. Algorithms include automatic node elimination, element classes, output data classes and model caching. The result is unparalleled circuit design interactivity and speed.

Version 4.0 includes a graphical user interface (GUI) with the flexibility and ease-of-use of modern interfaces, but which operates under DOS 3.1 or later. With the optional *SCHEMAX* program, circuits may be described by either text net-lists or quick and convenient schematic entry. Documentation and proposal quality output to printers, plotters and files is standard.

Multiple windows with post-processing support design of couplers, multiplexers, differential phase shift networks, circuits with shared components and parameter extraction. 3D plots provide a powerful visualization tool for understanding circuit behavior.

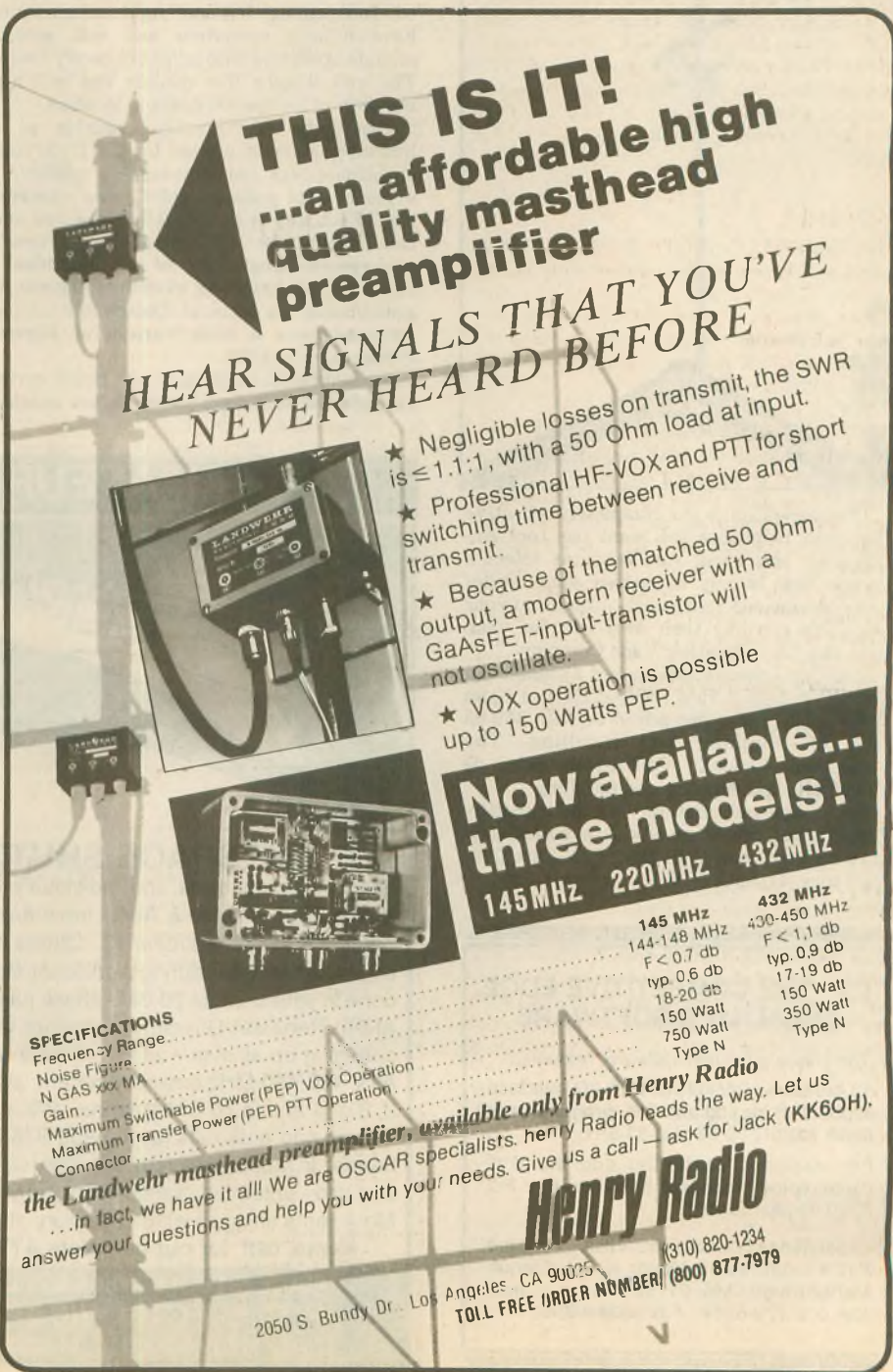
Version 4.0 includes over 2500 S-parameter data files for bipolar, FET, hybrid and MMIC devices from 11 manufacturers. Adding additional data is straightforward. Transmission line models have been verified by em simulation. Equations support user model definition.

Global noise analysis is supported for both active and passive circuits without any restriction on feedback or topology. Industry standard active device noise data is used. Special noise blocks are not required.

Available from stock. Simulator and schematic editor packages from \$695 to \$1390. Other engineering software available. Contact Eagleware: 404/939-0156; FAX 404/939-0157.

## ARRL Smith Chart simulation software

The ARRL *MicroSmith* version 2.00, for the IBM PC and compatible computers, and its accompanying 48-page user's guide were written by Wes Hayward, W7ZOI. The soft-



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		Type N

**SPECIFICATIONS**

Frequency Range.....  
Noise Figure.....  
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Gain.....  
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will be available from dealers who sell ARRL publications, or from ARRL Publication Sales, 225 Main Street, Newington CT 06111; 203/666-1541; FAX 203/665-1166. Available on 3 1/2 or 5 1/4 in. disks for the IBM PC or compatible computers only. Software and 48-page user's guide copyright 1992. Retail price \$39 (add \$3 shipping and handling; \$4 UPS).

## Ant-Ventures Stealthy

Ant-Ventures has just announced their new *Stealthy antenna*. This very effective antenna looks like, and indeed is, an attractive, functional weather vane that your XYL will actually like. Even other hams will have trouble finding your antenna.



This deception is so completely effective that your neighbors will want one too! Anticipating this need, Ant-Ventures offers a version that is only a weather vane. Order forms are included with each antenna so your neighbors can buy their own weather vane from the "A-V Weather Vane Company."

Stealthy Antenna models are available for 2M (WVA-146), 1.25M (WVA-223) and 70cm (WVA-446). These are priced at only \$59.95 plus \$5 shipping and handling. The "Neighbor Version" (WVA-NV) price is \$24.95 plus \$5 shipping and handling.

For more information on the Stealthy Antenna and other fine products, please send an SASE to: Ant-Ventures, P.O. Box 776, McHenry, IL 60051-0776.

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## CAL-AV Labs Keys

CAL-AV Labs, Inc. has introduced the Spirit series of dual "paddle" Morse keys, which incorporate advanced design and a new technology to eliminate contacts and all other moving parts.

Designed for optimum performance in a traditional operating environment, the Spirit provides familiar functionality very similar to a mechanical key. Its solid-state force sensors



activate when a given, preset force is exceeded. Independent left and right adjustments have infinite resolution and will accommodate operators with a light or heavy touch. The unit weighs five pounds and will not move from its desired desktop location.

The Spirit is currently available as a limited-production edition for the discerning enthusiast. Its uncompromising quality is evident in its polished, solid brass construction. Each key is individually serialized and can further be customized to a user's preferences: Engraving of an individual's name or call letters is available; chrome or gold plating are optional. Detachable cabling accommodates a wide variety of keyers. Prices start at \$380.

An additional offering in the Spirit series extends the advanced design to yet another

level. By incorporating an infra-red link that eliminates the cable, it gives new meaning to the phrase "wireless telegraphy." This is a dual link, which supports simultaneous transmission of dot and dash keying for iambic operation. A receiver, located within a few feet, connects to the station's electronic keyer.

CAL-AV Labs, Inc. has been a leader in advanced technology electronic systems since 1959. Its headquarters are located at 515-B Westchester Drive, Campbell, CA 95008.

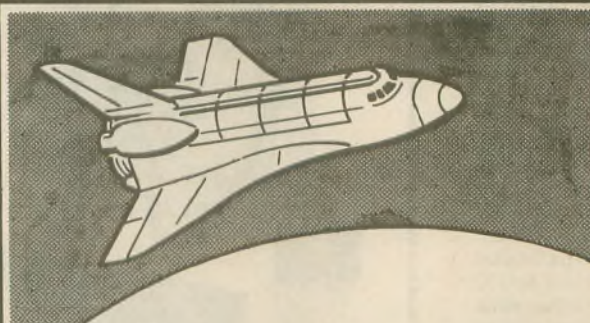
## LPS auto-disconnect

LPS Enterprises (LPS) has introduced a new line of Automatic Disconnect products. These products are designed to help protect electronic equipment from damage due to static discharges and voltage surges.

The Automatic Antenna Disconnect is a device designed to automatically disconnect an antenna when the transmitter or receiver is powered down, either by the operator or as a result of a power failure. The device automatically re-connects the antenna when power to the equipment is restored. The device is available with all types of RF connectors, and custom configurations are also offered. For the electronics hobbyist, a kit form is also available.

Additional automatic disconnect products are planned for introduction in 1993. For further information on these products, please contact Pete Nicholls, N4BHB, at LPS Enterprises, 308 Sterling Drive, Warner Robins, GA 31088; 912/929-9416.

## AMATEUR TELEVISION



### SEE THE SPACE SHUTTLE VIDEO

Many ATV repeaters and individuals are retransmitting Space Shuttle Video & Audio from their TVRO's tuned to Satcom F2-R transponder 13. Others may be retransmitting weather radar during significant storms. If it is being done in your area on 70 CM - check page 460 in the 93-94 ARRL Repeater Directory or call us, ATV repeaters are springing up all over - all you need is one of the TVC-4G ATV 420-450 MHz downconverters, add any TV set to ch 2, 3 or 4 and a 70 CM antenna. We also have downconverters and antennas for the 902-928 & 1240-1300 MHz bands. In fact we are your one stop for all your ATV needs and info - antennas, transceivers, transmitters, amps, etc. Most items shipped within 24 hours after you call.

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# When will AMSAT-OSCAR-13 be in range?

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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).

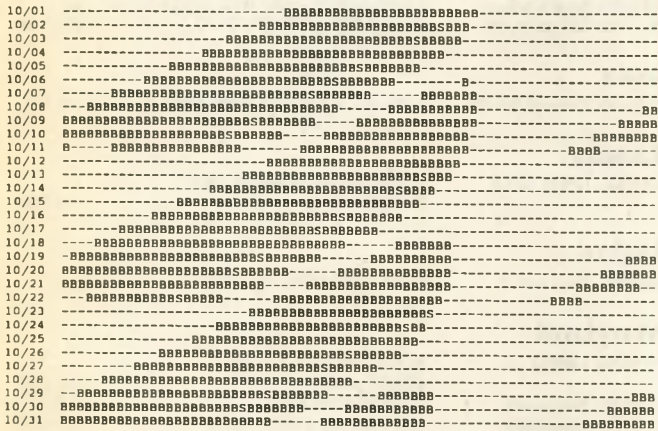
Remember, if a letter is printed on the chart, you should be able to hear OSCAR-13.

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

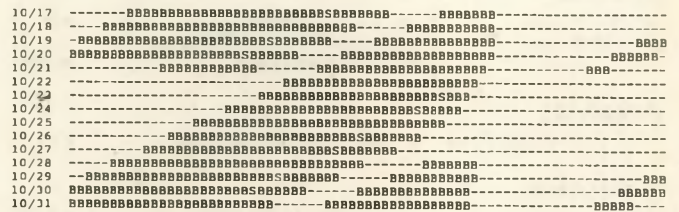
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24



### Station Mid

HOUR - UTC

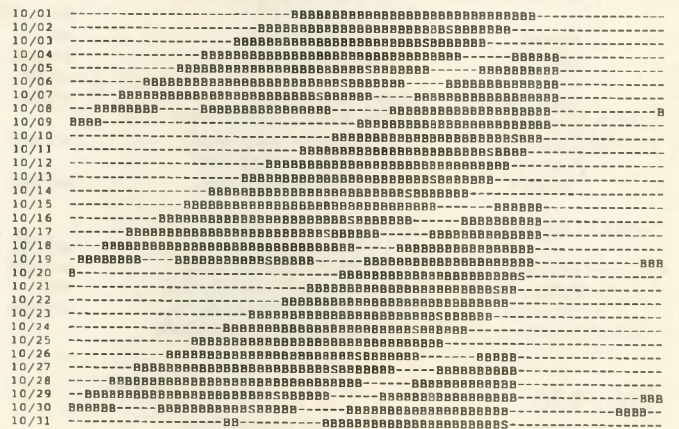
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24



### Station West

HOUR - UTC

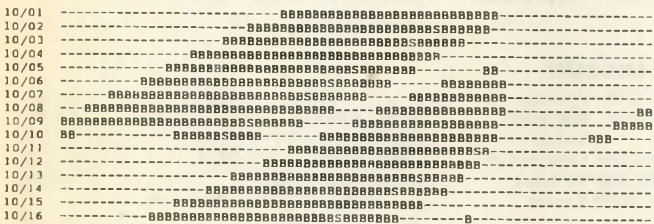
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24



### 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



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# VE exam schedules

As a service to our readers, Worldradio presents a feature listing those VE exams, times and locations which are sent to us. Please remember that our deadline for publication is three months in advance. For example, if your VE group is scheduling an exam for September, please have the information to us by mid June.

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
<b>Alabama</b>				<b>Indiana</b>			
10/9/93	Dothan	George, WA4MZL 205/793-4580	pr pref.	10/3/93	Terre Haute	K9EBK 812/466-2122	w/i OK
<b>Arizona</b>				10/8/93	Logansport	Bill, WA8HSU 219/722-1338	w/i OK
10/2/93	Tucson	Joe, K7OPX 602/886-7217	w/i	10/9/93	Hammond	Gerard, KE9I 219/845-8513	w/i
10/30/93	Tucson	Micki, AA7RR 602/883-8305 or 883-0202 after 11 a.m.	pr; w/i	10/12/93	New Carlisle	Jack, AA9BO 317/251-6000	p/r
<b>Arkansas</b>				10/20/93	Indianapolis		p/r only
10/16/93	Mountain Home	Gerald, WM5W 501/430-5123	p/r	<b>Iowa</b>			
<b>California</b>				10/30/93	Council Bluffs	Lorraine, AAØBS 712/322-1454	w/i OK
10/2/93	Los Angeles	Ali, AA6WC 213/778-6226	w/i OK	<b>Kansas</b>			
	Ontario	Harry, KM6LO 818/810-0442	w/i OK	10/7/93	Great Bend	WAØPSF 316/792-5363 days, 316/792-4249 eves	w/i OK
10/3/93	Sunnyvale	408/255-9000 24-hr.	w/i only	<b>Maine</b>			
10/9/93	Cottonwood	Christopher, N6WMF 916/347-0373	w/i OK	10/6/93	Brunswick	Steve, WZ1J 207/725-5155	
	Fontana	Rick Avery, KB6AVX, 829-8837, Laurence Pival, 8361 Nuevo Ave., #12, Fontana, CA 92335		<b>Maryland</b>			
	Manhattan Beach	Joe, WB6MYD 310/328-0817, Ed Hinz, KN6JN	p/r, w/i OK	10/16/93	Laurel	WB3GXW 301/572-5124 after 6 p.m.	p/r pref.
	Merced	W6XK 209/883-2968	w/i	10/21/93	Baltimore	410/426-8255 #3937	w/i OK
	San Pedro	N6DYZ 310/325-2965	p/r pref.; w/i ltd.	10/26/93	Annapolis	Ed, W3DEQ 410/647-0370	p/r pref.; w/i ltd.
	Santa Maria	KI6XG 805/922-8509	w/i OK	10/3/93	Landover	Freddie, NG3G 202/546-9348 or 301/773-2898	
10/9/93	San Jose	AA6IY, KG6XF 408/255-9000		<b>Minnesota</b>			
10/16/93	Culver City	Walt, KM6MQ 714/373-6077	w/i only	10/16/93	North Branch	Brad, NØMIN 612/629-6962 or 612/444-9814	
	Sacramento	Lyle, AA6DJ 916/483-3293		<b>Missouri</b>			
	Stockton	Ed, N6XMA 209/952-5996	w/i only	10/2/93	Antonia	Jim, WAØFQK 314/942-2268	no w/i
10/28/93	Long Beach	W6LRF 714/847-6370; N6LUH 310/592-1713	w/i OK	10/9/93	Big Bend	Gregg, KAØVWC, 314/567-8777	w/i ltd.
10/30/93	Fairfield	Jerry, AA6NO 916/662-0801	w/i only		Dutzow	Ed, WDØELL 314/459-6581	w/i ltd.
	Ridgecrest	Lloyd, WA6KZV 619/375-7245	w/i	10/14/93	Granite City	Larry, NZØP 314/524-3254	p/r pref.
	Vacaville	Irene, KK6XB 707/446-8376	w/i only	10/16/93	St. Louis	NØIS 314/892-4434	w/i OK
10/31/93	San Jose	AA6IY & KG6XF 408/255-9000		10/28/93	Seneca	Les, AAØGY 417/781-4331 (d), or 417/776-8420 (e)	w/i OK
<b>Colorado</b>				<b>New Jersey</b>			
10/9/93	Denver	Glenn, WØIJR 303/360-7293, 24-hr. message	w/i OK	10/9/93	Cranford	24-hr. hotline: 201/377-4790	
10/16/93	Westminster	AAØBZ 303/421-2795; NØHNR 303/278-4280	p/r or w/i	10/13/93	Fort Monmouth	MARS 908/532-5354	w/i
10/23/93	Pueblo	719/948-2291	w/i OK	10/16/93	Bayonne	Bob, N2IYY 201/435-5953	w/i OK
<b>Connecticut</b>				10/21/93	Bellmawr	WA2VQG 609/546-7710	w/i
10/27/93	Shelton	WJ1T 203/283-1044	w/i pref.	<b>New York</b>			
10/31/93	Milford	NB1M 203/933-5125; WA1YQE 203/874-1014	w/i	10/2/93	North Tonawanda	Vern, AA2AC 716/634-5276	p/r only
<b>Florida</b>				10/3/93	Yonkers	AC2V 914/237-5589	w/i OK
10/4/93	Dunedin	Marv, WC2G 813/938-7810	p/r or w/i	10/9/93	Albany	Bud, WF2B 518/283-2337	w/i OK
10/9/93	South Miami	Ross, AC4KZ 305/233-7462	w/i OK	10/12/93	Hicksville	Bob, W2ILP 516/953-7895	w/i only
10/16/93	Melbourne	WB9IVR 407/724-6183	w/i OK	10/16/93	Albion	Bob, WA2QDV 716/798-0976	w/i
10/26/93	New Port Richey	Marv, WC2G 813/938-7810	p/r or w/i	10/20/93	Lancaster	Chuck, WD2AIK 716/937-3592	p/r only
<b>Georgia</b>				10/30/93	Lockport	Judy, N2KJB, 716/751-9223;	p/r only
10/24/93	Sandy Springs	John, AB4GK 404/381-5291	w/i OK	<b>North Carolina</b>			
<b>Idaho</b>				10/10/93	Salisbury	Isabelle, AB4UX 704/284-2414	w/i OK
10/9/93	Boise	W7JMH 208/343-9153	w/i	<b>Ohio</b>			
<b>Illinois</b>				10/2/93	Cincinnati	Herb, WA8PBW 513/891-7556	w/i OK
10/9/93	Oak Forest	David, NF9N 708/448-9432	w/i	10/2/93	Mentor	Scott, KØ8O 216/256-0320	
10/16/93	Loves Park	Paul, WB9HGZ 815/987-6754	p/r; w/i	10/9/93	Van Wert	Bob, KA8IAF 419/795-5763	p/r only
10/19/93	Aurora	N9AKE 708/892-1252	w/i pref.	<b>Oklahoma</b>			
10/30/93	Alsip	Ron, K9FYG 708/597-2491	p/r; w/i	10/15/93	Pawhuska	KY5J 918/287-3517, WT5Z 918/287-3665	w/i OK

# Level of activity

(continued from page 22)

behooves an OIC or his/her designee to be tuned in closely to the community emergency services and to be aware of what is going on most of the time so he will know of any incident or threat that could or would use the services of their Amateur Radio operators — either “for real” or simply as a training vehicle.

It really can't be said often enough to volunteer groups: “More often than not, you have to request to be requested.” This goes hand in hand with: “Out of sight is out of mind.”

Government agencies don't see their “deputy communicators” day in and day out. More often than not they don't really understand what it is you do, why frequent usage or training of the volunteers is important or why the Amateur Radio emergency resource itself is important.

The OIC (or designees) monitors what is going on and what is scheduled in the future, actively looking for opportunities to serve. When the OIC identifies such an opportunity, he goes to his supervisor in the parent agency and requests permission for the unit to participate.


I have served on both sides of the fence over the years. As an OIC I have requested permission to respond to the incident or to participate in a support or training role. Quite often it required a selling job to educate the authorizing authority the benefits to be derived by both the participants and the sponsoring agency.

As an authorizing authority I have to weigh the benefits, the expected results and the hazards. As a rule I look for every reason to say “yes” and not an automatic turndown.

How does it work in your community, with your organization and your agencies?  
WR

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62 Scan Banks, 16 Search Banks, 35 Channels per second. Patented Computer control for logging and spectrum display. AM, NFM, WFM, & BFO for CW/SSB. Priority bank, delay/hold and selectable search increments. Permanent memory. DC or AC with adaptors. Mtng Brkt & Antenna included. Size: 2 1/4H x 5 5/8W x 6 1/2D. Wt. 1lb. Fax fact #305

**AR3000**  
\$1195.00  
400 Channels  
100KHz to 2036MHz



Patented computer control, top rated receiver in its class, offers AM, NFM Wide FM, LSB, USB, CW modes. RS232 control. 4 priority channels. Delay & hold & Freescan. AC/DC pwr cord and whip ant. Size: 3 1/7H x 5 2/5W x 7 7/8D. Wt 2lbs., 10oz. Fax fact document #105

**NEW AOR AR1500**  
\$499.00.



**Full Coverage with SSB and 1000 Channels.**

500KHz to 1300MHz. Ten scan banks, ten search banks. Search lock and store. BFO. 2 Antennas. AM/NFM/WFM. Selectable increments. Tons of features, small size: 5 7/8 x 1 1/2 x 2. Wt 14 oz. Fax fact document # 250

**Scanner with Shortwave**

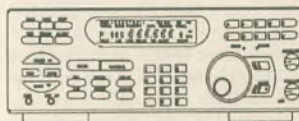


**Yupiter**  
8-1300MHz  
\$399.00



Top rated receivers from Japan now available in the USA. Tune down to 100KHz. Sensitivity guaranteed from 8MHz up. 200 scan channels. AM/NFM/WFM. Great intermod reject. Mobile is super slim line. AC/DC. Order MVT8000, includes antenna, mbl mnt. Order MVT7000 for the hand held. Complete with Ni-Cads, Charger, antenna & earphone. Fax fact document #275

**Continuous Coverage**



**Bearcat 2500XLTA hand held.....\$349.95**  
**Bearcat 8500XLTC mobile.....\$389.95**  
**Bearcat 890XLTB mobile.....\$259.95**  
25-1300MHz, 500 ch. in 8500, 400 in 2500. 890 has 200 ch & 29-956MHz. All call locked. Features include turbo scan, VFO, search and store, Priority, LCD display, and more. Fax Facts#74,475,476

**Mobile Scanners**

**Bearcat**  
760XLTM  
\$229.95  
100 Channel  
800 MHz



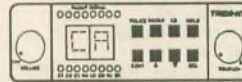
Five banks of 20 channels each. Covers 29-54, 118-174, 406-512 and 806-954MHz (with cell lock). Size: 4 3/8 x 6 15/16 x 1 5/8. Weight: 4.5lbs. Fax fact document #550

**Bearcat**  
560XLTZ  
\$99.95  
16 Channel  
10 Band



Compact, digital programmable unit covers 29-54, 136-174, and 406-512MHz. Size: 7 3/8 x 2 1/2 x 15/8. Wt: 2.5lbs. Fax fact #560

**Trident**  
TR-33WL  
\$399.00



**Scan/CB. X,K,Ka,Wide & Laser**  
Scans police pre-programmed by state channel plus full radar and laser alerts in one small unit. Weather, CB receive & mobile relay. Size: 5 5/8 x 4 7/8 x 1 3/4. Wt: 1.5lbs. Fax fact #580

**Shortwave Radios**

- Sangean ATS-818CS..... \$219.95
- Sangean ATS-818..... \$184.95
- Sangean ATS-803A..... \$169.95
- Sangean ATS-808..... \$179.95
- Sangean ATS-606..... \$149.95
- Sangean ATS-606P..... \$169.95
- Sangean ATS-800..... \$89.95

**Hand Held Scanners**

**Bearcat 200XLTN**  
\$209.95 200 Channels 800 MHz

Ten scan banks plus search. Covers 29-54, 118-174, 406-512 and 806 956MHz (with cell lock). Features scan, search, delay, 10 priorities, mem backup, lockout, WX search, keylock. Includes NiCad & Chrg. Size: 1 3/8 x 2 11/16 x 7 1/2. Wt. 32 oz. Fax Facts # 450



- Bearcat 100XLTN 100Ch H/L/U..... \$159.95**
- Bearcat 70XLTP 20Ch H/L/U..... \$139.95**
- Bearcat 55XLTR 10 Ch H/L/U..... \$ 99.95**

Coverage of above hand holds is: 29-54, 136-174, 406-512 except 100 which also adds 118-136 Air Band Fax facts #475

**Table Top Scanners**

- Bearcat 855XLTE 50Ch w/800..... \$159.95**
- Bearcat 142XLM 10Ch H/L/U..... \$ 84.95**
- Bearcat 147XLJ 16 Ch H/L/U..... \$ 89.95**
- Bearcat 172XM 20Ch H/L/U/Air..... \$124.95**
- Bearcat 210 16Ch H/L/U/Air..... \$129.95**

Coverage of above units is 29-54, 136-174, 406-512, plus Air in 172 and 210 and air plus 800MHz in the 855. Fax facts #675

**Bearcat**  
800XLX  
\$209.95



12 bands and 40 channels with 800MHz and nothing cut out. AC or DC. Fax facts #690

**Accessories & Etc.**

- Mag Mount Mobile Ant MA100..... \$ 19.95**
- Base Ant. 25-1000MHz AS300..... \$ 59.95**
- Pre-Amp .1-1500MHz GW2..... \$ 89.00**
- Downconverter 800 to 400 DC89..... \$ 89.00**
- Base Discone Ant DA300..... \$ 89.00**
- External Speaker MS190/opt. amp.... \$ 19.95**
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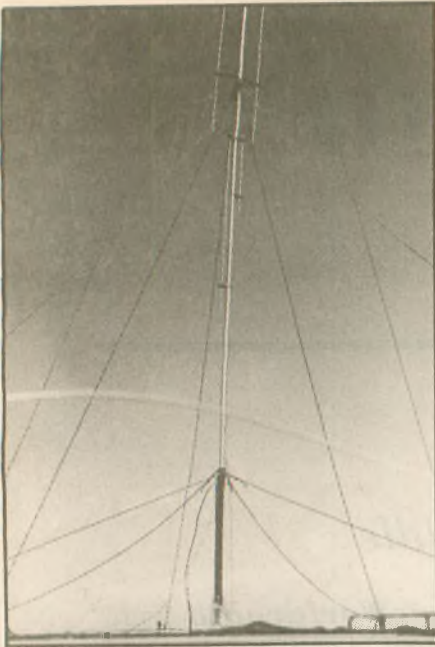
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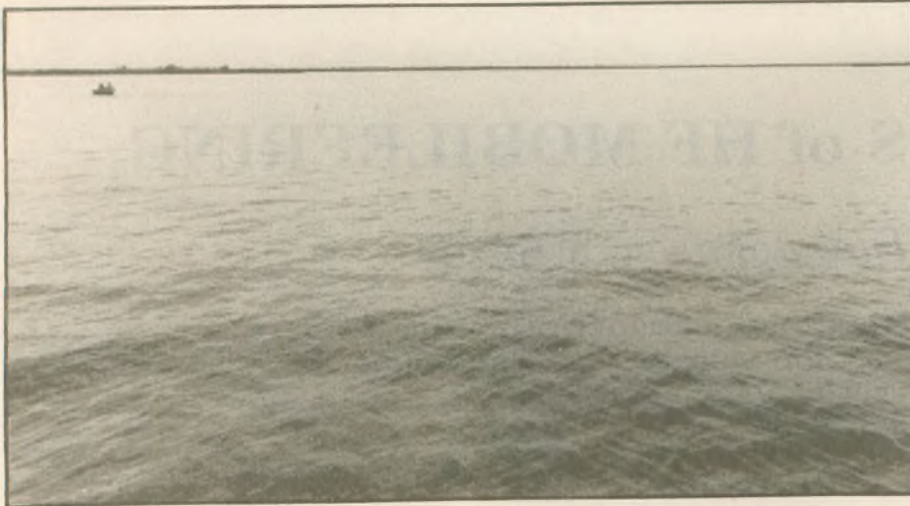


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Top left: The GAP antenna was mounted on the roof of the houseboat. Bottom: View from Field Day station N6WR. Above: During his off time, *Worldradio's* resident intellectual, the world-famous Norm Brooks, K6FO, does the *New York Times* Crossword Puzzle...in pen.

—Pictures by Armond Noble, N6WR



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